ガラスレンズ用プレス品硝種
Glass Lens Pressed Blanks

ガラス研磨レンズ用硝種
Glass Polished Lens

推奨硝種
Recommended Glass Type

E-FD15L

699-301

$n_d = 1.69895$ $\nu_d = 30.05$ (30.051) $n_F - n_C = 0.023259$
$n_e = 1.70444$ $\nu_e = 29.82$ (29.815) $n_{F'} - n_{C'} = 0.023627$

屈 折 率 Refractive Index

	λ (nm)	
$n_{1529.6}$	1529.60	1.66603
$n_{1128.64}$	1128.64	1.67335
n_t	1013.98	1.67607
n_s	852.11	1.68119
$n_{A'}$	768.195	1.68494
n_r	706.519	1.68852
n_C	656.273	1.69221
$n_{C'}$	643.847	1.69326
n_{633}	632.8	1.69425
n_D	589.294	1.69875
n_d	587.562	1.69895
n_e	546.074	1.70444
n_F	486.133	1.71547
$n_{F'}$	479.991	1.71689
n_g	435.834	1.72949
n_h	404.656	1.74205
n_i	365.015	1.76602

分散式の定数 Constants of dispersion formula

A_0	2.7924658
A_1	$-1.2540598 \times 10^{-2}$
A_2	2.8359569×10^{-2}
A_3	2.3368977×10^{-3}
A_4	$-2.0763765 \times 10^{-4}$
A_5	2.2481601×10^{-5}

部 分 分 散 Partial dispersions

$n_C - n_t$	0.016142
$n_d - n_C$	0.006742
$n_F - n_d$	0.016517
$n_g - n_F$	0.014020
$n_{C'} - n_t$	0.017194
$n_e - n_{C'}$	0.011183
$n_{F'} - n_e$	0.012444
$n_g - n_{F'}$	0.012600

部分分散比 Partial dispersion rates

P_{C_t}	0.6940	$P'_{C'\_t}$	0.7277
P_{d_C}	0.2899	$P'_{d\_C'}$	0.2408
P_{e_d}	0.2362	P'_{e_d}	0.2325
P_{F_e}	0.4740	$P'_{F'\_e}$	0.5267
P_{g_F}	0.6028	$P'_{g\_F'}$	0.5333
P_{h_g}	0.5402	P'_{h_g}	0.5318
P_{i_h}	1.0307	P'_{i_h}	1.0147

異常分散性 Anomalous dispersions

ΔP_{C_t}	0.0077
$\Delta P_{C\_A'}$	−0.0007
ΔP_{g_d}	0.0096
ΔP_{g_F}	0.0085
ΔP_{i_g}	0.0959

光弾性定数 Photoelastic Constant

B (10^{-12}/Pa)	2.82

比 重 Specific Gravity

d	2.94

化 学 的 性 質 Chemical Properties

D_W	1
D_A	1
T_{Blue}	1
D_{NaOH}	1
D_{STPP}	1
D_0	1
D_H	

熱 的 性 質 Thermal Properties

T_g (℃)	603
T_s (℃)	642
$T_{10^{14.5}}$ (℃)	562
$T_{10^{13}}$ (℃)	588
$T_{10^{7.6}}$ (℃)	675
$\alpha_{-30/+70℃}$ (10^{-7}/℃)	82
$\alpha_{100/300℃}$ (10^{-7}/℃)	101
λ [W/(m·K)]	0.932
C_p [kJ/(kg·K)]	0.683

機 械 的 性 質 Mechanical Properties

H_K	485(5)
F_A	150
E (GPa)	87
G (GPa)	35.1
μ	0.247
σ_b (MPa)	86

内部透過率 Internal Transmittance

λ (nm)	τ 2mm	τ 5mm	τ 10mm
2500	0.962	0.908	0.825
2400	0.972	0.931	0.867
2200	0.980	0.951	0.905
2000	0.992	0.979	0.958
1800	0.995	0.988	0.976
1600	0.998	0.996	0.992
1550	0.999	0.997	0.993
1500	0.999	0.997	0.993
1400	0.999	0.997	0.994
1300	0.999	0.999	0.998
1200	0.999	0.999	0.999
1100	0.999	0.999	0.999
1060	0.999	0.999	0.998
1050	0.999	0.999	0.998
1000	0.999	0.999	0.998
950	0.999	0.999	0.998
900	0.999	0.999	0.999
850	0.999	0.999	0.998
830	0.999	0.999	0.999
800	0.999	0.999	0.999
780	0.999	0.999	0.999
750	0.999	0.999	0.998
700	0.999	0.999	0.998
650	0.999	0.999	0.997
600	0.998	0.995	0.990
550	0.996	0.990	0.980
500	0.998	0.996	0.992
480	0.998	0.995	0.990
460	0.997	0.993	0.987
440	0.996	0.990	0.980
420	0.992	0.980	0.960
400	0.977	0.943	0.890
390	0.953	0.887	0.787
380	0.890	0.747	0.558
370	0.717	0.435	0.190
360	0.328	0.061	
350	0.031		
340			
330			
320			
310			
300			
290			
280			

屈折率の温度係数 dn/dT (×10^{-6}/℃) / アッベ数の温度係数 dν/dT (×10^{-3}/℃)
Temperature Coefficient of Refractive Index / Temperature Coefficient of Abbe-number

	(℃)	dn/dT										dν/dT	
		n_h	n_g	$n_{F'}$	n_F	n_e	n_d	n_{633}	$n_{C'}$	n_C	n_r	ν_e	ν_d
		404.66	435.84	479.99	486.13	546.07	587.56	632.80	643.85	656.27	706.52	546.07	587.56
dn/dT & dν/dT (rel.)	-40 / -20	5.6	4.6	3.5	3.4	2.6	2.3	2.0	1.9	1.9	1.7	-2.0	-2.0
	-20 / 0	5.9	4.7	3.7	3.6	2.7	2.4	2.1	2.0	1.9	1.7	-2.0	-2.0
	0 / 20	6.1	4.9	3.8	3.7	2.8	2.4	2.1	2.1	2.0	1.8	-2.1	-2.1
	20 / 40	6.3	5.1	3.9	3.8	2.9	2.5	2.2	2.1	2.0	1.8	-2.2	-2.2
	40 / 60	6.5	5.2	4.0	3.9	3.0	2.6	2.2	2.1	2.1	1.8	-2.2	-2.2
	60 / 80	6.6	5.3	4.1	4.0	3.0	2.6	2.2	2.1	2.1	1.8	-2.3	-2.3
	80 / 100	6.7	5.4	4.1	4.0	3.0	2.5	2.2	2.1	2.0	1.7	-2.4	-2.4
	100 / 120	6.8	5.4	4.1	3.9	2.9	2.4	2.0	2.0	1.9	1.6	-2.5	-2.5
	120 / 140	6.8	5.3	4.0	3.8	2.8	2.3	1.9	1.8	1.7	1.4	-2.6	-2.6
	140 / 150	6.7	5.2	3.8	3.7	2.6	2.1	1.7	1.7	1.6	1.3	-2.6	-2.6
dn/dT & dν/dT (abs.)	-40 / -20	3.3	2.2	1.2	1.1	0.3	0.0	-0.3	-0.4	-0.4	-0.6	-2.0	-2.0
	-20 / 0	3.8	2.7	1.7	1.6	0.8	0.4	0.1	0.0	0.0	-0.2	-2.0	-2.1
	0 / 20	4.3	3.2	2.1	2.0	1.1	0.7	0.4	0.4	0.3	0.1	-2.1	-2.1
	20 / 40	4.8	3.6	2.4	2.3	1.4	1.0	0.7	0.6	0.6	0.3	-2.2	-2.2
	40 / 60	5.2	3.9	2.7	2.6	1.7	1.3	0.9	0.8	0.8	0.5	-2.3	-2.3
	60 / 80	5.5	4.1	2.9	2.8	1.8	1.4	1.0	1.0	0.9	0.6	-2.3	-2.3
	80 / 100	5.7	4.3	3.0	2.9	1.9	1.5	1.1	1.0	1.0	0.7	-2.4	-2.4
	100 / 120	5.8	4.4	3.1	3.0	2.0	1.5	1.1	1.0	1.0	0.7	-2.5	-2.5
	120 / 140	5.9	4.4	3.1	3.0	1.9	1.4	1.1	1.0	0.9	0.6	-2.6	-2.6
	140 / 150	5.9	4.4	3.1	2.9	1.8	1.4	1.0	0.9	0.8	0.5	-2.6	-2.6

線膨張係数 α (×10^{-7}/℃)
Coefficient of Thermal Expansion

(℃)	α
-40 / -30	74
-30 / -20	76
-20 / -10	78
-10 / 0	80
0 / 10	81
10 / 20	82
20 / 30	83
30 / 40	84
40 / 50	84
50 / 60	85
60 / 70	85
70 / 80	86
80 / 90	86
90 / 100	87
100 / 110	87
110 / 120	88
120 / 130	89
130 / 140	90
140 / 150	91

着 色 度 Coloration Code

$\lambda_{80}(\lambda_{70})/\lambda_5$	405/365

着 色 度 (内部透過率) Coloration of Internal Transmittance

$\lambda_{\tau 80}/\lambda_{\tau 5}$	391/363

CCI Color Contribution Index

CCI(G)	2.01
CCI(R)	2.09

冷却速度による屈折率の変化 Difference of refractive indices by cooling rate

βC	
βd	
βF	
βg	

備 考 Remarks

硝種対照表 Glass Cross Reference Index

	HOYA	SCHOTT	OHARA	HIKARI	SUMITA	CDGM
Glass_Type	E-FD15L	N-SF15	S-TIM35	J-SF15	(K-CD300)	H-ZF11
Code	699-301	699-302	699-301	699-301	(692-296)	699-301

Excel File Name : HOYA20250701M.xlsm