



无色光学玻璃
Colorless optical glass
無色光学ガラス

红外光学玻璃
Infrared optical glass
赤外光学ガラス

2025

前言

湖北新华光信息材料有限公司作为专业的光学材料制造商，本着“简单、务实、快乐”的管理理念，积极倡导和推进绿色生产，为客户提供高品质的光学材料、光学元件和光学镜头等产品和技术服务，也可以根据客户的特殊需求，提供新型光学玻璃材料的设计、开发与制作。目前能提供 180 多种光学玻璃的性能数据。与 2024 年手册相比，本手册新增了 6 个新产品。

本手册为最新版本，取代之前所有版本，最新数据文件请到公司网站(www.hbnhg.com)下载更新。

如果本手册中没有包含您需要的信息，请与营销人员联系，我们将一如既往地为您提供优质的服务。

湖北新华光信息材料有限公司

2025.7 修订

Preface はじめに

As a professional manufacturer in the field of optical glasses, Hubei New Huaguang Information Materials Co., Ltd. (NHG) actively advocates and promotes green production relying on the management philosophy of “Simple, Pragmatic, Happy”, and provides optical materials, optical elements, optical lens and other products as well as technical services of high quality for customers. NHG is able to design, develop and manufacture new types of optical glass materials according to customers’ special requirements. NHG currently provides the performance data of more than 180 kinds of optical glass. Comparing to the edition of Year 2024, the handbook adds six new products.

湖北新華光信息材料有限公司は光学ガラス専門メーカーとして、“簡単、**务实**、快乐”の管理理念で、生産のエコ化を主張し、積極的に推進しています。お客様に高質量な光学材料と技術的なサービスをご提供しております。特別なご要望に対しまして、新型な光学材料のデザイン、開発と溶解生産も取り扱っています。目前、180種類以上の光学ガラスの性能データを提供することができる。2024年のカタログに比べて、6種類の新製品が追加されます。

The current handbook is the latest edition, replacing all previous editions. The latest data files are available on our website: www.hbnhg.com.

本カタログは最新版で、最新のデータは当社のウェブサイトよりダウンロードすることができます(www.hbnhg.com)。ご利用ください。

If what you need is not included in this handbook, please contact with the salesman. We will, as always, provide excellent services for you.

本カタログに記載されていない項目をご希望の場合には、当社営業部門へご問い合わせください。これから、当社はいつもの通りで高品質の製品と良いサービスをご提供いたします。

Hubei New Huaguang Information Materials Co., Ltd.

湖北新華光信息材料有限公司

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2025.7 修訂

目 录

产品推荐.....	1
光学玻璃牌号对照表.....	9
低熔点玻璃牌号对照表.....	13
红外材料对照表.....	14
产品推荐表.....	15
说明-无色光学玻璃.....	17
1 分类和命名.....	17
2 光学性能.....	19
3 化学性能.....	29
4 热学性能.....	33
5 机械性能.....	35
6 玻璃质量指标.....	39
7 供货形式.....	43
说明-红外材料.....	45
1 分类和命名.....	45
2 光学性能.....	45
3 介电常数.....	49
4 其它指标.....	49
5 主要质量指标.....	49
6 供货形式.....	51
无色光学玻璃数据表.....	53
红外材料数据表.....	241

Contents 目次

Product recommendations 製品推奨	1
Comparison table of optical glass types 光学ガラスの対照表	9
Comparison table of low softening point glass types 非球面レンズ用ガラス	13
Comparison table of infrared materials 赤外ガラスのデータ表	14
Product recommendation list 推奨硝種表	15
Instructions for colorless optical glass 無色光学ガラスの説明	18
1 Classification and designation 種類と表示.....	18
2 Optical properties 光学的性質.....	20
3 Chemical properties 化学的性質.....	30
4 Thermal properties 熱的特性.....	34
5 Mechanical properties 機械的性質.....	36
6 Quality definition ガラスの品質.....	40
7 Forms of supply 製品区分.....	44
Instructions for infrared materials 赤外ガラスの説明	46
1 Classification and designation 種類と表示.....	46
2 Optical properties 光学の性質.....	46
3 Dielectric constant 誘電率.....	50
4 Others 他の指標.....	50
5 Main quality definition 主要な質量指標.....	50
6 Forms of supply 製品区分.....	52
Colorless optical glass data sheets 無色光学ガラスのデータ表	53
IR materials data sheets 赤外ガラスのデータ表	241

产品推荐
Product recommendations
製品推奨

※ 低色散、异常色散玻璃

Low dispersion, abnormal dispersion glass 低分散、異常分散ガラス

H-FK 系列 H-FK series H-FK シリーズ

该类玻璃具有极低的折射率温度系数、色散系数大，还具有较高的特殊相对部分色散，在光学系统设计中能有效解决温度漂移、消除二级光谱；且软化温度低，可用于精密模压，实现光学系统的小型化和轻量化。

The H-FK series glass has very low dn/dt coefficient, large dispersion coefficient and relatively high special relative partial dispersion. In optical design system, the H-FK series glass can be used to effectively solve the temperature shift and eliminate secondary spectrum. The H-FK series glass can be used for precision mould pressing to realize the miniaturization and lightweight of optical system due to the low softening points.

この種類のガラスはもっと低い屈折率温度係数、分散係数が大きく、もっと高い特殊な相対部分色散を有し、光学系設計において温度ドリフトを効果的に解決し、二次スペクトルを除去することができ、軟化温度が低く、精密プレスに用いることができ、光学システムの小型化と軽量化を実現する。

性能 Properties	H-FK61	H-FK69	H-FK76	H-FK90	H-FK95
n_d	1.49700	1.59282	1.55032	1.45860	1.43700
v_d	81.61	68.63	75.50	90.19	95.10
相对折射率温度系数 dn/dt_{rel} Temperature coefficient of refractive index (d 线, 20-40°C, $\times 10^{-6}/^\circ\text{C}$)	-6.0	-5.6	-5.8	-6.5	-6.4
相对部分色散 $P_{g,F}$ Relative partial dispersion	0.5386	0.5441	0.5392	0.5388	0.5332
异常色散 $\Delta P_{g,F}$ Abnormal dispersion	0.0305	0.0145	0.0210	0.0450	0.0475
转变温度 T_g Transformation temperature ($^\circ\text{C}$)	464	584	553	442	409
弛垂温度 T_s Sag temperature ($^\circ\text{C}$)	489	608	576	467	443
密度 ρ Density (g/cm^3)	3.67	4.07	4.13	3.64	3.56
耐候性 CR Climatic resistance	1	1	1	1	1
耐水性 Dw Water resistance	1	1	1	2	2
耐酸性 D_A Acid resistance	3	3	2	3	3
耐碱性 $ROH(S)$ Alkali resistance	2	2	2	4	4
耐洗涤性 $RP(S)$ Phosphate resistance	2	2	2	2	3
内部透过率 (τ 10mm) Internal Transmittance	460nm	0.998	0.998	0.998	0.997
	400nm	0.998	0.994	0.998	0.997
	360nm	0.975	0.909	0.978	0.988

H-PK 系列 H-PK series H-PK シリーズ

该类玻璃具有负的折射率温度系数、较大的色散系数和特殊的相对部分色散，与火石玻璃配合使用可以消除透镜的像差和色差，同时膨胀系数小、加工性能好。

The H-PK series glass has the negative dn/dt coefficient, large dispersion coefficient and special relative partial dispersion. The H-PK series glass can be used with flint glass to eliminate the aberration and chromatic aberration of the lens. The H-PK series glass also has the advantage of low expansion coefficient and good processability.

この種類のガラスは負の屈折率温度係数、大きな分散係数と特殊な相対部分分散を有し、フリントガラスと組み合わせて使用する場合、レンズの収差と色差を解消することができ、同時に膨張係数が小さく、加工性能が良い。

性能 Properties		H-PK60A	H-PK62A	H-PK63	H-PK65	H-PK71
n _d		1.59349	1.61800	1.60300	1.61997	1.56907
v _d		67.00	63.39	65.44	63.88	71.30
相对折射率温度系数 dn/dt _{rel.} Temperature coefficient of refractive index (d 线, 20-40℃, ×10 ⁻⁶ /℃)		-1.7	-2.4	-3.4	-2.9	-9.5
相对部分色散 P _{g,F} Relative partial dispersion		0.5374	0.5395	0.5372	0.5420	0.5450
异常色散 ΔP _{g,F} Abnormal dispersion		0.0051	0.0012	0.0023	0.0045	0.0199
膨胀系数 α _{-50/80℃} (×10 ⁻⁷ /K) Thermal expansion coefficient		92	94	93	103	126
转变温度 T _g Transformation temperature (℃)		511	616	604	568	483
弛垂温度 T _s Sag temperature (℃)		541	662	639	594	514
密度 ρ Density (g/cm ³)		3.16	3.53	3.64	3.52	4.27
磨耗度 F _A Abrasion		250	320	351	315	435
耐候性 CR Climatic resistance		1	1	1	1	1
内部透过率 (τ _{10mm}) Internal Transmittance	460nm	0.996	0.998	0.998	0.986	0.998
	400nm	0.993	0.990	0.988	0.967	0.998
	360nm	0.965	0.906	0.936	0.785	0.983

异常色散玻璃 Abnormal dispersion glass 異常分散ガラス

该类玻璃具有异常色散特性，与其它玻璃组合使用时，可有效消除色差、改善成像质量；还具备膨胀系数小、加工性能和化学稳定性优异等特性。

The abnormal dispersion glass exhibits anomalous dispersion characteristics. It can be used to eliminate the chromatic aberration and improve the image quality by using with the other glass. Additionally, this type of glass features a low thermal expansion coefficient, excellent processing performance, and superior chemical stability.

この種類のガラスは異常分散特性を有し、他のガラスと組み合わせて使用する場合、色収差を効果的に解消し、結像品質を改善することができて、膨張係数が小さい、加工性能と化学安定性に優れるなどの特性を備える。

性能 Properties		H-TF3L	H-ZBaF65	H-ZF56	H-ZLaF86
n_d		1.61340	1.65412	1.85478	1.88252
v_d		44.11	39.68	24.80	27.00
相对折射率温度系数 dn/dt_{rel} Temperature coefficient of refractive index (d 线, 20-40℃, $\times 10^{-6}/^\circ\text{C}$)		5.1	3.6	2.9	3.2
相对部分色散 $P_{g,F}$ Relative partial dispersion		0.5623	0.5727	0.6119	0.6125
异常色散 $\Delta P_{g,F}$ Abnormal dispersion		-0.0080	-0.0050	0.0094	0.0137
膨胀系数 $\alpha_{50/80^\circ\text{C}}$ ($\times 10^{-7}/\text{K}$) Thermal expansion coefficient		62	74	76	70
转变温度 T_g Transformation temperature ($^\circ\text{C}$)		579	609	585	717
弛垂温度 T_s Sag temperature ($^\circ\text{C}$)		623	665	623	762
密度 ρ Density (g/cm^3)		2.84	3.01	3.49	4.05
硬度 HK Hardness (10^7Pa)		575	565	572	608
磨耗度 F_A Abrasion		111	141	201	94
耐水性 D_w Water resistance		1	1	1	1
耐酸性 D_A Acid resistance		1	1	1	1
耐碱性 $R_{OH}(S)$ Alkali resistance		1	1	1	1
耐洗涤性 $RP(S)$ Phosphate resistance		1	1	1	2
内部透过率 ($\tau_{10\text{mm}}$) Internal Transmittance	460nm	0.992	0.994	0.967	0.929
	400nm	0.980	0.983	0.862	0.647
	360nm	0.899	0.813	0.131	/

※ 高折射率玻璃

High refractive index glass 高屈折率ガラス

H-××GT 系列玻璃，经工艺优化实现蓝紫光谱区的透过率显著提升，同时保持其他性能指标不变。H-BiF200 玻璃，折射率超过 2.0，可支持大视场角光学设计，助力系统小型化，适用于智能终端、车载光学等高精度光学系统，并在医疗影像、光通信等领域具有应用潜力。

Through process optimization, the H-××GT glass series achieves significantly enhanced transmittance in the blue-violet spectral range while maintaining all other performance parameters.

The H-BiF200 material, with its ultra-high refractive index exceeding 2.0, supports wide-field-of-view optical designs and compact integration. This breakthrough solution is engineered for high-precision optical applications including smart terminals, automotive optics, as well as demonstrating potential in medical imaging and optical communication systems.

H-××GT シリーズのガラスは溶解条件の最適化によって、青紫光スペクトル域における透過率を著しく向上した硝材です。その他の特性を維持します。H-BiF200 硝材は 2.0 を超えた超高屈折率特性を有し、広視野角光学設計を実現するので、システムの小型化を促進します。スマート端末や車載光学などの高精度光学システムに適用可能であり、医療画像や光通信などの分野での応用ポテンシャルを有しています。

性能 Properties		H-ZF62GT	H-ZF72GT	H-ZF75GT	H-ZLaF70GT	H-ZLaF80A	H-ZLaF82GT	H-BiF200
n_d		1.92286	1.92286	1.94595	1.90366	2.00069	2.00100	2.00272
v_d		20.88	18.90	17.98	31.32	25.46	29.14	19.32
相对折射率温度系数 dn/dt_{rel} Temperature coefficient of refractive index (d 线, 20-40℃, $\times 10^{-6}/^\circ\text{C}$)		1.9	2.4	3.5	4.2	4.2	4.3	7.8
异常色散 $\Delta P_{g,F}$ Abnormal dispersion		0.0284	0.0377	0.0412	0.0031	0.0146	0.0045	0.0304
膨胀系数 $\alpha_{50/80^\circ\text{C}}$ ($\times 10^{-7}/\text{K}$) Thermal expansion coefficient		61	65	54	66	73	70	75
转变温度 T_g Transformation temperature ($^\circ\text{C}$)		690	656	682	679	700	725	519
密度 ρ Density (g/cm^3)		3.93	3.57	3.53	4.54	4.76	5.02	5.10
硬度 HK Hardness (10^7Pa)		485	488	510	640	630	720	403
耐水性 D_w Water resistance		1	1	1	1	1	1	1
耐酸性 D_A Acid resistance		1	1	1	2	1	1	1
内部透过率 Internal Transmittance (10mm)	460nm	0.965	0.949	0.946	0.975	0.922	0.969	0.838
	400nm	0.700	0.450	0.365	0.886	0.636	0.850	0.038

※ 负折射率温度系数玻璃

Negative thermal coefficient of refractive index glass 負の屈折率温度係数ガラス

H-LaK9 具有与 H-LaK6 相近的折射率和阿贝数，H-ZF52B 具有与 H-ZF52N 相同的折射率和阿贝数，且 H-LaK9、H-ZF52B 均具有负的折射率温度系数，H-ZF53 的折射率温度系数更负 ($dn/dt < -3 \times 10^{-6}/^{\circ}\text{C}$)。该类玻璃与正折射率温度系数的玻璃搭配使用，可抵消焦距漂移、提升温度稳定性，还能减少热应力与形变风险，并扩展设计自由度，平衡热性能和其它参数。

H-LaK9 has a refractive index and Abbe number similar to H-LaK6. H-ZF52B has the same refractive index and Abbe number as H-ZF52N. Moreover, both H-LaK9 and H-ZF52B have negative refractive index temperature coefficients. H-ZF53 exhibits an even more pronounced negative temperature coefficient ($dn/dt < -3 \times 10^{-6}/^{\circ}\text{C}$). When paired with glass materials possessing a positive refractive index temperature coefficient, these glasses effectively neutralize focal length drift, enhance thermal stability, reduce risks of thermal stress and deformation, and expand design flexibility, balance thermal performance with other optical parameters.

H-LaK9 は H-LaK6 と近い屈折率とアッペ数を持っています。H-ZF52B は H-ZF52N と同じ屈折率とアッペ数を持っています。さらに、H-LaK9 と H-ZF52B はどちらも負の屈折率温度係数を持っています。H-ZF53 はさらに大きな負の温度係数 ($dn/dt < -3 \times 10^{-6}/^{\circ}\text{C}$) の硝材です。正の屈折率温度係数を有するガラスと組み合わせることで、焦点距離のドリフトを相殺し、温度安定性を向上させて、熱応力や変形リスクを低減することになり、設計自由度を拡大し、熱性能のバランスを最適化できます。

性能 Properties		H-LaK6	H-LaK9	H-ZF52N	H-ZF52B	H-ZF7L	H-ZF53
n _d		1.69350	1.69930	1.84666	1.84666	1.80518	1.80810
v _d		53.31	51.11	23.78	23.78	25.46	22.70
相对折射率温度系数 dn/dt _{rel.} Temperature coefficient of refractive index (d 线, 20-40℃, ×10 ⁻⁶ /℃)		5.4	-1.5	1.0	-1.5	1.0	-3.4
相对部分色散 P _{g,F} Relative partial dispersion		0.5450	0.5569	0.6195	0.6277	0.6156	0.6244
膨胀系数 α _{-50/80℃} (×10 ⁻⁷ /K) Thermal expansion coefficient		51	85	83	83	88	93
转变温度 Tg Transformation temperature (℃)		646	654	632	551	606	554
弛垂温度 Ts Sag temperature (℃)		674	695	662	591	636	590
密度 ρ Density (g/cm ³)		3.57	4.26	3.54	3.71	3.38	3.32
耐水性 Dw Water resistance		1	2	1	1	1	1
耐酸性 DA Acid resistance		3	3	1	1	1	1
内部透射率 Internal Transmittance (10mm)	460nm	0.998	0.983	0.971	0.937	0.979	0.960
	400nm	0.985	0.964	0.830	0.704	0.894	0.819

※ 高强度、高信赖性玻璃

High strength, high reliability glass 高強度・高信頼性ガラス

机械强度高、耐热冲击强度高，化学稳定性好，透过率高，深受客户欢迎，能够有效满足高性能光学系统的设计需求。

This kind of glass has high mechanical strength, high thermal shock strength, good chemical stability, high transmittance, and are well received by customers, effectively meeting the design needs of high performance optical systems.

耐機械強度、耐熱衝撃強度が高く、優れた化学安定性、高い透過率があり、顧客の高性能光学システムの設計ニーズを効果的に満たすことができます。

性能 Properties	H-LaK77	H-ZLaF50C	H-ZLaF55F	H-ZLaF72	H-ZLaF72A
n_d	1.77536	1.80400	1.83481	1.91082	1.91082
ν_d	50.32	46.58	42.72	35.25	35.25
膨胀系数 $\alpha_{-50/80^\circ\text{C}}$ ($\times 10^{-7}/\text{K}$) Thermal expansion coefficient	62	64	68	67	68
转变温度 T_g Transformation temperature ($^\circ\text{C}$)	699	694	711	707	714
弛垂温度 T_s Sag temperature ($^\circ\text{C}$)	714	721	739	763	760
密度 ρ Density (g/cm^3)	4.35	4.49	4.66	4.88	4.82
硬度 HK Hardness (10^7Pa)	728	712	679	663	676
磨耗度 F_A Abrasion	115	116	69	74	67
杨氏模量 E Young's modulus (GPa)	108.0	122.0	121.8	127.8	125.6
剪切模量 G Shear modulus (GPa)	41.6	47.0	45.1	48.0	48.0
泊松比 μ Poisson ratio	0.297	0.299	0.349	0.333	0.304
耐水性 D_w Water resistance	1	1	1	1	1
耐酸性 D_A Acid resistance	3	3	3	1	1
耐碱性 $R_{OH}(S)$ Alkali resistance	1	1	1	1	1
耐洗涤性 Phosphate resistance $RP(S)$	2	1	1	1	1
内部透过率 ($\tau_{10\text{mm}}$) Internal Transmittance	460nm	0.992	0.994	0.990	0.948
	400nm	0.982	0.975	0.957	0.837
	360nm	0.903	0.808	0.801	0.261

※ 光波导用玻璃材料

Glass material for wave guides ウェイブガイド用ガラス素材

NHG 可提供折射率 1.8~2.0 范围内，最大规格 12 寸的多款适合光波导用的玻璃材料，该类材料具有较高的透过率、相对较低的密度和优异的化学稳定性等。特别是 H-ZLaF82GT 产品折射率高达 2.001，在高折射率的 H-ZLaF 系列中，是透过率最高的玻璃材料，在光学设计中可以提高视场角，蓝波区域光损失少，可用于各种领域，如波导基材。

NHG can provide a variety of glass materials for optical waveguide application whose refractive index ranges from 1.8-2.0 while the maximum size is 12 inches. The material has the relatively high transmittance, relatively low density and excellent chemical stability. H-ZLaF82GT glass material has the highest refractive index 2.001 among the high refractive H-ZLaF series glass. The H-ZLaF series glass material can be used to increase FOV in optical design. The light loss in blue wave region is low. This kind of glass material can be used in various fields such as waveguide substrate.

NHG は屈折率 1.8 ~ 2.0 の範囲内で、最大規格 12 寸の複数の光導波路用ガラス材料を提供することができ、このような材料は高透過率、もっと低い密度、優れた化学安定性などを持っている。特に H-ZLaF 82GT の屈折率は 2.001 に達し、高屈折率の H-ZLaF シリーズの中で、透過率が一番高いガラス材料であり、光学設計において視野角を高めることができ、青波領域の光損失が少なく、導波路基材などの様々な分野に広く応用できる。

性能 Properties		H-ZF7LGT	H-ZLaF79	H-ZLaF80A	H-ZLaF82GT
n_d		1.80518	1.92119	2.00069	2.00100
v_d		25.46	23.96	25.46	29.14
杨氏模量 Young's modulus	E (GPa)	93.6	114.7	123.5	133.7
剪切模量 Shear modulus	G (GPa)	36.1	44.6	46.3	50.0
泊松比 Poisson ratio	μ	0.296	0.285	0.355	0.338
密度 Density	ρ (g/cm ³)	3.38	3.86	4.76	5.02
硬度 Hardness	HK (10 ⁷ Pa)	523	626	630	720
磨损度 Abrasion	F _A	186	96	78	61
膨胀系数 Expansion coefficient	$\alpha_{-50/80^\circ\text{C}}$ (10 ⁻⁷ /K)	88	74	73	70
转变温度 Transformation temperature	T _g (°C)	606	661	700	725
耐水性 Water resistance	D _w	1	1	1	1
耐酸性 Acid resistance	D _A	1	1	1	1
内部透过率 Internal Transmittance (τ 10mm)	480nm	0.983	0.937	0.946	0.979
	460nm	0.980	0.914	0.922	0.969
	420nm	0.953	0.788	0.801	0.919
	400nm	0.904	0.627	0.636	0.850

※ 低熔点玻璃系列产品

Low softening point glass series 非球面用ガラス推奨硝種

低熔点玻璃目前能提供 27 个玻璃品种的批量供货。

At present, 27 types of low softening point glass are available in volume.

目前、27 種類の非球面用ガラスを量産的に出荷できます。

低熔点玻璃材料的折射率和阿贝数通常按照-30℃/H 达到标准值进行控制，也可按照-4℃/H 控制，允许波动范围： $n_d \pm 0.00050$ ， $v_d \pm 0.5\%$ 。

The refractive index and Abbe number of low melting point glass materials are usually controlled according to the standard value of -30℃/H, and can also be controlled according to -4℃/H, and the allowable ranges are: $n_d \pm 0.00050$, $v_d \pm 0.5\%$.

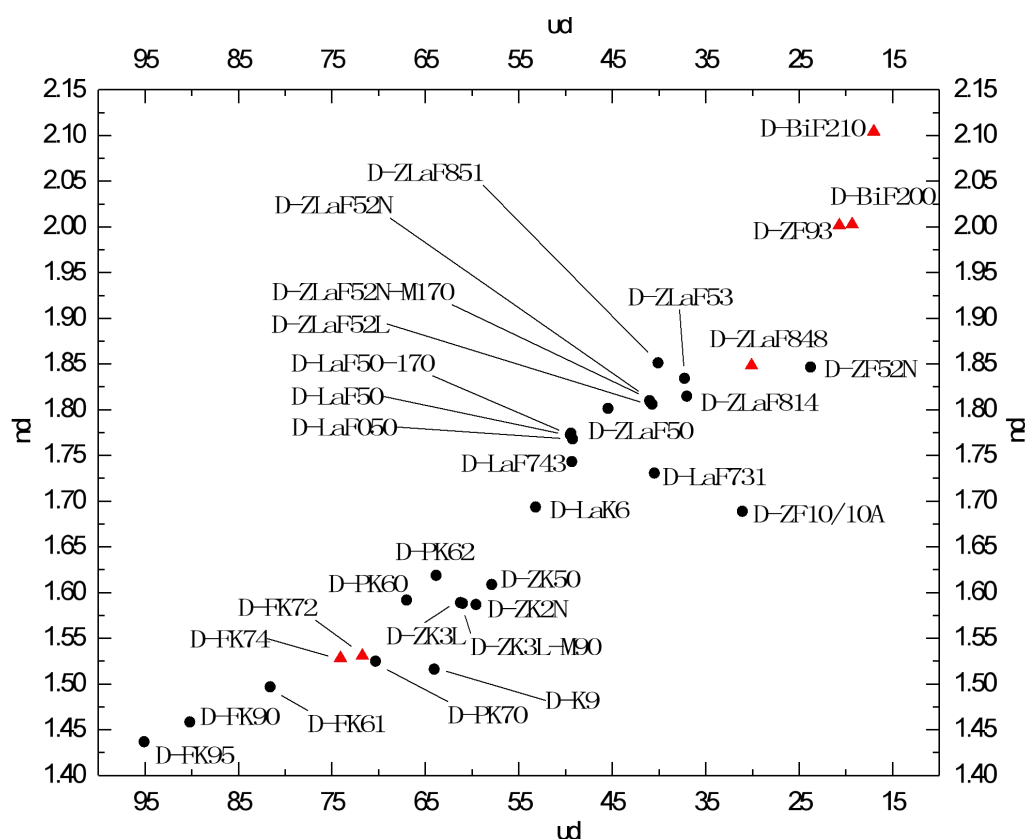
新華光の非球面用ガラスはガラス移転点温度付近から-30℃/H 或いは-4℃/H でアニールしたときに本カタログ基準値及び規格公差内であることを保証するものです。公差は $n_d \pm 0.00050$ ， $v_d \pm 0.5\%$ です。

可提供-60~160℃每隔 20℃的折射率温度系数、-50~160℃每隔 10℃的膨胀系数、模压前后折射率对照表、不同降温速率下折射率参考表等。并可根据客户需求，提供非球面精密模压技术支持。

We can provide temperature coefficients of refractive indices every 20℃ from -60℃ to 160℃, thermal expansion coefficients of every 10℃ from -50℃ to 160℃, comparison table of refractive indices before and after precision molding, reference table of refractive indices at different cooling rates, etc. We can also provide technical support of aspheric precision molding according to customers' demands.

-60~160℃の温度範囲に 20℃毎の屈折率温度係数、-50~160℃の温度範囲に 10℃毎の膨脹係数、モールドプレス前後の屈折率対照、冷却速度に対する屈折率の変化量などのデータが提供できます。お客様のニーズに対して、非球面レンズのモールドプレス条件など、技術的なサポートも可能です。

低熔点玻璃推荐牌号 Low softening point glass series 非球面用ガラス推奨硝種



光学玻璃牌号对照表
Comparison table of optical glass types 光学ガラスの对照表

代码 Code	牌号/ Type					页码 Page
	NHG	OHARA	CDGM	HOYA	SCHOTT	
497816	H-FK61	S-FPL51	H-FK61B	FCD1	N-PK52A	54
593686	H-FK69	(S-FPM2)	H-ZPK5	FCD515		55
550755	H-FK76		H-FK55	FCD705		56
459902	H-FK90		(H-FK71)	FCD10A	(N-FK58)	57
437951	H-FK95	(S-FPL53)	(H-FK95N)	FCD100		58
487704	H-QK3L	S-FSL5	H-QK3L	FC5	N-FK5	59
593670	H-PK60	(S-FPM2)	H-ZPK3	PCD51		60
593670	H-PK60A	(S-FPM2)	H-ZPK3	PCD51		61
618634	H-PK62A	S-PHM52	H-ZPK1A	PCD4	N-PSK53A	62
603654	H-PK63	S-PHM53	H-ZPK2A			63
620639	H-PK65	(S-PHM52)	(H-ZPK1A)	PCD40	(N-PSK53A)	64
569713	H-PK71		H-ZPK7	(FCD615)		65
511605	H-K6		H-K6		K7	66
517642	H-K9L	S-BSL7	H-K9L	BSC7	N-BK7	67
518590	H-K10	S-NSL3	H-K10	E-C3	(N-K5)	68
534555	H-K12		H-K12			69
523586	H-K51	(S-NSL3)	H-K51	(E-C3)	(N-K5)	70
540597	H-BaK2	S-BAL12	H-BaK2		N-BAK2	71
569560	H-BaK7B	S-BAL14	H-BaK7	BAC4	N-BAK4	72
573575	H-BaK8		H-BaK8		N-BAK1	73
589613	H-ZK3A	S-BAL35	H-ZK3A	BACD5	N-SK5	74
613586	H-ZK6		H-ZK6	BACD4	N-SK4	75
613606	H-ZK7		H-ZK7A			76
620603	H-ZK9A	S-BSM16	H-ZK9A	BACD16	N-SK16	77
622567	H-ZK10	(S-BSM10)	H-ZK10	(E-BACD10)	(N-SK10)	78
623570	H-ZK10N	S-BSM10	H-ZK10L	E-BACD10	N-SK10	79
639555	H-ZK11	S-BSM18	H-ZK11	BACD18		80
603606	H-ZK14	S-BSM14	H-ZK14	BACD14	N-SK14	81
617539	H-ZK20		H-ZK20			82
623581	H-ZK21	S-BSM15	H-ZK21	BACD15	N-SK15	83
607567	H-ZK50	S-BSM2	H-ZK50	BACD2	N-SK2	84
660574	H-LaK1		H-LaK1			85
691547	H-LaK2	S-LAL9	H-LaK59A	LAC9	N-LAK9	86
692545	H-LaK2H	(S-LAL9)	H-LaK2A	(LAC9)	(N-LAK9)	87
747510	H-LaK3	(S-LAM60)	H-LaK3		(N-LAK28)	88
640602	H-LaK4L	S-BSM81	H-LaK4L	LACL60	N-LAK21	89
678555	H-LaK5A	S-LAL12Q	H-LaK5A	LAC12	N-LAK12	90
694533	H-LaK6	L-LAL13	H-LaK6A	LAC13		91
713539	H-LaK7	S-LAL8	H-LaK7A	LAC8	N-LAK8	92
720503	H-LaK8A	S-LAL10	H-LaK8A	LAC10	N-LAK10	93
720503	H-LaK8B	S-LAL10	H-LaK8B	LAC10	N-LAK10	94
699511	H-LaK9	S-LAL20				95
651559	H-LaK10	S-LAL54Q	H-LaK10		N-LAK22	96
651562	H-LaK11	S-LAL54Q	H-LaK10		N-LAK22	97

代码 Code	牌号/ Type					页码 Page
	NHG	OHARA	CDGM	HOYA	SCHOTT	
697562	H-LaK12	(S-LAL14)	H-LaK12		(N-LAK14)	98
652584	H-LaK50A	S-LAL7Q	H-LaK50A	LAC7	N-LAK7	99
697555	H-LaK51	S-LAL14	H-LaK51A	LAC14	N-LAK14	100
697555	H-LaK51A	S-LAL14	H-LaK51A	LAC14	N-LAK14	101
729547	H-LaK52	S-LAL18	H-LaK52	TAC8	N-LAK34	102
755523	H-LaK53A	S-LAH97	H-LaK53A	TAC6	N-LAK33B	103
755523	H-LaK53B	S-LAH97	H-LaK53B	TAC6L	N-LAK33B	104
734511	H-LaK54	S-LAL59	H-LaK54	TAC4		105
741527	H-LaK61	S-LAL61	H-LaK61	TAC2		106
678507	H-LaK68					107
775503	H-LaK77	(S-LAH66)		(TAF1)	(N-LAF34)	108
517522	H-KF6	S-NSL36	H-KF6	E-CF6		109
596392	H-QF14		H-QF14	E-F8		110
581409	H-QF50	S-TIL25	H-QF50A	E-FL5	LF5	111
603380	H-F1	S-TIM5	H-F1	E-F5	F5	112
620364	H-F4	S-TIM2	H-F4	E-F2	N-F2	113
626357	H-F13		H-F13	E-F1		114
648338	H-ZF1B		H-ZF1A	E-FD2	N-SF2	115
673322	H-ZF2	S-TIM25	H-ZF2	E-FD5	N-SF5	116
717295	H-ZF3	S-TIH1	H-ZF3	E-FD1L	N-SF1	117
728283	H-ZF4A	S-TIH10	H-ZF4A	E-FD10L	N-SF10	118
728283	H-ZF4AGT		H-ZF4AGT			119
740283	H-ZF5	S-TIH3	H-ZF5	(E-FD13)		120
740283	H-ZF5GT					121
755275	H-ZF6	S-TIH4	H-ZF6	E-FD4L	N-SF4	122
755275	H-ZF6GT					123
805255	H-ZF7L	S-TIH6	H-ZF7LA	FD60	N-SF6	124
805255	H-ZF7LGT		H-ZF7LAGT	FD60-W	N-SF6HTultra	125
689312	H-ZF10	S-TIM28	H-ZF10	E-FD8	N-SF8	126
699301	H-ZF11	S-TIM35	H-ZF11	E-FD15L	N-SF15	127
762266	H-ZF12	S-TIH14	H-ZF12	FD140	N-SF14	128
762266	H-ZF12GT					129
785257	H-ZF13	S-TIH11	H-ZF13		N-SF11	130
785257	H-ZF13GT		H-ZF13GT			131
741278	H-ZF50	S-TIH13	H-ZF50	E-FD13		132
741278	H-ZF50GT					133
847238	H-ZF52N	S-TIH53W	H-ZF52GT	FDS90-SG	N-SF57HT	134
847238	H-ZF52NGT	S-TIH53W	H-ZF52TT	FDS90-SG	N-SF57HTultra	135
847238	H-ZF52B					136
808227	H-ZF53	S-NPH1	H-ZF71	FD225		137
855248	H-ZF56	S-NBH56		NBFD25		138
923209	H-ZF62		H-ZF62	E-FDS1	N-SF66	139
923209	H-ZF62GT		H-ZF62GT	E-FDS1-W		140
923189	H-ZF72B	S-NPH2	H-ZF72A			141
923189	H-ZF72GT		H-ZF72AGT			142
946180	H-ZF75A		H-ZF88	FDS18		143

代码 Code	牌号/ Type					页码 Page
	NHG	OHARA	CDGM	HOYA	SCHOTT	
946180	H-ZF75GT		H-ZF88GT	FDS18-W		144
959175	H-ZF76	S-NPH3	H-ZF73			145
613441	H-TF3L	S-NBM51	H-TF3L	E-ADF10	N-KZFS4	146
657511	H-ZBaF3	(S-BSM25)	H-ZBaF3	(BACED5)	(N-SSK5)	147
671473	H-ZBaF5		H-ZBaF5	(BAF10)	(N-BAF10)	148
618498	H-ZBaF10	S-BSM28			N-SSK8	149
667484	H-ZBaF16A	S-BAH11	H-ZBaF16	BAF11		150
702412	H-ZBaF20	S-BAH27	H-ZBaF20	BAFD7	(N-BASF64)	151
723380	H-ZBaF21	S-BAH28	H-ZBaF21	BAFD8		152
658509	H-ZBaF50	S-BSM25	H-ZBaF50	BACED5	N-SSK5	153
670472	H-ZBaF52		H-ZBaF52	BAF10	N-BAF10	154
654397	H-ZBaF65	S-NBH5	H-TF5	E-ADF50	N-KZFS5	155
694492	H-LaF1	(S-LAL58)	H-LaF1			156
717479	H-LaF2A	S-LAM3	H-LaF2	LAF3	N-LAF3	157
744449	H-LaF3B	S-LAM2	H-LaF3B	LAF2	N-LAF2	158
744449	H-LaF3C	S-LAM2	H-LaF3B	LAF2	N-LAF2	159
750350	H-LaF4A	S-LAM7	H-LaF4	E-LAF7	N-LAF7	160
757477	H-LaF6LB		H-LaF6LA			161
782371	H-LaF7		H-LaF7			162
788475	H-LaF10A	S-LAH64	H-LaF10LA	TAF4	N-LAF21	163
773496	H-LaF50B	S-LAH66	H-LaF50B	TAF1	N-LAF34	164
700481	H-LaF51		H-LaF51			165
786442	H-LaF52	S-LAH51	H-LaF52	NBFD11	N-LAF33	166
743492	H-LaF53	S-LAM60	H-LaF53	NBF1	N-LAF35	167
800423	H-LaF54	S-LAH52	H-LaF54	NBFD12	N-LAF36	168
750353	H-LaF55	S-NBH51				169
800422	H-LaF56	S-LAH52Q		NBFD12		170
720437	H-LaF62		H-LaF62			171
720460	H-LaF72			(LAF3)		172
762401	H-LaF76	S-LAM55	H-LaF55			173
802443	H-ZLaF1		H-ZLaF1			174
803468	H-ZLaF2	(S-LAH65V)	H-ZLaF2A	(TAF3)	(N-LASF44)	175
855366	H-ZLaF3		H-ZLaF3			176
804466	H-ZLaF50	S-LAH65V	H-ZLaF50E	TAF3D	N-LASF44	177
804466	H-ZLaF50C	S-LAH65V	H-ZLaF50E	TAF3D	N-LASF44	178
805396	H-ZLaF51	S-LAH63Q	H-ZLaF51	NBFD3	(N-LASF43)	179
806410	H-ZLaF52	S-LAH53	H-ZLaF52A	NBFD13	N-LASF43	180
834373	H-ZLaF53	S-LAH60	H-ZLaF53B	NBFD10	N-LASF40	181
816466	H-ZLaF54	S-LAH59	H-ZLaF69	TAF5		182
816466	H-ZLaF54A	S-LAH59	H-ZLaF69A	TAF5		183
835427	H-ZLaF55F	S-LAH55V	H-ZLaF55D	TAFD5G	N-LASF41	184
806333	H-ZLaF56B		H-ZLaF56B	NBFD15		185
800298	H-ZLaF57	S-NBH55				186
852408	H-ZLaF59	S-LAH89				187
850323	H-ZLaF60GT		H-ZLaF71AGT		N-LASF9HT	188
850323	H-ZLaF60A	S-LAH71	H-ZLaF71		N-LASF9	189

低熔点玻璃牌号对照表

Comparison table of low softening point glass types 非球面レンズ用ガラス

[illegible]

(): 附近牌号, Δn_d 超过 ± 0.00050 或 Δv_d 超过 ± 0.5 ;

(): Nearby types, Δn_d exceeds ± 0.00050 or Δv_d exceeds ± 0.5 ;

() : 近傍牌号, 他社材との n_d の差が 0.00050 以上、または他社材との v_d の差が 0.5 以上 ;

红外光学玻璃牌号对照表
Comparison table of infrared glass types 赤外ガラスの对照表

牌号 Type						页码 Page
NHG	VITRON	SCHOTT	UMICORE	PIKE	CDGM	
IRG201	IG2	IRG22		AMTIR-1	HWS3	243
IRG202			GASIR-1		HWS4	244
IRG203			GASIR-2		HWS2	245
IRG204						246
IRG205	IG5	IRG25		AMTIR-3	HWS1	247
IRG206	IG6	IRG26	GASIR-5	AMTIR-2	HWS6	248
IRG207	IG4	IRG24			HWS5	249
IRG208		IRG27			HWS27	250
IRG209						251

产品推荐表
Recommended products
推奨硝種表

重点推荐牌号：性能优异、存量充裕，可适时满足供货的牌号

Excellent recommended types: Glass types which have good performances and adequate stocks, and the demand can be satisfied in a short cycle

主要な推奨の硝種：優れる性能、充足な在庫量、タイムリーに供給できる硝種。

H-FK 系列	H-QK 系列	H-PK 系列	H-QF 系列	H-F 系列	H-ZF 系列
H-FK61	H-QK3L	H-PK60A	H-QF14	H-F1	H-ZF4AGT
H-FK69		H-PK62A	H-QF50	H-F13	H-ZF5GT
H-FK76		H-PK63			H-ZF7LGT
H-FK90		H-PK65			H-ZF12GT
H-FK95		H-PK71			H-ZF13GT
					H-ZF52N
					H-ZF56
					H-ZF62GT
					H-ZF72GT
					H-ZF75GT

H-ZBaF 系列	H-LaK 系列	H-LaF 系列	H-ZLaF 系列	低熔点系列	其它
H-ZBaF3	H-LaK2H	H-LaF1	H-ZLaF50	D-FK61	H-TF3L
H-ZBaF10	H-LaK4L	H-LaF2A	H-ZLaF50C	D-ZK2N	H-KF6
H-ZBaF16A	H-LaK5A	H-LaF3C	H-ZLaF52	D-ZK3L	
H-ZBaF21	H-LaK7	H-LaF4A	H-ZLaF53	D-LaK6	
H-ZBaF50	H-LaK9	H-LaF10A	H-ZLaF54A	D-ZF10A	
H-ZBaF52	H-LaK11	H-LaF50B	H-ZLaF56B	D-ZLaF52L	
H-ZBaF65	H-LaK12	H-LaF52	H-ZLaF55F	D-ZLaF52N	
	H-LaK51A	H-LaF62	H-ZLaF60A	D-ZLaF52N-M170	
	H-LaK52		H-ZLaF64	D-ZLaF851	
	H-LaK53B		H-ZLaF66A		
			H-ZLaF68A		
			H-ZLaF70GT		
			H-ZLaF70B		
			H-ZLaF72A		
			H-ZLaF76A		
			H-ZLaF77A		
			H-ZLaF80A		
			H-ZLaF82		
			H-ZLaF82GT		

说明-无色光学玻璃

1 分类和命名

1.1 分类

根据折射率 n_d 和色散系数 v_d 在 n_d-v_d 领域图中的位置，无色光学玻璃分为 18 类，见表 1。

表 1 Table 1 表 1

玻璃类别 Group	代号 Code	玻璃类别 Group	代号 Code
氟冕玻璃 Fluor Crown	FK	火石玻璃 Flint	F
轻冕玻璃 Light Crown	QK	钡火石玻璃 Barium Flint	BaF
磷冕玻璃 Phosphate Crown	PK	重钡火石玻璃 Dense Barium Flint	ZBaF
冕玻璃 Crown	K	重火石玻璃 Dense Flint	ZF
钡冕玻璃 Barium Crown	BaK	镧火石玻璃 Lanthanum Flint	LaF
重冕玻璃 Dense Crown	ZK	重镧火石玻璃 Dense Lanthanum Flint	ZLaF
镧冕玻璃 Lanthanum Crown	LaK	钛火石玻璃 Titanium Flint	TiF
冕火石玻璃 Crown Flint	KF	特种火石玻璃 Special Flint	TF
轻火石玻璃 Light Flint	QF	铋火石玻璃 Bismuth Flint	BiF

1.2 牌号命名

由其所属玻璃类别代号加序号组成，也可用六位数字作代码来标识（前三位数字表示折射率小数点后三位数，后三位数字表示阿贝数的前三位数）。例如：F4， $n_d=1.62005$ ， $v_d=36.35$ ，其代码为 620364。

1.3 环境友好玻璃的命名

无铅、砷、镉以及其它放射性元素的玻璃牌号，用“环”字汉语拼音字母的声母“H”加“-”作为前缀表示。例如：H-F4。

1.4 低软化点玻璃的命名

用于模压成型的低软化点环境友好玻璃，用“低”字汉语拼音字母的声母“D”加“-”作为前缀来表示。例如：D-LaK6。

对原有牌号进行折射率调整的产品，在原牌号后面使用“-折射率变化量”或“-M 折射率变化量”来表示，其中“M”表示折射率降低，否则为折射率提高。如：D-ZLaF52N 折射率 n_d 降低 170×10^{-5} ，则在牌号名称后加“-M170”，即 D-ZLaF52N-M170；D-LaF50 折射率 n_d 提高 170×10^{-5} ，则直接在牌号名称后加“-170”，即 D-LaF50-170。

1.5 高透过率玻璃牌号命名

高透过率玻璃牌号，在牌号后加字母“GT”命名。用“GT”即“高透”汉语拼音首位字母表示高透过率玻璃，如 H-ZF7LGT。

1.6 其他命名

在原牌号基础上进行光性微调的，在原牌号名称后加后缀“L”或“N”，其中“L”表示折射率或阿贝数比原牌号稍低，“N”表示折射率或阿贝数比原牌号稍高。

在原牌号基础上对其他性能进行配方改良的，不改变光性指标，依改良顺序在该牌号名称后加后缀“A”、“B”、“C”、……“F”。

Instructions For Colorless Optical Glass 無色光学ガラスの説明

1 Classification and Designation 種類と表示

1.1 Classification 種類

According to the position of refractive index (n_d) and dispersion coefficient (v_d) in n_d - v_d domain diagram, colorless optical glass are classified into the 18 groups as shown in table 1.

無色光学ガラスは屈折率 n_d 、分散係数（アッベ数） v_d が n_d - v_d 図にある位置によって、表 1 の 18 種類に分類されています。

1.2 Designation 表示

Each optical glass type within a group is designated by an abbreviated group symbol and a number. A six-digit code can also be used to characterize each glass type. The first three digits indicate the first three numbers after the decimal point of refractive index n_d , the last three digits indicate the first three numbers of the Abbe-number v_d . For example, F4 with n_d of 1.62005 and v_d of 36.35 is indicated by its six-digit code 620364.

光学ガラスが属するガラスグループ名称の記号とコードによって表示されます。また、6桁の数字をコードとして表示します（初めの3桁が屈折率の小数点後の3桁を表示して、後の3桁がアッベ数（ v_d ）の初めの3桁を表示しています）。例えば：F4, $n_d=1.62005$, $v_d=36.35$ 、そのコードは 620364 と表示されます。

1.3 Designation of environment-friendly glass types エコガラスの表示

The glass type without lead, arsenic, cadmium and other radioactive elements is expressed by a prefix “H-”. For example, H-F4.

鉛フリー、砒素フリー、カドミウムフリーガラス及びその他の放射性元素フリーのガラス硝種は名称記号の前に「H-」を付けて、エコガラスを表示しています。例えば：H-F4。

1.4 Designation of low softening point glass types 非球面用ガラスの表示

The low softening point environment-friendly glass used for molding is represented by the initial “D” of the Chinese pinyin alphabet with “-” as a prefix. For example, D-LaK6.

MO 用エコガラスはガラス硝種名の前に「D」をつけて表示しております。例えば：D-LaK6

When adjusting the refractive index on basis of the original types, “-refractive index variation” or “-M refractive index” is added to the end of the original names. The letter M means the refractive index is reduced. Otherwise, the refractive index is increased. Take D-ZLaF52N and D-LaF50 for example. If the refractive index (n_d) of D-ZLaF52N is reduced by 170×10^{-5} , the new material will be named as “D-ZLaF52N-M170”. If the refractive index (n_d) of D-LaF50 is increased by 170×10^{-5} , the new material will be named as “D-LaF50-170”.

設計要請による屈折率基準を微調整した硝種に対して、現行硝種名の後ろに、屈折率変化単位を付けて区分します。例えば、D-ZLaF52N($n_d=1.81000$)を微調整品の屈折率は 1.80834 となります。D-ZLaF52N の 1.81000 に比べて 170×10^{-5} マイナスなので、硝種名を D-ZLaF52N-M170 として区別します。逆に 170×10^{-5} プラスの場合は、“(現行硝種名)-170” で区別します。

1.5 Designation of high transmittance glass types 高透過率光学ガラスの表示

High transmittance glass is suffixed with “GT”, which refers to the first letter in Pinyin “Gao Tou”, for example, H-ZF7LGT.

高透過率ガラスは硝種名＋「GT」によって命名されます。「GT」は中国の漢字「高透」のピンインの最初の文字で高透過率ガラスを表示します、例：H-ZF7LGT。

1.6 Other designation その他の表示

If the optical constant is slightly adjusted, suffix “L” or “N” will be added to the end of the original material name. “L” means the refractive index or Abbe number is slightly lower than the original material while “N” shows the refractive index or Abbe number is slightly higher than the original material.

元の硝種の基礎で、光性を少し調整すれば、硝種名の後に「L」または「N」を付きます。「L」は屈折率またはアッベ数がより低くなった意味で、「N」は屈折率またはアッベ数がより高くなった意味です。

If the optical constants aren't changed while their formulation is modified to improve other properties, the prefix “A”, “B”, “C”..... “F” will be added to the end of the material name according to the sequence.

元の硝種の基礎で、他の性能を組成改善すれば、光性指標不変の場合、改善の順番に従って、硝種名の後に「A」「B」「C」.....「F」を付きます。

2 光学性能

2.1 折射率 n_x

n 表示折射率, x 表示光谱线或波长。

本手册中无色光学玻璃提供的表 1 中 20 条谱线的折射率是采用最小偏向角法测量得出。

测试设备: 德国 TRIOPTICS 公司 SpectroMaster UV-VIS-IR 高精度折射率测试仪;

测试精度: 紫外波段 $\pm 3 \times 10^{-6}$; 可见光波段 $\pm 2 \times 10^{-6}$; 近红外波段 $\pm 5 \times 10^{-6}$;

样品要求: 样品无肉眼可见的条纹、气泡和结石, 应力双折射 1 级。

若有特殊需要, 我们还可提供波长 253.65nm~14 μ m 范围内任一谱线的折射率的测试值。

在 365.01nm~2325.42nm 的光谱范围内, 未列出波长的折射率, 可以按肖特公式 (1) 计算:

$$n^2 = A_0 + A_1 \lambda^2 + A_2 \lambda^{-2} + A_3 \lambda^{-4} + A_4 \lambda^{-6} + A_5 \lambda^{-8} \dots \dots \dots (1)$$

式中: $A_0 \sim A_5$ —计算常数;

λ —波长, μ m;

n —折射率 (计算精度: 可见波段 $\pm 1 \times 10^{-5}$)。

表 2 Table 2 表 2

光谱线 Spectral Line	光源 Light Source	波长 (nm) Wavelength	光谱线 Spectral Line	光源 Light Source	波长 (nm) Wavelength
i	Hg	365.01	C	H	656.27
h	Hg	404.66	r	He	706.52
g	Hg	435.84	A'	K	768.19
F'	Cd	479.99	s	Cs	852.11
F	H	486.13	t	Hg	1013.98
e	Hg	546.07		Nd Laser	1064.00
d	He	587.56		Hg	1128.64
D	Na	589.29		Hg	1529.58
He-Ne	He-Ne laser	632.80		Hg	1970.09
C'	Cd	643.85		Hg	2325.42

本手册中的低软化点玻璃 (即: “D-”开头的玻璃) 给出的相关谱线的折射率是在 -30°C/H 退火速率下的数据, 手册中给出了 d 线折射率随冷却速度的变化量 β_d , 冷却速度 s 下的折射率 n_d 可以通过公式 (2) 计算。

其他谱线的折射率随冷却速度的变化, 如果需要我们也可提供。

$$n_{ds} = n_{ds_0} - \beta_d \times \log\left(\frac{s}{s_0}\right) \dots \dots \dots (2)$$

式中:

s —退火速率;

s_0 —退火速率 -30°C/H;

n_{ds_0} —退火速率 s_0 下的 d 线折射率;

n_{ds} —退火速率 s 下的 d 线折射率;

β_d —d 线折射率随冷却速度的变化量。

为满足设计使用需求, 还提供了不同退火速率下折射率及模压折射率 (一定模压条件下), 命名及数据见参考表 (见附表 1)。

2 Optical properties 光学的性質

2.1 Refractive index 屈折率 n_x

Refractive index is denoted by the letter n , while spectrum line or wavelength is denoted by x .

n は屈折率、 x はスペクトル線あるいは波長。

Twenty spectrum lines' refractive indices of colorless optical glass provided in table 1 are measured by minimum deviation angle method.

本カタログの無色光学ガラスの屈折率は表 1 中の 20 スペクトル線の屈折率で表示して、最小偏差角法によって測定されます。

Test equipment: High precision refractive index tester (SpectroMaster UV-VIS-IR) made by German TRIOPTICS,

試験設備: ドイツ TRIOPTICS 会社製 SpectromasterUv 可視光赤外線精密屈折計,

Measurement accuracy: $\pm 3 \times 10^{-6}$ in the ultraviolet range, $\pm 2 \times 10^{-6}$ in the visible range, $\pm 5 \times 10^{-6}$ in the near-infrared range,

測定の精度: 紫外波長: $\pm 3 \times 10^{-6}$ 、可視光波長: $\pm 2 \times 10^{-6}$ 、近赤外波長: $\pm 5 \times 10^{-6}$,

Sample requirements: No visible striae, bubbles or stones with naked eye, stress birefringence up to class 1.

サンプルの要求: 脈理と泡・異物は目で見えない程度、歪レベル 1 級。

Upon special request, we can provide refractive index of any spectral line from 253.65nm to 14 μ m.

特別なご要望があれば、波長 253.65nm~14 μ m の範囲内でいずれのスペクトル線の屈折率の測定値を提供できます。

In the spectral range of 365.01nm~2325.42nm, the refractive indices not listed in the handbook can be calculated by the Schott formula (1):

365.01nm~2325.42nm のスペクトル範囲で、波長の屈折率が表示されないとショット式 (1) で計算できます。

$$n^2 = A_0 + A_1 \lambda^2 + A_2 \lambda^{-2} + A_3 \lambda^{-4} + A_4 \lambda^{-6} + A_5 \lambda^{-8} \dots \dots \dots (1)$$

Where ここで:

$A_0 \sim A_5$ —Calculating constants 計算定数;

λ —Wavelength 波長, μ m;

n —Refractive index 屈折率 (Calculation accuracy at the visible band 目に見える光バンド: $\pm 1 \times 10^{-5}$).

Correlative spectrum lines' refractive indices of low softening point glass (glass starting with "D-") in this handbook are tested after -30 °C /H annealing process. The variations of refractive index of d line with annealing rates β_d are given in the handbook, and refractive index n_d in different annealing rates can be calculated by formula (2).

本カタログに掲載している MO 用ガラスの屈折率は -30°C/H で冷却アニールしたときの屈折率です。冷却速度に対する d 線屈折率の変化量 β_d も掲載しております。そのデータで冷却速度 s でアニールしたときの屈折率が下記の式 (2) で算出しております。

Other spectrum lines' refractive indices varying with annealing rates are also available if required.

その他のスペクトル線の冷却速度に対する屈折率変化量に対して、ご要望がある場合にも提供することができます。

$$n_{ds} = n_{ds_0} - \beta_d \times \log\left(\frac{s}{s_0}\right) \dots \dots \dots (2)$$

Where ここで:

s —Annealing rate アニールスピード,

s_0 —Annealing rate -30°C/H アニールスピード基準 -30°C/H,

n_{ds_0} —d-line refractive index at annealing rate s_0 アニールスピード s_0 時の d 線の屈折率,

n_{ds} —d-line refractive index at annealing rate s アニールスピード s 時の d 線の屈折率,

β_d —The amount of change in the refractive index of the d-line as a function of the cooling rate 冷却速度に対する d 線屈折率の変化量.

To meet the requirements of designers, we also provide the refractive index at different annealing rates and molded refractive index (under certain molding conditions), designations and datas are shown in the annexed table 1.

屈折率基準値を更新したガラス硝種に対して、モールドプレス後のアニール条件 (冷却速度) による屈折率データ、またはモールドプレス後そのままの屈折率データ (参考値。設備と条件によって異なる可能性がある) を掲載しています。別表 1 をご覧ください。

2.2 色散和阿贝数

中部色散为 n_F-n_C 或 $n_{F'}-n_{C'}$ 。

阿贝数 v_d 、 v_e 定义如下：

$$v_d = \frac{n_d - 1}{n_F - n_C} \dots\dots\dots (3)$$

$$v_e = \frac{n_e - 1}{n_{F'} - n_{C'}} \dots\dots\dots (4)$$

2.3 相对部分色散

相对部分色散一般用任意光谱线计算。如波长 X 和 Y 的相对部分色散按公式（5）表示：

$$P_{X,Y} = \frac{n_X - n_Y}{n_F - n_C}, \quad P'_{X,Y} = \frac{n_X - n_Y}{n_{F'} - n_{C'}} \dots\dots\dots (5)$$

手册中按牌号给出了 $P_{d,c}$ 、 $P_{e,d}$ 、 $P_{g,F}$ 和 $P'_{d,c'}$ 、 $P'_{e,d}$ 、 $P'_{g,F'}$ 的值。

2.4 异常色散性

根据阿贝公式，大多数所谓“正常玻璃”，存在如下线性关系：

$$P_{X,Y} = m_{X,Y} v_d + b_{X,Y} \dots\dots\dots (6)$$

相对部分色散的偏离 $\Delta P_{X,Y}$ 用如下公式表示：

$$P_{X,Y} = m_{X,Y} v_d + b_{X,Y} + \Delta P_{X,Y} \dots\dots\dots (7)$$

本手册中是以 H-K6 和 F4 为基准，按公式（8）计算 $\Delta P_{g,F}$ 、 $\Delta P_{F,e}$ 、 $\Delta P_{C,t}$ 和 $\Delta P_{C,s}$ 。

$$\begin{aligned} \Delta P_{F,e} &= P_{F,e} - 0.4902 + 0.000552 v_d \\ \Delta P_{g,F} &= P_{g,F} - 0.6436 + 0.001661 v_d \\ \Delta P_{C,t} &= P_{C,t} - 0.5401 - 0.004846 v_d \\ \Delta P_{C,s} &= P_{C,s} - 0.4004 - 0.002400 v_d \dots\dots\dots (8) \end{aligned}$$

2.5 折射率温度系数 dn/dt

光学玻璃的折射率会受温度的影响而发生变化。折射率随温度的变化用折射率温度系数 dn/dt 来表示。折射率温度系数可用干燥空气中的相对折射率温度系数 $(dn/dt)_{rel.}$ (101.3KPa)和真空中的绝对折射率温度系数 $(dn/dt)_{abs.}$ 表示。在-60℃~+160℃的温度范围内，每隔 20℃提供一个测试数据。

绝对折射率温度系数按公式（9）计算，空气的折射率温度系数 dn_{air}/dt 见表 3。

表 3 Table 3 表 3

温度范围 (℃)	$dn_{air}/dt(10^{-6}/^{\circ}C)$									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60~-40	-1.60	-1.60	-1.61	-1.61	-1.61	-1.61	-1.62	-1.63	-1.63	-1.64
-40~-20	-1.34	-1.35	-1.35	-1.35	-1.35	-1.36	-1.36	-1.37	-1.37	-1.38
-20~0	-1.15	-1.15	-1.15	-1.15	-1.16	-1.16	-1.16	-1.17	-1.17	-1.17
0~+20	-0.99	-0.99	-1.00	-1.00	-1.00	-1.00	-1.00	-1.01	-1.01	-1.01
+20~+40	-0.86	-0.86	-0.87	-0.87	-0.87	-0.87	-0.87	-0.88	-0.88	-0.88
+40~+60	-0.76	-0.76	-0.76	-0.76	-0.77	-0.77	-0.77	-0.77	-0.77	-0.78
+60~+80	-0.67	-0.67	-0.68	-0.68	-0.68	-0.68	-0.68	-0.69	-0.69	-0.69
+80~+100	-0.60	-0.60	-0.60	-0.61	-0.61	-0.61	-0.61	-0.61	-0.61	-0.62
+100~+120	-0.54	-0.54	-0.54	-0.54	-0.54	-0.55	-0.55	-0.55	-0.55	-0.55
+120~+140	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.50	-0.50	-0.50
+140~+160	-0.44	-0.44	-0.45	-0.45	-0.45	-0.45	-0.45	-0.45	-0.45	-0.45

$$\left(\frac{dn}{dt}\right)_{abs.} = \left(\frac{dn}{dt}\right)_{rel.} + n_{rel.} \cdot \frac{dn_{air}}{dt} \dots\dots\dots (9)$$

2.2 Dispersion and Abbe-number 分散とアッペ数

The central dispersion is expressed by $n_F - n_C$ or $n_{F'} - n_{C'}$.

中部分散は $n_F - n_C$ 或は $n_{F'} - n_{C'}$ です。

Abbe-number v_d and v_e are defined as:

アッペ数 v_d 、 v_e はそれぞれ次式によって求めています：

$$v_d = \frac{n_d - 1}{n_F - n_C} \dots \dots \dots (3)$$

$$v_e = \frac{n_e - 1}{n_{F'} - n_{C'}} \dots \dots \dots (4)$$

2.3 Relative partial dispersion 相対部分の分散

Relative partial dispersion is usually calculated with arbitrary spectrum lines. For example, relative partial dispersion for wavelength X and Y can be expressed by formula (5) :

相対部分の分散は任意のスペクトル線で計算できます。例：波長 X と Y の相対部分の分散比は公式 (5) で表示します。

$$P_{X,Y} = \frac{n_X - n_Y}{n_F - n_C}, P'_{X,Y} = \frac{n_X - n_Y}{n_{F'} - n_{C'}} \dots \dots \dots (5)$$

The values of $P_{d,c}$, $P_{e,d}$, $P_{g,F}$ and $P'_{d,c'}$, $P'_{e,d'}$, $P'_{g,F'}$ are given in the handbook.

カタログの中には硝種によって、 $P_{d,c}$ 、 $P_{e,d}$ 、 $P_{g,F}$ と $P'_{d,c'}$ 、 $P'_{e,d'}$ 、 $P'_{g,F'}$ 値で表示されます。

2.4 Abnormal dispersion 異常分散性

According to the Abbe-number formula, the following linear relationship is tenable for most "normal glass" :

アッペ公式に基づいて、大多数の「正常ガラス」が、次の公式は成立的です。

$$P_{X,Y} = m_{X,Y} v_d + b_{X,Y} \dots \dots \dots (6)$$

The deviation value $\Delta P_{X,Y}$ of relative partial dispersion can be calculated by the following formula:

相対部分の分散の偏差値 $\Delta P_{X,Y}$ の数値が次式によって求めています：

$$P_{X,Y} = m_{X,Y} v_d + b_{X,Y} + \Delta P_{X,Y} \dots \dots \dots (7)$$

$\Delta P_{g,F}$, $\Delta P_{F,e}$, $\Delta P_{C,t}$ and $\Delta P_{C,s}$ against H-K6, F4 can be calculated by formula (8) :

H-K6 と F4 を基準として、公式 (8) によって、 $\Delta P_{g,F}$ 、 $\Delta P_{F,e}$ 、 $\Delta P_{C,t}$ と $\Delta P_{C,s}$ を算出できます：

$$\begin{aligned} \Delta P_{F,e} &= P_{F,e} - 0.4902 + 0.000552 v_d \\ \Delta P_{g,F} &= P_{g,F} - 0.6436 + 0.001661 v_d \\ \Delta P_{C,t} &= P_{C,t} - 0.5401 - 0.004846 v_d \\ \Delta P_{C,s} &= P_{C,s} - 0.4004 - 0.002400 v_d \dots \dots \dots (8) \end{aligned}$$

2.5 Temperature coefficient of refractive index dn/dt 屈折率の温度係数 dn/dt

Refractive indices of optical glass change with temperatures. The relationship of refractive index changes to temperature change is called temperature coefficient of refractive index dn/dt. Temperature coefficients of refractive indices are determined by temperature coefficients of relative refractive indices in the dry air $(dn/dt)_{rel.}(101.3\text{KPa})$ and temperature coefficients of absolute refractive indices in the vacuum $(dn/dt)_{abs.}$. The testing data are provided every 20°C from -60°C to +160°C.

光学ガラスの屈折率は温度によって変化します。その変化は屈折率の温度係数 dn/dt で表示しています。屈折率の温度係数は乾燥的な空気中での相対屈折率の温度係数 $(dn/dt)_{rel.}(101.3\text{KPa})$ と真空中での絶対屈折率の温度係数 $(dn/dt)_{abs.}$ を表示します。-60°C ~ +160°C の温度範囲に、20°C 毎の実測 dn/dt データが示しています。

Temperature coefficients of absolute refractive indices $(dn/dt)_{abs.}$ can be calculated by formula (9), and the temperature coefficients of refractive indices for air (dn_{air}/dt) are indicated in table 3.

絶対屈折率の温度係数は公式 (9) によって算出できます、空気の屈折率温度係数 dn_{air}/dt は表 3 を参考します。

$$\left(\frac{dn}{dt}\right)_{abs.} = \left(\frac{dn}{dt}\right)_{rel.} + n_{rel.} \cdot \frac{dn_{air}}{dt} \dots \dots \dots (9)$$

2.6 折射率温度系数的计算常数

手册中没有给出的绝对折射率温度系数，按公式（10）计算：

$$\left(\frac{dn}{dt}\right)_{\text{abs.}} = \frac{n^2(\lambda, T_0) - 1}{2n(\lambda, T_0)} \cdot (D_0 + 2D_1 \cdot \Delta T + 3D_2 \cdot \Delta T^2 + \frac{E_0 + 2E_1 \cdot \Delta T}{\lambda^2 - \lambda_{TK}^2}) \dots\dots\dots (10)$$

式中：

$n(\lambda, T_0)$ —参考温度下的相对折射率；

T_0 —参考温度（20℃）；

T —目标温度（单位：℃）；

ΔT —温度 T 与 T_0 的差值；

λ —真空中电磁波的波长（单位：μm）；

D_0 、 D_1 、 D_2 、 E_0 、 E_1 和 λ_{TK} —与玻璃牌号有关的计算常数；

适用温度范围：-60℃~+160℃；

适用波长范围：0.365μm~1.014 μm。

2.7 应力光弹系数 B

采用圆盘压缩法测试样品的应力光弹系数 B ，即沿直径方向向圆盘施加载荷 F ，弹性力学圆盘中心处主应力差 $\Delta\sigma$ 值为：

$$\Delta\sigma = \frac{8 \cdot F}{\pi \cdot \Phi \cdot d} \dots\dots\dots (11)$$

式中：

F —加力的大小，kgf；

Φ —样品直径，cm；

d —样品厚度。

根据平面光弹性试验的平面应力-光学定律，在样品中心点处，垂直入射光线的延迟即光程差 δ ，与光弹系数 B 的主应力差 $\Delta\sigma$ 存在以下关系：

$$\delta = B \cdot \Delta\sigma \cdot d \dots\dots\dots (12)$$

由公式（11）（12）可以推导出光弹系数，见公式（13）：

$$B = \frac{\pi \times \Phi \times \delta}{8 \times F} \dots\dots\dots (13)$$

式中：

δ —光程差，nm；

Φ —样品直径，单位 cm；

F —加力的大小，单位 kgf；

B —应力光弹系数。

测试波长：1550nm，单位：10⁻¹²/Pa。

2.6 Calculating constants of dn/dt 屈折率温度係数の計算定数

The temperature coefficients of absolute refractive indices unspecified in the handbook can be calculated with the aid of equation (10).

このカタログではある温度の絶対屈折率温度係数が記載されない場合、次の公式 (10) によって算出できます。

$$\left(\frac{dn}{dt}\right)_{\text{abs.}} = \frac{n^2(\lambda, T_0) - 1}{2n(\lambda, T_0)} \cdot (D_0 + 2D_1 \cdot \Delta T + 3D_2 \cdot \Delta T^2 + \frac{E_0 + 2E_1 \cdot \Delta T}{\lambda^2 - \lambda_{TK}^2}) \dots\dots\dots (10)$$

Where ここで:

$n(\lambda, T_0)$ —Relative refractive index at the reference temperature 参考温度での相対屈折率;

T_0 —Reference temperature 参考温度(20 °C);

T —Targeted temperature 目標温度(°C);

ΔT —Temperature difference $T - T_0$ 温度 T と T_0 の差(°C);

λ —Wavelength of the electromagnetic wave in the vacuum 真空中の電磁波の波長(μm);

D_0, D_1, D_2, E_0, E_1 and λ_{TK} —Constants depending on glass type ガラス硝種により定まる計算定数.

The applied temperature range 温度範囲: -60°C to +160°C;

The applied wavelength range 波長範囲: 0.3650 μm to 1.014 μm .

2.7 Stress photoelastic coefficient 応力光弾性定数 B

The stress photoelastic coefficient B of the sample is tested by disk compression method, that is, the load F is applied to the disk along the diameter direction. The value of the principal stress difference $\Delta\sigma$ at the center of the elastic disk is:

円板圧縮法で試料の光弾性定数 B を測定しています。円板状試料の一直線方向に圧縮荷重を加えたときに円板の中心に生じる光路差 $\Delta\sigma$ は次の式で算出します。

$$\Delta\sigma = \frac{8 \cdot F}{\pi \cdot \Phi \cdot d} \dots\dots\dots (11)$$

Where ここで:

F—The magnitude of the aftereffect 荷重, kgf;

Φ —Sample diameter 試料直径, cm;

d—Sample thickness 試料厚み, cm.

According to the law of plane stress-optics in the plane photoelastic test, the delay of the perpendicular incident light, namely the optical path difference δ , at the center point of the sample has the following relationship with the principal stress difference $\Delta\sigma$ of the photoelastic coefficient B:

複屈折による光路差を $\delta(\text{nm})$ 、ガラスに生じた光路差を $\Delta\sigma$ 、試料の厚さを $d(\text{cm})$ とすると、これらの間には以下の関係があります。

$$\delta = B \cdot \Delta\sigma \cdot d \dots\dots\dots (12)$$

Stress photoelastic coefficient can be calculated from equations (11) and (12), as listed in equation (13):

式 (11) と (12) で換算すると、光弾性定数は式 (13) で算出できます。

$$B = \frac{\pi \times \Phi \times \delta}{8 \times F} \dots\dots\dots (13)$$

Where ここで:

δ —Optical path difference 光路差, nm;

Φ —Sample diameter サンプルの直径, cm;

F—The amount of force applied 加えた圧力の大きさ, Pa;

B—Stress photoelastic coefficient 応力光弾性定数.

The testing wavelength is 1550nm, and the unit is $10^{-12}/\text{Pa}$.

測定波長: 1550nm. 光弾性定数 B の単位: $10^{-12}/\text{Pa}$ で表示しております。

2.8 内部透过率 τ

测试不同厚度样品（50mm、10mm）的透过率，然后通过公式（14）计算厚度为 d 的样品在波长 λ 处的内部透过率 τ_λ ：

$$\tau_\lambda = \left(\frac{T_{1\lambda}}{T_{2\lambda}} \right)^{d/(d_1-d_2)} \dots\dots\dots (14)$$

式中：

d_1 、 d_2 —样品厚度， $d_1 > d_2$ ；

$T_{1\lambda}$ —厚度为 d_1 的样品在波长 λ 处的透过率（含表面损失）；

$T_{2\lambda}$ —厚度为 d_2 的样品在波长 λ 处的透过率（含表面损失）。

测试设备：日立 UH4150 UV-VIS-NIR 分光光度计；

测试精度：优于 $\pm 0.3\%$ ；

样品要求：气泡 1 级，条纹度 B 级。

手册里给出了各牌号玻璃 5mm 和 10mm 厚的不同波长的内透过率。

2.9 着色度 $\lambda_{80(70)}/\lambda_5$

光学玻璃的短波透射光谱特性用着色度 $\lambda_{80(70)}/\lambda_5$ 表示，测试厚度 $10\text{mm} \pm 0.1\text{mm}$ 玻璃的透过率（含表面反射损失），分别以透过率 80%、5%对应的波长 λ_{80} 和 λ_5 表示，以 5nm 为单位（将整数个位按 2 舍 3 入、7 舍 8 入的原则确定）。例如：80%透过率对应的波长为 357nm，5%透过率对应的波长为 324nm，玻璃的着色度 λ_{80}/λ_5 为 355/325，见图 1。

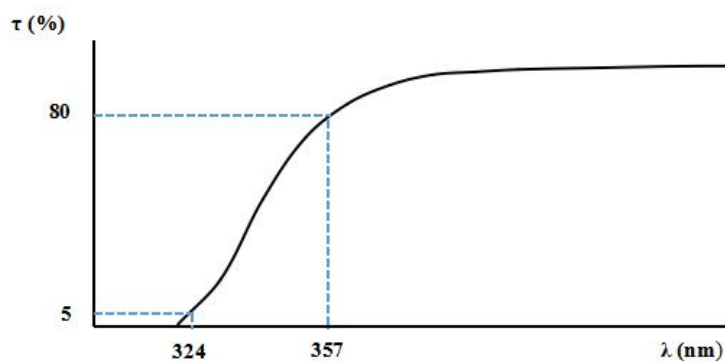


图 1 Figure 1 图 1

当 $n_e \geq 1.85$ 时，由于玻璃的反射损失较大，着色度用透过率 70%对应的波长 λ_{70} 代替 λ_{80} ，即 λ_{70}/λ_5 。着色度的变动范围一般在 $\pm 10\text{nm}$ 以内。如果客户有特殊要求，我们可以提供公差更小的材料。

2.8 Internal transmittance 内部透過率 τ

The internal transmittance of samples with different thickness (50mm, 10mm) are tested, and then the internal transmittance τ_λ of samples with thickness d at wavelength λ are calculated by equation (14) :

厚み50mmと10mmの試料のそれぞれの透過率を測定します。次の式 (14) で厚み d のガラスの波長 λ 時の内部透過率 τ_λ を算出できます。

$$\tau_\lambda = \left(\frac{T_{1\lambda}}{T_{2\lambda}} \right)^{d/(d_1-d_2)} \dots\dots\dots (14)$$

Where ここで:

d_1 、 d_2 —Sample thickness 試料厚み, $d_1 > d_2$;

$T_{1\lambda}$ —Transmittance at wavelength λ (including surface loss) for a sample of thickness d_1 厚み d_1 の試料の波長 λ 時の透過率 (表面損失を含む) ;

$T_{2\lambda}$ —Transmittance at wavelength λ (including surface loss) for a sample of thickness d_2 厚み d_2 の試料の波長 λ 時の透過率 (表面損失を含む) .

Test equipment: Hitachi spectrophotometer (UH4150 UV-VIS-NIR),

試験装置: 日立 UH4150 UV-VIS-NIR 分光光度計,

Measurement accuracy: better than $\pm 0.3\%$,

測定の精度 : $\pm 0.3\%$ より,

Sample requirement: bubble up to class 1, striae up to class B.

サンプルの要求: 泡は一級、脈理はB級。

In the handbook, internal transmittance of 10mm (τ_{10}) from 280nm to 2400nm can be calculated by formula (12).

マニュアルの 280~2400nm 波長範囲内の 10mm の内部透過率 (τ_{10})、2 つの標本の厚さの差の内部透過率に等しい (12) に計算されます。

The internal transmittances of different wavelengths for 5mm and 10mm glass are shown in the handbook.

カタログの中には各硝種の厚さ 5mm、10mm の内部透過率を記載しています。

2.9 Color code 着色度 $\lambda_{80(70)}/\lambda_5$

Transmitted spectrum performance of optical glass at short wave band can be expressed by the color code $\lambda_{80(70)}/\lambda_5$. Measure the transmittance of glass with a thickness of $10\text{mm} \pm 0.1\text{mm}$ (including reflection losses at the surfaces), wavelengths λ_{80} and λ_5 respectively corresponding with transmittance 80%, 5% are used to express color code in 5 nm step (round off 2 and round up 3 or more, round off 7 and round up 8 or more of the bits of integers). For instance, if the corresponding wavelength of transmittance 80% is 357nm while transmittance 5% is 324 nm, the color code λ_{80} / λ_5 is 355/325, as shown in figure 1.

光学ガラスの短波の分光透過特性は着色度 $\lambda_{80(70)}/\lambda_5$ で表示します。厚み $10\text{mm} \pm 0.1\text{mm}$ の試料の透過率 (表面反射損失を含め) は 80% と 5% を示す波長が λ_{80} と λ_5 で表示して、5nm を単位としています (整数の 1 の位数字が二捨三入、七捨八入の原則で決まります)。例えば、透過率 80% を示す波長が 357nm であり、透過率 5% を示す波長が 324nm であり、着色度 λ_{80}/λ_5 は 355/325 であります。図 1 を参考してください。

For a glass whose n_c is higher than 1.85, λ_{70} is used in place of λ_{80} as a color code due to a heavier reflecting loss. That is to say, the color code is expressed by λ_{70}/λ_5 .

また、 $n_c \geq 1.85$ の場合、表面反射損失が大きいため、80%の透過率を示す波長の代わりに 70%の透過率を示す波長を用いてのように表示します、即ち λ_{70}/λ_5 で表示します。

The variance range of color code is usually within ± 10 nm. Upon special request, we can provide materials with smaller tolerance.

着色度は基準値の $\pm 10\text{nm}$ 内に変動し管理されています。特別なご要望に対して、もっと小さい公差の材料を提供できます。

2.10 内透着色度 $\lambda_{\tau 80}/\lambda_{\tau 5}$

用 10mm 厚玻璃内透过率 80%和 5%对应的波长 $\lambda_{\tau 80}$ 、 $\lambda_{\tau 5}$ 简易表征玻璃的着色程度。

2.11 过度曝光指数 $\Delta\lambda$

“过度曝光”是指由阳光或紫外线长时间照射引起的光学玻璃透过率变化。按照 JOGIS: 04-2005 光学玻璃过度曝光测量方法进行测试。将 30mm×12.5mm×10mm 的两大面抛光的样品，在曝光前测试透过率 80%对应的透射波长 λ ，然后将样品固定在曝光装置的样品支架上，打开汞灯照射，使样品在 100℃±5℃旋转 4 小时，然后避光、室温保存，在 24 小时内测试波长 λ 所对应的透过率。前、后透过率之差 $\Delta\lambda$ 即为过度曝光指数。

过度曝光指数 $\Delta\lambda$ 以百分数表示，精确到小数点后 1 位。

2.10 Internal transmittance 内透着色度 $\lambda\tau_{80}/\lambda\tau_5$

For a 10 mm glass, wavelengths $\lambda\tau_{80}$ and $\lambda\tau_5$ respectively corresponding with internal transmittance 80%, 5% are used to express coloring degree of the glass simply.

厚み 10mm のガラスの内部透過率 80%と 5%を示す波長が $\lambda\tau_{80}/\lambda\tau_5$ によって、着色程度を簡易的に表示します。

2.11 Solarization ソラリゼーション $\Delta\lambda$

“Solarization” means the transmittance change of optical glass due to sun or ultraviolet radiation for a long time. Solarization is measured according to JOGIS: 04-2005. Polish the two large sides of a 30mm×12.5mm×10mm sample, and test its corresponding transmission wavelength λ where the transmittance is 80% before solarization. Fit the sample in the sample holder of solarization device, open mercury lamp to irradiate for 4h at 100°C±5°C, and then keep the sample in dark place and room temperature. Test its corresponding transmittance after solarization at wavelength λ inside 24h. $\Delta\lambda$ refers to the transmittance difference before and after solarization. Solarization $\Delta\lambda$ is expressed as a percentage and is accurate to one decimal place.

“ソラリゼーション $\Delta\lambda$ ”は太陽光線或いは紫外線を長い時間で照射して、光学ガラスの透過率を変化させると言うことです。JOGIS : 04-2005 光学ガラスのソラリゼーションの測定方法によって測定します。30mm×12.5mm×10mm のサンプルの両面を研磨し、測定する前に試料の透過率を測定します。サンプルを測定装置に固定され、試料温度を 100°C±5°Cに抑えて、試料を回転させながら光量が所定値になるような光源で 4 時間照射します。その後、室温で暗所に保存し、24 時間内に分光透過率を測定します。照射前の透過率 80%に対応する波長において照射後の透過率の減少を小数点第 1 位まで%単位で表示します。

3 化学性能

光学玻璃元件在制造和使用过程中,其抛光表面抵抗各种侵蚀性介质作用的能力称为光学玻璃的化学稳定性。

3.1 抗潮湿大气作用稳定性 RC(S)(表面法)

在温度 50℃、相对湿度 85%的条件下,根据玻璃抛光表面形成水解斑点所需要的时间,将光学玻璃抗潮湿大气作用稳定性分为三级,见表 4。

表 4 Table 4 表 4

级别 Grade	1	2	3
时间 Time (H)	>20	5~20	<5

3.2 抗酸作用稳定性 RA(S)(表面法)

在 0.1N (pH=2.9)、温度 50℃的醋酸溶液作用下,根据玻璃抛光表面出现干涉色,或表面呈现杂色或脱落所需要的时间,将光学玻璃抗酸作用稳定性分为三级,见表 5。

表 5 Table 5 表 5

级别 Grade	1	2	3
时间 Time (H)	>5	1~5	<1

3.3 耐水作用稳定性 Dw(粉末法)

在过滤器中装入 10g(精确至 0.0001g)、粒度 400~600μm 粉末玻璃(过 40 目~30 目筛),将之浸渍在装有 80mL 蒸馏水(pH=6.5~7.5)的石英玻璃烧瓶内,在 98~100℃水浴中恒温 60 分钟,将玻璃颗粒全部转移至恒重的过滤器中,用 80mL 无水乙醇洗涤后,放于 120±5℃烘干至恒重。根据式(15)计算玻璃浸出百分数:

$$D_W = \frac{B-C}{B-A} \times 100 \dots\dots\dots (15)$$

式中:

D_W—玻璃浸出百分数, %;

B—过滤器和试样的质量, g;

C—过滤器和侵蚀后试样的质量, g;

A—过滤器质量, g。

根据质量浸出百分数,将光学玻璃耐水作用稳定性 D_W分为六级,见表 6。

表 6 Table 6 表 6

级别 Grade	1	2	3	4	5	6
浸出百分数(%) Soaking-out percentage	<0.04	≥0.04 <0.10	≥0.10 <0.25	≥0.25 <0.60	≥0.60 <1.10	≥1.10

3.4 耐酸作用稳定性 DA(粉末法)

与 D_W的测定方法相同,在烧瓶内装入 0.01mol/L 的硝酸水溶液进行处理,根据式(16)计算玻璃浸出百分数:

$$D_A = \frac{B-C}{B-A} \times 100 \dots\dots\dots (16)$$

式中:

D_A—玻璃浸出百分数, %;

B—过滤器和试样的质量, g;

C—过滤器和侵蚀后试样的质量, g;

A—过滤器质量, g。

根据质量浸出百分数,将光学玻璃耐酸作用稳定性 D_A分为六级,见表 7。

表 7 Table 7 表 7

级别 Grade	1	2	3	4	5	6
浸出百分数(%) Soaking-out percentage	<0.20	≥0.20 <0.35	≥0.35 <0.65	≥0.65 <1.20	≥1.20 <2.20	≥2.20

3 Chemical properties 化学的性質

The chemical stability is the ability of polished surface to resist erosive substance of sorts during the glass component being processed and afterwards being applied.

ガラス素子は加工と使用の間に、研磨液や大気中の水蒸気、炭酸ガスなどの侵食を耐える能力が光学ガラスの化学耐久性質とされています。

3.1 Humidity resistance RC (S) (surface method) 湿気に対する耐久性 RC(S)(表面法)

The humidity resistance of optical glass is classified into 3 grades according to the time required for a polished surface to form a hydrolyzing spot at the temperature of 50°C and humidity of 85% (see table 4).

温度が 50°C、相対湿度 85%の環境条件で、ガラスの研磨の表面にヤケが生じるまでかかる時間によって、光学ガラスが湿気に対する耐久性を 3 級に分類されています、表 4 のように。

3.2 Acid resistance RA (S) (surface method) 耐酸性の作用の安定性 RA(S)(表面法)

The acid resistance of optical glass is classified into 3 grades according to the time required for a polished surface to appear interference color or parti-color or fall-off in 0.1N (pH=2.9) acetic acid solution at the temperature of 50°C (see table 5).

0.1N、温度 50°Cの酢酸溶液の作用の下で、ガラスの研磨表面にの破壊深さが 135nm までにかかる時間によって、光学ガラスは耐酸性の作用の安定性を 3 級に分類されています、表 5 のように。

3.3 Water Resistance Dw (powder method) 耐水性 Dw(粉末法)

Place 10g (accurate to 0.0001g) glass powder of grain size 400-600μm (sieved with 40~30 sized mesh) in the filter, soak into a silex glass flask filled with 80ml distilled water (pH=6.5~7.5). After constant temperature water bath (98~100°C) for 60 minutes, move all the glass grain to constant weight filter, wash with 80mL absolute ethyl alcohol, and then dry to constant weight at 120±5 °C . Calculate the leaching percentage according to formula (15).

フィルターに、10g(0.0001g まで正確に)、粒度 400~600 μ m 粉末ガラス (40~30 メッシュ通過)、80 ml の蒸留水(pH = 6.5~7.5)を入れた石英ガラスフラスコ中に浸漬し、98°C~100°Cの水浴中で 60 分間恒温保持後、ガラス粒子を一定の重量のフィルターに移し、80mL の無水エタノール洗浄し、120±5°Cに一定の重量になるまで乾燥させる。式(15)によると、ガラスの溶出率を算出します。

$$D_w = \frac{B-C}{B-A} \times 100 \dots \dots \dots (15)$$

Where ここで:

- D_w—Soaking-out percentage ガラスの浸出したパーセント, %;
- B—Mass of filter and sample フィルターと試料の質量, g;
- C—Mass of filter and soaked sample フィルターと侵食した後の試料の質量, g;
- A—Mass of filter フィルターの質量, g.

According to the calculation results, D_w is classified into 6 grades as shown in Table 6.

計算で得た侵食したパーセントによって、光学ガラスの耐水性 D_w を 6 級に分類されています、表 6 のように。

3.4 Acid resistance D_A (powder method) 耐酸性 D_A(粉末法)

The testing method is similar to D_w, but 0.01mol/L Nitric acid aqueous solution is placed into the flask for treatment. Calculate the leaching percentage according to formula (16).

D_w の測定方法と同じように 0.01mol /L 硝酸溶液がフラスコに入り、ガラス溶出率は(16) 式に従って計算されます。

$$D_A = \frac{B-C}{B-A} \times 100 \dots \dots \dots (16)$$

Where ここで:

- D_A—Soaking-out percentage ガラスの浸出したパーセント, %;
- B—Mass of filter and sample フィルターと試料の質量, g;
- C—Mass of filter and soaked sample フィルターと侵食した試料の質量, g;
- A—Mass of filter フィルターの質量, g.

According to the calculation results, D_A is classified into 6 grades, as shown in Table 7.

計算で得た侵食したパーセントによって、光学ガラスの耐酸性 D_A を 6 級に分類されています、表 7 のように。

3.5 耐碱作用稳定性 $R_{OH}(S)$ (表面法)

将六面抛光尺寸为 40mm×40mm×5mm 的试样，浸渍于充分搅拌、温度恒定为 50℃±3℃、浓度为 0.01mol/l 的氢氧化钠水溶液中 15 小时。根据单位面积内浸出质量的平均值，单位 mg/(cm²·15h)，将光学玻璃的耐碱作用稳定性 $R_{OH}(S)$ 分为五级，见表 8。

表 8 Table 8 表 8

级别 Grade	1	2	3	4	5
浸出质量 Soaking mass mg/(cm ² ·15h)	<0.02	≥0.02 <0.10	≥0.10 <0.20	≥0.20 <0.30	≥0.30

3.6 耐洗涤作用稳定性 $RP(S)$ (表面法)

将六面抛光的35mm×35mm×8mm试样，浸渍于温度恒定为50℃±3℃、浓度为0.01mol/L且充分搅拌的Na₅P₃O₁₀水溶液中1小时。根据单位面积内浸出质量的平均值，单位mg/(cm²·h)，将光学玻璃耐洗涤作用稳定性 $RP(S)$ 分为五级，见表9。

表 9 Table 9 表 9

级别 Grade	1	2	3	4	5
浸出质量 Soaking mass mg/(cm ² ·1h)	<0.02	≥0.02 <0.20	≥0.20 <0.40	≥0.40 <0.60	≥0.60

3.7 耐候性 CR

按GB-T7962.23-2019的测试方法，将试样放置在相对湿度为90%的饱和水蒸气环境的测试箱内，在40℃~50℃每隔1 h交替循环，循环15个周期。根据被测样品侵蚀前后的浊度增加量对耐候性进行分级，见表10。

表 10 Table 10 表 10

级别 Grade	1	2	3	4		
				a	b	c
浊度增加量 Increase in haze ΔH (%)	<0.3	≥0.3 <1.0	≥1.0 <2.0	≥2.0 <4.0	≥4.0 <6.0	≥6.0

3.5 Alkali Resistance $R_{OH}(S)$ (surface method) 耐アルカリ安定性 $R_{OH}(S)$ (表面法)

Dip a 40 mm×40 mm×5 mm sample polished for six surfaces into essentially stirred NaOH solution, whose constant temperature and concentration is $50\pm3^{\circ}\text{C}$, 0.01mol/L respectively, and the dipping time is fifteen hours. According to the calculated average value of the soaking mass in unit area and the unit is $\text{mg}/(\text{cm}^2\cdot 15\text{h})$, the alkali resistance $R_{OH}(S)$ of optical glass is classified into 5 grades as shown in table 8.

六面を研磨したサイズが 40mm×40mm×5mm の試料を十分に攪拌して、固定な温度 $50^{\circ}\text{C}\pm 3^{\circ}\text{C}$ 、濃度が 0.01mol/L の NaOH 水溶液に 15 時間を浸します。ユニット面積によって、浸出した重量の平均値を計算して、光学ガラスの耐アルカリ安定性 $R_{OH}(S)$ を 5 級に分類しています、単位 $\text{mg}/(\text{cm}^2\cdot 15\text{h})$ 。表 8 のように。

3.6 Phosphate Resistance $RP(S)$ (surface method) 耐洗剤安定性 $RP(S)$ (表面法)

Dip a 35 mm×35 mm×8 mm sample polished for six surfaces into essentially stirred $\text{Na}_5\text{P}_3\text{O}_{10}$ solution, whose constant temperature and concentration is $50\pm3^{\circ}\text{C}$, 0.01mol/L respectively, and the dipping time is one hour. According to the calculated average value of the soaking mass in unit area and the unit is $\text{mg}/(\text{cm}^2\cdot \text{h})$, the phosphate resistance $RP(S)$ of optical glass is classified into 5 grades as shown in table 9.

六面を研磨したサイズが 35mm×35mm×8mm の試料を十分に攪拌して、固定な温度 $50^{\circ}\text{C}\pm 3^{\circ}\text{C}$ 、濃度が 0.01mol/L の $\text{Na}_5\text{P}_3\text{O}_{10}$ 水溶液に 1 時間を浸します。ユニット面積によって、浸出した重量の平均値を計算して、光学ガラスの耐洗剤安定性 $RP(S)$ を 5 級に分類されています、単位 $\text{mg}/(\text{cm}^2\cdot \text{h})$ 。表 9 のように。

3.7 Climatic Resistance CR 耐候性 CR

According to the test method specified in GB/T 7962.23-2019, place the sample in a testing chamber with a saturated water vapor environment at 90% relative humidity. The temperature is cycled alternately every 1 hour between 40°C and 50°C for a total of 15 cycles. The climatic resistance is classified based on the increase in haze of the tested sample before and after exposure, as shown in Table 10.

GB-T7962.23-2019 の測定方法によって、試料を相対湿度 90%の飽和水蒸気環境試験箱内に入れて、 $40^{\circ}\text{C}\sim 50^{\circ}\text{C}$ の温度で 1 時間ごとに、15 サイクルに交互循環します。試料が侵蝕される前後の濁度増加量に基づいて、耐候性を等級分けています、表 10 を参照する。

4 热学性能

4.1 线性热膨胀系数 α

线性热膨胀系数指一定范围内温度升高 1℃时玻璃试样单位长度的伸长量。采用石英比较法，采用热膨胀仪测量，得到玻璃样品从室温至软化温度间的温度与样品伸长量的关系曲线，由作图法求得玻璃的转变温度和弛垂温度。被测样品在一定的温度范围内，温度每升高 1℃，单位长度的伸长量，表示此温度范围内样品的平均线膨胀系数，以 $10^{-7}/\text{K}$ 为单位表示。

测试设备：德国耐驰公司 DIL402 SELECT 膨胀系数测试仪；

温度范围：-150℃~1000℃；

测试精度：优于 $\pm 1\%$ ；

样品要求：样品玻璃内应无肉眼可见条纹、气泡、结石等夹杂物；应力双折射 1 类。

手册中给出了-50℃~80℃和 100℃~300℃的平均线膨胀系数（见图 2），以及-50℃~+160℃范围内每隔 10℃的平均线膨胀系数。

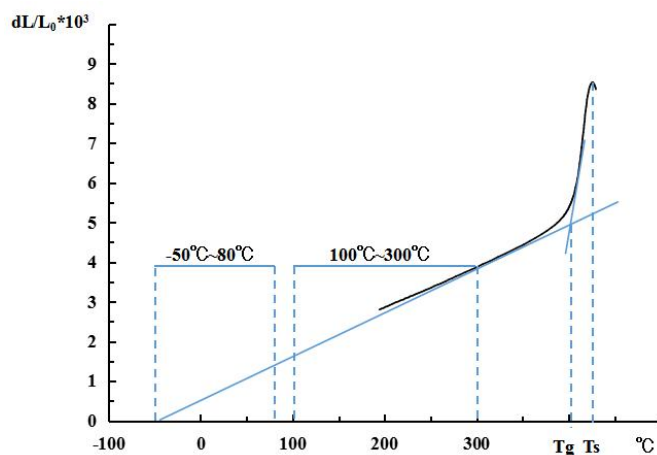


图 2 Figure 2 图 2

4.2 转变温度 T_g

将退火后的样品以一定速率升温，得到温度和试样伸长量关系的热膨胀曲线，如图 2 所示。将低温区域和高温区域伸长直线部分延长相交的交点所对应的温度作为转变温度，单位为℃。

4.3 弛垂温度 T_s

退火后的样品在升温过程中停止膨胀的温度为弛垂温度，单位为℃，如图 2 所示，膨胀曲线上的峰顶对应的温度即为弛垂温度。

4.4 应变点 $T_{10}^{14.5}$

应变点是玻璃粘度为 $10^{14.5}\text{dPa}\cdot\text{s}$ 时的温度，即几小时内可消除玻璃内应力的温度，也称为玻璃退火下限温度。

4.5 退火点 T_{10}^{13}

退火点是玻璃粘度为 $10^{13}\text{dPa}\cdot\text{s}$ 时的温度，即几分钟内可消除玻璃内应力的温度，也称为玻璃退火上限温度。

4.6 导热系数 λ

光学玻璃的导热系数是指在稳定传热条件下，单位时间内通过单位面积传递的热量除以单位距离的温度差，用 λ 表示，单位为 $\text{W}/(\text{m}\cdot^{\circ}\text{C})$ 。

本产品目录的数据表上记载的导热系数是玻璃温度为 70℃~30℃的数值，测定精确度 $\pm 5\%$ 。

4 Thermal properties 熱的特性

4.1 Linear thermal expansion coefficient 線膨張係数(α)

Linear thermal expansion coefficient refers to the elongation of the unit length of glass when heated per 1 °C in a certain temperature range. It is measured with thermal dilatometer by quartz comparison method. After obtaining the relationship curve between temperature and sample elongation from room temperature to softening temperature, we can get transition and sag temperatures through graphing method. In a certain temperature range, after every 1 °C increase in temperature, the elongation of the unit length of sample indicates the mean linear expansion coefficient in this temperature range, and expressed by $10^{-7}/K$.

線熱膨張係数：一定的な温度の範囲内に、ガラスの温度は 1 °C ごとに上げる時、ガラスの単位長さの伸長量です。石英の比較の方法を使用して、熱膨張計による室温から軟化温度までの温度とサンプルの伸長量の関係を求めたし、転移温度と屈伏点 T_s が描画法で求めた。測定サンプルは特定の温度範囲、1 °C ごとに温度上昇、単位長さの伸長量でこの温度範囲内でサンプルの平均線膨張係数を表します、単位は $10^{-7}/K$ です。

Test equipment: NETZSCH expansion coefficient tester (DIL402 SELECT),

試験装置: ドイツ Nike Corporation DIL402 SELECT 膨張係数測定機,

Temperature range: -150 °C ~ 1000 °C,

温度範囲: -150 °C ~ 1000 °C,

Measurement accuracy: better than $\pm 1\%$,

測定の精度: $\pm 1\%$ より,

Sample requirement: No visible stripes, bubbles, stones or other impurity with naked eye, stress birefringence up to class 1.

サンプルの要求: 脈理と泡と石は目で見えない程度、応力複屈折レベル 1 級。

The mean thermal expansion coefficients from -50 °C to 80 °C and from 100 °C to 300 °C are given in the handbook (see figure 2). Also, the mean thermal expansion coefficients of every 10 °C from -50 °C to 160 °C are provided.

カタログの中には、-50 °C ~ 80 °C と 100 °C ~ 300 °C の平均線熱膨張係数を掲示しています (図 2) , 及び -50 °C ~ 160 °C 温度範囲に 10 °C 毎の平均線膨張係数が提供されています。

4.2 Transformation temperature 転移点 T_g

Heat an annealed sample at a certain rate, we can obtain the thermal expansion curve between temperature and sample elongation, as shown in figure 2. The transformation temperature T_g is defined as the intersection of two lines that are extrapolated from the low and high temperature sides respectively.

アニールしたガラスが一定的な速度で昇温して、温度と試料の伸長量の関係の熱膨張グラフを得られます。図 2 に示すように。低温領域と高温領域の直線の延長部分の交差点に対応する温度が転移温度として、単位は °C です。

4.3 Sag temperature 屈伏点 T_s

The sag temperature T_s is defined as the temperature at which annealed sample stops expanding when being heated, as shown in figure 2. The peak temperature on the expansion curve is sag temperature.

図 2 に示すようにアニールしたガラスの伸びが止まる温度が屈伏点の温度として表示しています、単位 °C。膨張曲線のピークは、屈伏点 T_s に対応します。

4.4 Strain point 歪点 $T_{10}^{14.5}$

The strain point refers to the temperature at which the glass viscosity is $10^{14.5}$ dPa·s. It is also called the lower limit temperature at which inner stress in the glass can be eliminated within several hours.

歪み点はガラスの粘性が $10^{14.5}$ dPa·s になる時の温度です。即ち数時間、ガラス内の歪みを消去できる温度です、ガラスのアニールの下限温度とも言われています。

4.5 Annealing point 徐冷点 T_{10}^{13}

The annealing point refers to the temperature at which the glass viscosity is 10^{13} dPa·s. It is also called the upper limit temperature at which inner stress in the glass can be eliminated within several minutes.

徐冷点はガラスの粘度が 10^{13} dPa·s になる時の温度です。即ち数分の内、ガラス内の歪みを消去できる温度です。ガラスのアニールの上限温度とも言われています。

4.6 Thermal conductivity 熱伝導率(λ)

The thermal conductivity of optical glass refers to the heat transferred through the unit area per unit time divided by the temperature difference of the unit distance under stable heat transfer conditions, and expressed by λ , in unit of $W/(m \cdot ^\circ C)$.

The thermal conductivity listed in this catalog is measured at the temperature of 70 ~ 30 °C. The measurement accuracy is $\pm 5\%$.

熱伝導率は安定した熱伝達で単位時間に通る単位面積の熱量を単位距離の温度差で割って、 $W/(m \cdot ^\circ C)$ を単位として表示されます。70 ~ 30 °C の数値であり、測定精度は $\pm 5\%$ です。

5 机械性能

5.1 杨氏模量 E、剪切模量 G 和泊松比 μ

光学玻璃杨氏模量 E、剪切模量 G 和泊松比 μ 按下列公式计算：

$$E = \frac{4G^2 - 3G \cdot V_L^2 \cdot \rho}{G - V_L^2 \cdot \rho} \dots\dots\dots (17)$$

$$G = V_T^2 \cdot \rho \dots\dots\dots (18)$$

$$\mu = \frac{E}{2G} - 1 \dots\dots\dots (19)$$

式中：

E—杨氏模量，Pa；

G—剪切模量，Pa；

V_L —纵波速度，m/s；

V_T —横波速度，m/s；

μ —泊松比；

ρ —玻璃密度，g/cm³。

5.2 Knoop 硬度 HK

Knoop 硬度使用显微硬度仪测定。采用对称棱角为 172°30' 和 130°的四角锥金刚石压头，给试样表面施加 0.98N 的负荷，保持 15 秒出现痕迹，撤去负荷，用显微镜观察并测量试样上压痕长对角线的长度，使用公式(20)计算 Knoop 硬度：

$$HK = 1.451 \cdot \frac{F}{d^2} \dots\dots\dots (20)$$

式中：

F—加压负荷，N；

d—压痕长对角线的长度，mm；

HK—Knoop 硬度，10⁷Pa。

5.3 磨耗度 F_A

将 30mm×30mm×10mm 玻璃试样，水平固定在 65 转/分钟旋转的铸铁平面盘，距中心 80mm 的位置上，垂直施加 9.8N 的负荷，使用 W14#金刚砂研磨液连续研磨 3 分钟，测定研磨前后试样质量计算出磨损减少质量 W。并且，以同样方式，测定标准玻璃（H-K9L）的磨损减少质量 W₀，按公式（21）计算磨耗度。

$$F_A = \frac{W}{V_0} \times 100 = \frac{w/\rho}{w_0/\rho_0} \times 100 \dots\dots\dots (21)$$

式中：

W₀—标准玻璃 H-K9L 的磨损减少质量，g；

W—被测试样的磨损减少质量，g；

ρ_0 —标准玻璃 H-K9L 的密度，g/cm³；

ρ —被测试样的密度，g/cm³。

5 Mechanical properties 機械的性質

5.1 Young's modulus ヤング率 E, shear modulus 剛性率 G and poisson ratio とボアソン比 μ

Young's modulus E, shear modulus G and poisson ratio μ of optical glass can be calculated with the following formula:

光学ガラスのヤング率模量 E、剛性率 G とボアソン比 μ は次式によって計算します：

$$E = \frac{4G^2 - 3G \cdot V_L^2 \cdot \rho}{G \cdot V_L^2 \cdot \rho} \dots\dots\dots (17)$$

$$G = V_T^2 \cdot \rho \dots\dots\dots (18)$$

$$\mu = \frac{E}{2G} - 1 \dots\dots\dots (19)$$

Where ここで:

E—Young's modulus ヤング率, Pa;

G—Shear modulus 剛性率, Pa;

V_L —Velocity of longitudinal wave 縦波の速度, m/s;

V_T —Velocity of transverse wave 横波の速度, m/s;

μ —Poisson ratio ボアソン比;

ρ —Glass density ガラスの密度, g/cm³.

5.2 Knoop Hardness ヌープ硬さ HK

Knoop hardness is measured with micro hardness tester. For this measurement, a pyramid-shaped diamond indenter with vertex-angles 172°30' and 130° with a rhombic base is applied to the polished specimen surface for 15 seconds, and then remove the loads and the length of the longer diagonal of the resulting indentation is observed with a microscope. Knoop hardness is computed with formula (20):

ヌープ (Knoop) 硬さは微小硬さ試験機で測定します。対称の角度は 172°30' と 130° の 4 つのコーナーの円錐形ダイヤモンド圧ヘッドで試験片表面に 0.98N の荷重して 15 秒後にトレースを維持して、負荷を削除して、顕微鏡で観察して標本の長い斜めの線の長さを測定して、式 (20) でヌープ硬さを計算します。

$$HK = 1.451 \cdot \frac{F}{d^2} \dots\dots\dots (20)$$

Where ここで:

F—Load 荷重, N;

d—The length of the longer diagonal of the indentation くぼみの長い方の対角線の長さ, mm;

HK—Knoop hardness ヌープ (Knoop) 硬度, 10⁷Pa.

5.3 Abrasion factor 摩耗度 F_A

Fix a 30×30×10mm glass sample horizontally on the cast iron flat, rotating at 65 rpm. The test piece is located 80mm from the centre of the flat and is under a 9.8N load. Grind continuously with W14# emery grinding fluid for 3 minutes. Test sample weight before and after grinding, and calculate weight loss W. Test weight loss W_0 of standard glass H-K9L by the same method. Calculate abrasion factor F_A by formula (21):

30×30×10mm のサンプルが毎分 65 回転の鋳鉄平板の水平方向に固定して、センターから 80 mm の位置に 9.8N 垂直荷重、3 分連続 W14 # エメリー研削液を使用して、サンプルの前後の質量を測定して研削摩耗減少質量 W を計算します。そして、同じ方法で標準的なガラス (H-K9L) の摩耗減少質量 W_0 、(21) の数式に従って計算されます。

$$F_A = \frac{V}{V_0} \times 100 = \frac{w/p}{w_0/p_0} \times 100 \dots\dots\dots (21)$$

Where ここで:

W_0 —The grinding weight loss of the standard glass H-K9L 標準ガラス H-K9L の摩耗重量, g ;

W—The grinding weight loss of the test sample 試料の摩耗重量, g;

p_0 —The density of the standard glass H-K9L 標準ガラス H-K9L の密度, g/cm³;

ρ —The density of the test sample 試料の密度, g/cm³.

5.4 弯曲强度 σ_b

用“三点弯曲试验”法测试经过精退火且上下面抛光试样的断裂载荷，按公式（22）计算弯曲度：

$$\sigma_b = \frac{3P \cdot L}{2 \cdot w \cdot t^2} \dots\dots\dots (22)$$

式中：

P—断裂载荷，N；

L—跨距，mm；

w—宽度，mm；

t—厚度，mm。

5.5 密度 ρ

密度是指在规定温度下单位体积的质量。利用浸在介质中的物体受到的浮力大小等于该物体排开介质的重量即排水法测量玻璃的密度 ρ 。

5.4 Flexural Strength 曲げ強さ σ_b

Well-annealed specimens with polished upper and lower surfaces are used to measure breaking load by the "3-point bending test", and the flexural strength is calculated by the equation (22):

"3 点曲げ"試験法により、アニールされ、上下面が研磨された試料の破壊荷重を測定し、公式 (22) により曲げ強さを算出します。

$$\sigma_b = \frac{3P \cdot L}{2 \cdot w \cdot t^2} \dots \dots \dots (22)$$

Where ここで:

P—The breaking load 破壊荷重, N;

L—The support span 支点間距離, mm;

w—The width of the specimen 試料の幅, mm;

t—The thickness of the specimen 試料の厚さ, mm。

5.5 Density 密度 ρ

Density refers to the mass of per unit volume of optical glass at specified temperature. Use the size of buoyancy of object immersing in a medium equaling to medium weight discharged by this object can obtain glass density ρ , that is drainage method.

密度は規定の温度の単位体積の質量を指します。メディア内のオブジェクトが受ける浮力とオブジェクトがメディアを排出する重量は同じで、つまり排水法でガラスの密度を測定します。

6 玻璃质量指标

6.1 折射率 n_d 和阿贝数 v_d 允许偏差

每批次产品的折射率 n_d 和阿贝数 v_d 与标准值的差异一般在以下公差范围内：
折射率 n_d : $\pm 30 \times 10^{-5}$;
阿贝数 v_d : $\pm 0.5\%$ 。
如有特殊要求，可按照以下标准供货：
板料折射率 n_d : $\pm 2 \times 10^{-5} \sim \pm 5 \times 10^{-5}$;
阿贝数 v_d : $\pm 0.3\%$ 。
二次型料折射率 n_d : $\pm 10 \times 10^{-5} \sim \pm 20 \times 10^{-5}$;
阿贝数 v_d : $\pm 0.3\%$ 。
圆棒切片品折射率 n_d : $\pm 5 \times 10^{-5} \sim \pm 20 \times 10^{-5}$;
阿贝数 v_d : $\pm 0.3\%$ 。

6.2 应力双折射

6.2.1 中部应力

玻璃的应力双折射以其最长边中部单位长度上的光程差 δ 表示时，分为 4 级，见表 11。

表 11 Table 11 表 11

级别 Grade	玻璃中部光程差 $\delta(\text{nm/cm}) \leq$ Middle optical path difference
1	2
1a	4
2	6
3	10
注：粗退火条料按合同执行。 Remarks: coarse annealed strips according to the contract.	

6.2.2 边缘应力

玻璃的应力双折射以其距边缘 5% 直径或边长处的单位厚度上的最大光程差 $\delta_{\max}$ 表示时，分为 5 级，见表 12。

表 12 Table 12 表 12

级别 Grade	玻璃边缘光程差 $\delta_{\max}(\text{nm/cm}) \leq$ Edge optical path difference
S1	3
S2	5
S3	10
S4	20
S5	80

表 13 Table 13 表 13

6.3 条纹度

条纹度用点光源和透镜组成的平行光路条纹仪检查，
通过转动玻璃，检查最容易产生条纹的玻璃切断面方向内部的条纹影像，与标准试样进行比对，分为 4 级，见表 13。

级别 Grade	条纹特征 Striae feature
A	无条纹影像 Free of striae
B	有细而分散的条纹 Fine and scattering striae
C	有平行细条纹 Parallel and slight striae
D	有平行略粗条纹 Parallel and a bit thick striae

6 Quality definition ガラスの品質

6.1 Tolerances of refractive n_d index and Abbe-number v_d 屈折率 n_d とアッベ数 v_d の公差

The differences between refractive index n_d , Abbe-number v_d and standard values for each batch products are generally in the following tolerance ranges:

屈折率 n_d とアッベ数 v_d は標準値に対して、通常に以下の公差範囲内で：

Refractive index n_d : $\pm 30 \times 10^{-5}$

屈折率 n_d : $\pm 30 \times 10^{-5}$

Abbe-number v_d : $\pm 0.5\%$

アッベ数 v_d : $\pm 0.5\%$

For special request, we can supply according to the following criteria:

特別な要求がある場合は、次の規格公差内の製品も供給可能です。

Strips ストリップ材:

Refractive index 屈折率 n_d : $\pm 2 \times 10^{-5} \sim \pm 5 \times 10^{-5}$

Abbe-number アッベ数 v_d : $\pm 0.3\%$

Reheated-press blank プレス品:

Refractive index 屈折率 n_d : $\pm 10 \times 10^{-5} \sim \pm 20 \times 10^{-5}$

Abbe-number アッベ数 v_d : $\pm 0.3\%$

Products cut from round rod 丸棒切断品:

Refractive index 屈折率 n_d : $\pm 5 \times 10^{-5} \sim \pm 20 \times 10^{-5}$

Abbe-number アッベ数 v_d : $\pm 0.3\%$

6.2 Stress Birefringence 歪み

6.2.1 Middle stress 中部の歪み

When stress birefringence of glass is expressed by the optical path difference δ per unit in the middle section along the longest direction of glass, middle stress is divided into 4 grades as shown in table 11.

ガラスブロックの中央部の歪みの複屈折は最長方向の中央部の単位長さの光路差 δ で表示します。4級に分類しています、表 11 のように。

6.2.2 Edge stress 辺部歪み

When stress birefringence of glass is measured by the maximum optical path difference $\delta_{\max}$ at a distance of 5% of the diameter from the edge or per unit thickness from the side length of glass, edge stress is divided into 5 grades as shown in table 12.

ガラスブロックの辺部の歪みの複屈折は縁から直径の 5% 離れる或いは縁の単位厚さの最大光路差 $\delta_{\max}$ で表示して、5級に分類しています。表 12 のように。

6.3 Striae 脈理

Striae are inspected by a striae scope equipped with a point light source and lens system in a parallel path.

Examine the stripe image from direction of the cut surface where striae easily occur by turning round the sample, and then compare with the standard samples. Striae are classified into 4 grades as shown in table 13.

脈理は点光源とレンズからなる平行光路脈理検査装置を用いて検査します。ガラスを動かして、脈理の出やすい切断面方向から、内部脈理の映像を検査し、標準試料と比較して、4級に分類しています。表 13 のように。

6.4 气泡度

随着光学玻璃制造技术的不断进步，气泡已有明显的改善，但是制造出完全没有气泡的玻璃是非常困难的。玻璃内气泡的直径、个数由玻璃的种类和熔解条件决定。

光学玻璃气泡等级用 100 cm³ 玻璃中所含气泡(直径 $\Phi \geq 0.03\text{mm}$)的总截面积来确定，分为 5 级，见表 14。结石、结晶体及其它夹杂物也作气泡计算。扁长气泡取最长轴和最短轴的算术平均值为直径计算截面积。

表 14 Table 14 表 14

级别 Grade	1	2	3	4	5
$\Phi \geq 0.03 \text{ mm}$ 气泡总截面积 Total cross sectional area of bubbles (mm ² /100cm ³)	<0.03	≥ 0.03 <0.1	≥ 0.1 <0.25	≥ 0.25 <0.5	≥ 0.5

6.5 光吸收系数

玻璃光吸收系数以白光通过玻璃中每厘米路程的内部透过率的自然对数的负值表示。通过测量玻璃的白光内部透过率来计算光吸收系数，分为 8 级，见表 15。

表 15 Table 15 表 15

级别 Grade	光吸收系数 $\leq$ Coefficient of light absorption	级别 Grade	光吸收系数 $\leq$ Coefficient of light absorption
00	0.001	3	0.008
0	0.002	4	0.010
1	0.004	5	0.015
2	0.006	6	0.030

6.6 光学均匀性

光学均匀性以一块玻璃中各部分折射率偏差最大值 $\Delta n_{\max}$ 来表示，使用平行光管，采用分辨率法测量。分为 4 级，见表 16。

在高精度光学系统中使用的玻璃，对单块玻璃折射率的变化控制严格，即对光学均匀性要求比较高，需采用特殊的生产方法并使用干涉仪进行检查。如有需要，请另外咨询。

表 16 Table 16 表 16

级别 Grade	光学均匀性 $\Delta n_{\max}$ Optical homogeneity
H1	$\pm 2 \times 10^{-6}$
H2	$\pm 5 \times 10^{-6}$
H3	$\pm 10 \times 10^{-6}$
H4	$\pm 20 \times 10^{-6}$

6.4 Bubbles 泡

With the continuous development of manufacturing technology of optical glass, bubbles have been improved obviously, but it is very difficult to manufacture bubble-free optical glass. The diameters and numbers of bubbles in glass are determined by glass types and melting conditions. Bubble grades are established by specifying the total cross sectional area (in mm^2) of bubbles (diameter $\Phi \geq 0.03 \text{ mm}$) in 100 cm^3 glass volume, and are divided into 5 grades as shown in table 14.

光学ガラス製造技術の継続的な改善に従って泡が顕著な改善があった。しかし、泡の完全ないガラスを作成することが非常に困難です。ガラスの中の泡の直径と個数はガラスの種類と熔融条件によって決まります。光学ガラスの泡のグレードはガラスの中の泡(直径 $\varphi \geq 0.03 \text{ mm}$) の合計断面積によって決定されます。表 14 に示すように、5 つのレベルに分かれています。

Stones, crystals and other inclusions are treated as bubbles. The cross sectional area of oblate bubbles is obtained by the average value of the longest axis and shortest axis as the diameter.

結石と結晶体のような異物がある場合も、泡と同様と見なし、計算します。丸くない泡は直径の最大値と最小値の平均値を直径として、断面積を計算しています。

6.5 Coefficient of light absorption 光吸収係数

The coefficient of light absorption of glass is expressed by the negative value of the natural logarithm of internal transmission per centimeter distance passed by white light through glass. Coefficient of light absorption is calculated by internal transmittance of white light, and is classified into 8 grades as shown in table 15.

ガラスの白の光透過率を測定することによって光の吸収係数を算出します。光吸収係数は白光がガラスの中に 1cm ごとに光路を通る内部透過率の自然対数の負値で表示しています。表 15 の 8 級によって分類しています。

6.6 Optical homogeneity 光学的均一性

Optical homogeneity is expressed by the maximum value of the variation in the refractive index Δn_{max} within a single piece of glass. It is measured by resolution method with collimator, and is classified into 4 grades as shown in table 16.

光学的均一性はガラス中に各部分の屈折率の最大偏差値 Δn_{max} で表示します。表 16 の 4 級に分類しています（並列光管を使用して、解像度メソッドで測定します）。

For glass blanks used in extremely high-precision optical systems, variations in the refractive index within a single piece must be controlled within very narrow limits. Glass blanks with a tight index control or very high optical homogeneity control are manufactured by special manufacturing processes and inspected by an interferometer. Please contact us if required.

高精度な光学システムに使用するガラス、1 つのガラスの屈折率の変化は厳密に制御して、つまり光学的均質性の要件が高く、特別な製法が必要、干渉計が検査に使用されます。必要な場合、別を参照してください。

7 供货形式

7.1 条料

两端面为炸切面，其余四面为自然成型面，经粗退火或精退火。

7.2 压型坯料

7.2.1 一次压型坯料

一次压型坯料是通过熔炼直接滴料压制成型的坯料。

一次型件毛坯的外径及厚度公差见表 17。

表 17 Table 17 表 17 单位 units: mm

型料外径 Outer diameter of pressing blanks	一次压型坯料 DP products	
	外径公差 Tolerance of outer diameter	中心厚度公差 Tolerance of centre thickness
<12	±0.10	±0.20
12~40	±0.15	±0.20
41~60	±0.20	±0.20
61~90	±0.30	±0.30
91~150	±0.40	±0.40
>150	±0.50	±0.50

7.2.2 二次压型坯料

二次压型坯料是再次通过热加工压制成型的坯料。

二次型件毛坯的外径及厚度公差见表 18。

表 18 Table 18 表 18 单位 units: mm

型料外径 Outer diameter of pressing blanks	二次压型坯料 RP products	
	外径公差 Tolerance of outer diameter	中心厚度公差 Tolerance of centre thickness
<10	±0.10	+0.6/0
10~20	±0.10	+0.5/0
20~40	±0.15	+0.5/0
40~60	±0.20	+0.5/0
60~150	±0.30	+0.6/0
>150	±1.00	+1.0/0

7.3 圆棒切片品

通过滚圆或二次拉棒，将材料加工成圆棒后进行切断的产品。

圆棒切片品的外径和厚度公差见表 19。

表 19 Table 19 表 19 单位 units: mm

外径 Outer diameter	外径公差 Tolerance of outer diameter	中心厚度公差 Tolerance of centre thickness
1.5-15	±0.01	±0.01
>15	±0.03	±0.03

7.4 指定形状品

特殊形状（方形、棱镜等）、指定尺寸的产品。

7.5 其它

有特殊要求或大规格玻璃的需求，请联系销售人员。

我们列出了 NHG 的玻璃牌号以及 HOYA、OHARA、CDGM、SUMITA 和 SCHOTT 的牌号对照表。对照表中同一行内的牌号仅指玻璃代码构成相同或相近，与玻璃组分无关。

7 Forms of supply 製品区分

7.1 Strips ストリップ材

A strip has two cut ends and four naturally formed surfaces. The glass is coarse or fine annealed.
両側面は切断面で、ほかの4面は成型したままの面です。ラフアニール或いは精密アニールをします。

7.2 Pressing blanks プレス品

7.2.1 Direct-press blank (DP) ダイレクトプレス品

Direct-press blanks are directly dropped and pressed from melted glass.

DP品は溶解炉から流れるガラスを直接に金型に入れて、プレスした品です。

Tolerances of outer diameters and thicknesses for DP are shown in Table 17.

プレス品の外径及び厚さの公差は次の表17の通りです。

7.2.2 Reheated-press blank(RP) リヒートプレス品

Reheated-press blanks are formed by reheated-press process.

RP品は、ガラスを再加熱して成型したプレス品です。アニールをします。

Tolerances of outer diameters and thicknesses for RP are shown in Table 18.

プレス品の外径及び厚さの公差は次の表18の通りです。

7.3 Products cut from round rod 丸棒切断品

These products are cut from a precisely round rod formed on a center less grinding machine or by secondary drawn rod process.

丸め加工或いは二回に棒状引き加工によって外径を仕上げた後に切断したものです。

Tolerances of outer diameters and thicknesses for products cut from round rod are shown in Table 19.

丸棒切断品の外径及び厚さの公差は次の表19の通りです。

7.4 Products with specified shapes 指定型

Products with special shapes (rectangles, prisms, etc.), specified sizes.

特殊な形（方形、プリズム等）、サイズの製品を供給できます。

7.5 Others そのほか

If any optical glass of special specification or large size is needed, please contact the salesman.

特別な要求或いは大きいサイズのガラスをご要望があれば、あらかじめご相談ください。

We have listed NHG's glass types and corresponding types from HOYA, OHARA, CDGM, SUMITA and SCHOTT. In this comparative table, types in the same line are only same or similar in glass codes, have nothing to do with glass composition.

このカタログではNHG 硝種はHOYA、OHARA、CDGM、SUMITA、SCHOTTの他社材と相当していますが、ガラスの組成がそれぞれ違いますので、ご了承ください。

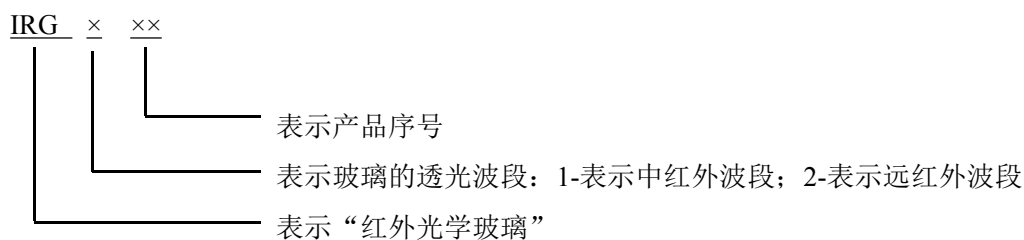
说明-红外材料

1 分类和命名

1.1 分类

产品按玻璃透光波段分为：中红外光学玻璃、远红外光学玻璃。

1.2 命名



例：IRG203 表示透远红外波段序号为 03 的红外光学玻璃。

2 光学性能

2.1 红外折射率 n_λ

红外折射率是指红外光在空气中传播速度与在介质中传播速度的比值。采用偏折角法测量入射角 i 、折射角 φ 及样品顶角 A ，根据公式（1）计算出波长 λ 的折射率 n_λ ，测试精度： $\pm 1 \times 10^{-4}$ 。

$$n_\lambda = \frac{\sqrt{\sin^2 \varphi + 2 \sin \varphi \cos A \sin i + \sin^2 i}}{\sin A} \quad (1)$$

红外光学玻璃 1.5~16 μm . 没有给出波段的折射率也可用 Herzberger 公式（2）计算：

$$n = A + BL + CL^2 + D\lambda^2 + E\lambda^4 + F\lambda^6 \quad (2)$$

式中：

$$L = \frac{1}{\lambda^2 - 0.028}$$

A、B、C、D、E、F—计算常数。

Instructions for Infrared Materials 赤外ガラスの説明

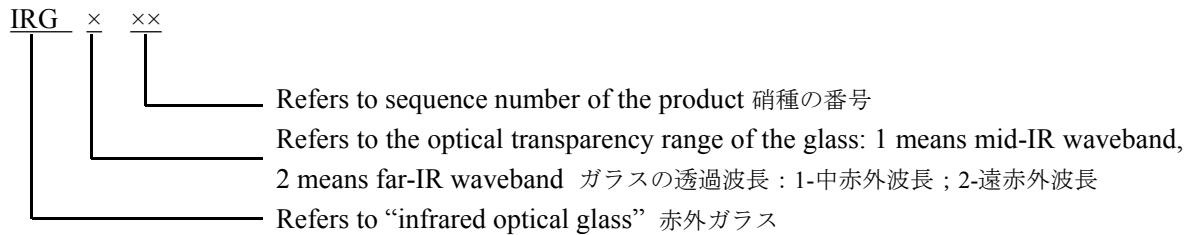
1 Classification and designation 種類と表示

1.1 Classification 種類

Products are classified to mid-IR and far-IR optical glass according to the optical transparency range.

ガラスの透過波長範囲によって、中赤外ガラスと遠赤外ガラスを分類されています。

1.2 Designation 表示



For example, IRG203 refers to infrared optical glass which has transmittance at far-IR waveband and the sequence number is 03.

例えば: IRG203 というのは遠赤外波長で番号が 03 の赤外ガラスです。

2 Optical properties 光学の性質

2.1 Infrared refractive index 赤外屈折率 n_λ

Infrared refractive index refers to the velocity of infrared light in the air as compared to that in the medium by the municipality. Deflection angle method is adopted to measure the incident angle i , refraction angle ϕ and vertex angle A . According to formula (1), we can obtain refractive index n_λ of wavelength λ , and the measuring accuracy is $\pm 1 \times 10^{-4}$.

赤外屈折率というのは赤外光が空気による伝播スピードと媒質による伝播スピードの比率です。折角法の測定原理で入射角 i 、折射角 ϕ 及び試料の頂角 A を求めて、公式 (1) によって各波長の屈折率 n_λ を計算できます。測定精度: $\pm 1 \times 10^{-4}$ 。

$$n_\lambda = \frac{\sqrt{\sin^2 \phi + 2 \sin \phi \cos A \sin i + \sin^2 i}}{\sin A} \dots \dots \dots (1)$$

In the spectral range of 1.5~16 μ m, the refractive indices not listed in the handbook can be calculated by the Herzberger formula (2):

赤外ガラス 1.5~16 μ m、バンドの屈折率が与えられない場合は Herzberger 公式 (2) で計算する。

$$n = A + BL + CL^2 + D\lambda^2 + E\lambda^4 + F\lambda^6 \dots \dots \dots (2)$$

Where ここで:

$$L = \frac{1}{\lambda^2 - 0.028}$$

A, B, C, D, E, F—Calculating constants 計算定数.

2.2 红外色散系数

不同红外波长范围内折射率的变化称为红外色散，用红外色散系数表示。本手册中给出了3~5μm和8~12.5μm 两个大气窗口红外色散系数 v_4 和 $v_{10.6}$ 。 v_4 和 $v_{10.6}$ 的色散系数按公式（3）计算：

$$v_4 = \frac{n_4 - 1}{n_3 - n_5}$$

$$v_{10.6} = \frac{n_{10.6} - 1}{n_8 - n_{12.5}} \dots\dots\dots (3)$$

式中：

v_4 —表示 3~5μm 的红外色散系数；

$v_{10.6}$ —表示 8~12.5μm 的红外色散系数；

n_λ ($\lambda=3、4、5、8、10.6、12.5$)—表示特定波长下的红外折射率（单位：μm）。

2.3 绝对折射率的计算常数

光学玻璃手册中所给出的折射率均为 22℃下的相对折射率，而在光学设计时往往需要其它温度下的折射率。利用公式（4）可以计算出温度范围从-40℃至+80℃间的任何波长的折射率。

$$\Delta n_{\text{abs.}} = \frac{n^2(\lambda, T_0) - 1}{2n(\lambda, T_0)} \cdot \left(D_0 \cdot \Delta T + D_1 \cdot \Delta T^2 + D_2 \cdot \Delta T^3 + \frac{E_0 \cdot \Delta T + E_1 \cdot \Delta T^2}{\lambda^2 - \lambda_{\text{TK}}^2} \right) \dots\dots\dots (4)$$

式中：

$\Delta n_{\text{abs.}}$ —绝对折射率的差值；

$n(\lambda, T_0)$ —参考温度下的相对折射率；

T_0 —参考温度（22℃）；

T —目标温度（单位：℃）；

ΔT —相对温度 T 与参考温度 T_0 的差值（单位：℃）；

λ —真空中电磁波的波长（单位：μm）；

$D_0、D_1、D_2、E_0、E_1$ 和 λ_{TK} —与玻璃牌号有关的常数；

适用温度范围：-40℃~+80℃；

适用波长范围：1μm~14μm。

2.4 红外内部透过率 τ

测试不同厚度样品（15mm、5mm）的透过率，然后通过公式（5）计算厚度为 d 的样品在波长 λ 处的内部透过率 τ_λ ：

$$\tau_\lambda = \left(\frac{T_{1\lambda}}{T_{2\lambda}} \right)^{d/(d_1 - d_2)} \dots\dots\dots (5)$$

式中：

$d_1、d_2$ —样品厚度， $d_1 > d_2$ ；

$T_{1\lambda}$ —厚度为 d_1 的样品在波长 λ 处的透过率（含表面损失）；

$T_{2\lambda}$ —厚度为 d_2 的样品在波长 λ 处的透过率（含表面损失）。

2.2 Infrared dispersion coefficient 赤外分散係数

Infrared dispersion means the deviations of refractive index at different infrared wavelengths. In this handbook, the infrared dispersion coefficients v_4 and $v_{10.6}$, of two air windows $3\mu\text{m}$ - $5\mu\text{m}$ and $8\mu\text{m}$ - $12.5\mu\text{m}$ are given. v_4 and $v_{10.6}$ can be calculated by equation (3):

異なる赤外波長範囲内で、屈折率の変化が赤外分散と呼ばれます。赤外分散係数で表示します。 $3\sim 5\mu\text{m}$ と $8\sim 12.5\mu\text{m}$ の 2 つの大気のウィンドウの赤外線分散係数 v_4 と $v_{10.6}$ がこのマニュアルで与えられています。 v_4 と $v_{10.6}$ の分散係数は、(3) の式で計算されます。

$$v_4 = \frac{n_4 - 1}{n_3 - n_5}$$

$$v_{10.6} = \frac{n_{10.6} - 1}{n_8 - n_{12.5}} \dots\dots\dots (3)$$

Where ここで:

v_4 —Infrared dispersion coefficient 赤外分散係数 ($3\sim 5\mu\text{m}$);

$v_{10.6}$ —Infrared dispersion coefficient 赤外分散係数 ($8\sim 12.5\mu\text{m}$);

n_λ ($\lambda=3, 4, 5, 8, 10.6, 12.5$)—Infrared refractive index at specific wavelengths 特定な波長の赤外分散係数 (μm).

2.3 Calculating constants of n_{abs} . 絶対屈折率の計算定数

The refractive indices given in the glass handbook in general are all relative values at 22°C , but refractive indices in other temperatures are always requested by many optic designers. The absolute refractive indices of glass regards to wavelengths and temperatures which are not listed in the handbook can be calculated by the following equation (4).

光学ガラスのカatalogに、全部の屈折率が 22°C での相対屈折率ですが、光学設計する時、他の温度での屈折率が要ります。ガラスの屈折率温度係数を通して、公式 (4) によって、 $-40^\circ\text{C}\sim +80^\circ\text{C}$ の温度範囲でのいかなる波長の屈折率を計算できます。

$$\Delta n_{\text{abs}} = \frac{n^2(\lambda, T_0) - 1}{2n(\lambda, T_0)} \cdot \left(D_0 \cdot \Delta T + D_1 \cdot \Delta T^2 + D_2 \cdot \Delta T^3 + \frac{E_0 \cdot \Delta T + E_1 \cdot \Delta T^2}{\lambda^2 - \lambda_{\text{TK}}^2} \right) \dots\dots\dots (4)$$

Where ここで:

Δn_{abs} —The difference of absolute indices 絶対屈折率の差;

$n(\lambda, T_0)$ —Relative index at the reference temperature 参考温度での相対屈折率;

T_0 —Reference temperature 参考温度 (22°C);

T —Targeted temperature 目標温度 ($^\circ\text{C}$);

ΔT —Temperature difference $T - T_0$ 相対温度 T と参考温度 T_0 の差 ($^\circ\text{C}$);

λ —Vacuum wavelength 真空中の電磁波の波長 (μm);

D_0, D_1, D_2, E_0, E_1 and λ_{TK} —Constants depending on glass types ガラス硝種と関係がある定数.

The applied temperature range 温度範囲: $-40^\circ\text{C}\sim +80^\circ\text{C}$;

The applied wavelength range 波長範囲: $1\mu\text{m}\sim 14\mu\text{m}$.

2.4 Infrared transmittance 赤外内部透過率 τ

The internal transmittance of samples with different thickness (15mm , 5mm) are tested, and then the internal transmittance τ_λ of samples with thickness d at wavelength λ are calculated by equation (5):

厚み 15mm と 5mm の試料のそれぞれの透過率を測定します。次の式 (5) で厚み d のガラスの波長 λ 時の内部透過率 τ_λ を算出できます。

$$\tau_\lambda = \left(\frac{T_{1\lambda}}{T_{2\lambda}} \right)^{d/(d_1 - d_2)} \dots\dots\dots (5)$$

Where ここで:

d_1, d_2 —Sample thickness 試料厚み, $d_1 > d_2$;

$T_{1\lambda}$ —Transmittance at wavelength λ (including surface loss) for a sample of thickness d_1 厚み d_1 の試料の波長 λ 時の透過率 (表面損失を含む);

$T_{2\lambda}$ —Transmittance at wavelength λ (including surface loss) for a sample of thickness d_2 厚み d_2 の試料の波長 λ 時の透過率 (表面損失を含む).

3 介电常数

依据 GB/T 1409-2006 测量电气绝缘材料在工频、音频、高频(包括米波波长在内)下电容率和介质损耗因数的推荐方法进行测试。

4 其它指标

本手册中化学稳定性、热性能和机械性能及密度按照无色光学玻璃相应指标测试方法测试。

5 主要质量指标

5.1 折射率和色散系数的允许偏差

每批次产品的折射率 n_λ ，色散系数 $v_{10.6}$ 与标准值的差异一般在以下公差范围内：
折射率 n_λ : $\pm 3 \times 10^{-4}$; $v_{10.6}$: $\pm 0.8\%$

5.2 条纹度

红外光学玻璃条纹度按 GB/T 32561.2 规定的测试方法进行测量,以条纹阴影图像的灰度和其所占观察图像的面积进行量化表达,分为 4 级,见表 1。

表 1 Table 1 表 1

级别 Grade	条纹可见度 Striae visibility
A	无明显的条纹阴影存在。 No obvious striae shadow.
B	内有直径 $\leq 1\text{mm}$ 的细而分散的条纹影像存在。 Fine and scattering striae shadow exists in side and the diameter is not greater than 1mm
C	内有直径 1~2mm 的细条纹。 Fine striae exists in side and the diameter is between 1mm and 2mm
D	内有直径 $\geq 2\text{mm}$ 的粗条纹,但不能密集存在。 Thick striae exists in side but not intensive and the diameter is not less than 2mm

5.3 杂质

红外光学玻璃杂质按 GB/T 52361.3 中规定的方法进行判定和检测,玻璃中允许杂质含量等级用 100cm^3 玻璃中所含杂质 ($\Phi_{\text{杂质}} \geq 0.1\text{mm}$) 的总截面积来确定,分为 5 级,见表 2。扁长气泡取最长轴和最短轴的算术平均值计算。

表 2 Table 2 表 2

级别 Grade	0	1	2	3	4
每 100cm^3 玻璃的总横截面积 Total cross sectional area S (mm^2)	$S < 0.05$	$0.05 \leq S < 0.2$	$0.2 \leq S < 0.4$	$0.4 \leq S < 0.6$	$0.6 \leq S < 1.2$

3 Dielectric constant 誘電率

Measure dielectric constant according to the recommended methods for capacitance and dielectric loss factor of electro-insulating material at power frequency, audio frequency and high frequency (including meter wavelength) in GB/T 1409-2006.

GB/T 1409-2006 に基づいて、電気絶縁材料が工頻（電線周波）、音頻（オーディオ周波）、高波（高周波）、米波（メートル波）での誘電率と媒質損耗因数を測定するという推薦方法によって測定します。

4 Others 他の指標

In this handbook, chemical stabilities, thermal properties, mechanical properties and density are measured by the corresponding testing methods of colorless optical glass.

このマニュアルの中で化学的安定性、熱的性質、機械的性質と密度は無色光学ガラスに対応する指標の測定方法によって求められます。

5 Main quality definition 主要な質量指標

5.1 Allowable tolerances of refractive index and dispersion coefficient 屈折率と分散係数の許容差

The differences between refractive index, dispersion coefficient of each batch products and the standard values are generally in the following tolerance ranges:

屈折率 n_λ 、分散係数 $v_{10.6}$ は標準値との偏差程度が生産ロットによって異なります。一般に以下の公差範囲内にあります。

Refractive index 屈折率 n_λ : $\pm 3 \times 10^{-4}$, $v_{10.6}$: $\pm 0.8\%$

5.2 Striae 脈理

Striae of infrared optical glass are inspected by the methods specified in GB/T 32561.2. The gray scale of shadow images and its area taking of the observable image are adopted for quantitative expression, and striae are classified into 4 grades as shown in table 1.

赤外光学ガラスの脈理は GB/T 32561.2 の測定方法によって測定しています。脈理の映像の深さは脈理が占めた面積との比率で表示しています。表 1 の 4 級に分類しています。

5.3 Impurities 異物

Impurities in optical glass are inspected by the method specified in GB/T 52361.3. Impurity content is established by specifying the total cross sectional area (in mm^2) of impurities (diameter $\Phi_{\text{impurity}} \geq 0.1 \text{ mm}$) in 100 cm^3 glass volume. The impurity grades are classified into 5 grades as shown in table 2. The cross sectional area of oblate impurity is obtained by the average value of the longest axis and shortest axis as the diameter.

GB/T 52361.3 の方法によって、赤外光学ガラス中の異物を測定して判定します。異物の程度は 100 cm^3 のガラス中に含まれている異物（ $\Phi_{\text{異物}} \geq 0.1 \text{ mm}$ ）の断面積の総和で判定します。表 2 の 5 級に分類しています。丸くない泡は直径の最大値と最小値の平均値で算出します。

6 供货形式

6.1 压型坯料

压型坯料是指再次通过热加工压制成型的各种形状的坯料（平片、凹凸件等）。可稳定提供直径 $\Phi 7\text{mm}$ ~ $\Phi 200\text{mm}$ 的产品。

6.2 红外镜片

6.2.1 冷加工镜片

是指经过粗磨、精磨、抛光或单点金刚石车削加工后的球面、非球面镜片。可按客户要求提供直径 $\Phi 5\text{mm}$ ~ $\Phi 160\text{mm}$ 的镜片。

6.2.2 精密模压镜片

是指通过模压成型的产品。可按客户要求提供直径 $\Phi 5\text{mm}$ ~ $\Phi 25\text{mm}$ 的精密模压镜片。

6.3 红外镜头

公司可提供焦距 3.5mm、6.5mm、10mm、13mm、15mm、19mm、25mm、35mm、45mm、50mm 等规格的标准远红外镜头，具体参数请与销售人员联系，其他规格可根据客户需求设计制作。

6.4 其它

如对产品有特殊要求，请联系销售人员。

6 Forms of supply 製品区分

6.1 Pressing blanks プレス品

Blanks of various shapes (plain film, concave-convex part, etc.) are formed by reheated-press process. We can provide products with diameters of $\Phi 7\text{mm} \sim \Phi 200\text{mm}$ stably.

プレス品は、ガラスを再加熱成型した各種類な形状の製品です（平面品、凸凹品等）。直径は $\Phi 7\text{ mm} \sim \Phi 200\text{ mm}$ のプレス品を安定に供給できます。

6.2 Infrared lens 赤外レンズ完品

6.2.1 Cold working lens 冷間加工レンズ

Cold working lens refer to spherical, aspheric lens after coarse grinding, fine grinding, polishing or single point diamond turning. We can provide lens with diameters of $\Phi 5\text{mm} \sim \Phi 160\text{mm}$ according to customers' requirements.

レンズ完品は荒摺して、砂掛け、研磨或いは車削で加工して成型した球面、非球面レンズです。お客様の要求で $\Phi 5\text{mm} \sim \Phi 160\text{mm}$ のレンズ完品を供給できます。

6.2.2 Precision molding lens 精密モールドレンズ

Precision molding lens refer to the products which are obtained by molding process. We can provide precision molding lens with diameters of $\Phi 5\text{mm} \sim \Phi 25\text{mm}$ according to customers' requirements.

ガラスをプレスして、成型したものです。お客様の要求で $\Phi 5\text{ mm} \sim \Phi 25\text{ mm}$ の精密モールドレンズを供給できます。

6.3 Infrared lens 赤外レンズ

Lens with focal length of 3.5mm, 6.5mm, 10mm, 13mm, 15mm, 19mm, 25mm, 35mm, 45mm, 50mm and standard lens of other sizes are now available. Please contact the salesman for specific parameters. We can also design and manufacture other sizes according to customers' requirements.

会社は焦点距離の 3.5mm、6.5mm、10mm、13mm、15mm、19mm、25mm、35mm、45mm、50mm 等のサイズの赤外レンズが供給できます。特定のパラメーター、営業スタッフにお問い合わせください。その以外のサイズも設計して供給できます。

6.4 Others その他

If you have any special requirement on our products, please contact the salesman.

特別なご要望があれば、あらかじめ営業部へご相談ください。

无色光学玻璃数据表

Colorless Optical Glass Data Sheets

無色光学ガラスのデータ表

H-FK61	497816	$n_d = 1.49700$	$v_d = 81.61$	$n_F - n_C = 0.006090$
		$n_e = 1.49845$	$v_e = 81.20$	$n_F - n_C' = 0.006139$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.47950	$P_{d,C}$	0.3054	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09	1.48263	$P_{e,d}$	0.2381	RA (S)	2	2200	0.999	0.998
n_{1530}	1529.58	1.48606	$P_{g,F}$	0.5386	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.48910	$P'_{d,c'}$	0.2557	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.48965	$P'_{e,d}$	0.2362	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.49010	$P'_{g,F'}$	0.4789	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.49183			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.49301	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.49407					1000	0.999	0.998
n_C	656.27	1.49514					950	0.999	0.998
$n_{C'}$	643.85	1.49543					900	0.999	0.998
n_{He-Ne}	632.80	1.49571					850	0.999	0.998
n_D	589.29	1.49694	ΔP_{Fe}	0.0113	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.49700	$\Delta P_{g,F}$	0.0305	-50/-40	115	750	0.999	0.998
n_e	546.07	1.49845	$\Delta P_{C,t}$	-0.1080	-40/-30	118	700	0.999	0.998
n_F	486.13	1.50123	$\Delta P_{C,s}$	-0.0528	-30/-20	121	650	0.999	0.998
$n_{F'}$	479.99	1.50157	Thermal Properties		-20/-10	123	600	0.999	0.998
n_g	435.84	1.50451	Tg ($^{\circ}C$)	464	-10/0	125	550	0.999	0.998
n_h	404.66	1.50721	Ts ($^{\circ}C$)	489	0/10	127	500	0.999	0.998
n_i	365.01	1.51173	$T_{10}^{14.5} (^{\circ}C)$	421	10/20	128	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	442	20/30	130	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	124	30/40	133	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	152	40/50	136	420	0.999	0.998
			λ (W/(m K))	0.74	50/60	138	400	0.999	0.998
					60/70	140	390	0.999	0.998
					70/80	142	380	0.999	0.998
					80/90	144	370	0.995	0.993
					90/100	145	360	0.984	0.975
					100/110	146	350	0.970	0.948
					110/120	147	340	0.942	0.893
					120/130	148	330	0.886	0.788
					130/140	149	320	0.788	0.621
					140/150	150	310	0.643	0.410
					150/160	151	300	0.466	0.212
							290	0.298	0.086
							280	0.176	0.031

Constants of Dispersion Formula	
A_0	2.21807952E+00
A_1	-5.67922113E-03
A_2	8.28756139E-03
A_3	9.66891434E-05
A_4	3.56668643E-06
A_5	-3.63065113E-07

Density		Solarization	
ρ (g/cm ³)	3.67	$\Delta\lambda$ (%)	-2.4

Mechanical Properties	
HK (10 ⁷ Pa)	350
F_A	385
E (GPa)	71.6
G (GPa)	27.4
μ	0.307
σ_b (MPa)	33
B (10 ⁻¹² /Pa)	0.69

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-5.4	-5.3	-5.3	-5.2	-5.1	-5.0	-4.9	-4.6	-4.6	-4.5
-40 ~ -20	-5.6	-5.4	-5.3	-5.3	-5.3	-5.3	-5.2	-5.1	-5.0	-4.8
-20 ~ 0	-5.8	-5.8	-5.7	-5.7	-5.7	-5.6	-5.5	-5.2	-5.2	-5.1
0 ~ 20	-6.1	-6.0	-5.9	-5.9	-5.9	-5.9	-5.8	-5.7	-5.6	-5.5
20 ~ 40	-6.4	-6.3	-6.2	-6.2	-6.2	-6.0	-6.0	-5.9	-5.8	-5.7
40 ~ 60	-6.6	-6.5	-6.4	-6.4	-6.5	-6.4	-6.3	-6.0	-6.0	-5.9
60 ~ 80	-6.8	-6.8	-6.7	-6.6	-6.6	-6.6	-6.5	-6.3	-6.2	-6.0
80 ~ 100	-7.0	-6.9	-6.9	-6.9	-6.9	-6.9	-6.8	-6.5	-6.4	-6.1
100 ~ 120	-7.2	-7.2	-7.1	-7.1	-7.1	-7.1	-6.9	-6.8	-6.7	-6.4
120 ~ 140	-7.5	-7.5	-7.4	-7.4	-7.4	-7.3	-7.1	-7.1	-7.0	-6.8
140 ~ 160	-7.9	-7.8	-7.7	-7.6	-7.6	-7.5	-7.4	-7.3	-7.2	-7.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/285
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	332/284

Constants of dn/dt		
D_0	D_1	D_2
-1.90E-05	-2.71E-09	-2.90E-11
E_0	E_1	λ_{TK}
3.52E-07	9.31E-11	2.28E-01

H-FK69	593686	$n_d = 1.59282$	$v_d = 68.63$	$n_F - n_C = 0.008638$
		$n_e = 1.59489$	$v_e = 68.25$	$n_F - n_C' = 0.008716$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.57002	$P_{d,C}$	0.3022	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09	1.57383	$P_{e,d}$	0.2396	RA (S)	1	2200	0.999	0.998
n_{1530}	1529.58	1.57808	$P_{g,F}$	0.5441	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.58198	$P'_{d,c'}$	0.2524	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.58269	$P'_{e,d}$	0.2375	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.58328	$P'_{g,F'}$	0.4819	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.58561			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.58723	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58873					1000	0.999	0.998
n_C	656.27	1.59021					950	0.999	0.998
$n_{C'}$	643.85	1.59062					900	0.999	0.998
n_{He-Ne}	632.80	1.59101					850	0.999	0.998
n_D	589.29	1.59275	ΔP_{Fe}	0.0050	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.59282	$\Delta P_{g,F}$	0.0145	-50/-40	103	750	0.999	0.998
n_e	546.07	1.59489	$\Delta P_{C,t}$	-0.0704	-40/-30	105	700	0.999	0.998
n_F	486.13	1.59884	$\Delta P_{C,s}$	-0.0326	-30/-20	107	650	0.999	0.998
$n_{F'}$	479.99	1.59934	Thermal Properties		-20/-10	108	600	0.999	0.998
n_g	435.84	1.60354			-10/0	109	550	0.999	0.998
n_h	404.66	1.60740	Tg ($^{\circ}C$)	584	0/10	110	500	0.999	0.998
n_i	365.01	1.61397	Ts ($^{\circ}C$)	608	10/20	111	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	564	20/30	112	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	575	30/40	113	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	113	40/50	114	420	0.998	0.996
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	136	50/60	115	400	0.997	0.994
			λ (W/(m K))	0.64	60/70	116	390	0.995	0.990
					70/80	117	380	0.990	0.978
			Mechanical Properties		80/90	118	370	0.978	0.956
					90/100	119	360	0.955	0.909
			HK (10^7Pa)	390	100/110	120	350	0.912	0.829
			F_A	365	110/120	122	340	0.839	0.702
			E (GPa)	73.3	120/130	123	330	0.728	0.530
			G (GPa)	28.2	130/140	124	320	0.591	0.350
			μ	0.298	140/150	125	310	0.448	0.201
			σ_b (MPa)	42	150/160	127	300	0.325	0.107
			B ($10^{-12}/Pa$)	0.44			290	0.235	0.056
							280	0.175	0.032

Constants of Dispersion Formula	
A_0	2.50210584E+00
A_1	-7.29437368E-03
A_2	1.22873858E-02
A_3	2.57463363E-04
A_4	-1.16391265E-05
A_5	6.15553004E-07

Density		Solarization	
ρ (g/cm ³)	4.07	$\Delta\lambda$ (%)	-1.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-5.0	-4.9	-4.8	-4.8	-4.8	-4.7	-4.6	-4.5	-4.5	-4.3
-40 ~ -20	-5.4	-5.3	-5.2	-5.2	-5.2	-5.1	-5.0	-4.9	-4.8	-4.6
-20 ~ 0	-5.6	-5.5	-5.5	-5.5	-5.5	-5.4	-5.2	-5.1	-5.1	-4.9
0 ~ 20	-5.7	-5.6	-5.6	-5.6	-5.6	-5.5	-5.4	-5.3	-5.3	-5.1
20 ~ 40	-5.8	-5.7	-5.7	-5.7	-5.7	-5.6	-5.5	-5.4	-5.4	-5.2
40 ~ 60	-6.0	-5.9	-5.9	-5.9	-5.8	-5.7	-5.6	-5.5	-5.5	-5.3
60 ~ 80	-6.1	-6.0	-5.9	-5.9	-5.9	-5.7	-5.6	-5.6	-5.5	-5.3
80 ~ 100	-6.2	-6.1	-6.0	-6.0	-6.0	-5.8	-5.7	-5.6	-5.6	-5.3
100 ~ 120	-6.3	-6.2	-6.1	-6.1	-6.1	-6.0	-5.8	-5.7	-5.6	-5.4
120 ~ 140	-6.4	-6.3	-6.2	-6.2	-6.2	-6.1	-5.9	-5.8	-5.7	-5.5
140 ~ 160	-6.6	-6.5	-6.4	-6.3	-6.3	-6.2	-6.1	-6.0	-5.9	-5.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	345/281

Constants of dn/dt		
D_0	D_1	D_2
-1.56E-05	2.44E-09	-1.24E-11
E_0	E_1	λ_{TK}
2.89E-07	2.96E-10	2.33E-01

H-FK76	550755	$n_d = 1.55032$	$v_d = 75.50$	$n_F - n_C = 0.007289$
		$n_e = 1.55206$	$v_e = 75.12$	$n_F - n_C' = 0.007349$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.53051	$P_{d,C}$	0.3046	RC (S)	1	2400	0.979	0.958
n_{1970}	1970.09	1.53391	$P_{e,d}$	0.2387	RA (S)	1	2200	0.984	0.968
n_{1530}	1529.58	1.53766	$P_{g,F}$	0.5392	D_W	1	2000	0.991	0.982
n_{1129}	1128.64	1.54106	$P'_{d,c'}$	0.2545	D_A	2	1800	0.995	0.989
n_{1064}	1064.00	1.54168	$P'_{e,d}$	0.2368	$R_{OH}(S)$	2	1600	0.998	0.996
n_t	1013.98	1.54220	$P'_{g,F'}$	0.4790	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.54420			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.54558	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.54684					1000	0.999	0.998
n_C	656.27	1.54810					950	0.999	0.998
$n_{C'}$	643.85	1.54845					900	0.999	0.998
n_{He-Ne}	632.80	1.54878					850	0.999	0.998
n_D	589.29	1.55025	ΔP_{Fe}	0.0083	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.55032	$\Delta P_{g,F}$	0.0210	-50/-40	112	750	0.999	0.998
n_e	546.07	1.55206	$\Delta P_{C,t}$	-0.0965	-40/-30	114	700	0.999	0.998
n_F	486.13	1.55539	$\Delta P_{C,s}$	-0.0465	-30/-20	115	650	0.999	0.998
$n_{F'}$	479.99	1.55580	Thermal Properties		-20/-10	118	600	0.999	0.998
n_g	435.84	1.55932	Tg ($^{\circ}C$)	553	-10/0	120	550	0.999	0.998
n_h	404.66	1.56256	Ts ($^{\circ}C$)	576	0/10	120	500	0.999	0.998
n_i	365.01	1.56803	$T_{10}^{14.5} (^{\circ}C)$	509	10/20	122	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	531	20/30	124	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	122	30/40	124	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	145	40/50	126	420	0.999	0.998
			λ (W/(m K))	0.56	50/60	126	400	0.999	0.998
					60/70	129	390	0.998	0.996
					70/80	129	380	0.997	0.994
			Mechanical Properties		80/90	130	370	0.995	0.990
			HK (10^7Pa)	385	90/100	131	360	0.989	0.978
			F_A	420	100/110	132	350	0.976	0.952
			E (GPa)	75.8	110/120	135	340	0.953	0.908
			G (GPa)	29.1	120/130	136	330	0.912	0.832
			μ	0.306	130/140	138	320	0.850	0.723
			σ_b (MPa)	66	140/150	138	310	0.766	0.587
			B ($10^{-12}/Pa$)	0.43	150/160	142	300	0.671	0.450

Constants of Dispersion Formula	
A_0	2.37490887E+00
A_1	-6.34594354E-03
A_2	1.00559237E-02
A_3	2.32696930E-04
A_4	-1.51093626E-05
A_5	7.74351892E-07

Density		Solarization	
ρ (g/cm ³)	4.13	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-7.1	-6.8	-6.6	-6.5	-6.5	-6.4	-6.3	-6.2	-6.1	-5.8
-40 ~ -20	-6.8	-6.5	-6.4	-6.3	-6.3	-6.2	-6.2	-6.1	-6.0	-5.6
-20 ~ 0	-6.4	-6.2	-6.3	-6.2	-6.2	-6.2	-6.1	-5.9	-5.8	-5.5
0 ~ 20	-6.4	-6.3	-6.1	-6.1	-6.1	-5.9	-5.8	-5.6	-5.6	-5.3
20 ~ 40	-6.4	-6.3	-6.0	-6.0	-6.0	-5.8	-5.6	-5.5	-5.4	-5.0
40 ~ 60	-6.2	-6.1	-5.8	-5.8	-5.8	-5.6	-5.5	-5.4	-5.3	-4.9
60 ~ 80	-6.0	-6.0	-5.8	-5.7	-5.6	-5.5	-5.3	-5.2	-5.1	-4.8
80 ~ 100	-6.0	-5.8	-5.6	-5.6	-5.5	-5.4	-5.2	-4.9	-4.9	-4.7
100 ~ 120	-5.9	-5.7	-5.6	-5.5	-5.5	-5.4	-5.1	-4.9	-4.8	-4.5
120 ~ 140	-5.8	-5.5	-5.4	-5.4	-5.4	-5.2	-5.0	-4.9	-4.8	-4.2
140 ~ 160	-5.5	-5.3	-5.2	-5.2	-5.2	-5.1	-4.9	-4.8	-4.7	-4.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/285
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	327/280

Constants of dn/dt		
D_0	D_1	D_2
-1.79E-05	1.92E-08	-3.61E-11
E_0	E_1	λ_{TK}
4.81E-07	3.20E-10	2.11E-01

H-FK90	459902	$n_d = 1.45860$	$v_d = 90.19$	$n_F - n_C = 0.005085$
		$n_e = 1.45981$	$v_e = 89.77$	$n_F - n_C' = 0.005122$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.44358	$P_{d,C}$	0.3068	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09	1.44630	$P_{e,d}$	0.2380	RA (S)	2	2200	0.999	0.998
n_{1530}	1529.58	1.44928	$P_{g,F}$	0.5388	D_W	2	2000	0.999	0.998
n_{1129}	1128.64	1.45191	$P'_{d,c'}$	0.2558	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.45238	$P'_{e,d}$	0.2362	$R_{OH}(S)$	4	1600	0.999	0.998
n_t	1013.98	1.45277	$P'_{g,F'}$	0.4783	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.45425			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.45524	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.45615					1000	0.999	0.998
n_C	656.27	1.45704					950	0.999	0.998
$n_{C'}$	643.85	1.45729					900	0.999	0.998
n_{He-Ne}	632.80	1.45752					850	0.999	0.998
n_D	589.29	1.45855	ΔP_{Fe}	0.0139	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.45860	$\Delta P_{g,F}$	0.0450	-50/-40	123	750	0.999	0.998
n_e	546.07	1.45981	$\Delta P_{C,t}$	-0.1374	-40/-30	126	700	0.999	0.998
n_F	486.13	1.46212	$\Delta P_{C,s}$	-0.0682	-30/-20	128	650	0.999	0.998
$n_{F'}$	479.99	1.46241	Thermal Properties		-20/-10	130	600	0.999	0.998
n_g	435.84	1.46486			-10/0	132	550	0.999	0.998
n_h	404.66	1.46710			0/10	133	500	0.999	0.998
n_i	365.01	1.47085			10/20	135	480	0.999	0.998
					20/30	138	460	0.999	0.998
					30/40	140	440	0.999	0.998
					40/50	143	420	0.999	0.998
					50/60	144	400	0.999	0.998
			Mechanical Properties		60/70	145	390	0.999	0.998
					70/80	146	380	0.999	0.998
					80/90	147	370	0.999	0.998
					90/100	149	360	0.998	0.996
					100/110	150	350	0.997	0.994
					110/120	151	340	0.993	0.986
					120/130	153	330	0.984	0.968
					130/140	155	320	0.967	0.935
			Density		140/150	157	310	0.935	0.874
					150/160	160	300	0.883	0.779
							290	0.809	0.654
			Solarization				280	0.721	0.520

Constants of Dispersion Formula	
A_0	2.10866977E+00
A_1	-4.81589397E-03
A_2	7.02478609E-03
A_3	-2.48667024E-05
A_4	1.78185408E-05
A_5	-1.09874507E-06

Density		Solarization	
ρ (g/cm ³)	3.64	$\Delta\lambda$ (%)	-0.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6}/^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-7.0	-6.7	-6.5	-6.4	-6.2	-6.0	-5.9	-5.6	-5.6	-5.3
-40 ~ -20	-7.2	-6.8	-6.5	-6.5	-6.4	-6.2	-6.0	-5.8	-5.8	-5.5
-20 ~ 0	-7.3	-6.9	-6.7	-6.7	-6.6	-6.4	-6.3	-6.0	-5.9	-5.7
0 ~ 20	-7.3	-7.0	-6.8	-6.8	-6.7	-6.5	-6.5	-6.1	-6.1	-6.0
20 ~ 40	-7.5	-7.1	-7.0	-6.9	-6.8	-6.5	-6.5	-6.2	-6.2	-6.2
40 ~ 60	-7.6	-7.3	-7.2	-7.2	-7.1	-6.7	-6.6	-6.5	-6.5	-6.3
60 ~ 80	-7.9	-7.6	-7.5	-7.5	-7.4	-7.0	-7.0	-6.8	-6.7	-6.6
80 ~ 100	-8.0	-7.8	-7.7	-7.6	-7.4	-7.2	-7.1	-6.9	-6.8	-6.7
100 ~ 120	-8.1	-8.1	-8.0	-7.9	-7.8	-7.6	-7.4	-7.2	-7.2	-7.0
120 ~ 140	-8.2	-8.0	-8.0	-8.0	-7.9	-7.8	-7.7	-7.5	-7.5	-7.3
140 ~ 160	-8.4	-8.3	-8.3	-8.2	-8.2	-8.0	-8.0	-7.9	-7.8	-7.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	310/260
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	300/260

Constants of dn/dt		
D_0	D_1	D_2
-2.37E-05	5.32E-09	-4.63E-11
E_0	E_1	λ_{TK}
9.51E-07	-1.08E-09	2.02E-08

H-FK95	437951	$n_d = 1.43700$	$v_d = 95.10$	$n_F - n_C = 0.004595$
		$n_e = 1.43810$	$v_e = 94.66$	$n_F - n_C' = 0.004628$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.42310	$P_{d,C}$	0.3069	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09	1.42566	$P_{e,d}$	0.2394	RA (S)	3	2200	0.999	0.998
n_{1530}	1529.58	1.42846	$P_{g,F}$	0.5332	D_W	2	2000	0.999	0.998
n_{1129}	1128.64	1.43091	$P'_{d,c'}$	0.2550	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.43134	$P'_{e,d}$	0.2377	$R_{OH}(S)$	4	1600	0.999	0.998
n_t	1013.98	1.43170	$P'_{g,F'}$	0.4754	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.43306			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.43396	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.43478					1000	0.999	0.998
n_C	656.27	1.43559					950	0.999	0.998
$n_{C'}$	643.85	1.43582					900	0.999	0.998
n_{He-Ne}	632.80	1.43603					850	0.999	0.998
n_D	589.29	1.43696	ΔP_{Fe}	0.0171	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.43700	$\Delta P_{g,F}$	0.0475	-50/-40	129	750	0.999	0.998
n_e	546.07	1.43810	$\Delta P_{C,t}$	-0.1544	-40/-30	131	700	0.999	0.998
n_F	486.13	1.44019	$\Delta P_{C,s}$	-0.0780	-30/-20	132	650	0.999	0.998
$n_{F'}$	479.99	1.44044	Thermal Properties		-20/-10	134	600	0.999	0.998
n_g	435.84	1.44264			-10/0	134	550	0.999	0.998
n_h	404.66	1.44466			0/10	137	500	0.999	0.998
n_i	365.01	1.44803			10/20	140	480	0.999	0.998
					20/30	140	460	0.998	0.997
					30/40	143	440	0.998	0.997
					40/50	145	420	0.998	0.997
					50/60	145	400	0.998	0.997
			Mechanical Properties		60/70	147	390	0.998	0.997
					70/80	149	380	0.998	0.997
					80/90	150	370	0.997	0.995
					90/100	152	360	0.994	0.988
					100/110	154	350	0.986	0.973
					110/120	156	340	0.965	0.932
					120/130	159	330	0.925	0.856
					130/140	160	320	0.845	0.714
			Density		140/150	164	310	0.716	0.513
					150/160	168	300	0.535	0.286
							290	0.367	0.135
			Solarization				280	0.205	0.042

Constants of Dispersion Formula	
A_0	2.04831817E+00
A_1	-4.48612591E-03
A_2	6.22248873E-03
A_3	-7.98581030E-06
A_4	1.22118495E-05
A_5	-7.39464344E-07

Density		Solarization	
ρ (g/cm ³)	3.56	$\Delta\lambda$ (%)	-3.2

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-5.5	-5.3	-5.2	-5.2	-5.1	-5.0	-4.9	-4.8	-4.8	-4.5
-40 ~ -20	-6.0	-5.8	-5.7	-5.7	-5.6	-5.5	-5.3	-5.1	-5.1	-4.9
-20 ~ 0	-6.4	-6.2	-6.0	-6.0	-5.9	-5.8	-5.7	-5.5	-5.5	-5.3
0 ~ 20	-6.7	-6.5	-6.4	-6.4	-6.3	-6.2	-6.1	-5.8	-5.8	-5.6
20 ~ 40	-7.0	-6.8	-6.7	-6.7	-6.6	-6.4	-6.4	-6.2	-6.1	-5.9
40 ~ 60	-7.2	-7.0	-6.9	-6.9	-6.8	-6.7	-6.6	-6.5	-6.4	-6.2
60 ~ 80	-7.3	-7.2	-7.1	-7.1	-7.0	-6.9	-6.8	-6.7	-6.6	-6.4
80 ~ 100	-7.3	-7.2	-7.1	-7.1	-7.0	-6.9	-6.8	-6.7	-6.7	-6.5
100 ~ 120	-7.3	-7.2	-7.1	-7.1	-7.1	-7.0	-6.9	-6.7	-6.7	-6.6
120 ~ 140	-7.4	-7.3	-7.2	-7.1	-7.1	-7.0	-6.8	-6.7	-6.7	-6.6
140 ~ 160	-7.5	-7.4	-7.2	-7.2	-7.1	-7.0	-6.9	-6.8	-6.7	-6.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	330/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	326/280

Constants of dn/dt		
D_0	D_1	D_2
-2.28E-05	-4.73E-09	3.04E-11
E_0	E_1	λ_{TK}
6.79E-07	-1.59E-10	1.98E-07

H-QK3L	487704	$n_d = 1.48749$	$v_d = 70.44$	$n_F - n_C = 0.006921$
		$n_e = 1.48914$	$v_e = 70.24$	$n_F - n_C' = 0.006964$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.46249	$P_{d,C}$	0.3092	RC (S)	1	2400	0.925	0.856
n_{1970}	1970.09	1.46773	$P_{e,d}$	0.2384	RA (S)	3	2200	0.943	0.889
n_{1530}	1529.58	1.47329	$P_{g,F}$	0.5303	D_W	4	2000	0.986	0.972
n_{1129}	1128.64	1.47783	$P'_{d,C'}$	0.2585	D_A	4	1800	0.995	0.990
n_{1064}	1064.00	1.47859	$P'_{e,d}$	0.2369	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.47919	$P'_{g,F'}$	0.4710	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.48141			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.48284	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.48411					1000	0.999	0.998
n_C	656.27	1.48535					950	0.999	0.998
$n_{C'}$	643.85	1.48569					900	0.999	0.998
n_{He-Ne}	632.80	1.48601					850	0.999	0.998
n_D	589.29	1.48743	ΔP_{Fe}	0.0009	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.48749	$\Delta P_{g,F}$	0.0037	-50/-40	87	750	0.999	0.998
n_e	546.07	1.48914	$\Delta P_{C,t}$	0.0086	-40/-30	88	700	0.999	0.998
n_F	486.13	1.49227	$\Delta P_{C,s}$	-0.0002	-30/-20	89	650	0.999	0.998
$n_{F'}$	479.99	1.49266	Thermal Properties		-20/-10	90	600	0.999	0.998
n_g	435.84	1.49594	Tg ($^{\circ}C$)	500	-10/0	91	550	0.999	0.998
n_h	404.66	1.49896	Ts ($^{\circ}C$)	580	0/10	92	500	0.999	0.998
n_i	365.01	1.50405	$T_{10}^{14.5} (^{\circ}C)$	424	10/20	92	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	463	20/30	93	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	88	30/40	93	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	40/50	94	420	0.999	0.998
			λ (W/(m K))	1.11	50/60	94	400	0.999	0.998
					60/70	95	390	0.999	0.998
					70/80	96	380	0.999	0.998
			Mechanical Properties		80/90	96	370	0.999	0.998
			HK (10^7Pa)	457	90/100	97	360	0.999	0.998
			F_A	109	100/110	97	350	0.998	0.996
			E (GPa)	61.9	110/120	98	340	0.996	0.992
			G (GPa)	25.3	120/130	99	330	0.989	0.979
			μ	0.225	130/140	100	320	0.987	0.975
			σ_b (MPa)	50	140/150	101	310	0.965	0.932
			B ($10^{-12}/Pa$)	2.71	150/160	102	300	0.920	0.846

Constants of Dispersion Formula	
A_0	2.18954799E+00
A_1	-9.65634602E-03
A_2	8.30751905E-03
A_3	3.65672497E-04
A_4	-3.54722930E-05
A_5	1.87564584E-06

Density		Solarization	
ρ (g/cm ³)	2.48	$\Delta\lambda$ (%)	-10.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.9	-1.8	-1.8	-1.8	-1.8	-1.7	-1.6	-1.3	-1.3	-1.2
-40 ~ -20	-1.9	-1.8	-1.7	-1.7	-1.7	-1.6	-1.5	-1.3	-1.3	-1.2
-20 ~ 0	-1.9	-1.8	-1.7	-1.7	-1.7	-1.6	-1.5	-1.3	-1.3	-1.2
0 ~ 20	-1.8	-1.8	-1.7	-1.7	-1.6	-1.6	-1.5	-1.3	-1.2	-1.1
20 ~ 40	-1.8	-1.7	-1.7	-1.6	-1.6	-1.5	-1.4	-1.2	-1.2	-1.0
40 ~ 60	-1.7	-1.6	-1.6	-1.5	-1.5	-1.5	-1.3	-1.0	-1.0	-0.9
60 ~ 80	-1.6	-1.5	-1.4	-1.4	-1.4	-1.3	-1.2	-0.9	-0.9	-0.8
80 ~ 100	-1.4	-1.3	-1.2	-1.2	-1.2	-1.1	-1.0	-0.8	-0.8	-0.7
100 ~ 120	-1.4	-1.1	-1.0	-1.0	-1.0	-0.9	-0.8	-0.7	-0.7	-0.5
120 ~ 140	-1.2	-1.0	-0.9	-0.9	-0.9	-0.8	-0.6	-0.7	-0.6	-0.4
140 ~ 160	-1.2	-0.9	-0.9	-0.8	-0.8	-0.7	-0.5	-0.5	-0.5	-0.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	300/265
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	295/265

Constants of dn/dt		
D_0	D_1	D_2
-8.43E-06	1.76E-08	-1.61E-11
E_0	E_1	λ_{TK}
4.36E-07	-4.66E-11	1.20E-01

H-PK60	593670	$n_d = 1.59349$	$v_d = 67.00$	$n_F - n_C = 0.008858$
		$n_e = 1.59561$	$v_e = 66.74$	$n_F - n_C' = 0.008924$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42	1.56575	$P_{d,C}$	0.3059	RC (S)	1	2400	0.915	0.837
n_{1970}	1970.09	1.57107	$P_{e,d}$	0.2393	RA (S)	1	2200	0.947	0.897
n_{1530}	1529.58	1.57682	$P_{g,F}$	0.5362	D_W	1	2000	0.977	0.955
n_{1129}	1128.64	1.58173	$P'_{d,c'}$	0.2555	D_A	4	1800	0.990	0.980
n_{1064}	1064.00	1.58259	$P'_{e,d}$	0.2376	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.58329	$P'_{g,F'}$	0.4762	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.58591			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.58765	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58923					1000	0.999	0.998
n_C	656.27	1.59078					950	0.999	0.998
$n_{C'}$	643.85	1.59121					900	0.999	0.998
n_{He-Ne}	632.80	1.59162					850	0.999	0.998
n_D	589.29	1.59341	ΔP_{Fe}	0.0017	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.59349	$\Delta P_{g,F}$	0.0039	-50/-40	79	750	0.999	0.998
n_e	546.07	1.59561	$\Delta P_{C,t}$	-0.0192	-40/-30	81	700	0.999	0.998
n_F	486.13	1.59964	$\Delta P_{C,s}$	-0.0114	-30/-20	85	650	0.999	0.998
$n_{F'}$	479.99	1.60014	Thermal Properties		-20/-10	87	600	0.999	0.998
n_g	435.84	1.60439	Tg ($^{\circ}C$)	509	-10/0	89	550	0.999	0.998
n_h	404.66	1.60831	Ts ($^{\circ}C$)	538	0/10	90	500	0.999	0.998
n_i	365.01	1.61494	$T_{10}^{14.5} (^{\circ}C)$	481	10/20	91	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	502	20/30	93	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	87	30/40	93	440	0.998	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	113	40/50	95	420	0.996	0.992
			λ (W/(m K))	0.86	50/60	96	400	0.994	0.988
					60/70	96	390	0.992	0.984
					70/80	98	380	0.990	0.980
			Mechanical Properties		80/90	100	370	0.985	0.972
			HK ($10^7 Pa$)	426	90/100	102	360	0.978	0.952
			F_A	299	100/110	102	350	0.967	0.930
			E (GPa)	80.4	110/120	103	340	0.945	0.889
			G (GPa)	31.0	120/130	104	330	0.908	0.821
			μ	0.297	130/140	106	320	0.848	0.716
			σ_b (MPa)	57	140/150	106	310	0.762	0.579
			B ($10^{-12}/Pa$)	1.30	150/160	108	300	0.657	0.433

Constants of Dispersion Formula	
A_0	2.50540910E+00
A_1	-1.03738928E-02
A_2	1.20696135E-02
A_3	3.48394725E-04
A_4	-2.40306361E-05
A_5	1.23924095E-06

Density		Solarization	
ρ (g/cm ³)	3.27	$\Delta\lambda$ (%)	-1.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.8	-1.7	-1.5	-1.5	-1.5	-1.4	-1.3	-1.1	-1.1	-0.9
-40 ~ -20	-1.9	-1.8	-1.6	-1.6	-1.6	-1.5	-1.4	-1.2	-1.2	-1.0
-20 ~ 0	-2.0	-1.9	-1.8	-1.7	-1.7	-1.6	-1.4	-1.3	-1.3	-1.1
0 ~ 20	-2.1	-1.9	-1.8	-1.8	-1.8	-1.7	-1.6	-1.4	-1.4	-1.1
20 ~ 40	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.7	-1.4	-1.4	-1.2
40 ~ 60	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.6	-1.4	-1.4	-1.2
60 ~ 80	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.6	-1.4	-1.4	-1.1
80 ~ 100	-2.2	-2.0	-2.0	-2.0	-2.0	-1.9	-1.7	-1.5	-1.5	-1.2
100 ~ 120	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.8	-1.4	-1.4	-1.1
120 ~ 140	-2.1	-2.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.4	-1.4	-1.1
140 ~ 160	-2.1	-2.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.4	-1.4	-1.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/265
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	328/264

Constants of dn/dt		
D_0	D_1	D_2
-7.70E-06	8.43E-09	-1.72E-11
E_0	E_1	λ_{TK}
2.66E-07	1.07E-10	2.75E-01

H-PK60A	593670	$n_d = 1.59349$	$v_d = 67.00$	$n_F - n_C = 0.008858$
		$n_e = 1.59561$	$v_e = 66.74$	$n_F - n_C' = 0.008924$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3059	RC (S)	2	2400	0.958	0.917
n_{1970}	1970.09		$P_{e,d}$	0.2393	RA (S)	2	2200	0.978	0.956
n_{1530}	1529.58		$P_{g,F}$	0.5374	D_W	1	2000	0.991	0.983
n_{1129}	1128.64	1.58173	$P'_{d,C'}$	0.2555	D_A	4	1800	0.996	0.991
n_{1064}	1064.00	1.58257	$P'_{e,d}$	0.2376	$R_{OH}(S)$	1	1600	0.999	0.997
n_t	1013.98	1.58326	$P'_{g,F'}$	0.4774	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.58588			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.58763	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58921					1000	0.999	0.998
n_C	656.27	1.59078					950	0.999	0.998
$n_{C'}$	643.85	1.59121					900	0.999	0.998
n_{He-Ne}	632.80	1.59162					850	0.999	0.998
n_D	589.29	1.59341	ΔP_{Fe}	0.0017	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.59349	$\Delta P_{g,F}$	0.0051	-50/-40	82	750	0.999	0.998
n_e	546.07	1.59561	$\Delta P_{C,t}$	-0.0158	-40/-30	86	700	0.999	0.998
n_F	486.13	1.59964	$\Delta P_{C,s}$	-0.0080	-30/-20	88	650	0.999	0.998
$n_{F'}$	479.99	1.60014	Thermal Properties		-20/-10	89	600	0.999	0.998
n_g	435.84	1.60440	Tg ($^{\circ}C$)	511	-10/0	90	550	0.999	0.998
n_h	404.66	1.60833	Ts ($^{\circ}C$)	541	0/10	91	500	0.999	0.998
n_i	365.01	1.61496	$T_{10}^{14.5} (^{\circ}C)$	483	10/20	93	480	0.999	0.997
			$T_{10}^{13} (^{\circ}C)$	505	20/30	94	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	92	30/40	96	440	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	117	40/50	97	420	0.997	0.994
			λ (W/(m K))	0.85	50/60	98	400	0.996	0.993
					60/70	99	390	0.995	0.990
					70/80	100	380	0.993	0.986
			Mechanical Properties		80/90	102	370	0.989	0.979
			HK ($10^7 Pa$)	466	90/100	103	360	0.983	0.965
			F_A	250	100/110	104	350	0.968	0.938
			E (GPa)	88.2	110/120	105	340	0.944	0.891
			G (GPa)	34.5	120/130	107	330	0.902	0.814
			μ	0.278	130/140	109	320	0.838	0.703
			σ_b (MPa)		140/150	112	310	0.750	0.563
			B ($10^{-12}/Pa$)	1.38	150/160	115	300	0.649	0.421

Constants of Dispersion Formula	
A_0	2.50316750E+00
A_1	-9.41524451E-03
A_2	1.37151213E-02
A_3	-1.71470005E-04
A_4	4.91628159E-05
A_5	-2.48523874E-06

Density		Solarization	
ρ (g/cm ³)	3.16	$\Delta\lambda$ (%)	-1.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-2.8	-2.6	-2.4	-2.3	-2.3	-2.1	-1.9	-1.7	-1.6	-1.2
-40 ~ -20	-2.5	-2.4	-2.2	-2.2	-2.2	-2.0	-1.8	-1.6	-1.4	-1.0
-20 ~ 0	-2.4	-2.4	-2.1	-2.1	-2.1	-1.9	-1.6	-1.4	-1.3	-0.9
0 ~ 20	-2.2	-2.2	-2.0	-2.0	-2.0	-1.8	-1.5	-1.3	-1.2	-0.8
20 ~ 40	-2.2	-2.1	-1.9	-1.9	-1.9	-1.7	-1.4	-1.2	-1.0	-0.7
40 ~ 60	-2.0	-1.9	-1.7	-1.6	-1.6	-1.5	-1.4	-1.1	-0.9	-0.6
60 ~ 80	-1.9	-1.8	-1.6	-1.5	-1.5	-1.4	-1.3	-1.0	-0.8	-0.5
80 ~ 100	-1.8	-1.7	-1.5	-1.5	-1.5	-1.3	-1.1	-0.9	-0.8	-0.4
100 ~ 120	-1.8	-1.6	-1.4	-1.3	-1.3	-1.2	-1.1	-0.8	-0.7	-0.3
120 ~ 140	-1.7	-1.5	-1.3	-1.3	-1.3	-1.2	-1.1	-0.8	-0.7	-0.2
140 ~ 160	-1.6	-1.5	-1.3	-1.3	-1.3	-1.1	-1.0	-0.7	-0.5	-0.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	328/267

Constants of dn/dt		
D_0	D_1	D_2
-8.44E-06	1.49E-08	-2.04E-11
E_0	E_1	λ_{TK}
7.08E-07	-1.08E-10	6.42E-13

H-PK62A	618634	$n_d = 1.61800$	$v_d = 63.39$	$n_F - n_C = 0.009749$
		$n_e = 1.62033$	$v_e = 63.12$	$n_F - n_C' = 0.009828$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.59079	$P_{d,C}$	0.3046	RC (S)	1	2400	0.930	0.865
n_{1970}	1970.09	1.59567	$P_{e,d}$	0.2390	RA (S)	2	2200	0.953	0.908
n_{1530}	1529.58	1.60096	$P_{g,F}$	0.5395	D_W	1	2000	0.980	0.960
n_{1129}	1128.64	1.60561	$P'_{d,C'}$	0.2544	D_A	4	1800	0.990	0.980
n_{1064}	1064.00	1.60646	$P'_{e,d}$	0.2371	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.60715	$P'_{g,F'}$	0.4792	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.60983			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.61167	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61335					1000	0.999	0.998
n_C	656.27	1.61503					950	0.999	0.998
$n_{C'}$	643.85	1.61550					900	0.999	0.998
n_{He-Ne}	632.80	1.61594					850	0.999	0.998
n_D	589.29	1.61791	ΔP_{Fe}	0.0012	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61800	$\Delta P_{g,F}$	0.0012	-50/-40	85	750	0.999	0.998
n_e	546.07	1.62033	$\Delta P_{C,t}$	-0.0390	-40/-30	87	700	0.999	0.998
n_F	486.13	1.62478	$\Delta P_{C,s}$	-0.0191	-30/-20	89	650	0.999	0.998
$n_{F'}$	479.99	1.62533	Thermal Properties		-20/-10	90	600	0.999	0.998
n_g	435.84	1.63004	Tg ($^{\circ}C$)	616	-10/0	90	550	0.999	0.998
n_h	404.66	1.63439	Ts ($^{\circ}C$)	662	0/10	91	500	0.999	0.998
n_i	365.01	1.64180	$T_{10}^{14.5} (^{\circ}C)$	557	10/20	91	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	598	20/30	92	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	94	30/40	93	440	0.998	0.996
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	111	40/50	93	420	0.997	0.994
			λ (W/(m K))	1.15	50/60	93	400	0.995	0.990
					60/70	94	390	0.992	0.984
					70/80	94	380	0.985	0.973
			Mechanical Properties		80/90	95	370	0.971	0.950
			HK (10^7Pa)	391	90/100	95	360	0.948	0.906
			F_A	320	100/110	96	350	0.911	0.837
			E (GPa)	71.1	110/120	97	340	0.849	0.730
			G (GPa)	27.0	120/130	99	330	0.759	0.586
			μ	0.317	130/140	100	320	0.641	0.420
			σ_b (MPa)	48	140/150	104	310	0.506	0.264
			B ($10^{-12}/Pa$)	1.17	150/160	105	300	0.369	0.142
							290	0.241	0.062
							280		

Constants of Dispersion Formula	
A_0	2.57978592E+00
A_1	-9.52472897E-03
A_2	1.26301504E-02
A_3	8.06546409E-04
A_4	-9.53388389E-05
A_5	5.37975011E-06

Density		Solarization	
ρ (g/cm ³)	3.53	$\Delta\lambda$ (%)	-1.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-2.6	-2.4	-2.3	-2.2	-2.2	-2.1	-2.0	-1.7	-1.7	-1.4
-40 ~ -20	-2.7	-2.5	-2.4	-2.3	-2.3	-2.2	-2.1	-1.8	-1.8	-1.7
-20 ~ 0	-2.8	-2.6	-2.4	-2.4	-2.4	-2.3	-2.2	-1.9	-1.9	-1.8
0 ~ 20	-2.8	-2.6	-2.5	-2.4	-2.4	-2.3	-2.2	-1.9	-1.9	-1.8
20 ~ 40	-2.8	-2.6	-2.5	-2.4	-2.4	-2.4	-2.3	-2.0	-2.0	-1.8
40 ~ 60	-2.8	-2.6	-2.5	-2.4	-2.4	-2.4	-2.3	-2.0	-2.0	-1.6
60 ~ 80	-2.8	-2.6	-2.5	-2.5	-2.5	-2.4	-2.3	-2.1	-2.0	-1.6
80 ~ 100	-2.9	-2.6	-2.5	-2.5	-2.5	-2.4	-2.3	-2.1	-2.0	-1.5
100 ~ 120	-2.8	-2.6	-2.5	-2.5	-2.5	-2.4	-2.3	-2.1	-2.0	-1.6
120 ~ 140	-2.9	-2.6	-2.5	-2.5	-2.4	-2.4	-2.4	-2.1	-2.0	-1.6
140 ~ 160	-2.8	-2.6	-2.5	-2.4	-2.4	-2.4	-2.4	-2.1	-2.1	-1.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	348/276

Constants of dn/dt		
D_0	D_1	D_2
-9.02E-06	9.55E-09	-2.00E-11
E_0	E_1	λ_{TK}
3.79E-07	3.28E-11	2.20E-01

H-PK63	603654	$n_d = 1.60300$	$v_d = 65.44$	$n_F - n_C = 0.009214$
		$n_e = 1.60520$	$v_e = 65.20$	$n_F - n_C' = 0.009282$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.57538	$P_{d,C}$	0.3050	RC (S)	1	2400	0.804	0.646
n_{1970}	1970.09	1.58054	$P_{e,d}$	0.2388	RA (S)	1	2200	0.854	0.730
n_{1530}	1529.58	1.58614	$P_{g,F}$	0.5372	D_W	1	2000	0.931	0.867
n_{1129}	1128.64	1.59099	$P'_{d,c'}$	0.2543	D_A	4	1800	0.967	0.935
n_{1064}	1064.00	1.59183	$P'_{e,d}$	0.2370	$R_{OH}(S)$	2	1600	0.990	0.980
n_t	1013.98	1.59252	$P'_{g,F'}$	0.4773	RP (S)	2	1400	0.995	0.990
n_s	852.11	1.59517			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.59696	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.59858					1000	0.999	0.998
n_C	656.27	1.60019					950	0.999	0.998
$n_{C'}$	643.85	1.60064					900	0.999	0.998
n_{He-Ne}	632.80	1.60106					850	0.999	0.998
n_D	589.29	1.60292	ΔP_{Fe}	0.0018	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.60300	$\Delta P_{g,F}$	0.0023	-50/-40	73	750	0.999	0.998
n_e	546.07	1.60520	$\Delta P_{C,t}$	-0.0248	-40/-30	76	700	0.999	0.998
n_F	486.13	1.60940	$\Delta P_{C,s}$	-0.0126	-30/-20	77	650	0.999	0.998
$n_{F'}$	479.99	1.60992	Thermal Properties		-20/-10	79	600	0.999	0.998
n_g	435.84	1.61435	Tg ($^{\circ}C$)	604	-10/0	81	550	0.999	0.998
n_h	404.66	1.61845	Ts ($^{\circ}C$)	639	0/10	81	500	0.999	0.998
n_i	365.01	1.62538	$T_{10}^{14.5} (^{\circ}C)$	561	10/20	82	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	588	20/30	82	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	93	30/40	83	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	110	40/50	83	420	0.997	0.994
			λ (W/(m K))	0.48	50/60	84	400	0.994	0.988
					60/70	84	390	0.990	0.981
					70/80	84	380	0.984	0.974
			Mechanical Properties		80/90	85	370	0.973	0.961
			HK ($10^7 Pa$)	361	90/100	86	360	0.961	0.936
			F_A	351	100/110	87	350	0.941	0.899
			E (GPa)	64.8	110/120	87	340	0.907	0.835
			G (GPa)	24.7	120/130	89	330	0.848	0.728
			μ	0.309	130/140	90	320	0.754	0.575
			σ_b (MPa)	42	140/150	91	310	0.620	0.390
			B ($10^{-12}/Pa$)	1.05	150/160	92	300	0.457	0.212

Constants of Dispersion Formula	
A_0	2.53403512E+00
A_1	-1.00840331E-02
A_2	1.24087634E-02
A_3	4.77201613E-04
A_4	-4.35207709E-05
A_5	2.38050740E-06

Density		Solarization	
ρ (g/cm ³)	3.64	$\Delta\lambda$ (%)	-2.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-3.8	-3.6	-3.5	-3.5	-3.5	-3.4	-3.3	-3.2	-3.1	-2.9
-40 ~ -20	-3.7	-3.5	-3.4	-3.4	-3.4	-3.3	-3.3	-3.1	-3.1	-2.8
-20 ~ 0	-3.7	-3.5	-3.5	-3.5	-3.5	-3.3	-3.3	-3.1	-3.1	-2.8
0 ~ 20	-3.7	-3.5	-3.5	-3.5	-3.5	-3.4	-3.4	-3.2	-3.2	-2.9
20 ~ 40	-3.7	-3.4	-3.5	-3.5	-3.5	-3.4	-3.4	-3.2	-3.2	-2.9
40 ~ 60	-3.7	-3.5	-3.5	-3.5	-3.5	-3.4	-3.4	-3.2	-3.2	-2.8
60 ~ 80	-3.6	-3.5	-3.5	-3.4	-3.4	-3.3	-3.3	-3.0	-3.0	-2.8
80 ~ 100	-3.6	-3.6	-3.5	-3.4	-3.4	-3.3	-3.1	-2.9	-2.8	-2.7
100 ~ 120	-3.6	-3.6	-3.4	-3.4	-3.4	-3.2	-3.0	-2.8	-2.7	-2.6
120 ~ 140	-3.7	-3.5	-3.4	-3.4	-3.4	-3.2	-3.1	-2.8	-2.7	-2.6
140 ~ 160	-3.6	-3.6	-3.4	-3.4	-3.4	-3.3	-3.1	-2.8	-2.7	-2.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	345/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	333/274

Constants of dn/dt		
D_0	D_1	D_2
-1.10E-05	1.08E-08	-2.38E-11
E_0	E_1	λ_{TK}
2.86E-07	3.72E-10	2.46E-01

H-PK65	620639	$n_d = 1.61997$	$v_d = 63.88$	$n_F - n_C = 0.009705$
		$n_e = 1.62228$	$v_e = 63.58$	$n_F - n_C' = 0.009787$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.59263	$P_{d,C}$	0.3050	RC (S)	1	2400	0.957	0.916
n_{1970}	1970.09	1.59750	$P_{e,d}$	0.2380	RA (S)	3	2200	0.979	0.958
n_{1530}	1529.58	1.60283	$P_{g,F}$	0.5420	D_W	1	2000	0.995	0.990
n_{1129}	1128.64	1.60756	$P'_{d,c'}$	0.2544	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.60841	$P'_{e,d}$	0.2360	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.60912	$P'_{g,F'}$	0.4813	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.61182			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.61366	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61534					1000	0.999	0.998
n_C	656.27	1.61701					950	0.999	0.998
$n_{C'}$	643.85	1.61748					900	0.999	0.998
n_{He-Ne}	632.80	1.61792					850	0.999	0.998
n_D	589.29	1.61988	ΔP_{Fe}	0.0026	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61997	$\Delta P_{g,F}$	0.0045	-50/-40	94	750	0.999	0.998
n_e	546.07	1.62228	$\Delta P_{C,t}$	-0.0367	-40/-30	96	700	0.999	0.998
n_F	486.13	1.62672	$\Delta P_{C,s}$	-0.0189	-30/-20	97	650	0.999	0.998
$n_{F'}$	479.99	1.62727	Thermal Properties		-20/-10	98	600	0.999	0.998
n_g	435.84	1.63198	Tg ($^{\circ}C$)	568	-10/0	99	550	0.999	0.998
n_h	404.66	1.63633	Ts ($^{\circ}C$)	594	0/10	99	500	0.999	0.998
n_i	365.01	1.64372	$T_{10}^{14.5} (^{\circ}C)$	515	10/20	100	480	0.997	0.992
			$T_{10}^{13} (^{\circ}C)$	555	20/30	100	460	0.995	0.986
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	103	30/40	102	440	0.993	0.980
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	118	40/50	102	420	0.991	0.974
			λ (W/(m K))	0.61	50/60	103	400	0.989	0.967
					60/70	103	390	0.982	0.952
					70/80	104	380	0.966	0.922
					80/90	104	370	0.943	0.871
			Mechanical Properties		90/100	105	360	0.897	0.785
			HK ($10^7 Pa$)	420	100/110	105	350	0.821	0.655
			F_A	315	110/120	106	340	0.711	0.489
			E (GPa)	77.8	120/130	107	330	0.577	0.320
			G (GPa)	29.5	130/140	108	320	0.437	0.183
			μ	0.317	140/150	109	310	0.320	0.097
			σ_b (MPa)	38	150/160	110	300	0.235	0.053
			B ($10^{-12}/Pa$)	1.03			290		
							280		

Constants of Dispersion Formula	
A_0	2.58545747E+00
A_1	-9.52904974E-03
A_2	1.36602628E-02
A_3	3.41551059E-04
A_4	-1.52997403E-05
A_5	7.30579296E-07

Density		Solarization	
ρ (g/cm ³)	3.52	$\Delta\lambda$ (%)	-1.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-3.0	-3.0	-2.8	-2.8	-2.7	-2.7	-2.5	-2.3	-2.3	-2.0
-40 ~ -20	-3.1	-3.1	-2.9	-2.9	-2.8	-2.8	-2.6	-2.3	-2.3	-2.1
-20 ~ 0	-3.2	-3.0	-3.0	-3.0	-2.9	-2.8	-2.7	-2.4	-2.4	-2.1
0 ~ 20	-3.2	-3.2	-3.0	-3.0	-2.9	-2.9	-2.8	-2.4	-2.4	-2.2
20 ~ 40	-3.3	-3.2	-3.1	-3.1	-3.0	-2.9	-2.8	-2.5	-2.5	-2.2
40 ~ 60	-3.4	-3.3	-3.2	-3.1	-3.0	-3.0	-2.8	-2.5	-2.4	-2.2
60 ~ 80	-3.3	-3.2	-3.1	-3.1	-3.0	-3.0	-2.7	-2.4	-2.4	-2.1
80 ~ 100	-3.3	-3.2	-3.2	-3.1	-3.1	-3.1	-2.8	-2.4	-2.4	-2.2
100 ~ 120	-3.4	-3.3	-3.2	-3.2	-3.1	-3.1	-2.8	-2.5	-2.5	-2.2
120 ~ 140	-3.4	-3.3	-3.2	-3.2	-3.2	-3.2	-2.9	-2.6	-2.6	-2.3
140 ~ 160	-3.5	-3.3	-3.3	-3.3	-3.2	-3.2	-3.0	-2.7	-2.7	-2.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	365/295
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	335/278

Constants of dn/dt		
D_0	D_1	D_2
-1.00E-05	9.01E-09	-2.64E-11
E_0	E_1	λ_{TK}
3.58E-07	1.03E-10	2.54E-01

H-PK71	569713	$n_d = 1.56907$	$v_d = 71.30$	$n_F - n_C = 0.007981$
		$n_e = 1.57097$	$v_e = 70.90$	$n_F - n_C = 0.008053$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3032	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09		$P_{e,d}$	0.2381	RA (S)	1	2200	0.999	0.998
n_{1530}	1529.58		$P_{g,F}$	0.5450	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.55914	$P'_{d,c}$	0.2533	D_A	1	1800	0.999	0.998
n_{1064}	1064.00	1.55976	$P'_{e,d}$	0.2359	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.56028	$P'_{g,F}$	0.4843	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.56240			CR	1	1200	0.999	0.998
n_A	768.19	1.56389	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.56527					1000	0.999	0.998
n_C	656.27	1.56665					950	0.999	0.998
$n_{C'}$	643.85	1.56703					900	0.999	0.998
n_{He-Ne}	632.80	1.56739					850	0.999	0.998
n_D	589.29	1.56900	ΔP_{Fe}	0.0077	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.56907	$\Delta P_{g,F}$	0.0199	-50/-40	118	750	0.999	0.998
n_e	546.07	1.57097	$\Delta P_{C,t}$	-0.0875	-40/-30	119	700	0.999	0.998
n_F	486.13	1.57463	$\Delta P_{C,s}$	-0.0390	-30/-20	120	650	0.999	0.998
$n_{F'}$	479.99	1.57508	Thermal Properties		-20/-10	121	600	0.999	0.998
n_g	435.84	1.57898	Tg ($^{\circ}C$)	483	-10/0	124	550	0.999	0.998
n_h	404.66	1.58260	Ts ($^{\circ}C$)	514	0/10	124	500	0.999	0.998
n_i	365.01	1.58869	$T_{10}^{14.5} (^{\circ}C)$	442	10/20	126	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	463	20/30	128	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	126	30/40	129	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	152	40/50	131	420	0.999	0.998
			λ (W/(m K))	0.46	50/60	132	400	0.999	0.998
					60/70	132	390	0.999	0.998
					70/80	134	380	0.997	0.994
			Mechanical Properties		80/90	135	370	0.995	0.990
			HK ($10^7 Pa$)	359	90/100	137	360	0.991	0.983
			F_A	435	100/110	138	350	0.982	0.965
			E (GPa)	65.5	110/120	140	340	0.970	0.940
			G (GPa)	25.0	120/130	141	330	0.933	0.871
			μ	0.313	130/140	144	320	0.879	0.773
			σ_b (MPa)		140/150	147	310	0.769	0.592
			B ($10^{-12}/Pa$)	0.23	150/160	149	300	0.679	0.461

Constants of Dispersion Formula	
A_0	2.42613257E+00
A_1	-4.57004276E-03
A_2	1.39177172E-02
A_3	-6.13250165E-04
A_4	1.09104778E-04
A_5	-5.55700744E-06

Density		Solarization	
ρ (g/cm ³)	4.27	$\Delta\lambda$ (%)	-1.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-9.4	-9.2	-9.1	-9.0	-8.9	-8.8	-8.4	-8.2	-8.1	-7.9
-40 ~ -20	-9.5	-9.4	-9.3	-9.2	-9.1	-9.0	-8.8	-8.5	-8.3	-8.3
-20 ~ 0	-9.6	-9.5	-9.4	-9.3	-9.2	-9.1	-8.9	-8.8	-8.6	-8.6
0 ~ 20	-9.8	-9.7	-9.6	-9.5	-9.4	-9.3	-9.2	-8.9	-8.9	-8.9
20 ~ 40	-10.0	-9.9	-9.7	-9.6	-9.6	-9.5	-9.4	-9.3	-9.2	-9.1
40 ~ 60	-10.1	-10.0	-9.9	-9.9	-9.8	-9.7	-9.7	-9.5	-9.4	-9.3
60 ~ 80	-10.3	-10.1	-10.1	-9.9	-9.8	-9.8	-9.8	-9.6	-9.5	-9.4
80 ~ 100	-10.5	-10.3	-10.3	-10.1	-10.0	-9.9	-9.8	-9.8	-9.4	-9.4
100 ~ 120	-10.5	-10.3	-10.3	-10.2	-10.1	-9.9	-9.9	-10.0	-9.7	-9.6
120 ~ 140	-10.5	-10.3	-10.3	-10.3	-10.2	-10.1	-10.0	-10.1	-9.8	-9.7
140 ~ 160	-10.6	-10.4	-10.3	-10.3	-10.3	-10.4	-10.3	-10.1	-10.0	-9.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	330/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	318/267

Constants of dn/dt		
D_0	D_1	D_2
-2.55E-05	4.39E-09	-1.28E-11
E_0	E_1	λ_{TK}
6.70E-07	-7.70E-10	3.16E-08

H-K6	511605	$n_d = 1.51112$	$v_d = 60.46$	$n_F - n_C = 0.008454$
		$n_e = 1.51314$	$v_e = 60.21$	$n_F - n_C' = 0.008523$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.48663	$P_{d,C}$	0.3041	RC (S)	3	2400	0.861	0.741
n_{1970}	1970.09	1.49101	$P_{e,d}$	0.2391	RA (S)	1	2200	0.898	0.807
n_{1530}	1529.58	1.49582	$P_{g,F}$	0.5432	D_W	2	2000	0.951	0.904
n_{1129}	1128.64	1.50010	$P'_{d,c'}$	0.2535	D_A	1	1800	0.978	0.957
n_{1064}	1064.00	1.50087	$P'_{e,d}$	0.2371	$R_{OH}(S)$	1	1600	0.995	0.990
n_t	1013.98	1.50151	$P'_{g,F'}$	0.4824	RP (S)	1	1400	0.996	0.992
n_s	852.11	1.50394			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.50558	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.50707					1000	0.999	0.998
n_C	656.27	1.50855					950	0.999	0.998
$n_{C'}$	643.85	1.50896					900	0.999	0.998
n_{He-Ne}	632.80	1.50934					850	0.999	0.998
n_D	589.29	1.51105	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.51112	$\Delta P_{g,F}$	0.0000	-50/-40	76	750	0.999	0.998
n_e	546.07	1.51314	$\Delta P_{C,t}$	0.0000	-40/-30	79	700	0.999	0.998
n_F	486.13	1.51700	$\Delta P_{C,s}$	0.0001	-30/-20	81	650	0.999	0.998
$n_{F'}$	479.99	1.51748	Thermal Properties		-20/-10	82	600	0.999	0.998
n_g	435.84	1.52159			-10/0	83	550	0.999	0.998
n_h	404.66	1.52540			0/10	84	500	0.998	0.997
n_i	365.01	1.53188			10/20	84	480	0.998	0.997
					20/30	85	460	0.998	0.997
					30/40	85	440	0.998	0.997
					40/50	86	420	0.998	0.997
					50/60	87	400	0.998	0.997
			Mechanical Properties		60/70	87	390	0.998	0.997
					70/80	88	380	0.998	0.996
					80/90	88	370	0.998	0.996
					90/100	89	360	0.997	0.994
					100/110	89	350	0.994	0.989
					110/120	90	340	0.990	0.981
					120/130	91	330	0.982	0.964
					130/140	92	320	0.951	0.905
			Density		140/150	94	310	0.875	0.766
					150/160	94	300	0.696	0.485
							290	0.404	0.163
							280		

Constants of Dispersion Formula	
A_0	2.25095310E+00
A_1	-7.97694290E-03
A_2	1.21729170E-02
A_3	-9.99979160E-05
A_4	4.17761640E-05
A_5	-2.09126230E-06

Density		Solarization	
ρ (g/cm ³)	2.53	$\Delta\lambda$ (%)	-3.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6}/^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.2	0.4	0.6	0.6	0.6	0.8	1.0	1.3	1.3	1.6
-40 ~ -20	0.2	0.4	0.6	0.6	0.6	0.8	1.1	1.4	1.4	1.7
-20 ~ 0	0.1	0.3	0.6	0.6	0.7	0.9	1.1	1.4	1.4	1.6
0 ~ 20	0.2	0.4	0.7	0.7	0.8	0.9	1.0	1.3	1.4	1.6
20 ~ 40	0.2	0.4	0.6	0.7	0.7	0.8	1.1	1.4	1.4	1.7
40 ~ 60	0.3	0.5	0.7	0.7	0.7	0.9	1.2	1.4	1.5	1.8
60 ~ 80	0.3	0.5	0.7	0.7	0.7	0.9	1.2	1.5	1.5	1.8
80 ~ 100	0.4	0.6	0.8	0.8	0.8	1.0	1.3	1.6	1.6	1.9
100 ~ 120	0.4	0.7	0.9	0.9	1.0	1.0	1.4	1.6	1.7	2.0
120 ~ 140	0.5	0.7	0.9	1.0	1.0	1.1	1.4	1.7	1.7	2.1
140 ~ 160	0.6	0.8	1.0	1.1	1.1	1.2	1.5	1.7	1.7	2.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	330/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	312/283

Constants of dn/dt		
D_0	D_1	D_2
-3.51E-06	1.40E-08	-2.33E-11
E_0	E_1	λ_{TK}
7.26E-07	1.47E-10	1.23E-01

H-K9L	517642	$n_d = 1.51680$	$v_d = 64.20$	$n_F - n_C = 0.008050$
		$n_e = 1.51872$	$v_e = 64.00$	$n_F - n_C' = 0.008105$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.48969	$P_{d,C}$	0.3081	RC (S)	1	2400	0.907	0.823
n_{1970}	1970.09	1.49515	$P_{e,d}$	0.2385	RA (S)	1	2200	0.933	0.870
n_{1530}	1529.58	1.50098	$P_{g,F}$	0.5379	D_W	2	2000	0.980	0.960
n_{1129}	1128.64	1.50585	$P'_{d,c'}$	0.2566	D_A	1	1800	0.992	0.985
n_{1064}	1064.00	1.50668	$P'_{e,d}$	0.2369	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.50735	$P'_{g,F'}$	0.4787	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.50983			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.51145	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.51290					1000	0.999	0.998
n_C	656.27	1.51432					950	0.999	0.998
$n_{C'}$	643.85	1.51472					900	0.999	0.998
n_{He-Ne}	632.80	1.51509					850	0.999	0.998
n_D	589.29	1.51673	ΔP_{Fe}	-0.0013	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.51680	$\Delta P_{g,F}$	0.0009	-50/-40	67	750	0.999	0.998
n_e	546.07	1.51872	$\Delta P_{C,t}$	0.0146	-40/-30	69	700	0.999	0.998
n_F	486.13	1.52237	$\Delta P_{C,s}$	0.0033	-30/-20	70	650	0.999	0.998
$n_{F'}$	479.99	1.52282	Thermal Properties		-20/-10	71	600	0.999	0.998
n_g	435.84	1.52670	$T_g (^{\circ}C)$	582	-10/0	72	550	0.999	0.998
n_h	404.66	1.53027	$T_s (^{\circ}C)$	630	0/10	73	500	0.999	0.998
n_i	365.01	1.53629	$T_{10}^{14.5} (^{\circ}C)$	519	10/20	73	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	548	20/30	74	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	73	30/40	75	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	92	40/50	75	420	0.999	0.998
			λ (W/(m K))	1.22	50/60	76	400	0.999	0.998
					60/70	77	390	0.998	0.997
					70/80	78	380	0.997	0.995
			Mechanical Properties		80/90	79	370	0.997	0.994
			HK (10^7 Pa)	581	90/100	79	360	0.996	0.993
			F_A	100	100/110	80	350	0.990	0.980
			E (GPa)	76.9	110/120	81	340	0.980	0.960
			G (GPa)	32.3	120/130	82	330	0.964	0.929
			μ	0.189	130/140	84	320	0.927	0.859
			σ_b (MPa)	92	140/150	85	310	0.851	0.724
			B (10^{-12} /Pa)	2.53	150/160	87	300	0.722	0.521

Constants of Dispersion Formula	
A_0	2.27223852E+00
A_1	-1.01682613E-02
A_2	1.03945607E-02
A_3	2.29862391E-04
A_4	-4.30423477E-06
A_5	5.00107200E-08

Density		Solarization	
ρ (g/cm ³)	2.49	$\Delta\lambda$ (%)	-20.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	1.7	1.9	1.9	1.9	2.0	2.3	2.6	2.7	2.9
-40 ~ -20	1.8	2.0	2.2	2.3	2.3	2.4	2.5	2.9	3.0	3.2
-20 ~ 0	2.0	2.2	2.3	2.3	2.5	2.5	2.6	3.0	3.0	3.3
0 ~ 20	2.2	2.3	2.4	2.4	2.5	2.6	2.7	3.0	3.0	3.3
20 ~ 40	2.3	2.4	2.4	2.5	2.6	2.6	2.8	3.1	3.1	3.4
40 ~ 60	2.3	2.4	2.5	2.6	2.7	2.8	3.0	3.3	3.3	3.5
60 ~ 80	2.4	2.5	2.6	2.7	2.7	2.8	3.0	3.3	3.3	3.6
80 ~ 100	2.5	2.6	2.7	2.8	2.9	2.9	3.0	3.3	3.3	3.5
100 ~ 120	2.5	2.6	2.8	2.9	3.0	3.0	3.0	3.3	3.3	3.5
120 ~ 140	2.5	2.6	2.9	3.0	3.0	3.0	3.0	3.3	3.4	3.6
140 ~ 160	2.5	2.7	3.0	3.1	3.1	3.1	3.1	3.4	3.4	3.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	325/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	317/280

Constants of dn/dt		
D_0	D_1	D_2
1.32E-06	2.02E-08	-4.68E-11
E_0	E_1	λ_{TK}
4.63E-07	-4.16E-10	2.04E-01

H-K10	518590	$n_d = 1.51818$	$v_d = 58.95$	$n_F - n_C = 0.008790$
		$n_e = 1.52027$	$v_e = 58.69$	$n_F - n_C' = 0.008865$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.49188	P _{d,C}	0.3060	RC (S)	1	2400	0.862	0.745		
n ₁₉₇₀	1970.09	1.49679	P _{e,d}	0.2378	RA (S)	1	2200	0.902	0.814		
n ₁₅₃₀	1529.58	1.50212	P _{g,F}	0.5461	D _W	1	2000	0.960	0.920		
n ₁₁₂₉	1128.64	1.50673	P' _{d,c´}	0.2549	D _A	1	1800	0.984	0.968		
n ₁₀₆₄	1064.00	1.50754	P' _{e,d}	0.2358	R _{OH} (S)	2	1600	0.999	0.998		
n _t	1013.98	1.50821	P' _{g,F´}	0.4839	RP (S)	1	1400	0.999	0.998		
n _s	852.11	1.51074			CR		1200	0.999	0.998		
n _{A´}	768.19	1.51243	Deviation of Relative Partial Dispersions			Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998	
n _r	706.52	1.51397						1000	0.999	0.998	
n _C	656.27	1.51549						950	0.999	0.998	
n _{C´}	643.85	1.51592						900	0.999	0.998	
n _{He-Ne}	632.80	1.51633						850	0.999	0.998	
n _D	589.29	1.51810	ΔP _{F,e}	-0.0015	°C	α	800	0.999	0.998		
n _d	587.56	1.51818	ΔP _{g,F}	0.0004	-50/-40	81	750	0.999	0.998		
n _e	546.07	1.52027	ΔP _{C,t}	0.0024	-40/-30	84	700	0.999	0.998		
n _F	486.13	1.52428	ΔP _{C,s}	-0.0015	-30/-20	86	650	0.999	0.998		
n _{F´}	479.99	1.52479	Thermal Properties		-20/-10	87	600	0.999	0.998		
n _g	435.84	1.52908			Tg (°C)	518	-10/0	88	550	0.999	0.998
n _h	404.66	1.53306			Ts (°C)	575	0/10	89	500	0.999	0.998
n _i	365.01	1.53987			T ₁₀ ^{14.5} (°C)	460	10/20	90	480	0.999	0.998
					T ₁₀ ¹³ (°C)	495	20/30	90	460	0.999	0.998
			α _{-50/80°C} (10 ⁻⁷ /K)	88	30/40	91	440	0.999	0.998		
			α _{100/300°C} (10 ⁻⁷ /K)	110	40/50	91					

Constants of Dispersion Formula	
A ₀	2.27263886E+00
A ₁	-9.07293538E-03
A ₂	1.14409318E-02
A ₃	2.89379329E-04
A ₄	-1.16567157E-05
A ₅	7.94218946E-07

Density		Solarization	
ρ (g/cm ³)	2.52	$\Delta\lambda$ (%)	0.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^\circ\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.2	1.3	1.4	1.5	1.5	1.5	1.8	2.0	2.0	2.4
-40 ~ -20	1.1	1.2	1.4	1.5	1.5	1.6	1.8	2.0	2.1	2.4
-20 ~ 0	1.1	1.3	1.4	1.5	1.5	1.6	1.8	2.1	2.1	2.5
0 ~ 20	1.1	1.3	1.5	1.5	1.5	1.6	1.8	2.1	2.1	2.5
20 ~ 40	1.1	1.3	1.5	1.5	1.5	1.6	1.8	2.1	2.2	2.5
40 ~ 60	1.1	1.3	1.6	1.6	1.6	1.7	1.9	2.1	2.2	2.6
60 ~ 80	1.2	1.4	1.6	1.6	1.6	1.7	1.9	2.1	2.2	2.6
80 ~ 100	1.2	1.4	1.6	1.6	1.7	1.8	2.0	2.2	2.3	2.7
100 ~ 120	1.3	1.5	1.6	1.6	1.7	1.8	2.0	2.3	2.3	2.7
120 ~ 140	1.3	1.5	1.6	1.6	1.7	1.8	2.0	2.3	2.4	2.8
140 ~ 160	1.3	1.5	1.6	1.7	1.7	1.9	2.1	2.3	2.4	2.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	345/315
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	342/315

Constants of dn/dt		
D ₀	D ₁	D ₂
-9.83E-07	1.34E-08	-2.97E-11
E ₀	E ₁	λ_{TK}
4.25E-07	1.90E-10	2.52E-01

H-K12	534555	$n_d = 1.53359$	$v_d = 55.47$	$n_F - n_C = 0.009619$
		$n_e = 1.53588$	$v_e = 55.17$	$n_F - n_C' = 0.009713$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.50814	P _{d,C}	0.3025	RC (S)	1	2400	0.874	0.764		
n ₁₉₇₀	1970.09	1.51249	P _{e,d}	0.2381	RA (S)	1	2200	0.898	0.806		
n ₁₅₃₀	1529.58	1.51727	P _{g,F}	0.5479	D _W	1	2000	0.955	0.909		
n ₁₁₂₉	1128.64	1.52160	P' _{d,c}	0.2522	D _A	1	1800	0.977	0.953		
n ₁₀₆₄	1064.00	1.52239	P' _{e,d}	0.2358	R _{OH} (S)	1	1600	0.994	0.988		
n _t	1013.98	1.52305	P' _{g,F}	0.4859	RP (S)	2	1400	0.999	0.998		
n _s	852.11	1.52562			CR		1200	0.999	0.998		
n _A	768.19	1.52740	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998		
n _r	706.52	1.52904					1000	0.999	0.998		
n _C	656.27	1.53068					950	0.999	0.998		
n _C	643.85	1.53114					900	0.999	0.998		
n _{He-Ne}	632.80	1.53157					850	0.999	0.998		
n _D	589.29	1.53350	ΔP _{F,e}	-0.0001	°C	α	800	0.999	0.998		
n _d	587.56	1.53359	ΔP _{g,F}	-0.0036	-50/-40	83	750	0.999	0.998		
n _e	546.07	1.53588	ΔP _{C,t}	-0.0157	-40/-30	86	700	0.999	0.998		
n _F	486.13	1.54030	ΔP _{C,s}	-0.0075	-30/-20	88	650	0.999	0.998		
n _F	479.99	1.54085	Thermal Properties		-20/-10	89	600	0.999	0.998		
n _g	435.84	1.54557			T _g (°C)	495	-10/0	91	550	0.999	0.998
n _h	404.66	1.54996			T _s (°C)	549	0/10	92	500	0.999	0.998
n _i	365.01	1.55752			T ₁₀ ^{14.5} (°C)	450	10/20	93	480	0.999	0.998
					T ₁₀ ¹³ (°C)	488	20/30	94	460	0.999	0.998
					α _{-50/80°C} (10 ⁻⁷ /K)	98	440	0.999	0.998		
					α _{100/300°C} (10 ⁻⁷ /K)	113					

H-K51	523586	$n_d = 1.52307$	$v_d = 58.63$	$n_F - n_C = 0.008921$
		$n_e = 1.52520$	$v_e = 58.39$	$n_F - n_C' = 0.008995$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.49748	$P_{d,C}$	0.3027	RC (S)	2	2400	0.900	0.810
n_{1970}	1970.09	1.50215	$P_{e,d}$	0.2388	RA (S)	1	2200	0.915	0.837
n_{1530}	1529.58	1.50724	$P_{g,F}$	0.5403	D_W	2	2000	0.963	0.927
n_{1129}	1128.64	1.51167	$P'_{d,C}$	0.2524	D_A	1	1800	0.984	0.968
n_{1064}	1064.00	1.51246	$P'_{e,d}$	0.2368	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.51310	$P'_{g,F}$	0.4792	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.51559			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.51728	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.51883					1000	0.998	0.996
n_C	656.27	1.52037					950	0.998	0.996
$n_{C'}$	643.85	1.52080					900	0.998	0.996
n_{He-Ne}	632.80	1.52120					850	0.998	0.996
n_D	589.29	1.52299	ΔP_{Fe}	0.0006	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.52307	$\Delta P_{g,F}$	-0.0059	-50/-40	79	750	0.998	0.997
n_e	546.07	1.52520	$\Delta P_{C,t}$	-0.0093	-40/-30	80	700	0.999	0.998
n_F	486.13	1.52929	$\Delta P_{C,s}$	-0.0053	-30/-20	82	650	0.999	0.998
$n_{F'}$	479.99	1.52980	Thermal Properties		-20/-10	83	600	0.999	0.998
n_g	435.84	1.53411	Tg ($^{\circ}C$)	564	-10/0	83	550	0.999	0.998
n_h	404.66	1.53811	Ts ($^{\circ}C$)	610	0/10	84	500	0.999	0.998
n_i	365.01	1.54495	$T_{10}^{14.5} (^{\circ}C)$	497	10/20	84	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	530	20/30	85	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	80	30/40	85	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	40/50	86	420	0.999	0.998
			λ (W/(m K))	1.18	50/60	87	400	0.999	0.998
					60/70	87	390	0.999	0.998
					70/80	88	380	0.999	0.998
					80/90	88	370	0.996	0.992
					90/100	90	360	0.996	0.992
					100/110	91	350	0.989	0.978
					110/120	92	340	0.970	0.941
					120/130	92	340	0.926	0.857
					130/140	94	330	0.826	0.682
					140/150	95	320	0.648	0.420
					150/160	96	310	0.375	0.141
							300	0.107	0.011
							290		
							280		

Constants of Dispersion Formula	
A_0	2.28724008E+00
A_1	-8.66259828E-03
A_2	1.09312658E-02
A_3	6.19326901E-04
A_4	-6.62977052E-05
A_5	3.74341463E-06

Density		Solarization	
ρ (g/cm ³)	2.52	$\Delta\lambda$ (%)	-2.2

Mechanical Properties	
HK (10 ⁷ Pa)	517
F_A	102
E (GPa)	73.0
G (GPa)	29.9
μ	0.218
σ_b (MPa)	52
B (10 ⁻¹² /Pa)	2.50

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.9	1.0	1.0	1.0	1.1	1.4	1.7	1.9	1.9	2.2
-40 ~ -20	1.0	1.0	1.1	1.1	1.2	1.5	1.8	2.0	2.0	2.4
-20 ~ 0	1.1	1.1	1.2	1.2	1.3	1.6	2.0	2.2	2.2	2.6
0 ~ 20	1.2	1.3	1.3	1.3	1.4	1.7	2.1	2.4	2.4	2.7
20 ~ 40	1.3	1.4	1.4	1.4	1.5	1.8	2.2	2.6	2.6	2.8
40 ~ 60	1.4	1.4	1.5	1.5	1.6	1.9	2.3	2.7	2.7	3.0
60 ~ 80	1.4	1.5	1.6	1.6	1.7	2.0	2.4	2.8	2.8	3.1
80 ~ 100	1.4	1.5	1.7	1.7	1.8	2.2	2.6	2.9	2.9	3.2
100 ~ 120	1.5	1.6	1.7	1.7	1.8	2.3	2.7	3.0	3.0	3.3
120 ~ 140	1.5	1.7	1.7	1.8	1.9	2.4	2.9	3.0	3.1	3.5
140 ~ 160	1.6	1.7	1.8	1.9	2.0	2.5	2.9	3.0	3.1	3.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/310
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	337/304

Constants of dn/dt		
D_0	D_1	D_2
-1.39E-06	1.68E-08	-3.96E-11
E_0	E_1	λ_{TK}
6.34E-07	6.47E-10	2.23E-01

H-BaK2	540597	$n_d = 1.53996$	$v_d = 59.72$	$n_F - n_C = 0.009041$
		$n_e = 1.54212$	$v_e = 59.45$	$n_F - n_C' = 0.009119$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42	1.51376	$P_{d,C}$	0.3042	RC (S)	1	2400	0.917	0.842
n_{1970}	1970.09	1.51856	$P_{e,d}$	0.2389	RA (S)	2	2200	0.937	0.880
n_{1530}	1529.58	1.52378	$P_{g,F}$	0.5442	D_W	1	2000	0.974	0.947
n_{1129}	1128.64	1.52833	$P'_{d,c'}$	0.2533	D_A	1	1800	0.987	0.976
n_{1064}	1064.00	1.52914	$P'_{e,d}$	0.2369	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.52981	$P'_{g,F'}$	0.4825	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.53235			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.53407	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.53565					1000	0.999	0.998
n_C	656.27	1.53721					950	0.999	0.998
$n_{C'}$	643.85	1.53765					900	0.999	0.998
n_{He-Ne}	632.80	1.53806					850	0.999	0.998
n_D	589.29	1.53988	Thermal Properties				800	0.999	0.998
n_d	587.56	1.53996					750	0.999	0.998
n_e	546.07	1.54212	Tg (°C)				700	0.999	0.998
n_F	486.13	1.54625					650	0.999	0.998
$n_{F'}$	479.99	1.54677	Ts (°C)				600	0.999	0.998
n_g	435.84	1.55117	$T_{10}^{14.5}$ (°C)				550	0.999	0.998
n_h	404.66	1.55525	T_{10}^{13} (°C)				500	0.999	0.998
n_i	365.01	1.56225	$\alpha_{-50/80^\circ C} (10^{-7}/K)$				480	0.999	0.998
			$\alpha_{100/300^\circ C} (10^{-7}/K)$				460	0.999	0.998
			λ (W/(m K))				440	0.999	0.998
							420	0.999	0.998

Constants of Dispersion Formula	
A_0	2.33787692E+00
A_1	-8.98050049E-03
A_2	1.15593975E-02
A_3	4.92789833E-04
A_4	-4.58314132E-05
A_5	2.77373664E-06

Density		Solarization	
ρ (g/cm ³)	2.85	$\Delta\lambda$ (%)	-29.0

Mechanical Properties	
HK (10 ⁷ Pa)	532
F_A	103
E (GPa)	71.1
G (GPa)	28.1
μ	0.266
σ_b (MPa)	79
B (10 ⁻¹² /Pa)	2.51

70/80	81
80/90	82
90/100	83
100/110	83
110/120	84
120/130	88
130/140	89
140/150	90
150/160	92

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^\circ C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.4	0.6	0.7	0.7	0.8	0.9	1.0	1.3	1.4	2.0
-40 ~ -20	0.6	0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.5	2.1
-20 ~ 0	0.8	0.9	1.0	1.1	1.2	1.3	1.5	1.5	1.6	2.3
0 ~ 20	0.9	1.1	1.2	1.2	1.4	1.5	1.8	1.9	2.1	2.6
20 ~ 40	1.4	1.4	1.5	1.5	1.6	1.7	2.0	2.2	2.3	2.6
40 ~ 60	1.5	1.6	1.7	1.7	1.8	1.9	2.1	2.3	2.4	2.7
60 ~ 80	1.6	1.7	1.8	1.8	2.0	2.1	2.4	2.5	2.5	2.9
80 ~ 100	1.7	1.8	1.9	2.0	2.1	2.3	2.5	2.6	2.7	3.1
100 ~ 120	1.9	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.9	3.3
120 ~ 140	2.1	2.1	2.2	2.3	2.4	2.7	2.8	2.8	2.9	3.5
140 ~ 160	2.2	2.3	2.3	2.4	2.5	2.8	2.9	2.9	3.0	3.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	330/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	313/281

Constants of dn/dt		
D_0	D_1	D_2
-1.01E-06	2.38E-08	-4.15E-11
E_0	E_1	λ_{TK}
3.35E-07	-1.37E-10	3.01E-01

H-BaK7B	569560	$n_d = 1.56883$	$v_d = 56.04$	$n_F - n_C = 0.010150$
		$n_e = 1.57125$	$v_e = 55.78$	$n_F - n_{C'} = 0.010242$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.54079	$P_{d,C}$	0.3034	RC (S)	1	2400	0.934	0.872
n_{1970}	1970.09	1.54574	$P_{e,d}$	0.2384	RA (S)	1	2200	0.953	0.908
n_{1530}	1529.58	1.55115	$P_{g,F}$	0.5488	D_W	1	2000	0.979	0.958
n_{1129}	1128.64	1.55598	$P'_{d,c'}$	0.2529	D_A	1	1800	0.988	0.976
n_{1064}	1064.00	1.55686	$P'_{e,d}$	0.2363	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.55758	$P'_{g,F'}$	0.4872	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.56036			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.56227	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.56401					1000	0.999	0.998
n_C	656.27	1.56575					950	0.999	0.998
$n_{C'}$	643.85	1.56624					900	0.999	0.998
n_{He-Ne}	632.80	1.56670					850	0.999	0.998
n_D	589.29	1.56874	ΔP_{Fe}	-0.0011	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.56883	$\Delta P_{g,F}$	-0.0017	-50/-40	62	750	0.999	0.998
n_e	546.07	1.57125	$\Delta P_{C,t}$	-0.0067	-40/-30	62	700	0.999	0.998
n_F	486.13	1.57590	$\Delta P_{C,s}$	-0.0039	-30/-20	63	650	0.999	0.998
$n_{F'}$	479.99	1.57648	Thermal Properties		-20/-10	63	600	0.999	0.998
n_g	435.84	1.58147	$T_g (^{\circ}C)$	587	-10/0	65	550	0.999	0.998
n_h	404.66	1.58611	$T_s (^{\circ}C)$	646	0/10	66	500	0.999	0.998
n_i	365.01	1.59408	$T_{10}^{14.5} (^{\circ}C)$	530	10/20	67	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	565	20/30	67	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	68	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	40/50	74	420	0.996	0.992
			λ (W/(m K))	1.08	50/60	74	400	0.994	0.990
					60/70	76	390	0.992	0.986
					70/80	76	380	0.988	0.980
			Mechanical Properties		80/90	78	370	0.982	0.965
			HK (10^7 Pa)	553	90/100	79	360	0.961	0.928
			F_A	123	100/110	79	350	0.917	0.845
			E (GPa)	80.1	110/120	80	340	0.808	0.654
			G (GPa)	33.1	120/130	82	330	0.560	0.315
			μ	0.210	130/140	83	320	0.192	0.039
			σ_b (MPa)	78	140/150	84	310		
			B (10^{-12} /Pa)	2.52	150/160	85	300		

Constants of Dispersion Formula	
A_0	2.42201339E+00
A_1	-9.34171338E-03
A_2	1.36739157E-02
A_3	3.76328562E-04
A_4	-1.74732935E-05
A_5	1.22001270E-06

Density		Solarization	
ρ (g/cm ³)	2.85	$\Delta\lambda$ (%)	-0.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.0	3.2	3.3	3.4	3.4	3.5	3.8	4.2	4.2	4.4
-40 ~ -20	3.1	3.3	3.4	3.4	3.5	3.7	3.9	4.2	4.3	4.5
-20 ~ 0	3.1	3.3	3.4	3.5	3.5	3.6	3.8	4.2	4.2	4.5
0 ~ 20	3.0	3.4	3.4	3.5	3.5	3.6	3.8	4.2	4.3	4.5
20 ~ 40	3.0	3.3	3.4	3.5	3.6	3.6	3.8	4.2	4.2	4.6
40 ~ 60	3.0	3.3	3.5	3.6	3.6	3.6	3.8	4.3	4.3	4.7
60 ~ 80	3.1	3.4	3.5	3.6	3.7	3.7	3.9	4.4	4.4	4.9
80 ~ 100	3.2	3.3	3.6	3.6	3.7	3.9	4.1	4.5	4.5	5.0
100 ~ 120	3.2	3.4	3.6	3.7	3.7	3.8	4.0	4.4	4.5	5.1
120 ~ 140	3.2	3.4	3.6	3.7	3.7	3.8	4.0	4.4	4.5	5.0
140 ~ 160	3.2	3.5	3.6	3.7	3.7	3.9	4.1	4.4	4.6	5.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	355/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	347/321

Constants of dn/dt		
D_0	D_1	D_2
3.18E-06	1.21E-08	-2.72E-11
E_0	E_1	λ_{TK}
4.09E-07	3.53E-10	2.69E-01

H-BaK8	573575	$n_d = 1.57250$	$v_d = 57.49$	$n_F - n_C = 0.009959$
		$n_e = 1.57487$	$v_e = 57.20$	$n_F - n_C' = 0.010051$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.54549	$P_{d,C}$	0.3032	RC (S)	1	2400	0.931	0.866
n_{1970}	1970.09	1.55016	$P_{e,d}$	0.2380	RA (S)	3	2200	0.952	0.910
n_{1530}	1529.58	1.55531	$P_{g,F}$	0.5482	D_W	1	2000	0.984	0.966
n_{1129}	1128.64	1.55993	$P'_{d,c'}$	0.2527	D_A	2	1800	0.992	0.985
n_{1064}	1064.00	1.56078	$P'_{e,d}$	0.2358	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.56148	$P'_{g,F'}$	0.4865	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.56419			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.56606	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.56777					1000	0.999	0.998
n_C	656.27	1.56948					950	0.999	0.998
$n_{C'}$	643.85	1.56996					900	0.999	0.998
n_{He-Ne}	632.80	1.57041					850	0.999	0.998
n_D	589.29	1.57241	ΔP_{Fe}	0.0004	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.57250	$\Delta P_{g,F}$	0.0001	-50/-40	66	750	0.999	0.998
n_e	546.07	1.57487	$\Delta P_{C,t}$	-0.0154	-40/-30	68	700	0.999	0.998
n_F	486.13	1.57944	$\Delta P_{C,s}$	-0.0072	-30/-20	69	650	0.999	0.998
$n_{F'}$	479.99	1.58001	Thermal Properties		-20/-10	70	600	0.999	0.998
n_g	435.84	1.58490	Tg ($^{\circ}C$)	614	-10/0	71	550	0.999	0.998
n_h	404.66	1.58941	Ts ($^{\circ}C$)	664	0/10	72	500	0.999	0.998
n_i	365.01	1.59715	$T_{10}^{14.5} (^{\circ}C)$	549	10/20	72	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	592	20/30	73	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	73	30/40	74	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	86	40/50	74	420	0.999	0.998
			λ (W/(m K))	0.94	50/60	74	400	0.999	0.998
					60/70	75	390	0.999	0.998
					70/80	75	380	0.997	0.995
			Mechanical Properties		80/90	76	370	0.995	0.990
			HK ($10^7 Pa$)	527	90/100	77	360	0.991	0.983
			F _A	127	100/110	77	350	0.983	0.967
			E (GPa)	72.3	110/120	78	340	0.964	0.930
			G (GPa)	29.1	120/130	79	330	0.930	0.866
			μ	0.243	130/140	80	320	0.863	0.744
			σ_b (MPa)	78	140/150	82	310	0.751	0.558
			B ($10^{-12}/Pa$)	2.56	150/160	83	300	0.576	0.329
							290	0.344	0.120
							280		

Constants of Dispersion Formula	
A_0	2.43375651E+00
A_1	-8.82982376E-03
A_2	1.35916939E-02
A_3	3.60922117E-04
A_4	-1.79584197E-05
A_5	1.11930116E-06

Density		Solarization	
ρ (g/cm ³)	3.17	$\Delta\lambda$ (%)	-13.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.0	2.2	2.4	2.4	2.4	2.5	2.8	3.1	3.1	3.3
-40 ~ -20	2.1	2.2	2.5	2.5	2.5	2.5	2.8	3.1	3.1	3.4
-20 ~ 0	2.0	2.2	2.5	2.5	2.5	2.6	2.8	3.1	3.1	3.5
0 ~ 20	2.0	2.1	2.5	2.5	2.5	2.6	2.8	3.1	3.1	3.6
20 ~ 40	2.1	2.3	2.6	2.6	2.7	2.8	2.9	3.3	3.3	3.6
40 ~ 60	2.2	2.5	2.7	2.8	2.8	2.9	3.1	3.4	3.4	3.8
60 ~ 80	2.4	2.6	2.8	2.9	2.9	3.0	3.3	3.5	3.6	3.9
80 ~ 100	2.5	2.7	2.9	3.0	3.0	3.2	3.3	3.6	3.7	4.0
100 ~ 120	2.6	2.8	3.1	3.2	3.2	3.3	3.5	3.7	3.8	4.1
120 ~ 140	2.8	3.0	3.2	3.3	3.4	3.5	3.6	3.7	3.8	4.2
140 ~ 160	2.9	3.1	3.3	3.3	3.4	3.5	3.6	3.7	3.8	4.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	335/285
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	324/284

Constants of dn/dt		
D_0	D_1	D_2
9.63E-07	1.65E-08	-1.99E-11
E_0	E_1	λ_{TK}
5.81E-07	-1.28E-10	1.29E-01

H-ZK3A	589613	$n_d = 1.58913$	$v_d = 61.25$	$n_F - n_C = 0.009618$
		$n_e = 1.59142$	$v_e = 61.01$	$n_F - n_C' = 0.009694$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.55975	$P_{d,C}$	0.3057	RC (S)	1	2400	0.917	0.842
n_{1970}	1970.09	1.56532	$P_{e,d}$	0.2381	RA (S)	3	2200	0.973	0.947
n_{1530}	1529.58	1.57133	$P_{g,F}$	0.5417	D_W	2	2000	0.991	0.982
n_{1129}	1128.64	1.57650	$P'_{d,c'}$	0.2548	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.57741	$P'_{e,d}$	0.2362	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.57815	$P'_{g,F'}$	0.4817	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.58095			CR	4a	1200	0.999	0.998
$n_{A'}$	768.19	1.58282	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58451					1000	0.999	0.998
n_C	656.27	1.58619					950	0.999	0.998
$n_{C'}$	643.85	1.58666					900	0.999	0.998
n_{He-Ne}	632.80	1.58709					850	0.999	0.998
n_D	589.29	1.58903	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.58913	$\Delta P_{g,F}$	-0.0002	-50/-40	48	750	0.999	0.998
n_e	546.07	1.59142	$\Delta P_{C,t}$	-0.0010	-40/-30	50	700	0.999	0.998
n_F	486.13	1.59581	$\Delta P_{C,s}$	-0.0026	-30/-20	53	650	0.999	0.998
$n_{F'}$	479.99	1.59635	Thermal Properties		-20/-10	54	600	0.999	0.998
n_g	435.84	1.60102			-10/0	56	550	0.999	0.998
n_h	404.66	1.60533	Tg ($^{\circ}C$)	678	0/10	56	500	0.999	0.998
n_i	365.01	1.61266	Ts ($^{\circ}C$)	733	10/20	56	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	609	20/30	57	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	650	30/40	57	440	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	55	40/50	58	420	0.998	0.996
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	67	50/60	58	400	0.997	0.994
			λ (W/(m K))	1.05	60/70	59	390	0.992	0.985
					70/80	59	380	0.990	0.980
			Mechanical Properties		80/90	60	370	0.989	0.978
					90/100	61	360	0.972	0.945
			HK (10^7Pa)	550	100/110	62	350	0.949	0.900
			F_A	119	110/120	62	340	0.906	0.821
			E (GPa)	81.3	120/130	63	330	0.833	0.694
			G (GPa)	32.7	130/140	63	320	0.720	0.518
			μ	0.244	140/150	65	310	0.564	0.318
			σ_b (MPa)	72	150/160	66	300	0.387	0.150
			B ($10^{-12}/Pa$)	2.06			290	0.210	0.044
							280	0.114	0.013

Constants of Dispersion Formula	
A_0	2.48859886E+00
A_1	-1.07631038E-02
A_2	1.30844889E-02
A_3	3.33048453E-04
A_4	-1.29820178E-05
A_5	6.37252025E-07

Density		Solarization	
ρ (g/cm ³)	3.31	$\Delta\lambda$ (%)	-5.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.0	3.1	3.3	3.3	3.4	3.5	3.5	3.8	3.9	4.2
-40 ~ -20	3.0	3.2	3.3	3.3	3.3	3.5	3.7	3.8	3.9	4.2
-20 ~ 0	3.1	3.3	3.4	3.4	3.4	3.5	3.7	3.9	3.9	4.2
0 ~ 20	3.1	3.3	3.4	3.4	3.5	3.5	3.6	3.9	3.9	4.3
20 ~ 40	3.1	3.3	3.4	3.4	3.5	3.6	3.7	4.0	4.0	4.4
40 ~ 60	3.2	3.3	3.5	3.5	3.6	3.7	3.8	4.1	4.2	4.5
60 ~ 80	3.3	3.5	3.6	3.7	3.8	3.9	4.0	4.3	4.4	4.7
80 ~ 100	3.4	3.6	3.7	3.8	3.9	4.1	4.2	4.4	4.5	4.9
100 ~ 120	3.5	3.6	3.8	3.9	4.0	4.3	4.5	4.6	4.7	5.2
120 ~ 140	3.6	3.8	4.0	4.1	4.2	4.4	4.6	4.8	4.9	5.4
140 ~ 160	3.7	3.9	4.1	4.2	4.3	4.6	4.9	5.1	5.2	5.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	345/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	338/290

Constants of dn/dt		
D_0	D_1	D_2
3.00E-06	1.29E-08	-9.66E-12
E_0	E_1	λ_{TK}
3.80E-07	7.20E-10	2.31E-01

H-ZK6	613586	$n_d = 1.61272$	$v_d = 58.58$	$n_F - n_C = 0.010460$
		$n_e = 1.61521$	$v_e = 58.30$	$n_F - n_C' = 0.010552$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58370	$P_{d,C}$	0.3040	RC (S)	1	2400	0.922	0.844
n_{1970}	1970.09	1.58884	$P_{e,d}$	0.2380	RA (S)	3	2200	0.967	0.927
n_{1530}	1529.58	1.59446	$P_{g,F}$	0.5459	D_W	1	2000	0.993	0.986
n_{1129}	1128.64	1.59947	$P'_{d,c'}$	0.2530	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.60038	$P'_{e,d}$	0.2360	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.60112	$P'_{g,F'}$	0.4843	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.60399			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.60595	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.60774					1000	0.999	0.998
n_C	656.27	1.60954					950	0.999	0.998
$n_{C'}$	643.85	1.61005					900	0.999	0.998
n_{He-Ne}	632.80	1.61052					850	0.999	0.998
n_D	589.29	1.61263	ΔP_{Fe}	0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61272	$\Delta P_{g,F}$	-0.0004	-50/-40	58	750	0.999	0.998
n_e	546.07	1.61521	$\Delta P_{C,t}$	-0.0190	-40/-30	60	700	0.999	0.998
n_F	486.13	1.62000	$\Delta P_{C,s}$	-0.0104	-30/-20	61	650	0.999	0.998
$n_{F'}$	479.99	1.62060	Thermal Properties		-20/-10	62	600	0.999	0.998
n_g	435.84	1.62571			-10/0	63	550	0.999	0.998
n_h	404.66	1.63044	Tg ($^{\circ}C$)	672	0/10	63	500	0.999	0.998
n_i	365.01	1.63849	Ts ($^{\circ}C$)	713	10/20	64	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	597	20/30	64	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	644	30/40	65	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	63	40/50	65	420	0.999	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	81	50/60	65	400	0.997	0.990
			λ (W/(m K))	0.94	60/70	66	390	0.995	0.982
					70/80	66	380	0.989	0.971
			Mechanical Properties		80/90	67	370	0.980	0.952
					90/100	67	360	0.958	0.908
			HK (10^7Pa)	520	100/110	67	350	0.911	0.830
			F_A	140	110/120	68	340	0.842	0.709
			E (GPa)	81.9	120/130	69	330	0.730	0.536
			G (GPa)	31.6	130/140	70	320	0.570	0.326
			μ	0.296	140/150	71	310	0.377	0.145
			σ_b (MPa)	65	150/160	71	300	0.197	0.041
			B ($10^{-12}/Pa$)	1.73			290		
							280		

Constants of Dispersion Formula	
A_0	2.55955140E+00
A_1	-1.00093149E-02
A_2	1.42930361E-02
A_3	4.66646324E-04
A_4	-2.70113303E-05
A_5	1.35057919E-06

Density		Solarization	
ρ (g/cm ³)	3.59	$\Delta\lambda$ (%)	-7.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	1.6	1.7	1.7	1.8	1.9	2.3	2.5	2.6	3.0
-40 ~ -20	1.6	1.7	1.8	1.8	1.9	2.1	2.4	2.7	2.8	3.1
-20 ~ 0	1.9	1.8	1.9	1.9	2.0	2.1	2.5	2.8	2.9	3.2
0 ~ 20	1.9	1.9	1.9	1.9	2.0	2.2	2.6	2.9	2.9	3.3
20 ~ 40	2.0	2.0	2.1	2.1	2.2	2.4	2.7	3.0	3.1	3.6
40 ~ 60	1.9	2.0	2.2	2.2	2.3	2.5	2.8	3.3	3.4	3.9
60 ~ 80	2.1	2.3	2.5	2.5	2.6	2.8	3.1	3.5	3.6	4.2
80 ~ 100	2.3	2.5	2.7	2.7	2.8	3.1	3.4	3.9	4.0	4.6
100 ~ 120	2.4	2.7	2.9	3.0	3.1	3.4	3.7	4.2	4.3	4.9
120 ~ 140	2.5	2.8	3.1	3.2	3.3	3.6	3.9	4.4	4.5	5.1
140 ~ 160	2.6	2.9	3.3	3.4	3.4	3.8	4.0	4.5	4.6	5.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/300
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	345/299

Constants of dn/dt		
D_0	D_1	D_2
-6.10E-08	1.58E-08	-1.22E-11
E_0	E_1	λ_{TK}
4.83E-07	8.41E-10	2.69E-01

H-ZK7	613606	$n_d = 1.61309$	$v_d = 60.58$	$n_F - n_C = 0.010120$
		$n_e = 1.61551$	$v_e = 60.34$	$n_F - n_C' = 0.010201$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58169	$P_{d,C}$	0.3043	RC (S)	1	2400	0.841	0.707
n_{1970}	1970.09	1.58773	$P_{e,d}$	0.2391	RA (S)	3	2200	0.925	0.857
n_{1530}	1529.58	1.59423	$P_{g,F}$	0.5405	D_W	2	2000	0.981	0.963
n_{1129}	1128.64	1.59978	$P'_{d,c'}$	0.2539	D_A	4	1800	0.992	0.986
n_{1064}	1064.00	1.60074	$P'_{e,d}$	0.2372	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.60153	$P'_{g,F'}$	0.4803	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.60449			CR	3	1200	0.999	0.998
$n_{A'}$	768.19	1.60646	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.60824					1000	0.999	0.998
n_C	656.27	1.61001					950	0.999	0.998
$n_{C'}$	643.85	1.61050					900	0.999	0.998
n_{He-Ne}	632.80	1.61096					850	0.999	0.998
n_D	589.29	1.61300	ΔP_{Fe}	-0.0002	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61309	$\Delta P_{g,F}$	-0.0025	-50/-40	52	750	0.999	0.998
n_e	546.07	1.61551	$\Delta P_{C,t}$	0.0043	-40/-30	54	700	0.999	0.998
n_F	486.13	1.62013	$\Delta P_{C,s}$	-0.0003	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.62070	Thermal Properties		-20/-10	57	600	0.999	0.998
n_g	435.84	1.62560			-10/0	57	550	0.999	0.998
n_h	404.66	1.63013	Tg ($^{\circ}C$)	651	0/10	58	500	0.999	0.998
n_i	365.01	1.63783	Ts ($^{\circ}C$)	685	10/20	59	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	582	20/30	60	460	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	623	30/40	61	440	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	59	40/50	61	420	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	73	50/60	62	400	0.997	0.994
			λ (W/(m K))	1.03	60/70	63	390	0.994	0.989
					70/80	63	380	0.989	0.979
			Mechanical Properties		80/90	64	370	0.983	0.966
					90/100	64	360	0.967	0.935
			HK (10^7Pa)	539	100/110	65	350	0.936	0.877
			F_A	149	110/120	65	340	0.885	0.784
			E (GPa)	86.2	120/130	66	330	0.806	0.650
			G (GPa)	33.8	130/140	68	320	0.687	0.472
			μ	0.275	140/150	69	310	0.529	0.280
			σ_b (MPa)	74	150/160	71	300	0.348	0.123
			B ($10^{-12}/\text{Pa}$)	2.00			290	0.181	0.037
							280		

Constants of Dispersion Formula	
A_0	2.56343719E+00
A_1	-1.18778982E-02
A_2	1.36592937E-02
A_3	4.36395177E-04
A_4	-2.37642691E-05
A_5	1.12532867E-06

Density		Solarization	
ρ (g/cm ³)	3.50	$\Delta\lambda$ (%)	-2.1

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.0	1.1	1.1	1.1	1.2	1.3	1.4	1.6	1.7	2.0
-40 ~ -20	1.0	1.1	1.1	1.1	1.2	1.3	1.5	1.8	1.9	2.3
-20 ~ 0	1.1	1.1	1.2	1.3	1.4	1.6	1.8	1.9	2.0	2.4
0 ~ 20	1.2	1.3	1.3	1.4	1.5	1.6	1.9	2.0	2.1	2.6
20 ~ 40	1.3	1.4	1.4	1.5	1.6	1.7	1.9	2.1	2.2	2.8
40 ~ 60	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.3	2.4	2.9
60 ~ 80	1.5	1.5	1.6	1.7	1.8	2.0	2.1	2.4	2.5	3.1
80 ~ 100	1.6	1.6	1.7	1.7	1.8	2.0	2.2	2.5	2.6	3.3
100 ~ 120	1.6	1.7	1.8	1.8	1.9	2.1	2.4	2.7	2.8	3.5
120 ~ 140	1.6	1.8	1.9	1.9	1.9	2.1	2.6	2.8	2.9	3.6
140 ~ 160	1.6	1.8	1.9	1.9	2.0	2.2	2.7	3.0	3.1	3.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	341/292

Constants of dn/dt		
D_0	D_1	D_2
-9.28E-07	1.47E-08	-3.06E-11
E_0	E_1	λ_{TK}
2.76E-07	5.01E-10	3.19E-01

H-ZK9A	620603	$n_d = 1.62041$	$v_d = 60.34$	$n_F - n_C = 0.010281$
		$n_e = 1.62286$	$v_e = 60.10$	$n_F - n_C' = 0.010363$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58878	$P_{d,C}$	0.3054	RC (S)	1	2400	0.864	0.746
n_{1970}	1970.09	1.59483	$P_{e,d}$	0.2383	RA (S)	2	2200	0.944	0.891
n_{1530}	1529.58	1.60134	$P_{g,F}$	0.5398	D_W	2	2000	0.995	0.990
n_{1129}	1128.64	1.60692	$P'_{d,c'}$	0.2548	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.60789	$P'_{e,d}$	0.2364	$R_{OH}(S)$	3	1600	0.999	0.998
n_t	1013.98	1.60868	$P'_{g,F'}$	0.4796	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.61168			CR	4a	1200	0.999	0.998
$n_{A'}$	768.19	1.61367	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61548					1000	0.999	0.998
n_C	656.27	1.61727					950	0.999	0.998
$n_{C'}$	643.85	1.61777					900	0.999	0.998
n_{He-Ne}	632.80	1.61824					850	0.999	0.998
n_D	589.29	1.62032	ΔP_{Fe}	-0.0007	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.62041	$\Delta P_{g,F}$	-0.0035	-50/-40	56	750	0.999	0.998
n_e	546.07	1.62286	$\Delta P_{C,t}$	0.0030	-40/-30	59	700	0.999	0.998
n_F	486.13	1.62755	$\Delta P_{C,s}$	-0.0015	-30/-20	61	650	0.999	0.998
$n_{F'}$	479.99	1.62813	Thermal Properties		-20/-10	62	600	0.999	0.998
n_g	435.84	1.63310	Tg ($^{\circ}C$)	663	-10/0	63	550	0.999	0.998
n_h	404.66	1.63768	Ts ($^{\circ}C$)	695	0/10	64	500	0.999	0.998
n_i	365.01	1.64549	$T_{10}^{14.5} (^{\circ}C)$	600	10/20	64	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	640	20/30	65	460	0.997	0.995
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	64	30/40	65	440	0.996	0.993
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	75	40/50	66	420	0.996	0.992
			λ (W/(m K))	1.02	50/60	66	400	0.994	0.988
					60/70	67	390	0.991	0.982
					70/80	67	380	0.986	0.972
					80/90	68	370	0.976	0.952
					90/100	68	360	0.955	0.912
					100/110	69	350	0.917	0.841
					110/120	70	340	0.857	0.734
					120/130	71	330	0.757	0.573
					130/140	72	320	0.620	0.385
					140/150	73	310	0.447	0.200
					150/160	74	300	0.272	0.074
							290		
							280		

Constants of Dispersion Formula	
A_0	2.58626893E+00
A_1	-1.19483745E-02
A_2	1.37737392E-02
A_3	5.49112685E-04
A_4	-4.52101305E-05
A_5	2.44542790E-06

Density		Solarization	
ρ (g/cm ³)	3.55	$\Delta\lambda$ (%)	-2.0

Mechanical Properties	
HK (10 ⁷ Pa)	550
F_A	105
E (GPa)	89.5
G (GPa)	34.5
μ	0.297
σ_b (MPa)	87
B (10 ⁻¹² /Pa)	1.82

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.8	2.1	2.2	2.2	2.2	2.4	2.5	2.6	2.6	2.7
-40 ~ -20	1.9	2.2	2.2	2.2	2.3	2.4	2.6	2.6	2.7	2.7
-20 ~ 0	1.9	2.2	2.3	2.3	2.4	2.5	2.7	2.7	2.8	2.8
0 ~ 20	2.0	2.3	2.4	2.4	2.4	2.5	2.7	2.8	2.8	2.9
20 ~ 40	2.0	2.3	2.4	2.4	2.4	2.6	2.7	2.8	2.9	2.9
40 ~ 60	2.1	2.3	2.5	2.5	2.5	2.6	2.8	3.0	3.1	3.1
60 ~ 80	2.2	2.3	2.5	2.5	2.6	2.7	2.9	3.0	3.2	3.3
80 ~ 100	2.2	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.4	3.6
100 ~ 120	2.4	2.6	2.6	2.6	2.7	2.8	3.0	3.3	3.5	3.6
120 ~ 140	2.5	2.6	2.7	2.7	2.7	2.8	3.2	3.3	3.5	3.7
140 ~ 160	2.5	2.6	2.7	2.7	2.7	2.9	3.3	3.5	3.7	3.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	345/297

Constants of dn/dt		
D_0	D_1	D_2
7.48E-07	1.25E-08	-2.50E-11
E_0	E_1	λ_{TK}
4.11E-07	7.77E-10	7.84E-02

H-ZK10	622567	$n_d = 1.62210$	$v_d = 56.71$	$n_F - n_C = 0.010970$
		$n_e = 1.62470$	$v_e = 56.38$	$n_F - n_{C'} = 0.011080$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.59235	$P_{d,C}$	0.3036	RC (S)	1	2400	0.912	0.832
n_{1970}	1970.09	1.59753	$P_{e,d}$	0.2370	RA (S)	3	2200	0.962	0.925
n_{1530}	1529.58	1.60321	$P_{g,F}$	0.5479	D_W	1	2000	0.995	0.990
n_{1129}	1128.64	1.60830	$P'_{d,c'}$	0.2536	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.60923	$P'_{e,d}$	0.2347	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.61000	$P'_{g,F'}$	0.4856	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.61297			CR	4a	1200	0.999	0.998
$n_{A'}$	768.19	1.61501	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61689					1000	0.999	0.998
n_C	656.27	1.61877					950	0.999	0.998
$n_{C'}$	643.85	1.61929					900	0.999	0.998
n_{He-Ne}	632.80	1.61979					850	0.999	0.998
n_D	589.29	1.62199	$\Delta P_{F,e}$	0.0005	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.62210	$\Delta P_{g,F}$	-0.0015	-50/-40	55	750	0.999	0.998
n_e	546.07	1.62470	$\Delta P_{C,t}$	-0.0155	-40/-30	57	700	0.999	0.998
n_F	486.13	1.62974	$\Delta P_{C,s}$	-0.0078	-30/-20	58	650	0.999	0.998
$n_{F'}$	479.99	1.63037	Thermal Properties		-20/-10	59	600	0.999	0.998
n_g	435.84	1.63575			-10/0	60	550	0.999	0.998
n_h	404.66	1.64074	Tg ($^{\circ}C$)	664	0/10	61	500	0.999	0.998
n_i	365.01	1.64931	Ts ($^{\circ}C$)	704	10/20	62	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	597	20/30	63	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	635	30/40	64	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	64	40/50	65	420	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	78	50/60	65	400	0.995	0.992
			λ (W/(m K))	0.94	60/70	66	390	0.990	0.984
					70/80	67	380	0.983	0.968
			Mechanical Properties		80/90	68	370	0.969	0.941
					90/100	69	360	0.933	0.876
			HK ($10^7 Pa$)	528	100/110	69	350	0.867	0.757
			F_A	147	110/120	70	340	0.730	0.537
			E (GPa)	79.5	120/130	71	330	0.473	0.228
			G (GPa)	31.9	130/140	72	320	0.154	0.027
			μ	0.248	140/150	73	310		
			σ_b (MPa)	75	150/160	74	300		
			B ($10^{-12}/Pa$)	1.80			290		
							280		

Constants of Dispersion Formula	
A_0	2.58741488E+00
A_1	-1.01011954E-02
A_2	1.49670832E-02
A_3	5.68916443E-04
A_4	-4.40176529E-05
A_5	2.64008379E-06

Density		Solarization	
ρ (g/cm ³)	3.63	$\Delta\lambda$ (%)	-1.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.3	1.5	1.7	1.8	1.9	2.0	2.1	2.5	2.6	3.0
-40 ~ -20	1.3	1.5	1.7	1.8	1.9	2.1	2.2	2.6	2.7	3.2
-20 ~ 0	1.3	1.5	1.7	1.8	2.0	2.1	2.3	2.6	2.7	3.2
0 ~ 20	1.3	1.5	1.7	1.8	2.0	2.1	2.3	2.6	2.7	3.2
20 ~ 40	1.3	1.6	1.8	1.9	2.0	2.2	2.4	2.7	2.8	3.3
40 ~ 60	1.5	1.7	1.8	1.9	2.0	2.2	2.4	2.8	2.8	3.4
60 ~ 80	1.6	1.8	1.9	2.0	2.1	2.3	2.6	2.8	2.9	3.6
80 ~ 100	1.6	1.9	2.0	2.1	2.2	2.4	2.7	2.9	3.0	3.7
100 ~ 120	1.6	1.9	2.0	2.1	2.2	2.4	2.8	3.0	3.1	3.8
120 ~ 140	1.7	1.9	2.0	2.2	2.3	2.4	2.8	3.0	3.1	3.8
140 ~ 160	1.7	1.9	2.1	2.2	2.3	2.5	2.9	3.1	3.2	4.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	353/322

Constants of dn/dt		
D_0	D_1	D_2
-7.55E-07	1.29E-08	-2.51E-11
E_0	E_1	λ_{TK}
5.33E-07	3.07E-10	2.48E-01

H-ZK10N	623570	$n_d = 1.62280$	$v_d = 56.98$	$n_F - n_C = 0.010931$
		$n_e = 1.62541$	$v_e = 56.74$	$n_F - n_C' = 0.011023$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42	1.59301	$P_{d,C}$	0.3037	RC (S)	1	2400	0.914	0.825
n_{1970}	1970.09	1.59824	$P_{e,d}$	0.2388	RA (S)	3	2200	0.963	0.923
n_{1530}	1529.58	1.60395	$P_{g,F}$	0.5462	D_W	1	2000	0.996	0.984
n_{1129}	1128.64	1.60905	$P'_{d,c'}$	0.2522	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.60998	$P'_{e,d}$	0.2368	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.61074	$P'_{g,F'}$	0.4853	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.61371			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.61574	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61761					1000	0.999	0.998
n_C	656.27	1.61948					950	0.999	0.998
$n_{C'}$	643.85	1.62002					900	0.999	0.998
n_{He-Ne}	632.80	1.62051					850	0.999	0.998
n_D	589.29	1.62270	ΔP_{Fe}	-0.0004	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.62280	$\Delta P_{g,F}$	-0.0028	-50/-40	57	750	0.999	0.998
n_e	546.07	1.62541	$\Delta P_{C,t}$	-0.0167	-40/-30	59	700	0.999	0.998
n_F	486.13	1.63042	$\Delta P_{C,s}$	-0.0093	-30/-20	61	650	0.999	0.998
$n_{F'}$	479.99	1.63104	Thermal Properties		-20/-10	62	600	0.999	0.998
n_g	435.84	1.63639	Tg ($^{\circ}C$)	661	-10/0	62	550	0.999	0.998
n_h	404.66	1.64136	Ts ($^{\circ}C$)	708	0/10	63	500	0.999	0.998
n_i	365.01	1.64991	$T_{10}^{14.5} (^{\circ}C)$	595	10/20	64	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	638	20/30	64	460	0.997	0.995
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	66	30/40	65	440	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	80	40/50	66	420	0.996	0.993
			λ (W/(m K))	0.80	50/60	67	400	0.994	0.992
					60/70	67	390	0.991	0.981
					70/80	68	380	0.986	0.972
					80/90	69	370	0.971	0.943
					90/100	70	360	0.942	0.888
					100/110	71	350	0.860	0.740
					110/120	72	340	0.740	0.547
					120/130	73	330	0.515	0.265
					130/140	74	320	0.221	0.049
					140/150	76	310		
					150/160	77	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	2.59016969E+00
A_1	-1.02103680E-02
A_2	1.46213934E-02
A_3	6.92375177E-04
A_4	-6.66173315E-05
A_5	4.03789352E-06

Density		Solarization	
ρ (g/cm ³)	3.64	$\Delta\lambda$ (%)	-0.7

Mechanical Properties	
HK (10 ⁷ Pa)	521
F_A	153
E (GPa)	81.9
G (GPa)	32.4
μ	0.265
σ_b (MPa)	62
B (10 ⁻¹² /Pa)	1.88

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.0	2.2	2.3	2.3	2.4	2.5	2.7	3.0	3.1	3.2
-40 ~ -20	2.1	2.2	2.3	2.3	2.4	2.5	2.7	3.0	3.1	3.3
-20 ~ 0	2.1	2.3	2.3	2.3	2.4	2.5	2.7	3.1	3.1	3.4
0 ~ 20	2.1	2.3	2.4	2.4	2.5	2.6	2.8	3.2	3.2	3.5
20 ~ 40	2.1	2.3	2.5	2.5	2.6	2.7	2.9	3.2	3.3	3.6
40 ~ 60	2.1	2.4	2.6	2.6	2.7	2.8	2.9	3.4	3.4	3.7
60 ~ 80	2.2	2.5	2.6	2.7	2.8	3.0	3.0	3.4	3.4	3.7
80 ~ 100	2.3	2.6	2.7	2.8	2.9	3.0	3.1	3.5	3.5	3.8
100 ~ 120	2.4	2.7	2.8	2.9	3.0	3.1	3.2	3.6	3.6	3.8
120 ~ 140	2.4	2.7	2.9	2.9	3.0	3.1	3.2	3.6	3.6	3.8
140 ~ 160	2.5	2.8	2.9	3.0	3.1	3.3	3.4	3.7	3.7	4.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	353/320

Constants of dn/dt		
D_0	D_1	D_2
6.89E-07	1.42E-08	-2.56E-11
E_0	E_1	λ_{TK}
3.07E-10	1.53E-10	1.41E-01

H-ZK11	639555	$n_d = 1.63854$	$v_d = 55.45$	$n_F - n_C = 0.011516$
		$n_e = 1.64129$	$v_e = 55.18$	$n_F - n_{C'} = 0.011621$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.60803	$P_{d,C}$	0.3031	RC (S)	1	2400	0.902	0.815
n_{1970}	1970.09	1.61325	$P_{e,d}$	0.2388	RA (S)	2	2200	0.964	0.930
n_{1530}	1529.58	1.61900	$P_{g,F}$	0.5505	D_W	1	2000	0.994	0.989
n_{1129}	1128.64	1.62419	$P'_{d,c'}$	0.2521	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.62514	$P'_{e,d}$	0.2366	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.62593	$P'_{g,F'}$	0.4888	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.62900			CR	4a	1200	0.999	0.998
$n_{A'}$	768.19	1.63114	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.63310					1000	0.999	0.998
n_C	656.27	1.63505					950	0.999	0.998
$n_{C'}$	643.85	1.63561					900	0.999	0.998
n_{He-Ne}	632.80	1.63613					850	0.999	0.998
n_D	589.29	1.63844	ΔP_{Fe}	-0.0011	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.63854	$\Delta P_{g,F}$	-0.0010	-50/-40	63	750	0.999	0.998
n_e	546.07	1.64129	$\Delta P_{C,t}$	-0.0169	-40/-30	67	700	0.999	0.998
n_F	486.13	1.64657	$\Delta P_{C,s}$	-0.0081	-30/-20	68	650	0.999	0.998
$n_{F'}$	479.99	1.64723	Thermal Properties		-20/-10	70	600	0.999	0.998
n_g	435.84	1.65291	Tg ($^{\circ}C$)	649	-10/0	72	550	0.999	0.998
n_h	404.66	1.65819	Ts ($^{\circ}C$)	685	0/10	73	500	0.999	0.998
n_i	365.01	1.66725	$T_{10}^{14.5} (^{\circ}C)$	591	10/20	73	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	624	20/30	73	460	0.995	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	71	30/40	74	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	85	40/50	74	420	0.993	0.986
			λ (W/(m K))	1.03	50/60	75	400	0.988	0.976
					60/70	75	390	0.981	0.962
					70/80	76	380	0.968	0.937
			Mechanical Properties		80/90	77	370	0.945	0.893
			HK ($10^7 Pa$)	510	90/100	78	360	0.898	0.806
			F_A	160	100/110	78	350	0.801	0.642
			E (GPa)	86.2	110/120	79	340	0.616	0.379
			G (GPa)	33.0	120/130	80	330	0.326	0.106
			μ	0.307	130/140	81	320	0.067	0.004
			σ_b (MPa)	53	140/150	82	310		
			B ($10^{-12}/Pa$)	1.69	150/160	83	300		

Constants of Dispersion Formula	
A_0	2.63821944E+00
A_1	-1.02473310E-02
A_2	1.58983043E-02
A_3	5.77973503E-04
A_4	-3.90220391E-05
A_5	2.35832993E-06

Density		Solarization	
ρ (g/cm ³)	3.67	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.3	1.5	1.7	1.8	1.9	1.9	2.1	2.3	2.5	2.9
-40 ~ -20	1.3	1.5	1.7	1.8	1.9	2.0	2.2	2.5	2.7	2.9
-20 ~ 0	1.3	1.5	1.7	1.8	2.0	2.0	2.3	2.6	2.7	2.9
0 ~ 20	1.3	1.5	1.7	1.8	2.0	2.0	2.4	2.7	2.8	3.0
20 ~ 40	1.3	1.5	1.8	1.9	2.0	2.0	2.4	2.7	2.8	3.1
40 ~ 60	1.5	1.7	1.7	1.9	2.0	2.1	2.4	2.7	2.8	3.1
60 ~ 80	1.5	1.8	1.8	1.9	2.0	2.2	2.4	2.7	2.8	3.1
80 ~ 100	1.5	1.9	1.9	1.9	2.0	2.2	2.5	2.8	2.9	3.3
100 ~ 120	1.6	1.9	1.9	1.9	2.0	2.2	2.7	2.9	3.0	3.4
120 ~ 140	1.8	1.9	1.9	2.0	2.1	2.3	2.7	2.9	3.0	3.4
140 ~ 160	1.8	1.9	2.0	2.0	2.1	2.3	2.7	3.0	3.1	3.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	365/325
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	358/326

Constants of dn/dt		
D_0	D_1	D_2
-8.12E-07	1.25E-08	-2.55E-11
E_0	E_1	λ_{TK}
5.57E-07	2.06E-10	1.96E-01

H-ZK14	603606	$n_d = 1.60311$	$v_d = 60.60$	$n_F - n_C = 0.009952$
		$n_e = 1.60548$	$v_e = 60.35$	$n_F - n_C = 0.010033$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.57307	$P_{d,C}$	0.3055	RC (S)	3	2400	0.879	0.774
n_{1970}	1970.09	1.57874	$P_{e,d}$	0.2381	RA (S)	3	2200	0.939	0.880
n_{1530}	1529.58	1.58486	$P_{g,F}$	0.5406	D_W	2	2000	0.983	0.967
n_{1129}	1128.64	1.59014	$P'_{d,c}$	0.2542	D_A	4	1800	0.993	0.984
n_{1064}	1064.00	1.59106	$P'_{e,d}$	0.2362	$R_{OH}(S)$	2	1600	0.999	0.996
n_t	1013.98	1.59182	$P'_{g,F}$	0.4804	RP (S)	2	1400	0.999	0.997
n_s	852.11	1.59469			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.59661	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.59835					1000	0.999	0.998
n_C	656.27	1.60007					950	0.999	0.998
$n_{C'}$	643.85	1.60056					900	0.999	0.998
n_{He-Ne}	632.80	1.60101					850	0.999	0.998
n_D	589.29	1.60302	ΔP_{Fe}	0.0004	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.60311	$\Delta P_{g,F}$	-0.0023	-50/-40	50	750	0.999	0.998
n_e	546.07	1.60548	$\Delta P_{C,t}$	-0.0048	-40/-30	52	700	0.999	0.998
n_F	486.13	1.61003	$\Delta P_{C,s}$	-0.0052	-30/-20	54	650	0.999	0.998
$n_{F'}$	479.99	1.61059	Thermal Properties		-20/-10	55	600	0.999	0.998
n_g	435.84	1.61541			-10/0	56	550	0.999	0.998
n_h	404.66	1.61987	Tg ($^{\circ}C$)	666	0/10	57	500	0.999	0.998
n_i	365.01	1.62743	Ts ($^{\circ}C$)	704	10/20	58	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	583	20/30	59	460	0.997	0.995
			$T_{10}^{13} (^{\circ}C)$	625	30/40	59	440	0.997	0.995
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	57	40/50	60	420	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	73	50/60	61	400	0.996	0.995
			λ (W/(m K))	0.93	60/70	61	390	0.994	0.990
					70/80	62	380	0.992	0.985
			Mechanical Properties		80/90	62	370	0.985	0.976
					90/100	63	360	0.976	0.957
			HK (10^7Pa)	567	100/110	63	350	0.954	0.916
			F_A	131	110/120	64	340	0.919	0.852
			E (GPa)	85.1	120/130	65	330	0.862	0.747
			G (GPa)	33.3	130/140	66	320	0.762	0.588
			μ	0.278	140/150	67	310	0.615	0.385
			σ_b (MPa)	85	150/160	68	300	0.419	0.180
			B ($10^{-12}/Pa$)	1.84			290	0.210	0.050
							280		

Constants of Dispersion Formula	
A_0	2.53182995E+00
A_1	-1.10534989E-02
A_2	1.34222293E-02
A_3	4.21021754E-04
A_4	-2.24912138E-05
A_5	1.01669782E-06

Density		Solarization	
ρ (g/cm ³)	3.42	$\Delta\lambda$ (%)	-5.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.6	2.7	2.9	2.9	2.9	3.0	3.3	3.3	3.3	3.8
-40 ~ -20	2.7	2.7	2.9	2.9	3.0	3.1	3.4	3.5	3.5	3.8
-20 ~ 0	2.7	2.8	2.9	3.0	3.0	3.1	3.4	3.7	3.7	3.8
0 ~ 20	2.8	2.9	3.1	3.1	3.2	3.3	3.5	3.7	3.7	3.9
20 ~ 40	2.8	2.9	3.1	3.2	3.2	3.3	3.5	3.7	3.7	4.0
40 ~ 60	3.0	3.0	3.2	3.2	3.2	3.4	3.7	3.8	3.9	4.3
60 ~ 80	3.1	3.2	3.2	3.3	3.4	3.6	3.8	3.9	4.0	4.4
80 ~ 100	3.2	3.3	3.3	3.4	3.5	3.7	4.1	4.1	4.2	4.6
100 ~ 120	3.3	3.4	3.4	3.5	3.5	3.7	4.4	4.3	4.4	4.9
120 ~ 140	3.5	3.5	3.5	3.6	3.6	3.9	4.5	4.4	4.5	5.0
140 ~ 160	3.5	3.6	3.7	3.7	3.8	4.1	4.5	4.6	4.7	5.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	345/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	334/290

Constants of dn/dt		
D_0	D_1	D_2
2.35E-06	1.42E-08	-1.91E-11
E_0	E_1	λ_{TK}
3.40E-07	4.95E-10	2.58E-01

H-ZK20	617539	$n_d = 1.61720$	$v_d = 53.91$	$n_F - n_C = 0.011448$
		$n_e = 1.61993$	$v_e = 53.62$	$n_F - n_C' = 0.011561$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58879	$P_{d,C}$	0.3014	RC (S)	1	2400	0.911	0.830
n_{1970}	1970.09	1.59335	$P_{e,d}$	0.2385	RA (S)	3	2200	0.957	0.916
n_{1530}	1529.58	1.59844	$P_{g,F}$	0.5503	D_W	1	2000	0.987	0.974
n_{1129}	1128.64	1.60320	$P'_{d,c'}$	0.2508	D_A	3	1800	0.995	0.990
n_{1064}	1064.00	1.60410	$P'_{e,d}$	0.2361	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.60485	$P'_{g,F'}$	0.4878	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.60781			CR	3	1200	0.999	0.998
$n_{A'}$	768.19	1.60989	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61181					1000	0.999	0.998
n_C	656.27	1.61375					950	0.999	0.998
$n_{C'}$	643.85	1.61430					900	0.999	0.998
n_{He-Ne}	632.80	1.61481					850	0.999	0.998
n_D	589.29	1.61710	ΔP_{Fe}	-0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61720	$\Delta P_{g,F}$	-0.0037	-50/-40	77	750	0.999	0.998
n_e	546.07	1.61993	$\Delta P_{C,t}$	-0.0239	-40/-30	79	700	0.999	0.998
n_F	486.13	1.62520	$\Delta P_{C,s}$	-0.0109	-30/-20	81	650	0.999	0.998
$n_{F'}$	479.99	1.62586	Thermal Properties		-20/-10	82	600	0.999	0.998
n_g	435.84	1.63150	Tg ($^{\circ}C$)	555	-10/0	82	550	0.999	0.998
n_h	404.66	1.63676	Ts ($^{\circ}C$)	592	0/10	83	500	0.999	0.998
n_i	365.01	1.64578	$T_{10}^{14.5} (^{\circ}C)$	501	10/20	84	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	535	20/30	85	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	87	30/40	85	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	99	40/50	86	420	0.998	0.996
			λ (W/(m K))	0.85	50/60	86	400	0.997	0.994
					60/70	87	390	0.996	0.992
					70/80	88	380	0.994	0.989
			Mechanical Properties		80/90	89	370	0.988	0.976
			HK ($10^7 Pa$)	525	90/100	91	360	0.977	0.952
			F_A	158	100/110	92	350	0.954	0.905
			E (GPa)	76.6	110/120	93	340	0.907	0.821
			G (GPa)	30.9	120/130	93	330	0.830	0.689
			μ	0.241	130/140	95	320	0.711	0.508
			σ_b (MPa)	57	140/150	97	310	0.551	0.307
			B ($10^{-12}/Pa$)	2.06	150/160	98	300	0.371	0.141

Constants of Dispersion Formula	
A_0	2.56855897E+00
A_1	-8.74295850E-03
A_2	1.59604033E-02
A_3	4.91034285E-04
A_4	-2.77331960E-05
A_5	1.72056496E-06

Density		Solarization	
ρ (g/cm ³)	3.60	$\Delta\lambda$ (%)	-11.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.9	2.2	2.4	2.5	2.6	2.9	3.3	3.7	3.8	4.5
-40 ~ -20	2.1	2.3	2.4	2.5	2.6	3.0	3.5	3.8	3.9	4.6
-20 ~ 0	2.1	2.3	2.5	2.6	2.7	3.0	3.6	3.9	4.0	4.7
0 ~ 20	2.3	2.4	2.5	2.6	2.7	3.1	3.6	4.0	4.1	4.9
20 ~ 40	2.4	2.6	2.7	2.8	2.8	3.2	3.8	4.2	4.3	4.9
40 ~ 60	2.5	2.7	2.9	2.9	3.0	3.4	4.0	4.5	4.6	5.1
60 ~ 80	2.6	2.9	3.1	3.1	3.2	3.7	4.2	4.6	4.8	5.3
80 ~ 100	2.7	3.1	3.3	3.3	3.4	4.0	4.5	4.8	4.9	5.5
100 ~ 120	2.9	3.2	3.4	3.5	3.5	4.2	4.7	5.0	5.1	5.6
120 ~ 140	3.0	3.3	3.5	3.6	3.6	4.3	4.8	5.1	5.2	5.7
140 ~ 160	3.0	3.4	3.6	3.6	3.7	4.4	5.0	5.3	5.3	5.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/295
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	337/290

Constants of dn/dt		
D_0	D_1	D_2
4.73E-07	1.71E-08	-2.20E-11
E_0	E_1	λ_{TK}
8.83E-07	2.84E-10	2.17E-01

H-ZK21	623581	$n_d = 1.62299$	$v_d = 58.12$	$n_F - n_C = 0.010719$
		$n_e = 1.62555$	$v_e = 57.87$	$n_F - n_{C'} = 0.010809$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.59235	$P_{d,C}$	0.3041	RC (S)	3	2400	0.882	0.778
n_{1970}	1970.09	1.59795	$P_{e,d}$	0.2388	RA (S)	3	2200	0.948	0.899
n_{1530}	1529.58	1.60402	$P_{g,F}$	0.5448	D_W	2	2000	0.980	0.960
n_{1129}	1128.64	1.60931	$P'_{d,c'}$	0.2535	D_A	4	1800	0.988	0.976
n_{1064}	1064.00	1.61026	$P'_{e,d}$	0.2368	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.61103	$P'_{g,F'}$	0.4839	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.61401			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.61603	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61787					1000	0.999	0.998
n_C	656.27	1.61973					950	0.999	0.998
$n_{C'}$	643.85	1.62025					900	0.999	0.998
n_{He-Ne}	632.80	1.62074					850	0.999	0.998
n_D	589.29	1.62290	ΔP_{Fe}	-0.0010	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.62299	$\Delta P_{g,F}$	-0.0022	-50/-40	61	750	0.999	0.998
n_e	546.07	1.62555	$\Delta P_{C,t}$	-0.0101	-40/-30	63	700	0.999	0.998
n_F	486.13	1.63045	$\Delta P_{C,s}$	-0.0063	-30/-20	65	650	0.999	0.998
$n_{F'}$	479.99	1.63106	Thermal Properties		-20/-10	66	600	0.999	0.998
n_g	435.84	1.63629	$T_g (^{\circ}C)$	664	-10/0	66	550	0.999	0.998
n_h	404.66	1.64113	$T_s (^{\circ}C)$	706	0/10	67	500	0.999	0.998
n_i	365.01	1.64946	$T_{10}^{14.5} (^{\circ}C)$	605	10/20	67	480	0.997	0.995
			$T_{10}^{13} (^{\circ}C)$	651	20/30	68	460	0.996	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	67	30/40	68	440	0.996	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	79	40/50	69	420	0.996	0.992
			$\lambda (W/(m K))$	0.76	50/60	69	400	0.992	0.985
					60/70	70	390	0.988	0.976
					70/80	70	380	0.982	0.965
			Mechanical Properties		80/90	70	370	0.962	0.926
			HK ($10^7 Pa$)	551	90/100	71	360	0.924	0.854
			F_A	138	100/110	71	350	0.850	0.723
			E (GPa)	85.3	110/120	72	340	0.698	0.487
			G (GPa)	33.3	120/130	73	330	0.421	0.177
			μ	0.279	130/140	74	320	0.071	0.005
			σ_b (MPa)	87	140/150	75	310		
			B ($10^{-12}/Pa$)	1.81	150/160	76	300		

Constants of Dispersion Formula	
A_0	2.59254654E+00
A_1	-1.10129354E-02
A_2	1.38896553E-02
A_3	8.21371542E-04
A_4	-8.84083953E-05
A_5	5.19951049E-06

Density		Solarization	
$\rho (g/cm^3)$	3.61	$\Delta\lambda (%)$	-0.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.9	2.1	2.2	2.2	2.3	2.4	2.5	2.8	2.8	3.1
-40 ~ -20	1.9	2.1	2.2	2.2	2.3	2.4	2.5	2.8	2.8	3.2
-20 ~ 0	1.9	2.1	2.2	2.2	2.3	2.4	2.5	2.8	2.8	3.1
0 ~ 20	1.9	2.1	2.3	2.3	2.4	2.4	2.6	2.9	2.9	3.2
20 ~ 40	2.0	2.2	2.3	2.3	2.4	2.5	2.7	3.0	3.0	3.3
40 ~ 60	2.1	2.3	2.4	2.4	2.5	2.6	2.7	3.1	3.1	3.5
60 ~ 80	2.1	2.3	2.5	2.5	2.6	2.7	2.9	3.2	3.2	3.7
80 ~ 100	2.3	2.5	2.7	2.7	2.7	2.9	3.1	3.4	3.4	3.9
100 ~ 120	2.4	2.6	2.8	2.8	2.8	3.1	3.3	3.5	3.5	4.0
120 ~ 140	2.4	2.7	2.9	2.9	2.9	3.2	3.5	3.6	3.7	4.2
140 ~ 160	2.5	2.8	3.0	3.1	3.1	3.4	3.6	3.7	3.8	4.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	355/323

Constants of dn/dt		
D_0	D_1	D_2
5.19E-07	1.33E-08	-1.46E-11
E_0	E_1	λ_{TK}
4.16E-07	4.90E-10	2.14E-01

H-ZK50	607567	$n_d = 1.60738$	$v_d = 56.65$	$n_F - n_C = 0.010721$
		$n_e = 1.60994$	$v_e = 56.38$	$n_F - n_C = 0.010819$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.57933	$P_{d,C}$	0.3022	RC (S)	1	2400	0.917	0.841
n_{1970}	1970.09	1.58405	$P_{e,d}$	0.2388	RA (S)	3	2200	0.952	0.904
n_{1530}	1529.58	1.58926	$P_{g,F}$	0.5475	D_W	1	2000	0.983	0.966
n_{1129}	1128.64	1.59403	$P'_{d,c}$	0.2523	D_A	3	1800	0.993	0.986
n_{1064}	1064.00	1.59491	$P'_{e,d}$	0.2366	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.59564	$P'_{g,F}$	0.4862	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.59850			CR	4c	1200	0.999	0.998
$n_{A'}$	768.19	1.60048	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.60230					1000	0.999	0.998
n_C	656.27	1.60414					950	0.999	0.998
$n_{C'}$	643.85	1.60465					900	0.999	0.998
n_{He-Ne}	632.80	1.60513					850	0.999	0.998
n_D	589.29	1.60729	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.60738	$\Delta P_{g,F}$	-0.0020	-50/-40	72	750	0.999	0.998
n_e	546.07	1.60994	$\Delta P_{C,t}$	-0.0218	-40/-30	75	700	0.999	0.998
n_F	486.13	1.61486	$\Delta P_{C,s}$	-0.0103	-30/-20	77	650	0.999	0.998
$n_{F'}$	479.99	1.61547	Thermal Properties		-20/-10	78	600	0.999	0.998
n_g	435.84	1.62073			-10/0	79	550	0.999	0.998
n_h	404.66	1.62562	Tg ($^{\circ}C$)	594	0/10	80	500	0.999	0.998
n_i	365.01	1.63393	Ts ($^{\circ}C$)	637	10/20	80	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	532	20/30	81	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	570	30/40	82	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	80	40/50	82	420	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	95	50/60	83	400	0.995	0.991
			λ (W/(m K))	0.87	60/70	84	390	0.992	0.986
					70/80	85	380	0.990	0.981
			Mechanical Properties		80/90	86	370	0.983	0.968
					90/100	89	360	0.971	0.944
			HK ($10^7 Pa$)	489	100/110	90	350	0.948	0.898
			F_A	210	110/120	91	340	0.903	0.813
			E (GPa)	83.7	120/130	92	330	0.824	0.673
			G (GPa)	31.5	130/140	94	320	0.698	0.482
			μ	0.328	140/150	96	310	0.515	0.262
			σ_b (MPa)	84	150/160	97	300	0.312	0.095
			B ($10^{-12}/Pa$)	1.77			290	0.145	0.021
							280		

Constants of Dispersion Formula	
A_0	2.54047355E+00
A_1	-9.05535161E-03
A_2	1.49621725E-02
A_3	3.92388778E-04
A_4	-1.51543800E-05
A_5	7.76341926E-07

Density		Solarization	
ρ (g/cm ³)	3.47	$\Delta\lambda$ (%)	-10.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.9	1.1	1.2	1.2	1.3	1.3	1.5	1.8	1.8	2.2
-40 ~ -20	0.9	1.1	1.2	1.2	1.3	1.3	1.6	1.8	1.9	2.3
-20 ~ 0	0.9	1.0	1.2	1.2	1.2	1.3	1.6	1.8	1.9	2.3
0 ~ 20	0.8	1.0	1.1	1.2	1.2	1.2	1.6	1.8	1.9	2.3
20 ~ 40	0.8	1.1	1.2	1.3	1.3	1.3	1.7	1.9	1.9	2.3
40 ~ 60	0.9	1.1	1.3	1.3	1.3	1.3	1.7	1.9	1.9	2.4
60 ~ 80	0.9	1.2	1.4	1.4	1.5	1.5	1.9	2.0	2.1	2.5
80 ~ 100	1.0	1.3	1.5	1.5	1.5	1.5	2.0	2.1	2.1	2.7
100 ~ 120	1.1	1.4	1.6	1.6	1.6	1.6	2.1	2.3	2.4	2.8
120 ~ 140	1.3	1.4	1.7	1.7	1.7	1.8	2.3	2.4	2.5	3.0
140 ~ 160	1.3	1.5	1.8	1.8	1.9	1.9	2.3	2.6	2.7	3.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	345/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	339/292

Constants of dn/dt		
D_0	D_1	D_2
-1.74E-06	1.22E-08	-1.24E-11
E_0	E_1	λ_{TK}
4.12E-07	3.48E-10	2.52E-01

H-LaK1	660574	$n_d = 1.65950$	$v_d = 57.35$	$n_F - n_C = 0.011500$
		$n_e = 1.66224$	$v_e = 57.13$	$n_F - n_C' = 0.011592$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.62649	$P_{d,C}$	0.3043	RC (S)	1	2400	0.873	0.762
n_{1970}	1970.09	1.63247	$P_{e,d}$	0.2383	RA (S)	1	2200	0.954	0.910
n_{1530}	1529.58	1.63901	$P_{g,F}$	0.5443	D_W	3	2000	0.993	0.986
n_{1129}	1128.64	1.64475	$P'_{d,c'}$	0.2545	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.64577	$P'_{e,d}$	0.2364	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.64660	$P'_{g,F'}$	0.4848	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.64983			CR	3	1200	0.999	0.998
$n_{A'}$	768.19	1.65202	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.65403					1000	0.999	0.998
n_C	656.27	1.65600					950	0.999	0.998
$n_{C'}$	643.85	1.65655					900	0.999	0.998
n_{He-Ne}	632.80	1.65707					850	0.999	0.998
n_D	589.29	1.65939	ΔP_{Fe}	-0.0012	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65950	$\Delta P_{g,F}$	-0.0040	-50/-40	59	750	0.999	0.998
n_e	546.07	1.66224	$\Delta P_{C,t}$	-0.0006	-40/-30	61	700	0.999	0.998
n_F	486.13	1.66750	$\Delta P_{C,s}$	-0.0015	-30/-20	63	650	0.999	0.998
$n_{F'}$	479.99	1.66814	Thermal Properties		-20/-10	64	600	0.999	0.998
n_g	435.84	1.67376	Tg ($^{\circ}C$)	651	-10/0	64	550	0.999	0.998
n_h	404.66	1.67897	Ts ($^{\circ}C$)	685	0/10	65	500	0.999	0.998
n_i	365.01	1.68783	$T_{10}^{14.5} (^{\circ}C)$	588	10/20	65	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	617	20/30	66	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	65	30/40	67	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	81	40/50	67	420	0.997	0.995
			λ (W/(m K))	0.82	50/60	67	400	0.995	0.992
					60/70	68	390	0.993	0.987
					70/80	68	380	0.990	0.981
			Mechanical Properties		80/90	69	370	0.981	0.970
			HK ($10^7 Pa$)	581	90/100	70	360	0.968	0.947
			F_A	112	100/110	71	350	0.950	0.910
			E (GPa)	90.9	110/120	72	340	0.918	0.852
			G (GPa)	35.7	120/130	73	330	0.868	0.762
			μ	0.273	130/140	74	320	0.796	0.641
			σ_b (MPa)	85	140/150	75	310	0.697	0.495
			B ($10^{-12}/Pa$)	1.50	150/160	76	300	0.581	0.346

Constants of Dispersion Formula	
A_0	2.70733270E+00
A_1	-1.20058561E-02
A_2	1.64047722E-02
A_3	4.17032662E-04
A_4	-1.43172608E-05
A_5	7.78703513E-07

Density		Solarization	
ρ (g/cm ³)	3.64	$\Delta\lambda$ (%)	-2.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	1.9	2.1	2.1	2.1	2.2	2.3	2.5	2.6	3.0
-40 ~ -20	1.7	1.9	2.0	2.0	2.0	2.1	2.3	2.6	2.7	3.0
-20 ~ 0	1.6	1.9	2.1	2.1	2.1	2.2	2.3	2.6	2.7	3.0
0 ~ 20	1.6	1.9	2.1	2.2	2.2	2.2	2.3	2.6	2.7	3.1
20 ~ 40	1.6	1.9	2.1	2.1	2.1	2.1	2.4	2.7	2.8	3.1
40 ~ 60	1.6	2.0	2.2	2.2	2.2	2.3	2.4	2.7	2.8	3.2
60 ~ 80	1.8	2.1	2.2	2.2	2.2	2.4	2.5	2.7	2.9	3.3
80 ~ 100	1.9	2.1	2.2	2.2	2.2	2.4	2.5	2.8	2.9	3.4
100 ~ 120	1.9	2.2	2.3	2.3	2.3	2.5	2.6	2.9	3.0	3.5
120 ~ 140	2.0	2.3	2.4	2.4	2.4	2.6	2.7	3.0	3.1	3.6
140 ~ 160	2.1	2.4	2.5	2.5	2.5	2.7	2.8	3.1	3.2	3.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	334/272

Constants of dn/dt		
D_0	D_1	D_2
1.09E-07	1.22E-08	-1.85E-11
E_0	E_1	λ_{TK}
2.95E-07	1.37E-10	2.81E-01

H-LaK2	691547	$n_d = 1.69100$	$v_d = 54.70$	$n_F - n_C = 0.012633$
		$n_e = 1.69401$	$v_e = 54.48$	$n_F - n_C' = 0.012739$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ	P _{d,C}	0.3048	RC (S)	1	λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65330	P _{e,d}	0.2383	RA (S)	3	2400	0.766	0.579
n_{1970}	1970.09	1.66043	P _{g,F}	0.5438	D _W	1	2200	0.919	0.846
n_{1530}	1529.58	1.66812	P' _{d,c}	0.2543	D _A	3	2000	0.973	0.955
n_{1129}	1128.64	1.67471	P' _{e,d}	0.2363	R _{OH} (S)	1	1800	0.989	0.986
n_{1064}	1064.00	1.67587	P' _{g,F}	0.4828	RP (S)	3	1600	0.999	0.998
n_t	1013.98	1.67681			CR	1	1400	0.999	0.998
n_s	852.11	1.68039	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/\text{K})$		1200	0.999	0.998
$n_{A'}$	768.19	1.68280					1060	0.999	0.998
n_r	706.52	1.68499					1000	0.999	0.998
n_C	656.27	1.68715					950	0.999	0.998
$n_{C'}$	643.85	1.68776					900	0.999	0.998
$n_{\text{He-Ne}}$	632.80	1.68833	Thermal Properties		$^{\circ}\text{C}$		850	0.999	0.998
n_D	589.29	1.69088					800	0.999	0.998
n_d	587.56	1.69100	ΔP_{Fe}	-0.0033	-50/-40	52	750	0.999	0.998
n_e	546.07	1.69401	$\Delta P_{\text{g,F}}$	-0.0089	-40/-30	54	700	0.999	0.998
n_F	486.13	1.69978	$\Delta P_{\text{C,t}}$	0.0133	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.70050	$\Delta P_{\text{C,s}}$	0.0034	-20/-10	57	600	0.999	0.998
n_g	435.84	1.70665	Mechanical Properties		-10/0	57	550	0.999	0.998
n_h	404.66	1.71235			0/10	58	500	0.999	0.998
n_i	365.01	1.72209	T _g (°C)	630	10/20	58	480	0.999	0.998
			T _s (°C)	661	20/30	59	460	0.999	0.998
			T ₁₀ ^{14.5} (°C)	585	30/40	59	440	0.999	0.995
			T ₁₀ ¹³ (°C)	602	40/50	59	420	0.999	0.991
			$\alpha_{-50/80^{\circ}\text{C}} (10^{-7}/\text{K})$	57	50/60	60	400	0.994	0.985
			$\alpha_{100/300^{\circ}\text{C}} (10^{-7}/\text{K})$	73	60/70	60	390	0.987	0.979
			λ (W/(m K))	0.94	70/80	61	380	0.980	0.965
					80/90	61	370	0.969	0.943
					90/100	62	360	0.948	0.906
					100/110	62	350	0.916	0.838
					110/120	63	340	0.867	0.757
					120/130	64	330	0.801	0.645
					130/140	64	320	0.712	0.509
					140/150	65	310	0.599	0.360
					150/160	66	300	0.449	0.202
							290	0.245	0.063
							280		

Constants of Dispersion Formula	
A ₀	2.80955685E+00
A ₁	-1.46673580E-02
A ₂	1.68842607E-02
A ₃	9.16821494E-04
A ₄	-7.97191507E-05
A ₅	4.19772399E-06

Density		Solarization	
ρ (g/cm ³)	3.63	$\Delta\lambda$ (%)	-0.8

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6}/^{\circ}\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.0	3.1	3.3	3.4	3.5	3.6	3.7	3.9	4.0	4.2
-40 ~ -20	3.1	3.4	3.5	3.6	3.6	3.8	3.9	4.1	4.1	4.4
-20 ~ 0	3.2	3.5	3.5	3.6	3.7	3.8	3.9	4.2	4.2	4.6
0 ~ 20	3.2	3.6	3.7	3.7	3.9	4.0	4.1	4.3	4.3	4.8
20 ~ 40	3.2	3.8	3.8	3.8	3.9	4.1	4.1	4.6	4.6	4.9
40 ~ 60	3.5	3.9	3.9	3.9	4.0	4.1	4.3	4.6	4.6	4.9
60 ~ 80	3.5	3.9	3.9	3.9	4.1	4.2	4.4	4.6	4.6	5.1
80 ~ 100	3.7	3.8	3.9	3.9	4.1	4.4	4.5	4.8	4.8	5.2
100 ~ 120	3.8	4.0	4.1	4.1	4.4	4.4	4.5	4.8	4.8	5.2
120 ~ 140	3.9	4.2	4.3	4.3	4.4	4.4	4.6	4.8	4.8	5.3
140 ~ 160	4.0	4.2	4.3	4.4	4.6	4.6	4.7	4.9	5.0	5.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	335/287

Constants of dn/dt		
D ₀	D ₁	D ₂
2.98E-06	1.59E-08	-3.12E-11
E ₀	E ₁	λ_{TK}
4.05E-07	-4.14E-11	1.83E-01

H-LaK2H	692545	$n_d = 1.69211$	$v_d = 54.54$	$n_F - n_C = 0.012690$
		$n_e = 1.69514$	$v_e = 54.29$	$n_F - n_C' = 0.012804$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65358	$P_{d,C}$	0.3026	RC (S)	1	2400	0.754	0.568
n_{1970}	1970.09	1.66092	$P_{e,d}$	0.2388	RA (S)	3	2200	0.915	0.837
n_{1530}	1529.58	1.66884	$P_{g,F}$	0.5414	D_W	1	2000	0.980	0.960
n_{1129}	1128.64	1.67561	$P'_{d,c'}$	0.2523	D_A	3	1800	0.990	0.980
n_{1064}	1064.00	1.67679	$P'_{e,d}$	0.2366	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.67775	$P'_{g,F'}$	0.4803	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.68140			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.68384	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.68606					1000	0.999	0.998
n_C	656.27	1.68827					950	0.999	0.998
$n_{C'}$	643.85	1.68888					900	0.999	0.998
n_{He-Ne}	632.80	1.68945					850	0.999	0.998
n_D	589.29	1.69201	ΔP_{Fe}	-0.0015	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69211	$\Delta P_{g,F}$	-0.0116	-50/-40	52	750	0.999	0.998
n_e	546.07	1.69514	$\Delta P_{C,t}$	0.0246	-40/-30	54	700	0.999	0.998
n_F	486.13	1.70096	$\Delta P_{C,s}$	0.0101	-30/-20	55	650	0.999	0.998
$n_{F'}$	479.99	1.70168	Thermal Properties		-20/-10	56	600	0.999	0.998
n_g	435.84	1.70783	Tg ($^{\circ}C$)	636	-10/0	56	550	0.999	0.998
n_h	404.66	1.71355	Ts ($^{\circ}C$)	662	0/10	57	500	0.999	0.998
n_i	365.01	1.72334	$T_{10}^{14.5} (^{\circ}C)$	599	10/20	58	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	635	20/30	60	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	59	30/40	61	440	0.997	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	74	40/50	61	420	0.995	0.991
			λ (W/(m K))	0.92	50/60	62	400	0.993	0.986
					60/70	62	390	0.991	0.981
					70/80	63	380	0.987	0.973
			Mechanical Properties		80/90	63	370	0.980	0.959
			HK (10^7Pa)	665	90/100	64	360	0.964	0.928
			F_A	77	100/110	64	350	0.943	0.889
			E (GPa)	111.3	110/120	64	340	0.910	0.828
			G (GPa)	42.0	120/130	65	330	0.862	0.744
			μ	0.325	130/140	66	320	0.800	0.639
			σ_b (MPa)	67	140/150	67	310	0.724	0.523
			B ($10^{-12}/\text{Pa}$)	2.00	150/160	68	300	0.638	0.406

Constants of Dispersion Formula	
A_0	2.81281207E+00
A_1	-1.51090486E-02
A_2	1.73324917E-02
A_3	8.29325128E-04
A_4	-7.29570094E-05
A_5	4.13913961E-06

Density		Solarization	
ρ (g/cm ³)	3.53	$\Delta\lambda$ (%)	-3.1

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.9	4.1	4.2	4.2	4.3	4.4	4.7	5.1	5.1	5.5
-40 ~ -20	3.9	4.1	4.2	4.3	4.4	4.5	4.7	5.1	5.1	5.6
-20 ~ 0	3.9	4.1	4.2	4.3	4.4	4.5	4.8	5.1	5.1	5.6
0 ~ 20	4.0	4.2	4.4	4.4	4.4	4.5	4.8	5.1	5.2	5.6
20 ~ 40	3.9	4.2	4.4	4.5	4.5	4.5	4.9	5.2	5.2	5.7
40 ~ 60	4.1	4.3	4.5	4.6	4.6	4.7	4.9	5.3	5.3	5.8
60 ~ 80	4.2	4.4	4.6	4.7	4.7	4.9	5.0	5.5	5.5	6.1
80 ~ 100	4.3	4.5	4.7	4.8	4.8	5.2	5.3	5.6	5.7	6.4
100 ~ 120	4.4	4.6	4.8	4.9	4.9	5.3	5.4	5.7	5.8	6.6
120 ~ 140	4.4	4.6	4.8	5.0	5.0	5.4	5.5	5.8	5.9	6.7
140 ~ 160	4.5	4.7	5.0	5.1	5.2	5.5	5.7	6.0	6.1	6.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	333/265

Constants of dn/dt		
D_0	D_1	D_2
4.09E-06	1.29E-08	-1.66E-11
E_0	E_1	λ_{TK}
3.70E-07	3.58E-10	2.77E-01

H-LaK3	747510	$n_d = 1.74693$	$v_d = 50.95$	$n_F - n_C = 0.014660$
		$n_e = 1.75042$	$v_e = 50.72$	$n_F - n_C' = 0.014794$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70600	$P_{d,C}$	0.3022	RC (S)	1	2400	0.779	0.612
n_{1970}	1970.09	1.71332	$P_{e,d}$	0.2381	RA (S)	1	2200	0.931	0.868
n_{1530}	1529.58	1.72133	$P_{g,F}$	0.5505	D_W	1	2000	0.986	0.963
n_{1129}	1128.64	1.72838	$P'_{d,c'}$	0.2521	D_A	3	1800	0.997	0.994
n_{1064}	1064.00	1.72965	$P'_{e,d}$	0.2359	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.73069	$P'_{g,F'}$	0.4894	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.73471			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.73747	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.73998					1000	0.999	0.998
n_C	656.27	1.74250					950	0.999	0.998
$n_{C'}$	643.85	1.74320					900	0.999	0.998
n_{He-Ne}	632.80	1.74386					850	0.999	0.998
n_D	589.29	1.74680	ΔP_{Fe}	-0.0023	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.74693	$\Delta P_{g,F}$	-0.0085	-50/-40	49	750	0.999	0.998
n_e	546.07	1.75042	$\Delta P_{C,t}$	0.0186	-40/-30	51	700	0.999	0.998
n_F	486.13	1.75716	$\Delta P_{C,s}$	0.0087	-30/-20	53	650	0.999	0.998
$n_{F'}$	479.99	1.75799	Thermal Properties		-20/-10	54	600	0.999	0.998
n_g	435.84	1.76523	$T_g (^{\circ}C)$	674	-10/0	54	550	0.999	0.998
n_h	404.66	1.77195	$T_s (^{\circ}C)$	695	0/10	54	500	0.999	0.998
n_i	365.01	1.78350	$T_{10}^{14.5} (^{\circ}C)$	603	10/20	55	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	641	20/30	56	460	0.999	0.997
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	53	30/40	56	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	66	40/50	56	420	0.994	0.990
			λ (W/(m K))	0.80	50/60	57	400	0.990	0.981
					60/70	57	390	0.987	0.974
					70/80	57	380	0.980	0.959
			Mechanical Properties		80/90	58	370	0.968	0.935
			HK (10^7 Pa)	769	90/100	58	360	0.946	0.891
			F_A	50	100/110	59	350	0.907	0.817
			E (GPa)	120.3	110/120	59	340	0.850	0.724
			G (GPa)	45.3	120/130	60	330	0.767	0.589
			μ	0.328	130/140	61	320	0.640	0.410
			σ_b (MPa)	96	140/150	62	310	0.420	0.180
			B (10^{-12} /Pa)	1.56	150/160	63	300	0.155	0.034

Constants of Dispersion Formula	
A_0	2.98964410E+00
A_1	-1.53853950E-02
A_2	2.14098946E-02
A_3	7.35181833E-04
A_4	-3.80789614E-05
A_5	2.29046629E-06

Density		Solarization	
ρ (g/cm ³)	4.10	$\Delta\lambda$ (%)	-0.4

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.8	2.1	2.3	2.3	2.4	2.6	3.1	3.4	3.4	3.8
-40 ~ -20	2.2	2.4	2.7	2.7	2.8	3.0	3.4	3.8	3.9	4.3
-20 ~ 0	2.9	3.1	3.2	3.2	3.3	3.4	4.0	4.4	4.5	4.7
0 ~ 20	3.1	3.5	3.7	3.7	3.8	4.0	4.7	4.9	5.0	5.4
20 ~ 40	3.7	4.0	4.3	4.3	4.4	4.5	4.7	5.1	5.1	5.8
40 ~ 60	4.0	4.2	4.5	4.5	4.6	4.8	5.3	5.5	5.5	6.1
60 ~ 80	4.5	4.7	4.8	4.8	4.9	5.1	5.3	5.8	5.9	6.4
80 ~ 100	4.7	4.8	5.1	5.2	5.3	5.5	5.8	6.3	6.4	6.7
100 ~ 120	5.0	5.1	5.2	5.3	5.4	5.6	6.0	6.5	6.5	7.0
120 ~ 140	5.1	5.3	5.5	5.6	5.7	5.9	6.3	6.7	6.7	7.2
140 ~ 160	5.3	5.5	5.6	5.8	6.0	6.3	6.6	6.8	6.9	7.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/300
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	332/264

Constants of dn/dt		
D_0	D_1	D_2
2.62E-06	2.82E-08	-5.41E-11
E_0	E_1	λ_{TK}
5.36E-07	-4.51E-11	2.24E-01

H-LaK4L	640602	$n_d = 1.64000$	$v_d = 60.20$	$n_F - n_C = 0.010631$
		$n_e = 1.64254$	$v_e = 60.00$	$n_F - n_C' = 0.010709$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.60415	$P_{d,C}$	0.3067	RC (S)	3	2400	0.777	0.604
n_{1970}	1970.09	1.61142	$P_{e,d}$	0.2389	RA (S)	2	2200	0.926	0.857
n_{1530}	1529.58	1.61918	$P_{g,F}$	0.5343	D_W	4	2000	0.985	0.970
n_{1129}	1128.64	1.62562	$P'_{d,c'}$	0.2559	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.62670	$P'_{e,d}$	0.2372	$R_{OH}(S)$	5	1600	0.999	0.998
n_t	1013.98	1.62759	$P'_{g,F'}$	0.4744	RP (S)	4	1400	0.999	0.998
n_s	852.11	1.63083			CR	3	1200	0.999	0.998
$n_{A'}$	768.19	1.63296	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.63486					1000	0.999	0.998
n_C	656.27	1.63674					950	0.999	0.998
$n_{C'}$	643.85	1.63726					900	0.999	0.998
n_{He-Ne}	632.80	1.63775					850	0.999	0.998
n_D	589.29	1.63990	ΔP_{Fe}	-0.0026	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.64000	$\Delta P_{g,F}$	-0.0093	-50/-40	57	750	0.999	0.998
n_e	546.07	1.64254	$\Delta P_{C,t}$	0.0289	-40/-30	59	700	0.999	0.998
n_F	486.13	1.64737	$\Delta P_{C,s}$	0.0110	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.64797	Thermal Properties		-20/-10	60	600	0.999	0.998
n_g	435.84	1.65305	Tg ($^{\circ}C$)	667	-10/0	61	550	0.999	0.998
n_h	404.66	1.65776	Ts ($^{\circ}C$)	700	0/10	62	500	0.999	0.998
n_i	365.01	1.66574	$T_{10}^{14.5} (^{\circ}C)$	603	10/20	62	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	637	20/30	63	460	0.997	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	62	30/40	63	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	80	40/50	65	420	0.993	0.987
			λ (W/(m K))	1.03	50/60	65	400	0.991	0.984
					60/70	66	390	0.989	0.977
					70/80	66	380	0.986	0.971
			Mechanical Properties		80/90	67	370	0.979	0.956
			HK ($10^7 Pa$)	640	90/100	67	360	0.965	0.931
			F_A	78	100/110	68	350	0.941	0.883
			E (GPa)	113.3	110/120	69	340	0.906	0.823
			G (GPa)	44.0	120/130	70	330	0.858	0.736
			μ	0.289	130/140	71	320	0.791	0.628
			σ_b (MPa)	86	140/150	72	310	0.706	0.505
			B ($10^{-12}/Pa$)	1.84	150/160	73	300	0.612	0.380

Constants of Dispersion Formula	
A_0	2.65004076E+00
A_1	-1.46730544E-02
A_2	1.38448882E-02
A_3	7.00625352E-04
A_4	-6.62250000E-05
A_5	3.53607313E-06

Density		Solarization	
ρ (g/cm ³)	2.98	$\Delta\lambda$ (%)	-3.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.7	2.9	2.9	2.9	2.9	3.1	3.2	3.3	3.4	3.7
-40 ~ -20	2.8	2.9	2.9	2.9	3.0	3.1	3.2	3.3	3.4	3.9
-20 ~ 0	2.9	2.9	2.9	3.0	3.1	3.2	3.4	3.5	3.5	3.9
0 ~ 20	2.9	2.9	3.0	3.0	3.2	3.2	3.4	3.6	3.6	3.9
20 ~ 40	2.9	2.9	3.0	3.1	3.2	3.2	3.5	3.7	3.7	3.9
40 ~ 60	2.9	2.9	3.1	3.2	3.2	3.3	3.5	3.7	3.8	4.0
60 ~ 80	2.9	3.0	3.1	3.2	3.2	3.3	3.5	3.8	3.8	4.1
80 ~ 100	2.9	3.0	3.2	3.2	3.2	3.4	3.6	3.9	3.9	4.2
100 ~ 120	2.9	3.1	3.3	3.3	3.3	3.5	3.7	4.0	4.0	4.3
120 ~ 140	2.9	3.1	3.4	3.4	3.4	3.5	3.8	4.1	4.1	4.3
140 ~ 160	3.0	3.1	3.4	3.4	3.4	3.5	3.8	4.1	4.1	4.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	355/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	334/266

Constants of dn/dt		
D_0	D_1	D_2
2.19E-06	1.20E-08	-2.68E-11
E_0	E_1	λ_{TK}
3.21E-07	4.86E-10	2.20E-01

H-LaK5A	678555	$n_d = 1.67790$	$v_d = 55.52$	$n_F - n_C = 0.012211$
		$n_e = 1.68081$	$v_e = 55.26$	$n_F - n_C' = 0.012319$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.64174	$P_{d,C}$	0.3030	RC (S)	3	2400	0.791	0.625
n_{1970}	1970.09	1.64851	$P_{e,d}$	0.2383	RA (S)	3	2200	0.925	0.855
n_{1530}	1529.58	1.65581	$P_{g,F}$	0.5430	D_W	3	2000	0.976	0.953
n_{1129}	1128.64	1.66213	$P'_{d,c'}$	0.2525	D_A	3	1800	0.990	0.979
n_{1064}	1064.00	1.66325	$P'_{e,d}$	0.2362	$R_{OH}(S)$	2	1600	0.996	0.991
n_t	1013.98	1.66416	$P'_{g,F'}$	0.4822	RP (S)	3	1400	0.996	0.991
n_s	852.11	1.66763			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.66996	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.67209					1000	0.999	0.998
n_C	656.27	1.67420					950	0.999	0.998
$n_{C'}$	643.85	1.67479					900	0.999	0.998
n_{He-Ne}	632.80	1.67533					850	0.999	0.998
n_D	589.29	1.67779	ΔP_{Fe}	-0.0010	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.67790	$\Delta P_{g,F}$	-0.0084	-50/-40	62	750	0.999	0.998
n_e	546.07	1.68081	$\Delta P_{C,t}$	0.0131	-40/-30	65	700	0.999	0.998
n_F	486.13	1.68641	$\Delta P_{C,s}$	0.0044	-30/-20	67	650	0.999	0.998
$n_{F'}$	479.99	1.68710	Thermal Properties		-20/-10	68	600	0.998	0.997
n_g	435.84	1.69304	Tg ($^{\circ}C$)	658	-10/0	69	550	0.998	0.997
n_h	404.66	1.69854	Ts ($^{\circ}C$)	684	0/10	70	500	0.998	0.997
n_i	365.01	1.70795	$T_{10}^{14.5} (^{\circ}C)$	595	10/20	71	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	630	20/30	71	460	0.996	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	70	30/40	72	440	0.996	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	81	40/50	73	420	0.995	0.990
			λ (W/(m K))	0.76	50/60	73	400	0.993	0.987
					60/70	74	390	0.991	0.983
					70/80	75	380	0.987	0.974
			Mechanical Properties		80/90	75	370	0.980	0.960
			HK (10^7Pa)	595	90/100	76	360	0.966	0.933
			F_A	117	100/110	78	350	0.943	0.889
			E (GPa)	94.6	110/120	79	340	0.909	0.826
			G (GPa)	37.3	120/130	80	330	0.853	0.727
			μ	0.270	130/140	81	320	0.777	0.603
			σ_b (MPa)	90	140/150	82	310	0.686	0.471
			B ($10^{-12}/Pa$)	1.74	150/160	83	300	0.580	0.336

Constants of Dispersion Formula	
A_0	2.76662000E+00
A_1	-1.37659970E-02
A_2	1.68042016E-02
A_3	7.09094213E-04
A_4	-5.52664143E-05
A_5	3.02453719E-06

Density		Solarization	
ρ (g/cm ³)	3.53	$\Delta\lambda$ (%)	-1.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.9	2.1	2.2	2.2	2.2	2.3	2.5	2.7	2.7	3.1
-40 ~ -20	1.8	2.0	2.2	2.2	2.2	2.4	2.5	2.7	2.8	3.2
-20 ~ 0	1.8	2.0	2.2	2.2	2.2	2.4	2.6	2.8	2.8	3.2
0 ~ 20	1.8	2.1	2.2	2.2	2.2	2.4	2.6	2.8	2.9	3.2
20 ~ 40	1.8	2.0	2.2	2.2	2.3	2.4	2.6	2.9	2.9	3.4
40 ~ 60	1.8	2.1	2.3	2.3	2.4	2.5	2.6	3.0	3.0	3.4
60 ~ 80	2.0	2.1	2.3	2.4	2.4	2.5	2.9	3.2	3.2	3.6
80 ~ 100	2.0	2.2	2.4	2.5	2.5	2.5	3.0	3.3	3.4	3.6
100 ~ 120	2.2	2.3	2.5	2.7	2.7	2.7	3.2	3.4	3.5	3.8
120 ~ 140	2.3	2.4	2.6	2.7	2.7	2.8	3.3	3.5	3.7	3.9
140 ~ 160	2.4	2.5	2.7	2.7	2.8	2.9	3.5	3.7	3.8	4.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	339/274

Constants of dn/dt		
D_0	D_1	D_2
1.13E-07	1.17E-08	-1.44E-11
E_0	E_1	λ_{TK}
4.21E-07	4.77E-10	2.11E-01

H-LaK6	694533	$n_d = 1.69350$	$v_d = 53.31$	$n_F - n_C = 0.013008$
		$n_e = 1.69660$	$v_e = 53.11$	$n_F - n_C' = 0.013115$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65451	$P_{d,C}$	0.3037	RC (S)	2	2400	0.752	0.566
n_{1970}	1970.09	1.66191	$P_{e,d}$	0.2383	RA (S)	3	2200	0.915	0.837
n_{1530}	1529.58	1.66989	$P_{g,F}$	0.5450	D_W	1	2000	0.983	0.966
n_{1129}	1128.64	1.67672	$P'_{d,c'}$	0.2531	D_A	3	1800	0.998	0.996
n_{1064}	1064.00	1.67791	$P'_{e,d}$	0.2364	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.67889	$P'_{g,F'}$	0.4842	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.68258			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.68506	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.68731					1000	0.999	0.998
n_C	656.27	1.68955					950	0.999	0.998
$n_{C'}$	643.85	1.69018					900	0.999	0.998
n_{He-Ne}	632.80	1.69076					850	0.999	0.998
n_D	589.29	1.69337	ΔP_{Fe}	-0.0026	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69350	$\Delta P_{g,F}$	-0.0100	-50/-40	46	750	0.999	0.998
n_e	546.07	1.69660	$\Delta P_{C,t}$	0.0211	-40/-30	47	700	0.999	0.998
n_F	486.13	1.70256	$\Delta P_{C,s}$	0.0075	-30/-20	49	650	0.999	0.998
$n_{F'}$	479.99	1.70330	Thermal Properties		-20/-10	50	600	0.999	0.998
n_g	435.84	1.70965			-10/0	51	550	0.999	0.998
n_h	404.66	1.71556	Tg ($^{\circ}C$)	646	0/10	52	500	0.999	0.998
n_i	365.01	1.72565	Ts ($^{\circ}C$)	674	10/20	52	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	580	20/30	53	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	625	30/40	54	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	51	40/50	54	420	0.994	0.989
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	67	50/60	55	400	0.990	0.985
			λ (W/(m K))	0.94	60/70	55	390	0.987	0.977
					70/80	56	380	0.981	0.966
			Mechanical Properties		80/90	56	370	0.971	0.946
					90/100	57	360	0.955	0.910
			HK (10^7Pa)	665	100/110	58	350	0.924	0.856
			F_A	84	110/120	58	340	0.879	0.771
			E (GPa)	109.8	120/130	59	330	0.810	0.654
			G (GPa)	42.0	130/140	60	320	0.707	0.499
			μ	0.309	140/150	61	310	0.551	0.300
			σ_b (MPa)	87	150/160	62	300	0.301	0.089
			B ($10^{-12}/Pa$)	1.96			290		
							280		

Constants of Dispersion Formula	
A_0	2.81648072E+00
A_1	-1.52313167E-02
A_2	1.76168363E-02
A_3	8.07769313E-04
A_4	-5.32742539E-05
A_5	2.58509025E-06

Density		Solarization	
ρ (g/cm ³)	3.57	$\Delta\lambda$ (%)	-1.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	5.0	5.1	5.2	5.3	5.3	5.4	5.8	6.1	6.1	6.5
-40 ~ -20	4.8	5.1	5.3	5.3	5.4	5.5	5.7	5.9	6.0	6.4
-20 ~ 0	4.7	5.0	5.3	5.3	5.3	5.4	5.6	5.9	6.0	6.4
0 ~ 20	4.7	5.0	5.2	5.2	5.3	5.3	5.6	5.9	6.0	6.4
20 ~ 40	4.6	5.0	5.2	5.2	5.3	5.4	5.7	6.0	6.1	6.5
40 ~ 60	4.9	5.1	5.3	5.3	5.4	5.6	5.8	6.2	6.3	6.7
60 ~ 80	5.0	5.2	5.4	5.5	5.6	5.8	6.0	6.4	6.5	6.9
80 ~ 100	5.0	5.3	5.6	5.7	5.8	6.0	6.1	6.5	6.6	7.0
100 ~ 120	5.1	5.4	5.8	5.9	6.0	6.1	6.4	6.8	6.9	7.3
120 ~ 140	5.1	5.5	5.9	6.0	6.1	6.3	6.6	7.0	7.1	7.5
140 ~ 160	5.0	5.4	6.0	6.0	6.1	6.3	6.7	7.2	7.3	7.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/300
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	338/297

Constants of dn/dt		
D_0	D_1	D_2
5.25E-06	1.04E-08	-7.12E-12
E_0	E_1	λ_{TK}
6.31E-07	9.91E-10	6.71E-02

H-LaK7	713539	$n_d = 1.71300$	$v_d = 53.94$	$n_F - n_C = 0.013219$
		$n_e = 1.71615$	$v_e = 53.72$	$n_F - n_C' = 0.013332$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.67450	$P_{d,C}$	0.3041	RC (S)	1	2400	0.774	0.600
n_{1970}	1970.09	1.68160	$P_{e,d}$	0.2383	RA (S)	2	2200	0.924	0.854
n_{1530}	1529.58	1.68930	$P_{g,F}$	0.5469	D_W	1	2000	0.986	0.972
n_{1129}	1128.64	1.69601	$P'_{d,c'}$	0.2535	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.69720	$P'_{e,d}$	0.2363	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.69818	$P'_{g,F'}$	0.4860	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.70190			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.70441	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.70670					1000	0.999	0.998
n_C	656.27	1.70898					950	0.999	0.998
$n_{C'}$	643.85	1.70962					900	0.999	0.998
n_{He-Ne}	632.80	1.71021					850	0.999	0.998
n_D	589.29	1.71287	ΔP_{Fe}	-0.0028	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.71300	$\Delta P_{g,F}$	-0.0071	-50/-40	53	750	0.999	0.998
n_e	546.07	1.71615	$\Delta P_{C,t}$	0.0155	-40/-30	54	700	0.999	0.998
n_F	486.13	1.72220	$\Delta P_{C,s}$	0.0057	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.72295	Thermal Properties		-20/-10	57	600	0.999	0.998
n_g	435.84	1.72943	Tg ($^{\circ}C$)	640	-10/0	57	550	0.999	0.998
n_h	404.66	1.73545	Ts ($^{\circ}C$)	665	0/10	58	500	0.999	0.998
n_i	365.01	1.74574	$T_{10}^{14.5} (^{\circ}C)$	573	10/20	61	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	619	20/30	62	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	61	30/40	62	440	0.997	0.993
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	77	40/50	63	420	0.995	0.990
			λ (W/(m K))	0.77	50/60	64	400	0.993	0.984
					60/70	64	390	0.990	0.977
					70/80	65	380	0.987	0.964
			Mechanical Properties		80/90	65	370	0.975	0.939
			HK (10^7Pa)	626	90/100	66	360	0.950	0.899
			F_A	76	100/110	67	350	0.914	0.833
			E (GPa)	111.1	110/120	67	340	0.860	0.738
			G (GPa)	43.2	120/130	68	330	0.785	0.614
			μ	0.285	130/140	69	320	0.687	0.473
			σ_b (MPa)	64	140/150	70	310	0.577	0.334
			B ($10^{-12}/Pa$)	1.67	150/160	71	300	0.464	0.217

Constants of Dispersion Formula	
A_0	2.87989018E+00
A_1	-1.46958687E-02
A_2	1.89956868E-02
A_3	6.06495285E-04
A_4	-2.91346717E-05
A_5	1.65584289E-06

Density		Solarization	
ρ (g/cm ³)	3.78	$\Delta\lambda$ (%)	-1.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.6	3.8	4.0	4.1	4.1	4.2	4.3	4.7	4.7	5.1
-40 ~ -20	3.6	3.8	4.0	4.0	4.1	4.3	4.3	4.8	4.9	5.2
-20 ~ 0	3.7	3.9	4.1	4.1	4.1	4.3	4.5	4.8	4.9	5.3
0 ~ 20	3.7	3.9	4.1	4.1	4.1	4.4	4.5	5.0	5.1	5.4
20 ~ 40	3.7	3.9	4.1	4.1	4.2	4.4	4.6	5.0	5.1	5.5
40 ~ 60	3.7	3.9	4.2	4.2	4.2	4.5	4.7	5.1	5.2	5.6
60 ~ 80	3.8	4.0	4.3	4.3	4.4	4.7	4.9	5.3	5.3	5.7
80 ~ 100	3.9	4.1	4.5	4.5	4.5	4.8	5.0	5.4	5.4	5.8
100 ~ 120	4.1	4.3	4.7	4.7	4.8	5.1	5.3	5.4	5.4	6.0
120 ~ 140	4.2	4.4	4.8	4.8	4.9	5.3	5.4	5.6	5.6	6.2
140 ~ 160	4.3	4.5	5.0	5.0	5.1	5.4	5.6	5.7	5.7	6.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	337/268

Constants of dn/dt		
D_0	D_1	D_2
3.18E-06	1.31E-08	-1.47E-11
E_0	E_1	λ_{TK}
5.57E-07	3.42E-10	1.46E-01

H-LaK8A	720503	$n_d = 1.72000$	$v_d = 50.34$	$n_F - n_C = 0.014302$
		$n_e = 1.72341$	$v_e = 50.10$	$n_F - n_C' = 0.014439$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.68225	$P_{d,C}$	0.3021	RC (S)	1	2400	0.828	0.686
n_{1970}	1970.09	1.68879	$P_{e,d}$	0.2384	RA (S)	3	2200	0.946	0.895
n_{1530}	1529.58	1.69593	$P_{g,F}$	0.5503	D_W	1	2000	0.991	0.982
n_{1129}	1128.64	1.70232	$P'_{d,c'}$	0.2521	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.70349	$P'_{e,d}$	0.2362	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.70446	$P'_{g,F'}$	0.4883	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.70823			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.71084	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.71325					1000	0.999	0.998
n_C	656.27	1.71568					950	0.999	0.998
$n_{C'}$	643.85	1.71636					900	0.999	0.998
n_{He-Ne}	632.80	1.71700					850	0.999	0.998
n_D	589.29	1.71987	ΔP_{Fe}	-0.0030	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.72000	$\Delta P_{g,F}$	-0.0097	-50/-40	63	750	0.999	0.998
n_e	546.07	1.72341	$\Delta P_{C,t}$	0.0005	-40/-30	66	700	0.999	0.998
n_F	486.13	1.72998	$\Delta P_{C,s}$	-0.0003	-30/-20	68	650	0.999	0.998
$n_{F'}$	479.99	1.73080	Thermal Properties		-20/-10	68	600	0.999	0.998
n_g	435.84	1.73785			-10/0	69	550	0.999	0.998
n_h	404.66	1.74443	Tg ($^{\circ}C$)	650	0/10	70	500	0.999	0.998
n_i	365.01	1.75588	Ts ($^{\circ}C$)	679	10/20	71	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	588	20/30	71	460	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	616	30/40	72	440	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	71	40/50	72	420	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	50/60	73	400	0.992	0.983
			λ (W/(m K))	0.96	60/70	73	390	0.987	0.974
					70/80	74	380	0.979	0.959
			Mechanical Properties		80/90	74	370	0.965	0.931
					90/100	75	360	0.945	0.880
			HK ($10^7 Pa$)	606	100/110	75	350	0.900	0.804
			F_A	108	110/120	76	340	0.812	0.689
			E (GPa)	107.5	120/130	77	330	0.717	0.530
			G (GPa)	40.9	130/140	79	320	0.581	0.330
			μ	0.313	140/150	80	310	0.326	0.110
			σ_b (MPa)	76	150/160	81	300	0.088	0.008
			B ($10^{-12}/Pa$)	1.73			290		
							280		

Constants of Dispersion Formula	
A_0	2.89933470E+00
A_1	-1.34878716E-02
A_2	1.90766692E-02
A_3	1.36400166E-03
A_4	-1.50217455E-04
A_5	9.16048470E-06

Density		Solarization	
ρ (g/cm ³)	3.87	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.0	2.2	2.4	2.5	2.5	2.6	2.9	3.3	3.3	3.6
-40 ~ -20	1.9	2.2	2.4	2.4	2.5	2.6	2.9	3.3	3.4	3.7
-20 ~ 0	1.9	2.2	2.4	2.4	2.5	2.6	3.0	3.3	3.4	3.8
0 ~ 20	2.0	2.2	2.5	2.5	2.6	2.7	3.0	3.3	3.4	3.8
20 ~ 40	2.0	2.3	2.5	2.5	2.6	2.7	3.0	3.4	3.4	3.9
40 ~ 60	2.1	2.4	2.5	2.5	2.6	2.8	3.1	3.5	3.5	4.0
60 ~ 80	2.2	2.5	2.6	2.7	2.7	2.9	3.3	3.7	3.7	4.2
80 ~ 100	2.2	2.5	2.7	2.7	2.8	3.0	3.4	3.8	3.8	4.3
100 ~ 120	2.3	2.7	2.9	2.9	3.0	3.2	3.6	3.9	4.0	4.6
120 ~ 140	2.5	2.8	3.0	3.1	3.1	3.4	3.8	4.0	4.1	4.7
140 ~ 160	2.6	2.9	3.2	3.3	3.3	3.6	4.0	4.2	4.3	5.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/305
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	345/305

Constants of dn/dt		
D_0	D_1	D_2
1.67E-07	1.21E-08	-1.18E-11
E_0	E_1	λ_{TK}
5.40E-07	3.41E-10	2.06E-01

H-LaK8B	720503	$n_d = 1.72000$	$v_d = 50.34$	$n_F - n_C = 0.014302$
		$n_e = 1.72341$	$v_e = 50.10$	$n_F - n_C' = 0.014439$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3014	RC (S)	1	2400	0.876	0.768
n_{1970}	1970.09		$P_{e,d}$	0.2384	RA (S)	3	2200	0.965	0.932
n_{1530}	1529.58		$P_{g,F}$	0.5517	D_W	1	2000	0.986	0.973
n_{1129}	1128.64	1.70247	$P'_{d,c'}$	0.2507	D_A	3	1800	0.995	0.990
n_{1064}	1064.00	1.70360	$P'_{e,d}$	0.2362	$R_{OH}(S)$	1	1600	0.998	0.997
n_t	1013.98	1.70455	$P'_{g,F'}$	0.4896	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.70826			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.71086	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.71327					1000	0.999	0.998
n_C	656.27	1.71569					950	0.999	0.998
$n_{C'}$	643.85	1.71638					900	0.999	0.998
n_{He-Ne}	632.80	1.71701					850	0.999	0.998
n_D	589.29	1.71987	ΔP_{Fe}	-0.0016	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.72000	$\Delta P_{g,F}$	-0.0083	-50/-40	66	750	0.999	0.998
n_e	546.07	1.72341	$\Delta P_{C,t}$	-0.0051	-40/-30	68	700	0.999	0.998
n_F	486.13	1.73000	$\Delta P_{C,s}$	-0.0017	-30/-20	69	650	0.999	0.998
$n_{F'}$	479.99	1.73082	Thermal Properties		-20/-10	70	600	0.999	0.998
n_g	435.84	1.73789	Tg ($^{\circ}C$)	651	-10/0	71	550	0.999	0.998
n_h	404.66	1.74450	Ts ($^{\circ}C$)	680	0/10	72	500	0.999	0.997
n_i	365.01	1.75588	$T_{10}^{14.5} (^{\circ}C)$	589	10/20	73	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	617	20/30	74	460	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	30/40	75	440	0.996	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	40/50	75	420	0.994	0.989
			λ (W/(m K))	0.83	50/60	76	400	0.992	0.984
					60/70	77	390	0.989	0.978
					70/80	78	380	0.984	0.968
			Mechanical Properties		80/90	79	370	0.975	0.950
			HK (10^7Pa)	606	90/100	79	360	0.958	0.919
			F_A	156	100/110	80	350	0.931	0.868
			E (GPa)	103.9	110/120	81	340	0.890	0.792
			G (GPa)	39.9	120/130	83	330	0.821	0.674
			μ	0.301	130/140	84	320	0.724	0.524
			σ_b (MPa)	90	140/150	85	310	0.570	0.325
			B ($10^{-12}/Pa$)	1.67	150/160	87	300	0.336	0.113

Constants of Dispersion Formula	
A_0	2.89634931E+00
A_1	-1.17449806E-02
A_2	2.12156990E-02
A_3	6.32018297E-04
A_4	-3.39053843E-05
A_5	2.46626102E-06

Density		Solarization	
ρ (g/cm ³)	3.91	$\Delta\lambda$ (%)	-1.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.0	1.2	1.5	1.7	1.8	2.0	2.4	2.7	2.7	3.1
-40 ~ -20	1.1	1.3	1.6	1.8	2.0	2.2	2.4	2.8	2.9	3.3
-20 ~ 0	1.2	1.3	1.6	1.8	2.0	2.3	2.5	2.8	2.9	3.3
0 ~ 20	1.2	1.4	1.6	1.8	2.0	2.3	2.6	2.8	2.9	3.4
20 ~ 40	1.2	1.4	1.6	1.8	2.0	2.3	2.7	2.9	3.0	3.4
40 ~ 60	1.3	1.4	1.7	2.0	2.2	2.4	2.7	2.9	3.0	3.4
60 ~ 80	1.4	1.5	1.7	2.0	2.2	2.5	2.8	3.0	3.1	3.5
80 ~ 100	1.5	1.7	1.9	2.1	2.3	2.7	2.9	3.2	3.3	3.7
100 ~ 120	1.6	1.7	2.0	2.2	2.4	2.8	3.1	3.3	3.4	3.8
120 ~ 140	1.7	1.9	2.2	2.4	2.6	2.9	3.3	3.5	3.6	3.9
140 ~ 160	1.7	2.0	2.3	2.5	2.7	3.0	3.3	3.5	3.7	4.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	365/300
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	341/295

Constants of dn/dt		
D_0	D_1	D_2
-1.62E-06	1.34E-08	-1.84E-11
E_0	E_1	λ_{TK}
8.88E-07	4.63E-11	6.23E-09

H-LaK9	699511	$n_d = 1.69930$	$v_d = 51.11$	$n_F - n_C = 0.013682$
		$n_e = 1.70256$	$v_e = 50.82$	$n_F - n_C' = 0.013825$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.66716	$P_{d,C}$	0.2997	RC (S)	1	2400	0.916	0.838
n_{1970}	1970.09	1.67189	$P_{e,d}$	0.2383	RA (S)	3	2200	0.969	0.939
n_{1530}	1529.58	1.67730	$P_{g,F}$	0.5569	D_W	2	2000	0.987	0.974
n_{1129}	1128.64	1.68265	$P'_{d,C'}$	0.2495	D_A	3	1800	0.994	0.988
n_{1064}	1064.00	1.68370	$P'_{e,d}$	0.2358	$R_{OH}(S)$	1	1600	0.998	0.995
n_t	1013.98	1.68458	$P'_{g,F'}$	0.4940	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.68810			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.69058	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.69288					1000	0.999	0.998
n_C	656.27	1.69520					950	0.999	0.998
$n_{C'}$	643.85	1.69585					900	0.999	0.998
n_{He-Ne}	632.80	1.69646					850	0.999	0.998
n_D	589.29	1.69918	ΔP_{Fe}	-0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69930	$\Delta P_{g,F}$	-0.0018	-50/-40	79	750	0.999	0.998
n_e	546.07	1.70256	$\Delta P_{C,t}$	-0.0116	-40/-30	80	700	0.999	0.998
n_F	486.13	1.70888	$\Delta P_{C,s}$	-0.0041	-30/-20	81	650	0.999	0.998
$n_{F'}$	479.99	1.70967	Thermal Properties		-20/-10	82	600	0.999	0.998
n_g	435.84	1.71650	Tg ($^{\circ}C$)	654	-10/0	83	550	0.999	0.998
n_h	404.66	1.72288	Ts ($^{\circ}C$)	695	0/10	85	500	0.999	0.998
n_i	365.01	1.73368	$T_{10}^{14.5} (^{\circ}C)$	618	10/20	85	480	0.996	0.992
			$T_{10}^{13} (^{\circ}C)$	645	20/30	87	460	0.994	0.988
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	85	30/40	88	440	0.991	0.983
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	95	40/50	88	420	0.989	0.978
			λ (W/(m K))	0.66	50/60	90	400	0.987	0.974
					60/70	91	390	0.982	0.964
					70/80	91	380	0.976	0.953
					80/90	91	370	0.966	0.934
			Mechanical Properties		90/100	93	360	0.948	0.899
			HK ($10^7 Pa$)	511	100/110	94	350	0.918	0.842
			F_A	253	110/120	94	340	0.868	0.754
			E (GPa)	84.5	120/130	96	330	0.792	0.627
			G (GPa)	32.3	130/140	96	320	0.685	0.469
			μ	0.309	140/150	96	310	0.540	0.292
			σ_b (MPa)	81	150/160	98	300	0.366	0.134
			B ($10^{-12}/Pa$)	1.37			290	0.200	0.040
							280		

Constants of Dispersion Formula	
A_0	2.82518848E+00
A_1	-9.25237822E-03
A_2	2.31572298E-02
A_3	-5.65059188E-04
A_4	1.62553405E-04
A_5	-9.14469356E-06

Density		Solarization	
ρ (g/cm ³)	4.26	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-2.7	-2.5	-2.3	-2.3	-2.2	-2.0	-1.7	-1.6	-1.6	-1.4
-40 ~ -20	-2.7	-2.5	-2.2	-2.1	-2.0	-1.8	-1.7	-1.5	-1.5	-1.4
-20 ~ 0	-2.6	-2.4	-2.0	-2.0	-1.9	-1.7	-1.5	-1.4	-1.3	-1.2
0 ~ 20	-2.5	-2.3	-1.8	-1.8	-1.8	-1.5	-1.4	-1.3	-1.2	-1.0
20 ~ 40	-2.5	-2.2	-1.7	-1.7	-1.6	-1.5	-1.4	-1.3	-1.1	-0.9
40 ~ 60	-2.5	-2.2	-1.7	-1.6	-1.6	-1.4	-1.3	-1.1	-1.0	-0.8
60 ~ 80	-2.4	-2.1	-1.5	-1.5	-1.4	-1.2	-1.1	-0.9	-0.8	-0.6
80 ~ 100	-2.3	-1.8	-1.4	-1.4	-1.4	-1.0	-1.0	-0.8	-0.7	-0.4
100 ~ 120	-2.3	-1.8	-1.2	-1.2	-1.2	-1.0	-0.9	-0.6	-0.6	-0.4
120 ~ 140	-2.1	-1.7	-1.2	-1.2	-1.2	-0.8	-0.8	-0.7	-0.5	-0.1
140 ~ 160	-2.1	-1.6	-1.1	-1.1	-1.0	-0.7	-0.5	-0.3	-0.2	0.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/310
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	355/304

Constants of dn/dt		
D_0	D_1	D_2
-7.86E-06	1.43E-08	-2.55E-11
E_0	E_1	λ_{TK}
6.68E-07	5.75E-10	2.86E-16

H-LaK10	651559	$n_d = 1.65113$	$v_d = 55.89$	$n_F - n_C = 0.011650$
		$n_e = 1.65391$	$v_e = 55.62$	$n_F - n_C' = 0.011757$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.61921	$P_{d,C}$	0.3030	RC (S)	1	2400	0.891	0.794
n_{1970}	1970.09	1.62487	$P_{e,d}$	0.2386	RA (S)	2	2200	0.966	0.933
n_{1530}	1529.58	1.63105	$P_{g,F}$	0.5433	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.63650	$P'_{d,c'}$	0.2526	D_A	4	1800	0.995	0.990
n_{1064}	1064.00	1.63749	$P'_{e,d}$	0.2365	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.63830	$P'_{g,F'}$	0.4814	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.64144			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.64361	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.64560					1000	0.999	0.998
n_C	656.27	1.64760					950	0.999	0.998
$n_{C'}$	643.85	1.64816					900	0.999	0.998
n_{He-Ne}	632.80	1.64869					850	0.999	0.998
n_D	589.29	1.65103	ΔP_{Fe}	-0.0010	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65113	$\Delta P_{g,F}$	-0.0074	-50/-40	59	750	0.999	0.998
n_e	546.07	1.65391	$\Delta P_{C,t}$	-0.0127	-40/-30	61	700	0.999	0.998
n_F	486.13	1.65925	$\Delta P_{C,s}$	-0.0058	-30/-20	62	650	0.999	0.998
$n_{F'}$	479.99	1.65992	Thermal Properties		-20/-10	63	600	0.999	0.998
n_g	435.84	1.66558	$T_g (^{\circ}C)$	656	-10/0	63	550	0.999	0.998
n_h	404.66	1.67083	$T_s (^{\circ}C)$	687	0/10	64	500	0.999	0.998
n_i	365.01	1.67985	$T_{10}^{14.5} (^{\circ}C)$	589	10/20	65	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	629	20/30	65	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	67	30/40	66	440	0.998	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	82	40/50	67	420	0.996	0.992
			λ (W/(m K))	0.80	50/60	68	400	0.994	0.989
					60/70	68	390	0.991	0.985
					70/80	69	380	0.988	0.979
			Mechanical Properties		80/90	69	370	0.982	0.968
			HK (10^7 Pa)	552	90/100	70	360	0.971	0.945
			F_A	170	100/110	71	350	0.952	0.910
			E (GPa)	90.3	110/120	72	340	0.920	0.849
			G (GPa)	34.4	120/130	73	330	0.867	0.756
			μ	0.311	130/140	74	320	0.790	0.628
			σ_b (MPa)	54	140/150	75	310	0.684	0.469
			B (10^{-12} /Pa)	1.90	150/160	76	300	0.551	0.305

Constants of Dispersion Formula	
A_0	2.68014719E+00
A_1	-1.13022222E-02
A_2	1.49971961E-02
A_3	1.08435000E-03
A_4	-1.25822106E-04
A_5	7.18648482E-06

Density		Solarization	
ρ (g/cm ³)	3.72	$\Delta\lambda$ (%)	-4.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.5	2.8	2.9	3.0	3.0	3.1	3.3	3.5	3.6	4.0
-40 ~ -20	2.5	2.7	2.8	2.9	2.9	3.1	3.3	3.5	3.6	4.0
-20 ~ 0	2.5	2.8	2.9	2.9	2.9	3.1	3.3	3.5	3.6	4.0
0 ~ 20	2.5	2.8	3.0	3.0	3.0	3.1	3.3	3.5	3.6	4.1
20 ~ 40	2.5	2.8	3.0	3.0	3.0	3.1	3.3	3.5	3.6	4.1
40 ~ 60	2.6	2.8	3.0	3.0	3.0	3.1	3.4	3.6	3.7	4.2
60 ~ 80	2.6	2.9	3.1	3.1	3.1	3.2	3.6	3.8	3.9	4.4
80 ~ 100	2.7	3.0	3.2	3.2	3.3	3.4	3.7	3.9	4.0	4.6
100 ~ 120	2.8	3.1	3.2	3.2	3.3	3.5	3.8	4.1	4.2	4.8
120 ~ 140	2.9	3.2	3.3	3.3	3.4	3.6	3.9	4.2	4.3	4.9
140 ~ 160	3.0	3.3	3.4	3.4	3.5	3.7	4.0	4.3	4.4	5.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	329/275

Constants of dn/dt		
D_0	D_1	D_2
1.69E-06	1.16E-08	-1.39E-11
E_0	E_1	λ_{TK}
3.41E-07	4.23E-10	2.78E-01

H-LaK11	651562	$n_d = 1.65100$	$v_d = 56.24$	$n_F - n_C = 0.011576$
		$n_e = 1.65376$	$v_e = 56.02$	$n_F - n_C' = 0.011670$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3049	RC (S)	1	2400	0.789	0.623
n_{1970}	1970.09		$P_{e,d}$	0.2384	RA (S)	1	2200	0.933	0.871
n_{1530}	1529.58		$P_{g,F}$	0.5434	D_W	1	2000	0.980	0.961
n_{1129}	1128.64		$P'_{d,c'}$	0.2545	D_A	3	1800	0.993	0.985
n_{1064}	1064.00	1.63688	$P'_{e,d}$	0.2365	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.63776	$P'_{g,F'}$	0.4833	RP (S)	2	1400	0.995	0.991
n_s	852.11	1.64113			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.64340	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.64543					1000	0.999	0.998
n_C	656.27	1.64747					950	0.999	0.998
$n_{C'}$	643.85	1.64803					900	0.999	0.998
n_{He-Ne}	632.80	1.64856					850	0.999	0.998
n_D	589.29	1.65089	ΔP_{Fe}	-0.0022	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65100	$\Delta P_{g,F}$	-0.0068	-50/-40	32	750	0.999	0.998
n_e	546.07	1.65376	$\Delta P_{C,t}$	0.0262	-40/-30	34	700	0.999	0.998
n_F	486.13	1.65905	$\Delta P_{C,s}$	0.0123	-30/-20	36	650	0.999	0.998
$n_{F'}$	479.99	1.65970	Thermal Properties		-20/-10	36	600	0.999	0.998
n_g	435.84	1.66534	Tg ($^{\circ}C$)	689	-10/0	36	550	0.999	0.998
n_h	404.66	1.67056	Ts ($^{\circ}C$)	723	0/10	37	500	0.999	0.998
n_i	365.01	1.67944	$T_{10}^{14.5} (^{\circ}C)$	646	10/20	39	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	679	20/30	40	460	0.998	0.997
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	40	30/40	41	440	0.998	0.996
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	56	40/50	41	420	0.997	0.993
			λ (W/(m K))	1.00	50/60	42	400	0.993	0.987
					60/70	42	390	0.989	0.978
					70/80	42	380	0.983	0.967
			Mechanical Properties		80/90	43	370	0.973	0.947
			HK (10^7Pa)	680	90/100	45	360	0.956	0.913
			F_A	75	100/110	46	350	0.926	0.858
			E (GPa)	104.6	110/120	48	340	0.883	0.781
			G (GPa)	40.4	120/130	49	330	0.817	0.667
			μ	0.296	130/140	51	320	0.732	0.536
			σ_b (MPa)	121	140/150	52	310	0.627	0.393
			B ($10^{-12}/Pa$)	2.27	150/160	54	300	0.508	0.258

Constants of Dispersion Formula	
A_0	2.67752226E+00
A_1	-1.24341775E-02
A_2	1.81020008E-02
A_3	-1.38622158E-04
A_4	6.22866969E-05
A_5	-3.07013984E-06

Density		Solarization	
ρ (g/cm ³)	3.34	$\Delta\lambda$ (%)	-1.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.3	4.5	4.6	4.7	4.9	5.1	5.5	5.7	5.8	6.2
-40 ~ -20	4.3	4.5	4.7	4.8	4.9	5.3	5.5	5.7	5.8	6.2
-20 ~ 0	4.3	4.5	4.7	4.9	4.9	5.4	5.6	5.8	5.8	6.3
0 ~ 20	4.3	4.6	4.8	4.9	5.1	5.5	5.6	5.9	5.9	6.4
20 ~ 40	4.4	4.6	4.9	5.0	5.2	5.5	5.6	6.0	6.0	6.5
40 ~ 60	4.4	4.8	4.9	5.0	5.2	5.6	5.8	6.0	6.2	6.7
60 ~ 80	4.5	4.9	5.1	5.2	5.3	5.8	5.9	6.1	6.2	6.9
80 ~ 100	4.5	5.0	5.1	5.3	5.5	5.9	5.9	6.2	6.3	7.0
100 ~ 120	4.5	5.0	5.2	5.4	5.6	6.0	6.1	6.3	6.4	7.2
120 ~ 140	4.6	5.1	5.3	5.5	5.7	6.1	6.2	6.4	6.4	7.3
140 ~ 160	4.6	5.2	5.4	5.5	5.7	6.1	6.2	6.5	6.6	7.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	342/277

Constants of dn/dt		
D_0	D_1	D_2
4.70E-06	1.30E-08	-2.38E-11
E_0	E_1	λ_{TK}
8.51E-07	6.66E-10	4.15E-14

H-LaK12	697562	$n_d = 1.69680$	$v_d = 56.19$	$n_F - n_C = 0.012400$
		$n_e = 1.69975$	$v_e = 55.98$	$n_F - n_C' = 0.012500$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65825	$P_{d,C}$	0.3056	RC (S)	1	2400	0.795	0.614
n_{1970}	1970.09	1.66578	$P_{e,d}$	0.2379	RA (S)	2	2200	0.953	0.898
n_{1530}	1529.58	1.67381	$P_{g,F}$	0.5395	D_W	1	2000	0.988	0.969
n_{1129}	1128.64	1.68059	$P'_{d,c'}$	0.2552	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.68176	$P'_{e,d}$	0.2360	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.68271	$P'_{g,F'}$	0.4792	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.68629			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.68869	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.69087					1000	0.999	0.998
n_C	656.27	1.69301					950	0.999	0.998
$n_{C'}$	643.85	1.69361					900	0.999	0.998
n_{He-Ne}	632.80	1.69418					850	0.999	0.998
n_D	589.29	1.69668	ΔP_{Fe}	-0.0027	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69680	$\Delta P_{g,F}$	-0.0108	-50/-40	53	750	0.999	0.998
n_e	546.07	1.69975	$\Delta P_{C,t}$	0.0182	-40/-30	55	700	0.999	0.998
n_F	486.13	1.70541	$\Delta P_{C,s}$	0.0067	-30/-20	57	650	0.999	0.998
$n_{F'}$	479.99	1.70611	Thermal Properties		-20/-10	58	600	0.999	0.998
n_g	435.84	1.71210	Tg ($^{\circ}C$)	673	-10/0	58	550	0.999	0.998
n_h	404.66	1.71764	Ts ($^{\circ}C$)	696	0/10	59	500	0.999	0.998
n_i	365.01	1.72713	$T_{10}^{14.5} (^{\circ}C)$	611	10/20	59	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	638	20/30	60	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	56	30/40	60	440	0.999	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	72	40/50	60	420	0.999	0.989
			λ (W/(m K))	1.07	50/60	61	400	0.999	0.984
					60/70	61	390	0.997	0.978
					70/80	61	380	0.992	0.967
			Mechanical Properties		80/90	62	370	0.983	0.948
			HK ($10^7 Pa$)	616	90/100	62	360	0.968	0.918
			F_A	79	100/110	63	350	0.942	0.858
			E (GPa)	112.9	110/120	64	340	0.907	0.792
			G (GPa)	43.2	120/130	65	330	0.856	0.699
			μ	0.307	130/140	66	320	0.785	0.581
			σ_b (MPa)	73	140/150	67	310	0.688	0.442
			B ($10^{-12}/Pa$)	1.59	150/160	67	300	0.564	0.289

Constants of Dispersion Formula	
A_0	2.83112539E+00
A_1	-1.55847682E-02
A_2	1.58070931E-02
A_3	1.24470183E-03
A_4	-1.41192909E-04
A_5	7.83660883E-06

Density		Solarization	
ρ (g/cm ³)	3.71	$\Delta\lambda$ (%)	-2.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.5	1.5	1.6	1.6	1.7	1.8	2.0	2.2	2.2	2.3
-40 ~ -20	1.6	1.6	1.7	1.7	1.8	1.9	2.1	2.4	2.4	2.6
-20 ~ 0	1.7	1.8	2.0	2.0	2.1	2.2	2.3	2.6	2.7	3.3
0 ~ 20	1.8	2.0	2.2	2.2	2.3	2.4	2.6	2.7	2.8	3.4
20 ~ 40	2.0	2.2	2.4	2.4	2.5	2.6	2.8	3.0	3.1	3.5
40 ~ 60	2.1	2.3	2.5	2.5	2.6	2.8	2.9	3.1	3.2	3.6
60 ~ 80	2.1	2.3	2.5	2.4	2.5	2.8	3.0	3.2	3.3	3.8
80 ~ 100	2.1	2.4	2.6	2.6	2.7	2.9	3.1	3.4	3.5	3.9
100 ~ 120	2.1	2.6	2.8	2.8	2.9	3.1	3.3	3.5	3.6	4.0
120 ~ 140	2.2	2.7	2.8	2.8	2.9	3.1	3.3	3.5	3.6	4.3
140 ~ 160	2.4	2.8	3.0	3.0	3.1	3.2	3.5	3.7	3.8	4.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	334/268

Constants of dn/dt		
D_0	D_1	D_2
1.91E-07	1.65E-08	-3.83E-11
E_0	E_1	λ_{TK}
3.84E-07	4.87E-10	2.27E-01

H-LaK50A	652584	$n_d = 1.65160$	$v_d = 58.40$	$n_F - n_C = 0.011157$
		$n_e = 1.65426$	$v_e = 58.15$	$n_F - n_C' = 0.011251$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.61677	$P_{d,C}$	0.3047	RC (S)	1	2400	0.840	0.706
n_{1970}	1970.09	1.62349	$P_{e,d}$	0.2384	RA (S)	3	2200	0.954	0.910
n_{1530}	1529.58	1.63071	$P_{g,F}$	0.5432	D_W	3	2000	0.991	0.982
n_{1129}	1128.64	1.63688	$P'_{d,c'}$	0.2542	D_A	4	1800	0.999	0.998
n_{1064}	1064.00	1.63795	$P'_{e,d}$	0.2364	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.63882	$P'_{g,F'}$	0.4817	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.64210			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.64428	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.64625					1000	0.999	0.998
n_C	656.27	1.64820					950	0.999	0.998
$n_{C'}$	643.85	1.64874					900	0.999	0.998
n_{He-Ne}	632.80	1.64924					850	0.999	0.998
n_D	589.29	1.65150	ΔP_{Fe}	-0.0017	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65160	$\Delta P_{g,F}$	-0.0034	-50/-40	57	750	0.999	0.998
n_e	546.07	1.65426	$\Delta P_{C,t}$	0.0176	-40/-30	59	700	0.999	0.998
n_F	486.13	1.65935	$\Delta P_{C,s}$	0.0062	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.65999	Thermal Properties		-20/-10	61	600	0.999	0.998
n_g	435.84	1.66541	Tg ($^{\circ}C$)	622	-10/0	62	550	0.999	0.998
n_h	404.66	1.67043	Ts ($^{\circ}C$)	659	0/10	63	500	0.999	0.998
n_i	365.01	1.67894	$T_{10}^{14.5} (^{\circ}C)$	570	10/20	64	480	0.997	0.996
			$T_{10}^{13} (^{\circ}C)$	615	20/30	64	460	0.995	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	60	30/40	65	440	0.993	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	77	40/50	65	420	0.991	0.990
			λ (W/(m K))	0.95	50/60	66	400	0.989	0.988
					60/70	66	390	0.986	0.985
					70/80	67	380	0.982	0.979
			Mechanical Properties		80/90	68	370	0.974	0.968
			HK (10^7Pa)	594	90/100	68	360	0.969	0.949
			F_A	105	100/110	69	350	0.948	0.916
			E (GPa)	102.9	110/120	70	340	0.920	0.863
			G (GPa)	39.5	120/130	71	330	0.881	0.783
			μ	0.302	130/140	73	320	0.816	0.672
			σ_b (MPa)	76	140/150	74	310	0.725	0.531
			B ($10^{-12}/\text{Pa}$)	1.85	150/160	75	300	0.607	0.377

Constants of Dispersion Formula	
A_0	2.68404972E+00
A_1	-1.34999767E-02
A_2	1.56364220E-02
A_3	3.91605064E-04
A_4	-8.87810681E-06
A_5	2.90663584E-07

Density		Solarization	
ρ (g/cm ³)	3.48	$\Delta\lambda$ (%)	-2.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.7	2.9	3.1	3.2	3.2	3.3	3.4	3.6	3.6	4.0
-40 ~ -20	2.7	2.9	3.2	3.3	3.3	3.3	3.5	3.7	3.7	4.1
-20 ~ 0	2.8	3.0	3.3	3.3	3.3	3.3	3.6	3.7	3.8	4.2
0 ~ 20	2.8	3.0	3.3	3.3	3.3	3.3	3.6	3.8	3.9	4.2
20 ~ 40	2.9	3.1	3.3	3.3	3.3	3.4	3.6	3.9	4.0	4.3
40 ~ 60	3.0	3.2	3.3	3.4	3.4	3.5	3.8	4.0	4.1	4.4
60 ~ 80	3.0	3.3	3.4	3.5	3.5	3.7	3.8	4.1	4.2	4.5
80 ~ 100	3.0	3.3	3.5	3.6	3.6	3.8	3.9	4.2	4.3	4.6
100 ~ 120	3.2	3.4	3.6	3.6	3.6	3.9	4.0	4.3	4.4	4.8
120 ~ 140	3.2	3.4	3.6	3.7	3.7	4.0	4.1	4.4	4.5	5.0
140 ~ 160	3.2	3.5	3.7	3.7	3.8	4.1	4.2	4.5	4.6	5.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	332/270

Constants of dn/dt		
D_0	D_1	D_2
2.25E-06	1.25E-08	-2.25E-11
E_0	E_1	λ_{TK}
4.23E-07	5.63E-10	1.91E-01

H-LaK51	697555	$n_d = 1.69680$	$v_d = 55.46$	$n_F - n_C = 0.012564$
		$n_e = 1.69980$	$v_e = 55.25$	$n_F - n_C' = 0.012667$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65840	$P_{d,C}$	0.3048	RC (S)	1	2400	0.757	0.575
n_{1970}	1970.09	1.66575	$P_{e,d}$	0.2388	RA (S)	3	2200	0.923	0.846
n_{1530}	1529.58	1.67368	$P_{g,F}$	0.5420	D_W	1	2000	0.986	0.960
n_{1129}	1128.64	1.68042	$P'_{d,C'}$	0.2542	D_A	3	1800	0.999	0.993
n_{1064}	1064.00	1.68159	$P'_{e,d}$	0.2368	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.68254	$P'_{g,F'}$	0.4808	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.68616			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.68859	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.69079					1000	0.999	0.998
n_C	656.27	1.69297					950	0.999	0.998
$n_{C'}$	643.85	1.69358					900	0.999	0.998
n_{He-Ne}	632.80	1.69415					850	0.999	0.998
n_D	589.29	1.69669	ΔP_{Fe}	-0.0035	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69680	$\Delta P_{g,F}$	-0.0095	-50/-40	52	750	0.999	0.998
n_e	546.07	1.69980	$\Delta P_{C,t}$	0.0213	-40/-30	53	700	0.999	0.998
n_F	486.13	1.70553	$\Delta P_{C,s}$	0.0085	-30/-20	54	650	0.999	0.998
$n_{F'}$	479.99	1.70625	Thermal Properties		-20/-10	55	600	0.999	0.998
n_g	435.84	1.71234	Tg ($^{\circ}C$)	650	-10/0	56	550	0.999	0.998
n_h	404.66	1.71800	Ts ($^{\circ}C$)	676	0/10	56	500	0.999	0.998
n_i	365.01	1.72765	$T_{10}^{14.5} (^{\circ}C)$	591	10/20	57	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	625	20/30	57	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	55	30/40	58	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	71	40/50	58	420	0.999	0.998
			λ (W/(m K))	0.62	50/60	58	400	0.992	0.987
					60/70	59	390	0.990	0.980
					70/80	59	380	0.985	0.971
			Mechanical Properties		80/90	59	370	0.975	0.951
			HK (10^7Pa)	680	90/100	60	360	0.957	0.918
			F_A	85	100/110	61	350	0.928	0.862
			E (GPa)	110.2	110/120	61	340	0.885	0.787
			G (GPa)	43.9	120/130	62	330	0.827	0.683
			μ	0.255	130/140	63	320	0.748	0.561
			σ_b (MPa)	64	140/150	64	310	0.643	0.417
			B ($10^{-12}/Pa$)	1.70	150/160	65	300	0.553	0.308

Constants of Dispersion Formula	
A_0	2.82930828E+00
A_1	-1.51991877E-02
A_2	1.69710302E-02
A_3	9.14047795E-04
A_4	-8.69746514E-05
A_5	4.85293775E-06

Density		Solarization	
ρ (g/cm ³)	3.69	$\Delta\lambda$ (%)	-3.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.9	4.1	4.2	4.3	4.4	4.5	4.7	5.0	5.0	5.4
-40 ~ -20	3.9	4.2	4.3	4.3	4.4	4.5	4.7	5.1	5.1	5.4
-20 ~ 0	3.9	4.2	4.3	4.3	4.4	4.5	4.7	5.1	5.2	5.4
0 ~ 20	3.9	4.2	4.3	4.3	4.4	4.5	4.7	5.1	5.2	5.4
20 ~ 40	3.9	4.2	4.4	4.4	4.5	4.5	4.7	5.2	5.3	5.5
40 ~ 60	4.1	4.4	4.5	4.6	4.7	4.7	4.9	5.4	5.4	5.8
60 ~ 80	4.1	4.4	4.6	4.7	4.6	4.9	5.0	5.5	5.5	5.9
80 ~ 100	4.2	4.4	4.7	4.8	4.8	5.0	5.0	5.5	5.5	6.0
100 ~ 120	4.2	4.5	4.7	4.8	4.8	5.0	5.1	5.5	5.6	6.0
120 ~ 140	4.2	4.5	4.8	4.8	4.8	5.1	5.1	5.5	5.6	6.1
140 ~ 160	4.3	4.4	4.8	4.9	4.9	5.1	5.1	5.6	5.6	6.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	342/277

Constants of dn/dt		
D_0	D_1	D_2
4.02E-06	1.29E-08	-2.62E-11
E_0	E_1	λ_{TK}
4.49E-07	2.06E-10	2.05E-01

H-LaK51A		697555	n _d = 1.69680		v _d = 55.46		n _F − n _C = 0.012564				
			n _e = 1.69980		v _e = 55.25		n _F − n _C ′ = 0.012667				
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42						2400	0.742	0.550		
n ₁₉₇₀	1970.09						2200	0.904	0.817		
n ₁₅₃₀	1529.58						2000	0.980	0.960		
n ₁₁₂₉	1128.64		P _{d,C}	0.3048	RC (S)	1	1800	0.997	0.994		
n ₁₀₆₄	1064.00	1.68155	P _{e,d}	0.2388	RA (S)	3	1600	0.999	0.998		
n _t	1013.98	1.68252	P _{g,F}	0.5420	D _W	1	1400	0.999	0.998		
n _s	852.11	1.68615	P _{d,c} ′	0.2542	D _A	3	1200	0.999	0.998		
n _A ′	768.19	1.68860	P _{e,d} ′	0.2368	R _{OH} (S)	1	1060	0.999	0.998		
n _r	706.52	1.69080	P _{g,F} ′	0.4808	RP (S)	2	1000	0.999	0.998		
n _C	656.27	1.69297			CR	1	950	0.999	0.998		
n _C ′	643.85	1.69358	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		900	0.999	0.998		
n _{He-Ne}	632.80	1.69417					850	0.999	0.998		
n _D	589.29	1.69670					800	0.999	0.998		
n _d	587.56	1.69680					750	0.999	0.998		
n _e	546.07	1.69980					700	0.999	0.998		
n _F	486.13	1.70553	Thermal Properties		-20/-10	52	650	0.999	0.998		
n _F ′	479.99	1.70625			-10/0	53	600	0.999	0.998		
n _g	435.84	1.71234			0/10	55	550	0.999	0.998		
n _h	404.66	1.71799			10/20	56	500	0.999	0.998		
n _i	365.01	1.72764			20/30	56	480	0.998	0.997		
			α _{-50/80°C} (10 ⁻⁷ /K)	55	30/40	56	460	0.997	0.995		
			α _{100/300°C} (10 ⁻⁷ /K)	72	40/50	59	440	0.996	0.993		
			λ (W/(m K))	0.92	50/60	59	420	0.995	0.990		
Constants of Dispersion Formula					60/70	60	400	0.993	0.986		
			Mechanical Properties		70/80	60	390	0.990	0.981		
					80/90	63	380	0.986	0.973		
					90/100	64	370	0.979	0.959		
					100/110	64	360	0.966	0.933		
A ₀	2.82835724E+00	HK (10 ⁷ Pa)			608	100/120	65	350	0.946	0.895	
A ₁	-1.49967196E-02	F _A	119	110/130	65	340	0.915	0.838			
A ₂	1.78960905E-02	E (GPa)	111.4	120/140	67	330	0.872	0.760			
A ₃	5.80447845E-04	G (GPa)	43.3	130/150	69	320	0.812	0.659			
A ₄	-3.68202672E-05	μ	0.288	140/160	71	310	0.735	0.540			
A ₅	2.18285424E-06	σ _b (MPa)	107			300	0.643	0.413			
Density		Solarization		B (10 ⁻¹² /Pa)	1.75			290	0.537	0.288	
						280	0.405	0.164			
ρ (g/cm ³)	3.65	△λ (%)	-3.5								
Range of Temperature (°C)	Temperature Coefficients of Refractive Index										
	dn/dt relative (×10 ⁻⁶ / °C)										
	t	s	C	C'	He-Ne	d	e	F	F'	g	
	-60 ~ -40	1.6	2.0	2.1	2.2	2.4	2.6	3.0	3.1	3.2	3.5
	-40 ~ -20	1.6	2.0	2.2	2.3	2.4	2.7	3.0	3.1	3.2	3.6
	-20 ~ 0	1.6	2.2	2.3	2.3	2.4	2.8	3.2	3.3	3.3	3.8
	0 ~ 20	1.7	2.3	2.4	2.5	2.5	2.9	3.2	3.3	3.3	4.0
	20 ~ 40	1.7	2.3	2.5	2.6	2.7	3.1	3.3	3.4	3.4	4.2
	40 ~ 60	1.8	2.4	2.7	2.7	2.8	3.1	3.4	3.5	3.5	4.3
	60 ~ 80	1.8	2.4	2.8	2.8	2.9	3.3	3.6	3.7	3.8	4.6
80 ~ 100	2.0	2.6	3.0	3.1	3.2	3.4	3.8	3.9	3.9	4.8	
100 ~ 120	2.1	2.7	3.2	3.2	3.2	3.4	4.0	4.1	4.1	4.9	
120 ~ 140	2.1	2.8	3.2	3.2	3.2	3.5	4.0	4.2	4.3	5.1	
140 ~ 160	2.2	2.9	3.3	3.4	3.4	3.6	4.2	4.4	4.4	5.2	
Coloration Code											
λ ₈₀ (λ ₇₀)/λ ₅					360/270						
Coloration of Internal Transmittance											
λτ ₈₀ /λτ ₅					335/273						
Constants of dn/dt											
D ₀			D ₁			D ₂					
-2.78E-07			1.33E-08			-2.35E-11					
E ₀			E ₁			λ _{TK}					
8.64E-07			8.98E-10			4.82E-15					

H-LaK52	729547	$n_d = 1.72916$	$v_d = 54.67$	$n_F - n_C = 0.013337$
		$n_e = 1.73234$	$v_e = 54.44$	$n_F - n_C' = 0.013451$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.68934	P _{d,C}	0.3044	RC (S)	1	2400	0.769	0.591		
n ₁₉₇₀	1970.09	1.69681	P _{e,d}	0.2384	RA (S)	3	2200	0.926	0.857		
n ₁₅₃₀	1529.58	1.70490	P _{g,F}	0.5451	D _W	1	2000	0.978	0.956		
n ₁₁₂₉	1128.64	1.71188	P' _{d,c´}	0.2535	D _A	3	1800	0.994	0.988		
n ₁₀₆₄	1064.00	1.71310	P' _{e,d}	0.2364	R _{OH} (S)	1	1600	0.999	0.998		
n _t	1013.98	1.71409	P' _{g,F´}	0.4840	RP (S)	2	1400	0.999	0.998		
n _s	852.11	1.71790			CR	1	1200	0.999	0.998		
n _{A´}	768.19	1.72047					1060	0.999	0.998		
n _r	706.52	1.72279	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998		
n _C	656.27	1.72510					950	0.999	0.998		
n _{C´}	643.85	1.72575					900	0.999	0.998		
n _{He-Ne}	632.80	1.72635					850	0.999	0.998		
n _D	589.29	1.72904					800	0.999	0.998		
n _d	587.56	1.72916	ΔP _{F,e}	-0.0026	°C	α	750	0.999	0.998		
n _e	546.07	1.73234	ΔP _{g,F}	-0.0077	-50/-40	54	700	0.999	0.998		
n _F	486.13	1.73844	ΔP _{C,t}	0.0205	-40/-30	56	650	0.999	0.998		
n _{F´}	479.99	1.73920	ΔP _{C,s}	0.0082	-30/-20	57	600	0.999	0.998		
n _g	435.84	1.74571	Thermal Properties		-20/-10	58	550	0.999	0.998		
n _h	404.66	1.75176			Tg (°C)	688	-10/0	58	500	0.999	0.998
n _i	365.01	1.76205			Ts (°C)	705	0/10	59	480	0.999	0.998
					T ₁₀ ^{14.5} (°C)	620	10/20	59	460	0.999	0.998
					T ₁₀ ¹³ (°C)	645	20/30	59	440	0.997	0.995
					α _{-50/80°C} (10 ⁻⁷ /K)	61	30/40	60			
					α _{100/300°C} (10 ⁻⁷ /K)	74	40/50	61			

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.6	3.1	3.2	3.2	3.2	3.3	3.5	3.7	3.7	4.2
-40 ~ -20	2.7	3.1	3.2	3.2	3.2	3.2	3.5	3.7	3.8	4.3
-20 ~ 0	2.7	3.1	3.2	3.2	3.2	3.3	3.6	3.8	3.9	4.3
0 ~ 20	2.8	3.2	3.2	3.2	3.3	3.5	3.5	4.0	4.0	4.4
20 ~ 40	2.8	3.2	3.3	3.3	3.3	3.5	3.6	4.0	4.1	4.5
40 ~ 60	2.8	3.2	3.3	3.3	3.4	3.5	3.6	4.1	4.1	4.5
60 ~ 80	2.9	3.2	3.4	3.4	3.5	3.6	3.8	4.2	4.2	4.7
80 ~ 100	2.9	3.3	3.6	3.6	3.7	3.7	3.9	4.3	4.3	4.9
100 ~ 120	2.9	3.3	3.7	3.7	3.8	3.8	4.0	4.4	4.4	5.2
120 ~ 140	2.9	3.4	3.7	3.7	3.8	4.0	4.2	4.5	4.6	5.4
140 ~ 160	3.0	3.5	3.8	3.8	3.9	4.2	4.3	4.7	4.8	5.5

Constants of dn/dt		
D_0	D_1	D_2
1.80E-06	1.11E-08	-1.88E-11
E_0	E_1	λ_{TK}
4.02E-07	6.22E-10	2.23E-01

H-LaK53A	755523	$n_d = 1.75500$	$v_d = 52.32$	$n_F - n_C = 0.014430$
		$n_e = 1.75844$	$v_e = 52.09$	$n_F - n_C' = 0.014561$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.71389	$P_{d,C}$	0.3028	RC (S)	1	2400	0.778	0.605
n_{1970}	1970.09	1.72137	$P_{e,d}$	0.2384	RA (S)	2	2200	0.934	0.872
n_{1530}	1529.58	1.72950	$P_{g,F}$	0.5468	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.73661	$P'_{d,c'}$	0.2527	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.73789	$P'_{e,d}$	0.2362	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.73893	$P'_{g,F'}$	0.4855	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.74293			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.74566	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.74815					1000	0.999	0.998
n_C	656.27	1.75063					950	0.999	0.998
$n_{C'}$	643.85	1.75132					900	0.999	0.998
n_{He-Ne}	632.80	1.75197					850	0.999	0.998
n_D	589.29	1.75487	ΔP_{Fe}	-0.0026	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.75500	$\Delta P_{g,F}$	-0.0099	-50/-40	53	750	0.999	0.998
n_e	546.07	1.75844	$\Delta P_{C,t}$	0.0172	-40/-30	54	700	0.999	0.998
n_F	486.13	1.76506	$\Delta P_{C,s}$	0.0076	-30/-20	55	650	0.999	0.998
$n_{F'}$	479.99	1.76588	Thermal Properties		-20/-10	56	600	0.999	0.998
n_g	435.84	1.77295	Tg ($^{\circ}C$)	695	-10/0	57	550	0.999	0.998
n_h	404.66	1.77953	Ts ($^{\circ}C$)	712	0/10	58	500	0.999	0.998
n_i	365.01	1.79081	$T_{10}^{14.5} (^{\circ}C)$	631	10/20	59	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	652	20/30	59	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	57	30/40	59	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	72	40/50	60	420	0.995	0.989
			λ (W/(m K))	1.06	50/60	60	400	0.992	0.984
					60/70	60	390	0.989	0.978
					70/80	61	380	0.984	0.968
			Mechanical Properties		80/90	61	370	0.975	0.950
			HK ($10^7 Pa$)	718	90/100	62	360	0.957	0.918
			F_A	58	100/110	63	350	0.934	0.873
			E (GPa)	121.8	110/120	63	340	0.897	0.805
			G (GPa)	46.4	120/130	64	330	0.846	0.715
			μ	0.313	130/140	65	320	0.779	0.607
			σ_b (MPa)	102	140/150	66	310	0.672	0.450
			B ($10^{-12}/Pa$)	1.36	150/160	67	300	0.606	0.367

Constants of Dispersion Formula	
A_0	3.01906956E+00
A_1	-1.58184620E-02
A_2	2.09047144E-02
A_3	8.46561491E-04
A_4	-6.18209745E-05
A_5	3.65072914E-06

Density		Solarization	
ρ (g/cm ³)	4.24	$\Delta\lambda$ (%)	-3.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.3	3.5	3.7	3.7	3.7	4.0	4.2	4.6	4.7	4.9
-40 ~ -20	3.4	3.5	3.7	3.7	3.8	4.0	4.2	4.6	4.7	5.0
-20 ~ 0	3.4	3.6	3.8	3.8	3.8	4.1	4.3	4.7	4.8	5.0
0 ~ 20	3.4	3.6	3.9	3.9	3.9	4.2	4.3	4.7	4.8	5.1
20 ~ 40	3.5	3.7	3.9	3.9	3.9	4.2	4.4	4.8	4.9	5.1
40 ~ 60	3.5	3.8	4.0	4.0	4.0	4.2	4.5	5.0	5.0	5.3
60 ~ 80	3.5	3.9	4.1	4.1	4.1	4.3	4.5	5.0	5.0	5.5
80 ~ 100	3.6	3.9	4.2	4.2	4.2	4.4	4.5	5.1	5.1	5.6
100 ~ 120	3.7	4.1	4.3	4.3	4.3	4.5	4.6	5.2	5.2	5.7
120 ~ 140	3.7	4.2	4.3	4.3	4.4	4.6	4.7	5.4	5.4	5.8
140 ~ 160	3.9	4.3	4.3	4.4	4.6	4.6	4.9	5.5	5.5	5.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	340/276

Constants of dn/dt		
D_0	D_1	D_2
2.70E-06	1.23E-08	-2.14E-11
E_0	E_1	λ_{TK}
4.31E-07	2.47E-10	2.29E-01

H-LaK53B	755523	$n_d = 1.75500$	$v_d = 52.32$	$n_F - n_C = 0.014430$
		$n_e = 1.75844$	$v_e = 52.09$	$n_F - n_C' = 0.014561$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3028	RC (S)	1	2400	0.799	0.638
n_{1970}	1970.09		$P_{e,d}$	0.2384	RA (S)	1	2200	0.928	0.862
n_{1530}	1529.58		$P_{g,F}$	0.5475	D_W	1	2000	0.975	0.950
n_{1129}	1128.64	1.73669	$P'_{d,c'}$	0.2527	D_A	3	1800	0.990	0.981
n_{1064}	1064.00	1.73793	$P'_{e,d}$	0.2362	$R_{OH}(S)$	1	1600	0.996	0.993
n_t	1013.98	1.73896	$P'_{g,F'}$	0.4862	RP (S)	2	1400	0.996	0.992
n_s	852.11	1.74293			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.74567	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.74815					1000	0.999	0.998
n_C	656.27	1.75063					950	0.999	0.998
$n_{C'}$	643.85	1.75132					900	0.999	0.998
n_{He-Ne}	632.80	1.75199					850	0.999	0.998
n_D	589.29	1.75487	ΔP_{Fe}	-0.0026	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.75500	$\Delta P_{g,F}$	-0.0092	-50/-40	51	750	0.999	0.998
n_e	546.07	1.75844	$\Delta P_{C,t}$	0.0151	-40/-30	53	700	0.999	0.998
n_F	486.13	1.76506	$\Delta P_{C,s}$	0.0076	-30/-20	54	650	0.999	0.998
$n_{F'}$	479.99	1.76588	Thermal Properties		-20/-10	55	600	0.999	0.998
n_g	435.84	1.77296	Tg ($^{\circ}C$)	683	-10/0	55	550	0.999	0.998
n_h	404.66	1.77955	Ts ($^{\circ}C$)	712	0/10	57	500	0.998	0.996
n_i	365.01	1.79083	$T_{10}^{14.5} (^{\circ}C)$	622	10/20	57	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	643	20/30	58	460	0.996	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	57	30/40	59	440	0.994	0.989
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	73	40/50	59	420	0.993	0.986
			λ (W/(m K))	0.90	50/60	60	400	0.991	0.982
					60/70	60	390	0.988	0.977
					70/80	60	380	0.985	0.970
			Mechanical Properties		80/90	60	370	0.977	0.955
			HK ($10^7 Pa$)	635	90/100	60	360	0.967	0.935
			F_A	65	100/110	62	350	0.949	0.901
			E (GPa)	122.2	110/120	62	340	0.920	0.847
			G (GPa)	46.9	120/130	64	330	0.882	0.778
			μ	0.303	130/140	65	320	0.831	0.690
			σ_b (MPa)	91	140/150	65	310	0.764	0.584
			B ($10^{-12}/Pa$)	1.30	150/160	67	300	0.690	0.476

Constants of Dispersion Formula	
A_0	3.01608135E+00
A_1	-1.42847622E-02
A_2	2.30284242E-02
A_3	1.69148291E-04
A_4	3.56310545E-05
A_5	-1.43259924E-06

Density		Solarization	
ρ (g/cm ³)	4.18	$\Delta\lambda$ (%)	-3.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.1	2.4	2.7	2.8	3.0	3.1	3.2	3.4	3.6	3.9
-40 ~ -20	2.1	2.5	2.8	2.9	3.0	3.1	3.3	3.6	3.7	4.0
-20 ~ 0	2.2	2.7	2.9	3.0	3.1	3.2	3.5	3.7	3.7	4.2
0 ~ 20	2.2	2.9	3.0	3.0	3.2	3.4	3.6	3.8	3.9	4.3
20 ~ 40	2.2	3.0	3.1	3.2	3.3	3.5	3.8	4.0	4.1	4.4
40 ~ 60	2.3	3.2	3.3	3.4	3.5	3.6	3.8	4.1	4.3	4.5
60 ~ 80	2.5	3.2	3.4	3.5	3.7	3.9	4.0	4.2	4.4	4.6
80 ~ 100	2.6	3.3	3.6	3.6	3.7	4.1	4.2	4.3	4.6	4.7
100 ~ 120	2.7	3.5	3.7	3.8	4.0	4.3	4.3	4.4	4.7	4.9
120 ~ 140	2.8	3.7	3.8	3.9	4.0	4.3	4.5	4.7	4.8	5.1
140 ~ 160	2.8	3.7	3.8	3.9	4.1	4.4	4.6	4.8	4.9	5.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/270
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	333/272

Constants of dn/dt		
D_0	D_1	D_2
9.52E-07	1.46E-08	-2.48E-11
E_0	E_1	λ_{TK}
6.68E-07	3.49E-10	2.49E-09

H-LaK54	734511	$n_d = 1.73400$	$v_d = 51.05$	$n_F - n_C = 0.014377$
		$n_e = 1.73742$	$v_e = 50.82$	$n_F - n_C' = 0.014511$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.69388	$P_{d,C}$	0.3026	RC (S)	1	2400	0.786	0.618
n_{1970}	1970.09	1.70113	$P_{e,d}$	0.2379	RA (S)	2	2200	0.922	0.850
n_{1530}	1529.58	1.70899	$P_{g,F}$	0.5467	D_W	1	2000	0.987	0.974
n_{1129}	1128.64	1.71588	$P'_{d,c'}$	0.2522	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.71711	$P'_{e,d}$	0.2357	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.71813	$P'_{g,F'}$	0.4851	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.72204			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.72471	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.72718					1000	0.999	0.998
n_C	656.27	1.72965					950	0.999	0.998
$n_{C'}$	643.85	1.73034					900	0.999	0.998
n_{He-Ne}	632.80	1.73099					850	0.999	0.998
n_D	589.29	1.73387	ΔP_{Fe}	-0.0023	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.73400	$\Delta P_{g,F}$	-0.0121	-50/-40	44	750	0.999	0.998
n_e	546.07	1.73742	$\Delta P_{C,t}$	0.0138	-40/-30	47	700	0.999	0.998
n_F	486.13	1.74403	$\Delta P_{C,s}$	0.0064	-30/-20	48	650	0.999	0.998
$n_{F'}$	479.99	1.74485	Thermal Properties		-20/-10	49	600	0.999	0.998
n_g	435.84	1.75189	Tg ($^{\circ}C$)	636	-10/0	50	550	0.999	0.998
n_h	404.66	1.75842	Ts ($^{\circ}C$)	665	0/10	51	500	0.999	0.998
n_i	365.01	1.76975	$T_{10}^{14.5} (^{\circ}C)$	575	10/20	51	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	618	20/30	52	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	51	30/40	52	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	67	40/50	53	420	0.995	0.989
			λ (W/(m K))	0.96	50/60	53	400	0.992	0.984
					60/70	54	390	0.989	0.977
					70/80	54	380	0.983	0.966
			Mechanical Properties		80/90	55	370	0.973	0.947
			HK ($10^7 Pa$)	698	90/100	55	360	0.954	0.912
			F_A	80	100/110	56	350	0.926	0.859
			E (GPa)	112.3	110/120	57	340	0.885	0.782
			G (GPa)	43.5	120/130	58	330	0.823	0.677
			μ	0.291	130/140	59	320	0.735	0.540
			σ_b (MPa)	85	140/150	60	310	0.595	0.352
			B ($10^{-12}/Pa$)	1.81	150/160	61	300	0.385	0.148

Constants of Dispersion Formula	
A_0	2.94765208E+00
A_1	-1.51684002E-02
A_2	1.92673146E-02
A_3	1.38888212E-03
A_4	-1.55407755E-04
A_5	9.21281201E-06

Density		Solarization	
ρ (g/cm ³)	4.07	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	6.0	6.4	6.6	6.6	6.7	6.9	7.0	7.5	7.6	7.8
-40 ~ -20	6.1	6.4	6.6	6.6	6.7	6.9	7.0	7.5	7.6	8.0
-20 ~ 0	6.1	6.5	6.7	6.7	6.8	7.0	7.1	7.6	7.7	8.2
0 ~ 20	6.1	6.5	6.7	6.7	6.8	7.0	7.2	7.7	7.7	8.2
20 ~ 40	6.2	6.6	6.8	6.8	6.9	7.2	7.2	7.8	7.8	8.2
40 ~ 60	6.2	6.7	6.9	7.0	7.0	7.2	7.5	8.0	8.0	8.6
60 ~ 80	6.5	6.9	7.0	7.1	7.1	7.4	7.5	8.1	8.1	8.6
80 ~ 100	6.5	7.0	7.2	7.3	7.3	7.6	7.6	8.3	8.4	8.9
100 ~ 120	6.7	7.2	7.4	7.5	7.5	7.6	7.6	8.5	8.6	9.2
120 ~ 140	6.9	7.3	7.5	7.6	7.6	8.1	8.1	8.6	8.7	9.4
140 ~ 160	7.0	7.4	7.7	7.7	7.8	8.1	8.1	8.8	8.9	9.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	343/291

Constants of dn/dt		
D_0	D_1	D_2
7.73E-06	1.34E-08	-1.40E-11
E_0	E_1	λ_{TK}
4.76E-07	3.95E-10	2.32E-01

H-LaK61	741527	$n_d = 1.74100$	$v_d = 52.70$	$n_F - n_C = 0.014060$
		$n_e = 1.74435$	$v_e = 52.41$	$n_F - n_C' = 0.014203$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70124	$P_{d,C}$	0.3037	RC (S)	1	2400	0.783	0.613
n_{1970}	1970.09	1.70844	$P_{e,d}$	0.2383	RA (S)	2	2200	0.930	0.865
n_{1530}	1529.58	1.71627	$P_{g,F}$	0.5484	D_W	1	2000	0.986	0.972
n_{1129}	1128.64	1.72315	$P'_{d,c'}$	0.2528	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.72438	$P'_{e,d}$	0.2359	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.72540	$P'_{g,F'}$	0.4851	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.72928			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.73191	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.73432					1000	0.999	0.998
n_C	656.27	1.73673					950	0.999	0.998
$n_{C'}$	643.85	1.73741					900	0.999	0.998
n_{He-Ne}	632.80	1.73805					850	0.999	0.998
n_D	589.29	1.74087	ΔP_{Fe}	-0.0031	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.74100	$\Delta P_{g,F}$	-0.0077	-50/-40	49	750	0.999	0.998
n_e	546.07	1.74435	$\Delta P_{C,t}$	0.0103	-40/-30	51	700	0.999	0.998
n_F	486.13	1.75079	$\Delta P_{C,s}$	0.0030	-30/-20	52	650	0.999	0.998
$n_{F'}$	479.99	1.75161	Thermal Properties		-20/-10	53	600	0.999	0.998
n_g	435.84	1.75850			-10/0	54	550	0.999	0.998
n_h	404.66	1.76491	Tg ($^{\circ}C$)	668	0/10	55	500	0.999	0.998
n_i	365.01	1.77586	Ts ($^{\circ}C$)	693	10/20	56	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	601	20/30	57	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	635	30/40	57	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	56	40/50	58	420	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	71	50/60	58	400	0.997	0.993
			λ (W/(m K))	0.96	60/70	59	390	0.995	0.988
					70/80	59	380	0.990	0.979
			Mechanical Properties		80/90	60	370	0.983	0.964
					90/100	61	360	0.969	0.935
			HK ($10^7 Pa$)	706	100/110	61	350	0.948	0.893
			F_A	67	110/120	62	340	0.914	0.831
			E (GPa)	119.9	120/130	63	330	0.866	0.746
			G (GPa)	45.2	130/140	64	320	0.804	0.641
			μ	0.327	140/150	65	310	0.728	0.526
			σ_b (MPa)	81	150/160	66	300	0.644	0.411
			B ($10^{-12}/Pa$)	1.49			290	0.551	0.300
							280	0.444	0.193

Constants of Dispersion Formula	
A_0	2.97212067E+00
A_1	-1.51048406E-02
A_2	2.02885560E-02
A_3	7.34194347E-04
A_4	-3.75051084E-05
A_5	1.82377017E-06

Density		Solarization	
ρ (g/cm ³)	4.10	$\Delta\lambda$ (%)	-4.1

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.6	4.7	4.9	4.9	4.9	5.1	5.3	5.6	5.7	6.2
-40 ~ -20	4.6	4.7	4.8	4.9	5.0	5.2	5.2	5.7	5.8	6.2
-20 ~ 0	4.4	4.7	5.0	5.0	5.0	5.2	5.2	5.7	5.7	6.3
0 ~ 20	4.4	4.7	5.0	5.0	5.0	5.2	5.2	5.8	5.8	6.3
20 ~ 40	4.5	4.7	5.0	5.0	5.0	5.2	5.2	6.0	6.0	6.4
40 ~ 60	4.5	4.8	5.1	5.1	5.2	5.3	5.3	6.2	6.3	6.5
60 ~ 80	4.7	5.0	5.3	5.3	5.4	5.5	5.5	6.3	6.3	6.8
80 ~ 100	4.8	5.1	5.5	5.5	5.5	5.7	5.9	6.4	6.5	7.0
100 ~ 120	4.8	5.2	5.5	5.6	5.6	5.7	6.0	6.5	6.6	7.1
120 ~ 140	5.0	5.3	5.7	5.7	5.8	5.9	6.2	6.6	6.7	7.3
140 ~ 160	5.0	5.4	5.8	5.8	5.9	6.0	6.3	6.7	6.8	7.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	336/265

Constants of dn/dt		
D_0	D_1	D_2
4.66E-06	1.23E-08	-1.52E-11
E_0	E_1	λ_{TK}
4.36E-07	4.14E-10	2.38E-01

H-LaK68	678507	$n_d = 1.67790$	$v_d = 50.72$	$n_F - n_C = 0.013365$
		$n_e = 1.68108$	$v_e = 50.44$	$n_F - n_C' = 0.013502$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.64478	$P_{d,C}$	0.3008	RC (S)	1	2400	0.910	0.828
n_{1970}	1970.09	1.65017	$P_{e,d}$	0.2379	RA (S)	3	2200	0.968	0.937
n_{1530}	1529.58	1.65615	$P_{g,F}$	0.5559	D_W	1	2000	0.994	0.989
n_{1129}	1128.64	1.66167	$P'_{d,c'}$	0.2503	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.66271	$P'_{e,d}$	0.2355	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.66357	$P'_{g,F'}$	0.4925	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.66699			CR	3	1200	0.999	0.998
$n_{A'}$	768.19	1.66940	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.67162					1000	0.999	0.998
n_C	656.27	1.67388					950	0.999	0.998
$n_{C'}$	643.85	1.67452					900	0.999	0.998
n_{He-Ne}	632.80	1.67511					850	0.999	0.998
n_D	589.29	1.67778	ΔP_{Fe}	-0.0013	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.67790	$\Delta P_{g,F}$	-0.0034	-50/-40	67	750	0.999	0.998
n_e	546.07	1.68108	$\Delta P_{C,t}$	-0.0145	-40/-30	69	700	0.999	0.998
n_F	486.13	1.68724	$\Delta P_{C,s}$	-0.0066	-30/-20	71	650	0.999	0.998
$n_{F'}$	479.99	1.68802	Thermal Properties		-20/-10	72	600	0.998	0.996
n_g	435.84	1.69467			-10/0	72	550	0.997	0.993
n_h	404.66	1.70090	Tg ($^{\circ}C$)	657	0/10	73	500	0.996	0.990
n_i	365.01	1.71174	Ts ($^{\circ}C$)	698	10/20	74	480	0.995	0.987
			$T_{10}^{14.5} (^{\circ}C)$	594	20/30	74	460	0.993	0.984
			$T_{10}^{13} (^{\circ}C)$	628	30/40	75	440	0.991	0.981
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	40/50	75	420	0.989	0.976
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	89	50/60	75	400	0.986	0.966
			λ (W/(m K))	0.80	60/70	75	390	0.977	0.954
					70/80	76	380	0.967	0.931
			Mechanical Properties		80/90	77	370	0.944	0.884
					90/100	78	360	0.886	0.781
			HK ($10^7 Pa$)	528	100/110	78	350	0.756	0.566
			F_A	175	110/120	79	340	0.474	0.220
			E (GPa)	90.6	120/130	80	330	0.115	0.016
			G (GPa)	35.2	130/140	82	320		
			μ	0.287	140/150	82	310		
			σ_b (MPa)	74	150/160	83	300		
			B ($10^{-12}/Pa$)	1.67			290		
							280		

Constants of Dispersion Formula	
A_0	2.75995716E+00
A_1	-1.07353820E-02
A_2	1.82532687E-02
A_3	9.37020441E-04
A_4	-8.40203685E-05
A_5	5.44074316E-06

Density		Solarization	
ρ (g/cm ³)	3.86	$\Delta\lambda$ (%)	-0.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	1.8	2.0	2.0	2.1	2.2	2.4	2.7	2.7	3.4
-40 ~ -20	1.5	1.8	2.0	2.0	2.1	2.2	2.4	2.8	2.8	3.4
-20 ~ 0	1.5	1.8	1.9	2.0	2.0	2.2	2.5	2.8	2.9	3.4
0 ~ 20	1.6	1.9	2.0	2.0	2.1	2.2	2.5	2.8	2.9	3.5
20 ~ 40	1.6	1.8	2.0	2.0	2.1	2.3	2.6	2.9	2.9	3.5
40 ~ 60	1.7	1.9	2.0	2.0	2.2	2.3	2.7	3.0	3.1	3.6
60 ~ 80	1.7	2.0	2.1	2.1	2.3	2.5	2.8	3.1	3.2	3.8
80 ~ 100	1.8	2.1	2.2	2.2	2.3	2.6	2.9	3.2	3.3	3.9
100 ~ 120	1.9	2.2	2.3	2.3	2.4	2.7	3.0	3.3	3.4	4.0
120 ~ 140	2.0	2.2	2.3	2.4	2.5	2.8	3.2	3.4	3.5	4.1
140 ~ 160	2.0	2.2	2.4	2.5	2.6	2.9	3.4	3.6	3.7	4.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	375/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	361/333

Constants of dn/dt		
D_0	D_1	D_2
-3.65E-07	1.21E-08	-1.66E-11
E_0	E_1	λ_{TK}
4.42E-07	2.98E-10	2.70E-01

H-LaK77	775503	$n_d = 1.77536$	$v_d = 50.32$	$n_F - n_C = 0.015410$
		$n_e = 1.77902$	$v_e = 50.10$	$n_F - n_C' = 0.015550$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3030	RC (S)	1	2400	0.815	0.664
n_{1970}	1970.09		$P_{e,d}$	0.2375	RA (S)	1	2200	0.948	0.899
n_{1530}	1529.58	1.74890	$P_{g,F}$	0.5509	D_W	1	2000	0.984	0.968
n_{1129}	1128.64	1.75598	$P'_{d,c'}$	0.2521	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.75728	$P'_{e,d}$	0.2354	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.75836	$P'_{g,F'}$	0.4887	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.76253			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.76541	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.76805					1000	0.999	0.998
n_C	656.27	1.77069					950	0.999	0.998
$n_{C'}$	643.85	1.77144					900	0.999	0.998
n_{He-Ne}	632.80	1.77213					850	0.999	0.998
n_D	589.29	1.77522	ΔP_{Fe}	-0.0030	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.77536	$\Delta P_{g,F}$	-0.0091	-50/-40	52	750	0.999	0.998
n_e	546.07	1.77902	$\Delta P_{C,t}$	0.0162	-40/-30	54	700	0.999	0.998
n_F	486.13	1.78610	$\Delta P_{C,s}$	0.0084	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.78699	Thermal Properties		-20/-10	57	600	0.999	0.998
n_g	435.84	1.79459	Tg ($^{\circ}C$)	699	-10/0	58	550	0.999	0.998
n_h	404.66	1.80168	Ts ($^{\circ}C$)	714	0/10	58	500	0.999	0.998
n_i	365.01	1.81387	$T_{10}^{14.5} (^{\circ}C)$	625	10/20	59	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	670	20/30	59	460	0.996	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	62	30/40	60	440	0.996	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	76	40/50	60	420	0.996	0.992
			λ (W/(m K))	1.02	50/60	61	400	0.991	0.982
					60/70	61	390	0.986	0.972
					70/80	62	380	0.979	0.958
			Mechanical Properties		80/90	63	370	0.971	0.943
			HK (10^7Pa)	728	90/100	64	360	0.950	0.903
			F_A	115	100/110	65	350	0.913	0.834
			E (GPa)	108.0	110/120	66	340	0.870	0.757
			G (GPa)	41.6	120/130	67	330	0.813	0.661
			μ	0.297	130/140	68	320	0.736	0.542
			σ_b (MPa)	85	140/150	69	310	0.633	0.401
			B ($10^{-12}/\text{Pa}$)	1.20	150/160	70	300	0.550	0.303

Constants of Dispersion Formula	
A_0	3.08315587E+00
A_1	-1.49460142E-02
A_2	2.43300964E-02
A_3	3.65640749E-04
A_4	1.42131183E-05
A_5	-8.23160850E-08

Density		Solarization	
ρ (g/cm ³)	4.35	$\Delta\lambda$ (%)	-2.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.9	3.2	3.2	3.3	3.4	3.6	3.8	4.0	4.1	4.4
-40 ~ -20	3.0	3.2	3.4	3.5	3.6	3.7	3.7	4.0	4.1	4.6
-20 ~ 0	2.9	3.2	3.5	3.6	3.7	3.9	3.9	4.1	4.2	4.6
0 ~ 20	2.9	3.2	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.8
20 ~ 40	2.9	3.3	3.6	3.7	3.8	3.9	4.2	4.2	4.2	4.9
40 ~ 60	2.9	3.4	3.8	3.8	3.9	4.0	4.2	4.3	4.3	5.0
60 ~ 80	3.1	3.6	3.8	3.8	3.9	4.0	4.2	4.4	4.4	5.1
80 ~ 100	3.1	3.7	3.9	3.9	4.0	4.1	4.3	4.5	4.5	5.3
100 ~ 120	3.1	3.7	3.9	3.9	4.0	4.1	4.4	4.6	4.6	5.4
120 ~ 140	3.2	3.7	3.9	4.0	4.0	4.2	4.5	4.6	4.7	5.5
140 ~ 160	3.2	3.8	4.0	4.0	4.1	4.2	4.7	4.8	4.9	5.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	365/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	333/276

Constants of dn/dt		
D_0	D_1	D_2
1.90E-06	1.15E-08	-2.57E-11
E_0	E_1	λ_{TK}
5.50E-07	5.84E-10	6.74E-02

H-KF6	517522	$n_d = 1.51742$	$v_d = 52.15$	$n_F - n_C = 0.009922$
		$n_e = 1.51977$	$v_e = 51.85$	$n_F - n_C' = 0.010024$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.49023	$P_{d,C}$	0.3003	RC (S)	1	2400	0.929	0.861
n_{1970}	1970.09	1.49507	$P_{e,d}$	0.2368	RA (S)	1	2200	0.956	0.910
n_{1530}	1529.58	1.50035	$P_{g,F}$	0.5624	D_W	1	2000	0.994	0.987
n_{1129}	1128.64	1.50503	$P'_{d,c'}$	0.2504	D_A	2	1800	0.997	0.994
n_{1064}	1064.00	1.50588	$P'_{e,d}$	0.2344	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.50657	$P'_{g,F'}$	0.4998	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.50925			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.51108	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.51276					1000	0.999	0.998
n_C	656.27	1.51444					950	0.999	0.998
$n_{C'}$	643.85	1.51491					900	0.999	0.998
n_{He-Ne}	632.80	1.51535					850	0.999	0.998
n_D	589.29	1.51733	ΔP_{Fe}	0.0012	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.51742	$\Delta P_{g,F}$	0.0054	-50/-40	82	750	0.999	0.998
n_e	546.07	1.51977	$\Delta P_{C,t}$	0.0004	-40/-30	86	700	0.999	0.998
n_F	486.13	1.52436	$\Delta P_{C,s}$	-0.0025	-30/-20	88	650	0.999	0.998
$n_{F'}$	479.99	1.52493	Thermal Properties		-20/-10	89	600	0.999	0.998
n_g	435.84	1.52994			-10/0	90	550	0.999	0.998
n_h	404.66	1.53468	Tg ($^{\circ}C$)	461	0/10	91	500	0.999	0.998
n_i	365.01	1.54305	Ts ($^{\circ}C$)	536	10/20	92	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	407	20/30	92	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	430	30/40	93	440	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	91	40/50	93	420	0.997	0.993
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	102	50/60	94	400	0.995	0.991
			λ (W/(m K))	1.04	60/70	94	390	0.993	0.989
					70/80	95	380	0.987	0.979
			Mechanical Properties		80/90	96	370	0.976	0.957
					90/100	96	360	0.936	0.879
			HK (10^7Pa)	432	100/110	97	350	0.783	0.618
			F_A	107	110/120	98	340	0.390	0.154
			E (GPa)	56.3	120/130	99	330		
			G (GPa)	22.8	130/140	100	320		
			μ	0.233	140/150	101	310		
			σ_b (MPa)	48	150/160	102	300		
			B ($10^{-12}/Pa$)	3.12			290		
							280		

Constants of Dispersion Formula	
A_0	2.26634630E+00
A_1	-8.85481035E-03
A_2	1.25163602E-02
A_3	3.69483817E-04
A_4	-8.19964870E-06
A_5	1.43231024E-06

Density		Solarization	
ρ (g/cm ³)	2.52	$\triangle \lambda$ (%)	-4.1

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.2	-1.0	-0.9	-0.8	-0.8	-0.8	-0.6	-0.3	-0.2	0.2
-40 ~ -20	-1.1	-1.0	-0.9	-0.8	-0.7	-0.6	-0.5	-0.2	-0.1	0.3
-20 ~ 0	-1.1	-1.0	-0.9	-0.8	-0.7	-0.6	-0.4	-0.1	-0.1	0.3
0 ~ 20	-1.0	-0.9	-0.8	-0.7	-0.7	-0.5	-0.2	0.0	0.0	0.4
20 ~ 40	-0.9	-0.8	-0.7	-0.5	-0.5	-0.4	-0.2	0.1	0.1	0.6
40 ~ 60	-0.8	-0.7	-0.5	-0.4	-0.4	-0.2	0.0	0.2	0.3	0.7
60 ~ 80	-0.6	-0.5	-0.4	-0.2	-0.2	-0.2	0.1	0.3	0.4	0.9
80 ~ 100	-0.5	-0.4	-0.3	-0.2	-0.2	-0.1	0.3	0.5	0.6	1.1
100 ~ 120	-0.4	-0.3	-0.2	-0.1	-0.1	-0.1	0.5	0.7	0.7	1.2
120 ~ 140	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.5	0.8	0.8	1.3
140 ~ 160	-0.1	0.0	0.1	0.2	0.2	0.2	0.7	0.9	0.9	1.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	356/336

Constants of dn/dt		
D_0	D_1	D_2
-5.94E-06	1.78E-08	-2.50E-11
E_0	E_1	λ_{TK}
4.20E-07	1.79E-10	2.83E-01

H-QF14	596392	$n_d = 1.59551$	$v_d = 39.22$	$n_F - n_C = 0.015183$
		$n_e = 1.59911$	$v_e = 38.95$	$n_F - n_C' = 0.015383$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.56078	$P_{d,C}$	0.2951	RC (S)	1	2400	0.958	0.916
n_{1970}	1970.09	1.56608	$P_{e,d}$	0.2371	RA (S)	1	2200	0.964	0.927
n_{1530}	1529.58	1.57206	$P_{g,F}$	0.5849	D_W	1	2000	0.990	0.977
n_{1129}	1128.64	1.57777	$P'_{d,c'}$	0.2457	D_A	1	1800	0.994	0.987
n_{1064}	1064.00	1.57886	$P'_{e,d}$	0.2340	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.57979	$P'_{g,F'}$	0.5181	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.58348			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.58609	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58854					1000	0.999	0.998
n_C	656.27	1.59103					950	0.999	0.998
$n_{C'}$	643.85	1.59173					900	0.999	0.998
n_{He-Ne}	632.80	1.59239					850	0.999	0.998
n_D	589.29	1.59538	ΔP_{Fe}	-0.0009	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.59551	$\Delta P_{g,F}$	0.0064	-50/-40	73	750	0.999	0.998
n_e	546.07	1.59911	$\Delta P_{C,t}$	0.0101	-40/-30	75	700	0.999	0.998
n_F	486.13	1.60621	$\Delta P_{C,s}$	0.0027	-30/-20	76	650	0.999	0.998
$n_{F'}$	479.99	1.60712	Thermal Properties		-20/-10	76	600	0.999	0.998
n_g	435.84	1.61509	$T_g (^{\circ}C)$	540	-10/0	77	550	0.999	0.998
n_h	404.66	1.62284	$T_s (^{\circ}C)$	594	0/10	78	500	0.999	0.998
n_i	365.01	1.63695	$T_{10}^{14.5} (^{\circ}C)$	483	10/20	79	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	515	20/30	79	460	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	80	30/40	80	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	40/50	81	420	0.993	0.986
			λ (W/(m K))	1.13	50/60	81	400	0.990	0.980
					60/70	82	390	0.981	0.961
					70/80	83	380	0.956	0.914
					80/90	84	370	0.882	0.776
					90/100	85	360	0.641	0.413
					100/110	86	350	0.185	0.038
					110/120	87	340		
					120/130	88	330		
					130/140	89	320		
					140/150	90	310		
					150/160	91	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	2.48576653E+00
A_1	-9.89034420E-03
A_2	2.02035248E-02
A_3	4.92709000E-04
A_4	1.83898751E-05
A_5	2.51608701E-06

Density		Solarization	
ρ (g/cm ³)	2.71	$\Delta\lambda$ (%)	-0.5

Mechanical Properties	
HK (10 ⁷ Pa)	534
F_A	168
E (GPa)	75.3
G (GPa)	30.9
μ	0.221
σ_b (MPa)	73
B (10 ⁻¹² /Pa)	3.08

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.2	2.5	2.7	2.7	2.8	2.9	3.1	3.7	3.8	4.4
-40 ~ -20	2.2	2.5	2.8	2.8	2.8	3.0	3.2	3.7	3.8	4.5
-20 ~ 0	2.3	2.5	2.8	2.8	2.8	3.0	3.2	3.8	3.9	4.6
0 ~ 20	2.3	2.6	2.8	2.8	2.8	3.1	3.4	3.9	4.0	4.8
20 ~ 40	2.3	2.6	2.8	2.8	2.9	3.1	3.4	4.1	4.1	4.9
40 ~ 60	2.3	2.6	2.9	2.9	3.0	3.2	3.5	4.2	4.2	5.1
60 ~ 80	2.3	2.7	2.9	2.9	3.0	3.3	3.6	4.3	4.3	5.2
80 ~ 100	2.4	2.7	2.9	3.0	3.0	3.3	3.7	4.3	4.4	5.3
100 ~ 120	2.4	2.8	2.9	3.0	3.1	3.3	3.8	4.3	4.4	5.4
120 ~ 140	2.5	2.8	2.9	3.0	3.1	3.4	3.9	4.4	4.5	5.5
140 ~ 160	2.5	2.8	2.9	3.0	3.1	3.5	4.1	4.6	4.7	5.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	369/350

Constants of dn/dt		
D_0	D_1	D_2
1.19E-06	1.20E-08	-2.83E-11
E_0	E_1	λ_{TK}
5.30E-07	5.94E-10	3.05E-01

H-QF50	581409	$n_d = 1.58144$	$v_d = 40.89$	$n_F - n_C = 0.014220$
		$n_e = 1.58481$	$v_e = 40.61$	$n_F - n_C' = 0.014400$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.54848	$P_{d,C}$	0.2961	RC (S)	1	2400	0.933	0.810
n_{1970}	1970.09	1.55364	$P_{e,d}$	0.2370	RA (S)	1	2200	0.946	0.859
n_{1530}	1529.58	1.55940	$P_{g,F}$	0.5738	D_W	1	2000	0.980	0.960
n_{1129}	1128.64	1.56481	$P'_{d,c'}$	0.2465	D_A	1	1800	0.990	0.980
n_{1064}	1064.00	1.56584	$P'_{e,d}$	0.2340	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.56671	$P'_{g,F'}$	0.5083	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.57015			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.57260	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.57490					1000	0.999	0.998
n_C	656.27	1.57723					950	0.999	0.998
$n_{C'}$	643.85	1.57789					900	0.999	0.998
n_{He-Ne}	632.80	1.57852					850	0.999	0.998
n_D	589.29	1.58131	ΔP_{Fe}	-0.0007	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.58144	$\Delta P_{g,F}$	-0.0018	-50/-40	73	750	0.999	0.998
n_e	546.07	1.58481	$\Delta P_{C,t}$	0.0016	-40/-30	76	700	0.999	0.998
n_F	486.13	1.59145	$\Delta P_{C,s}$	-0.0006	-30/-20	78	650	0.999	0.998
$n_{F'}$	479.99	1.59229	Thermal Properties		-20/-10	79	600	0.999	0.998
n_g	435.84	1.59961			-10/0	80	550	0.999	0.998
n_h	404.66	1.60669	Tg ($^{\circ}C$)	590	0/10	80	500	0.999	0.998
n_i	365.01	1.61951	Ts ($^{\circ}C$)	649	10/20	81	480	0.998	0.996
			$T_{10}^{14.5} (^{\circ}C)$	515	20/30	82	460	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	559	30/40	82	440	0.996	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	82	40/50	83	420	0.994	0.989
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	50/60	84	400	0.992	0.981
			λ (W/(m K))	0.98	60/70	84	390	0.986	0.966
					70/80	85	380	0.966	0.926
			Mechanical Properties		80/90	85	370	0.903	0.808
					90/100	86	360	0.701	0.488
			HK (10^7Pa)	499	100/110	87	350	0.268	0.075
			F_A	128	110/120	88	340		
			E (GPa)	70.3	120/130	90	330		
			G (GPa)	27.7	130/140	91	320		
			μ	0.269	140/150	92	310		
			σ_b (MPa)	62	150/160	93	300		
			B ($10^{-12}/Pa$)	3.07			290		
							280		

Constants of Dispersion Formula	
A_0	2.44672171E+00
A_1	-9.64692814E-03
A_2	1.72763622E-02
A_3	1.09967502E-03
A_4	-9.37435013E-05
A_5	8.00160916E-06

Density		Solarization	
ρ (g/cm ³)	2.64	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.4	1.8	2.0	2.1	2.1	2.5	2.6	2.9	3.0	3.6
-40 ~ -20	1.6	1.9	2.2	2.3	2.3	2.5	2.7	3.1	3.1	3.8
-20 ~ 0	1.5	2.0	2.3	2.4	2.5	2.6	2.8	3.4	3.5	4.2
0 ~ 20	1.6	2.3	2.5	2.6	2.6	2.8	3.1	3.5	3.6	4.4
20 ~ 40	1.9	2.6	2.7	2.7	2.7	3.0	3.3	3.7	3.7	4.6
40 ~ 60	2.0	2.6	2.8	2.8	2.8	3.2	3.5	3.9	3.9	4.8
60 ~ 80	2.3	2.7	3.0	3.0	3.0	3.3	3.8	4.2	4.2	5.0
80 ~ 100	2.3	2.8	3.1	3.1	3.2	3.5	3.9	4.3	4.4	5.3
100 ~ 120	2.3	2.9	3.1	3.2	3.3	3.6	4.1	4.4	4.5	5.4
120 ~ 140	2.5	3.1	3.3	3.3	3.4	3.7	4.2	4.5	4.6	5.6
140 ~ 160	2.7	3.2	3.5	3.5	3.6	3.9	4.3	4.7	4.8	5.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	370/350

Constants of dn/dt		
D_0	D_1	D_2
3.81E-07	1.80E-08	-3.28E-11
E_0	E_1	λ_{TK}
7.19E-07	6.44E-10	2.45E-01

H-F1	603380	$n_d = 1.60342$	$v_d = 38.01$	$n_F - n_C = 0.015875$
		$n_e = 1.60718$	$v_e = 37.74$	$n_F - n_C' = 0.016088$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.56760	$P_{d,C}$	0.2948	RC (S)	1	2400	0.938	0.867
n_{1970}	1970.09	1.57308	$P_{e,d}$	0.2369	RA (S)	1	2200	0.950	0.892
n_{1530}	1529.58	1.57923	$P_{g,F}$	0.5820	D_W	1	2000	0.987	0.961
n_{1129}	1128.64	1.58506	$P'_{d,C}$	0.2449	D_A	1	1800	0.996	0.982
n_{1064}	1064.00	1.58618	$P'_{e,d}$	0.2337	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.58713	$P'_{g,F}$	0.5153	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.59091			CR	3	1200	0.999	0.998
$n_{A'}$	768.19	1.59361	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.59615					1000	0.999	0.998
n_C	656.27	1.59874					950	0.999	0.998
$n_{C'}$	643.85	1.59948					900	0.999	0.998
n_{He-Ne}	632.80	1.60017					850	0.999	0.998
n_D	589.29	1.60328	ΔP_{Fe}	-0.0006	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.60342	$\Delta P_{g,F}$	0.0016	-50/-40	73	750	0.999	0.998
n_e	546.07	1.60718	$\Delta P_{C,t}$	0.0070	-40/-30	74	700	0.999	0.998
n_F	486.13	1.61462	$\Delta P_{C,s}$	0.0016	-30/-20	74	650	0.999	0.998
$n_{F'}$	479.99	1.61557	Thermal Properties		-20/-10	74	600	0.999	0.998
n_g	435.84	1.62386	Tg ($^{\circ}C$)	591	-10/0	76	550	0.999	0.998
n_h	404.66	1.63190	Ts ($^{\circ}C$)	638	0/10	78	500	0.999	0.998
n_i	365.01	1.64667	$T_{10}^{14.5} (^{\circ}C)$	517	10/20	78	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	565	20/30	80	460	0.997	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	79	30/40	81	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	40/50	82	420	0.991	0.981
			λ (W/(m K))	1.19	50/60	83	400	0.985	0.965
					60/70	83	390	0.975	0.944
					70/80	86	380	0.940	0.867
			Mechanical Properties		80/90	87	370	0.841	0.683
			HK (10^7Pa)	491	90/100	88	360	0.540	0.279
			F_A	141	100/110	89	350	0.112	0.018
			E (GPa)	76.6	110/120	90	340		
			G (GPa)	31.3	120/130	93	330		
			μ	0.223	130/140	93	320		
			σ_b (MPa)		140/150	95	310		
			B ($10^{-12}/Pa$)	2.74	150/160	97	300		

Constants of Dispersion Formula	
A_0	2.50960367E+00
A_1	-1.03328069E-02
A_2	1.94468683E-02
A_3	1.23207636E-03
A_4	-9.94382918E-05
A_5	9.44281258E-06

Density		Solarization	
ρ (g/cm ³)	2.63	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.8	2.1	2.3	2.4	2.4	2.6	2.8	3.4	3.4	4.3
-40 ~ -20	1.8	2.1	2.3	2.4	2.4	2.6	2.9	3.5	3.5	4.3
-20 ~ 0	1.7	2.2	2.3	2.4	2.4	2.7	2.9	3.5	3.5	4.5
0 ~ 20	1.7	2.2	2.4	2.4	2.5	2.7	2.9	3.6	3.7	4.5
20 ~ 40	1.8	2.2	2.4	2.4	2.6	2.7	2.9	3.6	3.7	4.5
40 ~ 60	1.8	2.2	2.6	2.6	2.7	2.8	3.1	3.7	3.9	4.7
60 ~ 80	1.8	2.3	2.6	2.6	2.7	2.8	3.1	3.8	3.9	4.9
80 ~ 100	1.9	2.4	2.7	2.7	2.8	3.0	3.1	3.9	4.0	5.1
100 ~ 120	1.9	2.4	2.7	2.7	2.8	3.1	3.3	4.1	4.2	5.2
120 ~ 140	2.0	2.5	2.8	2.8	2.8	3.2	3.4	4.2	4.3	5.3
140 ~ 160	2.0	2.5	2.8	2.9	2.9	3.4	3.6	4.4	4.5	5.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/355
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	375/354

Constants of dn/dt		
D_0	D_1	D_2
1.43E-07	1.19E-08	-2.03E-11
E_0	E_1	λ_{TK}
5.89E-07	5.54E-10	2.98E-01

H-F4	620364	$n_d = 1.62005$	$v_d = 36.35$	$n_F - n_C = 0.017060$
		$n_e = 1.62408$	$v_e = 36.09$	$n_F - n_{C'} = 0.017291$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance					
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm			
n ₂₃₂₅	2325.42	1.58141	P _{d,C}	0.2937	RC (S)	1	2400	0.934	0.872			
n ₁₉₇₀	1970.09	1.58736	P _{e,d}	0.2362	RA (S)	1	2200	0.945	0.893			
n ₁₅₃₀	1529.58	1.59402	P _{g,F}	0.5885	D _W	1	2000	0.994	0.989			
n ₁₁₂₉	1128.64	1.60033	P' _{d,c´}	0.2446	D _A	1	1800	0.999	0.998			
n ₁₀₆₄	1064.00	1.60154	P' _{e,d}	0.2331	R _{OH} (S)	1	1600	0.999	0.998			
n _t	1013.98	1.60256	P' _{g,F´}	0.5217	RP (S)	1	1400	0.999	0.998			
n _s	852.11	1.60664			CR		1200	0.999	0.998			
n _{A´}	768.19	1.60954	Deviation of Relative Partial Dispersions			Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998		
n _r	706.52	1.61226						1000	0.999	0.998		
n _C	656.27	1.61504						950	0.999	0.998		
n _{C´}	643.85	1.61582						900	0.999	0.998		
n _{He-Ne}	632.80	1.61656						850	0.999	0.998		
n _D	589.29	1.61990	ΔP _{F,e}	0.0000	°C	α	800	0.999	0.998			
n _d	587.56	1.62005	ΔP _{g,F}	0.0053	-50/-40	71	750	0.999	0.998			
n _e	546.07	1.62408	ΔP _{C,t}	0.0153	-40/-30	73	700	0.999	0.998			
n _F	486.13	1.63210	ΔP _{C,s}	0.0047	-30/-20	75	650	0.999	0.998			
n _{F´}	479.99	1.63312	Thermal Properties			-20/-10	76	600	0.999	0.998		
n _g	435.84	1.64214				Tg (°C)	590	-10/0	77	550	0.999	0.998
n _h	404.66	1.65099				Ts (°C)	635	0/10	77	500	0.999	0.998
n _i	365.01	1.66740				T ₁₀ ^{14.5} (°C)	524	10/20	78	480	0.999	0.998
						T ₁₀ ¹³ (°C)	563	20/30	79	460	0.999	0.998
			α _{-50/80°C} (10 ⁻⁷ /K)	73	30/40	79	440	0.997	0.994			
			α _{100/300°C} (10 ⁻⁷ /K)	90	40/50	79		0.995	0.990			

Constants of Dispersion Formula	
A_0	2.55786478E+00
A_1	-1.12844748E-02
A_2	2.15761024E-02
A_3	1.06818810E-03
A_4	-6.19068712E-05
A_5	8.79794163E-06

Density		Solarization	
ρ (g/cm ³)	2.66	$\Delta\lambda$ (%)	-1.2

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.5	2.9	3.1	3.1	3.2	3.4	3.7	4.3	4.4	4.9
-40 ~ -20	2.5	3.0	3.2	3.2	3.2	3.4	3.8	4.3	4.4	5.1
-20 ~ 0	2.6	3.0	3.3	3.3	3.4	3.5	3.8	4.5	4.5	5.3
0 ~ 20	2.6	3.1	3.4	3.4	3.4	3.6	3.9	4.6	4.6	5.5
20 ~ 40	2.6	3.1	3.4	3.4	3.4	3.6	4.0	4.8	4.8	5.6
40 ~ 60	2.7	3.2	3.5	3.5	3.5	3.7	4.0	4.9	4.9	5.8
60 ~ 80	2.9	3.4	3.7	3.7	3.7	3.9	4.3	5.1	5.1	6.0
80 ~ 100	3.0	3.5	3.8	3.8	3.8	4.0	4.4	5.3	5.3	6.2
100 ~ 120	3.1	3.7	4.0	4.0	4.0	4.1	4.6	5.4	5.4	6.3
120 ~ 140	3.3	3.8	4.1	4.1	4.1	4.2	4.7	5.5	5.6	6.3
140 ~ 160	3.3	3.8	4.2	4.2	4.3	4.4	4.8	5.6	5.7	6.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	377/356

Constants of dn/dt		
D_0	D_1	D_2
1.85E-06	1.51E-08	-2.19E-11
E_0	E_1	λ_{TK}
6.75E-07	4.19E-10	2.71E-01

H-F13	626357	$n_d = 1.62588$	$v_d = 35.70$	$n_F - n_C = 0.017532$
		$n_e = 1.63003$	$v_e = 35.43$	$n_F - n_C' = 0.017780$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58752	$P_{d,C}$	0.2932	RC (S)	1	2400	0.945	0.893
n_{1970}	1970.09	1.59329	$P_{e,d}$	0.2367	RA (S)	1	2200	0.948	0.899
n_{1530}	1529.58	1.59977	$P_{g,F}$	0.5886	D_W	1	2000	0.982	0.964
n_{1129}	1128.64	1.60594	$P'_{d,C}$	0.2435	D_A	1	1800	0.984	0.968
n_{1064}	1064.00	1.60713	$P'_{e,d}$	0.2334	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.60814	$P'_{g,F}$	0.5214	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.61220			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.61513	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.61790					1000	0.998	0.996
n_C	656.27	1.62074					950	0.998	0.996
$n_{C'}$	643.85	1.62155					900	0.998	0.996
n_{He-Ne}	632.80	1.62231					850	0.998	0.996
n_D	589.29	1.62573	ΔP_{Fe}	0.0001	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.62588	$\Delta P_{g,F}$	0.0043	-50/-40	72	750	0.998	0.996
n_e	546.07	1.63003	$\Delta P_{C,t}$	0.0056	-40/-30	74	700	0.998	0.996
n_F	486.13	1.63828	$\Delta P_{C,s}$	0.0010	-30/-20	75	650	0.998	0.996
$n_{F'}$	479.99	1.63933	Thermal Properties		-20/-10	76	600	0.998	0.996
n_g	435.84	1.64860	Tg ($^{\circ}C$)	596	-10/0	76	550	0.998	0.996
n_h	404.66	1.65768	Ts ($^{\circ}C$)	639	0/10	77	500	0.996	0.993
n_i	365.01	1.67466	$T_{10}^{14.5} (^{\circ}C)$	522	10/20	77	480	0.994	0.989
			$T_{10}^{13} (^{\circ}C)$	566	20/30	77	460	0.992	0.984
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	75	30/40	78	440	0.989	0.978
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	93	40/50	78	420	0.982	0.967
			λ (W/(m K))	1.19	50/60	78	400	0.967	0.936
					60/70	78	390	0.941	0.890
					70/80	79	380	0.877	0.772
			Mechanical Properties		80/90	80	370	0.699	0.490
			HK ($10^7 Pa$)	546	90/100	81	360	0.308	0.098
			F_A	123	100/110	82	350		
			E (GPa)	80.4	110/120	83	340		
			G (GPa)	32.4	120/130	85	330		
			μ	0.240	130/140	86	320		
			σ_b (MPa)	71	140/150	87	310		
			B ($10^{-12}/Pa$)	3.04	150/160	88	300		

Constants of Dispersion Formula	
A_0	2.57590334E+00
A_1	-1.10109986E-02
A_2	2.05548046E-02
A_3	1.79594369E-03
A_4	-1.78465029E-04
A_5	1.57736814E-05

Density		Solarization	
ρ (g/cm ³)	2.72	$\Delta\lambda$ (%)	0.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.8	3.1	3.4	3.4	3.5	3.6	3.9	4.7	4.8	5.4
-40 ~ -20	2.8	3.1	3.4	3.4	3.5	3.7	4.0	4.7	4.8	5.5
-20 ~ 0	2.8	3.2	3.4	3.5	3.5	3.7	4.1	4.8	4.9	5.7
0 ~ 20	2.7	3.2	3.4	3.5	3.5	3.8	4.1	4.9	4.9	5.9
20 ~ 40	2.8	3.3	3.5	3.6	3.6	3.8	4.2	5.0	5.0	6.0
40 ~ 60	2.8	3.3	3.5	3.6	3.6	3.9	4.4	5.1	5.2	6.1
60 ~ 80	3.0	3.4	3.6	3.7	3.7	4.1	4.5	5.3	5.3	6.3
80 ~ 100	3.0	3.5	3.7	3.8	3.8	4.3	4.6	5.3	5.3	6.5
100 ~ 120	3.2	3.7	3.9	4.0	4.0	4.4	4.8	5.4	5.4	6.6
120 ~ 140	3.3	3.8	4.0	4.1	4.2	4.5	4.8	5.5	5.6	6.7
140 ~ 160	3.4	3.9	4.0	4.1	4.2	4.7	5.0	5.6	5.7	6.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	382/358

Constants of dn/dt		
D_0	D_1	D_2
2.09E-06	1.35E-08	-1.84E-11
E_0	E_1	λ_{TK}
6.50E-07	3.82E-10	2.92E-01

H-ZF1B	648338	$n_d = 1.64769$	$v_d = 33.84$	$n_F - n_C = 0.019140$
		$n_e = 1.65222$	$v_e = 33.58$	$n_F - n_{C'} = 0.019421$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2926	RC (S)	1	2400	0.930	0.865
n_{1970}	1970.09		$P_{e,d}$	0.2367	RA (S)	1	2200	0.944	0.891
n_{1530}	1529.58		$P_{g,F}$	0.5904	D_W	1	2000	0.976	0.953
n_{1129}	1128.64	1.62568	$P'_{d,c'}$	0.2425	D_A	1	1800	0.985	0.971
n_{1064}	1064.00	1.62715	$P'_{e,d}$	0.2333	$R_{OH}(S)$	1	1600	0.995	0.991
n_t	1013.98	1.62838	$P'_{g,F'}$	0.5221	RP (S)	1	1400	0.996	0.993
n_s	852.11	1.63289			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.63608	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.63905					1000	0.999	0.998
n_C	656.27	1.64209					950	0.999	0.998
$n_{C'}$	643.85	1.64298					900	0.999	0.998
n_{He-Ne}	632.80	1.64382					850	0.999	0.998
n_D	589.29	1.64754	ΔP_{Fe}	-0.0003	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.64769	$\Delta P_{g,F}$	0.0030	-50/-40	76	750	0.999	0.998
n_e	546.07	1.65222	$\Delta P_{C,t}$	0.0122	-40/-30	78	700	0.999	0.998
n_F	486.13	1.66124	$\Delta P_{C,s}$	-0.0009	-30/-20	79	650	0.999	0.998
$n_{F'}$	479.99	1.66240	Thermal Properties		-20/-10	80	600	0.999	0.998
n_g	435.84	1.67254	Tg ($^{\circ}C$)	580	-10/0	81	550	0.999	0.998
n_h	404.66	1.68252	Ts ($^{\circ}C$)	621	0/10	82	500	0.998	0.996
n_i	365.01	1.70116	$T_{10}^{14.5} (^{\circ}C)$	527	10/20	85	480	0.997	0.995
			$T_{10}^{13} (^{\circ}C)$	541	20/30	87	460	0.996	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	85	30/40	88	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	107	40/50	89	420	0.992	0.985
			λ (W/(m K))	1.11	50/60	91	400	0.980	0.961
					60/70	91	390	0.959	0.920
					70/80	92	380	0.898	0.807
			Mechanical Properties		80/90	94	370	0.726	0.527
			HK (10^7Pa)	538	90/100	94	360	0.367	0.135
			F_A	132	100/110	97	350		
			E (GPa)	82.0	110/120	98	340		
			G (GPa)	32.8	120/130	100	330		
			μ	0.252	130/140	102	320		
			σ_b (MPa)	81	140/150	102	310		
			B ($10^{-12}/Pa$)	2.79	150/160	104	300		

Constants of Dispersion Formula	
A_0	2.65337691E+00
A_1	-1.90021227E-02
A_2	1.44298518E-02
A_3	4.25529366E-03
A_4	-4.77918162E-04
A_5	3.06145958E-05

Density		Solarization	
ρ (g/cm ³)	2.77	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.2	0.4	0.8	1.0	1.1	1.5	1.7	2.0	2.2	2.8
-40 ~ -20	0.4	0.6	0.9	1.2	1.3	1.7	1.8	2.2	2.3	3.0
-20 ~ 0	0.5	0.7	1.1	1.3	1.5	1.9	2.1	2.3	2.4	3.4
0 ~ 20	0.6	0.9	1.3	1.4	1.6	2.1	2.3	2.5	2.5	3.6
20 ~ 40	0.8	1.1	1.5	1.5	1.7	2.2	2.5	2.5	2.6	3.9
40 ~ 60	0.9	1.2	1.6	1.6	1.8	2.4	2.7	2.7	2.9	4.1
60 ~ 80	0.9	1.4	1.7	1.8	2.0	2.5	2.8	2.9	3.1	4.3
80 ~ 100	0.9	1.5	1.8	1.9	2.1	2.6	3.0	3.0	3.2	4.5
100 ~ 120	0.9	1.6	1.8	1.9	2.2	2.7	3.0	3.1	3.3	4.7
120 ~ 140	1.0	1.6	2.0	2.1	2.3	2.8	3.1	3.2	3.4	5.1
140 ~ 160	1.0	1.7	2.1	2.2	2.4	3.0	3.2	3.3	3.5	5.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	379/356

Constants of dn/dt		
D_0	D_1	D_2
-2.51E-06	1.55E-08	-3.44E-11
E_0	E_1	λ_{TK}
9.45E-07	8.73E-10	1.94E-01

H-ZF2	673322	$n_d = 1.67270$	$v_d = 32.17$	$n_F - n_C = 0.020910$
		$n_e = 1.67764$	$v_e = 31.92$	$n_F - n_{C'} = 0.021227$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.63037	$P_{d,C}$	0.2912	RC (S)	1	2400	0.930	0.865
n_{1970}	1970.09	1.63613	$P_{e,d}$	0.2363	RA (S)	1	2200	0.952	0.906
n_{1530}	1529.58	1.64275	$P_{g,F}$	0.5988	D_W	1	2000	0.986	0.972
n_{1129}	1128.64	1.64942	$P'_{d,C'}$	0.2421	D_A	1	1800	0.996	0.992
n_{1064}	1064.00	1.65076	$P'_{e,d}$	0.2327	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.65190	$P'_{g,F'}$	0.5300	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.65659			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.66001	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.66327					1000	0.999	0.998
n_C	656.27	1.66661					950	0.999	0.998
$n_{C'}$	643.85	1.66756					900	0.999	0.998
n_{He-Ne}	632.80	1.66846					850	0.999	0.998
n_D	589.29	1.67252	ΔP_{Fe}	0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.67270	$\Delta P_{g,F}$	0.0086	-50/-40	76	750	0.999	0.998
n_e	546.07	1.67764	$\Delta P_{C,t}$	0.0075	-40/-30	79	700	0.999	0.998
n_F	486.13	1.68752	$\Delta P_{C,s}$	0.0016	-30/-20	80	650	0.999	0.998
$n_{F'}$	479.99	1.68879	Thermal Properties		-20/-10	82	600	0.999	0.998
n_g	435.84	1.70004	Tg ($^{\circ}C$)	592	-10/0	84	550	0.999	0.998
n_h	404.66	1.71115	Ts ($^{\circ}C$)	627	0/10	86	500	0.997	0.993
n_i	365.01	1.73203	$T_{10}^{14.5} (^{\circ}C)$	518	10/20	87	480	0.995	0.989
			$T_{10}^{13} (^{\circ}C)$	560	20/30	88	460	0.993	0.987
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	85	30/40	89	440	0.991	0.984
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	107	40/50	89	420	0.989	0.979
			λ (W/(m K))	1.20	50/60	90	400	0.986	0.970
					60/70	90	390	0.971	0.937
					70/80	91	380	0.943	0.883
			Mechanical Properties		80/90	92	370	0.868	0.747
			HK ($10^7 Pa$)	569	90/100	93	360	0.655	0.426
			F_A	140	100/110	94	350	0.225	0.052
			E (GPa)	82.1	110/120	95	340		
			G (GPa)	33.2	120/130	97	330		
			μ	0.237	130/140	98	320		
			σ_b (MPa)	89	140/150	99	310		
			B ($10^{-12}/Pa$)	2.53	150/160	100	300		

Constants of Dispersion Formula	
A_0	2.71254884E+00
A_1	-1.09981079E-02
A_2	2.69930833E-02
A_3	1.44291354E-03
A_4	-8.34857219E-05
A_5	1.26851609E-05

Density		Solarization	
ρ (g/cm ³)	2.90	$\Delta\lambda$ (%)	-0.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.7	1.0	1.4	1.4	1.5	1.7	2.0	2.9	3.0	3.7
-40 ~ -20	0.7	1.0	1.4	1.4	1.4	1.8	2.0	2.9	3.0	3.8
-20 ~ 0	0.7	1.1	1.4	1.5	1.5	1.8	2.1	3.0	3.1	4.0
0 ~ 20	0.7	1.1	1.5	1.5	1.6	1.8	2.2	3.1	3.2	4.2
20 ~ 40	0.7	1.1	1.5	1.5	1.6	1.8	2.3	3.3	3.3	4.5
40 ~ 60	0.7	1.3	1.6	1.6	1.7	2.1	2.5	3.5	3.6	4.5
60 ~ 80	0.9	1.4	1.7	1.8	1.8	2.3	2.5	3.7	3.8	4.8
80 ~ 100	0.9	1.5	1.8	1.9	2.0	2.4	2.7	4.0	4.0	4.9
100 ~ 120	1.0	1.6	2.0	2.1	2.1	2.6	2.8	4.1	4.1	5.1
120 ~ 140	1.2	1.8	2.2	2.3	2.3	2.8	3.1	4.2	4.3	5.2
140 ~ 160	1.2	1.8	2.3	2.4	2.4	2.9	3.3	4.3	4.4	5.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	395/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	382/360

Constants of dn/dt		
D_0	D_1	D_2
-2.44E-06	1.28E-08	-1.52E-11
E_0	E_1	λ_{TK}
8.60E-07	6.85E-10	2.66E-01

H-ZF3	717295	$n_d = 1.71736$	$v_d = 29.50$	$n_F - n_C = 0.024318$
		$n_e = 1.72310$	$v_e = 29.27$	$n_F - n_{C'} = 0.024707$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.67093	$P_{d,C}$	0.2895	RC (S)	1	2400	0.934	0.872
n_{1970}	1970.09	1.67676	$P_{e,d}$	0.2360	RA (S)	1	2200	0.963	0.927
n_{1530}	1529.58	1.68361	$P_{g,F}$	0.6041	D_W	1	2000	0.993	0.986
n_{1129}	1128.64	1.69079	$P'_{d,C'}$	0.2404	D_A	1	1800	0.998	0.996
n_{1064}	1064.00	1.69228	$P'_{e,d}$	0.2323	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.69355	$P'_{g,F'}$	0.5343	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.69884			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.70274	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.70647					1000	0.998	0.996
n_C	656.27	1.71032					950	0.998	0.996
$n_{C'}$	643.85	1.71142					900	0.998	0.996
n_{He-Ne}	632.80	1.71245					850	0.998	0.996
n_D	589.29	1.71715	ΔP_{Fe}	0.0006	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.71736	$\Delta P_{g,F}$	0.0095	-50/-40	75	750	0.998	0.996
n_e	546.07	1.72310	$\Delta P_{C,t}$	0.0066	-40/-30	78	700	0.998	0.996
n_F	486.13	1.73464	$\Delta P_{C,s}$	0.0009	-30/-20	80	650	0.998	0.996
$n_{F'}$	479.99	1.73613	Thermal Properties		-20/-10	82	600	0.998	0.996
n_g	435.84	1.74933	Tg ($^{\circ}C$)	601	-10/0	83	550	0.998	0.996
n_h	404.66	1.76249	Ts ($^{\circ}C$)	634	0/10	84	500	0.996	0.992
n_i	365.01	1.78745	$T_{10}^{14.5} (^{\circ}C)$	538	10/20	84	480	0.994	0.989
			$T_{10}^{13} (^{\circ}C)$	572	20/30	85	460	0.992	0.985
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	84	30/40	85	440	0.990	0.978
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	107	40/50	86	420	0.981	0.963
			λ (W/(m K))	1.14	50/60	87	400	0.954	0.910
					60/70	88	390	0.911	0.829
					70/80	89	380	0.801	0.641
			Mechanical Properties		80/90	90	370	0.534	0.286
			HK (10^7Pa)	578	90/100	91	360	0.161	0.026
			F_A	164	100/110	92	350		
			E (GPa)	88.0	110/120	93	340		
			G (GPa)	34.5	120/130	95	330		
			μ	0.276	130/140	96	320		
			σ_b (MPa)	74	140/150	97	310		
			B ($10^{-12}/\text{Pa}$)	2.66	150/160	98	300		

Constants of Dispersion Formula	
A_0	2.84670798E+00
A_1	-1.12350760E-02
A_2	3.23607570E-02
A_3	1.62442342E-03
A_4	-8.05719818E-05
A_5	1.55748376E-05

Density		Solarization	
ρ (g/cm ³)	3.06	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.4	1.0	1.5	1.5	1.5	1.8	2.1	2.9	3.0	4.1
-40 ~ -20	0.5	1.1	1.4	1.4	1.5	1.8	2.0	3.1	3.1	4.3
-20 ~ 0	0.6	1.2	1.4	1.5	1.5	1.9	2.2	3.2	3.3	4.5
0 ~ 20	0.6	1.2	1.4	1.5	1.5	1.9	2.2	3.3	3.4	4.7
20 ~ 40	0.6	1.3	1.5	1.6	1.6	1.9	2.4	3.5	3.6	5.0
40 ~ 60	0.6	1.4	1.6	1.7	1.7	2.0	2.6	3.8	3.8	5.2
60 ~ 80	0.8	1.4	1.7	1.7	1.8	2.3	2.6	4.0	4.0	5.5
80 ~ 100	0.9	1.6	1.8	1.9	1.9	2.3	2.8	4.1	4.1	5.6
100 ~ 120	0.9	1.7	2.0	2.1	2.1	2.4	2.9	4.1	4.2	5.8
120 ~ 140	1.1	1.8	2.1	2.2	2.3	2.7	3.1	4.2	4.3	6.0
140 ~ 160	1.2	1.9	2.3	2.3	2.4	2.8	3.3	4.3	4.4	6.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	405/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/362

Constants of dn/dt		
D_0	D_1	D_2
-2.26E-06	1.29E-08	-2.10E-11
E_0	E_1	λ_{TK}
7.27E-07	5.23E-10	3.08E-01

H-ZF4A	728283	$n_d = 1.72825$	$v_d = 28.32$	$n_F - n_C = 0.025716$
		$n_e = 1.73432$	$v_e = 28.10$	$n_F - n_{C'} = 0.026133$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2889	RC (S)	1	2400	0.922	0.851
n_{1970}	1970.09		$P_{e,d}$	0.2360	RA (S)	1	2200	0.951	0.904
n_{1530}	1529.58		$P_{g,F}$	0.6070	D_W	1	2000	0.982	0.965
n_{1129}	1128.64	1.70032	$P'_{d,C'}$	0.2399	D_A	1	1800	0.990	0.980
n_{1064}	1064.00	1.70187	$P'_{e,d}$	0.2323	$R_{OH}(S)$	1	1600	0.996	0.992
n_t	1013.98	1.70320	$P'_{g,F'}$	0.5373	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.70873			CR	1	1200	0.999	0.997
$n_{A'}$	768.19	1.71283	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.997
n_r	706.52	1.71676					1000	0.999	0.997
n_C	656.27	1.72082					950	0.999	0.997
$n_{C'}$	643.85	1.72198					900	0.999	0.997
n_{He-Ne}	632.80	1.72306					850	0.999	0.997
n_D	589.29	1.72802	ΔP_{Fe}	0.0006	$^{\circ}C$	α	800	0.999	0.997
n_d	587.56	1.72825	$\Delta P_{g,F}$	0.0105	-50/-40	79	750	0.999	0.997
n_e	546.07	1.73432	$\Delta P_{C,t}$	0.0078	-40/-30	82	700	0.998	0.997
n_F	486.13	1.74654	$\Delta P_{C,s}$	0.0018	-30/-20	84	650	0.998	0.996
$n_{F'}$	479.99	1.74811	Thermal Properties		-20/-10	84	600	0.997	0.994
n_g	435.84	1.76215	Tg ($^{\circ}C$)	594	-10/0	85	550	0.996	0.992
n_h	404.66	1.77622	Ts ($^{\circ}C$)	621	0/10	86	500	0.994	0.987
n_i	365.01	1.80305	$T_{10}^{14.5} (^{\circ}C)$	530	10/20	87	480	0.992	0.983
			$T_{10}^{13} (^{\circ}C)$	559	20/30	90	460	0.989	0.979
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	86	30/40	91	440	0.984	0.970
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	105	40/50	93	420	0.974	0.950
			λ (W/(m K))	1.12	50/60	94	400	0.940	0.884
					60/70	94	390	0.887	0.788
					70/80	95	380	0.762	0.582
			Mechanical Properties		80/90	95	370	0.477	0.228
			HK (10^7Pa)	551	90/100	97	360	0.068	0.010
			F_A	210	100/110	97	350		
			E (GPa)	90.7	110/120	99	340		
			G (GPa)	36.0	120/130	100	330		
			μ	0.262	130/140	100	320		
			σ_b (MPa)	73	140/150	101	310		
			B ($10^{-12}/Pa$)	2.65	150/160	103	300		

Constants of Dispersion Formula	
A_0	2.87790099E+00
A_1	-1.14975391E-02
A_2	3.40752512E-02
A_3	1.83854310E-03
A_4	-1.04547399E-04
A_5	1.87465641E-05

Density		Solarization	
ρ (g/cm ³)	3.05	$\Delta\lambda$ (%)	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.2	-1.0	-0.7	-0.6	-0.5	-0.3	0.4	1.3	1.4	1.9
-40 ~ -20	-1.2	-0.9	-0.5	-0.4	-0.4	-0.1	0.6	1.5	1.7	2.4
-20 ~ 0	-1.1	-0.7	-0.3	-0.2	-0.1	0.3	0.9	1.6	1.8	2.7
0 ~ 20	-1.1	-0.5	-0.2	-0.1	0.1	0.4	1.2	1.7	1.9	2.9
20 ~ 40	-1.0	-0.3	0.0	0.1	0.2	0.6	1.4	1.8	2.0	3.1
40 ~ 60	-1.0	-0.3	0.2	0.3	0.4	0.8	1.6	1.9	2.2	3.4
60 ~ 80	-0.9	-0.1	0.3	0.4	0.5	1.0	1.8	2.3	2.5	3.5
80 ~ 100	-0.9	-0.1	0.5	0.5	0.6	1.2	2.0	2.6	2.8	4.0
100 ~ 120	-0.8	0.1	0.7	0.7	0.8	1.3	2.1	2.9	3.1	4.2
120 ~ 140	-0.7	0.3	0.8	0.9	0.9	1.7	2.5	3.2	3.4	4.4
140 ~ 160	-0.7	0.4	0.9	1.0	1.1	1.8	2.6	3.5	3.6	4.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	391/364

Constants of dn/dt		
D_0	D_1	D_2
-6.13E-06	1.41E-08	-2.55E-11
E_0	E_1	λ_{TK}
1.37E-06	1.29E-09	1.57E-01

H-ZF4AGT	728283	$n_d = 1.72825$	$v_d = 28.32$	$n_F - n_C = 0.025716$
		$n_e = 1.73432$	$v_e = 28.10$	$n_F - n_{C'} = 0.026133$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2889	RC (S)	1	2400	0.902	0.814
n_{1970}	1970.09		$P_{e,d}$	0.2360	RA (S)	1	2200	0.938	0.880
n_{1530}	1529.58		$P_{g,F}$	0.6070	D_W	1	2000	0.970	0.940
n_{1129}	1128.64	1.70032	$P'_{d,c'}$	0.2399	D_A	1	1800	0.982	0.964
n_{1064}	1064.00	1.70187	$P'_{e,d}$	0.2323	$R_{OH}(S)$	1	1600	0.994	0.987
n_t	1013.98	1.70320	$P'_{g,F'}$	0.5373	RP (S)	1	1400	0.996	0.992
n_s	852.11	1.70873			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.71283	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.71676					1000	0.999	0.998
n_C	656.27	1.72082					950	0.999	0.998
$n_{C'}$	643.85	1.72198					900	0.999	0.998
n_{He-Ne}	632.80	1.72306					850	0.999	0.998
n_D	589.29	1.72802	ΔP_{Fe}	0.0006	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.72825	$\Delta P_{g,F}$	0.0105	-50/-40	79	750	0.999	0.998
n_e	546.07	1.73432	$\Delta P_{C,t}$	0.0078	-40/-30	82	700	0.998	0.997
n_F	486.13	1.74654	$\Delta P_{C,s}$	0.0018	-30/-20	84	650	0.998	0.996
$n_{F'}$	479.99	1.74811	Thermal Properties		-20/-10	84	600	0.998	0.996
n_g	435.84	1.76215	Tg ($^{\circ}C$)	594	-10/0	85	550	0.997	0.994
n_h	404.66	1.77622	Ts ($^{\circ}C$)	621	0/10	86	500	0.995	0.989
n_i	365.01	1.80305	$T_{10}^{14.5} (^{\circ}C)$	530	10/20	87	480	0.993	0.986
			$T_{10}^{13} (^{\circ}C)$	559	20/30	90	460	0.991	0.981
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	86	30/40	91	440	0.987	0.974
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	105	40/50	93	420	0.978	0.957
			λ (W/(m K))	1.12	50/60	94	400	0.949	0.900
					60/70	94	390	0.898	0.806
					70/80	95	380	0.775	0.601
			Mechanical Properties		80/90	95	370	0.493	0.243
			HK (10^7Pa)	551	90/100	97	360	0.136	0.019
			F_A	210	100/110	97	350		
			E (GPa)	90.7	110/120	99	340		
			G (GPa)	36.0	120/130	100	330		
			μ	0.262	130/140	100	320		
			σ_b (MPa)	73	140/150	101	310		
			B ($10^{-12}/Pa$)	2.65	150/160	103	300		

Constants of Dispersion Formula	
A_0	2.87790099E+00
A_1	-1.14975391E-02
A_2	3.40752512E-02
A_3	1.83854310E-03
A_4	-1.04547399E-04
A_5	1.87465641E-05

Density		Solarization	
ρ (g/cm ³)	3.05	$\Delta\lambda$ (%)	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.2	-1.0	-0.7	-0.6	-0.5	-0.3	0.4	1.3	1.4	1.9
-40 ~ -20	-1.2	-0.9	-0.5	-0.4	-0.4	-0.1	0.6	1.5	1.7	2.4
-20 ~ 0	-1.1	-0.7	-0.3	-0.2	-0.1	0.3	0.9	1.6	1.8	2.7
0 ~ 20	-1.1	-0.5	-0.2	-0.1	0.1	0.4	1.2	1.7	1.9	2.9
20 ~ 40	-1.0	-0.3	0.0	0.1	0.2	0.6	1.4	1.8	2.0	3.1
40 ~ 60	-1.0	-0.3	0.2	0.3	0.4	0.8	1.6	1.9	2.2	3.4
60 ~ 80	-0.9	-0.1	0.3	0.4	0.5	1.0	1.8	2.3	2.5	3.5
80 ~ 100	-0.9	-0.1	0.5	0.5	0.6	1.2	2.0	2.6	2.8	4.0
100 ~ 120	-0.8	0.1	0.7	0.7	0.8	1.3	2.1	2.9	3.1	4.2
120 ~ 140	-0.7	0.3	0.8	0.9	0.9	1.7	2.5	3.2	3.4	4.4
140 ~ 160	-0.7	0.4	0.9	1.0	1.1	1.8	2.6	3.5	3.6	4.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	390/364

Constants of dn/dt		
D_0	D_1	D_2
-6.13E-06	1.41E-08	-2.55E-11
E_0	E_1	λ_{TK}
1.37E-06	1.29E-09	1.57E-01

H-ZF5	740283	$n_d = 1.74000$	$v_d = 28.30$	$n_F - n_C = 0.026152$
		$n_e = 1.74617$	$v_e = 28.07$	$n_F - n_{C'} = 0.026584$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.69091	$P_{d,C}$	0.2887	RC (S)	1	2400	0.937	0.878
n_{1970}	1970.09	1.69701	$P_{e,d}$	0.2359	RA (S)	1	2200	0.962	0.925
n_{1530}	1529.58	1.70416	$P_{g,F}$	0.6076	D_W	1	2000	0.991	0.982
n_{1129}	1128.64	1.71169	$P'_{d,C'}$	0.2396	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.71325	$P'_{e,d}$	0.2321	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.71459	$P'_{g,F'}$	0.5375	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.72020			CR		1200	0.997	0.994
$n_{A'}$	768.19	1.72435	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.72833					1000	0.997	0.994
n_C	656.27	1.73245					950	0.997	0.994
$n_{C'}$	643.85	1.73363					900	0.997	0.994
n_{He-Ne}	632.80	1.73474					850	0.997	0.994
n_D	589.29	1.73977	ΔP_{Fe}	0.0011	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	1.74000	$\Delta P_{g,F}$	0.0110	-50/-40	76	750	0.997	0.994
n_e	546.07	1.74617	$\Delta P_{C,t}$	0.0057	-40/-30	78	700	0.997	0.994
n_F	486.13	1.75861	$\Delta P_{C,s}$	0.0001	-30/-20	80	650	0.997	0.994
$n_{F'}$	479.99	1.76021	Thermal Properties		-20/-10	82	600	0.997	0.994
n_g	435.84	1.77450	$T_g (^{\circ}C)$	604	-10/0	83	550	0.997	0.994
n_h	404.66	1.78876	$T_s (^{\circ}C)$	647	0/10	84	500	0.995	0.992
n_i	365.01	1.81588	$T_{10}^{14.5} (^{\circ}C)$	543	10/20	84	480	0.992	0.987
			$T_{10}^{13} (^{\circ}C)$	574	20/30	85	460	0.990	0.985
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	86	30/40	86	440	0.984	0.973
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	107	40/50	86	420	0.980	0.966
			$\lambda (W/(m\ K))$	1.15	50/60	87	400	0.971	0.949
					60/70	87	390	0.935	0.875
					70/80	88	380	0.892	0.800
					80/90	89	370	0.776	0.603
			Mechanical Properties		90/100	90	360	0.491	0.236
			HK ($10^7 Pa$)	580	100/110	91	350	0.109	0.013
			F_A	162	110/120	93	340		
			E (GPa)	91.2	120/130	94	330		
			G (GPa)	35.6	130/140	95	320		
			μ	0.283	140/150	97	310		
			σ_b (MPa)	62	150/160	98	300		
			B ($10^{-12}/Pa$)	2.58			290		
							280		

Constants of Dispersion Formula	
A_0	2.91687382E+00
A_1	-1.18527790E-02
A_2	3.42689145E-02
A_3	2.02963652E-03
A_4	-1.14580838E-04
A_5	1.85928308E-05

Density		Solarization	
$\rho (g/cm^3)$	3.09	$\Delta\lambda (\%)$	0.0

Range of Temperature $(^{\circ}C)$	Temperature Coefficients of Refractive Index									
	dn/dt relative $(\times 10^{-6} / ^{\circ}C)$									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.8	-0.5	-0.3	-0.3	-0.2	0.1	1.0	1.7	1.8	3.2
-40 ~ -20	-0.6	-0.3	-0.2	-0.2	-0.1	0.2	1.2	1.8	2.0	3.4
-20 ~ 0	-0.2	0.0	0.1	0.1	0.1	0.6	1.4	2.2	2.3	3.7
0 ~ 20	0.0	0.2	0.3	0.3	0.3	0.8	1.9	2.5	2.6	3.9
20 ~ 40	0.0	0.3	0.6	0.7	0.8	1.1	1.9	2.6	2.7	4.4
40 ~ 60	0.2	0.5	0.9	1.0	1.1	1.4	2.1	2.9	3.0	4.7
60 ~ 80	0.3	0.8	1.3	1.4	1.5	1.8	2.5	3.3	3.4	5.2
80 ~ 100	0.4	1.0	1.6	1.7	1.9	2.1	2.8	3.8	3.9	5.7
100 ~ 120	0.5	1.2	1.9	2.1	2.2	2.2	3.1	4.2	4.3	6.1
120 ~ 140	0.8	1.4	2.2	2.4	2.5	2.6	3.3	4.4	4.5	6.4
140 ~ 160	1.0	1.5	2.3	2.5	2.6	2.8	3.5	4.7	4.8	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	415/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	389/362

Constants of dn/dt		
D_0	D_1	D_2
-4.00E-06	1.95E-08	-2.24E-11
E_0	E_1	λ_{TK}
7.71E-07	5.88E-10	3.10E-01

H-ZF5GT	740283	$n_d = 1.74000$	$v_d = 28.30$	$n_F - n_C = 0.026152$
		$n_e = 1.74617$	$v_e = 28.07$	$n_F - n_C' = 0.026584$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.69091	$P_{d,C}$	0.2887	RC (S)	1	2400	0.937	0.878
n_{1970}	1970.09	1.69701	$P_{e,d}$	0.2359	RA (S)	1	2200	0.962	0.925
n_{1530}	1529.58	1.70416	$P_{g,F}$	0.6076	D_W	1	2000	0.991	0.982
n_{1129}	1128.64	1.71169	$P'_{d,c'}$	0.2396	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.71325	$P'_{e,d}$	0.2321	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.71459	$P'_{g,F'}$	0.5375	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.72020			CR		1200	0.997	0.994
$n_{A'}$	768.19	1.72435	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.72833					1000	0.997	0.994
n_C	656.27	1.73245					950	0.997	0.994
$n_{C'}$	643.85	1.73363					900	0.997	0.994
n_{He-Ne}	632.80	1.73474					850	0.997	0.994
n_D	589.29	1.73977	ΔP_{Fe}	0.0011	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	1.74000	$\Delta P_{g,F}$	0.0110	-50/-40	76	750	0.997	0.994
n_e	546.07	1.74617	$\Delta P_{C,t}$	0.0057	-40/-30	78	700	0.997	0.994
n_F	486.13	1.75861	$\Delta P_{C,s}$	0.0001	-30/-20	80	650	0.997	0.994
$n_{F'}$	479.99	1.76021	Thermal Properties		-20/-10	82	600	0.997	0.994
n_g	435.84	1.77450	Tg ($^{\circ}C$)	604	-10/0	83	550	0.995	0.992
n_h	404.66	1.78876	Ts ($^{\circ}C$)	647	0/10	84	500	0.992	0.988
n_i	365.01	1.81588	$T_{10}^{14.5} (^{\circ}C)$	543	10/20	84	480	0.990	0.985
			$T_{10}^{13} (^{\circ}C)$	574	20/30	85	460	0.988	0.981
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	86	30/40	86	440	0.985	0.973
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	107	40/50	86	420	0.978	0.957
			λ (W/(m K))	1.15	50/60	87	400	0.952	0.907
					60/70	87	390	0.912	0.834
					70/80	88	380	0.807	0.657
			Mechanical Properties		80/90	89	370	0.535	0.292
			HK ($10^7 Pa$)	580	90/100	90	360	0.113	0.016
			F_A	162	100/110	91	350		
			E (GPa)	91.2	110/120	93	340		
			G (GPa)	35.6	120/130	94	330		
			μ	0.283	130/140	95	320		
			σ_b (MPa)	62	140/150	97	310		
			B ($10^{-12}/Pa$)	2.58	150/160	98	300		

Constants of Dispersion Formula	
A_0	2.91687382E+00
A_1	-1.18527790E-02
A_2	3.42689145E-02
A_3	2.02963652E-03
A_4	-1.14580838E-04
A_5	1.85928308E-05

Density		Solarization	
ρ (g/cm ³)	3.09	$\Delta\lambda$ (%)	0.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.8	-0.5	-0.3	-0.3	-0.2	0.1	1.0	1.7	1.8	3.2
-40 ~ -20	-0.6	-0.3	-0.2	-0.2	-0.1	0.2	1.2	1.8	2.0	3.4
-20 ~ 0	-0.2	0.0	0.1	0.1	0.1	0.6	1.4	2.2	2.3	3.7
0 ~ 20	0.0	0.2	0.3	0.3	0.3	0.8	1.9	2.5	2.6	3.9
20 ~ 40	0.0	0.3	0.6	0.7	0.8	1.1	1.9	2.6	2.7	4.4
40 ~ 60	0.2	0.5	0.9	1.0	1.1	1.4	2.1	2.9	3.0	4.7
60 ~ 80	0.3	0.8	1.3	1.4	1.5	1.8	2.5	3.3	3.4	5.2
80 ~ 100	0.4	1.0	1.6	1.7	1.9	2.1	2.8	3.8	3.9	5.7
100 ~ 120	0.5	1.2	1.9	2.1	2.2	2.2	3.1	4.2	4.3	6.1
120 ~ 140	0.8	1.4	2.2	2.4	2.5	2.6	3.3	4.4	4.5	6.4
140 ~ 160	1.0	1.5	2.3	2.5	2.6	2.8	3.5	4.7	4.8	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	388/362

Constants of dn/dt		
D_0	D_1	D_2
-4.00E-06	1.95E-08	-2.24E-11
E_0	E_1	λ_{TK}
7.71E-07	5.88E-10	3.10E-01

H-ZF6	755275	$n_d = 1.75520$	$v_d = 27.53$	$n_F - n_C = 0.027432$
		$n_e = 1.76167$	$v_e = 27.31$	$n_F - n_C' = 0.027888$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70459	$P_{d,C}$	0.2883	RC (S)	1	2400	0.935	0.876
n_{1970}	1970.09	1.71072	$P_{e,d}$	0.2359	RA (S)	1	2200	0.968	0.937
n_{1530}	1529.58	1.71794	$P_{g,F}$	0.6084	D_W	1	2000	0.992	0.984
n_{1129}	1128.64	1.72566	$P'_{d,c'}$	0.2395	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.72728	$P'_{e,d}$	0.2320	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.72867	$P'_{g,F'}$	0.5379	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.73450			CR		1200	0.997	0.994
$n_{A'}$	768.19	1.73882	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.74299					1000	0.997	0.994
n_C	656.27	1.74729					950	0.997	0.994
$n_{C'}$	643.85	1.74852					900	0.997	0.994
n_{He-Ne}	632.80	1.74968					850	0.997	0.994
n_D	589.29	1.75496	ΔP_{Fe}	0.0007	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	1.75520	$\Delta P_{g,F}$	0.0105	-50/-40	81	750	0.997	0.994
n_e	546.07	1.76167	$\Delta P_{C,t}$	0.0053	-40/-30	84	700	0.997	0.994
n_F	486.13	1.77472	$\Delta P_{C,s}$	-0.0002	-30/-20	86	650	0.997	0.994
$n_{F'}$	479.99	1.77641	Thermal Properties		-20/-10	88	600	0.997	0.994
n_g	435.84	1.79141	$T_g (^{\circ}C)$	604	-10/0	90	550	0.995	0.991
n_h	404.66	1.80646	$T_s (^{\circ}C)$	635	0/10	91	500	0.996	0.992
n_i	365.01	1.83529	$T_{10}^{14.5} (^{\circ}C)$	536	10/20	92	480	0.994	0.988
			$T_{10}^{13} (^{\circ}C)$	575	20/30	93	460	0.990	0.984
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	88	30/40	94	440	0.988	0.978
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	109	40/50	95	420	0.983	0.966
			$\lambda (W/(m\ K))$	1.13	50/60	96	400	0.975	0.950
					60/70	97	390	0.941	0.884
					70/80	98	380	0.897	0.802
					80/90	98	370	0.774	0.603
					90/100	99	360	0.463	0.213
					100/110	100	350		
					110/120	100	340		
					120/130	101	330		
					130/140	102	320		
					140/150	104	310		
					150/160	104	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	2.96351629E+00
A_1	-1.19513676E-02
A_2	3.59998931E-02
A_3	2.29903731E-03
A_4	-1.58881885E-04
A_5	2.32603789E-05

Density		Solarization	
$\rho (g/cm^3)$	3.15	$\Delta\lambda (\%)$	-0.6

Mechanical Properties	
HK ($10^7 Pa$)	525
F_A	170
E (GPa)	92.0
G (GPa)	35.6
μ	0.290
σ_b (MPa)	81
B ($10^{-12}/Pa$)	2.54

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.1	0.6	0.9	0.9	1.0	1.4	1.9	2.8	2.9	4.3
-40 ~ -20	0.0	0.6	0.9	0.9	1.0	1.4	1.9	2.9	2.9	4.4
-20 ~ 0	0.0	0.7	1.0	1.0	1.0	1.6	2.0	3.1	3.2	4.7
0 ~ 20	0.0	0.7	1.1	1.1	1.1	1.7	2.2	3.3	3.3	4.8
20 ~ 40	0.2	0.8	1.2	1.2	1.2	1.8	2.2	3.4	3.5	5.1
40 ~ 60	0.2	0.9	1.3	1.3	1.4	1.8	2.4	3.6	3.7	5.3
60 ~ 80	0.3	1.1	1.5	1.5	1.6	2.0	2.6	3.9	4.0	5.7
80 ~ 100	0.3	1.1	1.6	1.7	1.8	2.2	3.0	4.3	4.3	5.9
100 ~ 120	0.5	1.3	1.7	1.9	2.0	2.4	3.1	4.5	4.6	6.3
120 ~ 140	0.7	1.5	2.0	2.1	2.1	2.7	3.3	4.7	4.8	6.5
140 ~ 160	0.9	1.7	2.1	2.2	2.2	2.8	3.5	4.9	5.0	6.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	389/363

Constants of dn/dt		
D_0	D_1	D_2
-3.39E-06	1.26E-08	-1.40E-11
E_0	E_1	λ_{TK}
8.90E-07	8.03E-10	2.96E-01

H-ZF6GT	755275	$n_d = 1.75520$	$v_d = 27.53$	$n_F - n_C = 0.027432$
		$n_e = 1.76167$	$v_e = 27.31$	$n_F - n_{C'} = 0.027888$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70459	$P_{d,C}$	0.2883	RC (S)	1	2400	0.937	0.880
n_{1970}	1970.09	1.71072	$P_{e,d}$	0.2359	RA (S)	1	2200	0.969	0.939
n_{1530}	1529.58	1.71794	$P_{g,F}$	0.6084	D_W	1	2000	0.992	0.984
n_{1129}	1128.64	1.72566	$P'_{d,c'}$	0.2395	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.72728	$P'_{e,d}$	0.2320	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.72867	$P'_{g,F'}$	0.5379	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.73450			CR		1200	0.997	0.994
$n_{A'}$	768.19	1.73882	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.74299					1000	0.997	0.994
n_C	656.27	1.74729					950	0.997	0.994
$n_{C'}$	643.85	1.74852					900	0.997	0.994
n_{He-Ne}	632.80	1.74968					850	0.997	0.994
n_D	589.29	1.75496	ΔP_{Fe}	0.0007	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	1.75520	$\Delta P_{g,F}$	0.0105	-50/-40	81	750	0.997	0.994
n_e	546.07	1.76167	$\Delta P_{C,t}$	0.0053	-40/-30	84	700	0.997	0.994
n_F	486.13	1.77472	$\Delta P_{C,s}$	-0.0002	-30/-20	86	650	0.997	0.994
$n_{F'}$	479.99	1.77641	Thermal Properties		-20/-10	88	600	0.997	0.994
n_g	435.84	1.79141			-10/0	90	550	0.996	0.993
n_h	404.66	1.80646	Tg ($^{\circ}C$)	604	0/10	91	500	0.994	0.988
n_i	365.01	1.83529	Ts ($^{\circ}C$)	635	10/20	92	480	0.992	0.986
			$T_{10}^{14.5} (^{\circ}C)$	536	20/30	93	460	0.989	0.980
			$T_{10}^{13} (^{\circ}C)$	575	30/40	94	440	0.985	0.975
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	88	40/50	95	420	0.977	0.958
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	109	50/60	96	400	0.950	0.909
			λ (W/(m K))	1.13	60/70	97	390	0.911	0.835
					70/80	98	380	0.799	0.646
			Mechanical Properties		80/90	98	370	0.512	0.263
					90/100	99	360	0.094	0.014
			HK (10^7Pa)	525	100/110	100	350		
			F_A	170	110/120	100	340		
			E (GPa)	92.0	120/130	101	330		
			G (GPa)	35.6	130/140	102	320		
			μ	0.290	140/150	104	310		
			σ_b (MPa)	81	150/160	104	300		
			B ($10^{-12}/Pa$)	2.54			290		
							280		

Constants of Dispersion Formula	
A_0	2.96351629E+00
A_1	-1.19513676E-02
A_2	3.59998931E-02
A_3	2.29903731E-03
A_4	-1.58881885E-04
A_5	2.32603789E-05

Density		Solarization	
ρ (g/cm ³)	3.15	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.1	0.6	0.9	0.9	1.0	1.4	1.9	2.8	2.9	4.3
-40 ~ -20	0.0	0.6	0.9	0.9	1.0	1.4	1.9	2.9	2.9	4.4
-20 ~ 0	0.0	0.7	1.0	1.0	1.0	1.6	2.0	3.1	3.2	4.7
0 ~ 20	0.0	0.7	1.1	1.1	1.1	1.7	2.2	3.3	3.3	4.8
20 ~ 40	0.2	0.8	1.2	1.2	1.2	1.8	2.2	3.4	3.5	5.1
40 ~ 60	0.2	0.9	1.3	1.3	1.4	1.8	2.4	3.6	3.7	5.3
60 ~ 80	0.3	1.1	1.5	1.5	1.6	2.0	2.6	3.9	4.0	5.7
80 ~ 100	0.3	1.1	1.6	1.7	1.8	2.2	3.0	4.3	4.3	5.9
100 ~ 120	0.5	1.3	1.7	1.9	2.0	2.4	3.1	4.5	4.6	6.3
120 ~ 140	0.7	1.5	2.0	2.1	2.1	2.7	3.3	4.7	4.8	6.5
140 ~ 160	0.9	1.7	2.1	2.2	2.2	2.8	3.5	4.9	5.0	6.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/363

Constants of dn/dt		
D_0	D_1	D_2
-3.39E-06	1.26E-08	-1.40E-11
E_0	E_1	λ_{TK}
8.90E-07	8.03E-10	2.96E-01

H-ZF7L	805255	$n_d = 1.80518$	$v_d = 25.46$	$n_F - n_C = 0.031630$
		$n_e = 1.81263$	$v_e = 25.25$	$n_F - n_{C'} = 0.032180$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.74928	$P_{d,C}$	0.2868	RC (S)	1	2400	0.927	0.863
n_{1970}	1970.09	1.75560	$P_{e,d}$	0.2355	RA (S)	1	2200	0.960	0.920
n_{1530}	1529.58	1.76321	$P_{g,F}$	0.6156	D_W	1	2000	0.979	0.956
n_{1129}	1128.64	1.77158	$P'_{d,C'}$	0.2380	D_A	1	1800	0.987	0.976
n_{1064}	1064.00	1.77339	$P'_{e,d}$	0.2315	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.77494	$P'_{g,F'}$	0.5441	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.78150			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.78642	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.79118					1000	0.998	0.996
n_C	656.27	1.79611					950	0.998	0.996
$n_{C'}$	643.85	1.79752					900	0.998	0.996
n_{He-Ne}	632.80	1.79883					850	0.998	0.996
n_D	589.29	1.80491	ΔP_{Fe}	0.0016	$^{\circ}C$	α	800	0.998	0.997
n_d	587.56	1.80518	$\Delta P_{g,F}$	0.0142	-50/-40	80	750	0.998	0.997
n_e	546.07	1.81263	$\Delta P_{C,t}$	0.0058	-40/-30	82	700	0.998	0.997
n_F	486.13	1.82774	$\Delta P_{C,s}$	0.0004	-30/-20	85	650	0.998	0.996
$n_{F'}$	479.99	1.82970	Thermal Properties		-20/-10	87	600	0.998	0.997
n_g	435.84	1.84721	Tg ($^{\circ}C$)	606	-10/0	89	550	0.998	0.997
n_h	404.66	1.86480	Ts ($^{\circ}C$)	636	0/10	90	500	0.997	0.995
n_i	365.01	1.89846	$T_{10}^{14.5} (^{\circ}C)$	565	10/20	91	480	0.994	0.988
			$T_{10}^{13} (^{\circ}C)$	581	20/30	92	460	0.992	0.984
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	88	30/40	92	440	0.989	0.979
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	109	40/50	93	420	0.984	0.969
			λ (W/(m K))	0.99	50/60	93	400	0.974	0.948
					60/70	94	390	0.946	0.894
					70/80	95	380	0.906	0.821
					80/90	95	370	0.799	0.638
			Mechanical Properties		90/100	97	360	0.527	0.278
			HK (10^7Pa)	523	100/110	98	350	0.148	0.022
			F_A	186	110/120	99	340		
			E (GPa)	93.6	120/130	100	330		
			G (GPa)	36.1	130/140	102	320		
			μ	0.296	140/150	102	310		
			σ_b (MPa)	77	150/160	103	300		
			B ($10^{-12}/\text{Pa}$)	2.67			290		
							280		

Constants of Dispersion Formula	
A_0	3.11898504E+00
A_1	-1.24052596E-02
A_2	4.32862244E-02
A_3	2.26049835E-03
A_4	-7.69462999E-05
A_5	2.11453139E-05

Density		Solarization	
ρ (g/cm ³)	3.38	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.8	-0.2	0.2	0.3	0.4	0.6	1.2	2.4	2.5	3.7
-40 ~ -20	-0.8	-0.1	0.3	0.4	0.4	0.7	1.3	2.5	2.6	4.0
-20 ~ 0	-0.8	-0.1	0.3	0.4	0.5	0.8	1.4	2.6	2.7	4.3
0 ~ 20	-0.8	-0.1	0.3	0.4	0.5	0.9	1.5	2.9	3.0	4.7
20 ~ 40	-0.8	-0.1	0.4	0.5	0.6	1.0	1.6	3.0	3.1	5.0
40 ~ 60	-0.7	0.1	0.5	0.6	0.7	1.1	1.8	3.3	3.4	5.3
60 ~ 80	-0.7	0.1	0.7	0.8	0.9	1.3	2.0	3.6	3.7	5.7
80 ~ 100	-0.6	0.2	0.9	1.0	1.1	1.5	2.1	3.8	3.9	5.9
100 ~ 120	-0.4	0.3	1.0	1.1	1.2	1.7	2.3	4.0	4.1	6.1
120 ~ 140	-0.3	0.4	1.1	1.2	1.3	1.8	2.4	4.2	4.3	6.4
140 ~ 160	-0.2	0.5	1.2	1.3	1.4	2.0	2.6	4.5	4.6	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	425/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	388/361

Constants of dn/dt		
D_0	D_1	D_2
-4.83E-06	1.06E-08	-1.80E-11
E_0	E_1	λ_{TK}
9.79E-07	1.08E-09	2.95E-01

H-ZF7LGT	805255	$n_d = 1.80518$	$v_d = 25.46$	$n_F - n_C = 0.031630$
		$n_e = 1.81263$	$v_e = 25.25$	$n_F - n_C' = 0.032180$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.74928	$P_{d,C}$	0.2868	RC (S)	1	2400	0.951	0.905
n_{1970}	1970.09	1.75560	$P_{e,d}$	0.2355	RA (S)	1	2200	0.974	0.949
n_{1530}	1529.58	1.76321	$P_{g,F}$	0.6156	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.77158	$P'_{d,c'}$	0.2380	D_A	1	1800	0.998	0.996
n_{1064}	1064.00	1.77339	$P'_{e,d}$	0.2315	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.77494	$P'_{g,F'}$	0.5441	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.78150			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.78642	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.79118					1000	0.998	0.996
n_C	656.27	1.79611					950	0.998	0.996
$n_{C'}$	643.85	1.79752					900	0.998	0.996
n_{He-Ne}	632.80	1.79883					850	0.998	0.996
n_D	589.29	1.80491	ΔP_{Fe}	0.0016	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.80518	$\Delta P_{g,F}$	0.0142	-50/-40	80	750	0.998	0.996
n_e	546.07	1.81263	$\Delta P_{C,t}$	0.0058	-40/-30	82	700	0.998	0.996
n_F	486.13	1.82774	$\Delta P_{C,s}$	0.0004	-30/-20	85	650	0.998	0.996
$n_{F'}$	479.99	1.82970	Thermal Properties		-20/-10	87	600	0.998	0.996
n_g	435.84	1.84721	Tg ($^{\circ}C$)	606	-10/0	89	550	0.996	0.993
n_h	404.66	1.86480	Ts ($^{\circ}C$)	636	0/10	90	500	0.994	0.988
n_i	365.01	1.89846	$T_{10}^{14.5} (^{\circ}C)$	565	10/20	91	480	0.992	0.983
			$T_{10}^{13} (^{\circ}C)$	581	20/30	92	460	0.990	0.980
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	88	30/40	92	440	0.987	0.971
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	109	40/50	93	420	0.977	0.953
			λ (W/(m K))	0.99	50/60	93	400	0.952	0.904
					60/70	94	390	0.913	0.830
					70/80	95	380	0.815	0.669
			Mechanical Properties		80/90	95	370	0.548	0.301
			HK (10^7Pa)	523	90/100	97	360	0.157	0.025
			F_A	186	100/110	98	350		
			E (GPa)	93.6	110/120	99	340		
			G (GPa)	36.1	120/130	100	330		
			μ	0.296	130/140	102	320		
			σ_b (MPa)	77	140/150	102	310		
			B ($10^{-12}/Pa$)	2.67	150/160	103	300		

Constants of Dispersion Formula	
A_0	3.11898504E+00
A_1	-1.24052596E-02
A_2	4.32862244E-02
A_3	2.26049835E-03
A_4	-7.69462999E-05
A_5	2.11453139E-05

Density		Solarization	
ρ (g/cm ³)	3.38	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.8	-0.2	0.2	0.3	0.4	0.6	1.2	2.4	2.5	3.7
-40 ~ -20	-0.8	-0.1	0.3	0.4	0.4	0.7	1.3	2.5	2.6	4.0
-20 ~ 0	-0.8	-0.1	0.3	0.4	0.5	0.8	1.4	2.6	2.7	4.3
0 ~ 20	-0.8	-0.1	0.3	0.4	0.5	0.9	1.5	2.9	3.0	4.7
20 ~ 40	-0.8	-0.1	0.4	0.5	0.6	1.0	1.6	3.0	3.1	5.0
40 ~ 60	-0.7	0.1	0.5	0.6	0.7	1.1	1.8	3.3	3.4	5.3
60 ~ 80	-0.7	0.1	0.7	0.8	0.9	1.3	2.0	3.6	3.7	5.7
80 ~ 100	-0.6	0.2	0.9	1.0	1.1	1.5	2.1	3.8	3.9	5.9
100 ~ 120	-0.4	0.3	1.0	1.1	1.2	1.7	2.3	4.0	4.1	6.1
120 ~ 140	-0.3	0.4	1.1	1.2	1.3	1.8	2.4	4.2	4.3	6.4
140 ~ 160	-0.2	0.5	1.2	1.3	1.4	2.0	2.6	4.5	4.6	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	420/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/361

Constants of dn/dt		
D_0	D_1	D_2
-4.83E-06	1.06E-08	-1.80E-11
E_0	E_1	λ_{TK}
9.79E-07	1.08E-09	2.95E-01

H-ZF10	689312	$n_d = 1.68893$	$v_d = 31.16$	$n_F - n_C = 0.022109$
		$n_e = 1.69416$	$v_e = 30.92$	$n_F - n_C' = 0.022450$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.64510	$P_{d,C}$	0.2904	RC (S)	1	2400	0.944	0.890
n_{1970}	1970.09	1.65089	$P_{e,d}$	0.2366	RA (S)	1	2200	0.966	0.933
n_{1530}	1529.58	1.65759	$P_{g,F}$	0.5989	D_W	1	2000	0.993	0.986
n_{1129}	1128.64	1.66444	$P'_{d,c'}$	0.2414	D_A	1	1800	0.998	0.996
n_{1064}	1064.00	1.66585	$P'_{e,d}$	0.2330	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.66704	$P'_{g,F'}$	0.5301	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.67195			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.67555	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.67898					1000	0.998	0.996
n_C	656.27	1.68251					950	0.998	0.996
$n_{C'}$	643.85	1.68351					900	0.998	0.996
n_{He-Ne}	632.80	1.68445					850	0.998	0.996
n_D	589.29	1.68874	ΔP_{Fe}	0.0001	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.68893	$\Delta P_{g,F}$	0.0070	-50/-40	79	750	0.998	0.996
n_e	546.07	1.69416	$\Delta P_{C,t}$	0.0086	-40/-30	82	700	0.998	0.996
n_F	486.13	1.70462	$\Delta P_{C,s}$	0.0024	-30/-20	84	650	0.998	0.996
$n_{F'}$	479.99	1.70596	Thermal Properties		-20/-10	87	600	0.998	0.996
n_g	435.84	1.71786	Tg ($^{\circ}C$)	597	-10/0	89	550	0.998	0.996
n_h	404.66	1.72964	Ts ($^{\circ}C$)	631	0/10	90	500	0.996	0.992
n_i	365.01	1.75182	$T_{10}^{14.5} (^{\circ}C)$	523	10/20	91	480	0.994	0.988
			$T_{10}^{13} (^{\circ}C)$	561	20/30	92	460	0.992	0.984
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	89	30/40	93	440	0.990	0.980
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	109	40/50	94	420	0.985	0.970
			λ (W/(m K))	1.11	50/60	94	400	0.971	0.931
					60/70	95	390	0.941	0.879
					70/80	95	380	0.861	0.741
			Mechanical Properties		80/90	96	370	0.652	0.427
			HK (10^7Pa)	545	90/100	97	360	0.256	0.075
			F_A	139	100/110	98	350		
			E (GPa)	85.4	110/120	99	340		
			G (GPa)	34.7	120/130	100	330		
			μ	0.232	130/140	102	320		
			σ_b (MPa)	82	140/150	103	310		
			B ($10^{-12}/Pa$)	2.71	150/160	104	300		

Constants of Dispersion Formula	
A_0	2.76089226E+00
A_1	-1.10845008E-02
A_2	2.89559966E-02
A_3	1.51547191E-03
A_4	-8.76539698E-05
A_5	1.38043475E-05

Density		Solarization	
ρ (g/cm ³)	2.93	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.7	1.2	1.6	1.6	1.7	1.9	2.2	3.1	3.1	4.1
-40 ~ -20	0.7	1.2	1.6	1.6	1.7	2.0	2.4	3.2	3.2	4.3
-20 ~ 0	0.8	1.2	1.6	1.6	1.7	2.1	2.4	3.3	3.3	4.4
0 ~ 20	0.7	1.3	1.7	1.7	1.7	2.1	2.4	3.3	3.4	4.5
20 ~ 40	0.7	1.2	1.7	1.8	1.8	2.1	2.5	3.4	3.5	4.7
40 ~ 60	0.7	1.3	1.8	1.8	1.8	2.3	2.5	3.6	3.7	4.9
60 ~ 80	0.8	1.4	1.8	1.9	1.9	2.4	2.7	3.9	3.9	5.2
80 ~ 100	0.8	1.5	1.9	2.0	2.1	2.6	2.9	4.1	4.1	5.4
100 ~ 120	0.9	1.6	2.0	2.1	2.2	2.8	3.0	4.3	4.3	5.5
120 ~ 140	1.0	1.7	2.1	2.2	2.3	2.8	3.2	4.3	4.4	5.6
140 ~ 160	1.2	1.8	2.2	2.3	2.4	3.0	3.5	4.5	4.6	5.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	400/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	383/359

Constants of dn/dt		
D_0	D_1	D_2
-2.36E-06	1.13E-08	-1.69E-11
E_0	E_1	λ_{TK}
9.20E-07	8.47E-10	2.63E-01

H-ZF11	699301	$n_d = 1.69894$	$v_d = 30.05$	$n_F - n_C = 0.023259$
		$n_e = 1.70444$	$v_e = 29.81$	$n_F - n_{C'} = 0.023628$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm
n ₂₃₂₅	2325.42	1.65368	P _{d,C}	0.2894	RC (S)	1	2400	0.930	0.857
n ₁₉₇₀	1970.09	1.65957	P _{e,d}	0.2365	RA (S)	1	2200	0.956	0.905
n ₁₅₃₀	1529.58	1.66640	P _{g,F}	0.6023	D _W	1	2000	0.980	0.961
n ₁₁₂₉	1128.64	1.67343	P' _{d,c´}	0.2404	D _A	1	1800	0.993	0.985
n ₁₀₆₄	1064.00	1.67487	P' _{e,d}	0.2328	R _{OH} (S)	1	1600	0.999	0.998
n _t	1013.98	1.67610	P' _{g,F´}	0.5328	RP (S)	1	1400	0.999	0.998
n _s	852.11	1.68119			CR		1200	0.999	0.998
n _{A´}	768.19	1.68494					1060	0.999	0.998
n _r	706.52	1.68852	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998
n _C	656.27	1.69221					950	0.999	0.998
n _{C´}	643.85	1.69326					900	0.999	0.998
n _{He-Ne}	632.80	1.69425					850	0.999	0.998
n _D	589.29	1.69875					800	0.999	0.998
n _d	587.56	1.69894	ΔP _{F,e}	0.0006	°C	α	750	0.999	0.998
n _e	546.07	1.70444	ΔP _{g,F}	0.0087	-50/-40	79	700	0.999	0.998
n _F	486.13	1.71547	ΔP _{C,t}	0.0069	-40/-30	82	650	0.999	0.998
n _{F´}	479.99	1.71689	ΔP _{C,s}	0.0013	-30/-20	84	600	0.999	0.998
n _g	435.84	1.72948	Thermal Properties		-20/-10	86	550	0.999	0.998
n _h	404.66	1.74204			-10/0	89	500	0.997	0.995
n _i	365.01	1.76590			0/10	89	480	0.996	0.993
					10/20	91	460	0.995	0.990
					20/30	92	440	0.993	0.986
					30/40	93			
					40/50	93			
					50/60	94			
					60/70	95			
			70/80	96					
			80/90	96					
			90/100	97					
			100/110	98					
			110/120	99					
			120/130	100					
			130/140	102					
			140/150	103					
			150/160	104					

Constants of Dispersion Formula	
A_0	2.79026920E+00
A_1	-1.13154551E-02
A_2	2.98537059E-02
A_3	1.85548133E-03
A_4	-1.33930426E-04
A_5	1.81714166E-05

Density		Solarization	
ρ (g/cm ³)	2.96	$\Delta\lambda$ (%)	-0.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.4	0.8	1.1	1.1	1.2	1.5	1.9	3.0	3.0	4.0
-40 ~ -20	0.3	0.8	1.1	1.2	1.3	1.6	2.0	3.0	3.1	4.0
-20 ~ 0	0.4	0.8	1.2	1.3	1.3	1.7	2.0	3.1	3.1	4.2
0 ~ 20	0.4	0.9	1.3	1.3	1.4	1.7	2.2	3.2	3.2	4.3
20 ~ 40	0.4	1.0	1.4	1.4	1.5	1.8	2.3	3.3	3.3	4.5
40 ~ 60	0.6	1.1	1.5	1.5	1.6	2.0	2.4	3.5	3.6	4.8
60 ~ 80	0.6	1.2	1.6	1.6	1.7	2.1	2.5	3.8	3.8	5.2
80 ~ 100	0.6	1.3	1.7	1.8	1.8	2.3	2.6	4.0	4.1	5.3
100 ~ 120	0.7	1.4	1.8	1.9	1.9	2.5	2.7	4.1	4.2	5.5
120 ~ 140	0.8	1.5	1.9	1.9	2.0	2.6	2.9	4.2	4.3	5.6
140 ~ 160	0.9	1.5	2.0	2.0	2.1	2.7	3.0	4.3	4.4	5.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	405/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/363

Constants of dn/dt		
D_0	D_1	D_2
-2.91E-06	1.29E-08	-2.24E-11
E_0	E_1	λ_{TK}
8.96E-07	6.62E-10	2.79E-01

H-ZF12	762266	$n_d = 1.76182$	$v_d = 26.61$	$n_F - n_C = 0.028631$
		$n_e = 1.76857$	$v_e = 26.39$	$n_F - n_C' = 0.029118$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70927	$P_{d,C}$	0.2875	RC (S)	1	2400	0.935	0.874
n_{1970}	1970.09	1.71556	$P_{e,d}$	0.2358	RA (S)	1	2200	0.956	0.914
n_{1530}	1529.58	1.72304	$P_{g,F}$	0.6123	D_W	1	2000	0.979	0.958
n_{1129}	1128.64	1.73106	$P'_{d,c'}$	0.2387	D_A	1	1800	0.986	0.972
n_{1064}	1064.00	1.73276	$P'_{e,d}$	0.2318	$R_{OH}(S)$	1	1600	0.995	0.990
n_t	1013.98	1.73422	$P'_{g,F'}$	0.5412	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.74028			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.74478	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.74912					1000	0.998	0.996
n_C	656.27	1.75359					950	0.998	0.996
$n_{C'}$	643.85	1.75487					900	0.998	0.996
n_{He-Ne}	632.80	1.75608					850	0.998	0.996
n_D	589.29	1.76157	ΔP_{Fe}	0.0012	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.76182	$\Delta P_{g,F}$	0.0129	-50/-40	77	750	0.998	0.996
n_e	546.07	1.76857	$\Delta P_{C,t}$	0.0075	-40/-30	78	700	0.998	0.996
n_F	486.13	1.78222	$\Delta P_{C,s}$	0.0006	-30/-20	78	650	0.998	0.996
$n_{F'}$	479.99	1.78399	Thermal Properties		-20/-10	79	600	0.998	0.996
n_g	435.84	1.79975	Tg ($^{\circ}C$)	614	-10/0	80	550	0.998	0.996
n_h	404.66	1.81558	Ts ($^{\circ}C$)	655	0/10	82	500	0.995	0.990
n_i	365.01	1.84562	$T_{10}^{14.5} (^{\circ}C)$	544	10/20	83	480	0.991	0.982
			$T_{10}^{13} (^{\circ}C)$	590	20/30	83	460	0.987	0.974
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	83	30/40	85	440	0.983	0.966
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	103	40/50	86	420	0.969	0.939
			λ (W/(m K))	1.10	50/60	87	400	0.923	0.849
					60/70	88	390	0.849	0.718
					70/80	89	380	0.711	0.508
			Mechanical Properties		80/90	90	370	0.355	0.129
			HK (10^7Pa)	545	90/100	92	360		
			F_A	158	100/110	93	350		
			E (GPa)	92.3	110/120	93	340		
			G (GPa)	36.0	120/130	95	330		
			μ	0.283	130/140	98	320		
			σ_b (MPa)	77	140/150	99	310		
			B ($10^{-12}/Pa$)	2.85	150/160	102	300		

Constants of Dispersion Formula	
A_0	2.98048977E+00
A_1	-1.22396125E-02
A_2	3.91094110E-02
A_3	1.60680583E-03
A_4	1.39107243E-06
A_5	1.34851004E-05

Density		Solarization	
ρ (g/cm ³)	3.16	$\Delta\lambda$ (%)	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.3	0.9	1.3	1.3	1.4	1.7	2.1	3.2	3.2	4.5
-40 ~ -20	0.3	0.9	1.4	1.4	1.5	1.7	2.2	3.3	3.3	4.7
-20 ~ 0	0.3	1.0	1.4	1.4	1.5	1.9	2.2	3.5	3.5	4.9
0 ~ 20	0.3	1.0	1.5	1.5	1.6	1.9	2.4	3.8	3.8	5.2
20 ~ 40	0.3	1.0	1.5	1.5	1.6	1.9	2.5	3.8	3.8	5.5
40 ~ 60	0.4	1.1	1.6	1.6	1.6	2.2	2.6	4.1	4.1	5.8
60 ~ 80	0.4	1.3	1.8	1.8	1.8	2.3	2.8	4.3	4.3	6.1
80 ~ 100	0.4	1.3	1.9	1.9	1.9	2.4	3.0	4.5	4.5	6.3
100 ~ 120	0.6	1.4	2.0	2.0	2.0	2.6	3.2	4.8	4.8	6.5
120 ~ 140	0.8	1.6	2.2	2.2	2.3	2.8	3.4	5.0	5.0	6.7
140 ~ 160	1.0	1.8	2.3	2.4	2.5	3.1	3.6	5.3	5.3	7.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	415/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	391/365

Constants of dn/dt		
D_0	D_1	D_2
-2.98E-06	1.11E-08	-1.51E-11
E_0	E_1	λ_{TK}
9.37E-07	9.52E-10	2.89E-01

H-ZF12GT	762266	$n_d = 1.76182$	$v_d = 26.61$	$n_F - n_C = 0.028631$
		$n_e = 1.76857$	$v_e = 26.39$	$n_F - n_C' = 0.029118$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ	P _{d,C}	0.2875	RC (S)	1	λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70927	P _{e,d}	0.2358	RA (S)	1	2400	0.962	0.926
n_{1970}	1970.09	1.71556	P _{g,F}	0.6123	D _W	1	2200	0.980	0.960
n_{1530}	1529.58	1.72304	P' _{d,c}	0.2387	D _A	1	2000	0.992	0.984
n_{1129}	1128.64	1.73106	P' _{e,d}	0.2318	R _{OH} (S)	1	1800	0.999	0.998
n_{1064}	1064.00	1.73276	P' _{g,F}	0.5412	RP (S)	1	1600	0.999	0.998
n_t	1013.98	1.73422			CR		1400	0.999	0.998
n_s	852.11	1.74028	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/\text{K})$		1200	0.999	0.998
$n_{A'}$	768.19	1.74478					1060	0.999	0.998
n_r	706.52	1.74912					1000	0.999	0.998
n_C	656.27	1.75359					950	0.999	0.998
$n_{C'}$	643.85	1.75487					900	0.999	0.998
$n_{\text{He-Ne}}$	632.80	1.75608	Thermal Properties		$^{\circ}\text{C}$		850	0.999	0.998
n_D	589.29	1.76157					800	0.999	0.998
n_d	587.56	1.76182	ΔP_{Fe}	0.0012	-50/-40	77	750	0.999	0.998
n_e	546.07	1.76857	$\Delta P_{\text{g,F}}$	0.0129	-40/-30	78	700	0.999	0.998
n_F	486.13	1.78222	$\Delta P_{\text{C,t}}$	0.0075	-30/-20	78	650	0.999	0.998
$n_{F'}$	479.99	1.78399	$\Delta P_{\text{C,s}}$	0.0006	-20/-10	79	600	0.998	0.996
n_g	435.84	1.79975	Mechanical Properties		-10/0	80	550	0.997	0.994
n_h	404.66	1.81558			0/10	82	500	0.993	0.987
n_i	365.01	1.84562	T _g (°C)	614	10/20	83	480	0.991	0.983
			T _s (°C)	665	20/30	83	460	0.988	0.977
			T ₁₀ ^{14.5} (°C)	544	30/40	85	440	0.984	0.969
			T ₁₀ ¹³ (°C)	590	40/50	86	420	0.975	0.951
			$\alpha_{-50/80^{\circ}\text{C}}$ (10 ⁻⁷ /K)	83	50/60	87	400	0.946	0.895
			$\alpha_{100/300^{\circ}\text{C}}$ (10 ⁻⁷ /K)	103	60/70	88	390	0.901	0.812
			λ (W/(m K))	1.10	70/80	89	380	0.767	0.588
					80/90	90	370	0.458	0.210
					90/100	92	360	0.105	0.011
					100/110	93	350		
					110/120	93	340		
					120/130	95	330		
					130/140	98	320		
					140/150	99	310		
					150/160	102	300		
							290		
							280		

Constants of Dispersion Formula	
A ₀	2.98048977E+00
A ₁	-1.22396125E-02
A ₂	3.91094110E-02
A ₃	1.60680583E-03
A ₄	1.39107243E-06
A ₅	1.34851004E-05

Density		Solarization	
ρ (g/cm ³)	3.16	$\Delta\lambda$ (%)	-0.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.3	0.9	1.3	1.3	1.4	1.7	2.1	3.2	3.2	4.5
-40 ~ -20	0.3	0.9	1.4	1.4	1.5	1.7	2.2	3.3	3.3	4.7
-20 ~ 0	0.3	1.0	1.4	1.4	1.5	1.9	2.2	3.5	3.5	4.9
0 ~ 20	0.3	1.0	1.5	1.5	1.6	1.9	2.4	3.8	3.8	5.2
20 ~ 40	0.3	1.0	1.5	1.5	1.6	1.9	2.5	3.8	3.8	5.5
40 ~ 60	0.4	1.1	1.6	1.6	1.6	2.2	2.6	4.1	4.1	5.8
60 ~ 80	0.4	1.3	1.8	1.8	1.8	2.3	2.8	4.3	4.3	6.1
80 ~ 100	0.4	1.3	1.9	1.9	1.9	2.4	3.0	4.5	4.5	6.3
100 ~ 120	0.6	1.4	2.0	2.0	2.0	2.6	3.2	4.8	4.8	6.5
120 ~ 140	0.8	1.6	2.2	2.2	2.3	2.8	3.4	5.0	5.0	6.7
140 ~ 160	1.0	1.8	2.3	2.4	2.5	3.1	3.6	5.3	5.3	7.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	389/362

Constants of dn/dt		
D ₀	D ₁	D ₂
-2.98E-06	1.11E-08	-1.51E-11
E ₀	E ₁	λ_{TK}
9.37E-07	9.52E-10	2.89E-01

H-ZF13	785257	$n_d = 1.78472$	$v_d = 25.72$	$n_F - n_C = 0.030510$
		$n_e = 1.79191$	$v_e = 25.51$	$n_F - n_C' = 0.031042$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.73037	$P_{d,C}$	0.2868	RC (S)	1	2400	0.950	0.900
n_{1970}	1970.09	1.73662	$P_{e,d}$	0.2357	RA (S)	1	2200	0.976	0.950
n_{1530}	1529.58	1.74411	$P_{g,F}$	0.6142	D_W	1	2000	0.987	0.972
n_{1129}	1128.64	1.75231	$P'_{d,c'}$	0.2381	D_A	1	1800	0.993	0.984
n_{1064}	1064.00	1.75406	$P'_{e,d}$	0.2316	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.75557	$P'_{g,F'}$	0.5428	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.76192			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.76666	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.77124					1000	0.998	0.996
n_C	656.27	1.77597					950	0.998	0.996
$n_{C'}$	643.85	1.77733					900	0.998	0.996
n_{He-Ne}	632.80	1.77861					850	0.998	0.996
n_D	589.29	1.78446	ΔP_{Fe}	0.0015	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.78472	$\Delta P_{g,F}$	0.0133	-50/-40	80	750	0.998	0.996
n_e	546.07	1.79191	$\Delta P_{C,t}$	0.0039	-40/-30	81	700	0.998	0.996
n_F	486.13	1.80648	$\Delta P_{C,s}$	-0.0016	-30/-20	82	650	0.998	0.996
$n_{F'}$	479.99	1.80837	Thermal Properties		-20/-10	82	600	0.998	0.996
n_g	435.84	1.82522			-10/0	84	550	0.996	0.992
n_h	404.66	1.84210	Tg ($^{\circ}C$)	601	0/10	87	500	0.994	0.988
n_i	365.01	1.87399	Ts ($^{\circ}C$)	638	10/20	88	480	0.990	0.980
			$T_{10}^{14.5} (^{\circ}C)$	535	20/30	88	460	0.984	0.968
			$T_{10}^{13} (^{\circ}C)$	573	30/40	89	440	0.976	0.953
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	87	40/50	91	420	0.962	0.925
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	111	50/60	93	400	0.907	0.819
			λ (W/(m K))	0.98	60/70	93	390	0.812	0.658
					70/80	95	380	0.640	0.407
			Mechanical Properties		80/90	96	370	0.308	0.095
					90/100	98	360		
			HK (10^7Pa)	528	100/110	98	350		
			F_A	181	110/120	99	340		
			E (GPa)	91.5	120/130	102	330		
			G (GPa)	35.7	130/140	103	320		
			μ	0.281	140/150	104	310		
			σ_b (MPa)	70	150/160	107	300		
			B ($10^{-12}/Pa$)	2.73			290		
							280		

Constants of Dispersion Formula	
A_0	3.05227481E+00
A_1	-1.21808741E-02
A_2	4.16791281E-02
A_3	1.79932930E-03
A_4	1.91659600E-05
A_5	1.22563456E-05

Density		Solarization	
ρ (g/cm ³)	3.22	$\Delta\lambda$ (%)	-0.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.8	-0.1	0.4	0.4	0.5	0.8	1.3	2.4	2.5	3.7
-40 ~ -20	-0.7	0.0	0.4	0.4	0.6	0.8	1.3	2.5	2.6	3.9
-20 ~ 0	-0.7	0.0	0.5	0.5	0.6	1.0	1.4	2.7	2.8	4.3
0 ~ 20	-0.6	0.1	0.6	0.6	0.7	1.1	1.6	3.0	3.1	4.8
20 ~ 40	-0.6	0.2	0.7	0.7	0.8	1.2	1.9	3.2	3.2	5.1
40 ~ 60	-0.5	0.3	0.8	0.8	0.9	1.3	2.0	3.4	3.4	5.3
60 ~ 80	-0.5	0.4	0.9	0.9	1.0	1.5	2.2	3.6	3.7	5.7
80 ~ 100	-0.3	0.5	1.0	1.0	1.1	1.7	2.3	3.9	4.0	6.0
100 ~ 120	-0.2	0.6	1.1	1.2	1.2	2.0	2.4	4.2	4.3	6.3
120 ~ 140	0.0	0.7	1.2	1.3	1.3	2.1	2.7	4.4	4.5	6.5
140 ~ 160	0.0	0.8	1.3	1.4	1.5	2.2	2.9	4.6	4.7	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	425/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	393/365

Constants of dn/dt		
D_0	D_1	D_2
-4.52E-06	1.15E-08	-2.19E-11
E_0	E_1	λ_{TK}
9.64E-07	1.10E-09	2.96E-01

H-ZF13GT	785257	$n_d = 1.78472$	$v_d = 25.72$	$n_F - n_C = 0.030510$
		$n_e = 1.79191$	$v_e = 25.51$	$n_F - n_{C'} = 0.031042$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.73037	$P_{d,C}$	0.2868	RC (S)	1	2400	0.950	0.900
n_{1970}	1970.09	1.73662	$P_{e,d}$	0.2357	RA (S)	1	2200	0.976	0.950
n_{1530}	1529.58	1.74411	$P_{g,F}$	0.6142	D_W	1	2000	0.987	0.972
n_{1129}	1128.64	1.75231	$P'_{d,c'}$	0.2381	D_A	1	1800	0.993	0.984
n_{1064}	1064.00	1.75406	$P'_{e,d}$	0.2316	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.75557	$P'_{g,F'}$	0.5428	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.76192			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.76666	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.77124					1000	0.998	0.996
n_C	656.27	1.77597					950	0.998	0.996
$n_{C'}$	643.85	1.77733					900	0.998	0.996
n_{He-Ne}	632.80	1.77861					850	0.998	0.996
n_D	589.29	1.78446	ΔP_{Fe}	0.0015	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.78472	$\Delta P_{g,F}$	0.0133	-50/-40	80	750	0.998	0.996
n_e	546.07	1.79191	$\Delta P_{C,t}$	0.0039	-40/-30	81	700	0.998	0.996
n_F	486.13	1.80648	$\Delta P_{C,s}$	-0.0016	-30/-20	82	650	0.998	0.996
$n_{F'}$	479.99	1.80837	Thermal Properties		-20/-10	82	600	0.998	0.996
n_g	435.84	1.82522			-10/0	84	550	0.998	0.996
n_h	404.66	1.84210	Tg ($^{\circ}C$)	601	0/10	87	500	0.998	0.996
n_i	365.01	1.87399	Ts ($^{\circ}C$)	638	10/20	88	480	0.996	0.992
			$T_{10}^{14.5} (^{\circ}C)$	535	20/30	88	460	0.993	0.985
			$T_{10}^{13} (^{\circ}C)$	573	30/40	89	440	0.986	0.975
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	87	40/50	91	420	0.970	0.950
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	111	50/60	93	400	0.938	0.889
			λ (W/(m K))	0.98	60/70	93	390	0.891	0.801
					70/80	95	380	0.760	0.590
			Mechanical Properties		80/90	96	370	0.458	0.210
					90/100	98	360	0.068	0.005
			HK ($10^7 Pa$)	528	100/110	98	350		
			F_A	181	110/120	99	340		
			E (GPa)	91.5	120/130	102	330		
			G (GPa)	35.7	130/140	103	320		
			μ	0.281	140/150	104	310		
			σ_b (MPa)	70	150/160	107	300		
			B ($10^{-12}/Pa$)	2.73			290		
							280		

Constants of Dispersion Formula	
A_0	3.05227481E+00
A_1	-1.21808741E-02
A_2	4.16791281E-02
A_3	1.79932930E-03
A_4	1.91659600E-05
A_5	1.22563456E-05

Density		Solarization	
ρ (g/cm ³)	3.22	$\Delta\lambda$ (%)	-0.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.8	-0.1	0.4	0.4	0.5	0.8	1.3	2.4	2.5	3.7
-40 ~ -20	-0.7	0.0	0.4	0.4	0.6	0.8	1.3	2.5	2.6	3.9
-20 ~ 0	-0.7	0.0	0.5	0.5	0.6	1.0	1.4	2.7	2.8	4.3
0 ~ 20	-0.6	0.1	0.6	0.6	0.7	1.1	1.6	3.0	3.1	4.8
20 ~ 40	-0.6	0.2	0.7	0.7	0.8	1.2	1.9	3.2	3.2	5.1
40 ~ 60	-0.5	0.3	0.8	0.8	0.9	1.3	2.0	3.4	3.4	5.3
60 ~ 80	-0.5	0.4	0.9	0.9	1.0	1.5	2.2	3.6	3.7	5.7
80 ~ 100	-0.3	0.5	1.0	1.0	1.1	1.7	2.3	3.9	4.0	6.0
100 ~ 120	-0.2	0.6	1.1	1.2	1.2	2.0	2.4	4.2	4.3	6.3
120 ~ 140	0.0	0.7	1.2	1.3	1.3	2.1	2.7	4.4	4.5	6.5
140 ~ 160	0.0	0.8	1.3	1.4	1.5	2.2	2.9	4.6	4.7	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	420/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	391/365

Constants of dn/dt		
D_0	D_1	D_2
-4.52E-06	1.15E-08	-2.19E-11
E_0	E_1	λ_{TK}
9.64E-07	1.10E-09	2.96E-01

H-ZF50	741278	$n_d = 1.74077$	$v_d = 27.76$	$n_F - n_C = 0.026685$
		$n_e = 1.74707$	$v_e = 27.54$	$n_F - n_{C'} = 0.027125$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.69064	$P_{d,C}$	0.2886	RC (S)	1	2400	0.954	0.908
n_{1970}	1970.09	1.69692	$P_{e,d}$	0.2361	RA (S)	1	2200	0.968	0.941
n_{1530}	1529.58	1.70426	$P_{g,F}$	0.6078	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.71195	$P'_{d,c'}$	0.2396	D_A	1	1800	0.993	0.986
n_{1064}	1064.00	1.71354	$P'_{e,d}$	0.2323	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.71491	$P'_{g,F'}$	0.5379	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.72060			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.72483	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.72888					1000	0.998	0.996
n_C	656.27	1.73307					950	0.998	0.996
$n_{C'}$	643.85	1.73427					900	0.998	0.996
n_{He-Ne}	632.80	1.73540					850	0.998	0.996
n_D	589.29	1.74054	ΔP_{Fe}	0.0007	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.74077	$\Delta P_{g,F}$	0.0103	-50/-40	72	750	0.998	0.996
n_e	546.07	1.74707	$\Delta P_{C,t}$	0.0059	-40/-30	75	700	0.998	0.996
n_F	486.13	1.75976	$\Delta P_{C,s}$	0.0003	-30/-20	77	650	0.998	0.996
$n_{F'}$	479.99	1.76139	Thermal Properties		-20/-10	78	600	0.998	0.996
n_g	435.84	1.77598			-10/0	80	550	0.998	0.996
n_h	404.66	1.79059	Tg ($^{\circ}C$)	616	0/10	81	500	0.996	0.990
n_i	365.01	1.81850	Ts ($^{\circ}C$)	650	10/20	82	480	0.993	0.984
			$T_{10}^{14.5} (^{\circ}C)$	540	20/30	83	460	0.990	0.979
			$T_{10}^{13} (^{\circ}C)$	591	30/40	84	440	0.986	0.972
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	81	40/50	85	420	0.980	0.955
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	101	50/60	85	400	0.940	0.884
			λ (W/(m K))	1.16	60/70	86	390	0.885	0.785
					70/80	87	380	0.745	0.554
			Mechanical Properties		80/90	87	370	0.431	0.185
					90/100	88	360		
			HK (10^7Pa)	555	100/110	89	350		
			F_A	143	110/120	90	340		
			E (GPa)	90.4	120/130	91	330		
			G (GPa)	36.2	130/140	93	320		
			μ	0.248	140/150	94	310		
			σ_b (MPa)	58	150/160	95	300		
			B ($10^{-12}/Pa$)	2.62			290		
							280		

Constants of Dispersion Formula	
A_0	2.91816811E+00
A_1	-1.22621813E-02
A_2	3.41878382E-02
A_3	2.36117574E-03
A_4	-1.68240994E-04
A_5	2.26673138E-05

Density		Solarization	
ρ (g/cm ³)	3.05	$\Delta\lambda$ (%)	0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.8	1.4	1.8	1.8	1.8	2.1	2.6	3.6	3.6	4.7
-40 ~ -20	0.8	1.4	1.8	1.8	1.9	2.1	2.7	3.7	3.7	5.0
-20 ~ 0	0.9	1.5	1.9	1.9	1.9	2.3	2.7	3.8	3.8	5.2
0 ~ 20	0.9	1.5	1.9	1.9	1.9	2.4	2.8	4.0	4.0	5.4
20 ~ 40	0.8	1.6	1.9	2.0	2.1	2.6	3.1	4.3	4.3	5.8
40 ~ 60	1.0	1.7	2.0	2.1	2.2	2.6	3.1	4.6	4.6	6.0
60 ~ 80	1.2	1.9	2.3	2.3	2.4	2.9	3.2	4.8	4.8	6.3
80 ~ 100	1.4	2.0	2.4	2.5	2.7	3.0	3.4	4.9	4.9	6.6
100 ~ 120	1.4	2.1	2.6	2.7	2.7	3.1	3.6	5.1	5.1	6.8
120 ~ 140	1.5	2.2	2.9	3.0	3.1	3.5	3.8	5.4	5.4	7.1
140 ~ 160	1.7	2.4	3.0	3.0	3.1	3.6	4.0	5.6	5.6	7.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	389/364

Constants of dn/dt		
D_0	D_1	D_2
-1.87E-06	1.30E-08	-1.69E-11
E_0	E_1	λ_{TK}
8.65E-07	7.76E-10	2.93E-01

H-ZF50GT	741278	$n_d = 1.74077$	$v_d = 27.76$	$n_F - n_C = 0.026685$
		$n_e = 1.74707$	$v_e = 27.54$	$n_F - n_{C'} = 0.027125$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.69064	$P_{d,C}$	0.2886	RC (S)	1	2400	0.956	0.910
n_{1970}	1970.09	1.69692	$P_{e,d}$	0.2361	RA (S)	1	2200	0.969	0.944
n_{1530}	1529.58	1.70426	$P_{g,F}$	0.6078	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.71195	$P'_{d,c'}$	0.2396	D_A	1	1800	0.993	0.986
n_{1064}	1064.00	1.71354	$P'_{e,d}$	0.2323	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.71491	$P'_{g,F'}$	0.5379	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.72060			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.72483	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.72888					1000	0.998	0.996
n_C	656.27	1.73307					950	0.998	0.996
$n_{C'}$	643.85	1.73427					900	0.998	0.996
n_{He-Ne}	632.80	1.73540					850	0.998	0.996
n_D	589.29	1.74054	ΔP_{Fe}	0.0007	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.74077	$\Delta P_{g,F}$	0.0103	-50/-40	72	750	0.998	0.996
n_e	546.07	1.74707	$\Delta P_{C,t}$	0.0059	-40/-30	75	700	0.998	0.996
n_F	486.13	1.75976	$\Delta P_{C,s}$	0.0003	-30/-20	77	650	0.998	0.996
$n_{F'}$	479.99	1.76139	Thermal Properties		-20/-10	78	600	0.998	0.996
n_g	435.84	1.77598	Tg ($^{\circ}C$)	616	-10/0	80	550	0.998	0.996
n_h	404.66	1.79059	Ts ($^{\circ}C$)	650	0/10	81	500	0.996	0.994
n_i	365.01	1.81850	$T_{10}^{14.5} (^{\circ}C)$	540	10/20	82	480	0.993	0.991
			$T_{10}^{13} (^{\circ}C)$	591	20/30	83	460	0.990	0.988
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	81	30/40	84	440	0.987	0.981
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	101	40/50	85	420	0.982	0.965
			λ (W/(m K))	1.16	50/60	85	400	0.955	0.914
					60/70	86	390	0.914	0.834
					70/80	87	380	0.790	0.623
			Mechanical Properties		80/90	87	370	0.467	0.219
			HK ($10^7 Pa$)	555	90/100	88	360		
			F_A	143	100/110	89	350		
			E (GPa)	90.4	110/120	90	340		
			G (GPa)	36.2	120/130	91	330		
			μ	0.248	130/140	93	320		
			σ_b (MPa)	58	140/150	94	310		
			B ($10^{-12}/Pa$)	2.62	150/160	95	300		

Constants of Dispersion Formula	
A_0	2.91816811E+00
A_1	-1.22621813E-02
A_2	3.41878382E-02
A_3	2.36117574E-03
A_4	-1.68240994E-04
A_5	2.26673138E-05

Density		Solarization	
ρ (g/cm ³)	3.05	$\Delta\lambda$ (%)	0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.8	1.4	1.8	1.8	1.8	2.1	2.6	3.6	3.6	4.7
-40 ~ -20	0.8	1.4	1.8	1.8	1.9	2.1	2.7	3.7	3.7	5.0
-20 ~ 0	0.9	1.5	1.9	1.9	1.9	2.3	2.7	3.8	3.8	5.2
0 ~ 20	0.9	1.5	1.9	1.9	1.9	2.4	2.8	4.0	4.0	5.4
20 ~ 40	0.8	1.6	1.9	2.0	2.1	2.6	3.1	4.3	4.3	5.8
40 ~ 60	1.0	1.7	2.0	2.1	2.2	2.6	3.1	4.6	4.6	6.0
60 ~ 80	1.2	1.9	2.3	2.3	2.4	2.9	3.2	4.8	4.8	6.3
80 ~ 100	1.4	2.0	2.4	2.5	2.7	3.0	3.4	4.9	4.9	6.6
100 ~ 120	1.4	2.1	2.6	2.7	2.7	3.1	3.6	5.1	5.1	6.8
120 ~ 140	1.5	2.2	2.9	3.0	3.1	3.5	3.8	5.4	5.4	7.1
140 ~ 160	1.7	2.4	3.0	3.0	3.1	3.6	4.0	5.6	5.6	7.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	389/364

Constants of dn/dt		
D_0	D_1	D_2
-1.87E-06	1.30E-08	-1.69E-11
E_0	E_1	λ_{TK}
8.65E-07	7.76E-10	2.93E-01

H-ZF52N	847238	$n_d = 1.84666$	$v_d = 23.78$	$n_F - n_C = 0.035608$
		$n_e = 1.85504$	$v_e = 23.59$	$n_F - n_C' = 0.036247$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.78524	$P_{d,C}$	0.2856	RC (S)	1	2400	0.962	0.925
n_{1970}	1970.09	1.79201	$P_{e,d}$	0.2353	RA (S)	1	2200	0.980	0.961
n_{1530}	1529.58	1.80020	$P_{g,F}$	0.6195	D_W	1	2000	0.992	0.985
n_{1129}	1128.64	1.80936	$P'_{d,C'}$	0.2370	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.81133	$P'_{e,d}$	0.2312	$R_{OH}(S)$	1	1600	0.999	0.999
n_t	1013.98	1.81304	$P'_{g,F'}$	0.5476	RP (S)	1	1400	0.999	0.999
n_s	852.11	1.82028			CR	1	1200	0.999	0.999
$n_{A'}$	768.19	1.82573	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.999
n_r	706.52	1.83101					1000	0.999	0.999
n_C	656.27	1.83649					950	0.999	0.999
$n_{C'}$	643.85	1.83807					900	0.999	0.999
n_{He-Ne}	632.80	1.83956					850	0.999	0.999
n_D	589.29	1.84635	ΔP_{Fe}	0.0020	$^{\circ}C$	α	800	0.999	0.999
n_d	587.56	1.84666	$\Delta P_{g,F}$	0.0154	-50/-40	75	750	0.999	0.999
n_e	546.07	1.85504	$\Delta P_{C,t}$	0.0032	-40/-30	78	700	0.999	0.999
n_F	486.13	1.87210	$\Delta P_{C,s}$	-0.0022	-30/-20	79	650	0.999	0.999
$n_{F'}$	479.99	1.87431	Thermal Properties		-20/-10	81	600	0.999	0.999
n_g	435.84	1.89416			-10/0	82	550	0.997	0.995
n_h	404.66	1.91418	Tg ($^{\circ}C$)	632	0/10	83	500	0.993	0.986
n_i	365.01	1.95237	Ts ($^{\circ}C$)	662	10/20	84	480	0.990	0.980
			$T_{10}^{14.5} (^{\circ}C)$	582	20/30	85	460	0.985	0.971
			$T_{10}^{13} (^{\circ}C)$	608	30/40	85	440	0.977	0.954
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	83	40/50	86	420	0.958	0.918
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	101	50/60	86	400	0.911	0.830
			λ (W/(m K))	1.04	60/70	87	390	0.843	0.710
					70/80	87	380	0.671	0.450
			Mechanical Properties		80/90	88	370	0.332	0.110
					90/100	89	360		
			HK (10^7Pa)	531	100/110	90	350		
			F_A	176	110/120	92	340		
			E (GPa)	96.1	120/130	93	330		
			G (GPa)	38.1	130/140	94	320		
			μ	0.262	140/150	96	310		
			σ_b (MPa)	56	150/160	97	300		
			B ($10^{-12}/\text{Pa}$)	2.54			290		
							280		

Constants of Dispersion Formula	
A_0	3.25093122E+00
A_1	-1.35032313E-02
A_2	4.90304607E-02
A_3	2.49344608E-03
A_4	-1.81762799E-05
A_5	1.94686410E-05

Density		Solarization	
ρ (g/cm ³)	3.54	$\Delta\lambda$ (%)	-1.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.0	-0.9	0.0	0.5	0.5	0.7	1.0	1.6	1.7	3.0
-40 ~ -20	-0.9	-0.9	0.0	0.5	0.6	0.8	1.1	1.9	2.0	3.6
-20 ~ 0	-0.7	-0.8	0.1	0.5	0.6	0.9	1.3	2.4	2.5	4.0
0 ~ 20	-0.7	-0.7	0.2	0.6	0.7	0.9	1.4	2.7	3.1	4.4
20 ~ 40	-0.7	-0.6	0.4	0.7	0.7	1.0	1.6	3.1	3.7	4.8
40 ~ 60	-0.7	-0.6	0.4	0.7	0.7	1.0	1.9	3.5	4.0	5.3
60 ~ 80	-0.7	-0.6	0.4	0.7	0.8	1.2	2.1	3.8	4.3	5.7
80 ~ 100	-0.6	-0.6	0.5	0.7	0.8	1.3	2.1	4.1	4.6	6.1
100 ~ 120	-0.6	-0.5	0.5	0.8	0.9	1.3	2.2	4.4	4.8	6.5
120 ~ 140	-0.6	-0.4	0.7	0.8	1.0	1.5	2.3	4.7	5.0	6.9
140 ~ 160	-0.7	-0.4	0.8	0.9	1.1	1.9	2.5	5.1	5.4	7.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(404)/368
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	398/368

Constants of dn/dt		
D_0	D_1	D_2
-5.25E-06	7.18E-09	-2.89E-11
E_0	E_1	λ_{TK}
1.16E-06	2.39E-09	2.61E-01

H-ZF52NGT	847238	$n_d = 1.84666$	$v_d = 23.78$	$n_F - n_C = 0.035608$
		$n_e = 1.85504$	$v_e = 23.59$	$n_F - n_C' = 0.036247$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.78524	$P_{d,C}$	0.2856	RC (S)	1	2400	0.893	0.928
n_{1970}	1970.09	1.79201	$P_{e,d}$	0.2353	RA (S)	1	2200	0.954	0.953
n_{1530}	1529.58	1.80020	$P_{g,F}$	0.6195	D_W	1	2000	0.994	0.977
n_{1129}	1128.64	1.80936	$P'_{d,C'}$	0.2370	D_A	1	1800	0.999	0.985
n_{1064}	1064.00	1.81133	$P'_{e,d}$	0.2312	$R_{OH}(S)$	1	1600	0.999	0.994
n_t	1013.98	1.81304	$P'_{g,F'}$	0.5476	RP (S)	1	1400	0.999	0.995
n_s	852.11	1.82028			CR		1200	0.999	0.996
$n_{A'}$	768.19	1.82573	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.83101					1000	0.999	0.998
n_C	656.27	1.83649					950	0.999	0.998
$n_{C'}$	643.85	1.83807					900	0.999	0.998
n_{He-Ne}	632.80	1.83956					850	0.999	0.998
n_D	589.29	1.84635	ΔP_{Fe}	0.0020	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.84666	$\Delta P_{g,F}$	0.0154	-50/-40	75	750	0.999	0.998
n_e	546.07	1.85504	$\Delta P_{C,t}$	0.0032	-40/-30	78	700	0.998	0.997
n_F	486.13	1.87210	$\Delta P_{C,s}$	-0.0022	-30/-20	79	650	0.998	0.996
$n_{F'}$	479.99	1.87431	Thermal Properties		-20/-10	81	600	0.997	0.994
n_g	435.84	1.89416	$T_g (^{\circ}C)$	632	-10/0	82	550	0.996	0.992
n_h	404.66	1.91418	$T_s (^{\circ}C)$	662	0/10	83	500	0.991	0.983
n_i	365.01	1.95237	$T_{10}^{14.5} (^{\circ}C)$	582	10/20	84	480	0.988	0.977
			$T_{10}^{13} (^{\circ}C)$	608	20/30	85	460	0.985	0.970
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	83	30/40	85	440	0.978	0.957
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	101	40/50	86	420	0.964	0.930
			λ (W/(m K))	1.04	50/60	86	400	0.925	0.855
					60/70	87	390	0.863	0.745
					70/80	87	380	0.695	0.483
			Mechanical Properties		80/90	88	370	0.346	0.120
			HK (10^7 Pa)	531	90/100	89	360		
			F_A	176	100/110	90	350		
			E (GPa)	96.1	110/120	92	340		
			G (GPa)	38.1	120/130	93	330		
			μ	0.262	130/140	94	320		
			σ_b (MPa)	56	140/150	96	310		
			B (10^{-12} /Pa)	2.54	150/160	97	300		

Constants of Dispersion Formula	
A_0	3.25093122E+00
A_1	-1.35032313E-02
A_2	4.90304607E-02
A_3	2.49344608E-03
A_4	-1.81762799E-05
A_5	1.94686410E-05

Density		Solarization	
ρ (g/cm ³)	3.54	$\Delta\lambda$ (%)	-1.1

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.0	-0.9	0.0	0.5	0.5	0.7	1.0	1.6	1.7	3.0
-40 ~ -20	-0.9	-0.9	0.0	0.5	0.6	0.8	1.1	1.9	2.0	3.6
-20 ~ 0	-0.7	-0.8	0.1	0.5	0.6	0.9	1.3	2.4	2.5	4.0
0 ~ 20	-0.7	-0.7	0.2	0.6	0.7	0.9	1.4	2.7	3.1	4.4
20 ~ 40	-0.7	-0.6	0.4	0.7	0.7	1.0	1.6	3.1	3.7	4.8
40 ~ 60	-0.7	-0.6	0.4	0.7	0.7	1.0	1.9	3.5	4.0	5.3
60 ~ 80	-0.7	-0.6	0.4	0.7	0.8	1.2	2.1	3.8	4.3	5.7
80 ~ 100	-0.6	-0.6	0.5	0.7	0.8	1.3	2.1	4.1	4.6	6.1
100 ~ 120	-0.6	-0.5	0.5	0.8	0.9	1.3	2.2	4.4	4.8	6.5
120 ~ 140	-0.6	-0.4	0.7	0.8	1.0	1.5	2.3	4.7	5.0	6.9
140 ~ 160	-0.7	-0.4	0.8	0.9	1.1	1.9	2.5	5.1	5.4	7.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(399)/369
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	395/368

Constants of dn/dt		
D_0	D_1	D_2
-5.25E-06	7.18E-09	-2.89E-11
E_0	E_1	λ_{TK}
1.16E-06	2.39E-09	2.61E-01

H-ZF52B	847238	$n_d = 1.84666$	$v_d = 23.78$	$n_F - n_C = 0.035608$
		$n_e = 1.85504$	$v_e = 23.59$	$n_F - n_{C'} = 0.036247$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2845	RC (S)	1	2400	0.957	0.915
n_{1970}	1970.09		$P_{e,d}$	0.2353	RA (S)	1	2200	0.978	0.957
n_{1530}	1529.58		$P_{g,F}$	0.6277	D_W	1	2000	0.993	0.987
n_{1129}	1128.64	1.80930	$P'_{d,C'}$	0.2359	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.81131	$P'_{e,d}$	0.2312	$R_{OH}(S)$	1	1600	0.998	0.997
n_t	1013.98	1.81304	$P'_{g,F'}$	0.5554	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.82033			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.82578	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.83105					1000	0.999	0.998
n_C	656.27	1.83653					950	0.999	0.998
$n_{C'}$	643.85	1.83811					900	0.999	0.998
n_{He-Ne}	632.80	1.83959					850	0.999	0.998
n_D	589.29	1.84636	ΔP_{Fe}	0.0029	$^{\circ}C$	α	800	0.998	0.997
n_d	587.56	1.84666	$\Delta P_{g,F}$	0.0236	-50/-40	67	750	0.998	0.997
n_e	546.07	1.85504	$\Delta P_{C,t}$	0.0043	-40/-30	75	700	0.998	0.996
n_F	486.13	1.87213	$\Delta P_{C,s}$	-0.0025	-30/-20	84	650	0.998	0.996
$n_{F'}$	479.99	1.87435	Thermal Properties		-20/-10	85	600	0.997	0.994
n_g	435.84	1.89448	Tg ($^{\circ}C$)	551	-10/0	85	550	0.996	0.993
n_h	404.66	1.91508	Ts ($^{\circ}C$)	591	0/10	86	500	0.993	0.987
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	507	10/20	86	480	0.985	0.971
			$T_{10}^{13} (^{\circ}C)$	540	20/30	86	460	0.979	0.958
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	83	30/40	87	440	0.968	0.937
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	99	40/50	87	420	0.952	0.906
			λ (W/(m K))	0.82	50/60	88	400	0.919	0.845
					60/70	89	390	0.839	0.704
					70/80	89	380	0.729	0.532
					80/90	90	370	0.455	0.207
					90/100	91	360	0.135	0.018
					100/110	93	350		
					110/120	95	340		
					120/130	98	330		
					130/140	99	320		
					140/150	101	310		
					150/160	103	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.25501075E+00
A_1	-1.55546766E-02
A_2	4.62097153E-02
A_3	3.54440350E-03
A_4	-2.41943734E-04
A_5	4.01197414E-05

Density		Solarization	
ρ (g/cm ³)	3.71	$\Delta\lambda$ (%)	-0.5

Mechanical Properties	
HK (10 ⁷ Pa)	450
F_A	195
E (GPa)	96.7
G (GPa)	37.9
μ	0.276
σ_b (MPa)	
B (10 ⁻¹² /Pa)	2.53

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-2.8	-2.6	-2.4	-2.3	-2.2	-2.1	-1.9	-1.7	-1.5	-1.0
-40 ~ -20	-2.7	-2.6	-2.3	-2.3	-2.2	-2.0	-1.8	-1.6	-1.4	-0.8
-20 ~ 0	-2.7	-2.4	-2.1	-2.0	-2.0	-1.9	-1.6	-1.4	-1.3	-0.5
0 ~ 20	-2.6	-2.3	-1.9	-1.9	-1.9	-1.7	-1.5	-1.2	-1.2	-0.4
20 ~ 40	-2.5	-2.2	-1.8	-1.8	-1.7	-1.5	-1.4	-1.1	-0.8	-0.1
40 ~ 60	-2.3	-2.0	-1.6	-1.6	-1.5	-1.3	-1.2	-0.9	-0.6	0.2
60 ~ 80	-2.3	-1.9	-1.6	-1.6	-1.5	-1.2	-1.1	-0.7	-0.3	0.6
80 ~ 100	-2.3	-1.7	-1.3	-1.3	-1.2	-1.0	-0.9	-0.5	-0.1	0.9
100 ~ 120	-2.1	-1.5	-1.1	-1.1	-1.0	-0.8	-0.7	-0.4	0.1	1.1
120 ~ 140	-2.0	-1.1	-0.9	-0.8	-0.8	-0.6	-0.3	-0.1	0.3	1.4
140 ~ 160	-1.9	-0.9	-0.7	-0.6	-0.6	-0.4	-0.1	0.1	0.4	1.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(420)/375
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	412/372

Constants of dn/dt		
D_0	D_1	D_2
-7.08E-06	1.39E-08	-1.78E-11
E_0	E_1	λ_{TK}
5.17E-07	6.08E-10	2.48E-01

H-ZF53	808227	$n_d = 1.80810$	$v_d = 22.70$	$n_F - n_C = 0.035602$
		$n_e = 1.81646$	$v_e = 22.51$	$n_F - n_C' = 0.036272$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2848	RC (S)	1	2400	0.952	0.907
n_{1970}	1970.09		$P_{e,d}$	0.2348	RA (S)	1	2200	0.977	0.955
n_{1530}	1529.58		$P_{g,F}$	0.6244	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.77093	$P'_{d,c'}$	0.2365	D_A	1	1800	0.996	0.992
n_{1064}	1064.00	1.77296	$P'_{e,d}$	0.2305	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.77469	$P'_{g,F'}$	0.5511	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.78190			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.78728	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79250					1000	0.999	0.998
n_C	656.27	1.79796					950	0.999	0.998
$n_{C'}$	643.85	1.79952					900	0.999	0.998
n_{He-Ne}	632.80	1.80101					850	0.999	0.998
n_D	589.29	1.80779	ΔP_{Fe}	0.0026	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80810	$\Delta P_{g,F}$	0.0185	-50/-40	81	750	0.999	0.998
n_e	546.07	1.81646	$\Delta P_{C,t}$	0.0035	-40/-30	83	700	0.999	0.998
n_F	486.13	1.83356	$\Delta P_{C,s}$	-0.0038	-30/-20	84	650	0.999	0.998
$n_{F'}$	479.99	1.83580	Thermal Properties		-20/-10	85	600	0.998	0.997
n_g	435.84	1.85579	$T_g (^{\circ}C)$	554	-10/0	87	550	0.996	0.991
n_h	404.66	1.87626	$T_s (^{\circ}C)$	590	0/10	89	500	0.988	0.975
n_i	365.01	1.91704	$T_{10}^{14.5} (^{\circ}C)$	510	10/20	93	480	0.983	0.966
			$T_{10}^{13} (^{\circ}C)$	543	20/30	94	460	0.980	0.960
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	93	30/40	96	440	0.970	0.942
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	118	40/50	97	420	0.953	0.907
			λ (W/(m K))	0.81	50/60	99	400	0.905	0.819
					60/70	101	390	0.815	0.664
					70/80	102	380	0.623	0.388
			Mechanical Properties		80/90	103	370	0.257	0.066
			HK (10^7Pa)	431	90/100	104	360		
			F_A	232	100/110	105	350		
			E (GPa)	82.2	110/120	106	340		
			G (GPa)	32.3	120/130	108	330		
			μ	0.273	130/140	113	320		
			σ_b (MPa)		140/150	114	310		
			B ($10^{-12}/\text{Pa}$)		150/160	119	300		

Constants of Dispersion Formula	
A_0	3.12913534E+00
A_1	-1.92479858E-02
A_2	3.50931423E-02
A_3	7.14577171E-03
A_4	-8.23234224E-04
A_5	7.26619702E-05

Density		Solarization	
ρ (g/cm ³)	3.32	$\Delta\lambda$ (%)	-1.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-7.5	-7.0	-5.3	-5.2	-5.1	-4.5	-3.9	-2.8	-2.6	-1.2
-40 ~ -20	-7.1	-6.7	-5.0	-4.9	-4.8	-4.2	-3.7	-2.6	-2.5	-0.9
-20 ~ 0	-6.8	-6.4	-4.6	-4.5	-4.4	-3.8	-3.6	-2.5	-2.4	-0.6
0 ~ 20	-6.4	-5.8	-4.3	-4.2	-4.0	-3.5	-3.3	-2.2	-2.0	-0.4
20 ~ 40	-5.7	-5.1	-4.1	-4.0	-3.7	-3.4	-3.0	-2.0	-1.8	-0.2
40 ~ 60	-5.2	-4.7	-4.0	-3.9	-3.6	-3.3	-2.9	-1.4	-1.2	0.6
60 ~ 80	-4.9	-4.5	-3.9	-3.8	-3.5	-3.3	-2.8	-1.2	-1.0	0.9
80 ~ 100	-4.6	-4.2	-3.9	-3.8	-3.4	-3.3	-2.7	-1.1	-0.9	0.4
100 ~ 120	-4.5	-4.1	-3.8	-3.7	-3.4	-3.1	-2.5	-1.1	-0.9	1.0
120 ~ 140	-4.4	-4.0	-3.7	-3.6	-3.4	-3.1	-2.5	-1.1	-0.9	1.0
140 ~ 160	-4.3	-3.9	-3.7	-3.6	-3.4	-3.1	-2.5	-1.1	-0.9	0.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	450/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	398/368

Constants of dn/dt		
D_0	D_1	D_2
-1.38E-05	2.31E-08	-5.22E-11
E_0	E_1	λ_{TK}
1.50E-06	-6.13E-10	2.33E-01

H-ZF56	855248	$n_d = 1.85478$	$v_d = 24.80$	$n_F - n_C = 0.034469$
		$n_e = 1.86290$	$v_e = 24.61$	$n_F - n_C' = 0.035057$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.79256	$P_{d,C}$	0.2872	RC (S)	1	2400	0.971	0.943
n_{1970}	1970.09	1.79984	$P_{e,d}$	0.2356	RA (S)	1	2200	0.982	0.964
n_{1530}	1529.58	1.80851	$P_{g,F}$	0.6119	D_W	1	2000	0.992	0.985
n_{1129}	1128.64	1.81792	$P'_{d,c'}$	0.2385	D_A	1	1800	0.994	0.988
n_{1064}	1064.00	1.81992	$P'_{e,d}$	0.2316	$R_{OH}(S)$	1	1600	0.997	0.995
n_t	1013.98	1.82165	$P'_{g,F'}$	0.5411	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.82888			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.83428	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.83948					1000	0.999	0.998
n_C	656.27	1.84488					950	0.999	0.998
$n_{C'}$	643.85	1.84642					900	0.999	0.998
n_{He-Ne}	632.80	1.84787					850	0.999	0.998
n_D	589.29	1.85448	ΔP_{Fe}	0.0007	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.85478	$\Delta P_{g,F}$	0.0094	-50/-40	64	750	0.999	0.998
n_e	546.07	1.86290	$\Delta P_{C,t}$	0.0137	-40/-30	67	700	0.999	0.997
n_F	486.13	1.87935	$\Delta P_{C,s}$	0.0043	-30/-20	73	650	0.999	0.997
$n_{F'}$	479.99	1.88147	Thermal Properties		-20/-10	73	600	0.998	0.996
n_g	435.84	1.90044	Tg ($^{\circ}C$)	585	-10/0	74	550	0.998	0.995
n_h	404.66	1.91945	Ts ($^{\circ}C$)	623	0/10	74	500	0.996	0.992
n_i	365.01	1.95583	$T_{10}^{14.5} (^{\circ}C)$	530	10/20	77	480	0.991	0.982
			$T_{10}^{13} (^{\circ}C)$	563	20/30	80	460	0.988	0.975
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	76	30/40	80	440	0.983	0.967
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	97	40/50	80	420	0.976	0.953
			λ (W/(m K))	1.23	50/60	83	400	0.961	0.924
					60/70	85	390	0.929	0.862
					70/80	85	380	0.897	0.804
					80/90	86	370	0.835	0.697
					90/100	88	360	0.683	0.466
					100/110	88	350	0.361	0.131
					110/120	89	340		
					120/130	89	330		
					130/140	93	320		
					140/150	93	310		
					150/160	95	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.28426529E+00
A_1	-1.47934043E-02
A_2	4.81498133E-02
A_3	2.74086829E-03
A_4	-1.33744832E-04
A_5	2.63779943E-05

Density		Solarization	
ρ (g/cm ³)	3.49	$\Delta\lambda$ (%)	-1.7

Mechanical Properties	
HK (10 ⁷ Pa)	572
F_A	201
E (GPa)	106.5
G (GPa)	42.3
μ	0.257
σ_b (MPa)	106
B (10 ⁻¹² /Pa)	3.06

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.3	0.7	1.3	1.4	1.5	1.7	2.1	2.6	2.8	4.7
-40 ~ -20	0.6	1.0	1.6	1.6	1.8	2.1	2.6	3.1	3.2	5.3
-20 ~ 0	0.8	1.2	1.8	1.8	1.9	2.3	2.9	3.3	3.4	5.7
0 ~ 20	1.0	1.3	2.0	2.1	2.2	2.6	3.1	3.5	3.7	6.0
20 ~ 40	1.1	1.5	2.3	2.4	2.5	2.9	3.4	3.8	4.0	6.5
40 ~ 60	1.2	1.8	2.6	2.6	2.7	3.2	3.6	4.2	4.3	6.9
60 ~ 80	1.4	2.1	2.8	2.9	3.1	3.5	4.0	4.6	4.7	7.3
80 ~ 100	1.5	2.4	3.0	3.1	3.3	3.7	4.3	4.9	5.1	7.6
100 ~ 120	1.7	2.6	3.2	3.3	3.5	3.9	4.6	5.2	5.3	8.0
120 ~ 140	1.8	2.7	3.5	3.6	3.7	4.1	4.8	5.4	5.6	8.2
140 ~ 160	1.9	2.8	3.8	3.8	3.9	4.3	5.1	5.6	5.7	8.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(395)/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	390/355

Constants of dn/dt		
D_0	D_1	D_2
-1.60E-06	1.75E-08	-2.60E-11
E_0	E_1	λ_{TK}
6.93E-07	5.83E-10	3.15E-01

H-ZF62	923209	$n_d = 1.92286$	$v_d = 20.88$	$n_F - n_C = 0.044198$
		$n_e = 1.93323$	$v_e = 20.71$	$n_F - n_C' = 0.045071$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.84761	$P_{d,C}$	0.2824	RC (S)	1	2400	0.957	0.916
n_{1970}	1970.09	1.85605	$P_{e,d}$	0.2346	RA (S)	1	2200	0.978	0.956
n_{1530}	1529.58	1.86617	$P_{g,F}$	0.6374	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.87734	$P'_{d,c'}$	0.2341	D_A	1	1800	0.999	0.998
n_{1064}	1064.00	1.87974	$P'_{e,d}$	0.2301	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.88181	$P'_{g,F'}$	0.5627	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.89061			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.89723	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.90366					1000	0.999	0.998
n_C	656.27	1.91038					950	0.999	0.998
$n_{C'}$	643.85	1.91231					900	0.999	0.998
n_{He-Ne}	632.80	1.91413					850	0.999	0.998
n_D	589.29	1.92248	ΔP_{Fe}	0.0042	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.92286	$\Delta P_{g,F}$	0.0284	-50/-40	54	750	0.999	0.998
n_e	546.07	1.93323	$\Delta P_{C,t}$	0.0051	-40/-30	56	700	0.999	0.998
n_F	486.13	1.95457	$\Delta P_{C,s}$	-0.0032	-30/-20	58	650	0.999	0.998
$n_{F'}$	479.99	1.95738	Thermal Properties		-20/-10	60	600	0.997	0.995
n_g	435.84	1.98274	$T_g (^{\circ}C)$	690	-10/0	61	550	0.997	0.986
n_h	404.66	2.00892	$T_s (^{\circ}C)$	725	0/10	62	500	0.983	0.965
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	625	10/20	62	480	0.976	0.952
			$T_{10}^{13} (^{\circ}C)$	664	20/30	63	460	0.966	0.934
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	61	30/40	63	440	0.950	0.902
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	74	40/50	64	420	0.917	0.840
			$\lambda (W/(m\ K))$	0.99	50/60	64	400	0.791	0.625
					60/70	65	390	0.586	0.343
					70/80	65	380	0.210	0.044
					80/90	65	370		
					90/100	67	360		
					100/110	67	350		
					110/120	68	340		
					120/130	70	330		
					130/140	70	320		
					140/150	72	310		
					150/160	72	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.49733468E+00
A_1	-1.75493772E-02
A_2	5.99594355E-02
A_3	3.90005481E-03
A_4	-1.39531497E-04
A_5	4.41807948E-05

Density		Solarization	
$\rho (g/cm^3)$	3.93	$\Delta\lambda (\%)$	-0.4

Mechanical Properties	
HK (10^7Pa)	485
F_A	228
E (GPa)	98.0
G (GPa)	39.0
μ	0.257
σ_b (MPa)	71
B ($10^{-12}/Pa$)	2.85

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.4	0.1	0.7	0.7	0.8	1.0	1.6	3.3	3.5	6.2
-40 ~ -20	0.1	0.5	1.0	1.1	1.2	1.5	2.2	3.9	4.1	6.7
-20 ~ 0	0.4	0.7	1.0	1.2	1.3	1.7	2.6	4.4	4.6	7.1
0 ~ 20	0.5	1.0	1.2	1.3	1.5	1.8	2.8	4.8	4.9	7.6
20 ~ 40	0.5	1.2	1.5	1.6	1.7	1.9	3.1	5.2	5.3	8.2
40 ~ 60	0.6	1.3	1.6	1.7	1.8	2.2	3.4	5.7	5.9	8.8
60 ~ 80	0.8	1.5	1.9	2.0	2.2	2.6	3.7	6.2	6.3	9.3
80 ~ 100	1.0	1.7	2.2	2.3	2.5	3.0	4.0	6.5	6.7	9.7
100 ~ 120	1.3	1.9	2.3	2.3	2.5	3.2	4.3	6.7	6.9	10.1
120 ~ 140	1.5	2.0	2.4	2.5	2.6	3.4	4.5	6.9	7.1	10.5
140 ~ 160	1.7	2.1	2.6	2.8	2.9	3.7	4.7	7.1	7.2	10.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(435)/385
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	415/382

Constants of dn/dt		
D_0	D_1	D_2
-2.92E-06	1.58E-08	-3.18E-11
E_0	E_1	λ_{TK}
8.11E-07	8.16E-10	3.44E-01

H-ZF62GT	923209	$n_d = 1.92286$	$v_d = 20.88$	$n_F - n_C = 0.044198$
		$n_e = 1.93323$	$v_e = 20.71$	$n_F - n_C' = 0.045071$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42	1.84761	$P_{d,C}$	0.2824	RC (S)	1	2400	0.961	0.924
n_{1970}	1970.09	1.85605	$P_{e,d}$	0.2346	RA (S)	1	2200	0.984	0.969
n_{1530}	1529.58	1.86617	$P_{g,F}$	0.6374	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.87734	$P'_{d,c'}$	0.2341	D_A	1	1800	0.999	0.998
n_{1064}	1064.00	1.87974	$P'_{e,d}$	0.2301	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.88181	$P'_{g,F'}$	0.5627	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.89061			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.89723	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.90366					1000	0.999	0.998
n_C	656.27	1.91038					950	0.999	0.998
$n_{C'}$	643.85	1.91231					900	0.999	0.998
n_{He-Ne}	632.80	1.91413					850	0.999	0.998
n_D	589.29	1.92248	ΔP_{Fe}	0.0042	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.92286	$\Delta P_{g,F}$	0.0284	-50/-40	54	750	0.999	0.998
n_e	546.07	1.93323	$\Delta P_{C,t}$	0.0051	-40/-30	56	700	0.999	0.998
n_F	486.13	1.95457	$\Delta P_{C,s}$	-0.0032	-30/-20	58	650	0.999	0.998
$n_{F'}$	479.99	1.95738	Thermal Properties		-20/-10	60	600	0.997	0.995
n_g	435.84	1.98274	$T_g (^{\circ}C)$	690	-10/0	61	550	0.997	0.994
n_h	404.66	2.00892	$T_s (^{\circ}C)$	725	0/10	62	500	0.991	0.983
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	625	10/20	62	480	0.988	0.975
			$T_{10}^{13} (^{\circ}C)$	664	20/30	63	460	0.983	0.965
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	61	30/40	63	440	0.974	0.949
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	74	40/50	64	420	0.945	0.894
			$\lambda (W/(m K))$	0.99	50/60	64	400	0.836	0.700
					60/70	65	390	0.615	0.378
					70/80	65	380	0.245	0.060
					80/90	65	370		
					90/100	67	360		
					100/110	67	350		
					110/120	68	340		
					120/130	70	330		
					130/140	70	320		
					140/150	72	310		
					150/160	72	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.49733468E+00
A_1	-1.75493772E-02
A_2	5.99594355E-02
A_3	3.90005481E-03
A_4	-1.39531497E-04
A_5	4.41807948E-05

Density		Solarization	
$\rho (g/cm^3)$	3.93	$\Delta\lambda (%)$	-0.4

Mechanical Properties	
HK ($10^7 Pa$)	485
F_A	228
E (GPa)	98.0
G (GPa)	39.0
μ	0.257
$\sigma_b (MPa)$	71
B ($10^{-12}/Pa$)	2.85

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.4	0.1	0.7	0.7	0.8	1.0	1.6	3.3	3.5	6.2
-40 ~ -20	0.1	0.5	1.0	1.1	1.2	1.5	2.2	3.9	4.1	6.7
-20 ~ 0	0.4	0.7	1.0	1.2	1.3	1.7	2.6	4.4	4.6	7.1
0 ~ 20	0.5	1.0	1.2	1.3	1.5	1.8	2.8	4.8	4.9	7.6
20 ~ 40	0.5	1.2	1.5	1.6	1.7	1.9	3.1	5.2	5.3	8.2
40 ~ 60	0.6	1.3	1.6	1.7	1.8	2.2	3.4	5.7	5.9	8.8
60 ~ 80	0.8	1.5	1.9	2.0	2.2	2.6	3.7	6.2	6.3	9.3
80 ~ 100	1.0	1.7	2.2	2.3	2.5	3.0	4.0	6.5	6.7	9.7
100 ~ 120	1.3	1.9	2.3	2.3	2.5	3.2	4.3	6.7	6.9	10.1
120 ~ 140	1.5	2.0	2.4	2.5	2.6	3.4	4.5	6.9	7.1	10.5
140 ~ 160	1.7	2.1	2.6	2.8	2.9	3.7	4.7	7.1	7.2	10.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(415)/382
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	408/380

Constants of dn/dt		
D_0	D_1	D_2
-2.92E-06	1.58E-08	-3.18E-11
E_0	E_1	λ_{TK}
8.11E-07	8.16E-10	3.44E-01

H-ZF72B		923189	n _d = 1.92286		v _d = 18.90		n _F – n _C = 0.048837										
			n _e = 1.93429		v _e = 18.74		n _F – n _C ´ = 0.049853										
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance										
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm								
n ₂₃₂₅	2325.42	1.84193					2400	0.983	0.966								
n ₁₉₇₀	1970.09	1.85076					2200	0.995	0.990								
n ₁₅₃₀	1529.58	1.86140					2000	0.997	0.994								
n ₁₁₂₉	1128.64	1.87330					1800	0.997	0.994								
n ₁₀₆₄	1064.00	1.87587	1600	0.997	0.994												
n _t	1013.98	1.87811	1400	0.997	0.994												
n _s	852.11	1.88761	1200	0.997	0.994												
n _A ´	768.19	1.89481	1060	0.997	0.994												
n _r	706.52	1.90181	1000	0.997	0.994												
n _C	656.27	1.90916	950	0.997	0.994												
n _C ´	643.85	1.91127	900	0.997	0.994												
n _{He-Ne}	632.80	1.91327	850	0.997	0.994												
n _D	589.29	1.92245	800	0.997	0.994												
n _d	587.56	1.92286	750	0.997	0.994												
n _e	546.07	1.93429	700	0.997	0.994												
n _F	486.13	1.95800	650	0.997	0.994												
n _F ´	479.99	1.96112	600	0.997	0.994												
n _g	435.84	1.98974	550	0.990	0.981												
n _h	404.66	2.01970	500	0.973	0.954												
n _i	365.01		480	0.966	0.938												
			460	0.954	0.915												
			440	0.933	0.875												
			420	0.890	0.788												
Constants of Dispersion Formula				400	0.642	0.410											
				390	0.253	0.066											
				380													
				370													
				360													
				350													
Density				340													
				330													
				320													
				310													
				300													
				290													
Solarization				280													
			Coloration Code														
			λ ₈₀ (λ ₇₀)/λ ₅		(440)/385		Coloration of Internal Transmittance										
			λτ ₈₀ /λτ ₅		422/389		Constants of dn/dt										
			D ₀		D ₁		D ₂										
			-3.91E-06		1.21E-08		-2.37E-11										
Range of Temperature (°C)			Temperature Coefficients of Refractive Index						E ₀		E ₁		λ _{TK}				
			dn/dt relative (×10 ⁻⁶ / °C)								1.14E-06		1.61E-09		3.25E-01		
			t	s	C	C'	He-Ne	d	e	F	F'	g					
			-60 ~ -40	-0.5	0.3	0.8	0.9	1.0	1.4	2.2	4.3	4.4	6.7				
			-40 ~ -20	-0.3	0.3	0.9	1.0	1.1	1.6	2.5	4.5	4.6	7.0				
			-20 ~ 0	-0.1	0.4	1.1	1.2	1.3	1.9	2.9	4.9	5.0	8.0				
0 ~ 20	-0.1	0.5	1.2	1.3	1.6	2.1	3.1	5.3	5.5	8.6							
20 ~ 40	0.0	0.6	1.6	1.7	1.8	2.4	3.3	5.7	6.0	9.4							
40 ~ 60	0.2	0.8	1.8	1.8	2.0	2.6	3.6	6.3	6.5	9.9							
60 ~ 80	0.3	1.0	1.9	2.0	2.2	2.9	4.0	6.8	7.0	10.7							
80 ~ 100	0.5	1.2	2.1	2.3	2.4	3.1	4.3	7.3	7.5	11.1							
100 ~ 120	0.6	1.4	2.3	2.4	2.5	3.3	4.6	7.8	8.0	11.9							
120 ~ 140	0.6	1.5	2.5	2.6	2.8	3.6	4.8	8.2	8.3	12.4							
140 ~ 160	0.7	1.7	2.7	2.9	3.0	3.8	5.1	8.6	8.7	12.8							

H-ZF72GT	923189	$n_d = 1.92286$	$v_d = 18.90$	$n_F - n_C = 0.048837$
		$n_e = 1.93429$	$v_e = 18.74$	$n_F - n_{C'} = 0.049853$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.84193	$P_{d,C}$	0.2805	RC (S)	1	2400	0.983	0.966
n_{1970}	1970.09	1.85076	$P_{e,d}$	0.2340	RA (S)	1	2200	0.995	0.990
n_{1530}	1529.58	1.86140	$P_{g,F}$	0.6499	D_W	1	2000	0.997	0.994
n_{1129}	1128.64	1.87330	$P'_{d,C'}$	0.2325	D_A	1	1800	0.999	0.998
n_{1064}	1064.00	1.87587	$P'_{e,d}$	0.2293	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.87811	$P'_{g,F'}$	0.5741	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.88761			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.89481	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.90181					1000	0.999	0.998
n_C	656.27	1.90916					950	0.999	0.998
$n_{C'}$	643.85	1.91127					900	0.999	0.998
n_{He-Ne}	632.80	1.91327					850	0.999	0.998
n_D	589.29	1.92245	ΔP_{Fe}	0.0057	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.92286	$\Delta P_{g,F}$	0.0377	-50/-40	57	750	0.999	0.998
n_e	546.07	1.93429	$\Delta P_{C,t}$	0.0041	-40/-30	60	700	0.999	0.998
n_F	486.13	1.95800	$\Delta P_{C,s}$	-0.0045	-30/-20	62	650	0.999	0.998
$n_{F'}$	479.99	1.96112	Thermal Properties		-20/-10	65	600	0.999	0.997
n_g	435.84	1.98974	Tg ($^{\circ}C$)	656	-10/0	66	550	0.998	0.997
n_h	404.66	2.01970	Ts ($^{\circ}C$)	684	0/10	67	500	0.996	0.991
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	585	10/20	69	480	0.988	0.977
			$T_{10}^{13} (^{\circ}C)$	634	20/30	69	460	0.983	0.965
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	65	30/40	70	440	0.974	0.949
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	81	40/50	70	420	0.959	0.919
			λ (W/(m K))	1.13	50/60	70	400	0.921	0.848
					60/70	71	390	0.671	0.450
					70/80	71	380	0.305	0.093
					80/90	72	370		
					90/100	72	360		
					100/110	73	350		
					110/120	74	340		
					120/130	74	330		
					130/140	75	320		
					140/150	76	310		
					150/160	77	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.47907547E+00
A_1	-1.82056514E-02
A_2	6.44069814E-02
A_3	4.67488595E-03
A_4	-2.34014347E-04
A_5	6.37833754E-05

Density		Solarization	
ρ (g/cm ³)	3.57	$\Delta\lambda$ (%)	-0.4

Mechanical Properties	
HK (10 ⁷ Pa)	488
F_A	206
E (GPa)	100.3
G (GPa)	40.3
μ	0.243
σ_b (MPa)	56
B (10 ⁻¹² /Pa)	3.24

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.5	0.3	0.8	0.9	1.0	1.4	2.2	4.3	4.4	6.7
-40 ~ -20	-0.3	0.3	0.9	1.0	1.1	1.6	2.5	4.5	4.6	7.0
-20 ~ 0	-0.1	0.4	1.1	1.2	1.3	1.9	2.9	4.9	5.0	8.0
0 ~ 20	-0.1	0.5	1.2	1.3	1.6	2.1	3.1	5.3	5.5	8.6
20 ~ 40	0.0	0.6	1.6	1.7	1.8	2.4	3.3	5.7	6.0	9.4
40 ~ 60	0.2	0.8	1.8	1.8	2.0	2.6	3.6	6.3	6.5	9.9
60 ~ 80	0.3	1.0	1.9	2.0	2.2	2.9	4.0	6.8	7.0	10.7
80 ~ 100	0.5	1.2	2.1	2.3	2.4	3.1	4.3	7.3	7.5	11.1
100 ~ 120	0.6	1.4	2.3	2.4	2.5	3.3	4.6	7.8	8.0	11.9
120 ~ 140	0.6	1.5	2.5	2.6	2.8	3.6	4.8	8.2	8.3	12.4
140 ~ 160	0.7	1.7	2.7	2.9	3.0	3.8	5.1	8.6	8.7	12.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(420)/385
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	417/387

Constants of dn/dt		
D_0	D_1	D_2
-3.91E-06	1.21E-08	-2.37E-11
E_0	E_1	λ_{TK}
1.14E-06	1.61E-09	3.25E-01

H-ZF75A	946180	$n_d = 1.94595$	$v_d = 17.98$	$n_F - n_C = 0.052600$
		$n_e = 1.95825$	$v_e = 17.84$	$n_F - n_{C'} = 0.053718$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.85978	$P_{d,C}$	0.2798	RC (S)	1	2400	0.972	0.945
n_{1970}	1970.09	1.86908	$P_{e,d}$	0.2338	RA (S)	1	2200	0.982	0.964
n_{1530}	1529.58	1.88034	$P_{g,F}$	0.6549	D_W	1	2000	0.997	0.994
n_{1129}	1128.64	1.89291	$P'_{d,C'}$	0.2318	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.89565	$P'_{e,d}$	0.2290	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.89802	$P'_{g,F'}$	0.5782	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.90816			CR		1200	0.997	0.994
$n_{A'}$	768.19	1.91585	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.92337					1000	0.997	0.994
n_C	656.27	1.93123					950	0.997	0.994
$n_{C'}$	643.85	1.93350					900	0.997	0.994
n_{He-Ne}	632.80	1.93564					850	0.997	0.994
n_D	589.29	1.94550	ΔP_{Fe}	0.0060	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	1.94595	$\Delta P_{g,F}$	0.0412	-50/-40	47	750	0.997	0.994
n_e	546.07	1.95825	$\Delta P_{C,t}$	0.0041	-40/-30	50	700	0.997	0.994
n_F	486.13	1.98383	$\Delta P_{C,s}$	-0.0050	-30/-20	51	650	0.997	0.994
$n_{F'}$	479.99	1.98722	Thermal Properties		-20/-10	53	600	0.995	0.990
n_g	435.84	2.01828	Tg ($^{\circ}C$)	682	-10/0	54	550	0.993	0.986
n_h	404.66	2.05110	Ts ($^{\circ}C$)	709	0/10	55	500	0.970	0.941
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	609	10/20	56	480	0.960	0.921
			$T_{10}^{13} (^{\circ}C)$	660	20/30	57	460	0.946	0.894
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	55	30/40	57	440	0.923	0.853
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	70	40/50	58	420	0.870	0.756
			λ (W/(m K))	1.11	50/60	60	400	0.546	0.298
					60/70	60	390	0.181	0.033
					70/80	61	380		
			Mechanical Properties		80/90	61	370		
			HK (10^7Pa)	510	90/100	62	360		
			F_A	199	100/110	63	350		
			E (GPa)	104.6	110/120	64	340		
			G (GPa)	41.1	120/130	65	330		
			μ	0.272	130/140	66	320		
			σ_b (MPa)	66	140/150	66	310		
			B ($10^{-12}/\text{Pa}$)	3.38	150/160	67	300		

Constants of Dispersion Formula	
A_0	3.55084508E+00
A_1	-1.93992631E-02
A_2	6.82201738E-02
A_3	5.85319322E-03
A_4	-4.21740063E-04
A_5	8.66214086E-05

Density		Solarization	
ρ (g/cm ³)	3.53	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.5	1.2	1.6	1.7	1.8	2.2	2.9	4.8	5.0	7.8
-40 ~ -20	0.5	1.3	1.8	1.9	2.0	2.5	3.4	5.4	5.6	8.7
-20 ~ 0	0.7	1.5	2.1	2.2	2.3	3.0	3.8	6.1	6.3	9.6
0 ~ 20	0.8	1.6	2.3	2.4	2.5	3.2	4.2	6.7	6.9	10.3
20 ~ 40	1.1	1.9	2.8	2.7	2.8	3.5	4.6	7.1	7.3	11.0
40 ~ 60	1.2	2.2	3.1	3.2	3.3	4.0	5.1	7.7	7.9	12.2
60 ~ 80	1.6	2.6	3.6	3.7	3.8	4.4	5.6	8.6	8.8	12.9
80 ~ 100	2.0	2.9	4.0	4.1	4.2	5.0	6.1	9.5	9.8	13.7
100 ~ 120	2.4	3.3	4.3	4.5	4.6	5.6	6.6	10.1	10.3	14.4
120 ~ 140	2.7	3.8	4.9	5.0	5.2	6.1	7.1	10.9	11.1	15.2
140 ~ 160	3.1	4.2	5.4	5.5	5.6	6.5	7.8	11.6	11.8	16.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(450)/390
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	424/391

Constants of dn/dt		
D_0	D_1	D_2
-2.30E-06	1.66E-08	-7.59E-12
E_0	E_1	λ_{TK}
1.12E-06	1.62E-09	3.30E-01

H-ZF75GT	946180	$n_d = 1.94595$	$v_d = 17.98$	$n_F - n_C = 0.052600$
		$n_e = 1.95825$	$v_e = 17.84$	$n_F - n_C' = 0.053718$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42	1.85978	$P_{d,C}$	0.2798	RC (S)	1	2400	0.975	0.951
n_{1970}	1970.09	1.86908	$P_{e,d}$	0.2338	RA (S)	1	2200	0.986	0.973
n_{1530}	1529.58	1.88034	$P_{g,F}$	0.6549	D_W	1	2000	0.997	0.995
n_{1129}	1128.64	1.89291	$P'_{d,c'}$	0.2318	D_A	1	1800	0.997	0.995
n_{1064}	1064.00	1.89565	$P'_{e,d}$	0.2290	$R_{OH}(S)$	1	1600	0.997	0.995
n_t	1013.98	1.89802	$P'_{g,F'}$	0.5782	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.90816			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.91585	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.92337					1000	0.998	0.996
n_C	656.27	1.93123					950	0.998	0.996
$n_{C'}$	643.85	1.93350					900	0.998	0.996
n_{He-Ne}	632.80	1.93564					850	0.998	0.996
n_D	589.29	1.94550	ΔP_{Fe}	0.0060	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.94595	$\Delta P_{g,F}$	0.0412	-50/-40	48	750	0.998	0.996
n_e	546.07	1.95825	$\Delta P_{C,t}$	0.0041	-40/-30	51	700	0.998	0.996
n_F	486.13	1.98383	$\Delta P_{C,s}$	-0.0050	-30/-20	53	650	0.998	0.996
$n_{F'}$	479.99	1.98722	Thermal Properties		-20/-10	55	600	0.998	0.996
n_g	435.84	2.01828	$T_g (^{\circ}C)$	682	-10/0	56	550	0.995	0.991
n_h	404.66	2.05110	$T_s (^{\circ}C)$	709	0/10	57	500	0.988	0.975
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	609	10/20	57	480	0.982	0.963
			$T_{10}^{13} (^{\circ}C)$	660	20/30	58	460	0.973	0.946
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	54	30/40	59	440	0.957	0.916
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	68	40/50	59	420	0.915	0.838
			λ (W/(m K))	1.11	50/60	60	400	0.604	0.365
					60/70	61	390	0.243	0.059
					70/80	61	380		
			Mechanical Properties		80/90	62	370		
			HK ($10^7 Pa$)	510	90/100	62	360		
			F_A	199	100/110	63	350		
			E (GPa)	104.6	110/120	64	340		
			G (GPa)	41.1	120/130	64	330		
			μ	0.272	130/140	66	320		
			σ_b (MPa)	78	140/150	67	310		
			B ($10^{-12}/Pa$)	3.38	150/160	68	300		

Constants of Dispersion Formula	
A_0	3.55084508E+00
A_1	-1.93992631E-02
A_2	6.82201738E-02
A_3	5.85319322E-03
A_4	-4.21740063E-04
A_5	8.66214086E-05

Density		Solarization	
ρ (g/cm ³)	3.53	$\Delta\lambda$ (%)	-0.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.5	1.2	1.6	1.7	1.8	2.2	2.9	4.8	5.0	7.8
-40 ~ -20	0.5	1.3	1.8	1.9	2.0	2.5	3.4	5.4	5.6	8.7
-20 ~ 0	0.7	1.5	2.1	2.2	2.3	3.0	3.8	6.1	6.3	9.6
0 ~ 20	0.8	1.6	2.3	2.4	2.5	3.2	4.2	6.7	6.9	10.3
20 ~ 40	1.1	1.9	2.8	2.7	2.8	3.5	4.6	7.1	7.3	11.0
40 ~ 60	1.2	2.2	3.1	3.2	3.3	4.0	5.1	7.7	7.9	12.2
60 ~ 80	1.6	2.6	3.6	3.7	3.8	4.4	5.6	8.6	8.8	12.9
80 ~ 100	2.0	2.9	4.0	4.1	4.2	5.0	6.1	9.5	9.8	13.7
100 ~ 120	2.4	3.3	4.3	4.5	4.6	5.6	6.6	10.1	10.3	14.4
120 ~ 140	2.7	3.8	4.9	5.0	5.2	6.1	7.1	10.9	11.1	15.2
140 ~ 160	3.1	4.2	5.4	5.5	5.6	6.5	7.8	11.6	11.8	16.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(430)/392
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	417/389

Constants of dn/dt		
D_0	D_1	D_2
-2.30E-06	1.66E-08	-7.59E-12
E_0	E_1	λ_{TK}
1.12E-06	1.62E-09	3.30E-01

H-ZF76	959175	$n_d = 1.95906$	$v_d = 17.47$	$n_F - n_C = 0.054890$
		$n_e = 1.97189$	$v_e = 17.33$	$n_F - n_{C'} = 0.056091$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2789	RC (S)	1	2400	0.976	0.953
n_{1970}	1970.09		$P_{e,d}$	0.2337	RA (S)	1	2200	0.990	0.980
n_{1530}	1529.58		$P_{g,F}$	0.6566	D_W	1	2000	0.992	0.984
n_{1129}	1128.64	1.90422	$P'_{d,C'}$	0.2309	D_A	1	1800	0.996	0.991
n_{1064}	1064.00	1.90710	$P'_{e,d}$	0.2287	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.90958	$P'_{g,F'}$	0.5792	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.92000			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.92789	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.93562					1000	0.999	0.998
n_C	656.27	1.94375					950	0.999	0.998
$n_{C'}$	643.85	1.94611					900	0.999	0.998
n_{He-Ne}	632.80	1.94834					850	0.999	0.998
n_D	589.29	1.95860	ΔP_{Fe}	0.0070	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.95906	$\Delta P_{g,F}$	0.0420	-50/-40	53	750	0.999	0.998
n_e	546.07	1.97189	$\Delta P_{C,t}$	-0.0022	-40/-30	55	700	0.998	0.996
n_F	486.13	1.99865	$\Delta P_{C,s}$	-0.0096	-30/-20	56	650	0.997	0.994
$n_{F'}$	479.99	2.00220	Thermal Properties		-20/-10	57	600	0.996	0.992
n_g	435.84	2.03469	Tg ($^{\circ}C$)	683	-10/0	58	550	0.988	0.977
n_h	404.66	2.06909	Ts ($^{\circ}C$)	712	0/10	58	500	0.972	0.944
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	605	10/20	59	480	0.957	0.917
			$T_{10}^{13} (^{\circ}C)$	655	20/30	60	460	0.936	0.876
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	59	30/40	62	440	0.897	0.804
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	73	40/50	62	420	0.805	0.648
			λ (W/(m K))		50/60	62	400	0.370	0.137
					60/70	62	390		
					70/80	65	380		
			Mechanical Properties		80/90	65	370		
			HK ($10^7 Pa$)	494	90/100	65	360		
			F_A	178	100/110	67	350		
			E (GPa)	102.9	110/120	67	340		
			G (GPa)	41.2	120/130	68	330		
			μ	0.249	130/140	70	320		
			σ_b (MPa)	79	140/150	70	310		
			B ($10^{-12}/Pa$)	3.58	150/160	70	300		

Constants of Dispersion Formula	
A_0	3.61187240E+00
A_1	-2.77611102E-02
A_2	5.45160847E-02
A_3	1.18687253E-02
A_4	-1.30897352E-03
A_5	1.41185183E-04

Density		Solarization	
ρ (g/cm ³)	3.56	$\Delta\lambda$ (%)	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.5	-0.2	0.4	0.5	0.6	1.1	2.0	3.9	4.1	6.8
-40 ~ -20	-0.4	-0.2	0.5	0.6	0.7	1.2	2.4	4.2	4.4	7.1
-20 ~ 0	-0.2	-0.1	0.7	0.9	1.0	1.4	2.7	4.6	4.7	7.7
0 ~ 20	0.1	0.0	0.9	1.1	1.2	1.8	3.1	4.9	5.0	8.2
20 ~ 40	0.1	0.2	1.1	1.3	1.4	2.0	3.3	5.2	5.3	8.5
40 ~ 60	0.2	0.4	1.2	1.4	1.5	2.4	3.4	5.4	5.6	9.1
60 ~ 80	0.6	0.8	1.4	1.6	1.8	2.7	3.8	5.7	5.9	9.6
80 ~ 100	0.8	1.3	1.6	1.9	2.1	3.0	4.2	6.0	6.3	10.0
100 ~ 120	0.9	1.5	1.9	2.1	2.5	3.1	4.3	6.5	6.8	10.5
120 ~ 140	1.0	1.7	2.0	2.3	2.6	3.4	4.5	6.8	7.2	10.9
140 ~ 160	1.1	1.7	2.2	2.5	2.7	3.6	4.7	7.1	7.5	11.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(460)/395
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	438/397

Constants of dn/dt		
D_0	D_1	D_2
-3.83E-06	1.49E-08	-2.21E-11
E_0	E_1	λ_{TK}
9.49E-07	6.87E-10	3.36E-01

H-TF3L	613441	$n_d = 1.61340$	$v_d = 44.11$	$n_F - n_C = 0.013907$
		$n_e = 1.61669$	$v_e = 43.91$	$n_F - n_{C'} = 0.014044$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.57673	$P_{d,C}$	0.2991	RC (S)	1	2400	0.885	0.782
n_{1970}	1970.09	1.58314	$P_{e,d}$	0.2366	RA (S)	1	2200	0.953	0.907
n_{1530}	1529.58	1.59013	$P_{g,F}$	0.5623	D_W	1	2000	0.994	0.988
n_{1129}	1128.64	1.59636	$P'_{d,c'}$	0.2492	D_A	1	1800	0.999	0.998
n_{1064}	1064.00	1.59749	$P'_{e,d}$	0.2343	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.59843	$P'_{g,F'}$	0.5006	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.60207			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.60458	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.60690					1000	0.999	0.998
n_C	656.27	1.60924					950	0.999	0.998
$n_{C'}$	643.85	1.60990					900	0.999	0.998
n_{He-Ne}	632.80	1.61051					850	0.999	0.998
n_D	589.29	1.61327	$\Delta P_{F,e}$	-0.0013	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61340	$\Delta P_{g,F}$	-0.0080	-50/-40	55	750	0.999	0.998
n_e	546.07	1.61669	$\Delta P_{C,t}$	0.0234	-40/-30	56	700	0.999	0.998
n_F	486.13	1.62315	$\Delta P_{C,s}$	0.0093	-30/-20	57	650	0.999	0.998
$n_{F'}$	479.99	1.62394	Thermal Properties		-20/-10	60	600	0.999	0.998
n_g	435.84	1.63097	$T_g (^{\circ}C)$	579	-10/0	63	550	0.999	0.998
n_h	404.66	1.63765	$T_s (^{\circ}C)$	623	0/10	62	500	0.998	0.996
n_i	365.01	1.64956	$T_{10}^{14.5} (^{\circ}C)$	504	10/20	61	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	547	20/30	64	460	0.996	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	62	30/40	63	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	78	40/50	66	420	0.993	0.987
			$\lambda (W/(m\ K))$	0.97	50/60	65	400	0.990	0.980
					60/70	66	390	0.989	0.978
					70/80	68	380	0.982	0.964
					80/90	66	370	0.970	0.941
			Mechanical Properties		90/100	73	360	0.948	0.899
			HK ($10^7 Pa$)	575	100/110	69	350	0.903	0.815
			F_A	111	110/120	68	340	0.828	0.685
			E (GPa)	86.9	120/130	72	330	0.647	0.418
			G (GPa)	35.1	130/140	71	320	0.239	0.057
			μ	0.238	140/150	76	310		
			σ_b (MPa)	63	150/160	73	300		
			B ($10^{-12}/Pa$)	3.28			290		
							280		

Constants of Dispersion Formula	
A_0	2.54989010E+00
A_1	-1.24016345E-02
A_2	1.74291594E-02
A_3	1.02656330E-03
A_4	-8.81502201E-05
A_5	6.75446845E-06

Density		Solarization	
$\rho (g/cm^3)$	2.84	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.3	4.5	4.6	4.7	4.8	5.0	5.2	5.5	5.6	6.3
-40 ~ -20	4.3	4.6	4.7	4.8	4.9	5.0	5.2	5.6	5.7	6.4
-20 ~ 0	4.3	4.5	4.7	4.8	4.9	5.0	5.3	5.7	5.8	6.5
0 ~ 20	4.4	4.6	4.8	4.9	5.0	5.1	5.4	5.7	5.8	6.6
20 ~ 40	4.4	4.6	4.8	4.9	5.0	5.1	5.4	5.8	5.9	6.7
40 ~ 60	4.4	4.7	4.9	5.0	5.1	5.2	5.5	6.0	6.1	6.8
60 ~ 80	4.5	4.8	5.0	5.1	5.2	5.3	5.6	6.0	6.1	6.9
80 ~ 100	4.5	4.9	5.1	5.2	5.3	5.4	5.7	6.1	6.2	7.1
100 ~ 120	4.5	4.9	5.2	5.2	5.3	5.5	5.8	6.2	6.3	7.2
120 ~ 140	4.5	5.0	5.3	5.3	5.4	5.7	6.0	6.3	6.4	7.3
140 ~ 160	4.6	5.1	5.4	5.4	5.5	5.8	6.1	6.5	6.6	7.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	349/321

Constants of dn/dt		
D_0	D_1	D_2
5.46E-06	1.31E-08	-2.19E-11
E_0	E_1	λ_{TK}
4.56E-07	3.98E-10	2.95E-01

H-ZBaF3	657511	$n_d = 1.65691$	$v_d = 51.12$	$n_F - n_C = 0.012850$
		$n_e = 1.65996$	$v_e = 50.88$	$n_F - n_{C'} = 0.012970$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.62663	$P_{d,C}$	0.2996	RC (S)	1	2400	0.938	0.880
n_{1970}	1970.09	1.63127	$P_{e,d}$	0.2374	RA (S)	3	2200	0.973	0.947
n_{1530}	1529.58	1.63649	$P_{g,F}$	0.5564	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.64148	$P'_{d,c'}$	0.2490	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.64245	$P'_{e,d}$	0.2352	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.64326	$P'_{g,F'}$	0.4942	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.64648			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.64877	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.65091					1000	0.999	0.998
n_C	656.27	1.65306					950	0.999	0.998
$n_{C'}$	643.85	1.65368					900	0.999	0.998
n_{He-Ne}	632.80	1.65424					850	0.999	0.998
n_D	589.29	1.65680	ΔP_{Fe}	0.0011	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65691	$\Delta P_{g,F}$	-0.0023	-50/-40	67	750	0.999	0.998
n_e	546.07	1.65996	$\Delta P_{C,t}$	-0.0252	-40/-30	70	700	0.999	0.998
n_F	486.13	1.66591	$\Delta P_{C,s}$	-0.0110	-30/-20	71	650	0.999	0.998
$n_{F'}$	479.99	1.66665	Thermal Properties		-20/-10	72	600	0.999	0.998
n_g	435.84	1.67306			-10/0	74	550	0.999	0.998
n_h	404.66	1.67907	Tg ($^{\circ}C$)	654	0/10	75	500	0.999	0.998
n_i	365.01	1.68947	Ts ($^{\circ}C$)	705	10/20	76	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	590	20/30	76	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	631	30/40	77	440	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	40/50	78	420	0.994	0.988
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	50/60	78	400	0.991	0.981
			λ (W/(m K))	0.82	60/70	79	390	0.987	0.968
					70/80	80	380	0.976	0.945
			Mechanical Properties		80/90	81	370	0.952	0.899
					90/100	82	360	0.894	0.798
			HK (10^7Pa)	520	100/110	83	350	0.782	0.611
			F_A	139	110/120	83	340	0.555	0.308
			E (GPa)	80.4	120/130	84	330	0.217	0.050
			G (GPa)	31.1	130/140	85	320		
			μ	0.292	140/150	86	310		
			σ_b (MPa)	77	150/160	87	300		
			B ($10^{-12}/Pa$)	1.83			290		
							280		

Constants of Dispersion Formula	
A_0	2.69121166E+00
A_1	-9.00413519E-03
A_2	1.83609733E-02
A_3	5.31180896E-04
A_4	-2.10926709E-05
A_5	1.72686254E-06

Density		Solarization	
ρ (g/cm ³)	3.89	$\Delta\lambda$ (%)	-0.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.2	2.5	2.8	2.8	2.8	3.0	3.2	3.6	3.6	4.2
-40 ~ -20	2.2	2.5	2.8	2.8	2.8	2.9	3.2	3.6	3.6	4.2
-20 ~ 0	2.3	2.6	2.8	2.8	2.9	3.1	3.2	3.7	3.7	4.3
0 ~ 20	2.3	2.6	2.8	2.8	2.9	3.1	3.3	3.7	3.7	4.4
20 ~ 40	2.3	2.6	2.9	2.9	2.9	3.1	3.3	3.7	3.7	4.4
40 ~ 60	2.4	2.7	2.9	2.9	3.0	3.2	3.5	3.9	3.9	4.5
60 ~ 80	2.4	2.7	2.9	3.0	3.1	3.3	3.5	4.1	4.1	4.7
80 ~ 100	2.6	2.8	3.0	3.1	3.2	3.4	3.6	4.2	4.2	4.8
100 ~ 120	2.7	2.9	3.1	3.2	3.3	3.4	3.6	4.4	4.4	5.1
120 ~ 140	2.7	2.9	3.2	3.3	3.4	3.6	3.7	4.5	4.5	5.2
140 ~ 160	2.9	3.0	3.3	3.4	3.5	3.8	3.9	4.8	4.9	5.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	375/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	360/330

Constants of dn/dt		
D_0	D_1	D_2
1.08E-06	1.18E-08	-1.50E-11
E_0	E_1	λ_{TK}
4.84E-07	5.39E-10	2.70E-01

H-ZBaF5	671473	n _d = 1.67103	v _d = 47.29	n _F − n _C = 0.014190
		n _e = 1.67440	v _e = 46.99	n _F − n _C ′ = 0.014353

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n _λ	P _{d,C}	0.2981	RC (S)	1	λ (nm)	τ5mm	τ10mm
n ₂₃₂₅	2325.42	1.63768	P _{e,d}	0.2375	RA (S)	3	2400	0.943	0.889
n ₁₉₇₀	1970.09	1.64279	P _{g,F}	0.5659	D _W	1	2200	0.971	0.942
n ₁₅₃₀	1529.58	1.64857	P _{d,c} ′	0.2487	D _A	2	2000	0.986	0.972
n ₁₁₂₉	1128.64	1.65410	P _{e,d} ′	0.2348	R _{OH} (S)	2	1800	0.992	0.984
n ₁₀₆₄	1064.00	1.65517	P _{g,F} ′	0.5016	RP (S)	2	1600	0.998	0.997
n _t	1013.98	1.65606			CR		1400	0.999	0.998
n _s	852.11	1.65961	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1200	0.999	0.998
n _A ′	768.19	1.66211					1060	0.999	0.998
n _r	706.52	1.66444					1000	0.999	0.998
n _C	656.27	1.66680					950	0.999	0.998
n _C ′	643.85	1.66746	ΔP _{F,e}	0.0003	°C	α	900	0.998	0.997
n _{He-Ne}	632.80	1.66809	ΔP _{g,F}	0.0008	-50/-40	69	850	0.998	0.996
n _D	589.29	1.67091	ΔP _{C,t}	-0.0124	-40/-30	71	800	0.995	0.991
n _d	587.56	1.67103	ΔP _{C,s}	-0.0072	-30/-20	74	750	0.995	0.991
n _e	546.07	1.67440	Thermal Properties		-20/-10	75	700	0.995	0.990
n _F	486.13	1.68099			-10/0	77	650	0.995	0.990
n _F ′	479.99	1.68182	T _g (°C)	583	0/10	78	600	0.994	0.989
n _g	435.84	1.68902	T _s (°C)	652	10/20	79	550	0.994	0.989
n _h	404.66	1.69578	T ₁₀ ^{14.5} (°C)	540	20/30	80	500	0.992	0.985
n _i	365.01	1.70732	T ₁₀ ¹³ (°C)	580	30/40	81	480	0.991	0.983
			α _{-50/80°C} (10 ⁻⁷ /K)	78	40/50	82	460	0.990	0.980
			α _{100/300°C} (10 ⁻⁷ /K)	94	50/60	82	440	0.988	0.976
			λ (W/(m K))	0.70	60/70	83	420	0.985	0.971
					70/80	85	400	0.976	0.953
			Mechanical Properties		80/90	86	390	0.964	0.930
					90/100	87	380	0.941	0.886
			HK (10 ⁷ Pa)	626	100/110	88	370	0.890	0.800
			F _A	140	110/120	89	360	0.790	0.630
			E (GPa)	97.0	120/130	90	350	0.580	0.340
			G (GPa)	38.1	130/140	91	340	0.230	0.060
			μ	0.273	140/150	92	330		
			σ _b (MPa)		150/160	93	320		
			B (10 ⁻¹² /Pa)	1.74			310		

Constants of Dispersion Formula	
A ₀	2.73214288E+00
A ₁	-9.99573110E-03
A ₂	2.10627506E-02
A ₃	9.14104150E-05
A ₄	9.31355399E-05
A ₅	-5.82600014E-06

Density		Solarization	
ρ (g/cm ³)	3.58	Δλ (%)	-0.4

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative (×10 ⁻⁶ / °C)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.4	2.8	3.0	3.1	3.2	3.4	3.9	4.5	4.6	5.0
-40 ~ -20	2.5	2.9	3.2	3.3	3.4	3.5	4.0	4.6	4.8	5.2
-20 ~ 0	2.7	3.1	3.4	3.5	3.6	3.7	4.1	4.7	4.8	5.3
0 ~ 20	2.7	3.2	3.7	3.8	3.9	4.0	4.2	4.8	4.9	5.4
20 ~ 40	2.8	3.3	3.9	4.0	4.1	4.2	4.3	4.9	5.0	5.5
40 ~ 60	3.0	3.4	4.1	4.2	4.3	4.4	4.5	5.0	5.1	5.6
60 ~ 80	3.1	3.6	4.3	4.4	4.4	4.5	4.6	5.1	5.2	5.8
80 ~ 100	3.2	3.7	4.4	4.5	4.5	4.6	4.7	5.2	5.3	5.9
100 ~ 120	3.3	3.9	4.6	4.7	4.7	4.8	4.9	5.3	5.4	6.1
120 ~ 140	3.3	4.0	4.7	4.8	4.8	4.9	5.0	5.4	5.5	6.2
140 ~ 160	3.4	4.0	4.8	4.9	4.9	5.0	5.2	5.6	5.6	6.3

Coloration Code	
λ ₈₀ (λ ₇₀)/λ ₅	380/340
Coloration of Internal Transmittance	
λτ ₈₀ /λτ ₅	370/340

Constants of dn/dt		
D ₀	D ₁	D ₂
1.66E-06	1.91E-08	-3.14E-11
E ₀	E ₁	λ _{TK}
1.03E-06	-3.69E-10	7.88E-09

H-ZBaF10	618498	$n_d = 1.61773$	$v_d = 49.83$	$n_F - n_C = 0.012397$
		$n_e = 1.62068$	$v_e = 49.54$	$n_F - n_{C'} = 0.012529$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58640	$P_{d,C}$	0.3001	RC (S)	1	2400	0.918	0.844
n_{1970}	1970.09	1.59159	$P_{e,d}$	0.2380	RA (S)	1	2200	0.952	0.908
n_{1530}	1529.58	1.59734	$P_{g,F}$	0.5598	D_W	1	2000	0.982	0.965
n_{1129}	1128.64	1.60261	$P'_{d,C'}$	0.2498	D_A	2	1800	0.992	0.984
n_{1064}	1064.00	1.60359	$P'_{e,d}$	0.2355	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.60441	$P'_{g,F'}$	0.4964	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.60761			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.60985	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61192					1000	0.999	0.998
n_C	656.27	1.61401					950	0.999	0.998
$n_{C'}$	643.85	1.61460					900	0.999	0.998
n_{He-Ne}	632.80	1.61515					850	0.999	0.998
n_D	589.29	1.61762	ΔP_{Fe}	-0.0005	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61773	$\Delta P_{g,F}$	-0.0010	-50/-40	65	750	0.999	0.998
n_e	546.07	1.62068	$\Delta P_{C,t}$	-0.0072	-40/-30	68	700	0.999	0.998
n_F	486.13	1.62641	$\Delta P_{C,s}$	-0.0037	-30/-20	70	650	0.999	0.998
$n_{F'}$	479.99	1.62713	Thermal Properties		-20/-10	71	600	0.999	0.998
n_g	435.84	1.63335			-10/0	72	550	0.999	0.998
n_h	404.66	1.63923	Tg ($^{\circ}C$)	627	0/10	73	500	0.999	0.998
n_i	365.01	1.64953	Ts ($^{\circ}C$)	672	10/20	74	480	0.997	0.994
			$T_{10}^{14.5} (^{\circ}C)$	548	20/30	75	460	0.995	0.992
			$T_{10}^{13} (^{\circ}C)$	590	30/40	76	440	0.993	0.988
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	72	40/50	77	420	0.990	0.982
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	86	50/60	78	400	0.984	0.970
			λ (W/(m K))	0.90	60/70	78	390	0.972	0.947
					70/80	78	380	0.944	0.893
			Mechanical Properties		80/90	79	370	0.892	0.800
					90/100	80	360	0.770	0.597
			HK (10^7Pa)	539	100/110	80	350	0.518	0.273
			F_A	142	110/120	81	340	0.167	0.038
			E (GPa)	86.1	120/130	82	330		
			G (GPa)	34.1	130/140	83	320		
			μ	0.263	140/150	84	310		
			σ_b (MPa)	83	150/160	85	300		
			B ($10^{-12}/Pa$)	2.12			290		
							280		

Constants of Dispersion Formula	
A_0	2.56767884E+00
A_1	-1.00060261E-02
A_2	1.66107744E-02
A_3	6.51052393E-04
A_4	-4.11297812E-05
A_5	3.35427062E-06

Density		Solarization	
ρ (g/cm ³)	3.16	$\Delta\lambda$ (%)	-1.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.1	2.3	2.5	2.5	2.6	2.7	2.9	3.3	3.3	3.8
-40 ~ -20	2.1	2.3	2.5	2.5	2.6	2.7	3.0	3.3	3.4	3.8
-20 ~ 0	2.1	2.3	2.5	2.6	2.6	2.8	3.0	3.4	3.5	3.9
0 ~ 20	2.1	2.4	2.5	2.6	2.6	2.8	3.1	3.4	3.5	4.0
20 ~ 40	2.2	2.4	2.6	2.6	2.7	2.9	3.1	3.5	3.6	4.0
40 ~ 60	2.3	2.5	2.7	2.7	2.7	2.9	3.1	3.6	3.8	4.1
60 ~ 80	2.3	2.7	2.8	2.9	2.9	3.0	3.3	3.7	3.8	4.3
80 ~ 100	2.5	2.8	2.9	3.0	3.0	3.2	3.3	3.7	3.8	4.3
100 ~ 120	2.5	2.8	3.0	3.1	3.1	3.2	3.4	3.8	3.9	4.4
120 ~ 140	2.7	2.9	3.1	3.1	3.1	3.3	3.5	3.9	3.9	4.5
140 ~ 160	2.7	3.0	3.2	3.2	3.3	3.4	3.6	4.0	4.1	4.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	385/345
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	370/341

Constants of dn/dt		
D_0	D_1	D_2
9.42E-07	1.44E-08	-2.13E-11
E_0	E_1	λ_{TK}
4.74E-07	3.62E-11	2.61E-01

H-ZBaF16A	667484	$n_d = 1.66672$	$v_d = 48.42$	$n_F - n_C = 0.013769$
		$n_e = 1.67000$	$v_e = 48.13$	$n_F - n_C' = 0.013920$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2992	RC (S)	1	2400	0.946	0.895
n_{1970}	1970.09		$P_{e,d}$	0.2382	RA (S)	2	2200	0.976	0.953
n_{1530}	1529.58		$P_{g,F}$	0.5600	D_W	1	2000	0.987	0.975
n_{1129}	1128.64	1.65042	$P'_{d,c}$	0.2493	D_A	3	1800	0.993	0.986
n_{1064}	1064.00	1.65140	$P'_{e,d}$	0.2356	$R_{OH}(S)$	1	1600	0.997	0.995
n_t	1013.98	1.65223	$P'_{g,F}$	0.4964	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.65560			CR	1	1200	0.999	0.997
$n_{A'}$	768.19	1.65802	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.997
n_r	706.52	1.66030					1000	0.998	0.997
n_C	656.27	1.66260					950	0.998	0.996
$n_{C'}$	643.85	1.66325					900	0.998	0.996
n_{He-Ne}	632.80	1.66385					850	0.997	0.995
n_D	589.29	1.66660	ΔP_{Fe}	-0.0008	$^{\circ}C$	α	800	0.998	0.997
n_d	587.56	1.66672	$\Delta P_{g,F}$	-0.0032	-50/-40	73	750	0.999	0.997
n_e	546.07	1.67000	$\Delta P_{C,t}$	-0.0216	-40/-30	75	700	0.998	0.997
n_F	486.13	1.67637	$\Delta P_{C,s}$	-0.0082	-30/-20	77	650	0.998	0.996
$n_{F'}$	479.99	1.67717	Thermal Properties		-20/-10	79	600	0.998	0.996
n_g	435.84	1.68408	$T_g (^{\circ}C)$	626	-10/0	80	550	0.998	0.996
n_h	404.66	1.69056	$T_s (^{\circ}C)$	687	0/10	81	500	0.997	0.995
n_i	365.01	1.70179	$T_{10}^{14.5} (^{\circ}C)$	561	10/20	82	480	0.997	0.993
			$T_{10}^{13} (^{\circ}C)$	590	20/30	82	460	0.996	0.991
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	81	30/40	84	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	40/50	85	420	0.994	0.989
			λ (W/(m K))	0.81	50/60	85	400	0.987	0.975
					60/70	86	390	0.984	0.968
					70/80	87	380	0.976	0.952
			Mechanical Properties		80/90	89	370	0.924	0.854
			HK (10^7 Pa)	544	90/100	89	360	0.892	0.796
			F_A	247	100/110	89	350	0.824	0.679
			E (GPa)	92.2	110/120	90	340	0.682	0.465
			G (GPa)	35.7	120/130	91	330	0.394	0.155
			μ	0.293	130/140	94	320		
			σ_b (MPa)	72	140/150	94	310		
			B (10^{-12} /Pa)	1.84	150/160	96	300		

Constants of Dispersion Formula	
A_0	2.71734266E+00
A_1	-7.93439759E-03
A_2	2.10245027E-02
A_3	2.14586811E-04
A_4	2.86536993E-05
A_5	-6.94769473E-07

Density		Solarization	
ρ (g/cm ³)	3.63	$\Delta\lambda$ (%)	-0.2

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.0	1.2	1.5	1.8	2.1	2.3	2.5	2.6	2.8	3.3
-40 ~ -20	1.0	1.3	1.5	1.8	2.1	2.3	2.6	2.7	2.8	3.3
-20 ~ 0	1.0	1.3	1.5	1.8	2.2	2.3	2.7	2.8	2.8	3.3
0 ~ 20	1.2	1.4	1.6	1.9	2.2	2.4	2.7	2.8	2.9	3.5
20 ~ 40	1.2	1.4	1.5	1.9	2.2	2.5	2.7	2.8	3.0	3.6
40 ~ 60	1.3	1.6	1.6	2.0	2.3	2.6	2.8	2.9	3.1	3.7
60 ~ 80	1.4	1.6	1.7	2.0	2.3	2.7	3.0	3.0	3.1	3.9
80 ~ 100	1.4	1.7	1.8	2.0	2.4	2.8	3.1	3.2	3.2	4.0
100 ~ 120	1.5	1.8	1.9	2.1	2.5	3.0	3.2	3.3	3.4	4.1
120 ~ 140	1.5	1.9	2.0	2.2	2.6	3.2	3.2	3.3	3.5	4.2
140 ~ 160	1.6	2.0	2.2	2.3	2.7	3.3	3.4	3.5	3.6	4.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/330
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	353/324

Constants of dn/dt		
D_0	D_1	D_2
-1.65E-06	1.28E-08	-1.94E-11
E_0	E_1	λ_{TK}
9.82E-07	4.78E-10	1.52E-08

H-ZBaF20	702412	$n_d = 1.70154$	$v_d = 41.15$	$n_F - n_C = 0.017049$
		$n_e = 1.70559$	$v_e = 40.86$	$n_F - n_{C'} = 0.017270$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2950	RC (S)	1	2400	0.949	0.901
n_{1970}	1970.09		$P_{e,d}$	0.2376	RA (S)	1	2200	0.976	0.952
n_{1530}	1529.58		$P_{g,F}$	0.5766	D_W	1	2000	0.991	0.982
n_{1129}	1128.64	1.68168	$P'_{d,c'}$	0.2455	D_A	1	1800	0.995	0.990
n_{1064}	1064.00	1.68293	$P'_{e,d}$	0.2345	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.68396	$P'_{g,F'}$	0.5107	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.68811			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.69103	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.69375					1000	0.999	0.998
n_C	656.27	1.69651					950	0.999	0.998
$n_{C'}$	643.85	1.69730					900	0.999	0.998
n_{He-Ne}	632.80	1.69806					850	0.999	0.998
n_D	589.29	1.70139	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.70154	$\Delta P_{g,F}$	0.0013	-50/-40	58	750	0.999	0.998
n_e	546.07	1.70559	$\Delta P_{C,t}$	-0.0034	-40/-30	61	700	0.999	0.998
n_F	486.13	1.71356	$\Delta P_{C,s}$	-0.0065	-30/-20	62	650	0.999	0.998
$n_{F'}$	479.99	1.71457	Thermal Properties		-20/-10	62	600	0.998	0.997
n_g	435.84	1.72339	Tg ($^{\circ}C$)	599	-10/0	66	550	0.998	0.997
n_h	404.66	1.73179	Ts ($^{\circ}C$)	657	0/10	67	500	0.997	0.994
n_i	365.01	1.74679	$T_{10}^{14.5} (^{\circ}C)$	555	10/20	67	480	0.996	0.992
			$T_{10}^{13} (^{\circ}C)$	595	20/30	68	460	0.994	0.989
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	68	440	0.993	0.986
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	84	40/50	70	420	0.989	0.978
			λ (W/(m K))	0.99	50/60	70	400	0.979	0.958
					60/70	73	390	0.964	0.930
					70/80	73	380	0.935	0.874
			Mechanical Properties		80/90	73	370	0.861	0.741
			HK (10^7Pa)	618	90/100	74	360	0.681	0.464
			F_A	125	100/110	76	350	0.343	0.118
			E (GPa)	98.5	110/120	77	340		
			G (GPa)	38.4	120/130	78	330		
			μ	0.284	130/140	79	320		
			σ_b (MPa)	78	140/150	79	310		
			B ($10^{-12}/Pa$)	2.05	150/160	82	300		

Constants of Dispersion Formula	
A_0	2.82868941E+00
A_1	-1.38728820E-02
A_2	2.03272973E-02
A_3	1.79527923E-03
A_4	-1.30823668E-04
A_5	8.20715361E-06

Density		Solarization	
ρ (g/cm ³)	3.64	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.5	3.1	3.6	3.6	3.7	4.1	4.7	5.4	5.5	5.9
-40 ~ -20	2.6	3.3	3.7	3.8	3.9	4.4	4.9	5.6	5.7	6.2
-20 ~ 0	2.8	3.4	4.0	4.1	4.2	4.6	5.0	5.7	5.9	6.4
0 ~ 20	3.1	3.6	4.3	4.4	4.4	4.7	5.1	5.8	6.0	6.6
20 ~ 40	3.4	3.9	4.6	4.6	4.7	5.0	5.2	6.1	6.2	6.9
40 ~ 60	3.7	4.2	4.8	4.9	4.9	5.2	5.3	6.2	6.3	7.1
60 ~ 80	4.1	4.4	4.9	5.3	5.3	5.5	5.7	6.4	6.6	7.5
80 ~ 100	4.4	4.6	5.1	5.3	5.4	5.7	5.9	6.7	6.9	7.9
100 ~ 120	4.7	4.9	5.3	5.4	5.6	6.0	6.1	7.0	7.2	8.3
120 ~ 140	5.0	5.1	5.4	5.6	5.7	6.1	6.3	7.3	7.5	8.7
140 ~ 160	5.2	5.3	5.7	5.8	5.9	6.3	6.6	7.6	7.7	9.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	373/347

Constants of dn/dt		
D_0	D_1	D_2
2.34E-06	2.11E-08	-2.27E-11
E_0	E_1	λ_{TK}
1.04E-06	-3.84E-11	1.99E-01

H-ZBaF21	723380	$n_d = 1.72341$	$v_d = 37.99$	$n_F - n_C = 0.019041$
		$n_e = 1.72793$	$v_e = 37.72$	$n_F - n_C' = 0.019297$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance			
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm	
n ₂₃₂₅	2325.42	1.68318	P _{d,C}	0.2941	RC (S)	1	2400	0.949	0.901	
n ₁₉₇₀	1970.09	1.68884	P _{e,d}	0.2374	RA (S)	1	2200	0.980	0.960	
n ₁₅₃₀	1529.58	1.69529	P _{g,F}	0.5819	D _W	1	2000	0.992	0.984	
n ₁₁₂₉	1128.64	1.70170	P' _{d,c´}	0.2446	D _A	2	1800	0.999	0.998	
n ₁₀₆₄	1064.00	1.70299	P' _{e,d}	0.2342	R _{OH} (S)	1	1600	0.999	0.998	
n _t	1013.98	1.70407	P' _{g,F´}	0.5156	RP (S)	1	1400	0.999	0.998	
n _s	852.11	1.70850			CR	1	1200	0.999	0.998	
n _{A´}	768.19	1.71169	Deviation of Relative Partial Dispersions ΔP_{F,e} -0.0008 ΔP_{g,F} 0.0014 ΔP_{C,t} -0.0026 ΔP_{C,s} -0.0026			Expansion Coefficient α (×10⁻⁷/K) °Cα -50/-4058 -40/-3061 -30/-2063 -20/-1063 -10/065 0/1065 10/2066 20/3067 30/4068 40/5068		1060	0.999	0.998
n _r	706.52	1.71471						1000	0.999	0.998
n _C	656.27	1.71781						950	0.999	0.998
n _{C´}	643.85	1.71869						900	0.999	0.998
n _{He-Ne}	632.80	1.71952						850	0.999	0.998
n _D	589.29	1.72325	Thermal Properties Tg (°C)614 Ts (°C)666 T₁₀^{14.5} (°C)558 T₁₀¹³ (°C)596 α_{-50/80°C} (10⁻⁷/K)67 α_{100/300°C} (10⁻⁷/K)83			800	0.999	0.998		
n _d	587.56	1.72341				750	0.999	0.998		
n _e	546.07	1.72793				700	0.999	0.998		
n _F	486.13	1.73685				650	0.999	0.998		
n _{F´}	479.99	1.73798				600	0.999	0.998		
n _g	435.84	1.74793	Mechanical Properties ρ (g/cm³)2.38 E (GPa)72 α_{100°C} (10⁻⁶/K)16 α_{200°C} (10⁻⁶/K)18 α_{300°C} (10⁻⁶/K)20 α_{400°C} (10⁻⁶/K)22 α_{500°C} (10⁻⁶/K)24			550	0.999	0.998		
n _h	404.66	1.75759				500	0.995	0.989		
n _i	365.01	1.77526				480	0.993	0.986		
						460	0.990	0.981		
						440	0.987	0.974		

Constants of Dispersion Formula	
A ₀	2.88881294E+00
A ₁	-1.12014238E-02
A ₂	2.61117044E-02
A ₃	1.31652955E-03
A ₄	-9.02985011E-05
A ₅	1.01643068E-05

Density		Solarization	
ρ (g/cm ³)	3.61	$\Delta\lambda$ (%)	-0.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^\circ\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.6	4.0	4.4	4.4	4.5	4.7	5.0	5.7	5.8	6.6
-40 ~ -20	3.7	4.1	4.4	4.4	4.5	4.7	5.1	5.7	5.8	6.6
-20 ~ 0	3.6	4.2	4.5	4.5	4.5	4.7	5.2	5.8	5.9	6.7
0 ~ 20	3.6	4.3	4.5	4.5	4.6	4.8	5.2	5.8	6.0	6.8
20 ~ 40	3.7	4.3	4.5	4.5	4.6	4.8	5.2	5.9	6.0	6.8
40 ~ 60	3.7	4.3	4.5	4.5	4.6	4.9	5.3	6.1	6.2	7.0
60 ~ 80	3.7	4.5	4.7	4.7	4.8	5.0	5.4	6.2	6.3	7.3
80 ~ 100	3.8	4.5	4.7	4.8	4.9	5.1	5.5	6.3	6.4	7.4
100 ~ 120	3.9	4.7	4.8	4.9	5.0	5.1	5.4	6.5	6.6	7.5
120 ~ 140	4.0	4.8	4.9	4.9	5.1	5.2	5.6	6.6	6.7	7.6
140 ~ 160	4.1	4.9	5.0	5.0	5.2	5.3	5.7	6.7	6.8	7.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	400/355
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	383/355

Constants of dn/dt		
D ₀	D ₁	D ₂
3.29E-06	1.22E-08	-2.04E-11
E ₀	E ₁	λ_{TK}
6.43E-07	3.41E-10	2.74E-01

H-ZBaF50	658509	$n_d = 1.65844$	$v_d = 50.85$	$n_F - n_C = 0.012948$
		$n_e = 1.66152$	$v_e = 50.57$	$n_F - n_C' = 0.013082$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.62814	$P_{d,C}$	0.3004	RC (S)	1	2400	0.937	0.880
n_{1970}	1970.09	1.63271	$P_{e,d}$	0.2379	RA (S)	3	2200	0.971	0.946
n_{1530}	1529.58	1.63788	$P_{g,F}$	0.5576	D_W	1	2000	0.993	0.982
n_{1129}	1128.64	1.64287	$P'_{d,c'}$	0.2500	D_A	3	1800	0.995	0.992
n_{1064}	1064.00	1.64384	$P'_{e,d}$	0.2354	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.64466	$P'_{g,F'}$	0.4946	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.64791			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.65021	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.65237					1000	0.999	0.998
n_C	656.27	1.65455					950	0.999	0.998
$n_{C'}$	643.85	1.65517					900	0.999	0.998
n_{He-Ne}	632.80	1.65575					850	0.999	0.998
n_D	589.29	1.65833	ΔP_{Fe}	-0.0003	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65844	$\Delta P_{g,F}$	-0.0015	-50/-40	66	750	0.999	0.998
n_e	546.07	1.66152	$\Delta P_{C,t}$	-0.0227	-40/-30	68	700	0.999	0.998
n_F	486.13	1.66750	$\Delta P_{C,s}$	-0.0096	-30/-20	70	650	0.999	0.998
$n_{F'}$	479.99	1.66825	Thermal Properties		-20/-10	71	600	0.999	0.998
n_g	435.84	1.67472	Tg ($^{\circ}C$)	650	-10/0	72	550	0.999	0.998
n_h	404.66	1.68081	Ts ($^{\circ}C$)	695	0/10	73	500	0.999	0.998
n_i	365.01	1.69138	$T_{10}^{14.5} (^{\circ}C)$	572	10/20	74	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	630	20/30	75	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	30/40	76	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	86	40/50	77	420	0.996	0.992
			λ (W/(m K))	0.69	50/60	77	400	0.991	0.983
					60/70	78	390	0.983	0.970
					70/80	78	380	0.969	0.946
			Mechanical Properties		80/90	79	370	0.937	0.893
			HK ($10^7 Pa$)	520	90/100	80	360	0.876	0.787
			F_A	132	100/110	81	350	0.752	0.585
			E (GPa)	93.4	110/120	82	340	0.521	0.275
			G (GPa)	37.3	120/130	83	330	0.203	0.037
			μ	0.253	130/140	83	320		
			σ_b (MPa)	60	140/150	84	310		
			B ($10^{-12}/Pa$)	1.84	150/160	85	300		

Constants of Dispersion Formula	
A_0	2.69513820E+00
A_1	-8.84212838E-03
A_2	1.89677206E-02
A_3	4.17388089E-04
A_4	-9.33466805E-06
A_5	1.53699645E-06

Density		Solarization	
ρ (g/cm ³)	3.90	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.4	2.7	3.0	3.0	3.0	3.2	3.4	3.7	3.8	4.5
-40 ~ -20	2.4	2.8	3.0	3.0	3.0	3.2	3.4	3.8	3.9	4.5
-20 ~ 0	2.4	2.7	3.0	3.0	3.0	3.2	3.4	3.9	4.0	4.5
0 ~ 20	2.4	2.7	3.0	3.1	3.1	3.2	3.4	3.9	4.0	4.5
20 ~ 40	2.4	2.7	3.0	3.0	3.0	3.2	3.4	4.0	4.1	4.6
40 ~ 60	2.3	2.9	3.2	3.2	3.2	3.3	3.5	4.2	4.3	4.7
60 ~ 80	2.5	3.0	3.2	3.3	3.3	3.4	3.6	4.3	4.4	4.9
80 ~ 100	2.6	3.1	3.3	3.4	3.4	3.6	3.8	4.5	4.6	5.0
100 ~ 120	2.7	3.2	3.4	3.5	3.5	3.7	3.9	4.6	4.7	5.2
120 ~ 140	2.7	3.3	3.5	3.6	3.6	3.8	4.0	4.7	4.8	5.3
140 ~ 160	2.7	3.3	3.6	3.6	3.7	3.9	4.1	4.9	5.0	5.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	360/330

Constants of dn/dt		
D_0	D_1	D_2
1.19E-06	1.20E-08	-1.58E-11
E_0	E_1	λ_{TK}
6.13E-07	5.48E-10	2.23E-01

H-ZBaF52	670472	$n_d = 1.67003$	$v_d = 47.20$	$n_F - n_C = 0.014197$
		$n_e = 1.67340$	$v_e = 46.90$	$n_F - n_C' = 0.014358$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.63652	$P_{d,C}$	0.2987	RC (S)	1	2400	0.938	0.877
n_{1970}	1970.09	1.64169	$P_{e,d}$	0.2374	RA (S)	3	2200	0.970	0.944
n_{1530}	1529.58	1.64750	$P_{g,F}$	0.5628	D_W	1	2000	0.989	0.978
n_{1129}	1128.64	1.65305	$P'_{d,c'}$	0.2486	D_A	1	1800	0.993	0.987
n_{1064}	1064.00	1.65411	$P'_{e,d}$	0.2347	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.65500	$P'_{g,F'}$	0.4987	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.65856			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.66107	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.66342					1000	0.999	0.998
n_C	656.27	1.66579					950	0.999	0.998
$n_{C'}$	643.85	1.66646					900	0.999	0.998
n_{He-Ne}	632.80	1.66709					850	0.999	0.998
n_D	589.29	1.66990	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.67003	$\Delta P_{g,F}$	-0.0024	-50/-40	55	750	0.999	0.998
n_e	546.07	1.67340	$\Delta P_{C,t}$	-0.0088	-40/-30	59	700	0.999	0.998
n_F	486.13	1.67999	$\Delta P_{C,s}$	-0.0044	-30/-20	62	650	0.999	0.998
$n_{F'}$	479.99	1.68082	Thermal Properties		-20/-10	64	600	0.999	0.998
n_g	435.84	1.68798	Tg ($^{\circ}C$)	602	-10/0	66	550	0.999	0.998
n_h	404.66	1.69475	Ts ($^{\circ}C$)	661	0/10	68	500	0.998	0.996
n_i	365.01	1.70662	$T_{10}^{14.5} (^{\circ}C)$	539	10/20	70	480	0.996	0.993
			$T_{10}^{13} (^{\circ}C)$	582	20/30	71	460	0.995	0.991
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	67	30/40	72	440	0.994	0.988
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	85	40/50	73	420	0.992	0.983
			λ (W/(m K))	1.08	50/60	73	400	0.983	0.967
					60/70	74	390	0.973	0.947
					70/80	74	380	0.952	0.907
			Mechanical Properties		80/90	75	370	0.909	0.826
			HK ($10^7 Pa$)	626	90/100	76	360	0.807	0.652
			F_A	151	100/110	77	350	0.596	0.355
			E (GPa)	96.3	110/120	77	340	0.269	0.072
			G (GPa)	37.6	120/130	78	330		
			μ	0.279	130/140	79	320		
			σ_b (MPa)	70	140/150	81	310		
			B ($10^{-12}/Pa$)	1.90	150/160	82	300		

Constants of Dispersion Formula	
A_0	2.72917137E+00
A_1	-1.01247435E-02
A_2	2.03135768E-02
A_3	5.48969301E-04
A_4	-1.03383424E-05
A_5	1.79727765E-06

Density		Solarization	
ρ (g/cm ³)	3.49	$\Delta\lambda$ (%)	-1.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.5	3.9	4.1	4.2	4.3	4.5	4.7	5.2	5.2	5.6
-40 ~ -20	3.5	3.8	4.1	4.2	4.3	4.5	4.7	5.2	5.2	5.6
-20 ~ 0	3.6	3.9	4.1	4.2	4.2	4.5	4.7	5.2	5.3	5.8
0 ~ 20	3.6	3.9	4.1	4.2	4.2	4.5	4.7	5.2	5.3	5.8
20 ~ 40	3.6	3.9	4.0	4.1	4.3	4.5	4.7	5.3	5.4	5.9
40 ~ 60	3.6	4.0	4.1	4.2	4.3	4.5	4.8	5.4	5.5	6.0
60 ~ 80	3.6	4.0	4.1	4.2	4.3	4.6	4.9	5.5	5.6	6.2
80 ~ 100	3.6	4.0	4.2	4.3	4.4	4.6	4.9	5.7	5.8	6.3
100 ~ 120	3.7	4.1	4.4	4.5	4.5	4.6	5.1	6.0	6.1	6.4
120 ~ 140	3.7	4.1	4.5	4.6	4.6	4.7	5.1	6.1	6.2	6.5
140 ~ 160	3.8	4.2	4.6	4.7	4.7	4.7	5.2	6.3	6.4	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	369/340

Constants of dn/dt		
D_0	D_1	D_2
3.13E-06	9.94E-09	-1.48E-11
E_0	E_1	λ_{TK}
6.71E-07	8.33E-10	2.17E-01

H-ZBaF65	654397	$n_d = 1.65412$	$v_d = 39.68$	$n_F - n_C = 0.016484$
		$n_e = 1.65803$	$v_e = 39.46$	$n_F - n_C' = 0.016678$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.61564	$P_{d,C}$	0.2973	RC (S)	1	2400	0.917	0.840
n_{1970}	1970.09	1.62166	$P_{e,d}$	0.2372	RA (S)	1	2200	0.950	0.900
n_{1530}	1529.58	1.62838	$P_{g,F}$	0.5727	D_W	1	2000	0.987	0.974
n_{1129}	1128.64	1.63471	$P'_{d,c'}$	0.2470	D_A	1	1800	0.993	0.986
n_{1064}	1064.00	1.63592	$P'_{e,d}$	0.2344	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.63693	$P'_{g,F'}$	0.5079	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.64097			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.64383	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.64651					1000	0.999	0.998
n_C	656.27	1.64922					950	0.999	0.998
$n_{C'}$	643.85	1.65000					900	0.999	0.998
n_{He-Ne}	632.80	1.65072					850	0.999	0.998
n_D	589.29	1.65397	ΔP_{Fe}	-0.0024	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.65412	$\Delta P_{g,F}$	-0.0050	-50/-40	66	750	0.999	0.998
n_e	546.07	1.65803	$\Delta P_{C,t}$	0.0132	-40/-30	69	700	0.999	0.998
n_F	486.13	1.66571	$\Delta P_{C,s}$	0.0049	-30/-20	71	650	0.999	0.998
$n_{F'}$	479.99	1.66668	Thermal Properties		-20/-10	72	600	0.999	0.998
n_g	435.84	1.67515			-10/0	73	550	0.999	0.998
n_h	404.66	1.68327	Tg ($^{\circ}C$)	609	0/10	74	500	0.999	0.998
n_i	365.01	1.69784	Ts ($^{\circ}C$)	665	10/20	75	480	0.998	0.996
			$T_{10}^{14.5} (^{\circ}C)$	549	20/30	75	460	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	590	30/40	76	440	0.996	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	40/50	77	420	0.994	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	89	50/60	78	400	0.991	0.983
			λ (W/(m K))	1.13	60/70	78	390	0.988	0.974
					70/80	79	380	0.977	0.958
			Mechanical Properties		80/90	79	370	0.957	0.919
					90/100	80	360	0.899	0.813
			HK (10^7Pa)	565	100/110	81	350	0.751	0.568
			F_A	141	110/120	82	340	0.401	0.164
			E (GPa)	92.0	120/130	83	330		
			G (GPa)	37.0	130/140	84	320		
			μ	0.243	140/150	85	310		
			σ_b (MPa)	88	150/160	85	300		
			B ($10^{-12}/Pa$)	2.77			290		
							280		

Constants of Dispersion Formula	
A_0	2.66955809E+00
A_1	-1.17053780E-02
A_2	2.16385159E-02
A_3	1.09755393E-03
A_4	-7.38357886E-05
A_5	6.82335888E-06

Density		Solarization	
ρ (g/cm ³)	3.01	$\Delta\lambda$ (%)	-1.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.0	2.4	2.7	2.8	2.9	3.1	3.3	3.7	3.8	4.6
-40 ~ -20	2.1	2.5	2.7	2.8	2.9	3.2	3.5	3.8	3.9	4.8
-20 ~ 0	2.4	2.7	2.9	2.9	3.0	3.3	3.5	3.9	3.9	4.9
0 ~ 20	2.6	2.9	3.1	3.1	3.2	3.5	3.6	4.1	4.1	4.9
20 ~ 40	2.7	3.0	3.2	3.2	3.3	3.6	3.7	4.3	4.3	5.1
40 ~ 60	2.7	3.0	3.3	3.3	3.4	3.7	4.0	4.6	4.6	5.4
60 ~ 80	2.9	3.1	3.3	3.3	3.4	3.9	4.3	4.8	4.8	5.6
80 ~ 100	3.0	3.2	3.4	3.5	3.6	4.0	4.4	5.0	5.0	5.8
100 ~ 120	3.2	3.4	3.6	3.7	3.8	4.1	4.5	5.2	5.2	6.0
120 ~ 140	3.3	3.5	3.8	3.9	4.0	4.3	4.6	5.3	5.3	6.1
140 ~ 160	3.4	3.6	3.9	4.0	4.1	4.4	4.8	5.3	5.4	6.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	360/336

Constants of dn/dt		
D_0	D_1	D_2
1.44E-06	1.63E-08	-2.55E-11
E_0	E_1	λ_{TK}
5.71E-07	3.95E-10	2.77E-01

H-LaF1	694492	$n_d = 1.69362$	$v_d = 49.20$	$n_F - n_C = 0.014099$
		$n_e = 1.69696$	$v_e = 48.85$	$n_F - n_C' = 0.014266$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65990	$P_{d,C}$	0.2986	RC (S)	1	2400	0.922	0.850
n_{1970}	1970.09	1.66516	$P_{e,d}$	0.2369	RA (S)	3	2200	0.976	0.953
n_{1530}	1529.58	1.67106	$P_{g,F}$	0.5603	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.67666	$P'_{d,c'}$	0.2488	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.67773	$P'_{e,d}$	0.2341	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.67863	$P'_{g,F'}$	0.4963	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.68220			CR	2	1200	0.999	0.998
$n_{A'}$	768.19	1.68471	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.68705					1000	0.999	0.998
n_C	656.27	1.68941					950	0.999	0.998
$n_{C'}$	643.85	1.69007					900	0.999	0.998
n_{He-Ne}	632.80	1.69070					850	0.999	0.998
n_D	589.29	1.69350	$\Delta P_{F,e}$	0.0015	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69362	$\Delta P_{g,F}$	-0.0016	-50/-40	65	750	0.999	0.998
n_e	546.07	1.69696	$\Delta P_{C,t}$	-0.0139	-40/-30	68	700	0.999	0.998
n_F	486.13	1.70351	$\Delta P_{C,s}$	-0.0071	-30/-20	70	650	0.999	0.998
$n_{F'}$	479.99	1.70433	Thermal Properties		-20/-10	71	600	0.999	0.998
n_g	435.84	1.71141			-10/0	72	550	0.999	0.998
n_h	404.66	1.71805	Tg ($^{\circ}C$)	663	0/10	73	500	0.999	0.998
n_i	365.01	1.72957	Ts ($^{\circ}C$)	699	10/20	73	480	0.997	0.994
			$T_{10}^{14.5} (^{\circ}C)$	603	20/30	75	460	0.995	0.990
			$T_{10}^{13} (^{\circ}C)$	640	30/40	76	440	0.992	0.986
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	40/50	76	420	0.987	0.982
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	87	50/60	77	400	0.981	0.971
			λ (W/(m K))	0.87	60/70	78	390	0.974	0.957
					70/80	78	380	0.961	0.931
			Mechanical Properties		80/90	79	370	0.932	0.876
					90/100	80	360	0.866	0.759
			HK (10^7Pa)	545	100/110	80	350	0.716	0.521
			F_A	159	110/120	81	340	0.409	0.174
			E (GPa)	91.9	120/130	82	330	0.078	0.010
			G (GPa)	36.0	130/140	83	320		
			μ	0.277	140/150	83	310		
			σ_b (MPa)	74	150/160	84	300		
			B ($10^{-12}/Pa$)	1.70			290		
							280		

Constants of Dispersion Formula	
A_0	2.80794251E+00
A_1	-1.04533648E-02
A_2	2.07773005E-02
A_3	4.06086547E-04
A_4	1.98268226E-05
A_5	-7.40077504E-07

Density		Solarization	
ρ (g/cm ³)	3.97	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.3	1.6	1.8	1.8	1.9	2.0	2.2	2.6	2.7	3.2
-40 ~ -20	1.3	1.7	1.9	1.9	1.9	2.0	2.2	2.6	2.7	3.2
-20 ~ 0	1.3	1.6	1.9	1.9	1.9	2.1	2.3	2.7	2.8	3.3
0 ~ 20	1.3	1.7	1.9	1.9	1.9	2.1	2.3	2.7	2.8	3.3
20 ~ 40	1.3	1.8	2.0	2.0	2.0	2.1	2.4	2.7	2.8	3.5
40 ~ 60	1.4	1.8	2.1	2.1	2.1	2.1	2.4	2.8	2.9	3.5
60 ~ 80	1.5	1.9	2.1	2.1	2.1	2.3	2.5	3.0	3.1	3.6
80 ~ 100	1.5	1.9	2.1	2.2	2.2	2.3	2.6	3.1	3.3	3.7
100 ~ 120	1.5	1.9	2.1	2.2	2.2	2.3	2.7	3.2	3.4	3.8
120 ~ 140	1.6	2.0	2.1	2.2	2.3	2.4	2.8	3.3	3.4	3.9
140 ~ 160	1.7	2.1	2.2	2.3	2.4	2.6	3.0	3.5	3.6	4.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/330
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	363/334

Constants of dn/dt		
D_0	D_1	D_2
-7.87E-07	1.19E-08	-2.18E-11
E_0	E_1	λ_{TK}
5.08E-07	3.70E-10	2.42E-01

H-LaF2A	717479	$n_d = 1.71700$	$v_d = 47.89$	$n_F - n_C = 0.014972$
		$n_e = 1.72056$	$v_e = 47.65$	$n_F - n_C' = 0.015122$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2999	RC (S)	1	2400	0.907	0.822
n_{1970}	1970.09		$P_{e,d}$	0.2378	RA (S)	2	2200	0.967	0.935
n_{1530}	1529.58		$P_{g,F}$	0.5604	D_W	1	2000	0.986	0.971
n_{1129}	1128.64	1.69904	$P'_{d,c'}$	0.2493	D_A	4	1800	0.994	0.988
n_{1064}	1064.00	1.70015	$P'_{e,d}$	0.2354	$R_{OH}(S)$	1	1600	0.998	0.995
n_t	1013.98	1.70108	$P'_{g,F'}$	0.4973	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.70484			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.70750	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.70999					1000	0.999	0.998
n_C	656.27	1.71251					950	0.999	0.998
$n_{C'}$	643.85	1.71323					900	0.999	0.998
n_{He-Ne}	632.80	1.71388					850	0.999	0.998
n_D	589.29	1.71687	ΔP_{Fe}	-0.0016	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.71700	$\Delta P_{g,F}$	-0.0037	-50/-40	67	750	0.999	0.998
n_e	546.07	1.72056	$\Delta P_{C,t}$	-0.0087	-40/-30	72	700	0.999	0.998
n_F	486.13	1.72748	$\Delta P_{C,s}$	-0.0030	-30/-20	73	650	0.999	0.998
$n_{F'}$	479.99	1.72835	Thermal Properties		-20/-10	75	600	0.999	0.997
n_g	435.84	1.73587	$T_g (^{\circ}C)$	689	-10/0	75	550	0.999	0.997
n_h	404.66	1.74295	$T_s (^{\circ}C)$	731	0/10	76	500	0.999	0.996
n_i	365.01	1.75527	$T_{10}^{14.5} (^{\circ}C)$	621	10/20	78	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	662	20/30	78	460	0.996	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	77	30/40	78	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	90	40/50	80	420	0.993	0.986
			λ (W/(m K))	0.63	50/60	80	400	0.989	0.977
					60/70	83	390	0.983	0.967
					70/80	83	380	0.974	0.948
			Mechanical Properties		80/90	84	370	0.951	0.905
			HK (10^7 Pa)	530	90/100	84	360	0.900	0.810
			F_A	122	100/110	84	350	0.770	0.593
			E (GPa)	91.7	110/120	85	340	0.488	0.238
			G (GPa)	35.5	120/130	85	330	0.143	0.020
			μ	0.293	130/140	86	320		
			σ_b (MPa)	85	140/150	88	310		
			B (10^{-12} /Pa)	1.29	150/160	89	300		

Constants of Dispersion Formula	
A_0	2.88020693E+00
A_1	-9.72282525E-03
A_2	2.40408618E-02
A_3	2.48389828E-05
A_4	6.26809703E-05
A_5	-1.98030657E-06

Density		Solarization	
ρ (g/cm ³)	4.21	$\Delta\lambda$ (%)	0.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.2	0.1	0.3	0.4	0.4	0.7	0.9	1.2	1.2	1.6
-40 ~ -20	-0.2	0.1	0.3	0.4	0.5	0.7	0.9	1.3	1.3	1.6
-20 ~ 0	-0.1	0.2	0.4	0.4	0.5	0.7	1.0	1.3	1.3	1.7
0 ~ 20	-0.2	0.3	0.4	0.5	0.5	0.8	1.0	1.3	1.3	1.7
20 ~ 40	-0.2	0.3	0.4	0.5	0.6	0.8	1.0	1.3	1.4	1.8
40 ~ 60	-0.2	0.3	0.4	0.5	0.6	0.9	1.1	1.3	1.4	1.8
60 ~ 80	-0.2	0.4	0.5	0.6	0.7	0.9	1.1	1.3	1.4	1.8
80 ~ 100	-0.1	0.5	0.5	0.7	0.9	1.0	1.3	1.5	1.6	2.0
100 ~ 120	-0.1	0.6	0.6	0.7	1.0	1.2	1.4	1.7	1.9	2.1
120 ~ 140	0.0	0.6	0.8	0.8	1.1	1.4	1.5	1.9	2.1	2.3
140 ~ 160	0.0	0.6	0.8	0.9	1.2	1.6	1.8	1.9	2.1	2.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	360/332

Constants of dn/dt		
D_0	D_1	D_2
-3.77E-06	1.15E-08	-1.71E-11
E_0	E_1	λ_{TK}
7.48E-07	4.03E-10	8.88E-09

H-LaF3B	744449	$n_d = 1.74400$	$v_d = 44.90$	$n_F - n_C = 0.016570$
		$n_e = 1.74794$	$v_e = 44.63$	$n_F - n_C' = 0.016760$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.70713	P _{d,C}	0.2981	RC (S)	1	2400	0.914	0.835		
n ₁₉₇₀	1970.09	1.71244	P _{e,d}	0.2378	RA (S)	3	2200	0.960	0.922		
n ₁₅₃₀	1529.58	1.71852	P _{g,F}	0.5631	D _W	1	2000	0.983	0.966		
n ₁₁₂₉	1128.64	1.72451	P' _{d,c´}	0.2482	D _A	3	1800	0.999	0.998		
n ₁₀₆₄	1064.00	1.72568	P' _{e,d}	0.2351	R _{OH} (S)	1	1600	0.999	0.998		
n _t	1013.98	1.72667	P' _{g,F´}	0.4988	RP (S)	1	1400	0.999	0.998		
n _s	852.11	1.73070			CR		1200	0.999	0.998		
n _{A´}	768.19	1.73359	Deviation of Relative Partial Dispersions			Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998	
n _r	706.52	1.73630						1000	0.999	0.998	
n _C	656.27	1.73906						950	0.999	0.998	
n _{C´}	643.85	1.73984						900	0.999	0.998	
n _{He-Ne}	632.80	1.74057						850	0.999	0.998	
n _D	589.29	1.74386	ΔP _{F,e}	-0.0013	°C	α	800	0.999	0.998		
n _d	587.56	1.74400	ΔP _{g,F}	-0.0060	-50/-40	67	750	0.999	0.998		
n _e	546.07	1.74794	ΔP _{C,t}	-0.0099	-40/-30	69	700	0.999	0.998		
n _F	486.13	1.75563	ΔP _{C,s}	-0.0036	-30/-20	71	650	0.999	0.998		
n _{F´}	479.99	1.75660	Thermal Properties		-20/-10	72	600	0.999	0.998		
n _g	435.84	1.76496			Tg (°C)	630	-10/0	73	550	0.999	0.998
n _h	404.66	1.77285			Ts (°C)	683	0/10	74	500	0.999	0.998
n _i	365.01	1.78666			T ₁₀ ^{14.5} (°C)	557	10/20	75	480	0.999	0.998
					T ₁₀ ¹³ (°C)	602	20/30	76	460	0.999	0.998
			α _{-50/80°C} (10 ⁻⁷ /K)	74	30/40	77	440	0.999	0.998		
			α _{100/300°C} (10 ⁻⁷ /K)	89	40/50	77					

Constants of Dispersion Formula	
A ₀	2.96773191E+00
A ₁	-1.07334025E-02
A ₂	2.46639798E-02
A ₃	7.96273827E-04
A ₄	-3.49870097E-05
A ₅	3.36130613E-06

Density		Solarization	
ρ (g/cm ³)	4.32	$\Delta\lambda$ (%)	-0.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^\circ C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.1	2.4	2.6	2.6	2.6	2.9	3.2	3.7	3.8	4.4
-40 ~ -20	2.0	2.3	2.6	2.7	2.7	2.9	3.2	3.7	3.8	4.4
-20 ~ 0	2.0	2.4	2.6	2.7	2.7	2.9	3.2	3.7	3.9	4.5
0 ~ 20	2.0	2.4	2.6	2.7	2.7	2.9	3.2	3.8	3.9	4.6
20 ~ 40	2.0	2.4	2.6	2.7	2.7	2.9	3.2	3.9	4.0	4.6
40 ~ 60	2.0	2.4	2.7	2.8	2.8	3.0	3.3	4.0	4.0	4.7
60 ~ 80	2.0	2.5	2.7	2.8	2.8	3.0	3.3	4.0	4.1	4.8
80 ~ 100	2.1	2.6	2.9	3.0	2.9	3.1	3.5	4.1	4.2	4.9
100 ~ 120	2.1	2.7	2.9	3.0	3.0	3.1	3.5	4.1	4.2	2.0
120 ~ 140	2.2	2.7	3.0	3.1	3.0	3.3	3.6	4.2	4.3	5.1
140 ~ 160	2.3	2.8	3.0	3.1	3.1	3.3	3.6	4.2	4.3	5.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	365/310
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	345/310

Constants of dn/dt		
D ₀	D ₁	D ₂
3.99E-08	1.22E-08	-2.10E-11
E ₀	E ₁	λ_{TK}
7.06E-07	-1.18E-10	1.86E-01

H-LaF3C	744449	$n_d = 1.74400$	$v_d = 44.90$	$n_F - n_C = 0.016570$
		$n_e = 1.74794$	$v_e = 44.63$	$n_F - n_C' = 0.016760$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2981	RC (S)	1	2400	0.910	0.828
n_{1970}	1970.09		$P_{e,d}$	0.2378	RA (S)	2	2200	0.962	0.926
n_{1530}	1529.58		$P_{g,F}$	0.5631	D_W	1	2000	0.982	0.965
n_{1129}	1128.64	1.72461	$P'_{d,c'}$	0.2482	D_A	3	1800	0.992	0.983
n_{1064}	1064.00	1.72577	$P'_{e,d}$	0.2351	$R_{OH}(S)$	1	1600	0.998	0.995
n_t	1013.98	1.72675	$P'_{g,F'}$	0.4988	RP (S)	2	1400	0.999	0.997
n_s	852.11	1.73074			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.73361	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.73633					1000	0.999	0.998
n_C	656.27	1.73906					950	0.999	0.998
$n_{C'}$	643.85	1.73984					900	0.999	0.998
n_{He-Ne}	632.80	1.74058					850	0.999	0.998
n_D	589.29	1.74386	ΔP_{Fe}	-0.0013	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.74400	$\Delta P_{g,F}$	-0.0060	-50/-40	78	750	0.999	0.998
n_e	546.07	1.74794	$\Delta P_{C,t}$	-0.0148	-40/-30	81	700	0.999	0.998
n_F	486.13	1.75563	$\Delta P_{C,s}$	-0.0060	-30/-20	84	650	0.999	0.998
$n_{F'}$	479.99	1.75660	Thermal Properties		-20/-10	86	600	0.999	0.998
n_g	435.84	1.76496	Tg ($^{\circ}C$)	626	-10/0	88	550	0.999	0.998
n_h	404.66	1.77287	Ts ($^{\circ}C$)	676	0/10	89	500	0.999	0.998
n_i	365.01	1.78671	$T_{10}^{14.5} (^{\circ}C)$	553	10/20	90	480	0.999	0.997
			$T_{10}^{13} (^{\circ}C)$	598	20/30	90	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	73	30/40	91	440	0.998	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	91	40/50	92	420	0.997	0.993
			λ (W/(m K))	0.70	50/60	92	400	0.995	0.991
					60/70	93	390	0.993	0.984
					70/80	93	380	0.986	0.971
			Mechanical Properties		80/90	94	370	0.972	0.943
			HK (10^7Pa)	502	90/100	95	360	0.934	0.870
			F_A	195	100/110	97	350	0.828	0.685
			E (GPa)		110/120	98	340	0.565	0.325
			G (GPa)		120/130	99	330	0.187	0.038
			μ		130/140	100	320		
			σ_b (MPa)		140/150	101	310		
			B ($10^{-12}/Pa$)		150/160	102	300		

Constants of Dispersion Formula	
A_0	2.96730744E+00
A_1	-1.01565086E-02
A_2	2.47645800E-02
A_3	7.87107350E-04
A_4	-3.51755571E-05
A_5	3.47733569E-06

Density		Solarization	
ρ (g/cm ³)	4.34	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.5	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.0	2.5
-40 ~ -20	0.5	0.8	1.1	1.2	1.2	1.4	1.7	1.9	2.1	2.6
-20 ~ 0	0.5	0.8	1.1	1.2	1.3	1.4	1.8	2.0	2.1	2.8
0 ~ 20	0.6	1.0	1.1	1.2	1.3	1.6	1.8	2.0	2.2	2.9
20 ~ 40	0.6	1.1	1.2	1.3	1.4	1.6	1.9	2.1	2.2	3.1
40 ~ 60	0.6	1.2	1.2	1.3	1.4	1.7	1.9	2.1	2.3	3.2
60 ~ 80	0.7	1.3	1.3	1.4	1.6	1.9	2.0	2.2	2.4	3.4
80 ~ 100	0.7	1.3	1.4	1.5	1.8	2.0	2.0	2.3	2.5	3.4
100 ~ 120	0.7	1.4	1.6	1.7	1.9	2.1	2.3	2.4	2.5	3.6
120 ~ 140	0.7	1.5	1.6	1.8	2.1	2.2	2.3	2.5	2.6	3.8
140 ~ 160	0.8	1.5	1.6	1.8	2.1	2.3	2.5	2.6	2.6	3.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	355/331

Constants of dn/dt		
D_0	D_1	D_2
-2.11E-06	1.25E-08	-2.36E-11
E_0	E_1	λ_{TK}
5.31E-07	3.26E-10	2.44E-01

H-LaF4A	750350	$n_d = 1.74950$	$v_d = 35.04$	$n_F - n_C = 0.021390$
		$n_e = 1.75456$	$v_e = 34.77$	$n_F - n_C' = 0.021700$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2927	RC (S)	1	2400	0.933	0.871
n_{1970}	1970.09		$P_{e,d}$	0.2366	RA (S)	1	2200	0.980	0.960
n_{1530}	1529.58		$P_{g,F}$	0.5881	D_W	1	2000	0.992	0.983
n_{1129}	1128.64	1.72537	$P'_{d,C}$	0.2433	D_A	3	1800	0.996	0.992
n_{1064}	1064.00	1.72677	$P'_{e,d}$	0.2332	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.72796	$P'_{g,F}$	0.5203	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.73284			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.73640	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.73977					1000	0.999	0.998
n_C	656.27	1.74324					950	0.999	0.998
$n_{C'}$	643.85	1.74422					900	0.999	0.998
n_{He-Ne}	632.80	1.74513					850	0.999	0.998
n_D	589.29	1.74931	ΔP_{Fe}	-0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.74950	$\Delta P_{g,F}$	0.0027	-50/-40	72	750	0.999	0.998
n_e	546.07	1.75456	$\Delta P_{C,t}$	0.0044	-40/-30	74	700	0.998	0.997
n_F	486.13	1.76463	$\Delta P_{C,s}$	0.0017	-30/-20	75	650	0.998	0.997
$n_{F'}$	479.99	1.76592	Thermal Properties		-20/-10	75	600	0.998	0.996
n_g	435.84	1.77721	Tg ($^{\circ}C$)	576	-10/0	77	550	0.997	0.995
n_h	404.66	1.78821	Ts ($^{\circ}C$)	620	0/10	78	500	0.994	0.989
n_i	365.01	1.80840	$T_{10}^{14.5} (^{\circ}C)$	507	10/20	80	480	0.991	0.983
			$T_{10}^{13} (^{\circ}C)$	548	20/30	81	460	0.988	0.976
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	80	30/40	83	440	0.982	0.965
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	98	40/50	85	420	0.971	0.943
			λ (W/(m K))	0.81	50/60	85	400	0.941	0.886
					60/70	86	390	0.910	0.829
					70/80	87	380	0.853	0.727
			Mechanical Properties		80/90	87	370	0.733	0.537
			HK (10^7Pa)	526	90/100	87	360	0.489	0.239
			F_A	177	100/110	88	350	0.161	0.026
			E (GPa)	93.7	110/120	89	340		
			G (GPa)	36.3	120/130	89	330		
			μ	0.290	130/140	96	320		
			σ_b (MPa)	72	140/150	96	310		
			B ($10^{-12}/Pa$)	2.36	150/160	97	300		

Constants of Dispersion Formula	
A_0	2.96710812E+00
A_1	-1.16353219E-02
A_2	3.04712653E-02
A_3	1.14514132E-03
A_4	-3.15749319E-05
A_5	7.84016441E-06

Density		Solarization	
ρ (g/cm ³)	3.84	$\Delta\lambda$ (%)	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.6	1.0	1.4	1.4	1.5	1.6	2.1	2.5	2.6	3.5
-40 ~ -20	0.6	1.0	1.4	1.4	1.5	1.6	2.1	2.6	2.7	3.6
-20 ~ 0	0.6	1.0	1.5	1.5	1.5	1.6	2.2	2.6	2.7	3.8
0 ~ 20	0.7	1.1	1.5	1.6	1.6	1.7	2.3	2.7	2.8	3.9
20 ~ 40	0.7	1.1	1.6	1.6	1.7	1.8	2.4	2.8	3.0	4.2
40 ~ 60	0.8	1.3	1.8	1.8	1.9	2.0	2.2	3.0	3.2	4.3
60 ~ 80	0.9	1.5	1.9	2.0	2.1	2.2	2.6	3.3	3.4	4.6
80 ~ 100	1.0	1.7	2.1	2.1	2.2	2.3	2.7	3.6	3.7	4.8
100 ~ 120	1.2	1.9	2.1	2.2	2.3	2.5	2.9	3.9	4.0	5.0
120 ~ 140	1.2	2.1	2.4	2.4	2.5	2.6	3.1	4.1	4.1	5.3
140 ~ 160	1.4	2.2	2.5	2.5	2.6	2.7	3.3	4.2	4.3	5.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	415/355
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/353

Constants of dn/dt		
D_0	D_1	D_2
-1.97E-06	1.30E-08	-1.43E-11
E_0	E_1	λ_{TK}
6.27E-07	5.47E-10	2.84E-01

H-LaF6LB	757477	$n_d = 1.75700$	$v_d = 47.71$	$n_F - n_C = 0.015866$
		$n_e = 1.76078$	$v_e = 47.47$	$n_F - n_C = 0.016028$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance			
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm	
n ₂₃₂₅	2325.42	1.71608	P _{d,C}	0.3006	RC (S)	1	2400	0.839	0.704	
n ₁₉₇₀	1970.09	1.72302	P _{e,d}	0.2382	RA (S)	3	2200	0.971	0.943	
n ₁₅₃₀	1529.58	1.73065	P _{g,F}	0.5546	D _W	1	2000	0.996	0.992	
n ₁₁₂₉	1128.64	1.73755	P' _{d,c´}	0.2508	D _A	3	1800	0.999	0.998	
n ₁₀₆₄	1064.00	1.73882	P' _{e,d}	0.2358	R _{OH} (S)	1	1600	0.999	0.998	
n _t	1013.98	1.73988	P' _{g,F´}	0.4916	RP (S)	2	1400	0.999	0.998	
n _s	852.11	1.74401			CR		1200	0.999	0.998	
n _{A´}	768.19	1.74688	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998	
n _r	706.52	1.74954					1000	0.999	0.998	
n _C	656.27	1.75223					950	0.999	0.998	
n _{C´}	643.85	1.75298					900	0.999	0.998	
n _{He-Ne}	632.80	1.75368					850	0.999	0.998	
n _D	589.29	1.75686	ΔP _{F,e}	-0.0031	-50/-40	48	800	0.999	0.998	
n _d	587.56	1.75700	ΔP _{g,F}	-0.0097	-40/-30	51	750	0.999	0.998	
n _e	546.07	1.76078	ΔP _{C,t}	0.0071	-30/-20	52	700	0.999	0.998	
n _F	486.13	1.76809	ΔP _{C,s}	0.0032	-20/-10	53	650	0.999	0.998	
n _{F´}	479.99	1.76901	Thermal Properties		-10/0	54	600	0.999	0.998	
n _g	435.84	1.77689	Tg (°C)		606	0/10	55	550	0.999	0.998
n _h	404.66	1.78427	Ts (°C)		631	10/20	55	500	0.999	0.998
n _i	365.01	1.79708	T ₁₀ ^{14.5} (°C)		538	20/30	56	480	0.999	0.997
			T ₁₀ ¹³ (°C)		580	30/40	57	460	0.998	0.996
			α _{-50/80°C} (10 ⁻⁷ /K)		54	40/50	57	440	0.997	0.994
			α _{100/300°C} (10 ⁻⁷ /K)		70					

Constants of Dispersion Formula	
A_0	3.01951070E+00
A_1	-1.45577999E-02
A_2	2.21379040E-02
A_3	1.27974562E-03
A_4	-1.16064079E-04
A_5	7.16841005E-06

Density		Solarization	
ρ (g/cm ³)	4.25	$\Delta\lambda$ (%)	-0.5

Relative Partial Dispersion	
P _{d,C}	0.3006
P _{e,d}	0.2382
P _{g,F}	0.5546
P' _{d,c'}	0.2508
P' _{e,d}	0.2358
P' _{g,F'}	0.4916

Deviation of Relative Partial Dispersions	
$\Delta P_{F,e}$	-0.0031
$\Delta P_{g,F}$	-0.0097
$\Delta P_{C,t}$	0.0071
$\Delta P_{C,s}$	0.0032

Thermal Properties	
T _g (°C)	606
T _s (°C)	631
T ₁₀ ^{14.5} (°C)	538
T ₁₀ ¹³ (°C)	580
α _{50/80°C} (10 ⁻⁷ /K)	54
α _{100/300°C} (10 ⁻⁷ /K)	70
λ (W/(m K))	0.90

Mechanical Properties	
HK (10^7 Pa)	654
F_A	78
E (GPa)	108.3
G (GPa)	41.3
μ	0.312
σ_b (MPa)	73
B (10^{-12} /Pa)	2.20

Chemical Properties (grade)	
RC (S)	1
RA (S)	3
D _W	1
D _A	3
R _{OH} (S)	1
RP (S)	2
CR	

Expansion Coefficient α ($\times 10^{-7}/\text{K}$)	
$^{\circ}\text{C}$	α
-50/-40	48
-40/-30	51
-30/-20	52
-20/-10	53
-10/0	54
0/10	55
10/20	55
20/30	56
30/40	57
40/50	57
50/60	58
60/70	58
70/80	58
80/90	59
90/100	60
100/110	61
110/120	62
120/130	63
130/140	64
140/150	65
150/160	65

Internal Transmittance		
λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
2400	0.839	0.704
2200	0.971	0.943
2000	0.996	0.992
1800	0.999	0.998
1600	0.999	0.998
1400	0.999	0.998
1200	0.999	0.998
1060	0.999	0.998
1000	0.999	0.998
950	0.999	0.998
900	0.999	0.998
850	0.999	0.998
800	0.999	0.998
750	0.999	0.998
700	0.999	0.998
650	0.999	0.998
600	0.999	0.998
550	0.999	0.998
500	0.999	0.998
480	0.999	0.997
460	0.998	0.996
440	0.997	0.994
420	0.994	0.989
400	0.991	0.981
390	0.988	0.974
380	0.982	0.961
370	0.972	0.939
360	0.956	0.895
350	0.928	0.841
340	0.881	0.758
330	0.802	0.627
320	0.652	0.412
310	0.361	0.125
300		
290		
280		

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/305
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	345/306

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^\circ\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	7.2	7.7	8.0	8.0	8.1	8.2	8.5	9.2	9.2	9.8
-40 ~ -20	7.2	7.7	8.0	8.1	8.1	8.2	8.6	9.2	9.2	9.8
-20 ~ 0	7.3	7.7	8.0	8.1	8.1	8.4	8.6	9.3	9.3	9.9
0 ~ 20	7.4	7.7	8.0	8.1	8.2	8.4	8.6	9.4	9.4	10.0
20 ~ 40	7.4	7.9	8.1	8.2	8.2	8.6	8.7	9.4	9.4	10.0
40 ~ 60	7.4	8.0	8.2	8.3	8.4	8.7	9.0	9.5	9.5	10.4
60 ~ 80	7.7	8.2	8.4	8.5	8.6	8.9	9.0	9.8	9.8	10.5
80 ~ 100	7.7	8.3	8.5	8.6	8.8	9.0	9.2	10.0	10.0	10.8
100 ~ 120	7.9	8.6	8.9	9.0	9.1	9.2	9.4	10.2	10.2	10.9
120 ~ 140	8.0	8.8	9.0	9.2	9.3	9.4	9.5	10.3	10.3	11.1
140 ~ 160	8.1	8.9	9.2	9.3	9.4	9.5	9.7	10.6	10.6	11.3

Constants of dn/dt		
D ₀	D ₁	D ₂
9.40E-06	1.36E-08	-1.08E-11
E ₀	E ₁	λ_{TK}
6.21E-07	2.74E-10	2.21E-01

H-LaF7	782371	$n_d = 1.78179$	$v_d = 37.09$	$n_F - n_C = 0.021077$
		$n_e = 1.78679$	$v_e = 36.83$	$n_F - n_C' = 0.021366$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.73781	$P_{d,C}$	0.2942	RC (S)	1	2400	0.939	0.882
n_{1970}	1970.09	1.74384	$P_{e,d}$	0.2372	RA (S)	1	2200	0.980	0.960
n_{1530}	1529.58	1.75079	$P_{g,F}$	0.5817	D_W	1	2000	0.997	0.994
n_{1129}	1128.64	1.75779	$P'_{d,c'}$	0.2443	D_A	1	1800	0.999	0.998
n_{1064}	1064.00	1.75919	$P'_{e,d}$	0.2340	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.76038	$P'_{g,F'}$	0.5148	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.76527			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.76881	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.77216					1000	0.999	0.998
n_C	656.27	1.77559					950	0.999	0.998
$n_{C'}$	643.85	1.77657					900	0.999	0.998
n_{He-Ne}	632.80	1.77748					850	0.998	0.996
n_D	589.29	1.78161	ΔP_{Fe}	-0.0010	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.78179	$\Delta P_{g,F}$	-0.0003	-50/-40	54	750	0.998	0.996
n_e	546.07	1.78679	$\Delta P_{C,t}$	0.0018	-40/-30	58	700	0.998	0.996
n_F	486.13	1.79667	$\Delta P_{C,s}$	0.0002	-30/-20	61	650	0.998	0.996
$n_{F'}$	479.99	1.79793	Thermal Properties		-20/-10	63	600	0.998	0.996
n_g	435.84	1.80893	Tg ($^{\circ}C$)	661	-10/0	65	550	0.997	0.994
n_h	404.66	1.81955	Ts ($^{\circ}C$)	685	0/10	67	500	0.997	0.994
n_i	365.01	1.83869	$T_{10}^{14.5} (^{\circ}C)$	581	10/20	69	480	0.995	0.990
			$T_{10}^{13} (^{\circ}C)$	623	20/30	70	460	0.989	0.978
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	67	30/40	71	440	0.981	0.962
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	82	40/50	72	420	0.967	0.935
			λ (W/(m K))	0.97	50/60	72	400	0.935	0.874
					60/70	73	390	0.906	0.821
					70/80	73	380	0.848	0.719
			Mechanical Properties		80/90	74	370	0.744	0.554
			HK ($10^7 Pa$)	566	90/100	75	360	0.582	0.339
			F_A	151	100/110	76	350	0.329	0.108
			E (GPa)	119.1	110/120	76	340		
			G (GPa)	46.1	120/130	77	330		
			μ	0.291	130/140	78	320		
			σ_b (MPa)		140/150	80	310		
			B ($10^{-12}/Pa$)	1.94	150/160	81	300		

Constants of Dispersion Formula	
A_0	3.08047013E+00
A_1	-1.22464411E-02
A_2	3.09400964E-02
A_3	1.05872727E-03
A_4	-1.30807247E-05
A_5	4.91706463E-06

Density		Solarization	
ρ (g/cm ³)	4.13	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.1	3.6	4.0	4.0	4.0	4.2	4.6	5.3	5.4	6.0
-40 ~ -20	3.1	3.6	4.0	4.0	4.0	4.3	4.7	5.3	5.4	6.3
-20 ~ 0	3.2	3.7	4.0	4.1	4.1	4.3	4.7	5.4	5.5	6.3
0 ~ 20	3.2	3.7	4.1	4.1	4.1	4.4	4.7	5.5	5.6	6.4
20 ~ 40	3.3	3.8	4.1	4.1	4.2	4.4	4.8	5.6	5.7	6.5
40 ~ 60	3.4	3.8	4.2	4.2	4.4	4.5	5.0	5.8	5.9	6.9
60 ~ 80	3.6	4.0	4.3	4.4	4.5	4.8	5.1	6.0	6.1	7.1
80 ~ 100	3.7	4.1	4.4	4.5	4.6	4.9	5.3	6.3	6.4	7.1
100 ~ 120	3.9	4.3	4.6	4.6	4.7	5.0	5.5	6.4	6.5	7.3
120 ~ 140	4.2	4.5	4.7	4.7	4.8	5.2	5.6	6.5	6.6	7.6
140 ~ 160	4.3	4.6	4.8	4.8	4.9	5.3	5.7	6.6	6.7	8.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	420/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	384/346

Constants of dn/dt		
D_0	D_1	D_2
2.32E-06	1.27E-08	-1.60E-11
E_0	E_1	λ_{TK}
5.87E-07	4.07E-10	2.86E-01

H-LaF10A	788475	$n_d = 1.78800$	$v_d = 47.49$	$n_F - n_C = 0.016592$
		$n_e = 1.79195$	$v_e = 47.26$	$n_F - n_C' = 0.016758$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm
n ₂₃₂₅	2325.42	1.74466	P _{d,C}	0.3014	RC (S)	1	2400	0.787	0.620
n ₁₉₇₀	1970.09	1.75204	P _{e,d}	0.2381	RA (S)	3	2200	0.927	0.859
n ₁₅₃₀	1529.58	1.76016	P _{g,F}	0.5539	D _W	1	2000	0.976	0.953
n ₁₁₂₉	1128.64	1.76750	P' _{d,c´}	0.2512	D _A	3	1800	0.991	0.982
n ₁₀₆₄	1064.00	1.76885	P' _{e,d}	0.2357	R _{OH} (S)	1	1600	0.999	0.998
n _t	1013.98	1.76996	P' _{g,F´}	0.4911	RP (S)	1	1400	0.999	0.998
n _s	852.11	1.77435			CR	1	1200	0.999	0.998
n _{A´}	768.19	1.77738					1060	0.999	0.998
n _r	706.52	1.78018	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998
n _C	656.27	1.78300					950	0.999	0.998
n _{C´}	643.85	1.78379					900	0.999	0.998
n _{He-Ne}	632.80	1.78453					850	0.999	0.998
n _D	589.29	1.78785					800	0.999	0.998
n _d	587.56	1.78800	ΔP _{F,e}	-0.0035	°C	α	750	0.999	0.998
n _e	546.07	1.79195	ΔP _{g,F}	-0.0108	-50/-40	55	700	0.999	0.998
n _F	486.13	1.79959	ΔP _{C,t}	0.0157	-40/-30	57	650	0.999	0.998
n _{F´}	479.99	1.80055	ΔP _{C,s}	0.0070	-30/-20	59	600	0.999	0.998
n _g	435.84	1.80878	Thermal Properties		-20/-10	60	550	0.999	0.998
n _h	404.66	1.81649			-10/0	61	500	0.999	0.998
n _i	365.01	1.82981			0/10	61	480	0.999	0.998
					10/20	62	460	0.999	0.998
					20/30	63	440	0.997	0.994
					30/40	63			
			α _{-50/80°C} (10 ⁻⁷ /K)	59	40/50	64			
			α _{100/300°C} (10 ⁻⁷ /K)	73					

Constants of Dispersion Formula	
A_0	3.12424071E+00
A_1	-1.57101635E-02
A_2	2.44837290E-02
A_3	1.02164022E-03
A_4	-7.05302601E-05
A_5	4.58907154E-06

Density		Solarization	
ρ (g/cm ³)	4.28	$\Delta\lambda$ (%)	-3.1

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.8	4.1	4.5	4.5	4.5	4.8	5.1	5.5	5.6	6.0
-40 ~ -20	3.9	4.2	4.5	4.5	4.6	4.8	5.1	5.6	5.7	6.1
-20 ~ 0	3.9	4.3	4.5	4.5	4.6	4.8	5.1	5.7	5.7	6.2
0 ~ 20	3.9	4.3	4.5	4.5	4.6	4.8	5.2	5.7	5.8	6.2
20 ~ 40	4.0	4.3	4.5	4.6	4.7	5.0	5.2	5.8	5.8	6.3
40 ~ 60	4.0	4.5	4.7	4.7	4.8	5.0	5.3	5.9	6.0	6.5
60 ~ 80	4.2	4.6	4.8	4.8	5.0	5.2	5.5	6.1	6.2	6.7
80 ~ 100	4.3	4.7	5.0	5.0	5.2	5.4	5.6	6.4	6.4	6.9
100 ~ 120	4.4	4.8	5.1	5.1	5.3	5.5	5.7	6.5	6.5	7.1
120 ~ 140	4.5	4.9	5.2	5.2	5.4	5.6	5.8	6.6	6.6	7.3
140 ~ 160	4.6	5.0	5.3	5.3	5.5	5.7	5.9	6.7	6.8	7.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/315
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	347/314

Constants of dn/dt		
D_0	D_1	D_2
3.30E-06	1.21E-08	-1.61E-11
E_0	E_1	λ_{TK}
5.85E-07	4.50E-10	2.21E-01

H-LaF50B	773496	$n_d = 1.77250$	$v_d = 49.60$	$n_F - n_C = 0.015575$
		$n_e = 1.77621$	$v_e = 49.36$	$n_F - n_C' = 0.015725$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3018	RC (S)	1	2400	0.759	0.576
n_{1970}	1970.09		$P_{e,d}$	0.2382	RA (S)	1	2200	0.905	0.818
n_{1530}	1529.58		$P_{g,F}$	0.5515	D_W	1	2000	0.969	0.939
n_{1129}	1128.64		$P'_{d,c'}$	0.2518	D_A	3	1800	0.986	0.972
n_{1064}	1064.00	1.75428	$P'_{e,d}$	0.2359	$R_{OH}(S)$	1	1600	0.994	0.987
n_t	1013.98	1.75538	$P'_{g,F'}$	0.4890	RP (S)	1	1400	0.994	0.987
n_s	852.11	1.75960			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.76249	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.76514					1000	0.999	0.998
n_C	656.27	1.76780					950	0.999	0.998
$n_{C'}$	643.85	1.76854					900	0.999	0.998
n_{He-Ne}	632.80	1.76924					850	0.999	0.998
n_D	589.29	1.77236	ΔP_{Fe}	-0.0031	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.77250	$\Delta P_{g,F}$	-0.0097	-50/-40	52	750	0.999	0.998
n_e	546.07	1.77621	$\Delta P_{C,t}$	0.0170	-40/-30	53	700	0.999	0.998
n_F	486.13	1.78337	$\Delta P_{C,s}$	0.0070	-30/-20	54	650	0.999	0.998
$n_{F'}$	479.99	1.78427	Thermal Properties		-20/-10	54	600	0.999	0.998
n_g	435.84	1.79196	Tg ($^{\circ}C$)	682	-10/0	54	550	0.999	0.998
n_h	404.66	1.79913	Ts ($^{\circ}C$)	712	0/10	55	500	0.999	0.998
n_i	365.01	1.81144	$T_{10}^{14.5} (^{\circ}C)$	619	10/20	57	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	665	20/30	57	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	56	30/40	57	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	72	40/50	58	420	0.995	0.990
			λ (W/(m K))	0.95	50/60	59	400	0.990	0.980
					60/70	61	390	0.984	0.968
					70/80	61	380	0.974	0.948
			Mechanical Properties		80/90	63	370	0.957	0.915
			HK (10^7Pa)	713	90/100	63	360	0.928	0.861
			F_A	62	100/110	64	350	0.883	0.780
			E (GPa)	117.3	110/120	65	340	0.812	0.660
			G (GPa)	46.9	120/130	66	330	0.699	0.488
			μ	0.250	130/140	66	320	0.528	0.279
			σ_b (MPa)	108	140/150	67	310	0.288	0.083
			B ($10^{-12}/Pa$)	1.37	150/160	70	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.07486227E+00
A_1	-1.60709812E-02
A_2	2.28883031E-02
A_3	8.28871954E-04
A_4	-4.04256219E-05
A_5	2.26879435E-06

Density		Solarization	
ρ (g/cm ³)	4.23	$\Delta\lambda$ (%)	-1.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.1	2.4	2.7	2.8	2.8	3.0	3.3	3.5	3.7	4.2
-40 ~ -20	2.2	2.4	2.8	2.9	3.0	3.1	3.4	3.7	3.8	4.4
-20 ~ 0	2.3	2.5	2.8	2.9	3.0	3.3	3.6	3.9	4.0	4.6
0 ~ 20	2.3	2.5	2.9	3.0	3.1	3.4	3.7	3.9	4.1	4.8
20 ~ 40	2.3	2.6	2.9	3.0	3.1	3.4	3.8	4.1	4.2	5.0
40 ~ 60	2.3	2.7	3.0	3.1	3.2	3.6	3.9	4.1	4.3	5.0
60 ~ 80	2.4	2.7	3.0	3.1	3.3	3.7	3.9	4.1	4.3	5.1
80 ~ 100	2.4	2.7	3.1	3.2	3.4	3.8	4.0	4.2	4.4	5.3
100 ~ 120	2.4	2.9	3.2	3.3	3.5	3.8	4.1	4.3	4.5	5.3
120 ~ 140	2.5	3.0	3.3	3.4	3.6	3.9	4.2	4.4	4.6	5.4
140 ~ 160	2.6	3.0	3.3	3.5	3.6	4.0	4.2	4.4	4.6	5.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	375/310
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	352/307

Constants of dn/dt		
D_0	D_1	D_2
4.34E-07	1.20E-08	-2.81E-11
E_0	E_1	λ_{TK}
7.25E-07	5.31E-10	1.62E-01

H-LaF51	700481	$n_d = 1.70000$	$v_d = 48.08$	$n_F - n_C = 0.014559$
		$n_e = 1.70346$	$v_e = 47.80$	$n_F - n_{C'} = 0.014717$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$		
n_{2325}	2325.42	1.66549	$P_{d,C}$	0.2995	RC (S)	1	2400	0.920	0.845		
n_{1970}	1970.09	1.67085	$P_{e,d}$	0.2377	RA (S)	1	2200	0.972	0.944		
n_{1530}	1529.58	1.67686	$P_{g,F}$	0.5619	D_W	1	2000	0.990	0.977		
n_{1129}	1128.64	1.68256	$P'_{d,c'}$	0.2494	D_A	3	1800	0.999	0.990		
n_{1064}	1064.00	1.68365	$P'_{e,d}$	0.2351	$R_{OH}(S)$	1	1600	0.999	0.998		
n_t	1013.98	1.68456	$P'_{g,F'}$	0.4987	RP (S)	2	1400	0.999	0.998		
n_s	852.11	1.68821			CR		1200	0.999	0.998		
$n_{A'}$	768.19	1.69079	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998		
n_r	706.52	1.69320					1000	0.999	0.998		
n_C	656.27	1.69564					950	0.999	0.998		
$n_{C'}$	643.85	1.69633					900	0.999	0.998		
n_{He-Ne}	632.80	1.69697					850	0.999	0.998		
n_D	589.29	1.69987	$\Delta P_{F,e}$	-0.0007	$^{\circ}C$	α	800	0.999	0.998		
n_d	587.56	1.70000	$\Delta P_{g,F}$	-0.0019	-50/-40	68	750	0.999	0.998		
n_e	546.07	1.70346	$\Delta P_{C,t}$	-0.0121	-40/-30	71	700	0.999	0.998		
n_F	486.13	1.71020	$\Delta P_{C,s}$	-0.0055	-30/-20	72	650	0.999	0.998		
$n_{F'}$	479.99	1.71104	Thermal Properties		-20/-10	74	600	0.999	0.998		
n_g	435.84	1.71838			Tg ($^{\circ}C$)	661	-10/0	75	550	0.999	0.998
n_h	404.66	1.72530			Ts ($^{\circ}C$)	703	0/10	75	500	0.999	0.998
n_i	365.01	1.73740			$T_{10}^{14.5} (^{\circ}C)$	591	10/20	76	480	0.999	0.998
					$T_{10}^{13} (^{\circ}C)$	635	20/30	77	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	77	30/40	77	440	0.997	0.996		
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	91	40/50	78					

H-LaF52	786442	$n_d = 1.78590$	$v_d = 44.19$	$n_F - n_C = 0.017786$
		$n_e = 1.79013$	$v_e = 43.93$	$n_F - n_C' = 0.017988$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.74308	$P_{d,C}$	0.2985	RC (S)	1	2400	0.830	0.689
n_{1970}	1970.09	1.74989	$P_{e,d}$	0.2378	RA (S)	3	2200	0.958	0.918
n_{1530}	1529.58	1.75749	$P_{g,F}$	0.5634	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.76459	$P'_{d,c'}$	0.2491	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.76594	$P'_{e,d}$	0.2352	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.76706	$P'_{g,F'}$	0.4992	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.77153			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.77468	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.77761					1000	0.999	0.998
n_C	656.27	1.78059					950	0.999	0.998
$n_{C'}$	643.85	1.78142					900	0.999	0.998
n_{He-Ne}	632.80	1.78221					850	0.999	0.998
n_D	589.29	1.78574	ΔP_{Fe}	-0.0025	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.78590	$\Delta P_{g,F}$	-0.0068	-50/-40	50	750	0.999	0.998
n_e	546.07	1.79013	$\Delta P_{C,t}$	0.0065	-40/-30	53	700	0.999	0.998
n_F	486.13	1.79837	$\Delta P_{C,s}$	0.0029	-30/-20	54	650	0.999	0.998
$n_{F'}$	479.99	1.79941	Thermal Properties		-20/-10	55	600	0.999	0.998
n_g	435.84	1.80839	Tg ($^{\circ}C$)	606	-10/0	56	550	0.999	0.998
n_h	404.66	1.81685	Ts ($^{\circ}C$)	638	0/10	57	500	0.999	0.998
n_i	365.01	1.83170	$T_{10}^{14.5} (^{\circ}C)$	548	10/20	58	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	574	20/30	59	460	0.996	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	56	30/40	59	440	0.994	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	72	40/50	60	420	0.988	0.985
			λ (W/(m K))	0.85	50/60	60	400	0.982	0.975
					60/70	61	390	0.975	0.963
					70/80	61	380	0.966	0.945
			Mechanical Properties		80/90	62	370	0.949	0.913
			HK ($10^7 Pa$)	649	90/100	63	360	0.920	0.858
			F_A	76	100/110	64	350	0.873	0.774
			E (GPa)	112.5	110/120	65	340	0.793	0.639
			G (GPa)	41.8	120/130	66	330	0.639	0.418
			μ	0.346	130/140	67	320	0.349	0.127
			σ_b (MPa)	90	140/150	68	310		
			B ($10^{-12}/Pa$)	2.06	150/160	68	300		

Constants of Dispersion Formula	
A_0	3.11096434E+00
A_1	-1.43300745E-02
A_2	2.60159962E-02
A_3	1.10002413E-03
A_4	-6.28685795E-05
A_5	4.85754790E-06

Density		Solarization	
ρ (g/cm ³)	4.38	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	7.3	7.7	8.0	8.0	8.1	8.4	8.7	9.4	9.4	10.2
-40 ~ -20	7.3	7.7	8.0	8.0	8.1	8.4	8.7	9.5	9.5	10.2
-20 ~ 0	7.3	7.7	8.1	8.1	8.2	8.5	8.9	9.6	9.6	10.3
0 ~ 20	7.4	7.8	8.2	8.2	8.2	8.5	8.9	9.6	9.6	10.4
20 ~ 40	7.4	7.8	8.2	8.2	8.3	8.6	8.9	9.7	9.7	10.5
40 ~ 60	7.5	7.9	8.3	8.4	8.4	8.6	9.0	9.7	9.9	10.6
60 ~ 80	7.7	8.2	8.4	8.5	8.6	8.8	9.2	10.1	10.2	10.8
80 ~ 100	7.8	8.3	8.6	8.7	8.7	8.8	9.4	10.3	10.4	11.0
100 ~ 120	8.1	8.4	8.7	8.8	8.8	9.0	9.0	10.5	10.6	11.3
120 ~ 140	8.0	8.6	8.9	9.0	9.0	9.3	9.3	10.8	10.8	11.5
140 ~ 160	8.2	8.7	9.0	9.1	9.2	9.4	9.4	11.0	11.1	11.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	350/316

Constants of dn/dt		
D_0	D_1	D_2
9.08E-06	1.24E-08	-1.32E-11
E_0	E_1	λ_{TK}
5.76E-07	4.15E-10	2.72E-01

H-LaF53	743492	$n_d = 1.74330$	$v_d = 49.22$	$n_F - n_C = 0.015101$
		$n_e = 1.74690$	$v_e = 48.99$	$n_F - n_C' = 0.015246$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70297	$P_{d,C}$	0.3013	RC (S)	1	2400	0.761	0.580
n_{1970}	1970.09	1.70999	$P_{e,d}$	0.2384	RA (S)	3	2200	0.914	0.835
n_{1530}	1529.58	1.71767	$P_{g,F}$	0.5536	D_W	1	2000	0.975	0.951
n_{1129}	1128.64	1.72455	$P'_{d,c'}$	0.2512	D_A	3	1800	0.993	0.986
n_{1064}	1064.00	1.72580	$P'_{e,d}$	0.2361	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.72685	$P'_{g,F'}$	0.4913	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.73087			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.73364	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.73619					1000	0.999	0.998
n_C	656.27	1.73875					950	0.999	0.998
$n_{C'}$	643.85	1.73947					900	0.999	0.998
n_{He-Ne}	632.80	1.74015					850	0.999	0.998
n_D	589.29	1.74317	ΔP_{Fe}	-0.0028	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.74330	$\Delta P_{g,F}$	-0.0082	-50/-40	44	750	0.999	0.998
n_e	546.07	1.74690	$\Delta P_{C,t}$	0.0094	-40/-30	47	700	0.999	0.998
n_F	486.13	1.75385	$\Delta P_{C,s}$	0.0033	-30/-20	49	650	0.999	0.998
$n_{F'}$	479.99	1.75472	Thermal Properties		-20/-10	50	600	0.999	0.998
n_g	435.84	1.76221	Tg ($^{\circ}C$)	608	-10/0	51	550	0.999	0.998
n_h	404.66	1.76921	Ts ($^{\circ}C$)	634	0/10	52	500	0.999	0.998
n_i	365.01	1.78127	$T_{10}^{14.5} (^{\circ}C)$	550	10/20	53	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	578	20/30	53	460	0.998	0.996
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	50	30/40	53	440	0.997	0.994
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	66	40/50	54	420	0.996	0.992
			λ (W/(m K))	0.83	50/60	54	400	0.992	0.987
					60/70	54	390	0.987	0.980
					70/80	55	380	0.981	0.970
			Mechanical Properties		80/90	56	370	0.970	0.950
			HK (10^7Pa)	661	90/100	57	360	0.951	0.914
			F_A	83	100/110	58	350	0.924	0.862
			E (GPa)	110.1	110/120	59	340	0.880	0.786
			G (GPa)	41.5	120/130	60	330	0.815	0.673
			μ	0.327	130/140	61	320	0.705	0.508
			σ_b (MPa)	75	140/150	62	310	0.505	0.263
			B ($10^{-12}/Pa$)	2.18	150/160	63	300	0.187	0.039

Constants of Dispersion Formula	
A_0	2.97513891E+00
A_1	-1.46215956E-02
A_2	2.17492662E-02
A_3	8.02001413E-04
A_4	-3.64703266E-05
A_5	2.12357903E-06

Density		Solarization	
ρ (g/cm ³)	4.15	$\Delta\lambda$ (%)	-1.1

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	7.4	7.7	7.9	7.9	7.9	8.1	8.5	8.9	9.0	9.5
-40 ~ -20	7.3	7.8	8.1	8.1	8.0	8.2	8.5	9.0	9.1	9.6
-20 ~ 0	7.3	7.9	8.1	8.1	8.1	8.2	8.6	9.1	9.2	9.7
0 ~ 20	7.4	8.0	8.2	8.2	8.2	8.3	8.7	9.2	9.3	9.8
20 ~ 40	7.4	8.0	8.2	8.2	8.2	8.4	8.7	9.3	9.4	9.9
40 ~ 60	7.5	8.1	8.3	8.3	8.3	8.5	8.8	9.4	9.6	10.0
60 ~ 80	7.6	8.2	8.4	8.4	8.5	8.6	9.0	9.6	9.7	10.2
80 ~ 100	7.7	8.3	8.5	8.6	8.6	8.7	9.1	9.8	9.9	10.4
100 ~ 120	7.8	8.5	8.6	8.6	8.6	9.0	9.3	10.0	10.1	10.7
120 ~ 140	7.9	8.5	8.7	8.7	8.7	9.1	9.5	10.2	10.3	11.0
140 ~ 160	8.1	8.7	8.8	8.8	8.8	9.3	9.7	10.4	10.5	11.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/300
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	342/301

Constants of dn/dt		
D_0	D_1	D_2
9.82E-06	1.23E-08	-1.80E-11
E_0	E_1	λ_{TK}
5.12E-07	6.03E-10	2.46E-01

H-LaF54	800423	$n_d = 1.79950$	$v_d = 42.34$	$n_F - n_C = 0.018883$
		$n_e = 1.80399$	$v_e = 42.09$	$n_F - n_C' = 0.019101$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.75473	$P_{d,C}$	0.2976	RC (S)	1	2400	0.811	0.658
n_{1970}	1970.09	1.76179	$P_{e,d}$	0.2378	RA (S)	3	2200	0.944	0.891
n_{1530}	1529.58	1.76966	$P_{g,F}$	0.5661	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.77705	$P'_{d,c'}$	0.2482	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.77846	$P'_{e,d}$	0.2351	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.77963	$P'_{g,F'}$	0.5021	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.78432			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.78763	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79073					1000	0.999	0.998
n_C	656.27	1.79388					950	0.999	0.998
$n_{C'}$	643.85	1.79476					900	0.999	0.998
n_{He-Ne}	632.80	1.79559					850	0.999	0.998
n_D	589.29	1.79934	ΔP_{Fe}	-0.0024	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.79950	$\Delta P_{g,F}$	-0.0072	-50/-40	47	750	0.999	0.998
n_e	546.07	1.80399	$\Delta P_{C,t}$	0.0094	-40/-30	49	700	0.999	0.998
n_F	486.13	1.81276	$\Delta P_{C,s}$	0.0043	-30/-20	51	650	0.999	0.998
$n_{F'}$	479.99	1.81386	Thermal Properties		-20/-10	53	600	0.999	0.998
n_g	435.84	1.82345	Tg ($^{\circ}C$)	606	-10/0	53	550	0.999	0.998
n_h	404.66	1.83254	Ts ($^{\circ}C$)	637	0/10	54	500	0.999	0.998
n_i	365.01	1.84858	$T_{10}^{14.5} (^{\circ}C)$	539	10/20	55	480	0.997	0.996
			$T_{10}^{13} (^{\circ}C)$	580	20/30	56	460	0.995	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	53	30/40	57	440	0.993	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	68	40/50	57	420	0.991	0.986
			λ (W/(m K))	1.30	50/60	58	400	0.984	0.973
					60/70	58	390	0.978	0.960
					70/80	59	380	0.966	0.935
			Mechanical Properties		80/90	60	370	0.941	0.890
			HK ($10^7 Pa$)	630	90/100	61	360	0.900	0.811
			F_A	84	100/110	62	350	0.815	0.665
			E (GPa)	114.4	110/120	63	340	0.638	0.408
			G (GPa)	42.7	120/130	64	330	0.316	0.102
			μ	0.340	130/140	65	320	0.048	0.011
			σ_b (MPa)	74	140/150	66	310		
			B ($10^{-12}/Pa$)	2.07	150/160	66	300		

Constants of Dispersion Formula	
A_0	3.15463077E+00
A_1	-1.49142692E-02
A_2	2.73983671E-02
A_3	1.30082902E-03
A_4	-8.39080192E-05
A_5	6.66808513E-06

Density		Solarization	
ρ (g/cm ³)	4.40	$\Delta\lambda$ (%)	-1.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	6.4	6.9	7.2	7.3	7.3	7.6	7.8	8.5	8.6	9.1
-40 ~ -20	6.6	7.0	7.4	7.4	7.5	7.6	8.1	8.7	8.8	9.4
-20 ~ 0	6.8	7.1	7.7	7.7	7.8	7.8	8.3	9.0	9.1	9.9
0 ~ 20	7.0	7.3	7.8	7.9	8.0	8.1	8.6	9.2	9.3	10.0
20 ~ 40	7.0	7.3	7.9	8.0	8.0	8.2	8.6	9.3	9.4	10.3
40 ~ 60	7.0	7.4	7.9	8.0	8.0	8.3	8.8	9.5	9.5	10.4
60 ~ 80	7.2	7.5	8.0	8.0	8.1	8.6	9.0	9.7	9.8	10.6
80 ~ 100	7.4	7.7	8.1	8.2	8.2	8.8	9.1	10.1	10.1	10.9
100 ~ 120	7.6	7.8	8.2	8.3	8.4	9.0	9.3	10.3	10.3	11.0
120 ~ 140	7.7	8.0	8.4	8.5	8.6	9.2	9.5	10.5	10.5	11.4
140 ~ 160	7.8	8.1	8.5	8.6	8.7	9.3	9.6	10.7	10.8	11.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/330
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	358/327

Constants of dn/dt		
D_0	D_1	D_2
7.96E-06	1.37E-08	-2.59E-11
E_0	E_1	λ_{TK}
7.10E-07	8.49E-10	2.31E-01

H-LaF55	750353	$n_d = 1.74950$	$v_d = 35.33$	$n_F - n_C = 0.021214$
		$n_e = 1.75453$	$v_e = 35.10$	$n_F - n_{C'} = 0.021498$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance						
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm				
n ₂₃₂₅	2325.42	1.70383	P _{d,C}	0.2941	RC (S)	1	2400	0.967	0.936				
n ₁₉₇₀	1970.09	1.71040	P _{e,d}	0.2371	RA (S)	1	2200	0.982	0.965				
n ₁₅₃₀	1529.58	1.71787	P _{g,F}	0.5789	D _W	1	2000	0.993	0.987				
n ₁₁₂₉	1128.64	1.72521	P' _{d,c´}	0.2447	D _A	1	1800	0.996	0.992				
n ₁₀₆₄	1064.00	1.72665	P' _{e,d}	0.2340	R _{OH} (S)	1	1600	0.998	0.995				
n _t	1013.98	1.72788	P' _{g,F´}	0.5121	RP (S)	1	1400	0.998	0.996				
n _s	852.11	1.73284			CR		1200	0.999	0.997				
n _{A´}	768.19	1.73642					1060	0.999	0.998				
n _r	706.52	1.73980	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998				
n _C	656.27	1.74326							950	0.999	0.998		
n _{C´}	643.85	1.74424					ΔP _{F,e}	-0.0021			900	0.999	0.998
n _{He-Ne}	632.80	1.74516					ΔP _{g,F}	-0.0061	°C	α	850	0.999	0.998
n _D	589.29	1.74932					ΔP _{C,t}	0.0137	-50/-40	70	800	0.999	0.998
n _d	587.56	1.74950	ΔP _{C,s}	0.0060	-40/-30	72	750	0.999	0.998				
n _e	546.07	1.75453			-30/-20	74	700	0.999	0.998				
n _F	486.13	1.76447	Thermal Properties		-20/-10	76	650	0.998	0.996				
n _{F´}	479.99	1.76574			Tg (°C)	551	-10/0	77	600	0.998	0.996		
n _g	435.84	1.77675			Ts (°C)	589	0/10	78	550	0.998	0.996		
n _h	404.66	1.78738			T ₁₀ ^{14.5} (°C)	482	10/20	79	500	0.996	0.992		
n _i	365.01	1.80661			T ₁₀ ¹³ (°C)	533	20/30	80	480	0.994	0.989		
					α _{-50/80°C} (10 ⁻⁷ /K)	78	30/40	81	460	0.992	0.985		
					α _{100/300°C} (10 ⁻⁷ /K)	104	40/50	82	440	0.990	0.980		

Constants of Dispersion Formula						60/70		84		400		0.981		0.963			
A ₀	2.96935883E+00					70/80		84		390		0.974		0.949			
A ₁	-1.32774456E-02	Mechanical Properties				80/90		85		380		0.963		0.928			
A ₂	2.93044954E-02	HK (10 ⁷ Pa)		580		90/100		86		370		0.946		0.895			
A ₃	1.50919828E-03	F _A		156		100/110		88		360		0.919		0.845			
A ₄	-9.11873783E-05	E (GPa)		109.7		110/120		89		350		0.872		0.760			
A ₅	9.40030979E-06	G (GPa)		42.5		120/130		91		340		0.759		0.576			
				μ		0.290		130/140		92		330		0.486			
Density		Solarization		σ _b (MPa)		81		140/150		94		320		0.014			
ρ (g/cm ³)	3.23	Δλ (%)		-0.4		B (10 ⁻¹² /Pa)		2.44		150/160		95					
												310					
												300					
												290					
												280					
Range of Temperature (°C)	Temperature Coefficients of Refractive Index																
	dn/dt relative (×10 ⁻⁶ / °C)																
	t	s	C	C'	He-Ne	d	e	F	F'	g							
-60 ~ -40	4.0	4.4	4.6	4.7	4.7	5.0	5.5	6.3	6.3	7.1							
-40 ~ -20	4.0	4.3	4.6	4.7	4.8	5.0	5.5	6.4	6.4	7.2							
-20 ~ 0	3.8	4.3	4.7	4.7	4.8	5.1	5.4	6.4	6.4	7.3							
0 ~ 20	3.8	4.3	4.7	4.7	4.8	5.1	5.4	6.4	6.4	7.4							
20 ~ 40	3.7	4.3	4.7	4.7	4.8	5.1	5.4	6.4	6.4	7.4							
40 ~ 60	3.7	4.3	4.7	4.7	4.8	5.1	5.5	6.6	6.6	7.5							
60 ~ 80	3.8	4.4	4.8	4.8	4.9	5.2	5.7	6.8	6.8	7.8							
80 ~ 100	4.0	4.4	4.9	4.9	5.0	5.3	5.8	6.9	6.9	7.9							
100 ~ 120	4.1	4.5	4.9	4.9	5.0	5.4	6.0	7.0	7.0	8.1							
120 ~ 140	4.2	4.5	5.0	5.1	5.2	5.5	6.2	7.1	7.1	8.2							
140 ~ 160	4.2	4.6	5.1	5.2	5.3	5.6	6.3	7.3	7.3	8.4							
												Coloration Code					
												λ ₈₀ (λ ₇₀)/λ ₅		390/325			
												Coloration of Internal Transmittance					
												λτ ₈₀ /λτ ₅		354/324			
												Constants of dn/dt					
												D ₀		D ₁		D ₂	
												3.12E-06		9.87E-09		-1.45E-11	
												E ₀		E ₁		λ _{TK}	
												7.63E-07		6.00E-10		2.65E-01	

H-LaF56		800422	n _d = 1.79952		v _d = 42.24		n _F − n _C = 0.018928								
			n _e = 1.80402		v _e = 41.98		n _F − n _C ′ = 0.019154								
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance								
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm						
n ₂₃₂₅	2325.42						2400	0.903	0.815						
n ₁₉₇₀	1970.09						2200	0.975	0.952						
n ₁₅₃₀	1529.58						2000	0.989	0.978						
n ₁₁₂₉	1128.64	1.77750	P _{d,C}	0.2974	RC (S)	1	1800	0.997	0.994						
n ₁₀₆₄	1064.00	1.77880	P _{e,d}	0.2377	RA (S)	2	1600	0.999	0.998						
n _t	1013.98	1.77991	P _{g,F}	0.5674	D _W	1	1400	0.999	0.998						
n _s	852.11	1.78443	P′ _{d,c} ′	0.2475	D _A	3	1200	0.999	0.998						
n _A ′	768.19	1.78769	P′ _{e,d}	0.2349	R _{OH} (S)	1	1060	0.999	0.998						
n _r	706.52	1.79076	P′ _{g,F} ′	0.5028	RP (S)	2	1000	0.999	0.998						
n _C	656.27	1.79389			CR		950	0.999	0.998						
n _C ′	643.85	1.79478	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		900	0.999	0.998						
n _{He-Ne}	632.80	1.79561					850	0.999	0.998						
n _D	589.29	1.79935					800	0.999	0.998						
n _d	587.56	1.79952					750	0.999	0.998						
n _e	546.07	1.80402					700	0.999	0.998						
n _F	486.13	1.81282	Thermal Properties				650	0.999	0.998						
n _F ′	479.99	1.81393					600	0.999	0.998						
n _g	435.84	1.82356					550	0.999	0.998						
n _h	404.66	1.83269					500	0.998	0.995						
n _i	365.01	1.84872					480	0.996	0.993						
			Mechanical Properties				460	0.995	0.990						
							440	0.992	0.985						
							420	0.989	0.978						
							400	0.982	0.963						
							390	0.974	0.949						
Constants of Dispersion Formula							380	0.961	0.923						
A ₀	3.14996339E+00						370	0.935	0.873						
A ₁	-1.12409199E-02						360	0.872	0.760						
A ₂	2.99099759E-02						350	0.722	0.522						
A ₃	5.96811598E-04						340	0.424	0.179						
A ₄	1.91751228E-05						330	0.112	0.013						
A ₅	9.69165865E-07						320								
Density		Solarization					310								
							300								
ρ (g/cm ³)	4.60	△λ (%)					-0.8						290		
				280											
Range of Temperature (°C)	Temperature Coefficients of Refractive Index										Coloration Code				
	dn/dt relative (×10 ⁻⁶ /°C)										λ ₈₀ (λ ₇₀)/λ ₅		390/335		
	t	s	C	C'	He-Ne	d	e	F	F'	g	Coloration of Internal Transmittance				
	-60 ~ -40	7.5	8.2	9.2	9.4	9.6	10.0	10.5	11.2	11.3	12.0	λτ ₈₀ /λτ ₅		363/336	
	-40 ~ -20	7.7	8.4	9.3	9.6	9.8	10.1	10.7	11.2	11.4	12.0				
	-20 ~ 0	7.8	8.6	9.5	9.7	9.9	10.3	10.8	11.4	11.6	12.1	Constants of dn/dt			
	0 ~ 20	8.1	8.7	9.6	9.8	10.0	10.5	10.9	11.5	11.7	12.2				
	20 ~ 40	8.2	8.8	9.8	9.9	10.1	10.5	11.2	11.7	11.9	12.5				
	40 ~ 60	8.5	9.0	10.1	10.2	10.4	10.7	11.3	11.8	12.0	12.6				
	60 ~ 80	8.6	9.2	10.4	10.5	10.6	10.9	11.5	12.1	12.3	12.9				
	80 ~ 100	8.7	9.5	10.5	10.6	10.7	11.1	11.7	12.1	12.3	13.0				
	100 ~ 120	8.9	9.7	10.7	10.8	10.9	11.2	11.8	12.4	12.5	13.1				
	120 ~ 140	9.1	9.8	10.8	10.9	11.0	11.3	12.0	12.5	12.6	13.3				
140 ~ 160	9.2	9.8	10.9	11.0	11.2	11.5	12.1	12.5	12.7	13.4					
			D ₀			D ₁			D ₂						
			9.77E-06			1.76E-08			-2.54E-11						
			E ₀			E ₁			λ _{TK}						
			1.41E-06			-2.80E-10			4.92E-10						

H-LaF62	720437	$n_d = 1.72000$	$v_d = 43.68$	$n_F - n_C = 0.016483$
		$n_e = 1.72391$	$v_e = 43.39$	$n_F - n_C' = 0.016682$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.68074	$P_{d,C}$	0.2967	RC (S)	1	2400	0.872	0.760
n_{1970}	1970.09	1.68697	$P_{e,d}$	0.2372	RA (S)	3	2200	0.954	0.910
n_{1530}	1529.58	1.69391	$P_{g,F}$	0.5673	D_W	1	2000	0.991	0.982
n_{1129}	1128.64	1.70040	$P'_{d,c'}$	0.2470	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.70163	$P'_{e,d}$	0.2344	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.70266	$P'_{g,F'}$	0.5023	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.70676			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.70965	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.71235					1000	0.999	0.998
n_C	656.27	1.71511					950	0.999	0.998
$n_{C'}$	643.85	1.71588					900	0.999	0.998
n_{He-Ne}	632.80	1.71660					850	0.999	0.998
n_D	589.29	1.71985	ΔP_{Fe}	-0.0002	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.72000	$\Delta P_{g,F}$	-0.0038	-50/-40	61	750	0.999	0.998
n_e	546.07	1.72391	$\Delta P_{C,t}$	0.0036	-40/-30	64	700	0.999	0.998
n_F	486.13	1.73159	$\Delta P_{C,s}$	0.0014	-30/-20	66	650	0.999	0.998
$n_{F'}$	479.99	1.73256	Thermal Properties		-20/-10	67	600	0.999	0.998
n_g	435.84	1.74094	Tg ($^{\circ}C$)	604	-10/0	68	550	0.999	0.998
n_h	404.66	1.74893	Ts ($^{\circ}C$)	640	0/10	69	500	0.998	0.996
n_i	365.01	1.76316	$T_{10}^{14.5} (^{\circ}C)$	530	10/20	70	480	0.996	0.993
			$T_{10}^{13} (^{\circ}C)$	581	20/30	71	460	0.994	0.990
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	71	30/40	72	440	0.992	0.985
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	40/50	73	420	0.984	0.975
			λ (W/(m K))	0.95	50/60	74	400	0.976	0.958
					60/70	75	390	0.966	0.940
					70/80	75	380	0.946	0.901
			Mechanical Properties		80/90	76	370	0.901	0.819
			HK (10^7Pa)	564	90/100	77	360	0.788	0.625
			F_A	149	100/110	79	350	0.517	0.272
			E (GPa)	106.1	110/120	80	340	0.127	0.020
			G (GPa)	40.3	120/130	81	330		
			μ	0.317	130/140	83	320		
			σ_b (MPa)	70	140/150	84	310		
			B ($10^{-12}/Pa$)	2.25	150/160	85	300		

Constants of Dispersion Formula	
A_0	2.88897190E+00
A_1	-1.26328327E-02
A_2	2.26898960E-02
A_3	1.15077142E-03
A_4	-8.54940157E-05
A_5	7.07758016E-06

Density		Solarization	
ρ (g/cm ³)	3.71	$\Delta\lambda$ (%)	-0.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.4	2.8	3.1	3.1	3.1	3.3	3.6	4.1	4.2	4.7
-40 ~ -20	2.4	2.8	3.1	3.1	3.1	3.3	3.5	4.2	4.3	4.8
-20 ~ 0	2.5	2.8	3.1	3.1	3.2	3.4	3.6	4.2	4.3	4.9
0 ~ 20	2.4	2.9	3.1	3.1	3.2	3.4	3.6	4.2	4.3	5.0
20 ~ 40	2.4	2.9	3.1	3.1	3.2	3.4	3.7	4.3	4.4	5.0
40 ~ 60	2.4	2.9	3.1	3.1	3.2	3.5	3.7	4.4	4.5	5.2
60 ~ 80	2.5	3.0	3.2	3.3	3.4	3.6	3.8	4.6	4.7	5.3
80 ~ 100	2.5	3.1	3.3	3.4	3.5	3.7	3.9	4.7	4.8	5.5
100 ~ 120	2.7	3.2	3.5	3.5	3.6	3.9	4.1	4.9	5.0	5.7
120 ~ 140	2.8	3.3	3.6	3.6	3.7	4.0	4.3	5.1	5.2	5.8
140 ~ 160	3.0	3.4	3.8	3.8	3.9	4.2	4.4	5.2	5.3	5.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	365/342

Constants of dn/dt		
D_0	D_1	D_2
9.15E-07	1.15E-08	-1.32E-11
E_0	E_1	λ_{TK}
6.49E-07	4.46E-10	2.36E-01

H-LaF72	720460	$n_d = 1.72000$	$v_d = 46.02$	$n_F - n_C = 0.015645$
		$n_e = 1.72372$	$v_e = 45.77$	$n_F - n_{C'} = 0.015811$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.68194	$P_{d,C}$	0.2985	RC (S)	1	2400	0.902	0.806
n_{1970}	1970.09	1.68799	$P_{e,d}$	0.2378	RA (S)	1	2200	0.982	0.949
n_{1530}	1529.58	1.69476	$P_{g,F}$	0.5650	D_W	1	2000	0.993	0.986
n_{1129}	1128.64	1.70111	$P'_{d,c'}$	0.2486	D_A	3	1800	0.998	0.996
n_{1064}	1064.00	1.70232	$P'_{e,d}$	0.2353	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.70333	$P'_{g,F'}$	0.5015	RP (S)	2	1400	0.998	0.996
n_s	852.11	1.70732			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.71011	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.71271					1000	0.998	0.996
n_C	656.27	1.71533					950	0.998	0.996
$n_{C'}$	643.85	1.71607					900	0.998	0.996
n_{He-Ne}	632.80	1.71676					850	0.998	0.996
n_D	589.29	1.71987	ΔP_{Fe}	-0.0014	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.72000	$\Delta P_{g,F}$	-0.0021	-50/-40	60	750	0.998	0.996
n_e	546.07	1.72372	$\Delta P_{C,t}$	0.0039	-40/-30	63	700	0.998	0.996
n_F	486.13	1.73097	$\Delta P_{C,s}$	0.0011	-30/-20	64	650	0.998	0.996
$n_{F'}$	479.99	1.73188	Thermal Properties		-20/-10	65	600	0.998	0.996
n_g	435.84	1.73981	Tg ($^{\circ}C$)	660	-10/0	66	550	0.998	0.996
n_h	404.66	1.74732	Ts ($^{\circ}C$)	692	0/10	67	500	0.998	0.996
n_i	365.01	1.76051	$T_{10}^{14.5} (^{\circ}C)$	584	10/20	68	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	628	20/30	70	460	0.995	0.992
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	67	30/40	70	440	0.993	0.987
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	82	40/50	71	420	0.988	0.982
			λ (W/(m K))	0.98	50/60	71	400	0.978	0.964
					60/70	72	390	0.967	0.946
					70/80	72	380	0.948	0.910
			Mechanical Properties		80/90	73	370	0.908	0.839
			HK ($10^7 Pa$)	585	90/100	74	360	0.826	0.698
			F_A	128	100/110	75	350	0.638	0.423
			E (GPa)	98.1	110/120	76	340	0.303	0.098
			G (GPa)	38.4	120/130	77	330		
			μ	0.277	130/140	78	320		
			σ_b (MPa)	70	140/150	79	310		
			B ($10^{-12}/Pa$)	1.77	150/160	80	300		

Constants of Dispersion Formula	
A_0	2.89068995E+00
A_1	-1.22258397E-02
A_2	2.34463603E-02
A_3	3.98991928E-04
A_4	2.73296394E-05
A_5	1.01579894E-07

Density		Solarization	
ρ (g/cm ³)	3.88	$\Delta\lambda$ (%)	-1.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.7	2.9	3.2	3.2	3.3	3.5	3.6	4.2	4.3	4.7
-40 ~ -20	2.7	3.0	3.2	3.3	3.3	3.5	3.6	4.2	4.3	4.8
-20 ~ 0	2.7	3.0	3.2	3.3	3.4	3.6	3.8	4.2	4.3	4.9
0 ~ 20	2.7	3.0	3.2	3.3	3.4	3.6	3.8	4.2	4.3	5.0
20 ~ 40	2.7	3.1	3.3	3.3	3.4	3.6	3.9	4.3	4.4	5.1
40 ~ 60	2.7	3.1	3.4	3.4	3.5	3.7	4.1	4.3	4.4	5.2
60 ~ 80	2.8	3.2	3.5	3.5	3.6	3.8	4.1	4.5	4.6	5.3
80 ~ 100	2.9	3.2	3.6	3.6	3.7	3.9	4.1	4.7	4.8	5.4
100 ~ 120	2.9	3.3	3.7	3.7	3.8	4.0	4.3	4.9	5.0	5.5
120 ~ 140	2.9	3.4	3.8	3.8	3.9	4.1	4.5	5.1	5.2	5.7
140 ~ 160	3.0	3.5	3.9	4.0	4.0	4.3	4.6	5.2	5.3	5.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	366/337

Constants of dn/dt		
D_0	D_1	D_2
1.36E-06	1.16E-08	-1.71E-11
E_0	E_1	λ_{TK}
6.48E-07	4.94E-10	1.99E-01

H-LaF76	762401	$n_d = 1.76200$	$v_d = 40.09$	$n_F - n_C = 0.019010$
		$n_e = 1.76651$	$v_e = 39.86$	$n_F - n_C' = 0.019232$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.71750	P _{d,C}	0.2956	RC (S)	1	2400	0.872	0.760		
n ₁₉₇₀	1970.09	1.72452	P _{e,d}	0.2372	RA (S)	3	2200	0.976	0.953		
n ₁₅₃₀	1529.58	1.73233	P _{g,F}	0.5734	D _W	1	2000	0.990	0.980		
n ₁₁₂₉	1128.64	1.73966	P' _{d,c}	0.2459	D _A	4	1800	0.998	0.996		
n ₁₀₆₄	1064.00	1.74105	P' _{e,d}	0.2345	R _{OH} (S)	1	1600	0.998	0.996		
n _t	1013.98	1.74222	P' _{g,F}	0.5085	RP (S)	1	1400	0.998	0.996		
n _s	852.11	1.74686			CR		1200	0.999	0.998		
n _A	768.19	1.75016	Deviation of Relative Partial Dispersions			Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998	
n _r	706.52	1.75325						1000	0.999	0.998	
n _C	656.27	1.75638						950	0.999	0.998	
n _C	643.85	1.75727						900	0.999	0.998	
n _{He-Ne}	632.80	1.75809						850	0.999	0.998	
n _D	589.29	1.76183	ΔP _{F,e}	-0.0009	°C	α	800	0.999	0.998		
n _d	587.56	1.76200	ΔP _{g,F}	-0.0036	-50/-40	55	750	0.999	0.998		
n _e	546.07	1.76651	ΔP _{C,t}	0.0105	-40/-30	57	700	0.999	0.998		
n _F	486.13	1.77539	ΔP _{C,s}	0.0042	-30/-20	59	650	0.999	0.998		
n _F	479.99	1.77651	Thermal Properties		-20/-10	60	600	0.999	0.998		
n _g	435.84	1.78629			Tg (°C)	656	-10/0	61	550	0.999	0.998
n _h	404.66	1.79568			Ts (°C)	682	0/10	62	500	0.996	0.992
n _i	365.01	1.81262			T ₁₀ ^{14.5} (°C)	589	10/20	63	480	0.994	0.989
					T ₁₀ ¹³ (°C)	625	20/30	63	460	0.992	0.984
			α _{-50/80°C} (10 ⁻⁷ /K)	62	30/40	64	440	0.990	0.980		
			α _{100/300°C} (10 ⁻⁷ /K)	74	40/50	64					

H-ZLaF1	802443	$n_d = 1.80166$	$v_d = 44.27$	$n_F - n_C = 0.018110$
		$n_e = 1.80596$	$v_e = 44.05$	$n_F - n_C' = 0.018298$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.75717	$P_{d,C}$	0.2993	RC (S)	1	2400	0.803	0.645
n_{1970}	1970.09	1.76442	$P_{e,d}$	0.2374	RA (S)	1	2200	0.935	0.874
n_{1530}	1529.58	1.77245	$P_{g,F}$	0.5610	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.77986	$P'_{d,c'}$	0.2492	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.78125	$P'_{e,d}$	0.2350	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78241	$P'_{g,F'}$	0.4979	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.78700			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.79021	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79321					1000	0.999	0.998
n_C	656.27	1.79624					950	0.999	0.998
$n_{C'}$	643.85	1.79710					900	0.999	0.998
n_{He-Ne}	632.80	1.79790					850	0.999	0.998
n_D	589.29	1.80150	ΔP_{Fe}	-0.0025	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80166	$\Delta P_{g,F}$	-0.0091	-50/-40	48	750	0.999	0.998
n_e	546.07	1.80596	$\Delta P_{C,t}$	0.0090	-40/-30	50	700	0.999	0.998
n_F	486.13	1.81435	$\Delta P_{C,s}$	0.0036	-30/-20	50	650	0.999	0.998
$n_{F'}$	479.99	1.81540	Thermal Properties		-20/-10	52	600	0.999	0.998
n_g	435.84	1.82451	Tg ($^{\circ}C$)	658	-10/0	57	550	0.999	0.998
n_h	404.66	1.83312	Ts ($^{\circ}C$)	687	0/10	54	500	0.999	0.998
n_i	365.01	1.84826	$T_{10}^{14.5} (^{\circ}C)$	596	10/20	55	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	627	20/30	59	460	0.995	0.991
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	56	30/40	61	440	0.994	0.987
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	74	40/50	58	420	0.990	0.981
			λ (W/(m K))	0.92	50/60	59	400	0.984	0.968
					60/70	61	390	0.976	0.953
					70/80	62	380	0.963	0.927
			Mechanical Properties		80/90	62	370	0.936	0.876
			HK (10^7Pa)	681	90/100	64	360	0.881	0.776
			F_A	75	100/110	62	350	0.747	0.558
			E (GPa)	121.2	110/120	64	340	0.485	0.235
			G (GPa)	45.9	120/130	68	330	0.156	0.024
			μ	0.319	130/140	70	320		
			σ_b (MPa)	63	140/150	71	310		
			B ($10^{-12}/Pa$)	1.76	150/160	72	300		

Constants of Dispersion Formula	
A_0	3.16628243E+00
A_1	-1.54411440E-02
A_2	2.61007358E-02
A_3	1.37123320E-03
A_4	-1.09192053E-04
A_5	7.83345535E-06

Density		Solarization	
ρ (g/cm ³)	4.41	$\Delta\lambda$ (%)	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.6	5.0	5.3	5.3	5.4	5.6	5.7	6.4	6.5	7.0
-40 ~ -20	4.6	4.9	5.3	5.3	5.4	5.6	5.7	6.4	6.5	7.2
-20 ~ 0	4.7	4.9	5.3	5.3	5.4	5.7	5.8	6.5	6.5	7.4
0 ~ 20	4.7	4.9	5.3	5.4	5.4	5.8	6.0	6.6	6.6	7.4
20 ~ 40	4.8	4.9	5.4	5.5	5.5	5.8	6.1	6.7	6.7	7.5
40 ~ 60	4.8	5.0	5.5	5.6	5.7	6.0	6.3	6.8	6.9	7.7
60 ~ 80	5.0	5.2	5.7	5.8	5.9	6.3	6.5	7.0	7.1	7.9
80 ~ 100	5.0	5.4	5.9	6.0	6.1	6.4	6.6	7.2	7.2	8.1
100 ~ 120	5.0	5.5	6.1	6.2	6.3	6.6	6.8	7.3	7.4	8.2
120 ~ 140	5.1	5.6	6.2	6.4	6.4	6.7	7.0	7.4	7.5	8.4
140 ~ 160	5.1	5.6	6.3	6.5	6.6	6.9	7.2	7.5	7.6	8.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	363/334

Constants of dn/dt		
D_0	D_1	D_2
4.19E-06	1.23E-08	-1.53E-11
E_0	E_1	λ_{TK}
7.59E-07	5.64E-10	1.65E-01

H-ZLaF2	803468	$n_d = 1.80279$	$v_d = 46.76$	$n_F - n_C = 0.017168$
		$n_e = 1.80687$	$v_e = 46.52$	$n_F - n_C' = 0.017345$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.75864	$P_{d,C}$	0.3006	RC (S)	1	2400	0.826	0.682
n_{1970}	1970.09	1.76610	$P_{e,d}$	0.2377	RA (S)	1	2200	0.959	0.920
n_{1530}	1529.58	1.77430	$P_{g,F}$	0.5580	D_W	1	2000	0.993	0.986
n_{1129}	1128.64	1.78174	$P'_{d,c'}$	0.2502	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.78312	$P'_{e,d}$	0.2352	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78426	$P'_{g,F'}$	0.4952	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.78874			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.79184	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79473					1000	0.999	0.998
n_C	656.27	1.79763					950	0.999	0.998
$n_{C'}$	643.85	1.79845					900	0.999	0.998
n_{He-Ne}	632.80	1.79921					850	0.999	0.998
n_D	589.29	1.80264	Thermal Properties				800	0.999	0.998
n_d	587.56	1.80279					750	0.999	0.998
n_e	546.07	1.80687	Tg (°C)				700	0.999	0.998
n_F	486.13	1.81480					650	0.999	0.998
$n_{F'}$	479.99	1.81579	T _s (°C)				600	0.998	0.997
n_g	435.84	1.82438	T ₁₀ ^{14.5} (°C)				550	0.998	0.996
n_h	404.66	1.83241	T ₁₀ ¹³ (°C)				500	0.997	0.995
n_i	365.01	1.84644	$\alpha_{-50/80^\circ C} (10^{-7}/K)$				480	0.996	0.993
			74				460	0.994	0.989
			λ (W/(m K))				440	0.994	0.988
			0.96				420	0.993	0.986
							400	0.988	0.976
							390	0.983	0.973
							380	0.975	0.956
							370	0.959	0.925
							360	0.929	0.870
							350	0.881	0.781
							340	0.791	0.629
							330	0.620	0.383
							320	0.322	0.103
							310	0.043	0.007
							300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.17454812E+00
A_1	-1.59776958E-02
A_2	2.51277775E-02
A_3	1.18617161E-03
A_4	-8.90435226E-05
A_5	6.03380469E-06

Density		Solarization	
ρ (g/cm ³)	4.68	$\Delta\lambda$ (%)	-1.1

Mechanical Properties	
HK (10 ⁷ Pa)	702
F_A	68
E (GPa)	123.6
G (GPa)	47.8
μ	0.292
σ_b (MPa)	95
B (10 ⁻¹² /Pa)	1.36

70/80	63
80/90	64
90/100	65
100/110	66
110/120	67
120/130	68
130/140	69
140/150	70
150/160	71

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^\circ C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.6	4.0	4.3	4.3	4.4	4.5	4.7	5.3	5.4	5.9
-40 ~ -20	3.7	4.0	4.3	4.3	4.4	4.5	4.8	5.3	5.3	5.9
-20 ~ 0	3.6	4.0	4.3	4.3	4.4	4.6	4.8	5.3	5.3	6.0
0 ~ 20	3.8	4.0	4.3	4.4	4.4	4.6	4.8	5.4	5.4	5.9
20 ~ 40	3.9	4.0	4.4	4.5	4.5	4.7	5.0	5.6	5.6	6.2
40 ~ 60	4.0	4.1	4.5	4.6	4.7	4.9	5.1	5.8	5.9	6.4
60 ~ 80	4.0	4.2	4.6	4.7	4.8	5.1	5.4	6.0	6.1	6.6
80 ~ 100	4.1	4.3	4.7	4.8	4.9	5.3	5.6	6.2	6.3	6.9
100 ~ 120	4.2	4.4	4.9	5.0	5.0	5.5	5.7	6.5	6.6	6.9
120 ~ 140	4.3	4.5	5.1	5.1	5.1	5.6	5.9	6.8	6.9	7.2
140 ~ 160	4.4	4.6	5.2	5.2	5.3	5.8	6.1	7.0	7.1	7.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	350/316

Constants of dn/dt		
D_0	D_1	D_2
2.69E-06	1.08E-08	-1.22E-11
E_0	E_1	λ_{TK}
6.81E-07	9.88E-10	1.72E-01

H-ZLaF3	855366	$n_d = 1.85544$	$v_d = 36.59$	$n_F - n_C = 0.023381$
		$n_e = 1.86099$	$v_e = 36.35$	$n_F - n_C' = 0.023687$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.80540	$P_{d,C}$	0.2943	RC (S)	1	2400	0.885	0.782
n_{1970}	1970.09	1.81252	$P_{e,d}$	0.2374	RA (S)	3	2200	0.970	0.940
n_{1530}	1529.58	1.82064	$P_{g,F}$	0.5795	D_W	1	2000	0.991	0.981
n_{1129}	1128.64	1.82866	$P'_{d,c'}$	0.2449	D_A	3	1800	0.998	0.996
n_{1064}	1064.00	1.83025	$P'_{e,d}$	0.2343	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.83159	$P'_{g,F'}$	0.5134	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.83706			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.84100	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.84474					1000	0.998	0.996
n_C	656.27	1.84856					950	0.998	0.996
$n_{C'}$	643.85	1.84964					900	0.998	0.996
n_{He-Ne}	632.80	1.85065					850	0.998	0.996
n_D	589.29	1.85524	ΔP_{Fe}	-0.0017	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.85544	$\Delta P_{g,F}$	-0.0033	-50/-40	53	750	0.998	0.996
n_e	546.07	1.86099	$\Delta P_{C,t}$	0.0084	-40/-30	56	700	0.998	0.996
n_F	486.13	1.87194	$\Delta P_{C,s}$	0.0036	-30/-20	57	650	0.998	0.996
$n_{F'}$	479.99	1.87333	Thermal Properties		-20/-10	58	600	0.998	0.996
n_g	435.84	1.88549			-10/0	59	550	0.998	0.996
n_h	404.66	1.89719	Tg ($^{\circ}C$)	625	0/10	60	500	0.998	0.996
n_i	365.01	1.91828	Ts ($^{\circ}C$)	653	10/20	61	480	0.994	0.989
			$T_{10}^{14.5} (^{\circ}C)$	557	20/30	61	460	0.988	0.976
			$T_{10}^{13} (^{\circ}C)$	591	30/40	62	440	0.982	0.964
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	60	40/50	62	420	0.975	0.948
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	75	50/60	63	400	0.959	0.911
			λ (W/(m K))	0.98	60/70	63	390	0.940	0.871
					70/80	64	380	0.904	0.803
			Mechanical Properties		80/90	65	370	0.832	0.680
					90/100	66	360	0.680	0.449
			HK (10^7Pa)	622	100/110	67	350	0.376	0.136
			F_A	77	110/120	68	340		
			E (GPa)	114.3	120/130	69	330		
			G (GPa)	43.7	130/140	70	320		
			μ	0.308	140/150	71	310		
			σ_b (MPa)	58	150/160	72	300		
			B ($10^{-12}/\text{Pa}$)	1.90			290		
							280		

Constants of Dispersion Formula	
A_0	3.33508086E+00
A_1	-1.51809916E-02
A_2	3.47880996E-02
A_3	1.57445974E-03
A_4	-7.28030297E-05
A_5	8.73416251E-06

Density		Solarization	
ρ (g/cm ³)	4.59	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.6	5.2	5.6	5.6	5.7	5.9	6.4	7.1	7.1	7.9
-40 ~ -20	4.9	5.5	5.8	5.9	5.9	6.3	6.7	7.6	7.6	8.5
-20 ~ 0	5.4	5.9	6.2	6.3	6.4	6.6	7.1	8.0	8.0	9.1
0 ~ 20	5.6	6.1	6.5	6.6	6.7	7.0	7.4	8.4	8.4	9.5
20 ~ 40	5.8	6.4	6.8	6.8	6.9	7.3	7.7	8.6	8.6	9.9
40 ~ 60	5.9	6.6	7.0	7.0	7.1	7.5	7.8	8.9	8.9	10.1
60 ~ 80	6.1	6.7	7.2	7.2	7.3	7.6	8.2	9.3	9.3	10.4
80 ~ 100	6.4	6.9	7.3	7.3	7.4	7.9	8.4	9.5	9.5	10.7
100 ~ 120	6.6	7.1	7.5	7.5	7.6	8.1	8.6	9.7	9.7	10.9
120 ~ 140	6.8	7.3	7.7	7.7	7.8	8.3	8.8	9.9	9.9	11.2
140 ~ 160	6.9	7.4	7.8	7.9	8.0	8.5	9.0	10.1	10.1	11.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(390)/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	378/345

Constants of dn/dt		
D_0	D_1	D_2
5.56E-06	1.86E-08	-3.98E-11
E_0	E_1	λ_{TK}
7.03E-07	5.83E-10	2.68E-01

H-ZLaF50	804466	$n_d = 1.80400$	$v_d = 46.58$	$n_F - n_C = 0.017262$
		$n_e = 1.80811$	$v_e = 46.33$	$n_F - n_C' = 0.017443$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.76102	$P_{d,C}$	0.3001	RC (S)	1	2400	0.834	0.705
n_{1970}	1970.09	1.76802	$P_{e,d}$	0.2381	RA (S)	2	2200	0.956	0.916
n_{1530}	1529.58	1.77579	$P_{g,F}$	0.5567	D_W	1	2000	0.990	0.978
n_{1129}	1128.64	1.78299	$P'_{d,c'}$	0.2500	D_A	3	1800	0.995	0.990
n_{1064}	1064.00	1.78434	$P'_{e,d}$	0.2356	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78546	$P'_{g,F'}$	0.4936	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.78990			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.79302	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79590					1000	0.999	0.998
n_C	656.27	1.79882					950	0.999	0.998
$n_{C'}$	643.85	1.79964					900	0.999	0.998
n_{He-Ne}	632.80	1.80041					850	0.999	0.998
n_D	589.29	1.80385	ΔP_{Fe}	-0.0028	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80400	$\Delta P_{g,F}$	-0.0095	-50/-40	54	750	0.999	0.998
n_e	546.07	1.80811	$\Delta P_{C,t}$	0.0081	-40/-30	57	700	0.999	0.998
n_F	486.13	1.81608	$\Delta P_{C,s}$	0.0045	-30/-20	58	650	0.999	0.998
$n_{F'}$	479.99	1.81708	Thermal Properties		-20/-10	59	600	0.999	0.998
n_g	435.84	1.82569	Tg ($^{\circ}C$)	688	-10/0	60	550	0.999	0.998
n_h	404.66	1.83377	Ts ($^{\circ}C$)	713	0/10	61	500	0.998	0.995
n_i	365.01	1.84783	$T_{10}^{14.5} (^{\circ}C)$	619	10/20	62	480	0.996	0.993
			$T_{10}^{13} (^{\circ}C)$	663	20/30	63	460	0.995	0.991
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	61	30/40	63	440	0.993	0.986
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	76	40/50	64	420	0.990	0.981
			λ (W/(m K))	1.00	50/60	64	400	0.987	0.973
					60/70	64	390	0.983	0.963
					70/80	65	380	0.974	0.948
			Mechanical Properties		80/90	66	370	0.961	0.918
			HK (10^7Pa)	712	90/100	67	360	0.931	0.869
			F_A	65	100/110	68	350	0.891	0.795
			E (GPa)	123.2	110/120	69	340	0.818	0.676
			G (GPa)	46.2	120/130	70	330	0.690	0.489
			μ	0.334	130/140	71	320	0.460	0.223
			σ_b (MPa)	110	140/150	72	310	0.136	0.022
			B ($10^{-12}/\text{Pa}$)	1.27	150/160	73	300		

Constants of Dispersion Formula	
A_0	3.17704600E+00
A_1	-1.49215351E-02
A_2	2.59816690E-02
A_3	1.02205007E-03
A_4	-6.86208852E-05
A_5	4.99362397E-06

Density		Solarization	
ρ (g/cm ³)	4.47	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.7	4.1	4.3	4.3	4.4	4.6	4.9	5.5	5.5	6.0
-40 ~ -20	3.7	4.1	4.3	4.4	4.5	4.6	4.9	5.5	5.6	6.0
-20 ~ 0	3.8	4.1	4.3	4.4	4.5	4.6	4.9	5.6	5.6	6.1
0 ~ 20	3.8	4.1	4.3	4.4	4.5	4.6	4.9	5.6	5.6	6.1
20 ~ 40	3.8	4.1	4.4	4.4	4.6	4.7	4.9	5.6	5.7	6.1
40 ~ 60	3.8	4.2	4.5	4.5	4.7	4.7	5.0	5.7	5.7	6.3
60 ~ 80	3.9	4.3	4.6	4.7	4.8	4.9	5.2	5.7	5.8	6.5
80 ~ 100	3.9	4.4	4.7	4.7	4.9	5.0	5.3	5.8	6.0	6.7
100 ~ 120	3.9	4.5	4.8	4.8	4.9	5.1	5.5	6.0	6.2	6.8
120 ~ 140	4.0	4.7	4.8	4.9	5.0	5.2	5.6	6.1	6.2	6.8
140 ~ 160	4.1	4.7	4.9	4.9	5.0	5.3	5.7	6.2	6.3	7.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/315
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	351/312

Constants of dn/dt		
D_0	D_1	D_2
2.88E-06	1.10E-08	-1.72E-11
E_0	E_1	λ_{TK}
5.90E-07	3.72E-10	2.17E-01

H-ZLaF50C	804466	$n_d = 1.80400$	$v_d = 46.58$	$n_F - n_C = 0.017262$
		$n_e = 1.80811$	$v_e = 46.33$	$n_F - n_{C'} = 0.017443$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42		$P_{d,C}$	0.3001	RC (S)	1	2400	0.869	0.755
n_{1970}	1970.09		$P_{e,d}$	0.2381	RA (S)	1	2200	0.966	0.932
n_{1530}	1529.58		$P_{g,F}$	0.5590	D_W	1	2000	0.988	0.975
n_{1129}	1128.64	1.78309	$P'_{d,c'}$	0.2500	D_A	3	1800	0.996	0.993
n_{1064}	1064.00	1.78441	$P'_{e,d}$	0.2356	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78552	$P'_{g,F'}$	0.4965	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.78993			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.79303	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79590					1000	0.999	0.998
n_C	656.27	1.79882					950	0.999	0.998
$n_{C'}$	643.85	1.79964					900	0.999	0.998
n_{He-Ne}	632.80	1.80040					850	0.999	0.998
n_D	589.29	1.80386	ΔP_{Fe}	-0.0028	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80400	$\Delta P_{g,F}$	-0.0072	-50/-40	58	750	0.999	0.998
n_e	546.07	1.80811	$\Delta P_{C,t}$	0.0047	-40/-30	59	700	0.999	0.998
n_F	486.13	1.81608	$\Delta P_{C,s}$	0.0028	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.81707	Thermal Properties		-20/-10	60	600	0.999	0.998
n_g	435.84	1.82573	$T_g (^{\circ}C)$	694	-10/0	64	550	0.999	0.998
n_h	404.66	1.83385	$T_s (^{\circ}C)$	721	0/10	65	500	0.998	0.997
n_i	365.01	1.84795	$T_{10}^{14.5} (^{\circ}C)$	625	10/20	65	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	669	20/30	66	460	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	64	30/40	66	440	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	79	40/50	66	420	0.993	0.986
			$\lambda (W/(m K))$	0.85	50/60	69	400	0.987	0.975
					60/70	70	390	0.981	0.963
					70/80	70	380	0.971	0.942
			Mechanical Properties		80/90	70	370	0.949	0.900
			HK ($10^7 Pa$)	712	90/100	72	360	0.899	0.808
			F_A	116	100/110	73	350	0.778	0.606
			E (GPa)	122.0	110/120	74	340	0.533	0.284
			G (GPa)	47.0	120/130	76	330	0.195	0.038
			μ	0.299	130/140	77	320		
			σ_b (MPa)	119	140/150	77	310		
			B ($10^{-12}/Pa$)		150/160	78	300		

Constants of Dispersion Formula	
A_0	3.17409614E+00
A_1	-1.33203094E-02
A_2	2.81374701E-02
A_3	2.83359178E-04
A_4	4.54411400E-05
A_5	-1.18800392E-06

Density		Solarization	
$\rho (g/cm^3)$	4.49	$\Delta\lambda (\%)$	-0.7

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.3	3.6	3.9	4.0	4.1	4.4	4.6	5.1	5.3	5.6
-40 ~ -20	3.3	3.6	3.9	4.0	4.1	4.4	4.5	5.2	5.4	5.6
-20 ~ 0	3.3	3.7	4.0	4.0	4.1	4.3	4.5	5.3	5.4	5.6
0 ~ 20	3.4	3.6	4.0	4.1	4.2	4.4	4.6	5.3	5.5	5.6
20 ~ 40	3.3	3.6	4.1	4.2	4.3	4.4	4.7	5.3	5.4	5.7
40 ~ 60	3.4	3.7	4.2	4.2	4.3	4.5	4.8	5.3	5.5	5.9
60 ~ 80	3.4	3.8	4.3	4.3	4.4	4.6	4.9	5.5	5.7	6.0
80 ~ 100	3.5	3.9	4.4	4.5	4.6	4.7	4.9	5.6	5.7	6.2
100 ~ 120	3.6	4.1	4.5	4.6	4.7	4.7	5.1	5.7	5.8	6.3
120 ~ 140	3.7	4.2	4.6	4.7	4.8	4.8	5.2	5.7	5.9	6.5
140 ~ 160	3.8	4.3	4.6	4.7	4.8	4.9	5.3	5.9	6.1	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	380/335
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	359/331

Constants of dn/dt		
D_0	D_1	D_2
1.90E-06	1.15E-08	-1.71E-11
E_0	E_1	λ_{TK}
8.52E-07	3.28E-10	2.15E-02

H-ZLaF51	805396	$n_d = 1.80450$	$v_d = 39.64$	$n_F - n_C = 0.020298$
		$n_e = 1.80932$	$v_e = 39.39$	$n_F - n_C' = 0.020549$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.75651	$P_{d,C}$	0.2961	RC (S)	1	2400	0.825	0.681
n_{1970}	1970.09	1.76414	$P_{e,d}$	0.2375	RA (S)	3	2200	0.950	0.903
n_{1530}	1529.58	1.77262	$P_{g,F}$	0.5730	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.78054	$P'_{d,c'}$	0.2467	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.78205	$P'_{e,d}$	0.2346	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78330	$P'_{g,F'}$	0.5081	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.78830			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.79183	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79513					1000	0.999	0.998
n_C	656.27	1.79849					950	0.999	0.998
$n_{C'}$	643.85	1.79943					900	0.999	0.998
n_{He-Ne}	632.80	1.80032					850	0.999	0.998
n_D	589.29	1.80432	ΔP_{Fe}	-0.0018	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80450	$\Delta P_{g,F}$	-0.0048	-50/-40	48	750	0.999	0.998
n_e	546.07	1.80932	$\Delta P_{C,t}$	0.0162	-40/-30	51	700	0.999	0.998
n_F	486.13	1.81879	$\Delta P_{C,s}$	0.0065	-30/-20	52	650	0.999	0.998
$n_{F'}$	479.99	1.81998	Thermal Properties		-20/-10	54	600	0.999	0.998
n_g	435.84	1.83042	Tg ($^{\circ}C$)	597	-10/0	54	550	0.999	0.998
n_h	404.66	1.84042	Ts ($^{\circ}C$)	630	0/10	55	500	0.999	0.998
n_i	365.01	1.85838	$T_{10}^{14.5} (^{\circ}C)$	533	10/20	56	480	0.997	0.993
			$T_{10}^{13} (^{\circ}C)$	568	20/30	57	460	0.995	0.989
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	55	30/40	57	440	0.992	0.984
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	70	40/50	58	420	0.988	0.977
			λ (W/(m K))	0.92	50/60	58	400	0.981	0.963
					60/70	58	390	0.966	0.933
					70/80	59	380	0.948	0.899
			Mechanical Properties		80/90	59	370	0.913	0.833
			HK (10^7Pa)	664	90/100	60	360	0.838	0.702
			F_A	76	100/110	61	350	0.668	0.446
			E (GPa)	121.8	110/120	62	340	0.358	0.128
			G (GPa)	45.7	120/130	63	330		
			μ	0.332	130/140	64	320		
			σ_b (MPa)	69	140/150	66	310		
			B ($10^{-12}/Pa$)	1.99	150/160	67	300		

Constants of Dispersion Formula	
A_0	3.16743537E+00
A_1	-1.61763813E-02
A_2	2.88108896E-02
A_3	1.51509661E-03
A_4	-1.00494023E-04
A_5	9.19692892E-06

Density		Solarization	
ρ (g/cm ³)	4.26	$\Delta\lambda$ (%)	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	5.7	6.2	6.5	6.6	6.6	6.8	7.0	7.7	7.8	8.5
-40 ~ -20	6.1	6.5	6.8	6.9	6.9	7.1	7.5	8.3	8.4	9.1
-20 ~ 0	6.5	6.9	7.1	7.2	7.2	7.5	7.9	8.9	9.0	10.0
0 ~ 20	6.9	7.3	7.5	7.5	7.6	8.0	8.3	9.4	9.5	10.5
20 ~ 40	7.0	7.5	7.9	7.9	7.9	8.3	8.7	9.6	9.7	10.6
40 ~ 60	7.2	7.9	8.2	8.2	8.2	8.6	9.1	9.9	10.0	11.0
60 ~ 80	7.5	8.2	8.5	8.5	8.5	9.0	9.4	10.2	10.3	11.5
80 ~ 100	7.7	8.5	8.8	8.8	8.8	9.2	9.8	10.6	10.7	11.7
100 ~ 120	7.9	8.7	9.0	9.0	9.1	9.4	10.0	10.9	11.0	12.0
120 ~ 140	8.2	8.9	9.3	9.3	9.4	9.7	10.3	11.2	11.3	12.4
140 ~ 160	8.4	9.1	9.6	9.6	9.7	10.0	10.6	11.6	11.7	12.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	410/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	378/347

Constants of dn/dt		
D_0	D_1	D_2
7.94E-06	2.19E-08	-3.80E-11
E_0	E_1	λ_{TK}
6.45E-07	6.29E-10	2.72E-01

H-ZLaF52		806410	n _d = 1.80610		v _d = 40.95		n _F − n _C = 0.019686									
			n _e = 1.81077		v _e = 40.69		n _F − n _C ′ = 0.019924									
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance									
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm							
n ₂₃₂₅	2325.42	1.75948					2400	0.800	0.640							
n ₁₉₇₀	1970.09	1.76685					2200	0.930	0.865							
n ₁₅₃₀	1529.58	1.77506					2000	0.992	0.984							
n ₁₁₂₉	1128.64	1.78274	P _{d,C}	0.2972	RC (S)	1	1800	0.999	0.998							
n ₁₀₆₄	1064.00	1.78421	P _{e,d}	0.2372	RA (S)	3	1600	0.999	0.998							
n _t	1013.98	1.78543	P _{g,F}	0.5679	D _W	1	1400	0.999	0.998							
n _s	852.11	1.79030	P _{d,c} ′	0.2474	D _A	3	1200	0.999	0.998							
n _A ′	768.19	1.79376	P _{e,d} ′	0.2344	R _{OH} (S)	1	1060	0.999	0.998							
n _r	706.52	1.79699	P _{g,F} ′	0.5029	RP (S)	2	1000	0.999	0.998							
n _C	656.27	1.80025			CR	1	950	0.999	0.998							
n _C ′	643.85	1.80117	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		900	0.999	0.998							
n _{He-Ne}	632.80	1.80204					850	0.999	0.998							
n _D	589.29	1.80592					800	0.999	0.998							
n _d	587.56	1.80610					750	0.999	0.998							
n _e	546.07	1.81077					700	0.999	0.998							
n _F	486.13	1.81994	Thermal Properties		-50/-40	47	650	0.999	0.998							
n _F ′	479.99	1.82110			-40/-30	50	600	0.999	0.998							
n _g	435.84	1.83112			-30/-20	51	550	0.999	0.998							
n _h	404.66	1.84069			-20/-10	52	500	0.999	0.998							
n _i	365.01	1.85767			-10/0	53	480	0.997	0.995							
			T _g (°C)	637	0/10	54	460	0.995	0.992							
			T _s (°C)	663	10/20	54	440	0.992	0.985							
			T ₁₀ ^{14.5} (°C)	590	20/30	55	420	0.986	0.976							
			T ₁₀ ¹³ (°C)	613	30/40	56	400	0.981	0.953							
			α _{-50/80°C} (10 ⁻⁷ /K)	54	40/50	56	390	0.975	0.928							
			α _{100/300°C} (10 ⁻⁷ /K)	64	50/60	56	380	0.953	0.885							
			λ (W/(m K))	0.90	60/70	57	370	0.910	0.804							
					70/80	57	360	0.817	0.644							
Constants of Dispersion Formula			Mechanical Properties		80/90	58	350	0.616	0.364							
					HK (10 ⁷ Pa)	651	90/100	58	340	0.270	0.071					
					F _A	76	100/110	59	330							
					E (GPa)	113.9	110/120	60	320							
					G (GPa)	43.7	120/130	60	310							
Density			Solarization		μ	0.303	130/140	61	300							
					σ _b (MPa)	92	140/150	62	290							
					B (10 ⁻¹² /Pa)	1.80	150/160	62	280							
					Temperature Coefficients of Refractive Index		Coloration Code		Coloration of Internal Transmittance		Constants of dn/dt					
Range of Temperature (°C)		dn/dt relative (×10 ⁻⁶ / °C)									λ ₈₀ (λ ₇₀)/λ ₅		400/340			
-60 ~ -40	5.1	5.5	5.7	5.8	5.9	6.0	6.3	7.1	7.3	7.8	λτ ₈₀ /λτ ₅		368/339			
-40 ~ -20	5.1	5.7	5.8	5.9	5.9	6.1	6.5	7.2	7.3	8.0						
-20 ~ 0	5.1	5.8	5.9	6.0	6.0	6.2	6.5	7.3	7.4	8.1						
0 ~ 20	5.2	5.9	5.9	6.0	6.1	6.3	6.6	7.3	7.4	8.1						
20 ~ 40	5.3	6.0	6.0	6.1	6.2	6.4	6.7	7.4	7.5	8.2						
40 ~ 60	5.3	6.0	6.1	6.2	6.3	6.5	6.9	7.5	7.6	8.4	D ₀		D ₁		D ₂	
60 ~ 80	5.4	6.1	6.2	6.3	6.4	6.7	7.0	7.7	7.8	8.7						
80 ~ 100	5.6	6.2	6.3	6.4	6.6	6.9	7.3	8.0	8.0	8.9						
100 ~ 120	5.7	6.3	6.5	6.5	6.7	7.1	7.5	8.2	8.2	9.2						
120 ~ 140	5.8	6.4	6.6	6.7	6.9	7.2	7.6	8.4	8.4	9.4						
140 ~ 160	6.0	6.6	6.8	6.9	7.1	7.4	7.8	8.6	8.7	9.6	E ₀		E ₁		λ _{TK}	

H-ZLaF53	834373	$n_d = 1.83400$	$v_d = 37.34$	$n_F - n_C = 0.022333$
		$n_e = 1.83930$	$v_e = 37.09$	$n_F - n_C' = 0.022629$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm
n ₂₃₂₅	2325.42	1.78596	P _{d,C}	0.2946	RC (S)	1	2400	0.828	0.685
n ₁₉₇₀	1970.09	1.79278	P _{e,d}	0.2373	RA (S)	3	2200	0.932	0.864
n ₁₅₃₀	1529.58	1.80056	P _{g,F}	0.5821	D _W	1	2000	0.967	0.933
n ₁₁₂₉	1128.64	1.80829	P' _{d,c´}	0.2453	D _A	3	1800	0.983	0.962
n ₁₀₆₄	1064.00	1.80983	P' _{e,d}	0.2342	R _{OH} (S)	1	1600	0.992	0.980
n _t	1013.98	1.81113	P' _{g,F´}	0.5157	RP (S)	1	1400	0.999	0.998
n _s	852.11	1.81639			CR	1	1200	0.999	0.998
n _{A´}	768.19	1.82019					1060	0.999	0.998
n _r	706.52	1.82376	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998
n _C	656.27	1.82742					950	0.999	0.998
n _{C´}	643.85	1.82845					900	0.999	0.998
n _{He-Ne}	632.80	1.82942					850	0.999	0.998
n _D	589.29	1.83381					800	0.999	0.998
n _d	587.56	1.83400	ΔP _{F,e}	-0.0017	°C	α	750	0.999	0.998
n _e	546.07	1.83930	ΔP _{g,F}	0.0005	-50/-40	48	700	0.999	0.996
n _F	486.13	1.84975	ΔP _{C,t}	0.0084	-40/-30	50	650	0.999	0.996
n _{F´}	479.99	1.85108	ΔP _{C,s}	0.0039	-30/-20	51	600	0.999	0.995
n _g	435.84	1.86275	Thermal Properties		-20/-10	53	550	0.999	0.995
n _h	404.66	1.87398			-10/0	54	500	0.997	0.989
n _i	365.01	1.89424			0/10	54	480	0.994	0.984
					T _g (°C)	596	460	0.991	0.977
					T _s (°C)	626	440	0.986	0.967
			T ₁₀ ^{14.5} (°C)	535					
			T ₁₀ ¹³ (°C)	573					
			α _{-50/80°C} (10 ⁻⁷ /K)	54					
			α _{100/300°C} (10 ⁻⁷ /K)	69					

Constants of Dispersion Formula	
A_0	3.26066843E+00
A_1	-1.43061602E-02
A_2	3.42503276E-02
A_3	9.45194718E-04
A_4	1.66625589E-05
A_5	3.78744906E-06

Density		Solarization	
ρ (g/cm ³)	4.56	$\Delta\lambda$ (%)	-0.4

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	7.6	8.0	8.4	8.5	8.6	8.9	9.3	10.0	10.1	11.1
-40 ~ -20	7.6	8.1	8.5	8.6	8.7	9.0	9.4	10.2	10.3	11.3
-20 ~ 0	7.6	8.2	8.6	8.7	8.8	9.1	9.5	10.5	10.5	11.5
0 ~ 20	7.6	8.3	8.7	8.8	8.8	9.2	9.6	10.7	10.7	11.7
20 ~ 40	7.7	8.4	8.8	8.9	8.9	9.4	9.7	10.8	10.8	11.9
40 ~ 60	7.8	8.6	9.0	9.0	9.1	9.6	9.9	11.0	11.0	12.0
60 ~ 80	7.9	8.7	9.1	9.2	9.3	9.7	10.2	11.3	11.3	12.5
80 ~ 100	8.1	8.9	9.3	9.3	9.5	9.9	10.4	11.5	11.6	12.8
100 ~ 120	8.3	9.0	9.4	9.4	9.6	10.1	10.6	11.7	11.7	13.1
120 ~ 140	8.5	9.1	9.5	9.5	9.7	10.2	10.8	11.8	11.8	13.2
140 ~ 160	8.6	9.2	9.6	9.6	9.8	10.3	10.9	11.9	12.0	13.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	425/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	380/350

Constants of dn/dt		
D_0	D_1	D_2
9.00E-06	1.29E-08	-2.11E-11
E_0	E_1	λ_{TK}
7.75E-07	7.39E-10	2.56E-01

H-ZLaF54		816466	n _d = 1.81600		v _d = 46.55		n _F − n _C = 0.017528										
			n _e = 1.82017		v _e = 46.33		n _F − n _C ′ = 0.017704										
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance										
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm								
n ₂₃₂₅	2325.42	1.77344					2400	0.888	0.789								
n ₁₉₇₀	1970.09	1.78023					2200	0.980	0.960								
n ₁₅₃₀	1529.58	1.78779					2000	0.992	0.984								
n ₁₁₂₉	1128.64	1.79484	P _{d,C}	0.3001	RC (S)	1	1800	0.999	0.998								
n ₁₀₆₄	1064.00	1.79618	P _{e,d}	0.2379	RA (S)	2	1600	0.999	0.998								
n _t	1013.98	1.79729	P _{g,F}	0.5551	D _W	1	1400	0.999	0.998								
n _s	852.11	1.80174	P _{d,c} ′	0.2502	D _A	3	1200	0.999	0.998								
n _A ′	768.19	1.80487	P _{e,d} ′	0.2355	R _{OH} (S)	1	1060	0.999	0.998								
n _r	706.52	1.80780	P _{g,F} ′	0.4925	RP (S)	1	1000	0.999	0.998								
n _C	656.27	1.81074			CR		950	0.999	0.998								
n _C ′	643.85	1.81157	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		900	0.999	0.998								
n _{He-Ne}	632.80	1.81235					°C	α	850	0.999	0.998						
n _D	589.29	1.81584					ΔP _{F,e}	-0.0024	-50/-40	54	800	0.999	0.998				
n _d	587.56	1.81600					ΔP _{g,F}	-0.0112	-40/-30	57	750	0.999	0.998				
n _e	546.07	1.82017					ΔP _{C,t}	0.0017	-30/-20	59	700	0.999	0.998				
n _F	486.13	1.82827	ΔP _{C,s}	0.0013	-20/-10	60	650	0.999	0.998								
n _F ′	479.99	1.82928	Thermal Properties		-10/0	61	600	0.999	0.998								
n _g	435.84	1.83800	T _g (°C)	715	0/10	62	550	0.999	0.998								
n _h	404.66	1.84618	T _s (°C)	740	10/20	63	500	0.999	0.998								
n _i	365.01	1.86037	T ₁₀ ^{14.5} (°C)	643	20/30	64	480	0.999	0.998								
			T ₁₀ ¹³ (°C)	662	30/40	64	460	0.998	0.996								
			α _{-50/80°C} (10 ⁻⁷ /K)	62	40/50	64	440	0.997	0.994								
			α _{100/300°C} (10 ⁻⁷ /K)	75	50/60	65	420	0.995	0.991								
Constants of Dispersion Formula			λ (W/(m K))	0.84	60/70	66	400	0.983	0.966								
					70/80	66	390	0.980	0.960								
			Mechanical Properties		80/90	67	380	0.975	0.949								
			HK (10 ⁷ Pa)	702	90/100	68	370	0.970	0.942								
			F _A	64	100/110	69	360	0.959	0.919								
Density			E (GPa)	126.0	110/120	70	350	0.940	0.885								
			G (GPa)	47.4	120/130	71	340	0.914	0.835								
			μ	0.330	130/140	72	330	0.876	0.768								
			σ _b (MPa)	86	140/150	73	320	0.815	0.663								
			B (10 ⁻¹² /Pa)	1.23	150/160	74	310	0.597	0.357								
Solarization											300	0.585	0.343				
											290	0.438	0.192				
Range of Temperature (°C)	Temperature Coefficients of Refractive Index										Coloration Code						
	dn/dt relative (×10 ⁻⁶ / °C)													λ ₈₀ (λ ₇₀)/λ ₅		380/290	
	t	s	C	C'	He-Ne	d	e	F	F'	g	Coloration of Internal Transmittance						
	-60 ~ -40	3.9	4.3	4.5	4.5	4.6	4.8	5.1	5.7	5.7				6.2			
	-40 ~ -20	3.9	4.2	4.4	4.5	4.7	4.9	5.2	5.7	5.7	6.2	λτ ₈₀ /λτ ₅			334/281		
	-20 ~ 0	3.9	4.3	4.6	4.6	4.7	4.9	5.2	5.7	5.8	6.4						
	0 ~ 20	3.9	4.4	4.6	4.6	4.7	5.0	5.3	5.7	5.8	6.5	Constants of dn/dt					
	20 ~ 40	3.9	4.5	4.7	4.7	4.8	5.0	5.3	5.8	6.0	6.5						
	40 ~ 60	4.0	4.5	4.8	4.8	4.9	5.2	5.4	6.0	6.1	6.7				D ₀	D ₁	D ₂
	60 ~ 80	4.1	4.6	4.9	4.9	5.0	5.2	5.5	6.2	6.3	7.0				3.23E-06	1.15E-08	-1.53E-11
80 ~ 100	4.2	4.7	5.0	5.0	5.1	5.4	5.5	6.3	6.4	7.2	E ₀				E ₁	λ _{TK}	
100 ~ 120	4.4	4.9	5.1	5.1	5.2	5.5	5.7	6.5	6.5	7.3	5.49E-07				4.69E-10	2.46E-01	
120 ~ 140	4.5	5.0	5.2	5.2	5.3	5.7	5.9	6.6	6.7	7.6							
140 ~ 160	4.6	5.1	5.3	5.3	5.5	5.8	6.0	6.8	6.9	7.8							

H-ZLaF54A	816466	$n_d = 1.81600$	$v_d = 46.55$	$n_F - n_C = 0.017528$
		$n_e = 1.82017$	$v_e = 46.33$	$n_F - n_{C'} = 0.017704$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.3001	RC (S)	1	2400	0.867	0.751
n_{1970}	1970.09		$P_{e,d}$	0.2379	RA (S)	1	2200	0.965	0.931
n_{1530}	1529.58		$P_{g,F}$	0.5574	D_W	1	2000	0.986	0.972
n_{1129}	1128.64	1.79487	$P'_{d,c'}$	0.2497	D_A	3	1800	0.996	0.992
n_{1064}	1064.00	1.79619	$P'_{e,d}$	0.2355	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.79731	$P'_{g,F'}$	0.4942	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.80175			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.80488	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.80779					1000	0.999	0.998
n_C	656.27	1.81074					950	0.999	0.998
$n_{C'}$	643.85	1.81158					900	0.999	0.998
n_{He-Ne}	632.80	1.81235					850	0.999	0.998
n_D	589.29	1.81585	ΔP_{Fe}	-0.0024	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.81600	$\Delta P_{g,F}$	-0.0089	-50/-40	57	750	0.999	0.998
n_e	546.07	1.82017	$\Delta P_{C,t}$	0.0005	-40/-30	58	700	0.999	0.998
n_F	486.13	1.82827	$\Delta P_{C,s}$	0.0008	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.82929	Thermal Properties		-20/-10	61	600	0.999	0.998
n_g	435.84	1.83804			-10/0	62	550	0.999	0.998
n_h	404.66	1.84625	Tg ($^{\circ}C$)	718	0/10	63	500	0.998	0.997
n_i	365.01	1.86049	Ts ($^{\circ}C$)	744	10/20	63	480	0.997	0.995
			$T_{10}^{14.5} (^{\circ}C)$	646	20/30	63	460	0.996	0.992
			$T_{10}^{13} (^{\circ}C)$	666	30/40	63	440	0.994	0.988
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	61	40/50	64	420	0.991	0.982
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	76	50/60	64	400	0.985	0.971
			λ (W/(m K))	0.83	60/70	67	390	0.980	0.961
					70/80	67	380	0.971	0.942
			Mechanical Properties		80/90	69	370	0.953	0.908
					90/100	69	360	0.920	0.846
			HK (10^7Pa)	693	100/110	69	350	0.847	0.718
			F_A	71	110/120	70	340	0.701	0.491
			E (GPa)	123.0	120/130	70	330	0.432	0.186
			G (GPa)	47.4	130/140	73	320	0.137	0.019
			μ	0.298	140/150	74	310		
			σ_b (MPa)		150/160	75	300		
			B ($10^{-12}/Pa$)	1.12			290		
							280		

Constants of Dispersion Formula	
A_0	3.21683817E+00
A_1	-1.36724876E-02
A_2	2.76347913E-02
A_3	7.16568289E-04
A_4	-1.97668563E-05
A_5	2.19878744E-06

Density		Solarization	
ρ (g/cm ³)	4.99	$\Delta\lambda$ (%)	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.1	2.4	2.8	3.0	3.1	3.3	3.6	3.9	4.0	4.5
-40 ~ -20	2.2	2.4	2.8	3.1	3.2	3.5	3.8	4.0	4.1	4.7
-20 ~ 0	2.2	2.4	2.9	3.1	3.3	3.6	3.9	4.1	4.2	5.0
0 ~ 20	2.3	2.5	3.0	3.2	3.4	3.8	4.1	4.2	4.4	5.1
20 ~ 40	2.3	2.6	3.1	3.3	3.5	4.0	4.2	4.4	4.6	5.3
40 ~ 60	2.4	2.8	3.3	3.5	3.7	4.2	4.4	4.6	4.7	5.6
60 ~ 80	2.4	2.9	3.4	3.6	3.9	4.4	4.6	4.8	4.9	5.8
80 ~ 100	2.4	3.0	3.6	3.8	4.1	4.6	4.7	5.0	5.1	6.0
100 ~ 120	2.6	3.2	3.8	4.0	4.2	4.8	4.9	5.2	5.3	6.3
120 ~ 140	2.8	3.3	4.1	4.2	4.4	5.0	5.1	5.4	5.5	6.6
140 ~ 160	2.9	3.4	4.3	4.4	4.5	5.1	5.3	5.5	5.7	6.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	385/325
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	355/322

Constants of dn/dt		
D_0	D_1	D_2
1.25E-07	1.24E-08	-1.76E-11
E_0	E_1	λ_{TK}
9.91E-07	1.10E-09	6.42E-09

H-ZLaF55F	835427	$n_d = 1.83481$	$v_d = 42.72$	$n_F - n_C = 0.019541$
		$n_e = 1.83944$	$v_e = 42.49$	$n_F - n_C' = 0.019757$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.79048	$P_{d,C}$	0.2989	RC (S)	1	2400	0.903	0.808
n_{1970}	1970.09	1.79707	$P_{e,d}$	0.2369	RA (S)	1	2200	0.979	0.954
n_{1530}	1529.58	1.80452	$P_{g,F}$	0.5650	D_W	1	2000	0.993	0.985
n_{1129}	1128.64	1.81175	$P'_{d,C'}$	0.2490	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.81316	$P'_{e,d}$	0.2343	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.81435	$P'_{g,F'}$	0.5011	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.81912			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.82253	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.82573					1000	0.999	0.998
n_C	656.27	1.82897					950	0.999	0.998
$n_{C'}$	643.85	1.82989					900	0.999	0.998
n_{He-Ne}	632.80	1.83076					850	0.999	0.998
n_D	589.29	1.83463	ΔP_{Fe}	-0.0025	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.83481	$\Delta P_{g,F}$	-0.0077	-50/-40	60	750	0.999	0.998
n_e	546.07	1.83944	$\Delta P_{C,t}$	0.0010	-40/-30	62	700	0.999	0.998
n_F	486.13	1.84851	$\Delta P_{C,s}$	0.0011	-30/-20	64	650	0.999	0.998
$n_{F'}$	479.99	1.84965	Thermal Properties		-20/-10	65	600	0.999	0.998
n_g	435.84	1.85955	Tg ($^{\circ}C$)	711	-10/0	66	550	0.999	0.998
n_h	404.66	1.86893	Ts ($^{\circ}C$)	739	0/10	67	500	0.999	0.998
n_i	365.01	1.88543	$T_{10}^{14.5} (^{\circ}C)$	640	10/20	68	480	0.997	0.994
			$T_{10}^{13} (^{\circ}C)$	687	20/30	69	460	0.995	0.990
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	70	440	0.992	0.984
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	84	40/50	71	420	0.987	0.974
			λ (W/(m K))	0.88	50/60	71	400	0.978	0.957
					60/70	72	390	0.969	0.939
					70/80	72	380	0.956	0.913
			Mechanical Properties		80/90	73	370	0.934	0.866
			HK (10^7Pa)	679	90/100	74	360	0.897	0.801
			F_A	69	100/110	75	350	0.829	0.681
			E (GPa)	121.8	110/120	76	340	0.726	0.522
			G (GPa)	45.1	120/130	77	330	0.544	0.290
			μ	0.349	130/140	79	320	0.250	0.065
			σ_b (MPa)	69	140/150	80	310		
			B ($10^{-12}/Pa$)	1.23	150/160	81	300		

Constants of Dispersion Formula	
A_0	3.27602602E+00
A_1	-1.40174355E-02
A_2	3.01024097E-02
A_3	1.06953465E-03
A_4	-5.08713944E-05
A_5	5.04484426E-06

Density		Solarization	
ρ (g/cm ³)	4.66	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.8	3.2	3.6	3.6	3.6	3.8	4.2	4.9	5.0	5.4
-40 ~ -20	2.8	3.3	3.6	3.6	3.7	3.8	4.2	4.9	5.0	5.5
-20 ~ 0	2.8	3.3	3.6	3.7	3.7	3.9	4.3	4.9	5.0	5.5
0 ~ 20	2.7	3.3	3.7	3.7	3.7	3.9	4.3	5.0	5.0	5.6
20 ~ 40	2.7	3.2	3.7	3.7	3.7	3.9	4.3	5.0	5.0	5.6
40 ~ 60	2.7	3.3	3.7	3.7	3.7	3.9	4.3	5.0	5.1	5.7
60 ~ 80	2.8	3.4	3.7	3.7	3.8	4.0	4.4	5.2	5.2	6.0
80 ~ 100	2.8	3.4	3.7	3.7	3.8	4.1	4.4	5.2	5.2	6.1
100 ~ 120	3.0	3.5	3.8	3.8	4.0	4.2	4.5	5.3	5.3	6.2
120 ~ 140	3.1	3.6	3.9	4.0	4.1	4.3	4.6	5.5	5.5	6.3
140 ~ 160	3.3	3.7	4.0	4.1	4.2	4.4	4.7	5.7	5.7	6.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	359/320

Constants of dn/dt		
D_0	D_1	D_2
1.12E-06	9.87E-09	-1.49E-11
E_0	E_1	λ_{TK}
6.99E-07	4.22E-10	2.11E-01

H-ZLaF56B	806333	$n_d = 1.80610$	$v_d = 33.27$	$n_F - n_C = 0.024229$
		$n_e = 1.81184$	$v_e = 33.03$	$n_F - n_C' = 0.024579$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.75720	$P_{d,C}$	0.2922	RC (S)	1	2400	0.931	0.867
n_{1970}	1970.09	1.76373	$P_{e,d}$	0.2369	RA (S)	1	2200	0.980	0.959
n_{1530}	1529.58	1.77128	$P_{g,F}$	0.5927	D_W	1	2000	0.992	0.984
n_{1129}	1128.64	1.77899	$P'_{d,c'}$	0.2429	D_A	2	1800	0.996	0.993
n_{1064}	1064.00	1.78055	$P'_{e,d}$	0.2335	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.78188	$P'_{g,F'}$	0.5248	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.78735			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.79134	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.79513					1000	0.998	0.996
n_C	656.27	1.79902					950	0.998	0.996
$n_{C'}$	643.85	1.80013					900	0.998	0.996
n_{He-Ne}	632.80	1.80117					850	0.998	0.996
n_D	589.29	1.80589	ΔP_{Fe}	-0.0009	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.80610	$\Delta P_{g,F}$	0.0043	-50/-40	66	750	0.998	0.996
n_e	546.07	1.81184	$\Delta P_{C,t}$	0.0061	-40/-30	70	700	0.998	0.996
n_F	486.13	1.82325	$\Delta P_{C,s}$	0.0014	-30/-20	71	650	0.998	0.996
$n_{F'}$	479.99	1.82471	Thermal Properties		-20/-10	71	600	0.998	0.996
n_g	435.84	1.83761			-10/0	72	550	0.996	0.994
n_h	404.66	1.85023			0/10	73	500	0.993	0.986
n_i	365.01	1.87349			10/20	74	480	0.990	0.981
					20/30	74	460	0.986	0.973
					30/40	75	440	0.981	0.962
					40/50	76	420	0.970	0.940
					50/60	76	400	0.944	0.890
			Mechanical Properties		60/70	77	390	0.915	0.836
					70/80	77	380	0.853	0.725
					80/90	78	370	0.692	0.478
					90/100	78	360	0.370	0.138
					100/110	80	350		
					110/120	81	340		
					120/130	82	330		
					130/140	83	320		
			Density		140/150	84	310		
					150/160	85	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.15342504E+00
A_1	-1.33526633E-02
A_2	3.50785430E-02
A_3	1.38157034E-03
A_4	-2.77539295E-05
A_5	9.11774978E-06

Density		Solarization	
ρ (g/cm ³)	3.75	$\Delta\lambda$ (%)	-0.7

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.8	4.2	4.7	4.8	4.9	5.1	5.4	6.3	6.4	6.8
-40 ~ -20	3.8	4.3	4.8	4.9	4.9	5.2	5.5	6.5	6.6	6.8
-20 ~ 0	3.8	4.5	4.9	5.0	5.1	5.3	5.7	6.5	6.6	6.9
0 ~ 20	3.8	4.6	4.9	5.0	5.1	5.4	5.9	6.7	6.8	7.1
20 ~ 40	3.8	4.6	5.0	5.1	5.2	5.6	6.0	6.9	6.9	7.4
40 ~ 60	3.9	4.8	5.2	5.2	5.3	5.7	6.3	6.9	7.0	7.7
60 ~ 80	3.9	4.8	5.4	5.4	5.5	5.9	6.5	6.9	7.1	7.8
80 ~ 100	3.9	4.9	5.5	5.6	5.7	6.1	6.6	7.2	7.3	8.1
100 ~ 120	4.0	5.1	5.7	5.8	5.9	6.2	6.8	7.5	7.5	8.3
120 ~ 140	4.0	5.2	5.8	5.8	6.0	6.3	6.8	7.6	7.6	8.5
140 ~ 160	4.0	5.3	5.9	5.9	6.0	6.3	6.9	7.7	7.8	8.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	415/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	386/355

Constants of dn/dt		
D_0	D_1	D_2
2.71E-06	1.16E-08	-2.20E-11
E_0	E_1	λ_{TK}
1.17E-06	1.13E-09	3.91E-09

H-ZLaF57	800298	$n_d = 1.80000$	$v_d = 29.84$	$n_F - n_C = 0.026806$
		$n_e = 1.80633$	$v_e = 29.62$	$n_F - n_C' = 0.027224$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance							
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm					
n ₂₃₂₅	2325.42	1.74747	P _{d,C}	0.2899	RC (S)	1	2400	0.945	0.893					
n ₁₉₇₀	1970.09	1.75431	P _{e,d}	0.2361	RA (S)	1	2200	0.983	0.966					
n ₁₅₃₀	1529.58	1.76226	P _{g,F}	0.5999	D _W	1	2000	0.996	0.992					
n ₁₁₂₉	1128.64	1.77044	P' _{d,c´}	0.2410	D _A	1	1800	0.996	0.992					
n ₁₀₆₄	1064.00	1.77212	P' _{e,d}	0.2325	R _{OH} (S)	1	1600	0.996	0.992					
n _t	1013.98	1.77354	P' _{g,F´}	0.5304	RP (S)	1	1400	0.996	0.992					
n _s	852.11	1.77945			CR		1200	0.996	0.992					
n _{A´}	768.19	1.78380	Deviation of Relative Partial Dispersions			Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.996	0.992				
n _r	706.52	1.78795								1000	0.996	0.992		
n _C	656.27	1.79223						ΔP _{F,e}	0.0000			950	0.996	0.992
n _{C´}	643.85	1.79344						ΔP _{g,F}	0.0058	°C	α	900	0.996	0.992
n _{He-Ne}	632.80	1.79459						ΔP _{C,t}	0.0125	-50/-40	65	850	0.996	0.992
n _D	589.29	1.79977	ΔP _{C,s}	0.0047	-40/-30	68	800	0.996	0.992					
n _d	587.56	1.80000	Thermal Properties			-30/-20	70	750	0.996	0.992				
n _e	546.07	1.80633				-20/-10	71	700	0.996	0.992				
n _F	486.13	1.81903				Tg (°C)	623	650	0.996	0.992				
n _{F´}	479.99	1.82067				Ts (°C)	658	600	0.996	0.988				
n _g	435.84	1.83511				T ₁₀ ^{14.5} (°C)	547	550	0.993	0.983				
n _h	404.66	1.84939				T ₁₀ ¹³ (°C)	592	500	0.984	0.970				
n _i	365.01	1.87619				α _{-50/80°C} (10 ⁻⁷ /K)	73	480	0.981	0.964				
						α _{100/300°C} (10 ⁻⁷ /K)	89	460	0.977	0.957				
								440	0.972	0.946				

Constants of Dispersion Formula	
A_0	3.12168528E+00
A_1	-1.38673767E-02
A_2	3.73009678E-02
A_3	1.94247273E-03
A_4	-9.80256201E-05
A_5	1.64841569E-05

Density		Solarization	
ρ (g/cm ³)	3.73	$\Delta\lambda$ (%)	-0.7

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.8	2.4	2.8	2.8	2.9	3.2	3.6	4.5	4.6	5.8
-40 ~ -20	1.9	2.5	2.8	2.9	2.9	3.3	3.7	4.6	4.7	6.0
-20 ~ 0	1.8	2.5	2.9	2.9	3.0	3.3	3.9	4.7	4.8	6.2
0 ~ 20	1.8	2.6	2.9	3.0	3.0	3.4	4.0	4.9	5.0	6.2
20 ~ 40	1.9	2.6	3.0	3.1	3.1	3.4	4.0	5.2	5.2	6.6
40 ~ 60	2.0	2.8	3.2	3.2	3.2	3.6	4.2	5.4	5.4	6.9
60 ~ 80	2.1	2.9	3.3	3.4	3.4	3.7	4.4	5.6	5.6	7.2
80 ~ 100	2.2	3.1	3.5	3.5	3.5	3.8	4.5	5.9	5.9	7.3
100 ~ 120	2.4	3.2	3.6	3.6	3.6	4.0	4.8	6.1	6.1	7.6
120 ~ 140	2.5	3.3	3.7	3.7	3.7	4.1	4.9	6.2	6.2	7.7
140 ~ 160	2.6	3.4	3.8	3.8	3.9	4.3	5.2	6.4	6.5	8.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	430/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	383/356

Constants of dn/dt		
D_0	D_1	D_2
-1.68E-07	1.19E-08	-1.81E-11
E_0	E_1	λ_{TK}
8.12E-07	7.58E-10	2.86E-01

H-ZLaF59	852408	$n_d = 1.85150$	$v_d = 40.78$	$n_F - n_C = 0.020880$
		$n_e = 1.85646$	$v_e = 40.53$	$n_F - n_C' = 0.021134$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.80328	$P_{d,C}$	0.2969	RC (S)	1	2400	0.861	0.742
n_{1970}	1970.09	1.81065	$P_{e,d}$	0.2375	RA (S)	3	2200	0.972	0.945
n_{1530}	1529.58	1.81893	$P_{g,F}$	0.5694	D_W	1	2000	0.995	0.990
n_{1129}	1128.64	1.82685	$P'_{d,c'}$	0.2470	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.82837	$P'_{e,d}$	0.2347	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.82965	$P'_{g,F'}$	0.5044	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.83478			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.83842	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.84183					1000	0.999	0.998
n_C	656.27	1.84530					950	0.999	0.998
$n_{C'}$	643.85	1.84628					900	0.999	0.998
n_{He-Ne}	632.80	1.84719					850	0.999	0.998
n_D	589.29	1.85132	ΔP_{Fe}	-0.0022	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.85150	$\Delta P_{g,F}$	-0.0064	-50/-40	56	750	0.999	0.998
n_e	546.07	1.85646	$\Delta P_{C,t}$	0.0118	-40/-30	58	700	0.999	0.998
n_F	486.13	1.86618	$\Delta P_{C,s}$	0.0056	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.86741	Thermal Properties		-20/-10	61	600	0.999	0.998
n_g	435.84	1.87807	Tg ($^{\circ}C$)	677	-10/0	63	550	0.998	0.996
n_h	404.66	1.88823	Ts ($^{\circ}C$)	701	0/10	63	500	0.996	0.993
n_i	365.01	1.90623	$T_{10}^{14.5} (^{\circ}C)$	632	10/20	64	480	0.994	0.990
			$T_{10}^{13} (^{\circ}C)$	667	20/30	65	460	0.991	0.987
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	62	30/40	66	440	0.988	0.979
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	78	40/50	66	420	0.982	0.971
			λ (W/(m K))	1.02	50/60	67	400	0.972	0.950
					60/70	67	390	0.961	0.929
					70/80	68	380	0.942	0.893
			Mechanical Properties		80/90	69	370	0.906	0.829
			HK (10^7Pa)	720	90/100	70	360	0.827	0.693
			F_A	68	100/110	71	350	0.666	0.451
			E (GPa)	121.8	110/120	72	340	0.357	0.131
			G (GPa)	46.4	120/130	73	330	0.059	0.010
			μ	0.312	130/140	74	320		
			σ_b (MPa)	65	140/150	76	310		
			B ($10^{-12}/Pa$)	1.25	150/160	77	300		

Constants of Dispersion Formula	
A_0	3.33177670E+00
A_1	-1.58867083E-02
A_2	3.20181245E-02
A_3	1.14888430E-03
A_4	-4.03184280E-05
A_5	5.06235629E-06

Density		Solarization	
ρ (g/cm ³)	4.72	$\Delta\lambda$ (%)	-0.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.7	4.1	4.5	4.5	4.6	4.7	5.1	5.8	5.9	6.7
-40 ~ -20	3.7	4.1	4.5	4.6	4.6	4.8	5.2	5.9	6.0	6.8
-20 ~ 0	3.7	4.1	4.6	4.6	4.7	4.9	5.4	6.0	6.1	6.9
0 ~ 20	3.7	4.2	4.6	4.6	4.7	5.0	5.3	6.1	6.2	7.0
20 ~ 40	3.7	4.3	4.7	4.7	4.8	5.0	5.4	6.2	6.3	7.2
40 ~ 60	3.8	4.4	4.8	4.8	4.9	5.0	5.4	6.3	6.4	7.3
60 ~ 80	3.9	4.5	4.9	5.0	5.0	5.2	5.6	6.5	6.6	7.5
80 ~ 100	4.1	4.6	5.0	5.1	5.1	5.3	5.6	6.6	6.7	7.7
100 ~ 120	4.2	4.7	5.2	5.3	5.3	5.5	5.7	6.7	6.8	7.8
120 ~ 140	4.3	4.8	5.3	5.4	5.4	5.5	5.8	6.8	6.9	7.9
140 ~ 160	4.4	4.9	5.4	5.4	5.5	5.7	6.0	6.9	7.0	8.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(380)/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	367/335

Constants of dn/dt		
D_0	D_1	D_2
2.71E-06	1.23E-08	-1.91E-11
E_0	E_1	λ_{TK}
6.47E-07	2.76E-10	2.55E-01

H-ZLaF60GT	850323	$n_d = 1.85026$	$v_d = 32.27$	$n_F - n_C = 0.026349$
		$n_e = 1.85649$	$v_e = 32.05$	$n_F - n_{C'} = 0.026727$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.79843	P _{d,C}	0.2911	RC (S)	1	2400	0.942	0.882		
n ₁₉₇₀	1970.09	1.80513	P _{e,d}	0.2364	RA (S)	1	2200	0.986	0.959		
n ₁₅₃₀	1529.58	1.81293	P _{g,F}	0.5909	D _W	1	2000	0.993	0.985		
n ₁₁₂₉	1128.64	1.82100	P' _{d,c´}	0.2421	D _A	1	1800	0.998	0.996		
n ₁₀₆₄	1064.00	1.82266	P' _{e,d}	0.2331	R _{OH} (S)	1	1600	0.998	0.996		
n _t	1013.98	1.82407	P' _{g,F´}	0.5231	RP (S)	2	1400	0.998	0.996		
n _s	852.11	1.82993			CR		1200	0.998	0.996		
n _{A´}	768.19	1.83424	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.998	0.996		
n _r	706.52	1.83835					1000	0.998	0.996		
n _C	656.27	1.84259					950	0.998	0.996		
n _{C´}	643.85	1.84379					900	0.998	0.996		
n _{He-Ne}	632.80	1.84491					850	0.998	0.996		
n _D	589.29	1.85003	ΔP _{F,e}	-0.0003	°C	α	800	0.998	0.996		
n _d	587.56	1.85026	ΔP _{g,F}	0.0009	-50/-40	65	750	0.998	0.996		
n _e	546.07	1.85649	ΔP _{C,t}	0.0064	-40/-30	67	700	0.998	0.996		
n _F	486.13	1.86893	ΔP _{C,s}	0.0026	-30/-20	70	650	0.998	0.996		
n _{F´}	479.99	1.87052	Thermal Properties		-20/-10	71	600	0.998	0.996		
n _g	435.84	1.88450			Tg (°C)	617	-10/0	71	550	0.996	0.994
n _h	404.66	1.89819			Ts (°C)	663	0/10	73	500	0.993	0.989
n _i	365.01	1.92348			T ₁₀ ^{14.5} (°C)	569	10/20	74	480	0.989	0.983
					T ₁₀ ¹³ (°C)	591	20/30	75	460	0.985	0.974
					α _{-50/80°C} (10 ⁻⁷ /K)	73	30/40	76	440	0.979	0.960
			α _{100/300°C} (10 ⁻⁷ /K)	92	40/50	77					

Constants of Dispersion Formula	
A_0	3.30260921E+00
A_1	-1.39415408E-02
A_2	3.82606507E-02
A_3	1.95805494E-03
A_4	-1.07295242E-04
A_5	1.47824013E-05

Density		Solarization	
ρ (g/cm ³)	4.00	$\Delta\lambda$ (%)	-0.2

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.2	3.7	4.1	4.1	4.2	4.5	4.9	5.8	5.8	6.9
-40 ~ -20	3.1	3.7	4.1	4.1	4.2	4.5	5.0	5.9	5.9	7.1
-20 ~ 0	3.1	3.7	4.2	4.2	4.3	4.7	5.1	6.2	6.2	7.4
0 ~ 20	3.1	3.7	4.2	4.2	4.3	4.6	5.2	6.2	6.2	7.6
20 ~ 40	3.1	3.7	4.3	4.3	4.3	4.8	5.2	6.3	6.3	7.9
40 ~ 60	3.1	3.7	4.3	4.4	4.5	4.8	5.3	6.5	6.5	8.1
60 ~ 80	3.2	3.8	4.4	4.5	4.6	5.0	5.5	6.8	6.8	8.4
80 ~ 100	3.3	3.9	4.5	4.6	4.6	5.2	5.5	7.0	7.0	8.6
100 ~ 120	3.3	4.0	4.6	4.7	4.8	5.3	5.6	7.2	7.2	8.9
120 ~ 140	3.5	4.1	4.7	4.7	4.8	5.6	5.8	7.4	7.4	9.1
140 ~ 160	3.6	4.2	4.8	4.8	4.9	5.7	6.0	7.7	7.7	9.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(395)/355
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/353

Constants of dn/dt		
D_0	D_1	D_2
1.56E-06	9.55E-09	-1.73E-11
E_0	E_1	λ_{TK}
8.08E-07	1.02E-09	2.78E-01

H-ZLaF60A	850323	$n_d = 1.85026$	$v_d = 32.27$	$n_F - n_C = 0.026349$
		$n_e = 1.85649$	$v_e = 32.05$	$n_F - n_{C'} = 0.026727$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2911	RC (S)	1	2400	0.969	0.939
n_{1970}	1970.09		$P_{e,d}$	0.2364	RA (S)	1	2200	0.987	0.974
n_{1530}	1529.58		$P_{g,F}$	0.5928	D_W	1	2000	0.995	0.989
n_{1129}	1128.64	1.82128	$P'_{d,c'}$	0.2421	D_A	1	1800	0.997	0.993
n_{1064}	1064.00	1.82287	$P'_{e,d}$	0.2331	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.82426	$P'_{g,F'}$	0.5249	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.83001			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.83428	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.83837					1000	0.999	0.998
n_C	656.27	1.84259					950	0.999	0.998
$n_{C'}$	643.85	1.84379					900	0.999	0.998
n_{He-Ne}	632.80	1.84491					850	0.999	0.998
n_D	589.29	1.85003	ΔP_{Fe}	-0.0003	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.85026	$\Delta P_{g,F}$	0.0028	-50/-40	57	750	0.999	0.998
n_e	546.07	1.85649	$\Delta P_{C,t}$	-0.0008	-40/-30	59	700	0.999	0.998
n_F	486.13	1.86893	$\Delta P_{C,s}$	-0.0004	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.87052	Thermal Properties		-20/-10	60	600	0.999	0.998
n_g	435.84	1.88455	$T_g (^{\circ}C)$	743	-10/0	64	550	0.998	0.996
n_h	404.66	1.89826	$T_s (^{\circ}C)$	795	0/10	64	500	0.996	0.993
n_i	365.01	1.92358	$T_{10}^{14.5} (^{\circ}C)$	682	10/20	65	480	0.990	0.980
			$T_{10}^{13} (^{\circ}C)$	704	20/30	65	460	0.986	0.972
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	65	30/40	65	440	0.980	0.961
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	79	40/50	66	420	0.971	0.944
			λ (W/(m K))	0.87	50/60	66	400	0.954	0.910
					60/70	68	390	0.913	0.833
					70/80	69	380	0.872	0.761
					80/90	69	370	0.797	0.635
			Mechanical Properties		90/100	71	360	0.640	0.410
			HK (10^7 Pa)	603	100/110	71	350	0.355	0.126
			F_A	147	110/120	72	340		
			E (GPa)	111.4	120/130	75	330		
			G (GPa)	42.9	130/140	76	320		
			μ	0.299	140/150	76	310		
			σ_b (MPa)		150/160	79	300		
			B (10^{-12} /Pa)	1.76			290		
							280		

Constants of Dispersion Formula	
A_0	3.30037670E+00
A_1	-1.19927180E-02
A_2	3.94905653E-02
A_3	1.56664097E-03
A_4	-4.50656039E-05
A_5	1.12714689E-05

Density		Solarization	
ρ (g/cm ³)	4.43	$\Delta\lambda$ (%)	-0.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.5	2.8	3.1	3.2	3.4	3.8	4.3	4.9	5.2	6.3
-40 ~ -20	2.5	2.8	3.2	3.3	3.4	3.9	4.5	5.1	5.3	6.6
-20 ~ 0	2.7	3.0	3.3	3.4	3.6	4.2	4.7	5.3	5.6	6.8
0 ~ 20	2.7	3.0	3.4	3.5	3.6	4.2	4.8	5.5	5.7	7.1
20 ~ 40	2.8	3.2	3.6	3.7	3.8	4.4	5.0	5.7	5.9	7.3
40 ~ 60	2.8	3.3	3.7	3.7	3.8	4.5	5.2	5.9	6.1	7.6
60 ~ 80	2.9	3.5	3.8	4.0	4.1	4.7	5.3	6.1	6.3	7.9
80 ~ 100	2.9	3.7	4.1	4.2	4.3	5.0	5.6	6.2	6.4	8.2
100 ~ 120	3.0	3.8	4.2	4.3	4.5	5.2	5.7	6.5	6.7	8.4
120 ~ 140	3.1	4.0	4.4	4.5	4.6	5.3	5.9	6.7	7.0	8.6
140 ~ 160	3.1	4.2	4.6	4.7	4.8	5.5	6.1	6.9	7.1	8.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(400)/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	395/357

Constants of dn/dt		
D_0	D_1	D_2
6.73E-07	1.31E-08	-2.05E-11
E_0	E_1	λ_{TK}
8.31E-07	7.05E-10	2.74E-01

H-ZLaF64	871407	$n_d = 1.87070$	$v_d = 40.73$	$n_F - n_C = 0.021378$
		$n_e = 1.87578$	$v_e = 40.48$	$n_F - n_{C'} = 0.021636$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2966	RC (S)	1	2400	0.900	0.810
n_{1970}	1970.09		$P_{e,d}$	0.2376	RA (S)	1	2200	0.973	0.947
n_{1530}	1529.58		$P_{g,F}$	0.5683	D_W	1	2000	0.988	0.976
n_{1129}	1128.64		$P'_{d,c'}$	0.2468	D_A	2	1800	0.996	0.993
n_{1064}	1064.00		$P'_{e,d}$	0.2348	$R_{OH}(S)$	1	1600	0.998	0.997
n_t	1013.98	1.84858	$P'_{g,F'}$	0.5033	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.85367			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.85735	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.86082					1000	0.999	0.998
n_C	656.27	1.86436					950	0.999	0.998
$n_{C'}$	643.85	1.86536					900	0.999	0.998
n_{He-Ne}	632.80	1.86629					850	0.999	0.998
n_D	589.29	1.87052	ΔP_{Fe}	-0.0023	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.87070	$\Delta P_{g,F}$	-0.0076	-50/-40	62	750	0.999	0.998
n_e	546.07	1.87578	$\Delta P_{C,t}$	0.0007	-40/-30	62	700	0.999	0.998
n_F	486.13	1.88573	$\Delta P_{C,s}$	0.0019	-30/-20	63	650	0.999	0.998
$n_{F'}$	479.99	1.88699	Thermal Properties		-20/-10	66	600	0.999	0.998
n_g	435.84	1.89788	Tg ($^{\circ}C$)	719	-10/0	67	550	0.998	0.997
n_h	404.66	1.90822	Ts ($^{\circ}C$)	746	0/10	67	500	0.996	0.992
n_i	365.01	1.92642	$T_{10}^{14.5} (^{\circ}C)$	689	10/20	69	480	0.993	0.986
			$T_{10}^{13} (^{\circ}C)$	706	20/30	70	460	0.989	0.979
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	71	440	0.985	0.970
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	84	40/50	72	420	0.978	0.957
			λ (W/(m K))	0.88	50/60	72	400	0.966	0.933
					60/70	72	390	0.954	0.911
					70/80	73	380	0.934	0.873
			Mechanical Properties		80/90	75	370	0.902	0.814
			HK (10^7Pa)	671	90/100	76	360	0.853	0.727
			F_A	91	100/110	76	350	0.773	0.598
			E (GPa)	123.4	110/120	77	340	0.645	0.416
			G (GPa)	46.9	120/130	77	330	0.427	0.182
			μ	0.316	130/140	80	320	0.164	0.027
			σ_b (MPa)	116	140/150	81	310		
			B ($10^{-12}/\text{Pa}$)	0.90	150/160	83	300		

Constants of Dispersion Formula	
A_0	3.39546999E+00
A_1	-1.28894532E-02
A_2	3.53964334E-02
A_3	5.98603397E-04
A_4	3.77588400E-05
A_5	6.23039754E-07

Density		Solarization	
ρ (g/cm ³)	4.84	$\Delta\lambda$ (%)	-0.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.5	1.7	1.8	1.9	2.0	2.1	2.3	2.5	2.6	3.2
-40 ~ -20	1.5	1.8	1.9	2.0	2.2	2.3	2.5	2.8	2.9	3.6
-20 ~ 0	1.7	2.0	2.2	2.3	2.5	2.6	2.9	3.2	3.4	4.1
0 ~ 20	1.9	2.3	2.5	2.6	2.7	2.9	3.3	3.6	3.7	4.6
20 ~ 40	2.1	2.6	2.8	2.9	3.0	3.3	3.6	3.9	4.0	5.1
40 ~ 60	2.3	2.8	3.1	3.2	3.3	3.5	4.0	4.2	4.3	5.5
60 ~ 80	2.4	3.0	3.4	3.4	3.5	3.8	4.3	4.4	4.5	5.8
80 ~ 100	2.5	3.2	3.4	3.5	3.6	4.0	4.5	4.7	4.8	6.0
100 ~ 120	2.5	3.3	3.6	3.6	3.7	4.1	4.7	4.9	5.0	6.1
120 ~ 140	2.7	3.3	3.7	3.8	3.9	4.3	4.9	5.2	5.3	6.4
140 ~ 160	2.9	3.5	3.8	3.9	4.0	4.5	5.1	5.4	5.5	6.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(375)/325
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	368/322

Constants of dn/dt		
D_0	D_1	D_2
-2.08E-07	1.66E-08	-3.59E-11
E_0	E_1	λ_{TK}
6.54E-07	1.08E-09	1.91E-01

H-ZLaF65		874306	n _d = 1.87408		v _d = 30.55		n _F − n _C = 0.028610						
			n _e = 1.88085		v _e = 30.34		n _F − n _C ′ = 0.029035						
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance						
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm				
n ₂₃₂₅	2325.42	1.82063					2400	0.928	0.861				
n ₁₉₇₀	1970.09	1.82703					2200	0.982	0.964				
n ₁₅₃₀	1529.58	1.83463					2000	0.997	0.994				
n ₁₁₂₉	1128.64	1.84284	P _{d,C}	0.2894	RC (S)	1	1800	0.997	0.994				
n ₁₀₆₄	1064.00	1.84457	P _{e,d}	0.2366	RA (S)	1	1600	0.997	0.994				
n _t	1013.98	1.84606	P _{g,F}	0.6012	D _W	1	1400	0.997	0.994				
n _s	852.11	1.85226	P _{d,c} ′	0.2404	D _A	3	1200	0.997	0.994				
n _A ′	768.19	1.85685	P _{e,d} ′	0.2332	R _{OH} (S)	1	1060	0.997	0.994				
n _r	706.52	1.86126	P _{g,F} ′	0.5328	RP (S)	2	1000	0.997	0.994				
n _C	656.27	1.86580			CR		950	0.997	0.994				
n _C ′	643.85	1.86710	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		900	0.997	0.994				
n _{He-Ne}	632.80	1.86830					850	0.997	0.994				
n _D	589.29	1.87384					800	0.997	0.994				
n _d	587.56	1.87408					750	0.997	0.994				
n _e	546.07	1.88085					700	0.997	0.994				
n _F	486.13	1.89441	Thermal Properties				650	0.997	0.994				
n _F ′	479.99	1.89614					600	0.995	0.990				
n _g	435.84	1.91161					550	0.993	0.985				
n _h	404.66	1.92693					500	0.985	0.967				
n _i	365.01	1.95549					480	0.979	0.956				
			Mechanical Properties				460	0.973	0.943				
							440	0.964	0.926				
							420	0.944	0.892				
							400	0.896	0.805				
							390	0.846	0.718				
Constants of Dispersion Formula							380	0.750	0.568				
A ₀	3.37787954E+00						370	0.555	0.316				
A ₁	-1.31762604E-02						360	0.213	0.051				
A ₂	4.34183952E-02						350						
A ₃	1.40530101E-03						340						
A ₄	2.38841484E-05		G (GPa)	47.6	120/130	92	330						
A ₅	1.02947705E-05		μ	0.310	130/140	93	320						
Density		Solarization		σ _b (MPa)		140/150	94	310					
ρ (g/cm ³)	4.55	△λ (%)	-0.7	B (10 ⁻¹² /Pa)	1.28	150/160	95	300					
										290			
										280			
Range of Temperature (°C)	Temperature Coefficients of Refractive Index										Coloration Code		
	dn/dt relative (×10 ⁻⁶ / °C)										λ ₈₀ (λ ₇₀)/λ ₅		(410)/360
	t	s	C	C'	He-Ne	d	e	F	F'	g	Coloration of Internal Transmittance		
	-60 ~ -40	2.1	2.6	2.9	3.0	3.0	3.2	3.8	4.9	5.0	5.9	λτ ₈₀ /λτ ₅	399/360
	-40 ~ -20	2.1	2.6	3.0	3.1	3.1	3.4	3.8	5.0	5.1	6.1		
	-20 ~ 0	2.1	2.6	3.0	3.1	3.2	3.4	3.9	5.1	5.2	6.4		
	0 ~ 20	2.2	2.7	3.1	3.2	3.2	3.5	4.1	5.3	5.4	6.8		
	20 ~ 40	2.2	2.8	3.1	3.2	3.3	3.8	4.2	5.5	5.6	7.0		
	40 ~ 60	2.4	3.0	3.3	3.4	3.5	4.0	4.5	5.8	5.9	7.5		
	60 ~ 80	2.5	3.1	3.5	3.6	3.7	4.3	4.8	6.1	6.1	7.7	Constants of dn/dt	
80 ~ 100	2.6	3.2	3.7	3.8	3.9	4.5	4.9	6.3	6.3	8.0	D ₀	D ₁	D ₂
100 ~ 120	2.7	3.4	4.0	4.0	4.1	4.6	5.3	6.5	6.5	8.3	1.88E-08	1.25E-08	-1.43E-11
120 ~ 140	2.9	3.6	4.2	4.2	4.3	4.9	5.5	6.8	6.8	8.6	E ₀	E ₁	λ _{TK}
140 ~ 160	3.0	3.7	4.3	4.4	4.4	5.1	5.7	7.0	7.1	8.8	7.76E-07	7.48E-10	2.89E-01

H-ZLaF66A	801350	$n_d = 1.80100$	$v_d = 34.97$	$n_F - n_C = 0.022907$
		$n_e = 1.80642$	$v_e = 34.72$	$n_F - n_{C'} = 0.023227$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.75440	$P_{d,C}$	0.2938	RC (S)	1	2400	0.936	0.876
n_{1970}	1970.09	1.76062	$P_{e,d}$	0.2366	RA (S)	1	2200	0.979	0.958
n_{1530}	1529.58	1.76782	$P_{g,F}$	0.5876	D_W	1	2000	0.991	0.983
n_{1129}	1128.64	1.77518	$P'_{d,C'}$	0.2441	D_A	2	1800	0.996	0.992
n_{1064}	1064.00	1.77667	$P'_{e,d}$	0.2333	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.77795	$P'_{g,F'}$	0.5205	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.78317			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.78697	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.79058					1000	0.998	0.996
n_C	656.27	1.79427					950	0.998	0.996
$n_{C'}$	643.85	1.79533					900	0.998	0.996
n_{He-Ne}	632.80	1.79632					850	0.998	0.996
n_D	589.29	1.80079	ΔP_{Fe}	-0.0012	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.80100	$\Delta P_{g,F}$	0.0021	-50/-40	66	750	0.998	0.996
n_e	546.07	1.80642	$\Delta P_{C,t}$	0.0029	-40/-30	69	700	0.998	0.996
n_F	486.13	1.81718	$\Delta P_{C,s}$	0.0002	-30/-20	71	650	0.998	0.996
$n_{F'}$	479.99	1.81855	Thermal Properties		-20/-10	72	600	0.998	0.996
n_g	435.84	1.83064	$T_g (^{\circ}C)$	677	-10/0	74	550	0.997	0.994
n_h	404.66	1.84242	$T_s (^{\circ}C)$	719	0/10	74	500	0.994	0.989
n_i	365.01	1.86397	$T_{10}^{14.5} (^{\circ}C)$	618	10/20	75	480	0.991	0.983
			$T_{10}^{13} (^{\circ}C)$	668	20/30	76	460	0.987	0.975
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	76	30/40	77	440	0.982	0.963
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	93	40/50	78	420	0.970	0.942
			λ (W/(m K))	1.15	50/60	78	400	0.946	0.895
					60/70	79	390	0.920	0.845
					70/80	79	380	0.866	0.751
			Mechanical Properties		80/90	80	370	0.748	0.558
			HK (10^7Pa)	640	90/100	81	360	0.491	0.241
			F_A	128	100/110	82	350	0.155	0.024
			E (GPa)	111.6	110/120	83	340		
			G (GPa)	42.1	120/130	85	330		
			μ	0.324	130/140	86	320		
			σ_b (MPa)	87	140/150	87	310		
			B ($10^{-12}/\text{Pa}$)	1.64	150/160	88	300		

Constants of Dispersion Formula	
A_0	3.14021962E+00
A_1	-1.26812790E-02
A_2	3.37217299E-02
A_3	1.19133791E-03
A_4	-2.03909360E-05
A_5	7.64423823E-06

Density		Solarization	
ρ (g/cm ³)	3.76	$\Delta\lambda$ (%)	-1.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.2	3.8	4.1	4.2	4.3	4.5	4.8	5.5	5.6	6.5
-40 ~ -20	3.3	3.9	4.2	4.3	4.3	4.6	5.1	5.7	5.8	6.9
-20 ~ 0	3.3	3.8	4.3	4.4	4.4	4.8	5.4	5.9	6.0	7.0
0 ~ 20	3.4	4.0	4.4	4.5	4.6	5.0	5.7	6.1	6.1	7.4
20 ~ 40	3.6	4.1	4.6	4.6	4.7	5.0	5.8	6.3	6.3	7.6
40 ~ 60	3.7	4.3	4.8	4.8	4.8	5.3	5.9	6.4	6.5	8.0
60 ~ 80	3.8	4.5	4.8	4.9	4.9	5.4	6.1	6.6	6.6	8.1
80 ~ 100	3.8	4.5	4.9	5.0	5.1	5.5	6.1	6.8	6.9	8.4
100 ~ 120	4.0	4.7	5.0	5.1	5.2	5.6	6.3	7.1	7.1	8.6
120 ~ 140	4.1	4.8	5.2	5.3	5.3	5.8	6.4	7.2	7.2	8.8
140 ~ 160	4.3	4.9	5.4	5.5	5.5	6.0	6.6	7.3	7.4	9.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	425/355
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	387/354

Constants of dn/dt		
D_0	D_1	D_2
2.52E-06	1.35E-08	-2.56E-11
E_0	E_1	λ_{TK}
7.53E-07	7.09E-10	2.67E-01

H-ZLaF67	881401	$n_d = 1.88100$	$v_d = 40.13$	$n_F - n_C = 0.021952$
		$n_e = 1.88622$	$v_e = 39.90$	$n_F - n_C' = 0.022209$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.83527	$P_{d,C}$	0.2961	RC (S)	1	2400	0.945	0.893
n_{1970}	1970.09	1.84141	$P_{e,d}$	0.2378	RA (S)	2	2200	0.980	0.972
n_{1530}	1529.58	1.84851	$P_{g,F}$	0.5699	D_W	1	2000	0.994	0.989
n_{1129}	1128.64	1.85576	$P'_{d,c'}$	0.2467	D_A	2	1800	0.999	0.998
n_{1064}	1064.00	1.85723	$P'_{e,d}$	0.2350	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.85849	$P'_{g,F'}$	0.5057	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.86362			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.86735	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.87088					1000	0.999	0.998
n_C	656.27	1.87450					950	0.999	0.998
$n_{C'}$	643.85	1.87552					900	0.999	0.998
n_{He-Ne}	632.80	1.87648					850	0.999	0.998
n_D	589.29	1.88081	ΔP_{Fe}	-0.0020	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.88100	$\Delta P_{g,F}$	-0.0071	-50/-40	64	750	0.999	0.998
n_e	546.07	1.88622	$\Delta P_{C,t}$	-0.0053	-40/-30	66	700	0.999	0.998
n_F	486.13	1.89645	$\Delta P_{C,s}$	-0.0011	-30/-20	68	650	0.999	0.998
$n_{F'}$	479.99	1.89773	Thermal Properties		-20/-10	69	600	0.999	0.998
n_g	435.84	1.90896	Tg ($^{\circ}C$)	715	-10/0	70	550	0.999	0.998
n_h	404.66	1.91961	Ts ($^{\circ}C$)	754	0/10	71	500	0.999	0.998
n_i	365.01	1.93853	$T_{10}^{14.5} (^{\circ}C)$	647	10/20	73	480	0.990	0.981
			$T_{10}^{13} (^{\circ}C)$	677	20/30	74	460	0.985	0.969
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	71	30/40	74	440	0.977	0.956
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	86	40/50	75	420	0.970	0.940
			λ (W/(m K))	0.84	50/60	75	400	0.950	0.903
					60/70	76	390	0.928	0.862
					70/80	76	380	0.891	0.794
					80/90	77	370	0.839	0.704
			Mechanical Properties		90/100	78	360	0.753	0.567
			HK (10^7Pa)	710	100/110	79	350	0.604	0.364
			F_A	71	110/120	80	340	0.361	0.130
			E (GPa)	122.0	120/130	81	330	0.102	0.010
			G (GPa)	46.9	130/140	82	320		
			μ	0.300	140/150	84	310		
			σ_b (MPa)	92	150/160	85	300		
			B ($10^{-12}/Pa$)	1.09			290		
							280		

Constants of Dispersion Formula	
A_0	3.43263393E+00
A_1	-1.31007856E-02
A_2	3.45483476E-02
A_3	1.34177704E-03
A_4	-7.37786129E-05
A_5	7.34356017E-06

Density		Solarization	
ρ (g/cm ³)	5.20	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.1	4.7	5.0	5.1	5.2	5.4	5.7	6.5	6.6	7.5
-40 ~ -20	4.1	4.7	5.0	5.1	5.2	5.5	5.8	6.6	6.7	7.6
-20 ~ 0	4.0	4.7	5.1	5.1	5.2	5.5	5.8	6.7	6.8	7.7
0 ~ 20	4.0	4.7	5.1	5.1	5.2	5.5	5.9	6.8	6.9	7.7
20 ~ 40	4.0	4.8	5.1	5.2	5.2	5.6	5.8	6.9	6.9	7.9
40 ~ 60	4.1	4.9	5.2	5.3	5.3	5.7	6.0	7.0	7.0	8.0
60 ~ 80	4.3	5.0	5.4	5.4	5.5	5.8	6.2	7.1	7.1	8.3
80 ~ 100	4.4	5.1	5.5	5.5	5.6	6.0	6.2	7.3	7.3	8.4
100 ~ 120	4.5	5.2	5.6	5.7	5.8	6.2	6.5	7.3	7.4	8.6
120 ~ 140	4.5	5.3	5.7	5.8	5.9	6.2	6.6	7.4	7.5	8.7
140 ~ 160	4.7	5.4	5.8	5.9	6.0	6.4	6.7	7.6	7.7	8.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(390)/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	380/336

Constants of dn/dt		
D_0	D_1	D_2
3.08E-06	1.15E-08	-1.54E-11
E_0	E_1	λ_{TK}
7.31E-07	3.03E-10	2.44E-01

H-ZLaF68A	883408	$n_d = 1.88300$	$v_d = 40.79$	$n_F - n_C = 0.021645$
		$n_e = 1.88815$	$v_e = 40.56$	$n_F - n_{C'} = 0.021897$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.83774	$P_{d,C}$	0.2971	RC (S)	1	2400	0.949	0.900
n_{1970}	1970.09	1.84375	$P_{e,d}$	0.2379	RA (S)	1	2200	0.993	0.985
n_{1530}	1529.58	1.85077	$P_{g,F}$	0.5692	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.85799	$P'_{d,c'}$	0.2475	D_A	2	1800	0.999	0.998
n_{1064}	1064.00	1.85944	$P'_{e,d}$	0.2352	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.86069	$P'_{g,F'}$	0.5046	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.86579			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.86950	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.87299					1000	0.999	0.998
n_C	656.27	1.87657					950	0.999	0.998
$n_{C'}$	643.85	1.87758					900	0.999	0.998
n_{He-Ne}	632.80	1.87853					850	0.999	0.998
n_D	589.29	1.88281	ΔP_{Fe}	-0.0029	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.88300	$\Delta P_{g,F}$	-0.0067	-50/-40	61	750	0.999	0.998
n_e	546.07	1.88815	$\Delta P_{C,t}$	-0.0041	-40/-30	62	700	0.999	0.998
n_F	486.13	1.89821	$\Delta P_{C,s}$	-0.0003	-30/-20	64	650	0.999	0.998
$n_{F'}$	479.99	1.89948	Thermal Properties		-20/-10	65	600	0.999	0.998
n_g	435.84	1.91053	Tg ($^{\circ}C$)	698	-10/0	66	550	0.999	0.998
n_h	404.66	1.92097	Ts ($^{\circ}C$)	746	0/10	67	500	0.997	0.995
n_i	365.01	1.93924	$T_{10}^{14.5} (^{\circ}C)$	629	10/20	68	480	0.994	0.992
			$T_{10}^{13} (^{\circ}C)$	667	20/30	69	460	0.991	0.989
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	70	440	0.988	0.985
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	83	40/50	70	420	0.984	0.981
			λ (W/(m K))	0.98	50/60	71	400	0.980	0.960
					60/70	71	390	0.970	0.937
					70/80	72	380	0.956	0.909
					80/90	73	370	0.937	0.873
			Mechanical Properties		90/100	74	360	0.903	0.815
			HK (10^7Pa)	682	100/110	75	350	0.857	0.730
			F_A	58	110/120	76	340	0.785	0.607
			E (GPa)	120.9	120/130	77	330	0.695	0.476
			G (GPa)	46.5	130/140	78	320	0.572	0.318
			μ	0.301	140/150	79	310	0.401	0.155
			σ_b (MPa)	95	150/160	80	300		
			B ($10^{-12}/Pa$)	1.32			290		
							280		

Constants of Dispersion Formula	
A_0	3.43996305E+00
A_1	-1.28171243E-02
A_2	3.56469712E-02
A_3	7.18879378E-04
A_4	3.46401317E-05
A_5	-9.50101800E-08

Density		Solarization	
ρ (g/cm ³)	5.47	$\Delta\lambda$ (%)	-2.1

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.7	5.2	5.5	5.6	5.7	6.0	6.5	7.1	7.2	7.9
-40 ~ -20	4.7	5.2	5.5	5.6	5.7	6.0	6.4	7.2	7.3	8.0
-20 ~ 0	4.7	5.2	5.5	5.6	5.7	6.0	6.5	7.3	7.4	8.1
0 ~ 20	4.7	5.2	5.5	5.6	5.7	6.0	6.4	7.3	7.4	8.2
20 ~ 40	4.7	5.2	5.5	5.6	5.7	6.0	6.5	7.4	7.4	8.3
40 ~ 60	4.8	5.3	5.6	5.7	5.8	6.1	6.6	7.5	7.5	8.4
60 ~ 80	4.9	5.6	5.8	6.0	6.1	6.4	6.9	7.7	7.8	8.7
80 ~ 100	4.9	5.9	6.0	6.2	6.3	6.6	7.0	8.0	8.1	9.0
100 ~ 120	5.0	6.1	6.3	6.5	6.5	6.8	7.4	8.1	8.2	9.2
120 ~ 140	5.1	6.3	6.5	6.6	6.7	6.9	7.6	8.3	8.4	9.4
140 ~ 160	5.3	6.5	6.7	6.8	6.9	7.1	7.8	8.5	8.6	9.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(370)/315
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	368/313

Constants of dn/dt		
D_0	D_1	D_2
3.73E-06	1.16E-08	-5.36E-12
E_0	E_1	λ_{TK}
8.04E-07	3.83E-10	2.13E-01

H-ZLaF68L	883392	$n_d = 1.88300$	$v_d = 39.22$	$n_F - n_C = 0.022515$
		$n_e = 1.88835$	$v_e = 38.97$	$n_F - n_C' = 0.022798$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2954	RC (S)	1	2400	0.898	0.807
n_{1970}	1970.09		$P_{e,d}$	0.2376	RA (S)	1	2200	0.970	0.940
n_{1530}	1529.58	1.84942	$P_{g,F}$	0.5698	D_W	1	2000	0.988	0.976
n_{1129}	1128.64	1.85707	$P'_{d,c'}$	0.2456	D_A	2	1800	0.995	0.991
n_{1064}	1064.00	1.85859	$P'_{e,d}$	0.2347	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.85990	$P'_{g,F'}$	0.5049	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.86519			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.86902	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.87265					1000	0.999	0.998
n_C	656.27	1.87635					950	0.999	0.998
$n_{C'}$	643.85	1.87740					900	0.999	0.998
n_{He-Ne}	632.80	1.87837					850	0.999	0.998
n_D	589.29	1.88281	ΔP_{Fe}	-0.0013	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.88300	$\Delta P_{g,F}$	-0.0086	-50/-40	63	750	0.999	0.998
n_e	546.07	1.88835	$\Delta P_{C,t}$	0.0005	-40/-30	65	700	0.999	0.998
n_F	486.13	1.89887	$\Delta P_{C,s}$	0.0011	-30/-20	67	650	0.999	0.998
$n_{F'}$	479.99	1.90019	Thermal Properties		-20/-10	68	600	0.999	0.998
n_g	435.84	1.91170	$T_g (^{\circ}C)$	720	-10/0	69	550	0.999	0.998
n_h	404.66	1.92270	$T_s (^{\circ}C)$	748	0/10	70	500	0.998	0.996
n_i	365.01	1.94220	$T_{10}^{14.5} (^{\circ}C)$	673	10/20	71	480	0.995	0.990
			$T_{10}^{13} (^{\circ}C)$	703	20/30	72	460	0.991	0.983
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	71	30/40	73	440	0.987	0.975
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	83	40/50	73	420	0.982	0.964
			λ (W/(m K))	0.78	50/60	74	400	0.974	0.949
					60/70	75	390	0.957	0.915
					70/80	76	380	0.939	0.881
					80/90	77	370	0.910	0.828
			Mechanical Properties		90/100	78	360	0.861	0.741
			HK (10^7 Pa)	700	100/110	79	350	0.771	0.594
			F_A	74	110/120	80	340	0.605	0.366
			E (GPa)	124.4	120/130	81	330	0.333	0.111
			G (GPa)	46.7	130/140	82	320		
			μ	0.333	140/150	84	310		
			σ_b (MPa)	125	150/160	85	300		
			B (10^{-12} /Pa)	0.93			290		
							280		

Constants of Dispersion Formula	
A_0	3.43867274E+00
A_1	-1.43248055E-02
A_2	3.49115425E-02
A_3	1.45301670E-03
A_4	-7.62581625E-05
A_5	7.47668790E-06

Density		Solarization	
ρ (g/cm ³)	5.12	$\Delta\lambda$ (%)	-0.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.9	1.4	1.9	2.0	2.2	2.5	3.2	3.4	3.7	4.9
-40 ~ -20	0.9	1.6	2.0	2.0	2.3	2.7	3.3	3.6	3.9	5.0
-20 ~ 0	1.0	1.6	2.1	2.2	2.5	2.7	3.5	3.6	4.0	5.1
0 ~ 20	1.2	1.7	2.3	2.4	2.6	2.8	3.7	3.8	4.2	5.3
20 ~ 40	1.3	1.7	2.4	2.4	2.6	2.9	3.8	4.1	4.3	5.4
40 ~ 60	1.5	1.9	2.4	2.6	2.8	3.0	3.9	4.1	4.4	5.5
60 ~ 80	1.6	2.1	2.6	2.8	2.9	3.3	4.1	4.3	4.5	5.6
80 ~ 100	1.6	2.3	2.8	2.9	3.0	3.5	4.2	4.5	4.6	5.7
100 ~ 120	1.8	2.3	2.9	3.0	3.2	3.5	4.4	4.6	4.7	5.9
120 ~ 140	1.9	2.4	3.0	3.1	3.3	3.7	4.4	4.7	4.8	6.1
140 ~ 160	1.9	2.6	3.1	3.2	3.4	3.9	4.6	4.9	5.1	6.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(380)/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	377/338

Constants of dn/dt		
D_0	D_1	D_2
-1.77E-06	1.42E-08	-2.29E-11
E_0	E_1	λ_{TK}
1.13E-06	1.17E-10	1.38E-01

H-ZLaF70	904313	$n_d = 1.90366$	$v_d = 31.32$	$n_F - n_C = 0.028857$
		$n_e = 1.91048$	$v_e = 31.08$	$n_F - n_{C'} = 0.029295$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.84663	$P_{d,C}$	0.2911	RC (S)	1	2400	0.904	0.817
n_{1970}	1970.09	1.85408	$P_{e,d}$	0.2363	RA (S)	2	2200	0.979	0.958
n_{1530}	1529.58	1.86274	$P_{g,F}$	0.5947	D_W	1	2000	0.998	0.996
n_{1129}	1128.64	1.87166	$P'_{d,c'}$	0.2420	D_A	2	1800	0.998	0.996
n_{1064}	1064.00	1.87348	$P'_{e,d}$	0.2328	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.87504	$P'_{g,F'}$	0.5260	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.88144			CR	1	1200	0.998	0.996
$n_{A'}$	768.19	1.88615	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.89065					1000	0.998	0.996
n_C	656.27	1.89526					950	0.998	0.996
$n_{C'}$	643.85	1.89657					900	0.998	0.996
n_{He-Ne}	632.80	1.89781					850	0.998	0.996
n_D	589.29	1.90341	$\Delta P_{F,e}$	-0.0002	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.90366	$\Delta P_{g,F}$	0.0031	-50/-40	59	750	0.998	0.996
n_e	546.07	1.91048	$\Delta P_{C,t}$	0.0088	-40/-30	61	700	0.998	0.996
n_F	486.13	1.92412	$\Delta P_{C,s}$	0.0033	-30/-20	62	650	0.998	0.996
$n_{F'}$	479.99	1.92587	Thermal Properties		-20/-10	64	600	0.998	0.996
n_g	435.84	1.94128	Tg ($^{\circ}C$)	679	-10/0	65	550	0.996	0.994
n_h	404.66	1.95645	Ts ($^{\circ}C$)	707	0/10	66	500	0.990	0.984
n_i	365.01	1.98472	$T_{10}^{14.5} (^{\circ}C)$	595	10/20	66	480	0.984	0.977
			$T_{10}^{13} (^{\circ}C)$	643	20/30	67	460	0.977	0.969
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	66	30/40	68	440	0.968	0.954
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	82	40/50	68	420	0.950	0.927
			λ (W/(m K))	1.04	50/60	69	400	0.914	0.859
					60/70	70	390	0.874	0.784
					70/80	70	380	0.790	0.635
			Mechanical Properties		80/90	71	370	0.591	0.348
			HK (10^7Pa)	640	90/100	71	360	0.229	0.053
			F_A	80	100/110	73	350		
			E (GPa)	117.6	110/120	74	340		
			G (GPa)	45.6	120/130	75	330		
			μ	0.288	130/140	76	320		
			σ_b (MPa)	63	140/150	77	310		
			B ($10^{-12}/\text{Pa}$)	2.01	150/160	77	300		

Constants of Dispersion Formula	
A_0	3.48854243E+00
A_1	-1.59982726E-02
A_2	4.28443509E-02
A_3	2.18903241E-03
A_4	-1.15672643E-04
A_5	1.78697063E-05

Density		Solarization	
ρ (g/cm ³)	4.54	$\Delta\lambda$ (%)	-0.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.4	2.8	3.3	3.4	3.4	3.6	4.0	5.1	5.1	6.4
-40 ~ -20	2.4	2.9	3.4	3.4	3.5	3.8	4.3	5.2	5.3	6.5
-20 ~ 0	2.4	3.1	3.5	3.5	3.6	4.0	4.5	5.4	5.5	6.8
0 ~ 20	2.5	3.3	3.6	3.6	3.7	4.1	4.6	5.6	5.7	7.1
20 ~ 40	2.6	3.4	3.7	3.7	3.8	4.2	4.7	5.9	6.0	7.5
40 ~ 60	2.7	3.4	3.8	3.9	3.9	4.3	4.9	6.2	6.2	7.7
60 ~ 80	2.7	3.5	4.0	4.0	4.1	4.6	5.1	6.5	6.5	8.0
80 ~ 100	2.9	3.5	4.1	4.1	4.2	4.8	5.2	6.8	6.8	8.2
100 ~ 120	3.1	3.7	4.2	4.2	4.4	4.9	5.2	7.0	7.0	8.3
120 ~ 140	3.3	3.9	4.3	4.4	4.6	5.1	5.4	7.1	7.2	8.4
140 ~ 160	3.5	4.0	4.4	4.4	4.6	5.3	5.6	7.2	7.3	8.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(405)/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	392/360

Constants of dn/dt		
D_0	D_1	D_2
6.13E-07	1.29E-08	-2.38E-11
E_0	E_1	λ_{TK}
7.62E-07	6.31E-10	2.84E-01

H-ZLaF70GT	904313	$n_d = 1.90366$	$v_d = 31.32$	$n_F - n_C = 0.028857$
		$n_e = 1.91048$	$v_e = 31.08$	$n_F - n_C' = 0.029295$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance							
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$					
n_{2325}	2325.42	1.84663	$P_{d,C}$	0.2911	RC (S)	1	2400	0.867	0.751					
n_{1970}	1970.09	1.85408	$P_{e,d}$	0.2363	RA (S)	2	2200	0.947	0.897					
n_{1530}	1529.58	1.86274	$P_{g,F}$	0.5947	D_W	1	2000	0.982	0.964					
n_{1129}	1128.64	1.87166	$P'_{d,c'}$	0.2420	D_A	2	1800	0.992	0.984					
n_{1064}	1064.00	1.87348	$P'_{e,d}$	0.2328	$R_{OH}(S)$	1	1600	0.997	0.995					
n_t	1013.98	1.87504	$P'_{g,F'}$	0.5260	RP (S)	1	1400	0.998	0.996					
n_s	852.11	1.88144			CR	1	1200	0.999	0.997					
$n_{A'}$	768.19	1.88615	Deviation of Relative Partial Dispersions			Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998				
n_r	706.52	1.89065								1000	0.999	0.998		
n_C	656.27	1.89526						$\Delta P_{F,e}$	-0.0002			950	0.999	0.998
$n_{C'}$	643.85	1.89657						$\Delta P_{g,F}$	0.0031	$^{\circ}\text{C}$	α	900	0.999	0.998
$n_{\text{He-Ne}}$	632.80	1.89781						$\Delta P_{C,t}$	0.0088	-50/-40	59	850	0.999	0.998
n_D	589.29	1.90341	$\Delta P_{C,s}$	0.0033	-40/-30	61	800	0.999	0.998					
n_d	587.56	1.90366	Thermal Properties			-30/-20	62	750	0.999	0.998				
n_e	546.07	1.91048						-20/-10	64	700	0.999	0.998		
n_F	486.13	1.92412				Tg ($^{\circ}\text{C}$)	679	-10/0	65	650	0.999	0.998		
$n_{F'}$	479.99	1.92587				Ts ($^{\circ}\text{C}$)	707	0/10	66	600	0.998	0.997		
n_g	435.84	1.94128				$T_{10}^{14.5} (^{\circ}\text{C})$	595	10/20	66	550	0.997	0.995		
n_h	404.66	1.95645	$T_{10}^{13} (^{\circ}\text{C})$	643	20/30	67	500	0.994	0.988					
n_i	365.01	1.98472	$\alpha_{-50/80^{\circ}\text{C}} (10^{-7}/K)$	66	30/40	68	480	0.991	0.983					
			$\alpha_{100/300^{\circ}\text{C}} (10^{-7}/K)$	82	40/50	68	460	0.987	0.975					
							440	0.982	0.964					

H-ZLaF70B	904313	$n_d = 1.90366$	$v_d = 31.32$	$n_F - n_C = 0.028857$
		$n_e = 1.91048$	$v_e = 31.08$	$n_F - n_{C'} = 0.029295$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2911	RC (S)	1	2400	0.871	0.758
n_{1970}	1970.09		$P_{e,d}$	0.2363	RA (S)	1	2200	0.959	0.919
n_{1530}	1529.58		$P_{g,F}$	0.5967	D_W	1	2000	0.983	0.966
n_{1129}	1128.64	1.87171	$P'_{d,c'}$	0.2420	D_A	2	1800	0.994	0.988
n_{1064}	1064.00	1.87351	$P'_{e,d}$	0.2328	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.87507	$P'_{g,F'}$	0.5281	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.88146			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.88615	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.89064					1000	0.999	0.998
n_C	656.27	1.89526					950	0.999	0.998
$n_{C'}$	643.85	1.89657					900	0.999	0.998
n_{He-Ne}	632.80	1.89779					850	0.999	0.998
n_D	589.29	1.90340	ΔP_{Fe}	-0.0002	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.90366	$\Delta P_{g,F}$	0.0052	-50/-40	62	750	0.999	0.998
n_e	546.07	1.91048	$\Delta P_{C,t}$	0.0078	-40/-30	63	700	0.999	0.998
n_F	486.13	1.92412	$\Delta P_{C,s}$	0.0027	-30/-20	64	650	0.999	0.998
$n_{F'}$	479.99	1.92587	Thermal Properties		-20/-10	65	600	0.999	0.997
n_g	435.84	1.94134	$T_g (^{\circ}C)$	684	-10/0	67	550	0.999	0.995
n_h	404.66	1.95653	$T_s (^{\circ}C)$	708	0/10	68	500	0.998	0.995
n_i	365.01	1.98473	$T_{10}^{14.5} (^{\circ}C)$	560	10/20	68	480	0.990	0.980
			$T_{10}^{13} (^{\circ}C)$	648	20/30	70	460	0.984	0.969
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	70	440	0.974	0.949
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	85	40/50	71	420	0.954	0.910
			λ (W/(m K))	0.91	50/60	73	400	0.901	0.812
					60/70	73	390	0.839	0.704
					70/80	74	380	0.713	0.508
			Mechanical Properties		80/90	75	370	0.471	0.222
			HK (10^7Pa)	690	90/100	76	360	0.160	0.026
			F_A	131	100/110	76	350		
			E (GPa)	121.8	110/120	79	340		
			G (GPa)	46.7	120/130	79	330		
			μ	0.302	130/140	80	320		
			σ_b (MPa)	99	140/150	81	310		
			B ($10^{-12}/\text{Pa}$)	1.20	150/160	83	300		

Constants of Dispersion Formula	
A_0	3.48732094E+00
A_1	-1.53300569E-02
A_2	4.38552114E-02
A_3	1.76295737E-03
A_4	-3.48293322E-05
A_5	1.26414315E-05

Density		Solarization	
ρ (g/cm ³)	4.53	$\Delta\lambda$ (%)	-0.9

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.0	1.2	1.6	1.7	1.8	1.9	2.3	2.5	2.6	5.2
-40 ~ -20	1.0	1.3	1.7	1.8	1.9	2.2	2.6	2.9	2.9	5.4
-20 ~ 0	1.2	1.4	1.8	1.9	2.0	2.4	2.7	3.0	3.1	5.5
0 ~ 20	1.2	1.6	2.0	2.1	2.2	2.5	2.9	3.1	3.2	5.8
20 ~ 40	1.2	1.7	2.1	2.2	2.3	2.7	3.1	3.3	3.4	6.0
40 ~ 60	1.3	1.8	2.1	2.2	2.4	2.8	3.3	3.5	3.6	6.1
60 ~ 80	1.5	2.0	2.4	2.5	2.6	3.0	3.5	3.8	3.9	6.5
80 ~ 100	1.6	2.1	2.4	2.6	2.7	3.2	3.6	3.9	4.0	6.7
100 ~ 120	1.7	2.2	2.5	2.6	2.7	3.4	3.7	4.0	4.1	6.9
120 ~ 140	1.8	2.4	2.7	2.7	2.9	3.4	3.8	4.1	4.2	7.1
140 ~ 160	1.9	2.6	2.9	3.0	3.2	3.6	4.0	4.3	4.4	7.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(405)/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	398/361

Constants of dn/dt		
D_0	D_1	D_2
-5.63E-07	1.42E-08	-2.54E-11
E_0	E_1	λ_{TK}
2.54E-07	1.45E-10	3.85E-01

H-ZLaF72	911353	$n_d = 1.91082$	$v_d = 35.25$	$n_F - n_C = 0.025839$
		$n_e = 1.91695$	$v_e = 35.01$	$n_F - n_C' = 0.026194$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.85959	$P_{d,C}$	0.2937	RC (S)	1	2400	0.931	0.867
n_{1970}	1970.09	1.86612	$P_{e,d}$	0.2372	RA (S)	1	2200	0.987	0.974
n_{1530}	1529.58	1.87377	$P_{g,F}$	0.5836	D_W	1	2000	0.997	0.994
n_{1129}	1128.64	1.88177	$P'_{d,c'}$	0.2439	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.88343	$P'_{e,d}$	0.2340	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.88484	$P'_{g,F'}$	0.5165	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.89068			CR	1	1200	0.997	0.994
$n_{A'}$	768.19	1.89497	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.89905					1000	0.997	0.994
n_C	656.27	1.90323					950	0.997	0.994
$n_{C'}$	643.85	1.90443					900	0.997	0.994
n_{He-Ne}	632.80	1.90554					850	0.997	0.994
n_D	589.29	1.91060	ΔP_{Fe}	-0.0017	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	1.91082	$\Delta P_{g,F}$	-0.0014	-50/-40	58	750	0.997	0.994
n_e	546.07	1.91695	$\Delta P_{C,t}$	0.0008	-40/-30	61	700	0.997	0.994
n_F	486.13	1.92907	$\Delta P_{C,s}$	0.0007	-30/-20	63	650	0.997	0.994
$n_{F'}$	479.99	1.93062	Thermal Properties		-20/-10	64	600	0.997	0.994
n_g	435.84	1.94415	Tg ($^{\circ}C$)	707	-10/0	65	550	0.997	0.994
n_h	404.66	1.95720	Ts ($^{\circ}C$)	763	0/10	66	500	0.992	0.987
n_i	365.01	1.98078	$T_{10}^{14.5} (^{\circ}C)$	655	10/20	67	480	0.983	0.969
			$T_{10}^{13} (^{\circ}C)$	680	20/30	68	460	0.980	0.960
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	67	30/40	69	440	0.974	0.948
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	83	40/50	69	420	0.966	0.931
			λ (W/(m K))	1.14	50/60	70	400	0.955	0.904
					60/70	70	390	0.921	0.837
					70/80	71	380	0.886	0.773
			Mechanical Properties		80/90	71	370	0.828	0.673
			HK ($10^7 Pa$)	663	90/100	72	360	0.721	0.510
			F_A	74	100/110	73	350	0.517	0.261
			E (GPa)	127.8	110/120	74	340	0.205	0.041
			G (GPa)	48.0	120/130	75	330		
			μ	0.333	130/140	76	320		
			σ_b (MPa)	77	140/150	78	310		
			B ($10^{-12}/Pa$)	1.41	150/160	79	300		

Constants of Dispersion Formula	
A_0	3.52587871E+00
A_1	-1.39436897E-02
A_2	4.09037520E-02
A_3	1.38553859E-03
A_4	-1.74895373E-05
A_5	6.86910964E-06

Density		Solarization	
ρ (g/cm ³)	4.88	$\Delta\lambda$ (%)	-0.9

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.5	4.9	5.3	5.3	5.4	5.7	6.3	7.3	7.4	8.4
-40 ~ -20	4.5	4.9	5.4	5.5	5.6	5.9	6.5	7.5	7.5	8.5
-20 ~ 0	4.6	4.9	5.6	5.7	5.8	6.1	6.6	7.6	7.7	8.8
0 ~ 20	4.6	5.1	5.7	5.8	6.1	6.1	6.6	7.7	7.8	8.9
20 ~ 40	4.7	5.3	5.9	6.0	6.2	6.3	6.7	7.8	7.9	9.1
40 ~ 60	4.7	5.3	6.1	6.1	6.2	6.5	7.0	7.9	8.0	9.3
60 ~ 80	4.7	5.4	6.1	6.1	6.2	6.6	7.1	8.1	8.3	9.5
80 ~ 100	4.7	5.4	6.1	6.1	6.2	6.7	7.2	8.2	8.4	9.6
100 ~ 120	4.8	5.5	6.1	6.1	6.2	6.6	7.2	8.3	8.4	9.7
120 ~ 140	4.8	5.6	6.2	6.2	6.2	6.6	7.3	8.4	8.4	9.7
140 ~ 160	4.8	5.7	6.2	6.2	6.2	6.7	7.4	8.4	8.4	9.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(400)/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	393/350

Constants of dn/dt		
D_0	D_1	D_2
3.50E-06	1.24E-08	-3.24E-11
E_0	E_1	λ_{TK}
8.61E-07	4.14E-10	2.43E-01

H-ZLaF72A	911353	$n_d = 1.91082$	$v_d = 35.25$	$n_F - n_C = 0.025839$
		$n_e = 1.91695$	$v_e = 35.01$	$n_F - n_C' = 0.026194$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2937	RC (S)	1	2400	0.709	0.502
n_{1970}	1970.09		$P_{e,d}$	0.2372	RA (S)	1	2200	0.908	0.824
n_{1530}	1529.58		$P_{g,F}$	0.5836	D_W	1	2000	0.959	0.919
n_{1129}	1128.64	1.88174	$P'_{d,c'}$	0.2439	D_A	1	1800	0.988	0.977
n_{1064}	1064.00	1.88340	$P'_{e,d}$	0.2340	$R_{OH}(S)$	1	1600	0.995	0.990
n_t	1013.98	1.88483	$P'_{g,F'}$	0.5165	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.89070			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.89498	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.89906					1000	0.999	0.998
n_C	656.27	1.90323					950	0.999	0.998
$n_{C'}$	643.85	1.90443					900	0.999	0.998
n_{He-Ne}	632.80	1.90554					850	0.999	0.998
n_D	589.29	1.91060	ΔP_{Fe}	-0.0017	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.91082	$\Delta P_{g,F}$	-0.0014	-50/-40	60	750	0.999	0.998
n_e	546.07	1.91695	$\Delta P_{C,t}$	0.0012	-40/-30	62	700	0.999	0.998
n_F	486.13	1.92907	$\Delta P_{C,s}$	-0.0001	-30/-20	64	650	0.999	0.998
$n_{F'}$	479.99	1.93062	Thermal Properties		-20/-10	65	600	0.999	0.998
n_g	435.84	1.94415	$T_g (^{\circ}C)$	714	-10/0	67	550	0.998	0.996
n_h	404.66	1.95722	$T_s (^{\circ}C)$	760	0/10	68	500	0.993	0.986
n_i	365.01	1.98087	$T_{10}^{14.5} (^{\circ}C)$	657	10/20	68	480	0.989	0.979
			$T_{10}^{13} (^{\circ}C)$	682	20/30	69	460	0.984	0.968
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	70	440	0.976	0.952
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	83	40/50	71	420	0.960	0.922
			λ (W/(m K))	0.96	50/60	72	400	0.925	0.856
					60/70	73	390	0.890	0.792
					70/80	73	380	0.827	0.684
			Mechanical Properties		80/90	74	370	0.711	0.506
			HK (10^7Pa)	676	90/100	75	360	0.495	0.245
			F_A	67	100/110	75	350	0.195	0.038
			E (GPa)	125.6	110/120	76	340		
			G (GPa)	48.0	120/130	77	330		
			μ	0.304	130/140	78	320		
			σ_b (MPa)	125	140/150	79	310		
			B ($10^{-12}/\text{Pa}$)	1.02	150/160	79	300		

Constants of Dispersion Formula	
A_0	3.52696534E+00
A_1	-1.46159641E-02
A_2	4.03353950E-02
A_3	1.52005930E-03
A_4	-3.40993875E-05
A_5	7.83574753E-06

Density		Solarization	
ρ (g/cm ³)	4.82	$\Delta\lambda$ (%)	-1.3

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.7	3.1	3.6	3.7	3.8	4.0	4.4	4.8	5.1	6.2
-40 ~ -20	2.8	3.2	3.8	3.9	4.0	4.2	4.6	5.0	5.2	6.4
-20 ~ 0	2.8	3.4	3.8	4.0	4.2	4.4	4.8	5.2	5.3	6.6
0 ~ 20	2.8	3.5	3.8	4.0	4.2	4.6	5.1	5.3	5.5	6.9
20 ~ 40	2.9	3.7	3.9	4.1	4.3	4.7	5.2	5.4	5.6	7.2
40 ~ 60	3.0	3.9	4.1	4.3	4.5	4.9	5.4	5.7	5.9	7.4
60 ~ 80	3.1	4.1	4.2	4.4	4.6	5.1	5.5	5.9	6.1	7.7
80 ~ 100	3.1	6.0	4.4	4.6	4.8	5.3	5.6	5.9	6.3	7.8
100 ~ 120	3.2	4.0	4.6	4.9	5.1	5.4	5.6	6.1	6.4	8.1
120 ~ 140	3.3	4.1	4.7	5.1	5.4	5.6	5.8	6.3	6.5	8.3
140 ~ 160	3.4	4.3	4.8	5.2	5.5	5.8	5.9	6.5	6.6	8.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(400)/355
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	392/351

Constants of dn/dt		
D_0	D_1	D_2
1.20E-06	1.30E-08	-2.28E-11
E_0	E_1	λ_{TK}
7.80E-07	5.81E-10	2.31E-01

H-ZLaF75	950294	$n_d = 1.95000$	$v_d = 29.37$	$n_F - n_C = 0.032350$
		$n_e = 1.95764$	$v_e = 29.15$	$n_F - n_C' = 0.032852$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.88995	$P_{d,C}$	0.2896	RC (S)	1	2400	0.926	0.857
n_{1970}	1970.09	1.89709	$P_{e,d}$	0.2362	RA (S)	1	2200	0.976	0.953
n_{1530}	1529.58	1.90559	$P_{g,F}$	0.5991	D_W	1	2000	0.983	0.966
n_{1129}	1128.64	1.91477	$P'_{d,c'}$	0.2408	D_A	1	1800	0.996	0.992
n_{1064}	1064.00	1.91670	$P'_{e,d}$	0.2326	$R_{OH}(S)$	1	1600	0.996	0.992
n_t	1013.98	1.91837	$P'_{g,F'}$	0.5303	RP (S)	1	1400	0.996	0.992
n_s	852.11	1.92534			CR		1200	0.996	0.992
$n_{A'}$	768.19	1.93052	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.996	0.992
n_r	706.52	1.93550					1000	0.996	0.992
n_C	656.27	1.94063					950	0.996	0.992
$n_{C'}$	643.85	1.94209					900	0.996	0.992
n_{He-Ne}	632.80	1.94347					850	0.996	0.992
n_D	589.29	1.94973	ΔP_{Fe}	0.0002	$^{\circ}C$	α	800	0.996	0.992
n_d	587.56	1.95000	$\Delta P_{g,F}$	0.0043	-50/-40	61	750	0.996	0.992
n_e	546.07	1.95764	$\Delta P_{C,t}$	0.0057	-40/-30	64	700	0.996	0.992
n_F	486.13	1.97298	$\Delta P_{C,s}$	0.0018	-30/-20	65	650	0.996	0.992
$n_{F'}$	479.99	1.97494	Thermal Properties		-20/-10	66	600	0.996	0.992
n_g	435.84	1.99236	Tg ($^{\circ}C$)	677	-10/0	67	550	0.996	0.992
n_h	404.66	2.00958	Ts ($^{\circ}C$)	714	0/10	68	500	0.991	0.982
n_i	365.01	2.04179	$T_{10}^{14.5} (^{\circ}C)$	617	10/20	69	480	0.981	0.962
			$T_{10}^{13} (^{\circ}C)$	653	20/30	69	460	0.968	0.937
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	70	440	0.953	0.908
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	83	40/50	71	420	0.929	0.863
			λ (W/(m K))	1.05	50/60	71	400	0.870	0.757
					60/70	72	390	0.730	0.533
					70/80	72	380	0.604	0.365
			Mechanical Properties		80/90	73	370	0.426	0.181
			HK (10^7Pa)	625	90/100	74	360	0.212	0.045
			F_A	66	100/110	75	350	0.165	0.027
			E (GPa)	120.0	110/120	76	340		
			G (GPa)	45.7	120/130	77	330		
			μ	0.314	130/140	78	320		
			σ_b (MPa)	61	140/150	79	310		
			B ($10^{-12}/Pa$)	1.25	150/160	80	300		

Constants of Dispersion Formula	
A_0	3.64549592E+00
A_1	-1.53200140E-02
A_2	4.96183427E-02
A_3	2.32042227E-03
A_4	-9.17626876E-05
A_5	1.92554151E-05

Density		Solarization	
ρ (g/cm ³)	4.77	$\Delta\lambda$ (%)	-2.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.6	5.2	5.6	5.6	5.7	6.0	6.6	7.7	7.8	9.1
-40 ~ -20	4.6	5.2	5.6	5.7	5.8	6.1	6.7	7.9	8.0	9.2
-20 ~ 0	4.6	5.3	5.7	5.8	5.9	6.2	6.8	8.1	8.2	9.3
0 ~ 20	4.6	5.3	5.8	5.9	5.9	6.2	6.9	8.2	8.3	9.5
20 ~ 40	4.7	5.4	5.9	6.0	6.0	6.3	7.0	8.3	8.4	9.7
40 ~ 60	4.7	5.5	5.9	6.0	6.0	6.3	7.1	8.4	8.5	9.8
60 ~ 80	4.7	5.6	5.9	6.0	6.1	6.4	7.1	8.5	8.6	10.1
80 ~ 100	4.8	5.7	6.1	6.2	6.2	6.5	7.2	8.6	8.7	10.2
100 ~ 120	4.8	5.7	6.2	6.3	6.3	6.6	7.3	8.7	8.8	10.4
120 ~ 140	4.9	5.8	6.3	6.4	6.4	6.7	7.4	8.8	8.9	10.5
140 ~ 160	4.9	5.9	6.3	6.4	6.5	6.8	7.5	8.9	9.0	10.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(430)/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	426/370

Constants of dn/dt		
D_0	D_1	D_2
3.47E-06	1.08E-08	-2.35E-11
E_0	E_1	λ_{TK}
7.66E-07	4.26E-10	2.84E-01

H-ZLaF76A	850301	$n_d = 1.85013$	$v_d = 30.06$	$n_F - n_C = 0.028285$
		$n_e = 1.85681$	$v_e = 29.84$	$n_F - n_C' = 0.028715$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2903	RC (S)	1	2400	0.891	0.793
n_{1970}	1970.09		$P_{e,d}$	0.2362	RA (S)	1	2200	0.956	0.914
n_{1530}	1529.58		$P_{g,F}$	0.5993	D_W	1	2000	0.982	0.965
n_{1129}	1128.64	1.81918	$P'_{d,c'}$	0.2413	D_A	2	1800	0.991	0.983
n_{1064}	1064.00	1.82091	$P'_{e,d}$	0.2326	$R_{OH}(S)$	1	1600	0.996	0.993
n_t	1013.98	1.82239	$P'_{g,F'}$	0.5307	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.82855			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.83308	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.83743					1000	0.999	0.998
n_C	656.27	1.84192					950	0.999	0.998
$n_{C'}$	643.85	1.84320					900	0.999	0.998
n_{He-Ne}	632.80	1.84441					850	0.999	0.998
n_D	589.29	1.84988	ΔP_{Fe}	0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.85013	$\Delta P_{g,F}$	0.0056	-50/-40	65	750	0.999	0.998
n_e	546.07	1.85681	$\Delta P_{C,t}$	0.0047	-40/-30	67	700	0.999	0.998
n_F	486.13	1.87021	$\Delta P_{C,s}$	0.0001	-30/-20	67	650	0.999	0.997
$n_{F'}$	479.99	1.87192	Thermal Properties		-20/-10	68	600	0.997	0.995
n_g	435.84	1.88716	$T_g (^{\circ}C)$	633	-10/0	70	550	0.996	0.992
n_h	404.66	1.90224	$T_s (^{\circ}C)$	682	0/10	71	500	0.991	0.982
n_i	365.01	1.93060	$T_{10}^{14.5} (^{\circ}C)$	570	10/20	71	480	0.987	0.974
			$T_{10}^{13} (^{\circ}C)$	606	20/30	73	460	0.982	0.964
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	72	30/40	75	440	0.974	0.948
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	40/50	76	420	0.957	0.916
			λ (W/(m K))	0.94	50/60	77	400	0.919	0.844
					60/70	78	390	0.876	0.768
					70/80	78	380	0.789	0.622
			Mechanical Properties		80/90	81	370	0.577	0.333
			HK (10^7 Pa)	558	90/100	82	360	0.252	0.063
			F_A	188	100/110	84	350		
			E (GPa)	122.0	110/120	85	340		
			G (GPa)	47.0	120/130	86	330		
			μ	0.297	130/140	88	320		
			σ_b (MPa)		140/150	88	310		
			B (10^{-12} /Pa)	1.93	150/160	89	300		

Constants of Dispersion Formula	
A_0	3.29574422E+00
A_1	-1.45780001E-02
A_2	3.91228442E-02
A_3	2.60140747E-03
A_4	-1.83898297E-04
A_5	2.23647491E-05

Density		Solarization	
ρ (g/cm ³)	4.06	$\Delta\lambda$ (%)	0.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	1.9	2.4	2.5	2.7	2.9	3.5	3.7	3.9	5.8
-40 ~ -20	1.6	2.2	2.6	2.7	2.9	3.1	3.6	3.9	4.1	6.2
-20 ~ 0	1.8	2.4	2.6	2.8	3.0	3.2	3.8	4.0	4.3	6.5
0 ~ 20	1.8	2.5	2.8	2.9	3.1	3.3	3.9	4.1	4.5	6.8
20 ~ 40	1.9	2.6	2.9	3.0	3.3	3.5	4.1	4.2	4.6	7.1
40 ~ 60	2.1	2.7	2.9	3.1	3.4	3.7	4.2	4.4	4.7	7.3
60 ~ 80	2.2	2.8	3.0	3.3	3.6	4.0	4.4	4.7	5.0	7.6
80 ~ 100	2.3	2.9	3.2	3.5	3.8	4.2	4.5	4.9	5.1	7.8
100 ~ 120	2.5	3.1	3.4	3.6	4.0	4.3	4.8	5.1	5.3	8.0
120 ~ 140	2.6	3.3	3.6	3.8	4.2	4.5	5.0	5.3	5.6	8.2
140 ~ 160	2.7	3.5	3.8	4.1	4.4	4.6	5.1	5.5	5.8	8.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(405)/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	394/361

Constants of dn/dt		
D_0	D_1	D_2
4.46E-07	1.46E-08	-2.16E-11
E_0	E_1	λ_{TK}
3.92E-07	2.47E-10	3.60E-01

H-ZLaF77A	954323	$n_d = 1.95375$	$v_d = 32.32$	$n_F - n_C = 0.029506$
		$n_e = 1.96073$	$v_e = 32.09$	$n_F - n_C' = 0.029940$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance						
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$				
n_{2325}	2325.42	1.89738	$P_{d,C}$	0.2918	RC (S)	1	2400	0.917	0.840				
n_{1970}	1970.09	1.90433	$P_{e,d}$	0.2366	RA (S)	1	2200	0.976	0.952				
n_{1530}	1529.58	1.91250	$P_{g,F}$	0.5904	D_W	1	2000	0.989	0.979				
n_{1129}	1128.64	1.92116	$P'_{d,c'}$	0.2425	D_A	1	1800	0.996	0.993				
n_{1064}	1064.00	1.92298	$P'_{e,d}$	0.2331	R_{OH} (S)	1	1600	0.999	0.998				
n_t	1013.98	1.92453	$P'_{g,F'}$	0.5224	RP (S)	1	1400	0.999	0.999				
n_s	852.11	1.93102			CR	1	1200	0.999	0.999				
$n_{A'}$	768.19	1.93582					1060	0.999	0.999				
n_r	706.52	1.94042	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1000	0.999	0.999				
n_C	656.27	1.94514							950	0.999	0.999		
$n_{C'}$	643.85	1.94649					$\Delta P_{F,e}$	-0.0006			900	0.999	0.999
n_{He-Ne}	632.80	1.94775					$\Delta P_{g,F}$	0.0005	$^{\circ}C$	α	850	0.999	0.999
n_D	589.29	1.95349					$\Delta P_{C,t}$	0.0018	-50/-40	61	800	0.999	0.999
n_d	587.56	1.95375	$\Delta P_{C,s}$	0.0006	-40/-30	64	750	0.999	0.999				
n_e	546.07	1.96073			-30/-20	65	700	0.999	0.999				
n_F	486.13	1.97465	Thermal Properties		-20/-10	67	650	0.999	0.998				
$n_{F'}$	479.99	1.97643			Tg ($^{\circ}C$)	723	-10/0	69	600	0.999	0.998		
n_g	435.84	1.99207			Ts ($^{\circ}C$)	763	0/10	70	550	0.998	0.996		
n_h	404.66	2.00732			$T_{10}^{14.5}$ ($^{\circ}C$)	680	10/20	71	500	0.993	0.986		
n_i	365.01	2.03539			T_{10}^{13} ($^{\circ}C$)	716	20/30	72	480	0.989	0.978		
			$\alpha_{-50/80^{\circ}C}$ ($10^{-7}/K$)	70	30/40	73	460	0.983	0.967				
			$\alpha_{100/300^{\circ}C}$ ($10^{-7}/K$)	87	40/50	74	440	0.976	0.953				

H-ZLaF78	901371	$n_d = 1.90069$	$v_d = 37.10$	$n_F - n_C = 0.024280$
		$n_e = 1.90645$	$v_e = 36.88$	$n_F - n_{C'} = 0.024580$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.85201	$P_{d,C}$	0.2953	RC (S)	1	2400	0.943	0.890
n_{1970}	1970.09	1.85828	$P_{e,d}$	0.2372	RA (S)	1	2200	0.987	0.974
n_{1530}	1529.58	1.86561	$P_{g,F}$	0.5754	D_W	1	2000	0.998	0.996
n_{1129}	1128.64	1.87323	$P'_{d,c'}$	0.2457	D_A	2	1800	0.998	0.997
n_{1064}	1064.00	1.87480	$P'_{e,d}$	0.2343	$R_{OH}(S)$	1	1600	0.998	0.997
n_t	1013.98	1.87614	$P'_{g,F'}$	0.5102	RP (S)	1	1400	0.998	0.997
n_s	852.11	1.88167			CR		1200	0.998	0.997
$n_{A'}$	768.19	1.88573	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.997
n_r	706.52	1.88958					1000	0.998	0.997
n_C	656.27	1.89352					950	0.998	0.997
$n_{C'}$	643.85	1.89465					900	0.998	0.997
n_{He-Ne}	632.80	1.89571					850	0.998	0.997
n_D	589.29	1.90048	ΔP_{Fe}	-0.0023	$^{\circ}C$	α	800	0.998	0.997
n_d	587.56	1.90069	$\Delta P_{g,F}$	-0.0066	-50/-40	58	750	0.998	0.996
n_e	546.07	1.90645	$\Delta P_{C,t}$	-0.0041	-40/-30	60	700	0.998	0.996
n_F	486.13	1.91780	$\Delta P_{C,s}$	-0.0014	-30/-20	61	650	0.998	0.996
$n_{F'}$	479.99	1.91923	Thermal Properties		-20/-10	63	600	0.998	0.996
n_g	435.84	1.93177	$T_g (^{\circ}C)$	690	-10/0	64	550	0.998	0.996
n_h	404.66	1.94382	$T_s (^{\circ}C)$	732	0/10	65	500	0.995	0.992
n_i	365.01	1.96535	$T_{10}^{14.5} (^{\circ}C)$	625	10/20	66	480	0.991	0.984
			$T_{10}^{13} (^{\circ}C)$	663	20/30	67	460	0.987	0.975
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	65	30/40	68	440	0.980	0.962
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	84	40/50	68	420	0.970	0.948
			$\lambda (W/(m\ K))$	0.75	50/60	69	400	0.958	0.917
					60/70	69	390	0.927	0.860
					70/80	70	380	0.898	0.806
					80/90	71	370	0.845	0.723
			Mechanical Properties		90/100	72	360	0.775	0.611
			HK ($10^7 Pa$)	670	100/110	73	350	0.652	0.439
			F_A	72	110/120	74	340	0.429	0.194
			E (GPa)	121.8	120/130	75	330	0.133	0.030
			G (GPa)	46.7	130/140	76	320		
			μ	0.303	140/150	77	310		
			σ_b (MPa)	94	150/160	78	300		
			B ($10^{-12}/Pa$)	1.20			290		
							280		

Constants of Dispersion Formula	
A_0	3.49532543E+00
A_1	-1.33990335E-02
A_2	3.79713413E-02
A_3	1.56188624E-03
A_4	-7.42686015E-05
A_5	8.65884802E-06

Density		Solarization	
$\rho (g/cm^3)$	5.05	$\Delta\lambda (\%)$	-1.3

Range of Temperature $(^{\circ}C)$	Temperature Coefficients of Refractive Index									
	dn/dt relative $(\times 10^{-6} / ^{\circ}C)$									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.8	5.0	5.2	5.3	5.5	5.7	6.2	6.9	7.0	8.2
-40 ~ -20	4.9	5.1	5.4	5.5	5.8	6.0	6.3	7.1	7.3	8.4
-20 ~ 0	4.9	5.2	5.5	5.7	5.9	6.2	6.4	7.4	7.4	8.7
0 ~ 20	5.0	5.4	5.7	5.9	6.0	6.4	6.4	7.6	7.6	8.9
20 ~ 40	5.0	5.5	5.9	5.9	6.1	6.4	6.5	7.8	7.8	9.1
40 ~ 60	5.0	5.6	6.1	6.1	6.2	6.5	6.8	8.0	8.0	9.2
60 ~ 80	5.1	5.7	6.2	6.2	6.3	6.6	7.0	8.3	8.3	9.4
80 ~ 100	5.1	5.8	6.2	6.3	6.5	6.8	7.2	8.4	8.4	9.7
100 ~ 120	5.2	5.9	6.3	6.4	6.7	6.8	7.3	8.5	8.5	9.8
120 ~ 140	5.3	6.0	6.4	6.5	6.8	6.9	7.4	8.6	8.6	10.0
140 ~ 160	5.4	6.0	6.4	6.5	6.8	7.0	7.5	8.7	8.7	10.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(390)/345
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	389/343

Constants of dn/dt		
D_0	D_1	D_2
4.25E-06	1.31E-08	-2.92E-11
E_0	E_1	λ_{TK}
6.05E-07	4.73E-10	2.92E-01

H-ZLaF79	921240	$n_d = 1.92119$	$v_d = 23.96$	$n_F - n_C = 0.038453$
		$n_e = 1.93024$	$v_e = 23.77$	$n_F - n_C' = 0.039142$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.85550	$P_{d,C}$	0.2858	RC (S)	1	2400	0.986	0.972
n_{1970}	1970.09	1.86269	$P_{e,d}$	0.2354	RA (S)	1	2200	0.989	0.978
n_{1530}	1529.58	1.87136	$P_{g,F}$	0.6184	D_W	1	2000	0.994	0.988
n_{1129}	1128.64	1.88103	$P'_{d,c'}$	0.2371	D_A	1	1800	0.998	0.996
n_{1064}	1064.00	1.88312	$P'_{e,d}$	0.2312	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.88494	$P'_{g,F'}$	0.5462	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.89268			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.89855	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.90425					1000	0.998	0.996
n_C	656.27	1.91020					950	0.998	0.996
$n_{C'}$	643.85	1.91191					900	0.998	0.996
n_{He-Ne}	632.80	1.91351					850	0.998	0.996
n_D	589.29	1.92086	ΔP_{Fe}	0.0018	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.92119	$\Delta P_{g,F}$	0.0146	-50/-40	68	750	0.998	0.996
n_e	546.07	1.93024	$\Delta P_{C,t}$	0.0007	-40/-30	71	700	0.998	0.996
n_F	486.13	1.94865	$\Delta P_{C,s}$	-0.0023	-30/-20	72	650	0.998	0.996
$n_{F'}$	479.99	1.95105	Thermal Properties		-20/-10	73	600	0.994	0.988
n_g	435.84	1.97243	$T_g (^{\circ}C)$	661	-10/0	74	550	0.989	0.979
n_h	404.66	1.99406	$T_s (^{\circ}C)$	701	0/10	75	500	0.977	0.953
n_i	365.01	2.03605	$T_{10}^{14.5} (^{\circ}C)$	618	10/20	76	480	0.968	0.937
			$T_{10}^{13} (^{\circ}C)$	638	20/30	77	460	0.956	0.914
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	30/40	77	440	0.933	0.871
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	91	40/50	78	420	0.887	0.788
			λ (W/(m K))	1.02	50/60	79	400	0.792	0.627
					60/70	81	390	0.691	0.478
					70/80	82	380	0.503	0.253
			Mechanical Properties		80/90	83	370	0.214	0.046
			HK (10^7 Pa)	626	90/100	84	360		
			F_A	96	100/110	85	350		
			E (GPa)	114.7	110/120	86	340		
			G (GPa)	44.6	120/130	87	330		
			μ	0.285	130/140	88	320		
			σ_b (MPa)	102	140/150	89	310		
			B (10^{-12} /Pa)	2.25	150/160	90	300		

Constants of Dispersion Formula	
A_0	3.51411868E+00
A_1	-1.49702982E-02
A_2	5.16999690E-02
A_3	4.53482010E-03
A_4	-3.71738355E-04
A_5	4.63319189E-05

Density		Solarization	
ρ (g/cm ³)	3.86	$\Delta\lambda$ (%)	-1.2

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.2	0.6	1.0	1.2	1.4	1.6	1.9	2.4	2.6	3.9
-40 ~ -20	0.5	0.9	1.4	1.5	1.6	1.8	2.3	2.7	2.9	4.3
-20 ~ 0	0.7	1.2	1.5	1.6	1.7	2.2	2.7	3.0	3.1	4.6
0 ~ 20	1.0	1.5	1.8	1.9	2.0	2.4	3.0	3.2	3.3	4.8
20 ~ 40	1.2	1.8	2.1	2.2	2.3	2.6	3.3	3.5	3.6	5.3
40 ~ 60	1.3	2.0	2.2	2.3	2.5	2.7	3.5	3.8	3.8	5.7
60 ~ 80	1.4	2.2	2.5	2.6	2.8	3.1	3.7	3.9	4.0	5.9
80 ~ 100	1.5	2.4	2.6	2.8	3.0	3.2	3.8	4.3	4.4	6.1
100 ~ 120	1.6	2.5	2.9	3.1	3.2	3.4	4.2	4.6	4.7	6.3
120 ~ 140	1.8	2.7	3.1	3.2	3.3	3.8	4.4	4.8	4.9	6.7
140 ~ 160	2.1	3.1	3.5	3.6	3.7	4.1	4.7	5.1	5.2	7.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(435)/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	422/371

Constants of dn/dt		
D_0	D_1	D_2
-1.48E-06	1.72E-08	-2.62E-11
E_0	E_1	λ_{TK}
5.91E-07	3.18E-10	2.91E-01

H-ZLaF80	001255	$n_d = 2.00069$	$v_d = 25.46$	$n_F - n_C = 0.039308$
		$n_e = 2.00996$	$v_e = 25.26$	$n_F - n_C' = 0.039985$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.93290	$P_{d,C}$	0.2862	RC (S)	1	2400	0.955	0.912
n_{1970}	1970.09	1.94015	$P_{e,d}$	0.2358	RA (S)	1	2200	0.983	0.966
n_{1530}	1529.58	1.94903	$P_{g,F}$	0.6159	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.95916	$P'_{d,C'}$	0.2376	D_A	1	1800	0.997	0.994
n_{1064}	1064.00	1.96137	$P'_{e,d}$	0.2318	$R_{OH}(S)$	1	1600	0.997	0.994
n_t	1013.98	1.96328	$P'_{g,F'}$	0.5447	RP (S)	1	1400	0.997	0.994
n_s	852.11	1.97139			CR	1	1200	0.997	0.994
$n_{A'}$	768.19	1.97747	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.997	0.994
n_r	706.52	1.98335					1000	0.997	0.994
n_C	656.27	1.98944					950	0.997	0.994
$n_{C'}$	643.85	1.99119					900	0.997	0.994
n_{He-Ne}	632.80	1.99284					850	0.997	0.994
n_D	589.29	2.00035	ΔP_{Fe}	0.0019	$^{\circ}C$	α	800	0.997	0.994
n_d	587.56	2.00069	$\Delta P_{g,F}$	0.0146	-50/-40	64	750	0.997	0.994
n_e	546.07	2.00996	$\Delta P_{C,t}$	0.0020	-40/-30	67	700	0.997	0.994
n_F	486.13	2.02875	$\Delta P_{C,s}$	-0.0023	-30/-20	69	650	0.997	0.994
$n_{F'}$	479.99	2.03118	Thermal Properties		-20/-10	70	600	0.997	0.994
n_g	435.84	2.05296	Tg ($^{\circ}C$)	700	-10/0	71	550	0.995	0.991
n_h	404.66	2.07475	Ts ($^{\circ}C$)	748	0/10	72	500	0.994	0.989
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	629	10/20	73	480	0.967	0.941
			$T_{10}^{13} (^{\circ}C)$	675	20/30	74	460	0.953	0.912
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	73	30/40	75	440	0.931	0.870
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	89	40/50	76	420	0.893	0.798
			λ (W/(m K))	1.19	50/60	76	400	0.816	0.662
					60/70	77	390	0.669	0.441
					70/80	78	380	0.559	0.312
					80/90	78	370	0.373	0.135
					90/100	79	360	0.144	0.024
					100/110	79	350		
					110/120	80	340		
					120/130	81	330		
					130/140	82	320		
					140/150	83	310		
					150/160	84	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.80762148E+00
A_1	-1.53801657E-02
A_2	6.26758348E-02
A_3	1.57569502E-03
A_4	2.15980103E-04
A_5	6.30489693E-06

Density		Solarization	
ρ (g/cm ³)	4.76	$\Delta\lambda$ (%)	-1.1

Mechanical Properties	
HK (10 ⁷ Pa)	630
F_A	78
E (GPa)	123.5
G (GPa)	46.3
μ	0.355
σ_b (MPa)	75
B (10 ⁻¹² /Pa)	1.22

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	2.4	2.9	3.1	3.2	3.3	4.0	5.6	5.9	7.4
-40 ~ -20	1.7	2.7	3.1	3.2	3.3	3.7	4.3	5.8	6.1	7.9
-20 ~ 0	1.8	2.7	3.2	3.3	3.4	3.9	4.5	6.1	6.3	8.4
0 ~ 20	1.9	2.8	3.4	3.5	3.6	4.1	4.8	6.4	6.7	8.8
20 ~ 40	2.0	2.9	3.5	3.6	3.7	4.2	5.0	6.8	7.0	9.2
40 ~ 60	2.1	3.1	3.6	3.7	3.8	4.5	5.2	7.0	7.2	9.6
60 ~ 80	2.2	3.3	3.9	3.9	4.1	4.7	5.6	7.4	7.7	10.1
80 ~ 100	2.4	3.6	4.3	4.3	4.4	4.9	5.9	7.8	8.1	10.4
100 ~ 120	2.6	3.7	4.5	4.6	4.7	5.3	6.4	8.2	8.5	10.6
120 ~ 140	2.8	4.0	4.7	4.8	4.9	5.5	6.8	8.7	9.0	10.8
140 ~ 160	2.9	4.1	4.9	5.0	5.0	5.7	7.0	9.1	9.3	11.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(460)/375
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	440/373

Constants of dn/dt		
D_0	D_1	D_2
-7.65E-07	1.27E-08	-1.65E-11
E_0	E_1	λ_{TK}
1.04E-06	1.04E-09	2.85E-01

H-ZLaF80A	001255	$n_d = 2.00069$	$v_d = 25.46$	$n_F - n_C = 0.039308$
		$n_e = 2.00996$	$v_e = 25.26$	$n_F - n_C' = 0.039985$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.93290	$P_{d,C}$	0.2862	RC (S)	1	2400	0.933	0.870
n_{1970}	1970.09	1.94015	$P_{e,d}$	0.2358	RA (S)	1	2200	0.976	0.953
n_{1530}	1529.58	1.94903	$P_{g,F}$	0.6159	D_W	1	2000	0.989	0.979
n_{1129}	1128.64	1.95916	$P'_{d,c'}$	0.2376	D_A	1	1800	0.994	0.989
n_{1064}	1064.00	1.96137	$P'_{e,d}$	0.2318	$R_{OH}(S)$	1	1600	0.998	0.995
n_t	1013.98	1.96328	$P'_{g,F'}$	0.5447	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.97139			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.97747	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.98335					1000	0.999	0.998
n_C	656.27	1.98944					950	0.999	0.998
$n_{C'}$	643.85	1.99119					900	0.999	0.998
n_{He-Ne}	632.80	1.99284					850	0.999	0.998
n_D	589.29	2.00035	ΔP_{Fe}	0.0019	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	2.00069	$\Delta P_{g,F}$	0.0146	-50/-40	64	750	0.999	0.998
n_e	546.07	2.00996	$\Delta P_{C,t}$	0.0020	-40/-30	67	700	0.998	0.997
n_F	486.13	2.02875	$\Delta P_{C,s}$	-0.0023	-30/-20	69	650	0.997	0.995
$n_{F'}$	479.99	2.03118	Thermal Properties		-20/-10	70	600	0.996	0.993
n_g	435.84	2.05296	Tg ($^{\circ}C$)	700	-10/0	71	550	0.992	0.985
n_h	404.66	2.07475	Ts ($^{\circ}C$)	748	0/10	72	500	0.981	0.962
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	629	10/20	73	480	0.972	0.946
			$T_{10}^{13} (^{\circ}C)$	675	20/30	74	460	0.960	0.922
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	73	30/40	75	440	0.939	0.881
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	89	40/50	76	420	0.895	0.801
			λ (W/(m K))	1.19	50/60	76	400	0.797	0.636
					60/70	77	390	0.696	0.484
					70/80	78	380	0.513	0.264
			Mechanical Properties		80/90	78	370	0.239	0.057
			HK ($10^7 Pa$)	630	90/100	79	360		
			F_A	78	100/110	79	350		
			E (GPa)	123.5	110/120	80	340		
			G (GPa)	46.3	120/130	81	330		
			μ	0.355	130/140	82	320		
			σ_b (MPa)	75	140/150	83	310		
			B ($10^{-12}/Pa$)	1.22	150/160	84	300		

Constants of Dispersion Formula	
A_0	3.80762148E+00
A_1	-1.53801657E-02
A_2	6.26758348E-02
A_3	1.57569502E-03
A_4	2.15980103E-04
A_5	6.30489693E-06

Density		Solarization	
ρ (g/cm ³)	4.76	$\Delta\lambda$ (%)	-1.0

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.6	2.4	2.9	3.1	3.2	3.3	4.0	5.6	5.9	7.4
-40 ~ -20	1.7	2.7	3.1	3.2	3.3	3.7	4.3	5.8	6.1	7.9
-20 ~ 0	1.8	2.7	3.2	3.3	3.4	3.9	4.5	6.1	6.3	8.4
0 ~ 20	1.9	2.8	3.4	3.5	3.6	4.1	4.8	6.4	6.7	8.8
20 ~ 40	2.0	2.9	3.5	3.6	3.7	4.2	5.0	6.8	7.0	9.2
40 ~ 60	2.1	3.1	3.6	3.7	3.8	4.5	5.2	7.0	7.2	9.6
60 ~ 80	2.2	3.3	3.9	3.9	4.1	4.7	5.6	7.4	7.7	10.1
80 ~ 100	2.4	3.6	4.3	4.3	4.4	4.9	5.9	7.8	8.1	10.4
100 ~ 120	2.6	3.7	4.5	4.6	4.7	5.3	6.4	8.2	8.5	10.6
120 ~ 140	2.8	4.0	4.7	4.8	4.9	5.5	6.8	8.7	9.0	10.8
140 ~ 160	2.9	4.1	4.9	5.0	5.0	5.7	7.0	9.1	9.3	11.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(440)/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	419/369

Constants of dn/dt		
D_0	D_1	D_2
-7.65E-07	1.27E-08	-1.65E-11
E_0	E_1	λ_{TK}
1.04E-06	1.04E-09	2.85E-01

H-ZLaF82	001291	$n_d = 2.00100$	$v_d = 29.14$	$n_F - n_C = 0.034352$
		$n_e = 2.00912$	$v_e = 28.92$	$n_F - n_C' = 0.034895$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.93864	$P_{d,C}$	0.2896	RC (S)	1	2400	0.935	0.875
n_{1970}	1970.09	1.94582	$P_{e,d}$	0.2364	RA (S)	1	2200	0.979	0.959
n_{1530}	1529.58	1.95440	$P_{g,F}$	0.5997	D_W	1	2000	0.990	0.981
n_{1129}	1128.64	1.96381	$P'_{d,c'}$	0.2407	D_A	1	1800	0.996	0.993
n_{1064}	1064.00	1.96583	$P'_{e,d}$	0.2327	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.96756	$P'_{g,F'}$	0.5304	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.97488			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.98035	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.98561					1000	0.999	0.998
n_C	656.27	1.99105					950	0.999	0.998
$n_{C'}$	643.85	1.99260					900	0.999	0.998
n_{He-Ne}	632.80	1.99406					850	0.999	0.998
n_D	589.29	2.00070	ΔP_{Fe}	-0.0002	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	2.00100	$\Delta P_{g,F}$	0.0045	-50/-40	61	750	0.999	0.998
n_e	546.07	2.00912	$\Delta P_{C,t}$	0.0025	-40/-30	64	700	0.999	0.998
n_F	486.13	2.02540	$\Delta P_{C,s}$	0.0004	-30/-20	65	650	0.999	0.998
$n_{F'}$	479.99	2.02749	Thermal Properties		-20/-10	67	600	0.999	0.998
n_g	435.84	2.04600	Tg ($^{\circ}C$)	725	-10/0	68	550	0.999	0.998
n_h	404.66	2.06424	Ts ($^{\circ}C$)	761	0/10	70	500	0.997	0.995
n_i	365.01	2.09830	$T_{10}^{14.5} (^{\circ}C)$	682	10/20	71	480	0.992	0.984
			$T_{10}^{13} (^{\circ}C)$	718	20/30	72	460	0.988	0.976
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	70	30/40	74	440	0.982	0.964
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	40/50	75	420	0.972	0.945
			λ (W/(m K))	1.10	50/60	75	400	0.951	0.904
					60/70	76	390	0.906	0.820
					70/80	76	380	0.848	0.719
			Mechanical Properties		80/90	77	370	0.739	0.546
			HK (10^7Pa)	720	90/100	78	360	0.515	0.265
			F_A	61	100/110	79	350	0.205	0.042
			E (GPa)	133.7	110/120	80	340		
			G (GPa)	50.0	120/130	82	330		
			μ	0.338	130/140	83	320		
			σ_b (MPa)	81	140/150	84	310		
			B ($10^{-12}/Pa$)	0.74	150/160	85	300		

Constants of Dispersion Formula	
A_0	3.83282270E+00
A_1	-1.56183327E-02
A_2	5.35172772E-02
A_3	2.75764007E-03
A_4	-1.28130130E-04
A_5	2.18199756E-05

Density		Solarization	
ρ (g/cm ³)	5.02	$\Delta\lambda$ (%)	-2.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.2	2.9	3.4	3.4	3.5	3.8	4.5	5.8	5.9	7.3
-40 ~ -20	2.2	2.9	3.4	3.4	3.5	3.9	4.5	5.9	5.9	7.4
-20 ~ 0	2.3	3.0	3.5	3.5	3.6	4.0	4.6	6.1	6.1	7.7
0 ~ 20	2.2	3.0	3.6	3.7	3.7	4.2	4.8	6.3	6.4	8.1
20 ~ 40	2.3	3.0	3.7	3.7	3.8	4.3	4.9	6.6	6.6	8.3
40 ~ 60	2.3	3.1	3.8	3.8	3.9	4.5	5.0	6.8	6.8	8.6
60 ~ 80	2.4	3.2	4.0	4.1	4.2	4.7	5.4	7.0	7.1	9.0
80 ~ 100	2.5	3.3	4.3	4.3	4.4	4.9	5.7	7.2	7.3	9.3
100 ~ 120	2.6	3.5	4.5	4.5	4.6	5.1	5.9	7.4	7.5	9.5
120 ~ 140	2.6	3.6	4.6	4.6	4.7	5.2	6.0	7.6	7.7	9.7
140 ~ 160	2.7	3.7	4.7	4.8	4.8	5.3	6.1	7.7	7.8	9.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(415)/365
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	397/361

Constants of dn/dt		
D_0	D_1	D_2
-2.90E-07	1.09E-08	-1.93E-11
E_0	E_1	λ_{TK}
9.83E-07	8.75E-10	2.67E-01

H-ZLaF82GT	001291	$n_d = 2.00100$	$v_d = 29.14$	$n_F - n_C = 0.034352$
		$n_e = 2.00912$	$v_e = 28.92$	$n_F - n_{C'} = 0.034895$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.93864	$P_{d,C}$	0.2896	RC (S)	1	2400	0.916	0.840
n_{1970}	1970.09	1.94582	$P_{e,d}$	0.2364	RA (S)	1	2200	0.974	0.948
n_{1530}	1529.58	1.95440	$P_{g,F}$	0.5997	D_W	1	2000	0.988	0.975
n_{1129}	1128.64	1.96381	$P'_{d,C'}$	0.2407	D_A	1	1800	0.995	0.990
n_{1064}	1064.00	1.96583	$P'_{e,d}$	0.2327	$R_{OH}(S)$	1	1600	0.999	0.997
n_t	1013.98	1.96756	$P'_{g,F'}$	0.5304	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.97488			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.98035	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.98561					1000	0.999	0.998
n_C	656.27	1.99105					950	0.999	0.998
$n_{C'}$	643.85	1.99260					900	0.999	0.998
n_{He-Ne}	632.80	1.99406					850	0.999	0.998
n_D	589.29	2.00070	ΔP_{Fe}	-0.0002	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	2.00100	$\Delta P_{g,F}$	0.0045	-50/-40	61	750	0.999	0.998
n_e	546.07	2.00912	$\Delta P_{C,t}$	0.0025	-40/-30	64	700	0.999	0.998
n_F	486.13	2.02540	$\Delta P_{C,s}$	0.0004	-30/-20	65	650	0.999	0.998
$n_{F'}$	479.99	2.02749	Thermal Properties		-20/-10	67	600	0.999	0.998
n_g	435.84	2.04600	$T_g (^{\circ}C)$	725	-10/0	68	550	0.999	0.998
n_h	404.66	2.06424	$T_s (^{\circ}C)$	761	0/10	70	500	0.998	0.996
n_i	365.01	2.09830	$T_{10}^{14.5} (^{\circ}C)$	682	10/20	71	480	0.993	0.987
			$T_{10}^{13} (^{\circ}C)$	718	20/30	72	460	0.989	0.979
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	70	30/40	74	440	0.984	0.969
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	88	40/50	75	420	0.977	0.954
			λ (W/(m K))	1.10	50/60	75	400	0.959	0.919
					60/70	76	390	0.922	0.850
					70/80	76	380	0.872	0.761
			Mechanical Properties		80/90	77	370	0.769	0.591
			HK (10^7 Pa)	720	90/100	78	360	0.547	0.299
			F_A	61	100/110	79	350	0.226	0.051
			E (GPa)	133.7	110/120	80	340		
			G (GPa)	50.0	120/130	82	330		
			μ	0.338	130/140	83	320		
			σ_b (MPa)		140/150	84	310		
			B (10^{-12} /Pa)	0.74	150/160	85	300		

Constants of Dispersion Formula	
A_0	3.83282270E+00
A_1	-1.56183327E-02
A_2	5.35172772E-02
A_3	2.75764007E-03
A_4	-1.28130130E-04
A_5	2.18199756E-05

Density		Solarization	
ρ (g/cm ³)	5.02	$\Delta\lambda$ (%)	-1.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.2	2.9	3.4	3.4	3.5	3.8	4.5	5.8	5.9	7.3
-40 ~ -20	2.2	2.9	3.4	3.4	3.5	3.9	4.5	5.9	5.9	7.4
-20 ~ 0	2.3	3.0	3.5	3.5	3.6	4.0	4.6	6.1	6.1	7.7
0 ~ 20	2.2	3.0	3.6	3.7	3.7	4.2	4.8	6.3	6.4	8.1
20 ~ 40	2.3	3.0	3.7	3.7	3.8	4.3	4.9	6.6	6.6	8.3
40 ~ 60	2.3	3.1	3.8	3.8	3.9	4.5	5.0	6.8	6.8	8.6
60 ~ 80	2.4	3.2	4.0	4.1	4.2	4.7	5.4	7.0	7.1	9.0
80 ~ 100	2.5	3.3	4.3	4.3	4.4	4.9	5.7	7.2	7.3	9.3
100 ~ 120	2.6	3.5	4.5	4.5	4.6	5.1	5.9	7.4	7.5	9.5
120 ~ 140	2.6	3.6	4.6	4.6	4.7	5.2	6.0	7.6	7.7	9.7
140 ~ 160	2.7	3.7	4.7	4.8	4.8	5.3	6.1	7.7	7.8	9.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(409)/363
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	381/360

Constants of dn/dt		
D_0	D_1	D_2
-2.90E-07	1.09E-08	-1.93E-11
E_0	E_1	λ_{TK}
9.83E-07	8.75E-10	2.67E-01

H-ZLaF86	883270	$n_d = 1.88252$	$v_d = 27.00$	$n_F - n_C = 0.032686$
		$n_e = 1.89022$	$v_e = 26.78$	$n_F - n_{C'} = 0.033246$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.82367	$P_{d,C}$	0.2876	RC (S)	1	2400	0.969	0.938
n_{1970}	1970.09	1.83046	$P_{e,d}$	0.2356	RA (S)	1	2200	0.987	0.975
n_{1530}	1529.58	1.83859	$P_{g,F}$	0.6125	D_W	1	2000	0.995	0.991
n_{1129}	1128.64	1.84749	$P'_{d,C'}$	0.2391	D_A	1	1800	0.998	0.997
n_{1064}	1064.00	1.84939	$P'_{e,d}$	0.2316	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.85103	$P'_{g,F'}$	0.5417	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.85790			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.86304	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.86800					1000	0.999	0.998
n_C	656.27	1.87312					950	0.999	0.998
$n_{C'}$	643.85	1.87457					900	0.999	0.998
n_{He-Ne}	632.80	1.87595					850	0.999	0.998
n_D	589.29	1.88223	ΔP_{Fe}	0.0017	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.88252	$\Delta P_{g,F}$	0.0137	-50/-40	60	750	0.999	0.998
n_e	546.07	1.89022	$\Delta P_{C,t}$	0.0049	-40/-30	63	700	0.998	0.997
n_F	486.13	1.90581	$\Delta P_{C,s}$	0.0004	-30/-20	63	650	0.998	0.997
$n_{F'}$	479.99	1.90782	Thermal Properties		-20/-10	65	600	0.997	0.995
n_g	435.84	1.92583			-10/0	68	550	0.997	0.987
n_h	404.66	1.94392			0/10	69	500	0.982	0.965
n_i	365.01	1.97855			10/20	70	480	0.975	0.950
					20/30	73	460	0.964	0.929
					30/40	74	440	0.944	0.891
					40/50	75	420	0.902	0.813
			Mechanical Properties		50/60	75	400	0.804	0.647
					60/70	75	390	0.701	0.491
					70/80	76	380	0.512	0.262
					80/90	76	370	0.230	0.053
					90/100	76	360		
			Density		100/110	77	350		
					110/120	78	340		
					120/130	79	330		
					130/140	80	320		
					140/150	81	310		
			Solarization		150/160	83	300		
							290		
							280		

Constants of Dispersion Formula	
A_0	3.39234287E+00
A_1	-1.39491556E-02
A_2	4.74887284E-02
A_3	2.28412158E-03
A_4	-8.32791862E-05
A_5	2.34034525E-05

Density		Solarization	
ρ (g/cm ³)	4.05	$\Delta\lambda$ (%)	-0.7

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.2	1.8	2.1	2.1	2.2	2.4	3.2	4.3	4.5	6.4
-40 ~ -20	1.3	1.9	2.2	2.3	2.4	2.6	3.4	4.5	4.7	6.6
-20 ~ 0	1.4	2.1	2.3	2.5	2.6	2.8	3.5	4.6	4.8	6.7
0 ~ 20	1.6	2.3	2.5	2.6	2.7	3.1	3.7	4.8	4.9	6.9
20 ~ 40	1.8	2.5	2.8	2.9	2.9	3.2	3.8	5.0	5.1	7.1
40 ~ 60	2.0	2.6	2.9	3.0	3.0	3.4	4.1	5.1	5.3	7.3
60 ~ 80	2.1	2.8	3.2	3.3	3.3	3.5	4.3	5.2	5.4	7.6
80 ~ 100	2.3	3.0	3.3	3.4	3.4	3.6	4.5	5.4	5.5	7.7
100 ~ 120	2.3	3.1	3.5	3.6	3.6	3.9	4.6	5.5	5.6	7.9
120 ~ 140	2.4	3.2	3.7	3.8	3.9	4.1	4.7	5.6	5.7	8.2
140 ~ 160	2.5	3.3	3.8	3.9	4.0	4.3	4.9	5.9	6.0	8.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(430)/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	418/370

Constants of dn/dt		
D_0	D_1	D_2
-4.29E-07	1.62E-08	-2.51E-11
E_0	E_1	λ_{TK}
5.81E-07	5.62E-12	3.40E-01

H-ZLaF95	051269	$n_d = 2.05090$	$v_d = 26.94$	$n_F - n_C = 0.039005$
		$n_e = 2.06011$	$v_e = 26.74$	$n_F - n_C' = 0.039645$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.98329	$P_{d,C}$	0.2884	RC (S)	1	2400	0.953	0.907
n_{1970}	1970.09	1.99055	$P_{e,d}$	0.2361	RA (S)	1	2200	0.985	0.970
n_{1530}	1529.58	1.99938	$P_{g,F}$	0.6040	D_W	1	2000	0.994	0.988
n_{1129}	1128.64	2.00940	$P'_{d,c'}$	0.2396	D_A	1	1800	0.998	0.996
n_{1064}	1064.00	2.01158	$P'_{e,d}$	0.2323	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	2.01348	$P'_{g,F'}$	0.5340	RP (S)	2	1400	0.998	0.996
n_s	852.11	2.02155			CR		1200	0.998	0.996
$n_{A'}$	768.19	2.02764	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	2.03354					1000	0.998	0.996
n_C	656.27	2.03965					950	0.998	0.996
$n_{C'}$	643.85	2.04140					900	0.998	0.996
n_{He-Ne}	632.80	2.04306					850	0.998	0.996
n_D	589.29	2.05057	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	2.05090	$\Delta P_{g,F}$	0.0052	-50/-40	65	750	0.998	0.996
n_e	546.07	2.06011	$\Delta P_{C,t}$	0.0003	-40/-30	68	700	0.998	0.996
n_F	486.13	2.07865	$\Delta P_{C,s}$	-0.0010	-30/-20	71	650	0.998	0.996
$n_{F'}$	479.99	2.08104	Thermal Properties		-20/-10	69	600	0.996	0.994
n_g	435.84	2.10221	Tg ($^{\circ}C$)	749	-10/0	71	550	0.992	0.986
n_h	404.66	2.12327	Ts ($^{\circ}C$)	784	0/10	74	500	0.976	0.953
n_i	365.01	2.16304	$T_{10}^{14.5} (^{\circ}C)$	726	10/20	73	480	0.963	0.928
			$T_{10}^{13} (^{\circ}C)$	743	20/30	76	460	0.944	0.892
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	74	30/40	78	440	0.914	0.835
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	90	40/50	75	420	0.854	0.729
			λ (W/(m K))	1.02	50/60	80	400	0.727	0.529
					60/70	82	390	0.618	0.382
					70/80	78	380	0.459	0.211
			Mechanical Properties		80/90	82	370	0.245	0.062
			HK ($10^7 Pa$)	699	90/100	81	360		
			F_A	63	100/110	81	350		
			E (GPa)	131.4	110/120	85	340		
			G (GPa)	50.2	120/130	83	330		
			μ	0.308	130/140	86	320		
			σ_b (MPa)	86	140/150	86	310		
			B ($10^{-12}/Pa$)	0.62	150/160	88	300		

Constants of Dispersion Formula	
A_0	4.00832073E+00
A_1	-1.59378407E-02
A_2	6.04102723E-02
A_3	3.81295608E-03
A_4	-2.46023955E-04
A_5	3.41387429E-05

Density		Solarization	
ρ (g/cm ³)	5.27	$\Delta\lambda$ (%)	-1.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.4	2.1	2.6	2.6	2.7	2.9	3.6	4.9	5.1	6.2
-40 ~ -20	1.6	2.2	2.7	2.7	2.8	3.2	3.8	5.3	5.4	6.4
-20 ~ 0	1.7	2.3	2.8	2.9	3.0	3.4	4.0	5.6	5.7	6.8
0 ~ 20	1.9	2.5	2.9	3.0	3.1	3.6	4.1	6.0	6.0	7.2
20 ~ 40	2.0	2.6	3.0	3.1	3.3	3.7	4.4	6.3	6.4	7.5
40 ~ 60	2.3	2.7	3.2	3.3	3.4	3.9	4.7	6.7	6.7	7.7
60 ~ 80	2.5	3.1	3.5	3.5	3.6	4.2	5.1	7.0	7.1	8.0
80 ~ 100	2.5	3.2	3.7	3.7	3.7	4.4	5.3	7.4	7.4	8.4
100 ~ 120	2.6	3.3	3.9	3.9	3.9	4.7	5.7	7.7	7.7	8.7
120 ~ 140	2.8	3.5	4.1	4.1	4.2	5.1	6.1	8.0	8.1	9.1
140 ~ 160	3.0	3.7	4.3	4.4	4.5	5.3	6.4	8.4	8.5	9.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(470)/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	432/369

Constants of dn/dt		
D_0	D_1	D_2
-1.09E-06	1.24E-08	-1.70E-11
E_0	E_1	λ_{TK}
9.96E-07	1.03E-09	2.51E-01

H-BiF200	003193	$n_d = 2.00272$	$v_d = 19.32$	$n_F - n_C = 0.051908$
		$n_e = 2.01489$	$v_e = 19.16$	$n_F - n_{C'} = 0.052967$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42		$P_{d,C}$	0.2815	RC (S)	1	2400	0.967	0.936
n_{1970}	1970.09		$P_{e,d}$	0.2345	RA (S)	1	2200	0.983	0.966
n_{1530}	1529.58		$P_{g,F}$	0.6419	D_W	1	2000	0.993	0.987
n_{1129}	1128.64	1.95027	$P'_{d,C'}$	0.2334	D_A	1	1800	0.997	0.993
n_{1064}	1064.00	1.95293	$P'_{e,d}$	0.2298	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.95525	$P'_{g,F'}$	0.5666	RP (S)	1	1400	0.999	0.997
n_s	852.11	1.96520			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.97282	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.98028					1000	0.998	0.995
n_C	656.27	1.98811					950	0.997	0.995
$n_{C'}$	643.85	1.99036					900	0.998	0.995
n_{He-Ne}	632.80	1.99250					850	0.997	0.994
n_D	589.29	2.00228	ΔP_{Fe}	0.0046	$^{\circ}C$	α	800	0.997	0.993
n_d	587.56	2.00272	$\Delta P_{g,F}$	0.0304	-50/-40	67	750	0.996	0.992
n_e	546.07	2.01489	$\Delta P_{C,t}$	-0.0007	-40/-30	69	700	0.996	0.991
n_F	486.13	2.04002	$\Delta P_{C,s}$	-0.0054	-30/-20	71	650	0.994	0.989
$n_{F'}$	479.99	2.04333	Thermal Properties		-20/-10	71	600	0.993	0.986
n_g	435.84	2.07334	$T_g (^{\circ}C)$	519	-10/0	71	550	0.985	0.970
n_h	404.66	2.10453	$T_s (^{\circ}C)$	558	0/10	73	500	0.961	0.924
n_i	365.01		$T_{10}^{14.5} (^{\circ}C)$	496	10/20	73	480	0.943	0.889
			$T_{10}^{13} (^{\circ}C)$	514	20/30	74	460	0.915	0.838
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	75	30/40	74	440	0.857	0.734
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	91	40/50	74	420	0.675	0.456
			$\lambda (W/(m \cdot K))$	0.72	50/60	75	400	0.195	0.038
					60/70	77	390		
					70/80	79	380		
					80/90	79	370		
			Mechanical Properties		90/100	81	360		
			HK ($10^7 Pa$)	403	100/110	81	350		
			F_A	251	110/120	81	340		
			E (GPa)	84.8	120/130	82	330		
			G (GPa)	33.6	130/140	82	320		
			μ	0.263	140/150	86	310		
			σ_b (MPa)	53	150/160	86	300		
			B ($10^{-12}/Pa$)	2.11			290		
							280		

Constants of Dispersion Formula	
A_0	3.77070363E+00
A_1	-1.89710141E-02
A_2	6.72915528E-02
A_3	7.22871114E-03
A_4	-6.15434682E-04
A_5	8.70566270E-05

Density		Solarization	
$\rho (g/cm^3)$	5.10	$\Delta\lambda (\%)$	-3.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.9	5.5	5.6	5.8	6.1	6.4	7.2	10.2	10.6	14.6
-40 ~ -20	5.0	5.5	5.8	6.1	6.2	6.8	7.6	10.6	10.9	15.0
-20 ~ 0	5.1	5.6	6.0	6.2	6.4	7.1	8.2	11.1	11.6	15.7
0 ~ 20	5.3	5.7	6.2	6.5	6.7	7.5	8.6	11.8	12.2	16.5
20 ~ 40	5.5	6.0	6.5	6.7	6.9	7.8	9.0	12.4	12.8	17.5
40 ~ 60	5.7	6.2	6.8	6.9	7.2	8.2	9.3	12.9	13.3	18.5
60 ~ 80	6.0	6.4	7.1	7.3	7.6	8.5	9.8	13.5	14.0	19.4
80 ~ 100	6.0	6.6	7.4	7.6	8.0	8.7	10.5	14.0	14.5	20.3
100 ~ 120	6.2	6.8	7.6	7.8	8.0	9.3	10.8	14.6	15.1	21.0
120 ~ 140	6.3	7.0	7.9	8.1	8.3	9.6	11.3	15.1	15.7	21.9
140 ~ 160	6.4	7.1	8.1	8.3	8.5	9.9	11.5	15.5	16.2	22.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(470)/400
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	446/399

Constants of dn/dt		
D_0	D_1	D_2
3.25E-06	1.38E-08	-2.30E-11
E_0	E_1	λ_{TK}
1.02E-06	1.47E-09	3.56E-01

D-FK61	497816	$n_d = 1.49700$	$v_d = 81.61$	$n_F - n_C = 0.006090$
		$n_e = 1.49845$	$v_e = 81.20$	$n_F - n_C' = 0.006139$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.47950	$P_{d,C}$	0.3054	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09	1.48263	$P_{e,d}$	0.2381	RA (S)	2	2200	0.999	0.998
n_{1530}	1529.58	1.48606	$P_{g,F}$	0.5386	D_W	1	2000	0.999	0.998
n_{1129}	1128.64	1.48910	$P'_{d,c'}$	0.2557	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.48965	$P'_{e,d}$	0.2362	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.49010	$P'_{g,F'}$	0.4789	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.49183			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.49301	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.49407					1000	0.999	0.998
n_C	656.27	1.49514					950	0.999	0.998
$n_{C'}$	643.85	1.49543					900	0.999	0.998
n_{He-Ne}	632.80	1.49571					850	0.999	0.998
n_D	589.29	1.49694	$\Delta P_{F,e}$	0.0113	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.49700	$\Delta P_{g,F}$	0.0305	-50/-40	115	750	0.999	0.998
n_e	546.07	1.49845	$\Delta P_{C,t}$	-0.1080	-40/-30	118	700	0.999	0.998
n_F	486.13	1.50123	$\Delta P_{C,s}$	-0.0528	-30/-20	121	650	0.999	0.998
$n_{F'}$	479.99	1.50157	Thermal Properties		-20/-10	123	600	0.999	0.998
n_g	435.84	1.50451	Tg ($^{\circ}C$)	464	-10/0	125	550	0.999	0.998
n_h	404.66	1.50721	Ts ($^{\circ}C$)	489	0/10	127	500	0.999	0.998
n_i	365.01	1.51173	$T_{10}^{14.5} (^{\circ}C)$	421	10/20	128	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	442	20/30	130	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	124	30/40	133	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	152	40/50	136	420	0.999	0.998
			λ (W/(m K))	0.74	50/60	138	400	0.999	0.998
			β_d	58	60/70	140	390	0.999	0.998
Constants of Dispersion Formula			Mechanical Properties		70/80	142	380	0.999	0.998
					80/90	144	370	0.995	0.993
					90/100	145	360	0.984	0.975
					100/110	146	350	0.970	0.948
					110/120	147	340	0.942	0.893
A_0	2.21807952E+00		HK (10^7Pa)	350	120/130	148	330	0.886	0.788
A_1	-5.67922113E-03		F_A	385	130/140	149	320	0.788	0.621
A_2	8.28756139E-03		E (GPa)	71.6	140/150	150	310	0.643	0.410
A_3	9.66891434E-05		G (GPa)	27.4	150/160	151	300	0.466	0.212
A_4	3.56668643E-06		μ	0.307			290	0.298	0.086
A_5	-3.63065113E-07		σ_b (MPa)	33			280	0.176	0.031

Constants of Dispersion Formula	
A_0	2.21807952E+00
A_1	-5.67922113E-03
A_2	8.28756139E-03
A_3	9.66891434E-05
A_4	3.56668643E-06
A_5	-3.63065113E-07

Density		Solarization	
ρ (g/cm ³)	3.67	$\Delta\lambda$ (%)	-2.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-5.4	-5.3	-5.3	-5.2	-5.1	-5.0	-4.9	-4.6	-4.6	-4.5
-40 ~ -20	-5.6	-5.4	-5.3	-5.3	-5.3	-5.3	-5.2	-5.1	-5.0	-4.8
-20 ~ 0	-5.8	-5.8	-5.7	-5.7	-5.7	-5.6	-5.5	-5.2	-5.2	-5.1
0 ~ 20	-6.1	-6.0	-5.9	-5.9	-5.9	-5.9	-5.8	-5.7	-5.6	-5.5
20 ~ 40	-6.4	-6.3	-6.2	-6.2	-6.2	-6.0	-6.0	-5.9	-5.8	-5.7
40 ~ 60	-6.6	-6.5	-6.4	-6.4	-6.5	-6.4	-6.3	-6.0	-6.0	-5.9
60 ~ 80	-6.8	-6.8	-6.7	-6.6	-6.6	-6.6	-6.5	-6.3	-6.2	-6.0
80 ~ 100	-7.0	-6.9	-6.9	-6.9	-6.9	-6.9	-6.8	-6.5	-6.4	-6.1
100 ~ 120	-7.2	-7.2	-7.1	-7.1	-7.1	-7.1	-6.9	-6.8	-6.7	-6.4
120 ~ 140	-7.5	-7.5	-7.4	-7.4	-7.4	-7.3	-7.1	-7.1	-7.0	-6.8
140 ~ 160	-7.9	-7.8	-7.7	-7.6	-7.6	-7.5	-7.4	-7.3	-7.2	-7.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/285
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	332/284

Constants of dn/dt		
D_0	D_1	D_2
-1.90E-05	-2.71E-09	-2.90E-11
E_0	E_1	λ_{TK}
3.52E-07	9.31E-11	2.28E-01

D-FK90	459902	$n_d = 1.45860$	$v_d = 90.19$	$n_F - n_C = 0.005085$
		$n_e = 1.45981$	$v_e = 89.77$	$n_F - n_C' = 0.005122$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.44358	P _{d,C}	0.3068	RC (S)	1	2400	0.999	0.998		
n ₁₉₇₀	1970.09	1.44630	P _{e,d}	0.2380	RA (S)	2	2200	0.999	0.998		
n ₁₅₃₀	1529.58	1.44928	P _{g,F}	0.5388	D _W	2	2000	0.999	0.998		
n ₁₁₂₉	1128.64	1.45191	P' _{d,c´}	0.2558	D _A	3	1800	0.999	0.998		
n ₁₀₆₄	1064.00	1.45238	P' _{e,d}	0.2362	R _{OH} (S)	4	1600	0.999	0.998		
n _t	1013.98	1.45277	P' _{g,F´}	0.4783	RP (S)	2	1400	0.999	0.998		
n _s	852.11	1.45425			CR		1200	0.999	0.998		
n _{A´}	768.19	1.45524					1060	0.999	0.998		
n _r	706.52	1.45615	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998		
n _C	656.27	1.45704					950	0.999	0.998		
n _{C´}	643.85	1.45729					900	0.999	0.998		
n _{He-Ne}	632.80	1.45752									
n _D	589.29	1.45855	ΔP _{F,e}	0.0139	°C	α	850	0.999	0.998		
n _d	587.56	1.45860	ΔP _{g,F}	0.0450	-50/-40	123	800	0.999	0.998		
n _e	546.07	1.45981	ΔP _{C,t}	-0.1374	-40/-30	126	750	0.999	0.998		
n _F	486.13	1.46212	ΔP _{C,s}	-0.0682	-30/-20	128	700	0.999	0.998		
n _{F´}	479.99	1.46241	Thermal Properties		-20/-10	130	650	0.999	0.998		
n _g	435.84	1.46486			Tg (°C)	442	-10/0	132	600	0.999	0.998
n _h	404.66	1.46710	Ts (°C)	467	0/10	133	550	0.999	0.998		
n _i	365.01	1.47085	T ₁₀ ^{14.5} (°C)	423	10/20	135	500	0.999	0.998		
			T ₁₀ ¹³ (°C)	436	20/30	138	480	0.999	0.998		
			α _{-50/80°C} (10 ⁻⁷ /K)	134	30/40	140	460	0.999	0.998		
			α _{100/300°C} (10 ⁻⁷ /K)	164	40/50	143	440	0.999	0.998		
Constants of Dispersion Formula			Mechanical Properties		80/90	145	400	0.999	0.998		
					90/100	149	370	0.999	0.998		
A ₀	2.10866977E+00		HK (10 ⁷ Pa)	354	100/110	150	360	0.998	0.996		
A ₁	-4.81589397E-03		F _A	459	110/120	151	350	0.997	0.994		
A ₂	7.02478609E-03		E (GPa)	68.9	120/130	153	340	0.993	0.986		
A ₃	-2.48667024E-05		G (GPa)	26.2	130/140	155	330	0.984	0.968		
A ₄	1.78185408E-05		μ	0.313	140/150	157	320	0.967	0.935		
A ₅	-1.09874507E-06		σ _b (MPa)	48	150/160	160	310	0.935	0.874		
Density			B (10 ⁻¹² /Pa)	0.60			300	0.883	0.779		
							290	0.809	0.654		
ρ (g/cm ³)	3.64						280	0.721	0.520		
Solarization											
Δλ (%)	-0.5										

Constants of Dispersion Formula	
A_0	2.10866977E+00
A_1	-4.81589397E-03
A_2	7.02478609E-03
A_3	-2.48667024E-05
A_4	1.78185408E-05
A_5	-1.09874507E-06

Density		Solarization	
ρ (g/cm ³)	3.64	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-7.0	-6.7	-6.5	-6.4	-6.2	-6.0	-5.9	-5.6	-5.6	-5.3
-40 ~ -20	-7.2	-6.8	-6.5	-6.5	-6.4	-6.2	-6.0	-5.8	-5.8	-5.5
-20 ~ 0	-7.3	-6.9	-6.7	-6.7	-6.6	-6.4	-6.3	-6.0	-5.9	-5.7
0 ~ 20	-7.3	-7.0	-6.8	-6.8	-6.7	-6.5	-6.5	-6.1	-6.1	-6.0
20 ~ 40	-7.5	-7.1	-7.0	-6.9	-6.8	-6.5	-6.5	-6.2	-6.2	-6.2
40 ~ 60	-7.6	-7.3	-7.2	-7.2	-7.1	-6.7	-6.6	-6.5	-6.5	-6.3
60 ~ 80	-7.9	-7.6	-7.5	-7.5	-7.4	-7.0	-7.0	-6.8	-6.7	-6.6
80 ~ 100	-8.0	-7.8	-7.7	-7.6	-7.4	-7.2	-7.1	-6.9	-6.8	-6.7
100 ~ 120	-8.1	-8.1	-8.0	-7.9	-7.8	-7.6	-7.4	-7.2	-7.2	-7.0
120 ~ 140	-8.2	-8.0	-8.0	-8.0	-7.9	-7.8	-7.7	-7.5	-7.5	-7.3
140 ~ 160	-8.4	-8.3	-8.3	-8.2	-8.2	-8.0	-8.0	-7.9	-7.8	-7.6

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	310/260
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	300/260

Constants of dn/dt		
D_0	D_1	D_2
-2.37E-05	5.32E-09	-4.63E-11
E_0	E_1	λ_{TK}
9.51E-07	-1.08E-09	2.02E-08

D-FK95	437951	$n_d = 1.43700$	$v_d = 95.10$	$n_F - n_C = 0.004595$
		$n_e = 1.43810$	$v_e = 94.66$	$n_F - n_C' = 0.004628$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.42310	$P_{d,C}$	0.3069	RC (S)	1	2400	0.999	0.998
n_{1970}	1970.09	1.42566	$P_{e,d}$	0.2394	RA (S)	3	2200	0.999	0.998
n_{1530}	1529.58	1.42846	$P_{g,F}$	0.5332	D_W	2	2000	0.999	0.998
n_{1129}	1128.64	1.43091	$P'_{d,c'}$	0.2550	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.43134	$P'_{e,d}$	0.2377	$R_{OH}(S)$	4	1600	0.999	0.998
n_t	1013.98	1.43170	$P'_{g,F'}$	0.4754	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.43306			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.43396	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.43478					1000	0.999	0.998
n_C	656.27	1.43559					950	0.999	0.998
$n_{C'}$	643.85	1.43582					900	0.999	0.998
n_{He-Ne}	632.80	1.43603	$\Delta P_{F,e}$	0.0171	$^{\circ}C$	α	850	0.999	0.998
n_D	589.29	1.43696	$\Delta P_{g,F}$	0.0475	-50/-40	129	800	0.999	0.998
n_d	587.56	1.43700	$\Delta P_{C,t}$	-0.1544	-40/-30	131	750	0.999	0.998
n_e	546.07	1.43810	$\Delta P_{C,s}$	-0.0780	-30/-20	132	700	0.999	0.998
n_F	486.13	1.44019	Thermal Properties		-20/-10	134	650	0.999	0.998
$n_{F'}$	479.99	1.44044			-10/0	134	600	0.999	0.998
n_g	435.84	1.44264	Tg ($^{\circ}C$)	409	0/10	137	550	0.999	0.998
n_h	404.66	1.44466	Ts ($^{\circ}C$)	443	10/20	140	500	0.999	0.998
n_i	365.01	1.44803	$T_{10}^{14.5} (^{\circ}C)$	377	20/30	140	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	390	30/40	143	460	0.998	0.997
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	139	40/50	145	440	0.998	0.997
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	170	50/60	145	420	0.998	0.997
			λ (W/(m K))	0.97	60/70	147	400	0.998	0.997
			β_d	45	70/80	149	390	0.998	0.997
Constants of Dispersion Formula			Mechanical Properties		80/90	150	380	0.998	0.997
					90/100	152	370	0.997	0.995
A_0	2.04831817E+00		HK (10^7 Pa)	358	100/110	154	360	0.994	0.988
A_1	-4.48612591E-03		F_A	449	110/120	156	350	0.986	0.973
A_2	6.22248873E-03		E (GPa)	71.4	120/130	159	340	0.965	0.932
A_3	-7.98581030E-06		G (GPa)	26.8	130/140	160	330	0.925	0.856
A_4	1.22118495E-05		μ	0.333	140/150	164	320	0.845	0.714
A_5	-7.39464344E-07		σ_b (MPa)	32	150/160	168	310	0.716	0.513
			B (10^{-12} /Pa)	0.59			300	0.535	0.286

Density		Solarization	
ρ (g/cm ³)	3.56	$\Delta\lambda$ (%)	-3.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-5.5	-5.3	-5.2	-5.2	-5.1	-5.0	-4.9	-4.8	-4.8	-4.5
-40 ~ -20	-6.0	-5.8	-5.7	-5.7	-5.6	-5.5	-5.3	-5.1	-5.1	-4.9
-20 ~ 0	-6.4	-6.2	-6.0	-6.0	-5.9	-5.8	-5.7	-5.5	-5.5	-5.3
0 ~ 20	-6.7	-6.5	-6.4	-6.4	-6.3	-6.2	-6.1	-5.8	-5.8	-5.6
20 ~ 40	-7.0	-6.8	-6.7	-6.7	-6.6	-6.4	-6.4	-6.2	-6.1	-5.9
40 ~ 60	-7.2	-7.0	-6.9	-6.9	-6.8	-6.7	-6.6	-6.5	-6.4	-6.2
60 ~ 80	-7.3	-7.2	-7.1	-7.1	-7.0	-6.9	-6.8	-6.7	-6.6	-6.4
80 ~ 100	-7.3	-7.2	-7.1	-7.1	-7.0	-6.9	-6.8	-6.7	-6.7	-6.5
100 ~ 120	-7.3	-7.2	-7.1	-7.1	-7.1	-7.0	-6.9	-6.7	-6.7	-6.6
120 ~ 140	-7.4	-7.3	-7.2	-7.1	-7.1	-7.0	-6.8	-6.7	-6.7	-6.6
140 ~ 160	-7.5	-7.4	-7.2	-7.2	-7.1	-7.0	-6.9	-6.8	-6.7	-6.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	330/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	326/280

Constants of dn/dt		
D_0	D_1	D_2
-2.28E-05	-4.73E-09	3.04E-11
E_0	E_1	λ_{TK}
6.79E-07	-1.59E-10	1.98E-07

D-K9	516641	$n_d = 1.51633$	$v_d = 64.06$	$n_F - n_C = 0.008060$
		$n_e = 1.51825$	$v_e = 63.87$	$n_F - n_C' = 0.008114$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.48801	$P_{d,C}$	0.3089	RC (S)	1	2400	0.878	0.771
n_{1970}	1970.09	1.49383	$P_{e,d}$	0.2382	RA (S)	1	2200	0.939	0.882
n_{1530}	1529.58	1.50003	$P_{g,F}$	0.5347	D_W	1	2000	0.985	0.970
n_{1129}	1128.64	1.50516	$P'_{d,c'}$	0.2576	D_A	1	1800	0.995	0.990
n_{1064}	1064.00	1.50603	$P'_{e,d}$	0.2366	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.50673	$P'_{g,F'}$	0.4745	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.50929			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.51094	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.51241					1000	0.999	0.998
n_C	656.27	1.51384					950	0.999	0.998
$n_{C'}$	643.85	1.51424					900	0.999	0.998
n_{He-Ne}	632.80	1.51461					850	0.999	0.998
n_D	589.29	1.51625	ΔP_{Fe}	-0.0020	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.51633	$\Delta P_{g,F}$	-0.0025	-50/-40	49	750	0.999	0.998
n_e	546.07	1.51825	$\Delta P_{C,t}$	0.0316	-40/-30	49	700	0.999	0.998
n_F	486.13	1.52190	$\Delta P_{C,s}$	0.0104	-30/-20	50	650	0.999	0.998
$n_{F'}$	479.99	1.52236	Thermal Properties		-20/-10	51	600	0.999	0.998
n_g	435.84	1.52621	Tg ($^{\circ}C$)	500	-10/0	53	550	0.999	0.998
n_h	404.66	1.52976	Ts ($^{\circ}C$)	560	0/10	54	500	0.999	0.998
n_i	365.01	1.53574	$T_{10}^{14.5} (^{\circ}C)$	450	10/20	55	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	465	20/30	56	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	55	30/40	57	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	70	40/50	58	420	0.999	0.998
			λ (W/(m K))	1.31	50/60	59	400	0.999	0.998
			β_d	55	60/70	60	390	0.998	0.997
			Mechanical Properties		70/80	61	380	0.997	0.996
			HK (10^7Pa)	581	80/90	61	370	0.996	0.995
			F_A	81	90/100	61	360	0.993	0.987
			E (GPa)	79.0	100/110	64	350	0.987	0.976
			G (GPa)	32.7	110/120	65	340	0.973	0.950
			μ	0.208	120/130	66	330	0.947	0.898
			σ_b (MPa)	92	130/140	66	320	0.891	0.794
			B ($10^{-12}/\text{Pa}$)	2.73	140/150	68	310	0.774	0.598
					150/160	69	300	0.556	0.308

Constants of Dispersion Formula	
A_0	2.27095299E+00
A_1	-1.08648469E-02
A_2	1.05786491E-02
A_3	1.54454636E-04
A_4	5.64088446E-06
A_5	-4.70999004E-07

Density		Solarization	
ρ (g/cm ³)	2.39	$\Delta\lambda$ (%)	-1.4

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.5	3.6	3.9
-40 ~ -20	2.7	2.8	2.9	3.1	3.1	3.3	3.4	3.6	3.7	4.0
-20 ~ 0	2.7	2.9	3.1	3.2	3.3	3.3	3.4	3.7	3.7	4.1
0 ~ 20	2.8	3.0	3.2	3.3	3.3	3.3	3.5	3.7	3.8	4.2
20 ~ 40	2.9	3.1	3.2	3.4	3.5	3.5	3.6	3.7	3.9	4.2
40 ~ 60	2.9	3.2	3.2	3.4	3.5	3.6	3.6	3.8	4.0	4.3
60 ~ 80	2.9	3.3	3.4	3.5	3.6	3.6	3.7	3.8	4.0	4.4
80 ~ 100	3.0	3.3	3.5	3.6	3.6	3.7	3.7	3.9	4.0	4.6
100 ~ 120	3.0	3.3	3.5	3.7	3.7	3.8	3.9	4.0	4.0	4.8
120 ~ 140	3.1	3.4	3.5	3.7	3.8	3.9	4.0	4.1	4.2	4.9
140 ~ 160	3.1	3.4	3.7	3.9	3.9	4.0	4.2	4.2	4.3	5.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	330/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	320/280

Constants of dn/dt		
D_0	D_1	D_2
3.06E-06	1.56E-08	-3.00E-11
E_0	E_1	λ_{TK}
4.56E-07	3.40E-10	2.15E-01

D-PK60	592670	$n_d = 1.59201$	$v_d = 67.00$	$n_F - n_C = 0.008833$
		$n_e = 1.59412$	$v_e = 66.73$	$n_F - n_C' = 0.008899$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.56449	$P_{d,C}$	0.3057	RC (S)	1	2400	0.915	0.837
n_{1970}	1970.09	1.56973	$P_{e,d}$	0.2389	RA (S)	1	2200	0.947	0.897
n_{1530}	1529.58	1.57540	$P_{g,F}$	0.5400	D_W	1	2000	0.977	0.955
n_{1129}	1128.64	1.58027	$P'_{d,C'}$	0.2551	D_A	4	1800	0.990	0.980
n_{1064}	1064.00	1.58112	$P'_{e,d}$	0.2371	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.58182	$P'_{g,F'}$	0.4798	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.58444			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.58618	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58775					1000	0.999	0.998
n_C	656.27	1.58931					950	0.999	0.998
$n_{C'}$	643.85	1.58974					900	0.999	0.998
n_{He-Ne}	632.80	1.59014					850	0.999	0.998
n_D	589.29	1.59193	$\Delta P_{F,e}$	0.0019	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.59201	$\Delta P_{g,F}$	0.0077	-50/-40	79	750	0.999	0.998
n_e	546.07	1.59412	$\Delta P_{C,t}$	-0.0168	-40/-30	81	700	0.999	0.998
n_F	486.13	1.59814	$\Delta P_{C,s}$	-0.0099	-30/-20	85	650	0.999	0.998
$n_{F'}$	479.99	1.59864	Thermal Properties		-20/-10	87	600	0.999	0.998
n_g	435.84	1.60291	Tg ($^{\circ}C$)	509	-10/0	89	550	0.999	0.998
n_h	404.66	1.60684	Ts ($^{\circ}C$)	538	0/10	90	500	0.999	0.998
n_i	365.01	1.61349	$T_{10}^{14.5} (^{\circ}C)$	481	10/20	91	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	502	20/30	93	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	87	30/40	93	440	0.998	0.995
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	113	40/50	95	420	0.996	0.992
			λ (W/(m K))	0.78	50/60	96	400	0.994	0.988
			β_d	120	60/70	96	390	0.992	0.984
Constants of Dispersion Formula			Mechanical Properties		70/80	98	380	0.990	0.980
					80/90	100	370	0.985	0.972
					90/100	102	360	0.978	0.952
					100/110	102	350	0.967	0.930
					110/120	103	340	0.945	0.889
			E (GPa)	80.4	120/130	104	330	0.908	0.821
			G (GPa)	31.0	130/140	106	320	0.848	0.716
			μ	0.297	140/150	106	310	0.762	0.579
			σ_b (MPa)	57	150/160	108	300	0.657	0.433
			B ($10^{-12}/Pa$)	1.30			290	0.542	0.297

Constants of Dispersion Formula	
A_0	2.50030926E+00
A_1	-1.01689443E-02
A_2	1.24607241E-02
A_3	1.85952458E-04
A_4	2.05179854E-06
A_5	-1.49222817E-07

Density		Solarization	
ρ (g/cm ³)	3.27	$\Delta\lambda$ (%)	-2.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-1.8	-1.7	-1.5	-1.5	-1.5	-1.4	-1.3	-1.1	-1.1	-0.9
-40 ~ -20	-1.9	-1.8	-1.6	-1.6	-1.6	-1.5	-1.4	-1.2	-1.2	-1.0
-20 ~ 0	-2.0	-1.9	-1.8	-1.7	-1.7	-1.6	-1.4	-1.3	-1.3	-1.1
0 ~ 20	-2.1	-1.9	-1.8	-1.8	-1.8	-1.7	-1.6	-1.4	-1.4	-1.1
20 ~ 40	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.7	-1.4	-1.4	-1.2
40 ~ 60	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.6	-1.4	-1.4	-1.2
60 ~ 80	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.6	-1.4	-1.4	-1.1
80 ~ 100	-2.2	-2.0	-2.0	-2.0	-2.0	-1.9	-1.7	-1.5	-1.5	-1.2
100 ~ 120	-2.1	-2.0	-1.9	-1.9	-1.9	-1.8	-1.8	-1.4	-1.4	-1.1
120 ~ 140	-2.1	-2.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.4	-1.4	-1.1
140 ~ 160	-2.1	-2.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.4	-1.4	-1.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/265
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	328/264

Constants of dn/dt		
D_0	D_1	D_2
-7.71E-06	8.45E-09	-1.72E-11
E_0	E_1	λ_{TK}
2.67E-07	1.07E-10	2.75E-01

D-PK62	619639	$n_d = 1.61881$	$v_d = 63.85$	$n_F - n_C = 0.009691$
		$n_e = 1.62112$	$v_e = 63.55$	$n_F - n_C' = 0.009773$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.59157	$P_{d,C}$	0.3044	RC (S)	1	2400	0.960	0.921
n_{1970}	1970.09	1.59638	$P_{e,d}$	0.2384	RA (S)	2	2200	0.977	0.954
n_{1530}	1529.58	1.60165	$P_{g,F}$	0.5459	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.60637	$P'_{d,C'}$	0.2538	D_A	4	1800	0.995	0.990
n_{1064}	1064.00	1.60722	$P'_{e,d}$	0.2364	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.60793	$P'_{g,F'}$	0.4850	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.61065			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.61249	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61418					1000	0.999	0.998
n_C	656.27	1.61586					950	0.999	0.998
$n_{C'}$	643.85	1.61633					900	0.999	0.998
n_{He-Ne}	632.80	1.61676					850	0.999	0.998
n_D	589.29	1.61872	$\Delta P_{F,e}$	0.0022	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.61881	$\Delta P_{g,F}$	0.0083	-50/-40	90	750	0.999	0.998
n_e	546.07	1.62112	$\Delta P_{C,t}$	-0.0312	-40/-30	91	700	0.999	0.998
n_F	486.13	1.62555	$\Delta P_{C,s}$	-0.0160	-30/-20	92	650	0.999	0.998
$n_{F'}$	479.99	1.62610	Thermal Properties		-20/-10	92	600	0.999	0.998
n_g	435.84	1.63084	Tg ($^{\circ}C$)	519	-10/0	96	550	0.999	0.998
n_h	404.66	1.63522	Ts ($^{\circ}C$)	562	0/10	97	500	0.999	0.998
n_i	365.01	1.64265	$T_{10}^{14.5} (^{\circ}C)$	488	10/20	98	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	510	20/30	99	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	98	30/40	102	440	0.998	0.996
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	122	40/50	102	420	0.997	0.994
			λ (W/(m K))	0.63	50/60	102	400	0.996	0.992
			β_d	95	60/70	105	390	0.994	0.989
Constants of Dispersion Formula			Mechanical Properties		70/80	106	380	0.992	0.985
					80/90	106	370	0.989	0.978
					90/100	107	360	0.982	0.964
					100/110	110	350	0.969	0.939
					110/120	112	340	0.949	0.899
A_0	2.58101085E+00		E (GPa)	78.4	120/130	112	330	0.913	0.834
A_1	-9.35112569E-03		G (GPa)	29.6	130/140	114	320	0.862	0.743
A_2	1.43302338E-02		μ	0.326	140/150	117	310	0.792	0.627
A_3	8.87867497E-05		σ_b (MPa)	45	150/160	120	300	0.707	0.500
A_4	2.39962149E-05		B ($10^{-12}/Pa$)	1.12			290	0.607	0.368
A_5	-1.31422303E-06						280	0.480	0.230

Constants of Dispersion Formula	
A_0	2.58101085E+00
A_1	-9.35112569E-03
A_2	1.43302338E-02
A_3	8.87867497E-05
A_4	2.39962149E-05
A_5	-1.31422303E-06

Density		Solarization	
ρ (g/cm ³)	3.51	$\Delta\lambda$ (%)	-1.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-5.2	-5.1	-4.9	-4.8	-4.8	-4.7	-4.3	-4.1	-4.0	-3.6
-40 ~ -20	-5.0	-4.8	-4.6	-4.6	-4.5	-4.4	-4.0	-3.8	-3.7	-3.3
-20 ~ 0	-4.8	-4.7	-4.4	-4.4	-4.4	-4.3	-3.8	-3.6	-3.5	-3.1
0 ~ 20	-4.7	-4.5	-4.4	-4.4	-4.3	-4.1	-3.8	-3.4	-3.4	-2.9
20 ~ 40	-4.6	-4.4	-4.3	-4.3	-4.2	-4.0	-3.6	-3.3	-3.3	-2.9
40 ~ 60	-4.5	-4.4	-4.2	-4.2	-4.1	-4.0	-3.5	-3.1	-3.1	-2.8
60 ~ 80	-4.3	-4.2	-4.1	-4.1	-4.0	-3.9	-3.4	-3.0	-3.0	-2.8
80 ~ 100	-4.1	-4.1	-4.0	-4.0	-3.9	-3.8	-3.3	-2.8	-2.8	-2.6
100 ~ 120	-4.0	-4.0	-3.9	-3.8	-3.7	-3.6	-3.0	-2.7	-2.6	-2.4
120 ~ 140	-3.9	-3.8	-3.7	-3.6	-3.5	-3.4	-2.9	-2.5	-2.4	-2.3
140 ~ 160	-3.8	-3.6	-3.5	-3.4	-3.4	-3.3	-2.7	-2.3	-2.2	-2.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	345/265
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	326/269

Constants of dn/dt		
D_0	D_1	D_2
-1.33E-05	1.77E-08	-2.79E-11
E_0	E_1	λ_{TK}
6.44E-07	1.51E-10	2.16E-01

D-PK70	525703	$n_d = 1.52500$	$v_d = 70.32$	$n_F - n_C = 0.007470$
		$n_e = 1.52679$	$v_e = 70.11$	$n_F - n_C' = 0.007510$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance				
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm		
n ₂₃₂₅	2325.42	1.49842	P _{d,C}	0.3092	RC (S)	1	2400	0.655	0.429		
n ₁₉₇₀	1970.09	1.50393	P _{e,d}	0.2396	RA (S)	1	2200	0.743	0.552		
n ₁₅₃₀	1529.58	1.50979	P _{g,F}	0.5301	D _W	1	2000	0.852	0.727		
n ₁₁₂₉	1128.64	1.51461	P' _{d,c´}	0.2583	D _A	1	1800	0.918	0.843		
n ₁₀₆₄	1064.00	1.51542	P' _{e,d}	0.2383	R _{OH} (S)	3	1600	0.973	0.947		
n _t	1013.98	1.51607	P' _{g,F´}	0.4727	RP (S)	2	1400	0.999	0.998		
n _s	852.11	1.51845			CR		1200	0.999	0.998		
n _{A´}	768.19	1.51999					1060	0.999	0.998		
n _r	706.52	1.52136	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998		
n _C	656.27	1.52269					950	0.999	0.998		
n _{C´}	643.85	1.52306					900	0.999	0.998		
n _{He-Ne}	632.80	1.52341					850	0.999	0.998		
n _D	589.29	1.52493					800	0.999	0.998		
n _d	587.56	1.52500	ΔP _{F,e}	0.0011	°C	α	750	0.999	0.998		
n _e	546.07	1.52679	ΔP _{g,F}	0.0033	-50/-40	68	700	0.999	0.998		
n _F	486.13	1.53017	ΔP _{C,t}	0.0053	-40/-30	70	650	0.999	0.998		
n _{F´}	479.99	1.53058	ΔP _{C,s}	-0.0016	-30/-20	71	600	0.999	0.998		
n _g	435.84	1.53413	Thermal Properties		-20/-10	73	550	0.999	0.998		
n _h	404.66	1.53738			Tg (°C)	534	-10/0	74	500	0.999	0.998
n _i	365.01	1.54287			Ts (°C)	578	0/10	75	480	0.999	0.998
					T ₁₀ ^{14.5} (°C)	505	10/20	76	460	0.998	0.996
					T ₁₀ ¹³ (°C)	528	20/30	76	440	0.997	0.993
			α _{-50/80°C} (10 ⁻⁷ /K)	75	30/40	77					
			α _{100/300°C} (10 ⁻⁷ /K)	96	40/50	78					

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.0	0.4	0.7	0.7	0.8	0.9	1.1	1.3	1.3	1.6
-40 ~ -20	0.1	0.5	0.7	0.7	0.8	1.0	1.3	1.5	1.5	1.7
-20 ~ 0	0.2	0.5	0.7	0.7	0.9	1.1	1.3	1.6	1.7	1.9
0 ~ 20	0.2	0.6	0.8	0.8	0.9	1.1	1.4	1.7	1.8	2.1
20 ~ 40	0.3	0.8	0.9	0.9	1.0	1.2	1.6	1.8	2.0	2.3
40 ~ 60	0.4	0.8	1.0	1.0	1.1	1.3	1.7	2.0	2.1	2.5
60 ~ 80	0.5	0.9	1.1	1.1	1.2	1.5	1.8	2.1	2.3	2.6
80 ~ 100	0.5	0.9	1.2	1.3	1.3	1.6	1.9	2.3	2.4	2.8
100 ~ 120	0.6	1.0	1.3	1.4	1.5	1.9	2.1	2.4	2.6	2.9
120 ~ 140	0.8	1.1	1.4	1.5	1.6	2.1	2.2	2.6	2.8	3.2
140 ~ 160	0.9	1.2	1.5	1.6	1.7	2.2	2.4	2.7	2.8	3.3

D-ZK2N	587596	$n_d = 1.58700$	$v_d = 59.59$	$n_F - n_C = 0.009850$
		$n_e = 1.58935$	$v_e = 59.35$	$n_F - n_C' = 0.009930$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.55732	$P_{d,C}$	0.3056	RC (S)	1	2400	0.920	0.831
n_{1970}	1970.09	1.56289	$P_{e,d}$	0.2386	RA (S)	3	2200	0.962	0.909
n_{1530}	1529.58	1.56892	$P_{g,F}$	0.5421	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.57412	$P'_{d,c'}$	0.2538	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.57504	$P'_{e,d}$	0.2367	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.57579	$P'_{g,F'}$	0.4804	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.57863			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.58054	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58228					1000	0.999	0.998
n_C	656.27	1.58399					950	0.999	0.998
$n_{C'}$	643.85	1.58448					900	0.999	0.998
n_{He-Ne}	632.80	1.58492					850	0.999	0.998
n_D	589.29	1.58691	ΔP_{Fe}	-0.0015	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.58700	$\Delta P_{g,F}$	-0.0025	-50/-40	64	750	0.999	0.998
n_e	546.07	1.58935	$\Delta P_{C,t}$	0.0036	-40/-30	67	700	0.999	0.998
n_F	486.13	1.59384	$\Delta P_{C,s}$	0.0007	-30/-20	70	650	0.999	0.998
$n_{F'}$	479.99	1.59441	Thermal Properties		-20/-10	71	600	0.999	0.998
n_g	435.84	1.59918			-10/0	72	550	0.999	0.998
n_h	404.66	1.60364	Tg ($^{\circ}C$)	507	0/10	73	500	0.999	0.998
n_i	365.01	1.61145	Ts ($^{\circ}C$)	548	10/20	74	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	448	20/30	75	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	485	30/40	76	440	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	72	40/50	76	420	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	92	50/60	77	400	0.999	0.998
			λ (W/(m K))	1.09	60/70	77	390	0.999	0.998
			β_d	90	70/80	78	380	0.999	0.998
			Mechanical Properties		80/90	79	370	0.999	0.998
					90/100	79	360	0.999	0.998
			HK (10^7Pa)	570	100/110	80	350	0.999	0.998
			F_A	107	110/120	82	340	0.999	0.998
			E (GPa)	91.6	120/130	83	330	0.999	0.998
			G (GPa)	36.9	130/140	84	320	0.999	0.998
			μ	0.242	140/150	85	310	0.999	0.998
			σ_b (MPa)	82	150/160	86	300	0.999	0.998
			B ($10^{-12}/Pa$)	2.11			290	0.999	0.998
							280	0.999	0.998

Constants of Dispersion Formula	
A_0	2.48098765E+00
A_1	-1.07611097E-02
A_2	1.30595297E-02
A_3	5.70453194E-04
A_4	-6.87445031E-05
A_5	5.08145529E-06

Density		Solarization	
ρ (g/cm ³)	2.98	$\Delta\lambda$ (%)	-6.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.7	4.0	4.0	4.0	4.1	4.2	4.3	4.6	4.7	5.1
-40 ~ -20	3.7	4.0	4.1	4.1	4.1	4.3	4.4	4.7	4.7	5.1
-20 ~ 0	3.7	4.1	4.1	4.1	4.1	4.3	4.4	4.7	4.7	5.1
0 ~ 20	3.7	4.1	4.1	4.2	4.1	4.3	4.4	4.7	4.7	5.1
20 ~ 40	3.7	4.1	4.2	4.2	4.2	4.4	4.5	4.7	4.7	5.1
40 ~ 60	3.7	4.1	4.2	4.2	4.2	4.4	4.6	4.7	4.7	5.1
60 ~ 80	3.7	4.1	4.2	4.2	4.2	4.4	4.7	4.8	4.8	5.2
80 ~ 100	3.7	4.1	4.2	4.3	4.2	4.5	4.8	4.8	4.9	5.2
100 ~ 120	3.7	4.0	4.2	4.3	4.2	4.5	4.8	4.9	4.9	5.2
120 ~ 140	3.8	4.0	4.2	4.3	4.2	4.5	4.8	4.9	4.9	5.3
140 ~ 160	3.8	4.1	4.3	4.3	4.2	4.5	4.8	4.9	5.0	5.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	335/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	323/275

Constants of dn/dt		
D_0	D_1	D_2
4.43E-06	1.18E-08	-2.81E-11
E_0	E_1	λ_{TK}
4.55E-07	3.17E-10	1.75E-01

D-ZK3L	589613	$n_d = 1.58913$	$v_d = 61.25$	$n_F - n_C = 0.009619$
		$n_e = 1.59142$	$v_e = 61.03$	$n_F - n_C' = 0.009690$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.55682	$P_{d,C}$	0.3067	RC (S)	1	2400	0.805	0.648
n_{1970}	1970.09	1.56338	$P_{e,d}$	0.2381	RA (S)	3	2200	0.913	0.834
n_{1530}	1529.58	1.57035	$P_{g,F}$	0.5354	D_W	2	2000	0.988	0.976
n_{1129}	1128.64	1.57613	$P'_{d,c'}$	0.2559	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.57711	$P'_{e,d}$	0.2363	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.57790	$P'_{g,F'}$	0.4757	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.58083			CR	4c	1200	0.999	0.998
$n_{A'}$	768.19	1.58275	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58448					1000	0.999	0.998
n_C	656.27	1.58618					950	0.999	0.998
$n_{C'}$	643.85	1.58665					900	0.999	0.998
n_{He-Ne}	632.80	1.58709					850	0.999	0.998
n_D	589.29	1.58904	ΔP_{Fe}	-0.0010	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.58913	$\Delta P_{g,F}$	-0.0065	-50/-40	58	750	0.999	0.998
n_e	546.07	1.59142	$\Delta P_{C,t}$	0.0239	-40/-30	59	700	0.999	0.998
n_F	486.13	1.59580	$\Delta P_{C,s}$	0.0088	-30/-20	59	650	0.999	0.998
$n_{F'}$	479.99	1.59634	Thermal Properties		-20/-10	62	600	0.999	0.998
n_g	435.84	1.60095	$T_g (^{\circ}C)$	508	-10/0	63	550	0.999	0.998
n_h	404.66	1.60520	$T_s (^{\circ}C)$	544	0/10	65	500	0.999	0.998
n_i	365.01	1.61247	$T_{10}^{14.5} (^{\circ}C)$	444	10/20	67	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	465	20/30	67	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	66	30/40	70	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	89	40/50	70	420	0.999	0.998
			λ (W/(m K))	1.31	50/60	72	400	0.999	0.998
			β_d	100	60/70	73	390	0.995	0.989
			Mechanical Properties		70/80	75	380	0.993	0.984
					80/90	75	370	0.989	0.977
					90/100	76	360	0.980	0.962
					100/110	77	350	0.965	0.933
					110/120	79	340	0.937	0.880
			E (GPa)	98.3	120/130	80	330	0.892	0.794
			G (GPa)	39.3	130/140	83	320	0.815	0.664
			μ	0.250	140/150	83	310	0.705	0.498
			σ_b (MPa)	70	150/160	84	300	0.566	0.322
			B ($10^{-12}/Pa$)	2.12			290	0.417	0.176
							280	0.281	0.082

Constants of Dispersion Formula	
A_0	2.49074484E+00
A_1	-1.28107504E-02
A_2	1.19021712E-02
A_3	7.38866979E-04
A_4	-8.24332058E-05
A_5	4.70546661E-06

Density		Solarization	
ρ (g/cm ³)	2.79	$\Delta\lambda$ (%)	-2.5

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.7	3.8	4.0	4.0	4.1	4.1	4.3	4.8	4.8	5.0
-40 ~ -20	3.7	3.8	4.0	4.0	4.1	4.2	4.4	4.8	4.8	5.0
-20 ~ 0	3.7	3.8	4.0	4.1	4.1	4.2	4.4	4.8	4.8	5.0
0 ~ 20	3.7	3.8	4.0	4.1	4.2	4.2	4.4	4.8	4.8	5.0
20 ~ 40	3.7	3.8	4.1	4.1	4.2	4.2	4.4	4.8	4.9	5.0
40 ~ 60	3.7	3.8	4.2	4.2	4.3	4.3	4.4	4.8	4.9	5.0
60 ~ 80	3.7	3.8	4.2	4.3	4.3	4.3	4.4	4.8	5.0	5.0
80 ~ 100	3.8	3.8	4.2	4.3	4.3	4.3	4.4	4.8	5.0	5.1
100 ~ 120	3.8	3.8	4.2	4.3	4.3	4.4	4.5	4.8	5.0	5.1
120 ~ 140	3.8	3.9	4.3	4.3	4.3	4.4	4.5	4.8	5.0	5.1
140 ~ 160	3.8	3.9	4.3	4.3	4.4	4.4	4.5	4.8	5.0	5.1

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	331/275

Constants of dn/dt		
D_0	D_1	D_2
4.03E-06	1.27E-08	-2.83E-11
E_0	E_1	λ_{TK}
6.09E-07	-8.90E-12	3.02E-08

D-ZK3L-M90	588610	$n_d = 1.58831$	$v_d = 61.02$	$n_F - n_C = 0.009640$
		$n_e = 1.59061$	$v_e = 60.81$	$n_F - n_C' = 0.009710$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42		$P_{d,C}$	0.3071	RC (S)	2	2400	0.884	0.781
n_{1970}	1970.09		$P_{e,d}$	0.2386	RA (S)	2	2200	0.955	0.911
n_{1530}	1529.58		$P_{g,F}$	0.5384	D_W	2	2000	0.987	0.974
n_{1129}	1128.64	1.57541	$P'_{d,c'}$	0.2564	D_A	3	1800	0.993	0.986
n_{1064}	1064.00	1.57635	$P'_{e,d}$	0.2369	$R_{OH}(S)$	2	1600	0.997	0.995
n_t	1013.98	1.57712	$P'_{g,F'}$	0.4768	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.58001			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.58193	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.58365					1000	0.999	0.998
n_C	656.27	1.58535					950	0.999	0.998
$n_{C'}$	643.85	1.58582					900	0.999	0.998
n_{He-Ne}	632.80	1.58627					850	0.999	0.998
n_D	589.29	1.58823	ΔP_{Fe}	-0.0022	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.58831	$\Delta P_{g,F}$	-0.0039	-50/-40	60	750	0.999	0.998
n_e	546.07	1.59061	$\Delta P_{C,t}$	0.0179	-40/-30	65	700	0.999	0.998
n_F	486.13	1.59499	$\Delta P_{C,s}$	0.0071	-30/-20	67	650	0.999	0.998
$n_{F'}$	479.99	1.59555	Thermal Properties		-20/-10	68	600	0.999	0.998
n_g	435.84	1.60018	Tg ($^{\circ}C$)	514	-10/0	72	550	0.999	0.998
n_h	404.66	1.60446	Ts ($^{\circ}C$)	546	0/10	73	500	0.999	0.998
n_i	365.01	1.61171	$T_{10}^{14.5} (^{\circ}C)$	474	10/20	73	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	502	20/30	75	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	73	30/40	77	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	96	40/50	79	420	0.999	0.998
			λ (W/(m K))	1.19	50/60	79	400	0.998	0.996
			β_d	100	60/70	81	390	0.997	0.994
			Mechanical Properties		70/80	82	380	0.995	0.991
			HK ($10^7 Pa$)	606	80/90	84	370	0.994	0.988
			F_A	103	90/100	84	360	0.986	0.973
			E (GPa)	99.1	100/110	86	350	0.975	0.951
			G (GPa)	38.8	110/120	86	340	0.953	0.908
			μ	0.278	120/130	89	330	0.914	0.836
			σ_b (MPa)	141	130/140	89	320	0.847	0.717
			B ($10^{-12}/Pa$)	2.14	140/150	91	310	0.738	0.545
					150/160	94	300	0.597	0.356

Constants of Dispersion Formula	
A_0	2.48520640E+00
A_1	-1.11940698E-02
A_2	1.38766236E-02
A_3	1.12540137E-04
A_4	1.15205458E-05
A_5	-4.63440822E-07

Density		Solarization	
ρ (g/cm ³)	2.80	$\Delta\lambda$ (%)	-2.2

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.8	2.2	2.2	2.3	2.4	2.6	2.7	2.9	2.9	3.1
-40 ~ -20	1.8	2.2	2.2	2.3	2.5	2.7	2.7	3.0	3.1	3.2
-20 ~ 0	1.9	2.3	2.4	2.5	2.6	2.9	3.0	3.1	3.2	3.3
0 ~ 20	2.0	2.4	2.5	2.6	2.7	2.9	3.1	3.2	3.2	3.5
20 ~ 40	2.1	2.5	2.7	2.8	2.9	3.0	3.2	3.3	3.4	3.7
40 ~ 60	2.3	2.7	2.8	2.8	3.0	3.2	3.4	3.5	3.6	3.9
60 ~ 80	2.3	2.8	3.0	3.0	3.1	3.4	3.5	3.7	3.8	4.2
80 ~ 100	2.3	2.8	3.2	3.2	3.3	3.6	3.7	3.9	4.0	4.3
100 ~ 120	2.4	3.0	3.3	3.3	3.4	3.7	3.9	4.0	4.1	4.5
120 ~ 140	2.5	3.2	3.4	3.5	3.6	3.8	4.0	4.1	4.2	4.6
140 ~ 160	2.6	3.3	3.5	3.6	3.8	3.9	4.1	4.3	4.4	4.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	340/275
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	327/275

Constants of dn/dt		
D_0	D_1	D_2
8.95E-07	1.58E-08	-2.51E-11
E_0	E_1	λ_{TK}
6.76E-07	8.92E-10	8.04E-09

D-ZK50	609579	$n_d = 1.60886$	$v_d = 57.90$	$n_F - n_C = 0.010516$
		$n_e = 1.61136$	$v_e = 57.70$	$n_F - n_C' = 0.010595$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.57477	$P_{d,C}$	0.3052	RC (S)	1	2400	0.780	0.608
n_{1970}	1970.09	1.58152	$P_{e,d}$	0.2377	RA (S)	3	2200	0.903	0.815
n_{1530}	1529.58	1.58874	$P_{g,F}$	0.5401	D_W	2	2000	0.987	0.974
n_{1129}	1128.64	1.59482	$P'_{d,c'}$	0.2548	D_A	3	1800	0.995	0.990
n_{1064}	1064.00	1.59586	$P'_{e,d}$	0.2360	$R_{OH}(S)$	2	1600	0.999	0.998
n_t	1013.98	1.59671	$P'_{g,F'}$	0.4795	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.59986			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.60194	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.60380					1000	0.999	0.998
n_C	656.27	1.60565					950	0.999	0.998
$n_{C'}$	643.85	1.60616					900	0.999	0.998
n_{He-Ne}	632.80	1.60664					850	0.999	0.998
n_D	589.29	1.60876	$\Delta P_{F,e}$	-0.0018	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.60886	$\Delta P_{g,F}$	-0.0073	-50/-40	58	750	0.999	0.998
n_e	546.07	1.61136	$\Delta P_{C,t}$	0.0294	-40/-30	61	700	0.999	0.998
n_F	486.13	1.61616	$\Delta P_{C,s}$	0.0112	-30/-20	64	650	0.999	0.998
$n_{F'}$	479.99	1.61676	Thermal Properties		-20/-10	65	600	0.999	0.998
n_g	435.84	1.62184	$T_g (^{\circ}C)$	505	-10/0	67	550	0.999	0.998
n_h	404.66	1.62655	$T_s (^{\circ}C)$	541	0/10	69	500	0.999	0.998
n_i	365.01	1.63460	$T_{10}^{14.5} (^{\circ}C)$	458	10/20	70	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	476	20/30	72	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	70	30/40	74	440	0.999	0.998
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	87	40/50	75	420	0.998	0.996
			λ (W/(m K))	1.18	50/60	76	400	0.997	0.994
			β_d	100	60/70	77	390	0.996	0.992
			Mechanical Properties		70/80	77	380	0.994	0.988
			HK (10^7 Pa)	669	80/90	78	370	0.989	0.978
			F_A	106	90/100	79	360	0.974	0.952
			E (GPa)	103.1	100/110	81	350	0.955	0.915
			G (GPa)	40.6	110/120	82	340	0.919	0.848
			μ	0.269	120/130	84	330	0.855	0.733
			σ_b (MPa)	90	130/140	85	320	0.740	0.548
			B (10^{-12} /Pa)	2.34	140/150	87	310	0.535	0.287
					150/160	88	300	0.230	0.054

Constants of Dispersion Formula	
A_0	2.54913552E+00
A_1	-1.32831855E-02
A_2	1.39362205E-02
A_3	4.99307363E-04
A_4	-3.36145332E-05
A_5	1.90094032E-06

Density		Solarization	
ρ (g/cm ³)	2.83	$\Delta\lambda$ (%)	0.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	0.9	1.1	1.2	1.2	1.3	1.6	1.7	1.9	1.9	2.1
-40 ~ -20	1.2	1.4	1.5	1.5	1.6	1.9	2.1	2.2	2.2	2.4
-20 ~ 0	2.0	2.1	2.2	2.2	2.3	2.4	2.6	2.7	2.7	3.4
0 ~ 20	2.1	2.4	2.4	2.4	2.4	2.5	2.7	2.9	3.0	3.6
20 ~ 40	2.1	2.4	2.5	2.5	2.5	2.7	2.9	3.2	3.2	3.8
40 ~ 60	2.3	2.6	2.6	2.6	2.6	2.8	3.0	3.4	3.5	4.0
60 ~ 80	2.3	2.7	2.7	2.7	2.8	2.9	3.1	3.5	3.5	4.0
80 ~ 100	2.4	2.8	2.9	2.9	3.0	3.1	3.2	3.7	3.7	4.2
100 ~ 120	2.4	2.9	3.0	3.1	3.1	3.2	3.3	3.8	3.8	4.3
120 ~ 140	2.5	3.0	3.1	3.2	3.2	3.3	3.4	3.9	3.9	4.4
140 ~ 160	2.6	3.1	3.2	3.3	3.3	3.4	3.5	3.9	4.0	4.5

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/305
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	337/300

Constants of dn/dt		
D_0	D_1	D_2
7.83E-07	2.24E-08	-6.10E-11
E_0	E_1	λ_{TK}
3.51E-07	3.25E-10	2.79E-01

D-LaK6	694532	$n_d = 1.69350$	$v_d = 53.20$	$n_F - n_C = 0.013036$
		$n_e = 1.69661$	$v_e = 52.97$	$n_F - n_C' = 0.013152$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.65586	$P_{d,C}$	0.3030	RC (S)	1	2400	0.834	0.696
n_{1970}	1970.09	1.66278	$P_{e,d}$	0.2386	RA (S)	3	2200	0.962	0.926
n_{1530}	1529.58	1.67028	$P_{g,F}$	0.5485	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.67683	$P'_{d,c'}$	0.2532	D_A	3	1800	0.997	0.994
n_{1064}	1064.00	1.67799	$P'_{e,d}$	0.2365	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.67895	$P'_{g,F'}$	0.4866	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.68259			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.68506	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.68731					1000	0.999	0.998
n_C	656.27	1.68955					950	0.999	0.998
$n_{C'}$	643.85	1.69017					900	0.999	0.998
n_{He-Ne}	632.80	1.69076					850	0.999	0.998
n_D	589.29	1.69338	$\Delta P_{F,e}$	-0.0029	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.69350	$\Delta P_{g,F}$	-0.0068	-50/-40	60	750	0.999	0.998
n_e	546.07	1.69661	$\Delta P_{C,t}$	0.0152	-40/-30	61	700	0.999	0.998
n_F	486.13	1.70258	$\Delta P_{C,s}$	0.0058	-30/-20	63	650	0.999	0.998
$n_{F'}$	479.99	1.70333	Thermal Properties		-20/-10	65	600	0.999	0.998
n_g	435.84	1.70973	Tg ($^{\circ}C$)	532	-10/0	66	550	0.999	0.998
n_h	404.66	1.71570	Ts ($^{\circ}C$)	570	0/10	67	500	0.999	0.998
n_i	365.01	1.72593	$T_{10}^{14.5} (^{\circ}C)$	481	10/20	67	480	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	516	20/30	68	460	0.999	0.998
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	68	30/40	69	440	0.998	0.996
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	89	40/50	70	420	0.997	0.994
			λ (W/(m K))	1.08	50/60	70	400	0.996	0.992
			β_d	130	60/70	71	390	0.995	0.990
Constants of Dispersion Formula			Mechanical Properties		70/80	72	380	0.993	0.985
					80/90	73	370	0.990	0.973
					90/100	74	360	0.976	0.943
					100/110	76	350	0.958	0.907
					110/120	77	340	0.927	0.847
A_0	2.81505089E+00		HK (10^7Pa)	642	120/130	79	330	0.879	0.758
A_1	-1.41604226E-02		F_A	107	130/140	80	320	0.810	0.640
A_2	1.82673200E-02		E (GPa)	113.9	140/150	82	310	0.707	0.482
A_3	6.74961616E-04		G (GPa)	44.7	150/160	83	300	0.557	0.296
A_4	-4.03278304E-05		μ	0.273			290	0.298	0.082
A_5	2.39186650E-06		σ_b (MPa)	75			280	0.058	0.013

Density		Solarization	
ρ (g/cm ³)	3.50	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.9	4.4	4.4	4.5	4.6	4.7	4.9	5.2	5.3	5.8
-40 ~ -20	4.0	4.5	4.5	4.6	4.6	4.7	5.0	5.3	5.4	5.8
-20 ~ 0	4.0	4.5	4.6	4.6	4.7	4.7	5.0	5.4	5.5	5.9
0 ~ 20	4.0	4.6	4.5	4.6	4.7	4.7	5.1	5.4	5.5	5.9
20 ~ 40	3.9	4.5	4.5	4.6	4.7	4.7	5.1	5.5	5.6	6.0
40 ~ 60	4.1	4.5	4.6	4.7	4.7	4.8	5.1	5.6	5.6	6.0
60 ~ 80	4.1	4.6	4.7	4.7	4.7	4.9	5.2	5.7	5.8	6.2
80 ~ 100	4.1	4.6	4.7	4.8	4.8	4.9	5.3	5.9	5.9	6.4
100 ~ 120	4.1	4.7	4.7	4.8	4.8	4.9	5.4	5.9	6.0	6.6
120 ~ 140	4.1	4.7	4.8	4.8	4.8	5.0	5.4	6.0	6.0	6.7
140 ~ 160	4.2	4.7	4.8	4.8	4.8	5.0	5.5	6.1	6.1	6.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	355/290
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	336/288

Constants of dn/dt		
D_0	D_1	D_2
4.28E-06	1.09E-08	-2.48E-11
E_0	E_1	λ_{TK}
4.38E-07	5.64E-10	2.59E-01

D-ZF10	689311	$n_d = 1.68893$	$v_d = 31.08$	$n_F - n_C = 0.022169$
		$n_e = 1.69417$	$v_e = 30.85$	$n_F - n_C' = 0.022498$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.64356	$P_{d,C}$	0.2905	RC (S)	1	2400	0.927	0.841
n_{1970}	1970.09	1.64994	$P_{e,d}$	0.2364	RA (S)	1	2200	0.972	0.927
n_{1530}	1529.58	1.65720	$P_{g,F}$	0.5950	D_W	1	2000	0.992	0.977
n_{1129}	1128.64	1.66435	$P'_{d,C}$	0.2414	D_A	1	1800	0.999	0.991
n_{1064}	1064.00	1.66578	$P'_{e,d}$	0.2329	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.66698	$P'_{g,F}$	0.5267	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.67192			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.67552	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.67896					1000	0.999	0.998
n_C	656.27	1.68249					950	0.999	0.998
$n_{C'}$	643.85	1.68350					900	0.999	0.998
n_{He-Ne}	632.80	1.68445					850	0.999	0.998
n_D	589.29	1.68875	$\Delta P_{F,e}$	0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.68893	$\Delta P_{g,F}$	0.0030	-50/-40	64	750	0.999	0.998
n_e	546.07	1.69417	$\Delta P_{C,t}$	0.0089	-40/-30	71	700	0.999	0.998
n_F	486.13	1.70466	$\Delta P_{C,s}$	0.0018	-30/-20	74	650	0.999	0.998
$n_{F'}$	479.99	1.70600	Thermal Properties		-20/-10	78	600	0.999	0.998
n_g	435.84	1.71785			-10/0	81	550	0.999	0.998
n_h	404.66	1.72959	Tg ($^{\circ}C$)	490	0/10	84	500	0.999	0.995
n_i	365.01	1.75178	Ts ($^{\circ}C$)	527	10/20	86	480	0.997	0.990
			$T_{10}^{14.5} (^{\circ}C)$	432	20/30	89	460	0.994	0.982
			$T_{10}^{13} (^{\circ}C)$	473	30/40	92	440	0.989	0.976
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	93	40/50	94	420	0.982	0.962
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	121	50/60	96	400	0.961	0.926
			λ (W/(m K))	1.20	60/70	97	390	0.944	0.889
			β_d	200	70/80	98	380	0.900	0.806
			Mechanical Properties		80/90	99	370	0.771	0.589
					90/100	101	360	0.419	0.180
			HK (10^7Pa)	539	100/110	104	350		
			F_A	146	110/120	106	340		
			E (GPa)	90.4	120/130	109	330		
			G (GPa)	35.4	130/140	112	320		
			μ	0.276	140/150	115	310		
			σ_b (MPa)	74	150/160	117	300		
			B ($10^{-12}/Pa$)	2.95			290		
							280		

Constants of Dispersion Formula	
A_0	2.76366083E+00
A_1	-1.24616807E-02
A_2	2.66401782E-02
A_3	2.38393825E-03
A_4	-2.27557760E-04
A_5	2.16448822E-05

Density		Solarization	
ρ (g/cm ³)	2.86	$\Delta\lambda$ (%)	-1.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.6	-0.3	0.0	0.0	0.1	0.4	0.8	1.0	1.1	1.8
-40 ~ -20	-0.6	-0.2	0.1	0.2	0.3	0.6	1.2	1.3	1.4	2.3
-20 ~ 0	-0.4	-0.1	0.3	0.4	0.4	0.8	1.5	1.8	1.8	2.7
0 ~ 20	-0.3	0.1	0.5	0.6	0.6	0.9	1.6	2.2	2.2	3.1
20 ~ 40	-0.4	0.1	0.6	0.7	0.8	1.0	1.6	2.4	2.4	3.7
40 ~ 60	-0.5	0.3	0.6	0.7	0.8	1.1	1.5	2.6	2.7	3.9
60 ~ 80	-0.6	0.3	0.6	0.6	0.7	1.0	1.5	2.8	2.8	4.1
80 ~ 100	-0.6	0.3	0.6	0.6	0.8	1.1	1.6	2.8	2.9	4.2
100 ~ 120	-0.6	0.3	0.6	0.6	0.8	1.2	1.7	3.0	3.1	4.4
120 ~ 140	-0.5	0.3	0.7	0.7	0.9	1.4	1.9	3.2	3.2	4.7
140 ~ 160	-0.3	0.3	0.9	0.9	1.0	1.7	2.2	3.5	3.6	5.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	400/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	380/358

Constants of dn/dt		
D_0	D_1	D_2
-4.48E-06	1.06E-08	-3.94E-11
E_0	E_1	λ_{TK}
9.15E-07	1.82E-09	2.55E-01

D-ZF10A	689311	$n_d = 1.68893$	$v_d = 31.08$	$n_F - n_C = 0.022169$
		$n_e = 1.69417$	$v_e = 30.85$	$n_F - n_C' = 0.022498$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	τ_{5mm}	τ_{10mm}
n_{2325}	2325.42		$P_{d,C}$	0.2905	RC (S)	1	2400	0.968	0.937
n_{1970}	1970.09		$P_{e,d}$	0.2364	RA (S)	1	2200	0.976	0.952
n_{1530}	1529.58		$P_{g,F}$	0.5995	D_W	1	2000	0.987	0.974
n_{1129}	1128.64	1.66447	$P'_{d,c}$	0.2414	D_A	1	1800	0.992	0.984
n_{1064}	1064.00	1.66585	$P'_{e,d}$	0.2329	$R_{OH}(S)$	1	1600	0.998	0.995
n_t	1013.98	1.66704	$P'_{g,F}$	0.5312	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.67193			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.67553	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.67895					1000	0.999	0.998
n_C	656.27	1.68249					950	0.999	0.998
$n_{C'}$	643.85	1.68350					900	0.999	0.998
n_{He-Ne}	632.80	1.68444					850	0.999	0.998
n_D	589.29	1.68874	$\Delta P_{F,e}$	0.0001	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.68893	$\Delta P_{g,F}$	0.0075	-50/-40	88	750	0.999	0.998
n_e	546.07	1.69417	$\Delta P_{C,t}$	0.0062	-40/-30	90	700	0.998	0.997
n_F	486.13	1.70466	$\Delta P_{C,s}$	0.0013	-30/-20	94	650	0.998	0.997
$n_{F'}$	479.99	1.70600	Thermal Properties		-20/-10	93	600	0.998	0.997
n_g	435.84	1.71795			-10/0	96	550	0.998	0.996
n_h	404.66	1.72975	Tg ($^{\circ}C$)	510	0/10	98	500	0.996	0.992
n_i	365.01	1.75193	Ts ($^{\circ}C$)	547	10/20	96	480	0.995	0.990
			$T_{10}^{14.5} (^{\circ}C)$	462	20/30	101	460	0.993	0.986
			$T_{10}^{13} (^{\circ}C)$	490	30/40	96	440	0.990	0.980
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	98	40/50	101	420	0.984	0.968
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	129	50/60	104	400	0.964	0.929
			λ (W/(m K))	1.14	60/70	109	390	0.939	0.881
			β_d	195	70/80	111	380	0.880	0.774
			Mechanical Properties		80/90	110	370	0.724	0.524
					90/100	108	360	0.387	0.150
					100/110	113	350		
					110/120	119	340		
					120/130	125	330		
			μ	0.260	130/140	128	320		
			σ_b (MPa)	101	140/150	128	310		
			B ($10^{-12}/Pa$)	2.92	150/160	123	300		

Constants of Dispersion Formula	
A_0	2.76027780E+00
A_1	-1.06941385E-02
A_2	2.92240616E-02
A_3	1.44064372E-03
A_4	-7.09323241E-05
A_5	1.25693927E-05

Density		Solarization	
ρ (g/cm ³)	2.90	$\triangle \lambda$ (%)	-0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.7	-0.5	-0.4	-0.3	-0.1	0.0	0.5	0.9	1.1	2.0
-40 ~ -20	-0.6	-0.4	-0.3	-0.1	0.0	0.3	0.7	1.1	1.2	2.1
-20 ~ 0	-0.6	-0.3	-0.2	0.0	0.1	0.4	0.7	1.2	1.3	2.3
0 ~ 20	-0.5	-0.3	-0.1	0.1	0.3	0.6	0.9	1.3	1.5	2.5
20 ~ 40	-0.4	-0.2	-0.1	0.2	0.3	0.7	1.1	1.4	1.5	2.6
40 ~ 60	-0.3	0.0	0.2	0.3	0.5	0.8	1.2	1.6	1.7	2.9
60 ~ 80	-0.3	0.1	0.4	0.5	0.8	1.2	1.5	1.7	1.9	3.2
80 ~ 100	-0.3	0.2	0.5	0.6	0.9	1.5	1.8	1.9	2.0	3.4
100 ~ 120	-0.1	0.3	0.6	0.8	1.0	1.7	2.0	2.1	2.2	3.8
120 ~ 140	0.0	0.5	0.8	1.0	1.3	1.9	2.1	2.3	2.5	4.2
140 ~ 160	0.1	0.6	1.0	1.2	1.5	2.0	2.3	2.6	2.8	4.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	400/360
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	382/355

Constants of dn/dt		
D_0	D_1	D_2
-4.60E-06	1.48E-08	-1.77E-11
E_0	E_1	λ_{TK}
7.06E-07	6.24E-10	2.74E-01

D-ZF52N	847238	$n_d = 1.84666$	$v_d = 23.78$	$n_F - n_C = 0.035608$
		$n_e = 1.85504$	$v_e = 23.59$	$n_F - n_C' = 0.036247$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.78377	$P_{d,C}$	0.2859	RC (S)	1	2400	0.885	0.784
n_{1970}	1970.09	1.79100	$P_{e,d}$	0.2353	RA (S)	1	2200	0.942	0.887
n_{1530}	1529.58	1.79963	$P_{g,F}$	0.6237	D_W	1	2000	0.973	0.947
n_{1129}	1128.64	1.80906	$P'_{d,c'}$	0.2373	D_A	1	1800	0.985	0.971
n_{1064}	1064.00	1.81108	$P'_{e,d}$	0.2312	$R_{OH}(S)$	1	1600	0.993	0.986
n_t	1013.98	1.81281	$P'_{g,F'}$	0.5515	RP (S)	2	1400	0.998	0.996
n_s	852.11	1.82015			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.82565	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.83096					1000	0.998	0.996
n_C	656.27	1.83648					950	0.998	0.996
$n_{C'}$	643.85	1.83806					900	0.998	0.996
n_{He-Ne}	632.80	1.83955					850	0.998	0.996
n_D	589.29	1.84635	$\Delta P_{F,e}$	0.0018	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.84666	$\Delta P_{g,F}$	0.0196	-50/-40	72	750	0.998	0.996
n_e	546.07	1.85504	$\Delta P_{C,t}$	0.0094	-40/-30	75	700	0.998	0.996
n_F	486.13	1.87209	$\Delta P_{C,s}$	0.0011	-30/-20	76	650	0.998	0.996
$n_{F'}$	479.99	1.87431	Thermal Properties		-20/-10	78	600	0.996	0.992
n_g	435.84	1.89430	Tg ($^{\circ}C$)	556	-10/0	79	550	0.992	0.985
n_h	404.66	1.91469	Ts ($^{\circ}C$)	600	0/10	80	500	0.984	0.967
n_i	365.01	1.95467	$T_{10}^{14.5} (^{\circ}C)$	520	10/20	81	480	0.978	0.956
			$T_{10}^{13} (^{\circ}C)$	546	20/30	82	460	0.968	0.937
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	82	30/40	84	440	0.951	0.904
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	103	40/50	85	420	0.917	0.841
			λ (W/(m K))	1.31	50/60	86	400	0.849	0.721
			β_d	260	60/70	87	390	0.779	0.607
			Mechanical Properties		70/80	88	380	0.623	0.388
					80/90	89	370	0.327	0.107
					90/100	91	360		
					100/110	93	350		
					110/120	94	340		
			E (GPa)	109.2	120/130	96	330		
			G (GPa)	42.7	130/140	97	320		
			μ	0.278	140/150	99	310		
			σ_b (MPa)	119	150/160	101	300		
			B ($10^{-12}/Pa$)	2.64			290		
							280		

Constants of Dispersion Formula	
A_0	3.25154745E+00
A_1	-1.45603806E-02
A_2	4.82406088E-02
A_3	3.12705995E-03
A_4	-2.06388870E-04
A_5	3.78595910E-05

Density		Solarization	
ρ (g/cm ³)	3.36	$\Delta\lambda$ (%)	-0.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	-0.4	-0.1	0.2	0.3	0.5	0.7	1.0	1.3	1.6	2.2
-40 ~ -20	-0.1	0.2	0.5	0.6	0.7	1.1	1.2	1.6	1.8	2.6
-20 ~ 0	0.3	0.5	0.7	0.8	0.9	1.3	1.7	1.9	2.0	3.0
0 ~ 20	0.5	0.8	0.9	1.0	1.1	1.7	2.0	2.2	2.3	3.4
20 ~ 40	0.6	0.9	1.1	1.2	1.2	1.7	2.4	2.6	2.8	3.8
40 ~ 60	0.7	1.1	1.3	1.4	1.5	1.9	2.7	2.9	3.2	4.3
60 ~ 80	0.8	1.1	1.3	1.4	1.6	2.1	2.8	3.2	3.4	4.6
80 ~ 100	1.1	1.4	1.6	1.7	1.9	2.3	3.0	3.5	3.7	4.8
100 ~ 120	1.2	1.5	1.8	2.0	2.2	2.4	3.1	3.6	3.8	4.9
120 ~ 140	1.4	1.7	2.0	2.2	2.5	2.7	3.5	3.9	4.0	5.2
140 ~ 160	1.5	2.0	2.2	2.4	2.7	2.9	3.7	4.0	4.2	5.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(420)/370
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	412/368

Constants of dn/dt		
D_0	D_1	D_2
-2.62E-06	1.68E-08	-3.23E-11
E_0	E_1	λ_{TK}
6.36E-07	7.31E-10	2.58E-01

D-LaF050	768492	$n_d = 1.76802$	$v_d = 49.24$	$n_F - n_C = 0.015597$
		$n_e = 1.77173$	$v_e = 49.00$	$n_F - n_C' = 0.015749$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.72707	$P_{d,C}$	0.3020	RC (S)	1	2400	0.820	0.672
n_{1970}	1970.09	1.73403	$P_{e,d}$	0.2379	RA (S)	3	2200	0.952	0.906
n_{1530}	1529.58	1.74170	$P_{g,F}$	0.5527	D_W	1	2000	0.978	0.956
n_{1129}	1128.64	1.74866	$P'_{d,c'}$	0.2514	D_A	3	1800	0.989	0.978
n_{1064}	1064.00	1.74994	$P'_{e,d}$	0.2356	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.75101	$P'_{g,F'}$	0.4908	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.75515			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.75802	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.76066					1000	0.999	0.998
n_C	656.27	1.76331					950	0.999	0.998
$n_{C'}$	643.85	1.76406					900	0.999	0.998
n_{He-Ne}	632.80	1.76475					850	0.999	0.998
n_D	589.29	1.76787	$\Delta P_{F,e}$	-0.0027	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.76802	$\Delta P_{g,F}$	-0.0091	-50/-40	58	750	0.999	0.998
n_e	546.07	1.77173	$\Delta P_{C,t}$	0.0099	-40/-30	59	700	0.999	0.998
n_F	486.13	1.77891	$\Delta P_{C,s}$	0.0046	-30/-20	60	650	0.999	0.998
$n_{F'}$	479.99	1.77980	Thermal Properties		-20/-10	61	600	0.999	0.998
n_g	435.84	1.78753	Tg ($^{\circ}C$)	615	-10/0	62	550	0.999	0.998
n_h	404.66	1.79475	Ts ($^{\circ}C$)	640	0/10	62	500	0.999	0.998
n_i	365.01	1.80718	$T_{10}^{14.5} (^{\circ}C)$	512	10/20	62	480	0.998	0.996
			$T_{10}^{13} (^{\circ}C)$	549	20/30	63	460	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	62	30/40	63	440	0.996	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	75	40/50	63	420	0.994	0.989
			λ (W/(m K))	0.79	50/60	64	400	0.992	0.984
			β_d	147	60/70	64	390	0.989	0.978
Constants of Dispersion Formula			Mechanical Properties		70/80	65	380	0.984	0.968
					80/90	66	370	0.975	0.951
					90/100	66	360	0.960	0.922
					100/110	67	350	0.938	0.879
					110/120	68	340	0.904	0.818
A_0	3.05764396E+00		E (GPa)	112.7	120/130	69	330	0.858	0.736
A_1	-1.46517743E-02		G (GPa)	43.1	130/140	71	320	0.796	0.634
A_2	2.34463123E-02		μ	0.306	140/150	72	310	0.629	0.396
A_3	7.01742420E-04		σ_b (MPa)	92	150/160	73	300	0.632	0.400
A_4	-2.73402326E-05		B ($10^{-12}/Pa$)	1.81			290	0.552	0.305
A_5	1.97166425E-06						280	0.381	0.145

Constants of Dispersion Formula	
A_0	3.05764396E+00
A_1	-1.46517743E-02
A_2	2.34463123E-02
A_3	7.01742420E-04
A_4	-2.73402326E-05
A_5	1.97166425E-06

Density		Solarization	
ρ (g/cm ³)	4.56	$\Delta\lambda$ (%)	-2.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.9	3.2	3.3	3.4	3.5	3.7	4.0	4.3	4.3	4.5
-40 ~ -20	3.0	3.2	3.3	3.4	3.5	3.8	4.1	4.4	4.4	4.8
-20 ~ 0	3.0	3.2	3.4	3.5	3.6	3.9	4.3	4.5	4.6	4.8
0 ~ 20	3.0	3.3	3.5	3.6	3.7	4.1	4.4	4.6	4.7	4.9
20 ~ 40	3.0	3.3	3.5	3.7	3.8	4.2	4.5	4.7	4.8	5.1
40 ~ 60	3.1	3.4	3.6	3.8	4.0	4.3	4.7	4.9	5.0	5.3
60 ~ 80	3.2	3.6	3.7	3.8	4.0	4.4	4.8	5.2	5.2	5.6
80 ~ 100	3.2	3.7	3.8	3.9	4.1	4.6	4.9	5.4	5.4	5.8
100 ~ 120	3.2	3.8	3.9	4.0	4.2	4.7	5.1	5.6	5.6	6.0
120 ~ 140	3.2	3.9	4.0	4.0	4.3	4.8	5.3	5.7	5.7	6.2
140 ~ 160	3.2	4.0	4.1	4.1	4.5	4.9	5.4	5.8	5.8	6.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	360/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	340/277

Constants of dn/dt		
D_0	D_1	D_2
1.61E-06	1.06E-08	-2.28E-11
E_0	E_1	λ_{TK}
7.75E-07	1.44E-09	3.04E-08

D-LaF50	773495	$n_d = 1.77250$	$v_d = 49.50$	$n_F - n_C = 0.015605$
		$n_e = 1.77622$	$v_e = 49.26$	$n_F - n_C' = 0.015757$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance							
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm					
n ₂₃₂₅	2325.42	1.73130	P _{d,C}	0.3018	RC (S)	1	2400	0.820	0.674					
n ₁₉₇₀	1970.09	1.73834	P _{e,d}	0.2384	RA (S)	3	2200	0.955	0.914					
n ₁₅₃₀	1529.58	1.74608	P _{g,F}	0.5537	D _W	1	2000	0.989	0.978					
n ₁₁₂₉	1128.64	1.75309	P' _{d,c}	0.2513	D _A	3	1800	0.997	0.994					
n ₁₀₆₄	1064.00	1.75438	P' _{e,d}	0.2361	R _{OH} (S)	1	1600	0.999	0.998					
n _t	1013.98	1.75545	P' _{g,F}	0.4912	RP (S)	2	1400	0.999	0.998					
n _s	852.11	1.75961			CR		1200	0.999	0.998					
n _A	768.19	1.76248	Deviation of Relative Partial Dispersions			Expansion Coefficient α (×10 ⁻⁷ /K)		1060	0.999	0.998				
n _r	706.52	1.76513								1000	0.999	0.998		
n _C	656.27	1.76779						ΔP _{F,e}	-0.0028			950	0.999	0.998
n _C	643.85	1.76854						ΔP _{g,F}	-0.0077	°C	α	900	0.999	0.998
n _{He-Ne}	632.80	1.76923						ΔP _{C,t}	0.0108	-50/-40	58	850	0.999	0.998
n _D	589.29	1.77236	ΔP _{C,s}	0.0050	-40/-30	60	800	0.999	0.998					
n _d	587.56	1.77250	Thermal Properties			-30/-20	61	750	0.999	0.998				
n _e	546.07	1.77622						-20/-10	62	700	0.999	0.998		
n _F	486.13	1.78340				Tg (°C)	633	-10/0	63	650	0.999	0.998		
n _F	479.99	1.78430				Ts (°C)	659	0/10	63	600	0.999	0.998		
n _g	435.84	1.79204				T ₁₀ ^{14.5} (°C)	583	10/20	64	550	0.999	0.998		
n _h	404.66	1.79927	T ₁₀ ¹³ (°C)	617	20/30	64	500	0.999	0.998					
n _i	365.01	1.81174	α _{-50/80°C} (10 ⁻⁷ /K)	65	30/40	64	480	0.998	0.996					
			α _{100/300°C} (10 ⁻⁷ /K)	75	40/50	65	460	0.997	0.994					
							440	0.996	0.992					

Constants of Dispersion Formula	
A ₀	3.07337625E+00
A ₁	-1.48574785E-02
A ₂	2.34948451E-02
A ₃	7.16989975E-04
A ₄	-3.03961557E-05
A ₅	2.24464169E-06

Density		Solarization	
ρ (g/cm ³)	4.62	$\Delta\lambda$ (%)	-1.8

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6}/^{\circ}\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	3.7	4.0	4.1	4.1	4.2	4.4	4.7	5.0	5.1	5.5
-40 ~ -20	3.8	4.0	4.2	4.2	4.3	4.5	4.9	5.2	5.3	5.7
-20 ~ 0	3.8	4.1	4.2	4.2	4.3	4.8	5.0	5.5	5.6	6.0
0 ~ 20	3.9	4.1	4.3	4.4	4.4	4.8	5.2	5.6	5.6	6.1
20 ~ 40	4.0	4.2	4.4	4.4	4.4	4.8	5.2	5.8	5.8	6.3
40 ~ 60	4.0	4.3	4.6	4.6	4.6	4.9	5.6	6.0	6.0	6.4
60 ~ 80	4.1	4.4	4.6	4.7	4.7	5.1	5.7	6.0	6.1	6.5
80 ~ 100	4.2	4.5	4.7	4.8	4.9	5.3	5.9	6.1	6.2	6.6
100 ~ 120	4.3	4.6	4.8	4.9	5.0	5.5	6.0	6.3	6.4	6.9
120 ~ 140	4.5	4.7	5.0	5.1	5.2	5.6	6.2	6.6	6.7	7.3
140 ~ 160	4.6	4.8	5.2	5.2	5.3	5.7	6.3	6.7	6.8	7.4

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	338/277

Constants of dn/dt		
D ₀	D ₁	D ₂
3.11E-06	1.25E-08	-2.12E-11
E ₀	E ₁	λ_{TK}
6.29E-07	7.94E-10	1.96E-01

D-LaF50-170	774494	$n_d = 1.77420$	$v_d = 49.41$	$n_F - n_C = 0.015670$
		$n_e = 1.77793$	$v_e = 49.17$	$n_F - n_C' = 0.015820$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.73298	$P_{d,C}$	0.3019	RC (S)	1	2400	0.814	0.663
n_{1970}	1970.09	1.74004	$P_{e,d}$	0.2380	RA (S)	2	2200	0.949	0.900
n_{1530}	1529.58	1.74780	$P_{g,F}$	0.5507	D_W	1	2000	0.980	0.960
n_{1129}	1128.64	1.75479	$P'_{d,c'}$	0.2516	D_A	3	1800	0.993	0.985
n_{1064}	1064.00	1.75608	$P'_{e,d}$	0.2358	$R_{OH}(S)$	1	1600	0.996	0.992
n_t	1013.98	1.75714	$P'_{g,F'}$	0.4886	RP (S)	2	1400	0.998	0.996
n_s	852.11	1.76129			CR		1200	0.998	0.996
$n_{A'}$	768.19	1.76416	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.998	0.996
n_r	706.52	1.76681					1000	0.998	0.996
n_C	656.27	1.76947					950	0.998	0.996
$n_{C'}$	643.85	1.77022					900	0.998	0.996
n_{He-Ne}	632.80	1.77092					850	0.998	0.996
n_D	589.29	1.77406	$\Delta P_{F,e}$	-0.0028	$^{\circ}C$	α	800	0.998	0.996
n_d	587.56	1.77420	$\Delta P_{g,F}$	-0.0108	-50/-40	53	750	0.998	0.996
n_e	546.07	1.77793	$\Delta P_{C,t}$	0.0073	-40/-30	54	700	0.998	0.996
n_F	486.13	1.78514	$\Delta P_{C,s}$	0.0030	-30/-20	56	650	0.998	0.996
$n_{F'}$	479.99	1.78604	Thermal Properties		-20/-10	57	600	0.998	0.996
n_g	435.84	1.79377	$T_g (^{\circ}C)$	628	-10/0	58	550	0.997	0.994
n_h	404.66	1.80098	$T_s (^{\circ}C)$	662	0/10	58	500	0.996	0.993
n_i	365.01	1.81346	$T_{10}^{14.5} (^{\circ}C)$	578	10/20	59	480	0.995	0.990
			$T_{10}^{13} (^{\circ}C)$	612	20/30	60	460	0.994	0.989
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	60	30/40	61	440	0.993	0.986
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	76	40/50	62	420	0.992	0.983
			λ (W/(m K))	0.80	50/60	63	400	0.990	0.980
			β_d	138	60/70	64	390	0.987	0.974
			Mechanical Properties		70/80	65	380	0.984	0.969
					80/90	66	370	0.979	0.959
					90/100	66	360	0.966	0.933
					100/110	67	350	0.942	0.887
					110/120	67	340	0.920	0.847
			μ	0.323	120/130	68	330	0.890	0.792
			σ_b (MPa)	100	130/140	68	320	0.849	0.720
			$B (10^{-12}/Pa)$	1.52	140/150	70	310	0.791	0.626
					150/160	72	300	0.632	0.400

Constants of Dispersion Formula	
A_0	3.07996867E+00
A_1	-1.49730363E-02
A_2	2.26125445E-02
A_3	1.12810004E-03
A_4	-9.99130408E-05
A_5	6.18705456E-06

Density		Solarization	
ρ (g/cm ³)	4.62	$\Delta\lambda$ (%)	-2.4

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	2.4	2.8	2.9	2.9	3.0	3.2	3.5	3.9	4.0	4.7
-40 ~ -20	2.4	2.8	2.9	3.0	3.1	3.3	3.7	4.2	4.3	5.0
-20 ~ 0	2.5	2.9	3.0	3.0	3.2	3.6	4.0	4.5	4.6	5.3
0 ~ 20	2.7	2.9	3.2	3.2	3.3	3.8	4.2	4.9	5.0	5.7
20 ~ 40	2.8	3.0	3.4	3.4	3.5	3.9	4.5	5.3	5.4	6.1
40 ~ 60	2.9	3.1	3.4	3.5	3.6	4.0	4.7	5.6	5.6	6.5
60 ~ 80	3.0	3.2	3.4	3.5	3.6	4.3	4.9	5.8	5.9	7.0
80 ~ 100	3.0	3.4	3.6	3.6	3.8	4.4	5.1	6.0	6.1	7.3
100 ~ 120	3.0	3.6	3.8	3.8	4.0	4.6	5.3	6.1	6.2	7.5
120 ~ 140	3.1	3.6	3.9	3.9	4.1	4.8	5.4	6.2	6.3	7.6
140 ~ 160	3.2	3.7	4.1	4.2	4.3	5.0	5.6	6.3	6.4	7.8

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	370/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	336/276

Constants of dn/dt		
D_0	D_1	D_2
9.91E-07	1.25E-08	-3.05E-11
E_0	E_1	λ_{TK}
6.90E-07	1.39E-09	2.72E-01

D-LaF731	731405	$n_d = 1.73077$	$v_d = 40.50$	$n_F - n_C = 0.018043$
		$n_e = 1.73505$	$v_e = 40.25$	$n_F - n_C' = 0.018263$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ	P _{d,C}	0.2971	RC (S)	1	λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.68874	P _{e,d}	0.2372	RA (S)	3	2400	0.900	0.810
n_{1970}	1970.09	1.69525	P _{g,F}	0.5714	D _W	1	2200	0.982	0.964
n_{1530}	1529.58	1.70254	P' _{d,c}	0.2475	D _A	2	2000	0.995	0.990
n_{1129}	1128.64	1.70947	P' _{e,d}	0.2344	R _{OH} (S)	1	1800	0.999	0.998
n_{1064}	1064.00	1.71080	P' _{g,F}	0.5059	RP (S)	2	1600	0.999	0.998
n_t	1013.98	1.71191			CR		1400	0.999	0.998
n_s	852.11	1.71635	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/\text{K})$		1200	0.999	0.998
$n_{A'}$	768.19	1.71949					1060	0.999	0.998
n_r	706.52	1.72243					1000	0.999	0.998
n_C	656.27	1.72541					950	0.999	0.998
$n_{C'}$	643.85	1.72625					900	0.999	0.998
$n_{\text{He-Ne}}$	632.80	1.72705	Thermal Properties		$^{\circ}\text{C}$		850	0.999	0.998
n_D	589.29	1.73061					800	0.999	0.998
n_d	587.56	1.73077	$\Delta P_{F,e}$	-0.0023	-50/-40	87	750	0.999	0.998
n_e	546.07	1.73505	$\Delta P_{g,F}$	-0.0049	-40/-30	90	700	0.999	0.998
n_F	486.13	1.74345	$\Delta P_{C,t}$	0.0118	-30/-20	91	650	0.999	0.998
$n_{F'}$	479.99	1.74452	$\Delta P_{C,s}$	0.0045	-20/-10	93	600	0.999	0.998
n_g	435.84	1.75376	Mechanical Properties		-10/0	94	550	0.997	0.995
n_h	404.66	1.76260			0/10	95	500	0.995	0.992
n_i	365.01	1.77835	T _g ($^{\circ}\text{C}$)	498	10/20	96	480	0.992	0.988
			T _s ($^{\circ}\text{C}$)	533	20/30	97	460	0.989	0.982
			T ₁₀ ^{14.5} ($^{\circ}\text{C}$)	460	30/40	97	440	0.985	0.974
			T ₁₀ ¹³ ($^{\circ}\text{C}$)	492	40/50	98	420	0.975	0.953
			$\alpha_{-50/80^{\circ}\text{C}}$ ($10^{-7}/\text{K}$)	95	50/60	98	400	0.967	0.937
			$\alpha_{100/300^{\circ}\text{C}}$ ($10^{-7}/\text{K}$)	112	60/70	99	390	0.951	0.908
			λ (W/(m K))	1.29	70/80	100	380	0.923	0.856
			β_d	105	80/90	101	370	0.863	0.752
					90/100	102	360	0.728	0.535
					100/110	103	350	0.410	0.171
					110/120	104	340	0.057	0.008
					120/130	105	330		
					130/140	106	320		
					140/150	108	310		
					150/160	109	300		

Constants of Dispersion Formula	
A ₀	2.91839395E+00
A ₁	-1.31881796E-02
A ₂	2.56126448E-02
A ₃	9.59611523E-04
A ₄	-3.53323234E-05
A ₅	4.57862484E-06

Density		Solarization	
ρ (g/cm ³)	3.21	$\Delta\lambda$ (%)	0.0

Range of Temperature ($^{\circ}\text{C}$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.1	1.4	1.7	1.8	2.2	2.3	2.5	2.8	2.9	3.6
-40 ~ -20	1.3	1.6	1.9	2.0	2.4	2.7	2.7	3.1	3.3	4.1
-20 ~ 0	1.5	1.8	2.1	2.2	2.7	2.9	3.0	3.4	3.5	4.3
0 ~ 20	1.6	2.0	2.4	2.5	2.9	3.1	3.3	3.6	3.8	4.5
20 ~ 40	1.8	2.2	2.6	2.7	2.9	3.2	3.5	3.8	4.0	4.8
40 ~ 60	1.9	2.2	2.6	2.8	2.9	3.3	3.7	4.0	4.1	5.0
60 ~ 80	2.2	2.3	2.7	2.9	3.0	3.5	3.8	4.2	4.3	5.2
80 ~ 100	2.3	2.5	2.8	2.9	3.1	3.6	4.0	4.4	4.5	5.4
100 ~ 120	2.4	2.7	2.9	3.0	3.2	3.7	4.1	4.5	4.6	5.7
120 ~ 140	2.4	2.7	2.9	3.0	3.3	3.8	4.3	4.6	4.7	6.0
140 ~ 160	2.6	2.8	3.0	3.1	3.4	3.9	4.4	4.8	4.8	6.3

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	364/335

Constants of dn/dt		
D ₀	D ₁	D ₂
-4.06E-07	1.61E-08	-3.91E-11
E ₀	E ₁	λ_{TK}
7.84E-07	7.44E-10	2.13E-01

D-LaF743	743493	$n_d = 1.74330$	$v_d = 49.33$	$n_F - n_C = 0.015069$
		$n_e = 1.74689$	$v_e = 49.07$	$n_F - n_C' = 0.015221$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.70399	$P_{d,C}$	0.3013	RC (S)	1	2400	0.830	0.689
n_{1970}	1970.09	1.71066	$P_{e,d}$	0.2382	RA (S)	3	2200	0.955	0.912
n_{1530}	1529.58	1.71800	$P_{g,F}$	0.5521	D_W	1	2000	0.982	0.965
n_{1129}	1128.64	1.72467	$P'_{d,c'}$	0.2510	D_A	3	1800	0.994	0.989
n_{1064}	1064.00	1.72590	$P'_{e,d}$	0.2359	$R_{OH}(S)$	1	1600	0.998	0.996
n_t	1013.98	1.72692	$P'_{g,F'}$	0.4895	RP (S)	1	1400	0.998	0.996
n_s	852.11	1.73091			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.73366	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.73621					1000	0.999	0.998
n_C	656.27	1.73876					950	0.999	0.998
$n_{C'}$	643.85	1.73948					900	0.999	0.998
n_{He-Ne}	632.80	1.74016					850	0.999	0.998
n_D	589.29	1.74317	$\Delta P_{F,e}$	-0.0024	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.74330	$\Delta P_{g,F}$	-0.0095	-50/-40	50	750	0.999	0.998
n_e	546.07	1.74689	$\Delta P_{C,t}$	0.0066	-40/-30	53	700	0.999	0.998
n_F	486.13	1.75383	$\Delta P_{C,s}$	0.0021	-30/-20	54	650	0.999	0.998
$n_{F'}$	479.99	1.75470	Thermal Properties		-20/-10	55	600	0.999	0.998
n_g	435.84	1.76215			-10/0	56	550	0.999	0.998
n_h	404.66	1.76911	Tg ($^{\circ}C$)	571	0/10	57	500	0.999	0.998
n_i	365.01	1.78110	Ts ($^{\circ}C$)	603	10/20	58	480	0.998	0.997
			$T_{10}^{14.5} (^{\circ}C)$	531	20/30	58	460	0.997	0.995
			$T_{10}^{13} (^{\circ}C)$	555	30/40	59	440	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	57	40/50	59	420	0.996	0.992
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	74	50/60	60	400	0.994	0.988
			λ (W/(m K))	0.88	60/70	60	390	0.992	0.984
			β_d	135	70/80	61	380	0.988	0.977
			Mechanical Properties		80/90	61	370	0.982	0.965
					90/100	62	360	0.973	0.946
			HK ($10^7 Pa$)	679	100/110	63	350	0.954	0.911
			F_A	113	110/120	64	340	0.930	0.865
			E (GPa)	111.3	120/130	65	330	0.892	0.795
			G (GPa)	42.6	130/140	66	320	0.843	0.710
			μ	0.308	140/150	68	310	0.723	0.523
			σ_b (MPa)	87	150/160	68	300	0.701	0.492
			B ($10^{-12}/Pa$)	2.17			290	0.628	0.394
							280	0.490	0.240

Constants of Dispersion Formula	
A_0	2.97441605E+00
A_1	-1.38572738E-02
A_2	2.19649180E-02
A_3	8.10197466E-04
A_4	-4.79702937E-05
A_5	3.00170973E-06

Density		Solarization	
ρ (g/cm ³)	4.23	$\Delta\lambda$ (%)	-3.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	7.3	7.6	8.0	8.0	8.1	8.1	8.3	8.9	9.0	9.4
-40 ~ -20	7.3	7.6	8.1	8.1	8.2	8.2	8.5	9.1	9.2	9.5
-20 ~ 0	7.4	7.7	8.1	8.1	8.2	8.3	8.5	9.2	9.3	9.7
0 ~ 20	7.5	7.8	8.1	8.1	8.2	8.4	8.5	9.3	9.4	9.8
20 ~ 40	7.6	7.8	8.1	8.2	8.2	8.5	8.7	9.3	9.5	9.9
40 ~ 60	7.6	7.9	8.2	8.2	8.3	8.6	8.7	9.4	9.6	10.0
60 ~ 80	7.7	7.9	8.3	8.4	8.4	8.8	8.9	9.6	9.7	10.2
80 ~ 100	7.8	8.1	8.4	8.5	8.5	8.9	9.1	9.7	9.8	10.4
100 ~ 120	7.9	8.2	8.4	8.5	8.6	9.1	9.3	9.9	10.0	10.6
120 ~ 140	8.0	8.4	8.5	8.6	8.7	9.3	9.5	10.0	10.1	10.8
140 ~ 160	8.1	8.5	8.6	8.7	8.8	9.4	9.6	10.2	10.2	10.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	365/280
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	331/262

Constants of dn/dt		
D_0	D_1	D_2
9.72E-06	1.25E-08	-2.05E-11
E_0	E_1	λ_{TK}
5.62E-07	5.06E-10	2.24E-01

D-ZLaF50	801455	$n_d = 1.80139$	$v_d = 45.45$	$n_F - n_C = 0.017632$
		$n_e = 1.80558$	$v_e = 45.21$	$n_F - n_C' = 0.017820$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm
n ₂₃₂₅	2325.42	1.75922	P _{d,C}	0.3000	RC (S)	1	2400	0.510	0.260
n ₁₉₇₀	1970.09	1.76581	P _{e,d}	0.2376	RA (S)	3	2200	0.866	0.750
n ₁₅₃₀	1529.58	1.77320	P _{g,F}	0.5603	D _W	1	2000	0.940	0.884
n ₁₁₂₉	1128.64	1.78019	P' _{d,c´}	0.2497	D _A	3	1800	0.983	0.966
n ₁₀₆₄	1064.00	1.78152	P' _{e,d}	0.2351	R _{OH} (S)	1	1600	0.996	0.992
n _t	1013.98	1.78264	P' _{g,F´}	0.4966	RP (S)	1	1400	0.999	0.998
n _s	852.11	1.78708			CR		1200	0.999	0.998
n _{A´}	768.19	1.79022					1060	0.999	0.998
n _r	706.52	1.79314	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		1000	0.999	0.998
n _C	656.27	1.79610					950	0.999	0.998
n _{C´}	643.85	1.79694	ΔP _{F,e}	-0.0029	°C	α	900	0.999	0.998
n _{He-Ne}	632.80	1.79771	ΔP _{g,F}	-0.0078	-50/-40	53	850	0.999	0.998
n _D	589.29	1.80122	ΔP _{C,t}	0.0030	-40/-30	56	800	0.999	0.998
n _d	587.56	1.80139	ΔP _{C,s}	0.0021	-40/-30	56	750	0.999	0.998
n _e	546.07	1.80558			-30/-20	56	700	0.999	0.998
n _F	486.13	1.81373	Thermal Properties		-20/-10	58	650	0.999	0.998
n _{F´}	479.99	1.81476			Tg (°C)	599	-10/0	61	600
n _g	435.84	1.82361	Ts (°C)	642	0/10	61	550	0.999	0.998
n _h	404.66	1.83193	T ₁₀ ^{14.5} (°C)	579	10/20	62	500	0.998	0.997
n _i	365.01	1.84640	T ₁₀ ¹³ (°C)	595	20/30	63	480	0.997	0.995
			α _{-50/80°C} (10 ⁻⁷ /K)	62	30/40	65	460	0.996	0.992
			α _{100/300°C} (10 ⁻⁷ /K)	77	40/50	66	440	0.995	0.990

Constants of Dispersion Formula	
A ₀	3.16516554E+00
A ₁	-1.39269813E-02
A ₂	2.68932250E-02
A ₃	8.75538542E-04
A ₄	-3.52600431E-05
A ₅	3.03103679E-06

Density		Solarization	
ρ (g/cm ³)	4.81	$\Delta\lambda$ (%)	-0.5

Range of Temperature ($^{\circ}\text{C}$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}\text{C}$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	4.0	4.4	4.7	4.8	4.9	5.0	5.2	5.3	5.5	5.8
-40 ~ -20	4.2	4.6	4.8	4.9	5.0	5.2	5.4	5.5	5.6	6.0
-20 ~ 0	4.4	4.7	4.9	5.0	5.1	5.3	5.6	5.7	5.8	6.4
0 ~ 20	4.4	4.8	5.2	5.3	5.4	5.5	5.9	5.9	6.0	6.5
20 ~ 40	4.5	5.0	5.4	5.5	5.6	5.7	6.1	6.1	6.1	6.9
40 ~ 60	4.5	5.1	5.5	5.6	5.6	5.7	6.1	6.3	6.4	7.2
60 ~ 80	4.6	5.3	5.6	5.7	5.8	6.0	6.3	6.5	6.6	7.3
80 ~ 100	4.6	5.4	5.8	5.9	6.0	6.2	6.4	6.7	6.8	7.4
100 ~ 120	4.8	5.7	6.0	6.1	6.2	6.3	6.5	6.9	7.0	7.6
120 ~ 140	5.0	5.8	6.2	6.2	6.3	6.4	6.7	7.1	7.2	7.9
140 ~ 160	5.2	5.8	6.2	6.3	6.4	6.5	6.9	7.3	7.4	8.0

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	375/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	349/316

Constants of dn/dt		
D ₀	D ₁	D ₂
4.18E-06	1.42E-08	-2.67E-11
E ₀	E ₁	λ_{TK}
6.65E-07	9.25E-10	1.82E-08

D-ZLaF52L	806407	$n_d = 1.80610$	$v_d = 40.73$	$n_F - n_C = 0.019791$
		$n_e = 1.81080$	$v_e = 40.48$	$n_F - n_C' = 0.020031$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.76065	$P_{d,C}$	0.2971	RC (S)	1	2400	0.848	0.719
n_{1970}	1970.09	1.76756	$P_{e,d}$	0.2375	RA (S)	3	2200	0.962	0.925
n_{1530}	1529.58	1.77534	$P_{g,F}$	0.5679	D_W	1	2000	0.995	0.990
n_{1129}	1128.64	1.78278	$P'_{d,c'}$	0.2476	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.78422	$P'_{e,d}$	0.2346	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78543	$P'_{g,F'}$	0.5037	RP (S)	3	1400	0.999	0.998
n_s	852.11	1.79027			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.79371	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.79694					1000	0.999	0.998
n_C	656.27	1.80022					950	0.999	0.998
$n_{C'}$	643.85	1.80114					900	0.999	0.998
n_{He-Ne}	632.80	1.80201					850	0.999	0.998
n_D	589.29	1.80592	$\Delta P_{F,e}$	-0.0018	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80610	$\Delta P_{g,F}$	-0.0080	-50/-40	52	750	0.999	0.998
n_e	546.07	1.81080	$\Delta P_{C,t}$	0.0098	-40/-30	55	700	0.999	0.998
n_F	486.13	1.82002	$\Delta P_{C,s}$	0.0046	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.82117	Thermal Properties		-20/-10	57	600	0.999	0.998
n_g	435.84	1.83126	$T_g (^{\circ}C)$	546	-10/0	58	550	0.999	0.998
n_h	404.66	1.84085	$T_s (^{\circ}C)$	580	0/10	59	500	0.998	0.995
n_i	365.01	1.85784	$T_{10}^{14.5} (^{\circ}C)$	519	10/20	59	480	0.996	0.992
			$T_{10}^{13} (^{\circ}C)$	538	20/30	60	460	0.994	0.988
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	59	30/40	61	440	0.992	0.983
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	75	40/50	61	420	0.988	0.976
			λ (W/(m K))	0.87	50/60	62	400	0.982	0.963
			β_d	140	60/70	63	390	0.975	0.949
			Mechanical Properties		70/80	64	380	0.963	0.928
					80/90	66	370	0.942	0.888
					90/100	67	360	0.902	0.818
					100/110	68	350	0.822	0.683
					110/120	68	340	0.658	0.433
			E (GPa)	112.8	120/130	69	330	0.342	0.118
			G (GPa)	42.0	130/140	71	320		
			μ	0.342	140/150	72	310		
			σ_b (MPa)	73	150/160	72	300		
			B ($10^{-12}/Pa$)	2.23			290		
							280		

Constants of Dispersion Formula	
A_0	3.17316178E+00
A_1	-1.45588429E-02
A_2	2.92758988E-02
A_3	1.20865059E-03
A_4	-6.18358136E-05
A_5	5.88185791E-06

Density		Solarization	
ρ (g/cm ³)	4.43	$\Delta\lambda$ (%)	0.0

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	5.4	6.3	6.5	6.6	6.7	7.3	7.6	8.0	8.2	9.6
-40 ~ -20	5.6	6.3	6.6	6.7	6.9	7.4	7.8	8.3	8.4	9.8
-20 ~ 0	5.8	6.3	6.8	6.8	6.9	7.5	7.9	8.4	8.5	9.9
0 ~ 20	6.0	6.4	6.8	6.9	6.9	7.5	8.0	8.5	8.6	9.9
20 ~ 40	6.2	6.5	6.9	6.9	7.0	7.7	8.1	8.5	8.6	9.9
40 ~ 60	6.4	6.6	6.9	7.0	7.1	7.9	8.1	8.7	8.8	10.0
60 ~ 80	6.5	6.7	7.0	7.1	7.3	7.9	8.1	8.6	8.8	10.2
80 ~ 100	6.6	6.8	7.1	7.3	7.4	8.1	8.4	9.0	9.1	10.4
100 ~ 120	6.7	7.0	7.3	7.4	7.5	8.2	8.6	9.0	9.2	10.5
120 ~ 140	6.8	7.1	7.4	7.5	7.7	8.4	8.7	9.1	9.3	10.7
140 ~ 160	6.9	7.1	7.6	7.7	7.9	8.5	8.8	9.3	9.5	10.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	395/330
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	357/327

Constants of dn/dt		
D_0	D_1	D_2
6.51E-06	1.42E-08	-2.06E-11
E_0	E_1	λ_{TK}
6.70E-07	3.07E-11	2.84E-01

D-ZLaF52N	810410	$n_d = 1.81000$	$v_d = 41.00$	$n_F - n_C = 0.019758$
		$n_e = 1.81469$	$v_e = 40.80$	$n_F - n_C' = 0.019970$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.76475	$P_{d,C}$	0.2981	RC (S)	1	2400	0.850	0.723
n_{1970}	1970.09	1.77159	$P_{e,d}$	0.2374	RA (S)	3	2200	0.956	0.914
n_{1530}	1529.58	1.77930	$P_{g,F}$	0.5674	D_W	1	2000	0.975	0.951
n_{1129}	1128.64	1.78671	$P'_{d,c'}$	0.2479	D_A	3	1800	0.988	0.976
n_{1064}	1064.00	1.78814	$P'_{e,d}$	0.2349	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78935	$P'_{g,F'}$	0.5038	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.79418			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.79762	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.80084					1000	0.999	0.998
n_C	656.27	1.80411					950	0.999	0.998
$n_{C'}$	643.85	1.80505					900	0.999	0.998
n_{He-Ne}	632.80	1.80591					850	0.999	0.998
n_D	589.29	1.80982	$\Delta P_{F,e}$	-0.0029	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.81000	$\Delta P_{g,F}$	-0.0081	-50/-40	51	750	0.999	0.998
n_e	546.07	1.81469	$\Delta P_{C,t}$	0.0083	-40/-30	54	700	0.999	0.998
n_F	486.13	1.82387	$\Delta P_{C,s}$	0.0038	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.82502	Thermal Properties		-20/-10	58	600	0.999	0.997
n_g	435.84	1.83508	$T_g (^{\circ}C)$	548	-10/0	59	550	0.999	0.997
n_h	404.66	1.84465	$T_s (^{\circ}C)$	578	0/10	60	500	0.998	0.996
n_i	365.01	1.86160	$T_{10}^{14.5} (^{\circ}C)$	510	10/20	61	480	0.996	0.996
			$T_{10}^{13} (^{\circ}C)$	529	20/30	62	460	0.994	0.993
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	60	30/40	63	440	0.992	0.988
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	79	40/50	64	420	0.990	0.974
			λ (W/(m K))	0.98	50/60	64	400	0.982	0.959
			β_d	140	60/70	64	390	0.975	0.944
			Mechanical Properties		70/80	65	380	0.963	0.919
					80/90	66	370	0.940	0.876
					90/100	67	360	0.894	0.795
					100/110	68	350	0.816	0.662
					110/120	69	340	0.646	0.415
			E (GPa)	114.4	120/130	70	330	0.320	0.103
			G (GPa)	42.6	130/140	71	320		
			μ	0.343	140/150	72	310		
			σ_b (MPa)	81	150/160	73	300		
			B ($10^{-12}/Pa$)	2.17			290		
							280		

Constants of Dispersion Formula	
A_0	3.18681101E+00
A_1	-1.44191920E-02
A_2	2.95460135E-02
A_3	1.15252022E-03
A_4	-5.90862778E-05
A_5	5.97442323E-06

Density		Solarization	
ρ (g/cm ³)	4.47	$\Delta\lambda$ (%)	-0.6

Range of Temperature (°C)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	5.1	5.6	6.7	6.9	7.0	7.2	7.9	9.7	9.8	11.2
-40 ~ -20	5.6	6.2	7.1	7.2	7.3	7.6	8.3	10.1	10.1	11.6
-20 ~ 0	6.0	6.7	7.4	7.6	7.8	8.0	8.6	10.4	10.6	12.0
0 ~ 20	6.5	7.2	7.6	7.9	8.2	8.3	8.8	10.6	10.8	12.3
20 ~ 40	6.7	7.5	7.8	8.1	8.2	8.6	8.9	10.8	11.0	12.5
40 ~ 60	7.0	7.8	8.0	8.2	8.4	8.8	9.0	11.0	11.2	12.7
60 ~ 80	7.2	8.0	8.2	8.3	8.4	9.0	9.2	11.2	11.4	12.9
80 ~ 100	7.4	8.2	8.4	8.4	8.6	9.2	9.4	11.4	11.5	12.9
100 ~ 120	7.7	8.3	8.5	8.5	8.7	9.3	9.6	11.5	11.6	13.0
120 ~ 140	8.0	8.4	8.6	8.6	8.9	9.3	9.7	11.6	11.7	13.1
140 ~ 160	8.3	8.6	8.6	8.6	9.2	9.4	9.8	11.7	11.9	13.2

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	395/330
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	360/327

Constants of dn/dt		
D_0	D_1	D_2
6.96E-06	2.21E-08	-4.66E-11
E_0	E_1	λ_{TK}
9.87E-07	-3.77E-10	2.98E-01

D-ZLaF52N-M170	808409	$n_d = 1.80834$	$v_d = 40.92$	$n_F - n_C = 0.019753$
		$n_e = 1.81303$	$v_e = 40.67$	$n_F - n_{C'} = 0.019992$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.76315	$P_{d,C}$	0.2972	RC (S)	1	2400	0.855	0.731
n_{1970}	1970.09	1.77000	$P_{e,d}$	0.2374	RA (S)	3	2200	0.968	0.937
n_{1530}	1529.58	1.77771	$P_{g,F}$	0.5670	D_W	1	2000	0.990	0.980
n_{1129}	1128.64	1.78511	$P'_{d,c'}$	0.2471	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.78654	$P'_{e,d}$	0.2346	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.78774	$P'_{g,F'}$	0.5022	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.79256			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.79599	Deviation of Relative Partial Dispersions		Expansion Coefficient α ($\times 10^{-7}/K$)		1060	0.999	0.998
n_r	706.52	1.79921					1000	0.999	0.998
n_C	656.27	1.80247					950	0.999	0.998
$n_{C'}$	643.85	1.80340					900	0.999	0.998
n_{He-Ne}	632.80	1.80427					850	0.999	0.998
n_D	589.29	1.80817	$\Delta P_{E,e}$	-0.0019	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.80834	$\Delta P_{g,F}$	-0.0086	-50/-40	51	750	0.999	0.998
n_e	546.07	1.81303	$\Delta P_{C,t}$	0.0073	-40/-30	54	700	0.999	0.998
n_F	486.13	1.82223	$\Delta P_{C,s}$	0.0031	-30/-20	56	650	0.999	0.998
$n_{F'}$	479.99	1.82339	Thermal Properties		-20/-10	58	600	0.999	0.998
n_g	435.84	1.83343	Tg ($^{\circ}C$)	548	-10/0	59	550	0.999	0.998
n_h	404.66	1.84298	Ts ($^{\circ}C$)	578	0/10	60	500	0.998	0.996
n_i	365.01	1.85982	$T_{10}^{14.5}$ ($^{\circ}C$)	510	10/20	61	480	0.996	0.993
			T_{10}^{13} ($^{\circ}C$)	529	20/30	62	460	0.994	0.990
			$\alpha_{.50/80^{\circ}C}$ ($10^{-7}/K$)	60	30/40	63	440	0.992	0.986
			$\alpha_{100/300^{\circ}C}$ ($10^{-7}/K$)	79	40/50	64	420	0.990	0.980
			λ (W/(m K))	1.00	50/60	64	400	0.982	0.967
			β_d	140	60/70	64	390	0.976	0.955
Constants of Dispersion Formula			Mechanical Properties		70/80	65	380	0.963	0.934
					80/90	66	370	0.942	0.898
					90/100	67	360	0.911	0.831
					100/110	68	350	0.834	0.701
					110/120	69	340	0.671	0.454
A_0	3.18131839E+00		HK (10^7 Pa)	625	120/130	70	330	0.372	0.136
A_1	-1.44359617E-02		F_A	91	130/140	71	320		
A_2	2.92512247E-02		E (GPa)	115.4	140/150	72	310		
A_3	1.19876602E-03		G (GPa)	42.9	150/160	73	300		
A_4	-5.70803235E-05		μ	0.344			290		
A_5	5.23040290E-06		σ_b (MPa)	71			280		
			B (10^{-12} /Pa)	2.17					

Constants of Dispersion Formula	
A_0	3.18131839E+00
A_1	-1.44359617E-02
A_2	2.92512247E-02
A_3	1.19876602E-03
A_4	-5.70803235E-05
A_5	5.23040290E-06

Density	Solarization
ρ (g/cm ³)	$\Delta\lambda$ (%)
4.47	-0.6

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	5.9	6.9	6.7	6.9	7.0	7.2	7.9	9.7	9.8	10.3
-40 ~ -20	5.9	7.0	7.1	7.2	7.3	7.6	8.3	10.1	10.1	10.5
-20 ~ 0	5.9	7.2	7.4	7.6	7.8	8.0	8.6	10.4	10.6	10.8
0 ~ 20	6.0	7.2	7.6	7.9	8.2	8.3	8.8	10.6	10.8	11.1
20 ~ 40	6.0	7.3	7.8	8.1	8.2	8.6	8.9	10.8	11.0	11.2
40 ~ 60	6.2	7.5	8.0	8.2	8.4	8.8	9.0	11.0	11.2	11.4
60 ~ 80	6.3	7.6	8.2	8.3	8.4	9.0	9.2	11.2	11.4	11.7
80 ~ 100	6.5	7.8	8.4	8.4	8.6	9.2	9.4	11.4	11.5	12.0
100 ~ 120	6.5	7.9	8.5	8.5	8.7	9.3	9.6	11.5	11.6	12.3
120 ~ 140	6.7	8.1	8.6	8.6	8.9	9.3	9.7	11.6	11.7	12.6
140 ~ 160	6.7	8.2	8.6	8.6	9.2	9.4	9.8	11.7	11.9	12.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	390/330
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	357/327

Constants of dn/dt		
D_0	D_1	D_2
6.23E-06	1.24E-08	-1.88E-11
E_0	E_1	λ_{TK}
1.67E-06	1.27E-09	4.39E-07

D-ZLaF53	834373	$n_d = 1.83441$	$v_d = 37.28$	$n_F - n_C = 0.022380$
		$n_e = 1.83972$	$v_e = 37.04$	$n_F - n_C' = 0.022672$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.78506	$P_{d,C}$	0.2949	RC (S)	1	2400	0.860	0.740
n_{1970}	1970.09	1.79228	$P_{e,d}$	0.2373	RA (S)	3	2200	0.970	0.941
n_{1530}	1529.58	1.80047	$P_{g,F}$	0.5795	D_W	1	2000	0.995	0.990
n_{1129}	1128.64	1.80847	$P'_{d,c'}$	0.2457	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.81004	$P'_{e,d}$	0.2342	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.81137	$P'_{g,F'}$	0.5134	RP (S)	2	1400	0.999	0.998
n_s	852.11	1.81671			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.82054	Deviation of Relative Partial Dispersions		Expansion Coefficient α ($\times 10^{-7}/K$)		1060	0.999	0.998
n_r	706.52	1.82414					1000	0.999	0.998
n_C	656.27	1.82781					950	0.999	0.998
$n_{C'}$	643.85	1.82884					900	0.999	0.998
n_{He-Ne}	632.80	1.82981					850	0.999	0.998
n_D	589.29	1.83421	$\Delta P_{F,e}$	-0.0018	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.83441	$\Delta P_{g,F}$	-0.0021	-50/-40	51	750	0.999	0.998
n_e	546.07	1.83972	$\Delta P_{C,t}$	0.0138	-40/-30	54	700	0.999	0.998
n_F	486.13	1.85019	$\Delta P_{C,s}$	0.0061	-30/-20	55	650	0.999	0.998
$n_{F'}$	479.99	1.85152	Thermal Properties		-20/-10	58	600	0.999	0.998
n_g	435.84	1.86316	Tg ($^{\circ}C$)	571	-10/0	59	550	0.999	0.998
n_h	404.66	1.87437	Ts ($^{\circ}C$)	606	0/10	60	500	0.997	0.995
n_i	365.01	1.89451	$T_{10}^{14.5}$ ($^{\circ}C$)	529	10/20	60	480	0.994	0.990
			T_{10}^{13} ($^{\circ}C$)	548	20/30	61	460	0.989	0.983
			$\alpha_{.50/80^{\circ}C}$ ($10^{-7}/K$)	60	30/40	62	440	0.983	0.972
			$\alpha_{100/300^{\circ}C}$ ($10^{-7}/K$)	77	40/50	63	420	0.971	0.950
			λ (W/(m K))	0.95	50/60	63	400	0.947	0.905
			β_d	175	60/70	64	390	0.923	0.860
			Mechanical Properties		70/80	64	380	0.882	0.784
					80/90	65	370	0.805	0.651
					90/100	66	360	0.641	0.412
					100/110	67	350	0.346	0.116
					110/120	68	340	0.051	0.004
			E (GPa)	117.2	120/130	69	330		
			G (GPa)	44.5	130/140	70	320		
			μ	0.319	140/150	71	310		
			σ_b (MPa)	63	150/160	71	300		
			B ($10^{-12}/Pa$)	2.01			290		
							280		

Constants of Dispersion Formula	
A_0	3.26258096E+00
A_1	-1.52499377E-02
A_2	3.41466836E-02
A_3	9.84000388E-04
A_4	1.27478564E-05
A_5	3.62442642E-06

Density	Solarization
ρ (g/cm ³)	$\Delta\lambda$ (%)
4.46	-0.3

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	6.1	6.5	6.7	6.8	6.9	7.3	7.8	8.5	8.7	9.5
-40 ~ -20	6.2	6.6	7.0	7.0	7.1	7.5	8.0	8.7	8.9	9.7
-20 ~ 0	6.4	6.9	7.1	7.2	7.2	7.7	8.1	9.1	9.2	9.9
0 ~ 20	6.5	6.9	7.1	7.2	7.4	7.7	8.2	9.1	9.5	10.1
20 ~ 40	6.5	7.0	7.3	7.3	7.4	7.8	8.3	9.2	9.5	10.1
40 ~ 60	6.5	7.1	7.3	7.4	7.5	7.8	8.4	9.2	9.6	10.4
60 ~ 80	6.5	7.3	7.5	7.5	7.6	7.9	8.4	9.5	9.8	10.6
80 ~ 100	6.6	7.4	7.7	7.7	7.8	8.1	8.5	9.9	9.8	10.9
100 ~ 120	6.7	7.5	7.9	8.0	8.0	8.2	8.7	10.2	10.0	11.3
120 ~ 140	6.7	7.6	8.0	8.1	8.1	8.3	8.9	10.5	10.1	11.6
140 ~ 160	6.8	7.8	8.0	8.1	8.2	8.4	9.1	10.8	10.2	11.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	430/350
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	382/347

Constants of dn/dt		
D_0	D_1	D_2
6.76E-06	1.23E-08	-2.21E-11
E_0	E_1	λ_{TK}
7.14E-07	6.99E-10	2.68E-01

D-ZLaF814		815370	n _d = 1.81474		v _d = 37.03		n _F − n _C = 0.022004					
			n _e = 1.81995		v _e = 36.78		n _F − n _C ′ = 0.022294					
Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance					
	λ (nm)	n _λ					λ (nm)	τ5mm	τ10mm			
n ₂₃₂₅	2325.42	1.76516					2400	0.846	0.715			
n ₁₉₇₀	1970.09	1.77267					2200	0.962	0.925			
n ₁₅₃₀	1529.58	1.78111					2000	0.986	0.972			
n ₁₁₂₉	1128.64	1.78919	P _{d,C}	0.2949	RC (S)	1	1800	0.995	0.990			
n ₁₀₆₄	1064.00	1.79076	P _{e,d}	0.2368	RA (S)	3	1600	0.999	0.998			
n _t	1013.98	1.79207	P _{g,F}	0.5763	D _W	1	1400	0.999	0.998			
n _s	852.11	1.79734	P _{d,c} ′	0.2454	D _A	4	1200	0.999	0.998			
n _A ′	768.19	1.80110	P _{e,d} ′	0.2337	R _{OH} (S)	1	1060	0.999	0.998			
n _r	706.52	1.80465	P _{g,F} ′	0.5100	RP (S)	2	1000	0.999	0.998			
n _C	656.27	1.80825			CR		950	0.999	0.998			
n _C ′	643.85	1.80927	Deviation of Relative Partial Dispersions		Expansion Coefficient α (×10 ⁻⁷ /K)		900	0.999	0.998			
n _{He-Ne}	632.80	1.81023					850	0.999	0.998			
n _D	589.29	1.81455					800	0.999	0.998			
n _d	587.56	1.81474					750	0.999	0.998			
n _e	546.07	1.81995					700	0.999	0.998			
n _F	486.13	1.83025	Thermal Properties		-20/-10	58	650	0.998	0.997			
n _F ′	479.99	1.83156			-10/0	59	600	0.997	0.995			
n _g	435.84	1.84293			0/10	60	550	0.993	0.986			
n _h	404.66	1.85388			T _g (°C)	544	500	0.989	0.979			
n _i	365.01	1.87363			T _s (°C)	580	480	0.985	0.970			
			T ₁₀ ^{14.5} (°C)	502	460	0.979	0.957					
			T ₁₀ ¹³ (°C)	525	440	0.968	0.938					
			α _{-50/80°C} (10 ⁻⁷ /K)	60	420	0.946	0.895					
			α _{100/300°C} (10 ⁻⁷ /K)	74	400	0.925	0.856					
			λ (W/(m K))	0.93	390	0.892	0.796					
			β _d	183	380	0.834	0.695					
Constants of Dispersion Formula			Mechanical Properties		80/90	66	370	0.719	0.516			
					HK (10 ⁷ Pa)	620	360	0.498	0.248			
					F _A	108	350	0.193	0.037			
					E (GPa)	115.3	340					
					G (GPa)	44.7	330					
			μ	0.290	130/140	73	320					
			σ _b (MPa)		140/150	74	310					
			B (10 ⁻¹² /Pa)	2.17	150/160	76	300					
Density			Solarization			Temperature Coefficients of Refractive Index					Coloration Code	
											λ ₈₀ (λ ₇₀)/λ ₅	
ρ (g/cm ³)	4.20	△λ (%)	-2.1	dn/dt relative (×10 ⁻⁶ / °C)							Coloration of Internal Transmittance	
								Constants of dn/dt				
								D ₀	D ₁	D ₂		
								3.28E-06	4.57E-09	8.29E-12		
								E ₀	E ₁	λ _{TK}		
								8.13E-07	5.49E-10	1.92E-01		

D-ZLaF851	851401	$n_d = 1.85135$	$v_d = 40.10$	$n_F - n_C = 0.021229$
		$n_e = 1.85639$	$v_e = 39.85$	$n_F - n_{C'} = 0.021488$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.80390	$P_{d,C}$	0.2968	RC (S)	1	2400	0.885	0.783
n_{1970}	1970.09	1.81087	$P_{e,d}$	0.2374	RA (S)	1	2200	0.984	0.968
n_{1530}	1529.58	1.81878	$P_{g,F}$	0.5700	D_W	1	2000	0.995	0.990
n_{1129}	1128.64	1.82650	$P'_{d,c'}$	0.2471	D_A	3	1800	0.999	0.998
n_{1064}	1064.00	1.82801	$P'_{e,d}$	0.2345	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.82929	$P'_{g,F'}$	0.5049	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.83442			CR	1	1200	0.999	0.998
$n_{A'}$	768.19	1.83808	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.84154					1000	0.999	0.998
n_C	656.27	1.84505					950	0.999	0.998
$n_{C'}$	643.85	1.84604					900	0.999	0.998
n_{He-Ne}	632.80	1.84697					850	0.999	0.998
n_D	589.29	1.85116	$\Delta P_{F,e}$	-0.0022	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.85135	$\Delta P_{g,F}$	-0.0070	-50/-40	54	750	0.999	0.998
n_e	546.07	1.85639	$\Delta P_{C,t}$	0.0080	-40/-30	57	700	0.999	0.998
n_F	486.13	1.86628	$\Delta P_{C,s}$	0.0041	-30/-20	58	650	0.999	0.998
$n_{F'}$	479.99	1.86753	Thermal Properties		-20/-10	60	600	0.999	0.998
n_g	435.84	1.87838	Tg ($^{\circ}C$)	619	-10/0	61	550	0.999	0.998
n_h	404.66	1.88871	Ts ($^{\circ}C$)	655	0/10	62	500	0.997	0.995
n_i	365.01	1.90699	$T_{10}^{14.5} (^{\circ}C)$	568	10/20	63	480	0.995	0.992
			$T_{10}^{13} (^{\circ}C)$	585	20/30	64	460	0.992	0.989
			$\alpha_{.50/80^{\circ}C} (10^{-7}/K)$	62	30/40	64	440	0.988	0.983
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	77	40/50	65	420	0.984	0.972
			λ (W/(m K))	0.96	50/60	66	400	0.971	0.949
			β_d	148	60/70	66	390	0.958	0.923
			Mechanical Properties		70/80	67	380	0.935	0.878
			HK (10^7 Pa)	634	80/90	68	370	0.893	0.792
			F_A	75	90/100	69	360	0.794	0.619
			E (GPa)	127.0	100/110	70	350	0.585	0.324
			G (GPa)	47.2	110/120	71	340	0.228	0.049
			μ	0.345	120/130	72	330		
			σ_b (MPa)	98	130/140	73	320		
			B (10^{-12} /Pa)	1.61	140/150	74	310		
					150/160	75	300		

Constants of Dispersion Formula	
A_0	3.32860198E+00
A_1	-1.49218815E-02
A_2	3.29458426E-02
A_3	1.05526131E-03
A_4	-2.14847086E-05
A_5	3.89175295E-06

Density	Solarization
ρ (g/cm ³)	$\Delta\lambda$ (%)
4.81	-0.8

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	5.0	5.3	5.6	5.6	5.7	6.0	6.1	6.4	6.4	6.9
-40 ~ -20	5.1	5.4	5.6	5.7	5.8	6.0	6.3	6.6	6.7	7.4
-20 ~ 0	5.3	5.6	5.8	5.9	6.0	6.1	6.4	6.6	6.7	7.7
0 ~ 20	5.3	5.6	5.9	6.0	6.1	6.2	6.6	6.6	6.7	8.0
20 ~ 40	5.4	5.7	6.0	6.1	6.2	6.3	6.7	6.8	6.9	8.4
40 ~ 60	5.4	5.7	6.0	6.1	6.2	6.4	6.8	6.9	7.0	8.7
60 ~ 80	5.5	5.7	6.0	6.1	6.2	6.4	6.9	7.1	7.2	8.9
80 ~ 100	5.6	5.8	6.0	6.1	6.2	6.4	7.0	7.2	7.3	9.1
100 ~ 120	5.7	5.9	6.1	6.1	6.2	6.5	7.1	7.4	7.5	9.2
120 ~ 140	5.8	6.0	6.1	6.2	6.3	6.6	7.2	7.7	7.7	9.4
140 ~ 160	5.8	6.0	6.1	6.2	6.3	6.7	7.3	7.9	7.9	9.7

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	(380)/340
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	371/340

Constants of dn/dt		
D_0	D_1	D_2
5.68E-06	1.13E-08	-2.80E-11
E_0	E_1	λ_{TK}
2.16E-07	4.91E-10	3.62E-01

F4	620364	$n_d = 1.62005$	$v_d = 36.35$	$n_F - n_C = 0.017060$
		$n_e = 1.62408$	$v_e = 36.09$	$n_F - n_{C'} = 0.017291$

Refractive Indices			Relative Partial Dispersion		Chemical Properties (grade)		Internal Transmittance		
	λ (nm)	n_λ					λ (nm)	$\tau_{5\text{mm}}$	$\tau_{10\text{mm}}$
n_{2325}	2325.42	1.58511	$P_{d,C}$	0.2937	RC (S)	1	2400	0.889	0.790
n_{1970}	1970.09	1.58980	$P_{e,d}$	0.2362	RA (S)	3	2200	0.918	0.843
n_{1530}	1529.58	1.59522	$P_{g,F}$	0.5832	D_W	1	2000	0.964	0.930
n_{1129}	1128.64	1.60075	$P'_{d,c'}$	0.2445	D_A	1	1800	0.986	0.972
n_{1064}	1064.00	1.60186	$P'_{e,d}$	0.2329	$R_{OH}(S)$	1	1600	0.999	0.998
n_t	1013.98	1.60282	$P'_{g,F'}$	0.5162	RP (S)	1	1400	0.999	0.998
n_s	852.11	1.60672			CR		1200	0.999	0.998
$n_{A'}$	768.19	1.60957	Deviation of Relative Partial Dispersions		Expansion Coefficient $\alpha (\times 10^{-7}/K)$		1060	0.999	0.998
n_r	706.52	1.61228					1000	0.999	0.998
n_C	656.27	1.61504					950	0.999	0.998
$n_{C'}$	643.85	1.61582					900	0.999	0.998
n_{He-Ne}	632.80	1.61656					850	0.999	0.998
n_D	589.29	1.61990	ΔP_{Fe}	0.0000	$^{\circ}C$	α	800	0.999	0.998
n_d	587.56	1.62005	$\Delta P_{g,F}$	0.0000	-50/-40	78	750	0.999	0.998
n_e	546.07	1.62408	$\Delta P_{C,t}$	0.0000	-40/-30	81	700	0.999	0.998
n_F	486.13	1.63210	$\Delta P_{C,s}$	0.0001	-30/-20	83	650	0.999	0.998
$n_{F'}$	479.99	1.63312	Thermal Properties		-20/-10	85	600	0.999	0.998
n_g	435.84	1.64205			-10/0	86	550	0.999	0.998
n_h	404.66	1.65066	Tg ($^{\circ}C$)	414	0/10	88	500	0.999	0.998
n_i	365.01	1.66625	Ts ($^{\circ}C$)	471	10/20	89	480	0.999	0.998
			$T_{10}^{14.5} (^{\circ}C)$	355	20/30	90	460	0.999	0.998
			$T_{10}^{13} (^{\circ}C)$	398	30/40	91	440	0.997	0.994
			$\alpha_{-50/80^{\circ}C} (10^{-7}/K)$	88	40/50	92	420	0.995	0.990
			$\alpha_{100/300^{\circ}C} (10^{-7}/K)$	110	50/60	93	400	0.993	0.986
			λ (W/(m K))	0.73	60/70	94	390	0.991	0.978
					70/80	95	380	0.987	0.968
			Mechanical Properties		80/90	96	370	0.982	0.957
					90/100	98	360	0.971	0.932
			HK (10^7Pa)	418	100/110	99	350	0.940	0.874
			F_A	172	110/120	100	340	0.855	0.725
			E (GPa)	58.4	120/130	101	330	0.620	0.383
			G (GPa)	23.3	130/140	103	320	0.178	0.036
			μ	0.251	140/150	104	310		
			σ_b (MPa)	60	150/160	105	300		
			B ($10^{-12}/Pa$)	2.48			290		
							280		

Constants of Dispersion Formula	
A_0	2.55510802E+00
A_1	-8.64431010E-03
A_2	2.26592448E-02
A_3	8.22256872E-04
A_4	-1.60646686E-05
A_5	4.04183096E-06

Density		Solarization	
ρ (g/cm ³)	3.57	$\Delta\lambda$ (%)	0.5

Range of Temperature ($^{\circ}C$)	Temperature Coefficients of Refractive Index									
	dn/dt relative ($\times 10^{-6} / ^{\circ}C$)									
	t	s	C	C'	He-Ne	d	e	F	F'	g
-60 ~ -40	1.2	1.7	2.1	2.1	2.1	2.3	2.5	3.2	3.3	4.3
-40 ~ -20	1.2	1.7	2.1	2.1	2.1	2.3	2.6	3.3	3.4	4.5
-20 ~ 0	1.3	1.7	2.1	2.1	2.1	2.4	2.7	3.5	3.6	4.5
0 ~ 20	1.3	1.8	2.1	2.1	2.2	2.5	2.8	3.6	3.7	4.6
20 ~ 40	1.4	1.9	2.2	2.2	2.2	2.5	3.0	3.7	3.8	4.9
40 ~ 60	1.4	1.9	2.3	2.4	2.4	2.7	3.0	3.9	4.0	5.0
60 ~ 80	1.5	2.0	2.5	2.6	2.6	2.9	3.4	4.1	4.2	5.2
80 ~ 100	1.7	2.1	2.6	2.6	2.7	2.9	3.5	4.2	4.3	5.3
100 ~ 120	1.8	2.2	2.7	2.7	2.8	3.2	3.7	4.3	4.4	5.5
120 ~ 140	2.0	2.3	2.8	2.9	3.0	3.4	3.8	4.5	4.6	5.7
140 ~ 160	2.1	2.4	3.0	3.1	3.2	3.5	4.1	4.7	4.8	5.9

Coloration Code	
$\lambda_{80}(\lambda_{70})/\lambda_5$	350/320
Coloration of Internal Transmittance	
$\lambda\tau_{80}/\lambda\tau_5$	342/320

Constants of dn/dt		
D_0	D_1	D_2
-1.07E-06	1.43E-08	-1.76E-11
E_0	E_1	λ_{TK}
8.75E-07	5.84E-10	2.59E-01

红外材料数据表

IR materials Data Sheets

赤外材料のデータ表

IRG105

$$n_4 = 1.8541$$

$$v_4 = 18.92$$

$$n_3 - n_5 = 0.0452$$

Refractive Indices	
$\lambda(\mu\text{m})$	n_λ
0.852	1.9156
1.014	1.9076
1.129	1.9037
1.530	1.8949
1.970	1.8883
2.000	1.8879
2.500	1.8809
3.000	1.8732
3.500	1.8643
4.000	1.8541
4.500	1.8421
5.000	1.8280
5.500	
6.000	

Constants of Dispersion Formula	
A	1.8933906E+00
B	1.6495794E-02
C	1.7208613E-04
D	-2.3819428E-03
E	-5.8492005E-06
F	-1.7972933E-07

Chemical Properties (grade)	
RC(S)	1
RA(S)	3
D _W	2
D _A	5
R _{OH} (S)	
RP (S)	

Thermal Properties	
T _g (°C)	534
T _s (°C)	565
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	65
$\alpha_{100/300^\circ\text{C}}$ (10 ⁻⁷ /K)	78

Mechanical Properties	
HK (10 ⁷ Pa)	447
弯曲强度(MPa)	
压缩强度(MPa)	
弹性模量(GPa)	

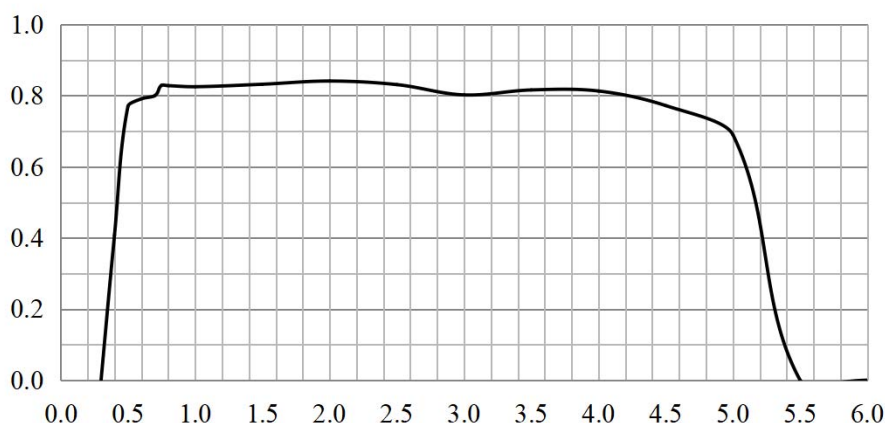
Other Properties	
ρ (g/cm ³)	5.62

Expansion Coefficient α (×10 ⁻⁷ /K)	
°C	α
-50/-40	57
-40/-30	59
-30/-20	61
-20/-10	63
-10/0	64
0/10	65
10/20	66
20/30	67
30/40	67
40/50	68
50/60	68
60/70	69
70/80	69
80/90	70
90/100	71
100/110	72
110/120	72
120/130	73
130/140	74
140/150	75
150/160	76

External Transmittance	
λ (μm)	τ 2mm
6.0	
5.5	
5.0	0.690
4.5	0.772
4.0	0.813
3.5	0.816
3.0	0.802
2.5	0.831
2.0	0.841
1.5	0.832
1.0	0.825
0.8	0.828
0.75	0.829
0.7	0.800
0.6	0.791
0.5	0.770
0.4	0.408
0.3	

Temperature Coefficients of Refractive Index dn/dt relative (×10 ⁻⁶ / °C)		
°C	1.013μm	0.852μm
-60~-40	16.5	16.9
-40~-20	16.5	16.9
-20~0	16.6	16.9
0~20	16.6	17.0
20~40	16.8	17.2
40~60	16.8	17.3
60~80	17.0	17.4
80~100	17.2	17.6
100~120	17.2	17.7
120~140	17.3	17.8
140~160	17.4	17.9

Transmittance τ (2mm)



$$n_{10.6} = 2.4940$$

$$v_{10.6} = 95.77$$

$$n_8 - n_{12.5} = 0.0156$$

Refractive Indices

λ (μm)	n_λ
2.0	2.5293
3.0	2.5175
4.0	2.5127
5.0	2.5097
6.0	2.5072
7.0	2.5047
8.0	2.5021
9.0	2.4993
10.0	2.4961
11.0	2.4926
12.0	2.4886
12.5	2.4865
13.0	2.4843
14.0	2.4794

Constants of Dispersion Formula

A	2.5100146E+00
B	7.7495165E-02
C	4.9371281E-03
D	-1.3389514E-04
E	-1.3508347E-07
F	5.7156655E-11

Other Properties

ρ (g/cm^3)	4.42
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _w	1
D _A	1
R _{OH} (S)	1
RP(S)	1

Thermal Properties

T _g (°C)	369
T _s (°C)	409
$\alpha_{-60/120^\circ\text{C}}$ ($10^{-7}/\text{K}$)	123
$\alpha_{20/120^\circ\text{C}}$ ($10^{-7}/\text{K}$)	123
C _p (J/g·K)	

Mechanical Properties

HK (10^7Pa)	150
E (GPa)	22.0
G (GPa)	8.3
μ	0.331

Temperature Coefficients of Refractive Index (-40 ~ 80°C) ($\times 10^{-6}/^\circ\text{C}$)

λ (μm)	dn_{rel}/dt
3	67
5	65
8	64
10	62
12	62

Expansion Coefficient α ($\times 10^{-7}/\text{K}$)

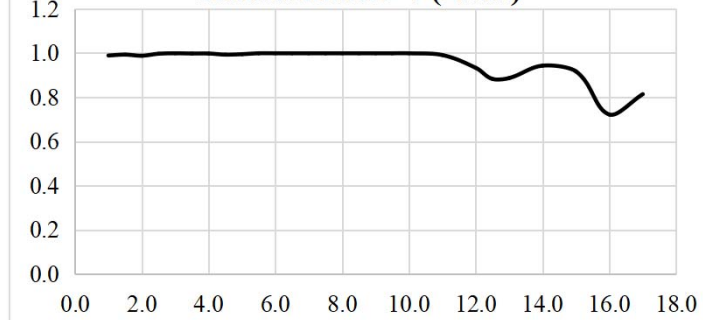
°C	α
-50/-40	118
-40/-30	120
-30/-20	121
-20/-10	122
-10/0	122
0/10	122
10/20	123
20/30	123
30/40	123
40/50	123
50/60	123
60/70	123
70/80	123
80/90	124
90/100	124
100/110	124
110/120	124
120/130	123
130/140	123
140/150	123
150/160	124

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.814
16.0	0.722
15.0	0.917
14.0	0.943
13.0	0.887
12.5	0.883
12.0	0.933
11.0	0.991
10.0	0.999
9.5	0.999
9.0	0.999
8.5	0.999
8.0	0.999
7.5	0.999
7.0	0.999
6.5	0.999
6.0	0.999
5.5	0.999
5.0	0.995
4.5	0.993
4.0	0.998
3.5	0.998
3.0	0.999
2.5	0.997
2.0	0.988
1.5	0.993
1.0	0.989

Constants of dn/dt

D ₀	5.82025E-05
D ₁	2.04218E-08
D ₂	-7.67374E-11
E ₀	1.65764E-04
E ₁	9.67536E-07
λ_{TK}	-4.58177E+00

Transmittance τ (2mm)


$$n_{10.6} = 2.4925$$

$$v_{10.6} = 102.93$$

$$n_8 - n_{12.5} = 0.0145$$

Refractive Indices

λ (μm)	n_λ
2.0	2.5265
3.0	2.5148
4.0	2.5101
5.0	2.5072
6.0	2.5047
7.0	2.5024
8.0	2.5000
9.0	2.4974
10.0	2.4944
11.0	2.4911
12.0	2.4875
12.5	2.4855
13.0	2.4835
14.0	2.4787

Constants of Dispersion Formula

A	2.5074929E+00
B	7.5363484E-02
C	8.9642516E-03
D	-1.3362851E-04
E	-1.5544515E-08
F	-3.1301497E-10

Other Properties

ρ (g/cm ³)	4.41
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _w	2
D _A	1
R _{OH} (S)	1
RP(S)	1

Thermal Properties

T _g (°C)	292
T _s (°C)	347
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	164
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	165
C _p (J/g·K)	

Mechanical Properties

HK (10 ⁷ Pa)	152
E (GPa)	18.6
G (GPa)	6.8
μ	0.367

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶ /°C)

λ (μm)	dn _{rel} /dt
3	41
5	40
8	39
10	39
12	37

Expansion Coefficient α (×10⁻⁷/K)

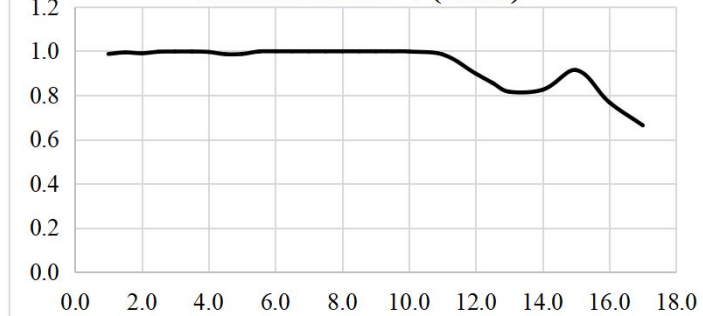
°C	α
-50/-40	161
-40/-30	162
-30/-20	163
-20/-10	164
-10/0	164
0/10	165
10/20	165
20/30	165
30/40	165
40/50	165
50/60	165
60/70	165
70/80	165
80/90	166
90/100	166
100/110	166
110/120	166
120/130	166
130/140	166
140/150	166
150/160	167

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.664
16.0	0.768
15.0	0.914
14.0	0.825
13.0	0.816
12.5	0.856
12.0	0.898
11.0	0.985
10.0	0.998
9.5	0.999
9.0	0.999
8.5	0.999
8.0	0.999
7.5	0.999
7.0	0.999
6.5	0.999
6.0	0.999
5.5	0.998
5.0	0.987
4.5	0.986
4.0	0.996
3.5	0.998
3.0	0.998
2.5	0.997
2.0	0.990
1.5	0.994
1.0	0.987

Constants of dn/dt

D ₀	3.41318E-05
D ₁	3.57898E-08
D ₂	5.35457E-10
E ₀	3.75406E-05
E ₁	6.49642E-07
λ_{TK}	-2.08675E+00

Transmittance τ (2mm)


$$n_{10.6} = 2.5837$$

$$v_{10.6} = 86.07$$

$$n_8 - n_{12.5} = 0.0184$$

Refractive Indices

λ (μm)	n_λ
2.0	2.6261
3.0	2.6118
4.0	2.6060
5.0	2.6024
6.0	2.5993
7.0	2.5963
8.0	2.5933
9.0	2.5899
10.0	2.5862
11.0	2.5820
12.0	2.5774
12.5	2.5749
13.0	2.5723
14.0	2.5666

Constants of Dispersion Formula

A	2.6027335E+00
B	9.4148223E-02
C	5.0288851E-03
D	-1.6360399E-04
E	-1.1188941E-07
F	-3.3257266E-11

Other Properties

ρ (g/cm ³)	4.71
ϵ_r	10

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _w	2
D _A	1
R _{OH} (S)	4
RP(S)	1

Thermal Properties

T _g (°C)	266
T _s (°C)	301
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	162
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	164
C _p (J/g·K)	

Mechanical Properties

HK (10 ⁷ Pa)	137
E (GPa)	19.8
G (GPa)	7.7
μ	0.291

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶ /°C)

λ (μm)	dn _{rel} /dt
3	42
5	40
8	39
10	39
12	39

Expansion Coefficient α (×10⁻⁷/K)

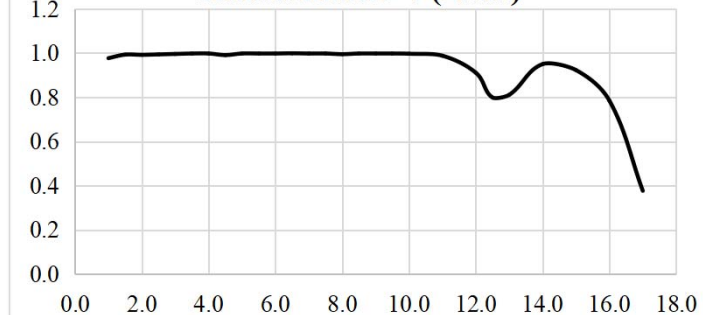
°C	α
-50/-40	159
-40/-30	160
-30/-20	161
-20/-10	162
-10/0	162
0/10	162
10/20	163
20/30	163
30/40	163
40/50	163
50/60	163
60/70	163
70/80	163
80/90	164
90/100	164
100/110	164
110/120	164
120/130	164
130/140	164
140/150	164
150/160	165

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.377
16.0	0.785
15.0	0.923
14.0	0.950
13.0	0.811
12.5	0.799
12.0	0.911
11.0	0.988
10.0	0.997
9.5	0.998
9.0	0.998
8.5	0.998
8.0	0.995
7.5	0.998
7.0	0.998
6.5	0.999
6.0	0.998
5.5	0.998
5.0	0.998
4.5	0.991
4.0	0.998
3.5	0.998
3.0	0.996
2.5	0.994
2.0	0.992
1.5	0.993
1.0	0.977

Constants of dn/dt

D ₀	3.47396E-05
D ₁	-7.61268E-09
D ₂	2.63506E-10
E ₀	1.45448E-05
E ₁	4.85455E-08
λ_{TK}	8.33183E-01

Transmittance τ (2mm)


$$n_{10.6} = 2.7659$$

$$v_{10.6} = 132.77$$

$$n_8 - n_{12.5} = 0.0133$$

Refractive Indices

λ (μm)	n_λ
2.0	2.8095
3.0	2.7914
4.0	2.7846
5.0	2.7808
6.0	2.7779
7.0	2.7754
8.0	2.7730
9.0	2.7704
10.0	2.7677
11.0	2.7647
12.0	2.7614
12.5	2.7597
13.0	2.7578
14.0	2.7538

Constants of Dispersion Formula

A	2.7790481E+00
B	1.1911498E-01
C	1.5043403E-02
D	-1.2268557E-04
E	-1.0906501E-08
F	-1.8517301E-10

Other Properties

ρ (g/cm ³)	4.72
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _w	2
D _A	1
R _{OH} (S)	2
RP(S)	1

Thermal Properties

T _g (°C)	174
T _s (°C)	199
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	209
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	212
C _p (J/g·K)	

Mechanical Properties

HK (10 ⁷ Pa)	115
E (GPa)	19.8
G (GPa)	7.3
μ	0.366

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶ /°C)

λ (μm)	dn _{rel} /dt
3	21
5	19
8	18
10	18
12	17

Expansion Coefficient α (×10⁻⁷/K)

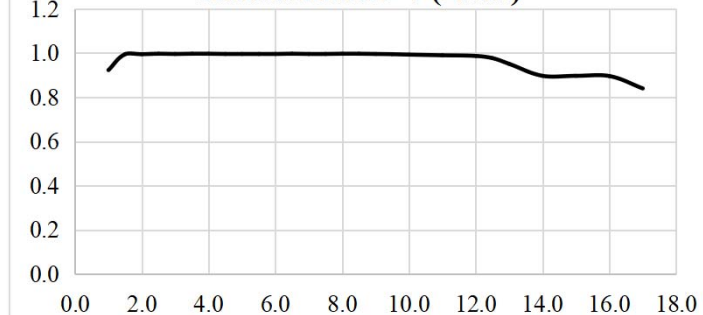
°C	α
-50/-40	202
-40/-30	205
-30/-20	206
-20/-10	207
-10/0	208
0/10	208
10/20	209
20/30	209
30/40	210
40/50	210
50/60	211
60/70	211
70/80	212
80/90	212
90/100	213
100/110	213
110/120	214
120/130	215
130/140	216
140/150	217
150/160	217

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.840
16.0	0.896
15.0	0.897
14.0	0.897
13.0	0.951
12.5	0.977
12.0	0.987
11.0	0.990
10.0	0.993
9.5	0.995
9.0	0.996
8.5	0.997
8.0	0.997
7.5	0.996
7.0	0.996
6.5	0.997
6.0	0.996
5.5	0.996
5.0	0.996
4.5	0.996
4.0	0.997
3.5	0.997
3.0	0.996
2.5	0.997
2.0	0.995
1.5	0.995
1.0	0.923

Constants of dn/dt

D ₀	1.39794E-05
D ₁	6.65805E-08
D ₂	-1.61120E-10
E ₀	3.04933E-05
E ₁	8.15250E-08
λ_{TK}	-7.27149E-01

Transmittance τ (2mm)


$$n_{10.6} = 2.6011$$

$$v_{10.6} = 93.63$$

$$n_8 - n_{12.5} = 0.0171$$

Refractive Indices

λ (μm)	n_λ
2.0	2.6423
3.0	2.6279
4.0	2.6222
5.0	2.6186
6.0	2.6157
7.0	2.6129
8.0	2.6100
9.0	2.6068
10.0	2.6033
11.0	2.5994
12.0	2.5952
12.5	2.5929
13.0	2.5905
14.0	2.5850

Constants of Dispersion Formula

A	2.6191393E+00
B	8.9681707E-02
C	1.9616489E-02
D	-1.6512236E-04
E	1.7019611E-08
F	-3.7871669E-10

Other Properties

ρ (g/cm ³)	4.68
ϵ_r	10

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _w	1
D _A	1
R _{OH} (S)	2
RP(S)	1

Thermal Properties

T _g (°C)	282
T _s (°C)	314
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	140
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	141
C _p (J/g·K)	0.33

Mechanical Properties

HK (10 ⁷ Pa)	132
E (GPa)	21.3
G (GPa)	8.5
μ	0.250

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶ /°C)

λ (μm)	dn _{rel} /dt
3	72
5	70
8	70
10	70
12	70

Expansion Coefficient α (×10⁻⁷/K)

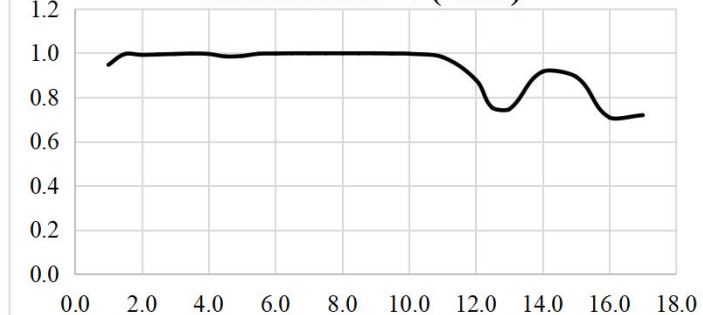
°C	α
-50/-40	137
-40/-30	139
-30/-20	139
-20/-10	140
-10/0	141
0/10	141
10/20	141
20/30	141
30/40	142
40/50	142
50/60	142
60/70	142
70/80	142
80/90	142
90/100	142
100/110	142
110/120	142
120/130	142
130/140	142
140/150	142
150/160	142

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.719
16.0	0.709
15.0	0.893
14.0	0.916
13.0	0.746
12.5	0.752
12.0	0.879
11.0	0.982
10.0	0.997
9.5	0.998
9.0	0.999
8.5	0.999
8.0	0.999
7.5	0.999
7.0	0.999
6.5	0.999
6.0	0.998
5.5	0.997
5.0	0.987
4.5	0.985
4.0	0.996
3.5	0.998
3.0	0.996
2.5	0.994
2.0	0.992
1.5	0.996
1.0	0.947

Constants of dn/dt

D ₀	6.14573E-05
D ₁	1.00146E-07
D ₂	4.99576E-10
E ₀	1.79054E-05
E ₁	4.39155E-09
λ_{TK}	9.29200E-01

Transmittance τ (2mm)


$$n_{10.6} = 2.7764$$

$$v_{10.6} = 137.71$$

$$n_8 - n_{12.5} = 0.0129$$

Refractive Indices

λ (μm)	n_λ
2.0	2.8197
3.0	2.8015
4.0	2.7947
5.0	2.7909
6.0	2.7880
7.0	2.7856
8.0	2.7832
9.0	2.7807
10.0	2.7781
11.0	2.7752
12.0	2.7720
12.5	2.7703
13.0	2.7685
14.0	2.7646

Constants of Dispersion Formula

A	2.7890145E+00
B	1.2022832E-01
C	1.4096806E-02
D	-1.1959367E-04
E	3.8785934E-09
F	-2.3183781E-10

Other Properties

ρ (g/cm^3)	4.63
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D_w	1
D_A	1
R_{OH} (S)	2
RP (S)	1

Thermal Properties

T_g ($^{\circ}\text{C}$)	184
T_s ($^{\circ}\text{C}$)	216
$\alpha_{-60/120^{\circ}\text{C}}$ ($10^{-7}/\text{K}$)	206
$\alpha_{20/120^{\circ}\text{C}}$ ($10^{-7}/\text{K}$)	208
C_p ($\text{J/g}\cdot\text{K}$)	0.24

Mechanical Properties

HK (10^7Pa)	118
E (GPa)	18.5
G (GPa)	7.0
μ	0.331

Temperature Coefficients of Refractive Index (-40 ~ 80 $^{\circ}\text{C}$) ($\times 10^{-6}/^{\circ}\text{C}$)

λ (μm)	dn_{rel}/dt
3	37
5	34
8	32
10	32
12	32

Expansion Coefficient α ($\times 10^{-7}/\text{K}$)

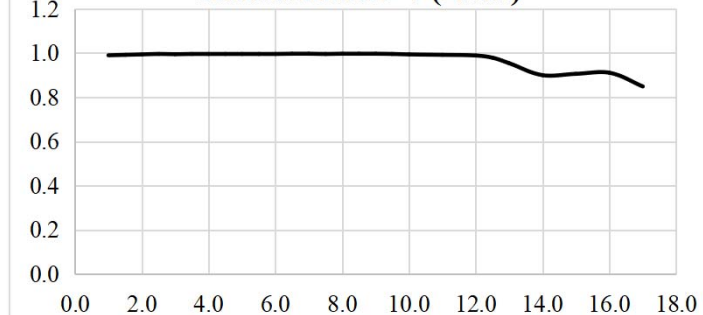
$^{\circ}\text{C}$	α
-50/-40	203
-40/-30	205
-30/-20	205
-20/-10	206
-10/0	207
0/10	207
10/20	207
20/30	207
30/40	207
40/50	207
50/60	208
60/70	208
70/80	208
80/90	208
90/100	208
100/110	208
110/120	209
120/130	209
130/140	209
140/150	210
150/160	210

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.849
16.0	0.911
15.0	0.906
14.0	0.900
13.0	0.954
12.5	0.979
12.0	0.989
11.0	0.992
10.0	0.994
9.5	0.996
9.0	0.997
8.5	0.997
8.0	0.997
7.5	0.996
7.0	0.997
6.5	0.997
6.0	0.996
5.5	0.996
5.0	0.996
4.5	0.996
4.0	0.996
3.5	0.996
3.0	0.995
2.5	0.996
2.0	0.994
1.5	0.992
1.0	0.990

Constants of dn/dt

D_0	2.65967E-05
D_1	-3.30028E-08
D_2	-2.13498E-10
E_0	3.35590E-05
E_1	4.18229E-08
λ_{TK}	4.48973E-02

Transmittance τ (2mm)

$$n_{10.6} = 2.6075$$

$$v_{10.6} = 154.57$$

$$n_8 - n_{12.5} = 0.0104$$

Refractive Indices

λ (μm)	n_λ
2.0	2.6413
3.0	2.6271
4.0	2.6219
5.0	2.6190
6.0	2.6168
7.0	2.6149
8.0	2.6130
9.0	2.6110
10.0	2.6089
11.0	2.6066
12.0	2.6040
12.5	2.6026
13.0	2.6011
14.0	2.5979

Constants of Dispersion Formula

A	2.6178540E+00
B	8.7753077E-02
C	2.7480087E-02
D	-9.7270254E-05
E	1.2742318E-08
F	-2.4376453E-10

Other Properties

ρ (g/cm ³)	4.49
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _w	1
D _A	1
R _{OH} (S)	1
RP(S)	1

Thermal Properties

T _g (°C)	228
T _s (°C)	281
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	206
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	209
C _p (J/g·K)	0.37

Mechanical Properties

HK (10 ⁷ Pa)	126
E (GPa)	15.6
G (GPa)	6.1
μ	0.287

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶ /°C)

λ (μm)	dn _{rel} /dt
3	18
5	17
8	17
10	17
12	

Expansion Coefficient α (×10⁻⁷/K)

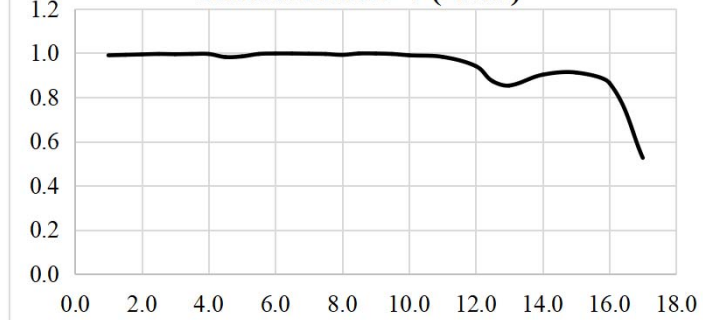
°C	α
-50/-40	199
-40/-30	201
-30/-20	203
-20/-10	204
-10/0	205
0/10	205
10/20	206
20/30	206
30/40	207
40/50	208
50/60	208
60/70	209
70/80	209
80/90	209
90/100	210
100/110	211
110/120	211
120/130	213
130/140	214
140/150	214
150/160	215

Internal Transmittance

λ (μm)	τ 2mm
17.0	0.526
16.0	0.865
15.0	0.912
14.0	0.902
13.0	0.853
12.5	0.873
12.0	0.941
11.0	0.983
10.0	0.990
9.5	0.996
9.0	0.998
8.5	0.998
8.0	0.992
7.5	0.996
7.0	0.997
6.5	0.998
6.0	0.998
5.5	0.996
5.0	0.985
4.5	0.982
4.0	0.996
3.5	0.996
3.0	0.995
2.5	0.996
2.0	0.994
1.5	0.992
1.0	0.990

Constants of dn/dt

D ₀	1.45032E-05
D ₁	3.49366E-08
D ₂	2.49190E-10
E ₀	1.32518E-05
E ₁	2.46745E-08
λ_{TK}	9.73196E-01

Transmittance τ (2mm)


$$n_{4.0} = 2.4168$$

$$v_{4.0} = 159.19$$

$$n_{3.0} - n_{5.0} = 0.0089$$

Refractive Indices

λ (μm)	n_λ
0.6328	2.6133
0.7065	2.5652
0.8521	2.5121
0.8944	2.5023
1.0140	2.4816
1.5296	2.4437
2.0	2.4318
2.5	2.4255
3.0	2.4217
4.0	2.4168
5.0	2.4128
6.0	2.4087
7.0	2.4043
8.0	2.3994
9.0	2.3936
10.0	2.3870
11.0	2.3793
12.0	2.3700

Constants of Dispersion Formula

A	2.4180937E+00
B	5.8099763E-02
C	5.4197832E-03
D	-3.1062129E-04
E	2.2955580E-07
F	-2.8583874E-09

Other Properties

ρ (g/cm ³)	3.19
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _W	1
D _A	1
R _{OH} (S)	4
RP (S)	2

Thermal Properties

T _g (°C)	205
T _s (°C)	227
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	218
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	221
C _p (J/g·K)	

Mechanical Properties

HK (10 ⁷ Pa)	112
E (GPa)	17.1
G (GPa)	6.5
μ	0.300

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶/°C)

λ (μm)	dn_{rel}/dt
3	-1.4
5	-2.8
8	-3.9
10	-4.0
12	-4.2

Expansion Coefficient α (×10⁻⁷/K)

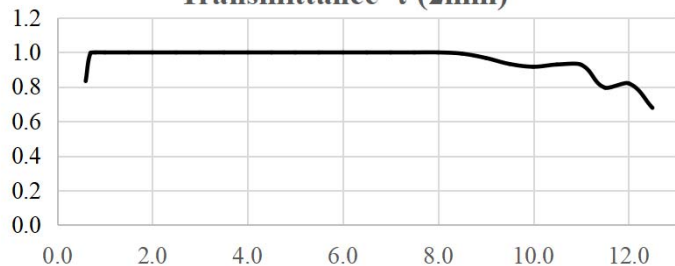
°C	α
-50/-40	209
-40/-30	210
-30/-20	212
-20/-10	213
-10/0	214
0/10	215
10/20	216
20/30	217
30/40	218
40/50	218
50/60	219
60/70	220
70/80	221
80/90	222
90/100	223
100/110	224
110/120	231
120/130	236
130/140	241
140/150	246
150/160	254

Internal Transmittance

λ (μm)	τ 2mm
12.5	0.678
12	0.820
11.5	0.795
11	0.928
10.5	0.929
10	0.916
9.5	0.932
9	0.967
8.5	0.992
8	0.999
7.5	0.999
7	0.999
6.5	0.999
6	0.999
5.5	0.999
5	0.999
4.5	0.999
4	0.999
3.5	0.999
3	0.999
2.5	0.999
2	0.999
1.5	0.999
1	0.999
0.8	0.999
0.7	0.996
0.6	0.833

Constants of dn/dt

D ₀	-4.64123E-06
D ₁	4.63395E-09
D ₂	2.54086E-11
E ₀	2.46810E-05
E ₁	4.44783E-08
λ_{TK}	5.91022E-08

Transmittance τ (2mm)

IRG209

$$n_{10.6} = 3.1393$$

$$v_{10.6} = 207.70$$

$$n_8 - n_{12.5} = 0.0103$$

Refractive Indices

λ (μm)	n_λ
2.0	
3.0	3.1767
4.0	3.1622
5.0	3.1552
6.0	3.1507
7.0	3.1477
8.0	3.1452
9.0	3.1429
10.0	3.1408
11.0	3.1385
12.0	3.1361
12.5	3.1349
13.0	
14.0	

Constants of Dispersion Formula

A	3.1453861E+00
B	2.8871318E-01
C	-1.7639771E-02
D	-7.2158095E-05
E	-7.1772673E-09
F	-2.3844250E-10

Other Properties

ρ (g/cm ³)	5.31
ϵ_r	

Chemical Properties (grade)

RC(S)	1
RA(S)	1
D _W	1
D _A	1
R _{OH} (S)	1
RP(S)	1

Thermal Properties

T _g (°C)	190
T _s (°C)	210
$\alpha_{-60/120^\circ\text{C}}$ (10 ⁻⁷ /K)	163
$\alpha_{20/120^\circ\text{C}}$ (10 ⁻⁷ /K)	167
C _p (J/g·K)	

Mechanical Properties

HK (10 ⁷ Pa)	112
E (GPa)	21.8
G (GPa)	8.1
μ	0.344

Temperature Coefficients of Refractive Index (-40 ~ 80°C) (×10⁻⁶ /°C)

λ (μm)	dn _{rel} /dt
3	181
5	168
8	161
10	160
12	159

Expansion Coefficient α (×10⁻⁷/K)

°C	α
-50/-40	160
-40/-30	161
-30/-20	162
-20/-10	163
-10/0	163
0/10	164
10/20	164
20/30	164
30/40	165
40/50	165
50/60	165
60/70	165
70/80	166
80/90	166
90/100	166
100/110	167
110/120	167
120/130	168
130/140	168
140/150	169
150/160	169

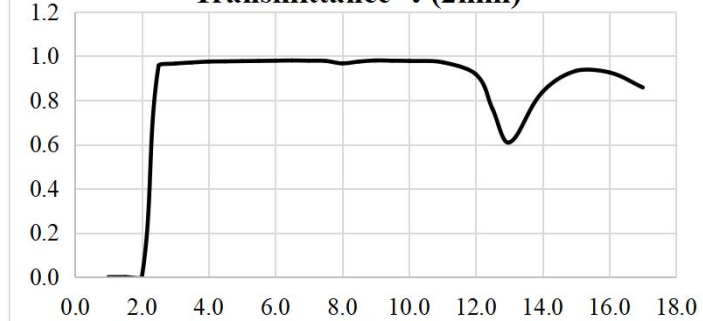
Internal Transmittance

λ (μm)	τ 2mm
17.0	0.858
16.0	0.926
15.0	0.933
14.0	0.838
13.0	0.609
12.5	0.761
12.0	0.918
11.0	0.972
10.0	0.978
9.5	0.979
9.0	0.980
8.5	0.975
8.0	0.967
7.5	0.978
7.0	0.979
6.5	0.980
6.0	0.979
5.5	0.978
5.0	0.977
4.5	0.976
4.0	0.975
3.5	0.971
3.0	0.966
2.5	0.956
2.0	
1.5	
1.0	

Constants of dn/dt

D ₀	1.16845E-04
D ₁	2.20933E-07
D ₂	-2.09490E-09
E ₀	1.32867E-04
E ₁	3.75602E-07
λ_{TK}	2.92771E-01

Transmittance τ (2mm)





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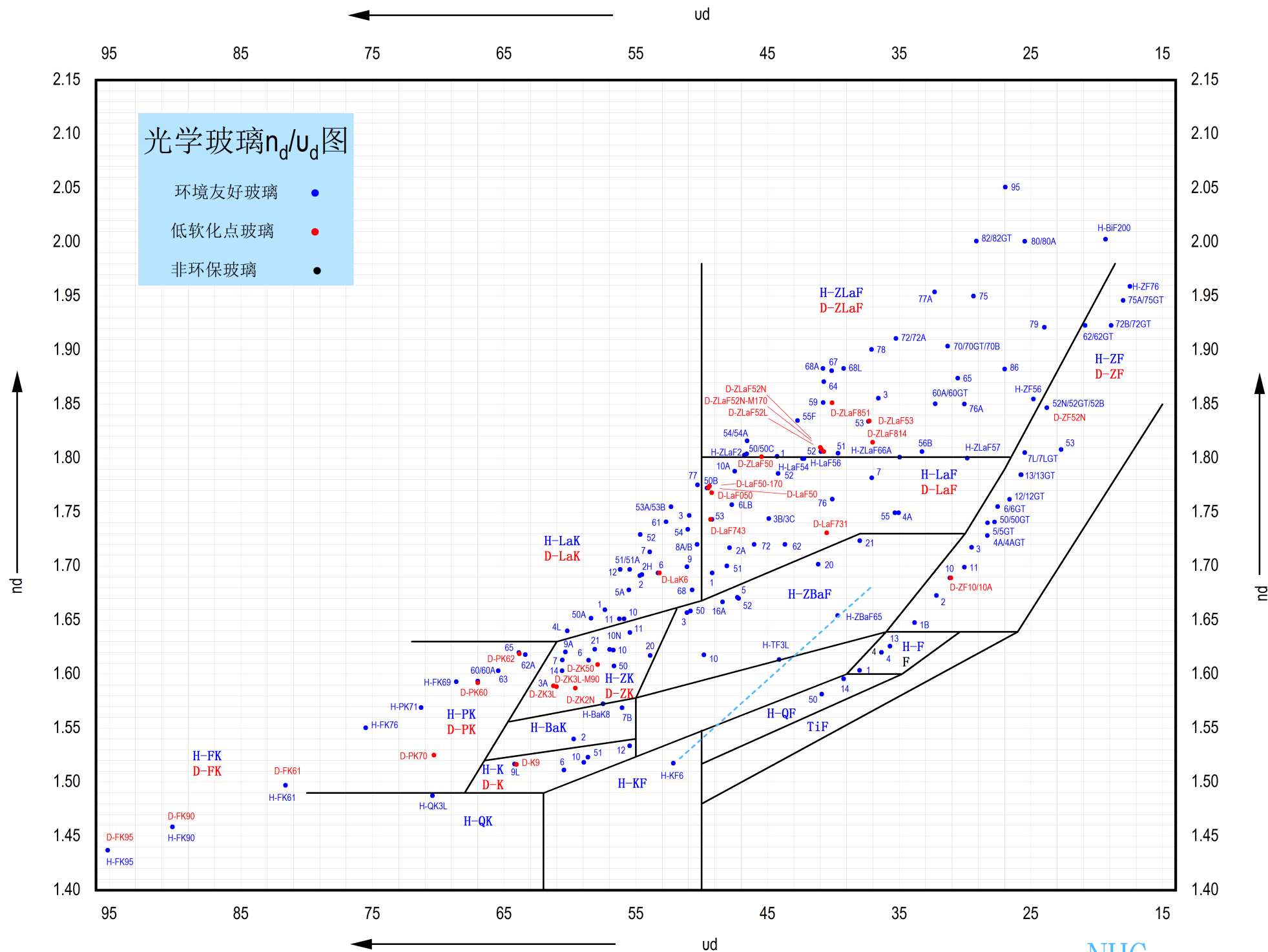
<http://www.hbnhg.com/>

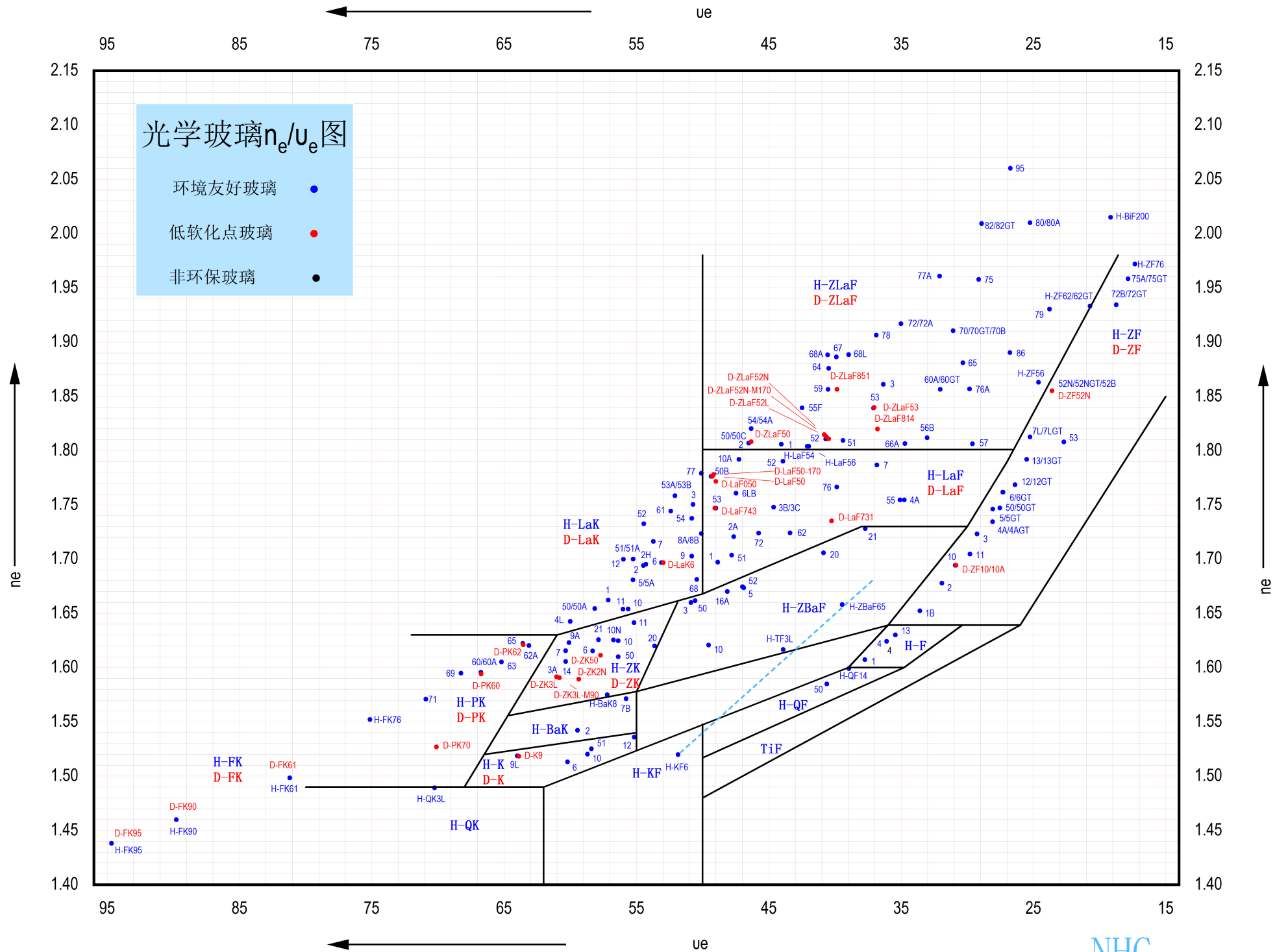
中英日文/V 2025

附表1

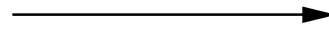
NHG低熔点玻璃在不同退火速率下折射率及模压折射率（一定模压条件下）参考对照表

牌号	分类	n ₁₀₆₄	n _t	n _s	n _{A'}	n _r	n _C	n _{C'}	n _{He-Ne}	n _D	n _d	n _e	n _F	n _{F'}	n _g	n _h	n _i	v _d	A ₀	A ₁	A ₂	A ₃	A ₄	A ₅
		1064.00	1013.98	852.11	768.19	706.52	656.27	643.85	632.80	589.29	587.56	546.07	486.13	479.99	435.84	404.66	365.01							
D-FK61	D-FK61@30	1.48965	1.49010	1.49183	1.49301	1.49407	1.49514	1.49543	1.49571	1.49694	1.49700	1.49845	1.50123	1.50157	1.50451	1.50721	1.51173	81.61	2.21807952E+00	-5.67922113E-03	8.28756139E-03	9.66891434E-05	3.56668643E-06	-3.63065113E-07
	D-FK61@4	1.49017	1.49062	1.49235	1.49353	1.49460	1.49566	1.49596	1.49623	1.49747	1.49752	1.49897	1.50175	1.50210	1.50504	1.50774	1.51226	81.69	2.21924633E+00	-5.50682294E-03	8.57906707E-03	3.76004475E-06	1.69911482E-05	-1.06003218E-06
	D-FK61@MY	1.48840	1.48888	1.49066	1.49184	1.49291	1.49396	1.49426	1.49454	1.49576	1.49582	1.49727	1.50004	1.50039	1.50332	1.50601	1.51053	81.55	2.21662175E+00	-6.95464652E-03	7.12874443E-03	3.95290832E-04	-3.34640166E-05	1.38048819E-06
D-FK90	D-FK90@30	1.45238	1.45277	1.45425	1.45524	1.45615	1.45704	1.45729	1.45752	1.45855	1.45860	1.45981	1.46212	1.46241	1.46486	1.46710	1.47085	90.19	2.10866977E+00	-4.81589397E-03	7.02478609E-03	-2.48667024E-05	1.78185408E-05	-1.09874507E-06
	D-FK90@MY	1.45130	1.45173	1.45328	1.45429	1.45520	1.45609	1.45633	1.45656	1.45759	1.45764	1.45885	1.46116	1.46145	1.46388	1.46612	1.46987	90.26	2.10864501E+00	-6.59257859E-03	5.45164317E-03	3.94323524E-04	-3.56305873E-05	1.47619898E-06
D-FK95	D-FK95@30	1.43134	1.43170	1.43306	1.43396	1.43478	1.43559	1.43582	1.43603	1.43696	1.43700	1.43810	1.44019	1.44044	1.44264	1.44466	1.44803	95.10	2.04831817E+00	-4.48612591E-03	6.22248873E-03	-7.98581030E-06	1.22118495E-05	-7.39464344E-07
	D-FK95@MY	1.43033	1.43075	1.43223	1.43317	1.43399	1.43480	1.43503	1.43524	1.43617	1.43621	1.43730	1.43940	1.43966	1.44185	1.44386	1.44723	94.83	2.05094559E+00	-7.62903612E-03	3.38061143E-03	7.59245138E-04	-8.44910069E-05	3.82064819E-06
	D-K9@30	1.50603	1.50673	1.50929	1.51094	1.51241	1.51384	1.51424	1.51461	1.51625	1.51633	1.51825	1.52190	1.52236	1.52621	1.52976	1.53574	64.06	2.27095299E+00	-1.08648469E-02	1.05786491E-02	1.54454636E-04	5.64088446E-06	-4.70999004E-07
D-K9	D-K9@4	1.50653	1.50723	1.50979	1.51144	1.51291	1.51434	1.51474	1.51511	1.51675	1.51682	1.51874	1.52240	1.52285	1.52670	1.53025	1.53624	64.12	2.27328277E+00	-1.12400565E-02	9.97599803E-03	3.45416287E-04	-2.14522809E-05	9.35402686E-07
	D-K9@MY	1.50444	1.50524	1.50804	1.50975	1.51123	1.51265	1.51305	1.51342	1.51504	1.51512	1.51703	1.52069	1.52115	1.52502	1.52858	1.53456	64.07	2.27572092E+00	-1.64829292E-02	6.08873299E-03	1.23341948E-03	-1.13324426E-04	4.43679918E-06
	D-PK60@30	1.58112	1.58182	1.58444	1.58618	1.58775	1.58931	1.58974	1.59014	1.59193	1.59201	1.59412	1.59814	1.59864	1.60291	1.60684	1.61349	67.00	2.50030926E+00	-1.01689443E-02	1.24607241E-02	1.85952458E-04	2.05179854E-06	-1.49222817E-07
D-PK60	D-PK60@MY	1.57865	1.57943	1.58223	1.58401	1.58559	1.58714	1.58757	1.58797	1.58975	1.58983	1.59193	1.59596	1.59646	1.60073	1.60466	1.61131	66.87	2.49938722E+00	-1.42892453E-02	9.34545116E-03	9.22415376E-04	-7.96926698E-05	3.28459896E-06
	D-PK62@30	1.60722	1.60793	1.61065	1.61249	1.61418	1.61586	1.61633	1.61676	1.61872	1.61881	1.62112	1.62555	1.62610	1.63084	1.63522	1.64265	63.85	2.58101085E+00	-9.35112569E-03	1.43302338E-02	8.87867497E-05	2.39962149E-05	-1.31422303E-06
	D-PK62@4	1.60801	1.60872	1.61144	1.61329	1.61498	1.61666	1.61712	1.61756	1.61951	1.61960	1.62191	1.62635	1.62690	1.63163	1.63602	1.64345	63.94	2.58349824E+00	-9.38526125E-03	1.44926085E-02	8.39203690E-06	3.91021928E-05	-2.23935731E-06
D-PK62	D-PK62@MY	1.60546	1.60610	1.60866	1.61047	1.61215	1.61384	1.61431	1.61475	1.61671	1.61680	1.61912	1.62355	1.62410	1.62882	1.63320	1.64063	63.52	2.56860724E+00	-5.38707629E-03	1.75069855E-02	-6.87624754E-04	1.10995728E-04	-4.98467098E-06
	D-PK70@30	1.51542	1.51607	1.51845	1.51999	1.52136	1.52269	1.52306	1.52341	1.52493	1.52500	1.52679	1.53017	1.53058	1.53413	1.53738	1.54287	70.32	2.29965045E+00	-1.03835061E-02	9.47420898E-03	3.16683036E-04	-2.62425226E-05	1.36324904E-06
	D-PK70@4	1.51690	1.51755	1.51993	1.52148	1.52285	1.52419	1.52456	1.52491	1.52644	1.52651	1.52829	1.53168	1.53210	1.53564	1.53890	1.54441	70.30	2.30381090E+00	-1.02497505E-02	9.70787950E-03	2.73667281E-04	-2.32664293E-05	1.35699791E-06
D-PK70	D-PK70@MY	1.51168	1.51234	1.51473	1.51627	1.51764	1.51897	1.51933	1.51968	1.52119	1.52126	1.52303	1.52638	1.52680	1.53033	1.53359	1.53908	70.35	2.28762859E+00	-1.01674763E-02	1.02576513E-02	-1.66576093E-05	2.58810983E-05	-1.41889408E-06
	D-ZK2N@30	1.57504	1.57579	1.57863	1.58054	1.58228	1.58399	1.58448	1.58492	1.58691	1.58700	1.58935	1.59384	1.59441	1.59918	1.60364	1.61145	59.59	2.48098765E+00	-1.07611097E-02	1.30595297E-02	5.70453194E-04	-6.87445031E-05	5.08145529E-06
	D-ZK2N@4	1.57581	1.57656	1.57941	1.58132	1.58305	1.58477	1.58525	1.58570	1.58769	1.58778	1.59013	1.59462	1.59518	1.59996	1.60442	1.61222	59.67	2.48339168E+00	-1.07617647E-02	1.30949062E-02	5.62576223E-04	-6.76286371E-05	5.01368289E-06
D-ZK2N	D-ZK2N@MY	1.57321	1.57395	1.57677	1.57867	1.58040	1.58212	1.58260	1.58304	1.58503	1.58512	1.58747	1.59196	1.59252	1.5973									





dn/dt relative(d line, 20-40°C) [$10^{-6}/^{\circ}\text{C}$]



-10

-8

-6

-4

-2

0

2

4

6

8

10

12

2.15

光学玻璃 n_d -dn/dt图

环境友好玻璃



低软化点玻璃



非环保玻璃



2.05

1.95

1.90

1.85

1.80

1.75

1.70

1.65

1.60

1.55

1.50

1.45

nd

nd

-10

-8

-6

-4

-2

0

2

4

6

8

10

12

dn/dt relative(d line, 20-40°C) [$10^{-6}/^{\circ}\text{C}$]



NHG