AR/MR ウェイブガイド基板用硝種
Glass for AR/MR waveguide

推奨硝種
Associate Recommended Glass Type

FDS165-W

986-173

n_d= 1.98611 ν_d= 17.25 (17.249) $n_F - n_C$ = 0.057168
n_e= 1.99947 ν_e= 17.11 (17.111) $n_{F'} - n_{C'}$ = 0.058411

屈折率 Refractive Index		
	λ (nm)	
$n_{1529.6}$	1529.60	1.91476
$n_{1128.64}$	1128.64	1.92889
n_t	1013.98	1.93442
n_s	852.11	1.94530
$n_{A'}$	768.195	1.95356
n_r	706.519	1.96166
n_C	656.273	1.97016
$n_{C'}$	643.847	1.97262
n_{633}	632.8	1.97494
n_D	589.294	1.98563
n_d	587.562	1.98611
n_e	546.074	1.99947
n_F	486.133	2.02733
$n_{F'}$	479.991	2.03103
n_g	435.834	2.06508
n_h	404.656	2.10138
n_i	365.015	2.17716

分散式の定数 Constants of dispersion formula	
A_0	3.6965670
A_1	$-2.5460100 \times 10^{-2}$
A_2	6.4261580×10^{-2}
A_3	1.0639130×10^{-2}
A_4	$-1.1915100 \times 10^{-3}$
A_5	1.4778490×10^{-4}

部分分散 Partial dispersions	
$n_C - n_t$	0.035740
$n_d - n_C$	0.015947
$n_F - n_d$	0.041221
$n_g - n_F$	0.037752
$n_{C'} - n_t$	0.038195
$n_e - n_{C'}$	0.026851
$n_{F'} - n_e$	0.031560
$n_g - n_{F'}$	0.034054

部分分散比 Partial dispersion rates			
P_{C_t}	0.6252	$P'_{C'\_t}$	0.6539
P_{d_C}	0.2789	$P'_{d\_C'}$	0.2310
P_{e_d}	0.2337	P'_{e_d}	0.2287
P_{F_e}	0.4874	$P'_{F'\_e}$	0.5403
P_{g_F}	0.6604	$P'_{g\_F'}$	0.5830
P_{h_g}	0.6350	P'_{h_g}	0.6215
P_{i_h}	1.3254	P'_{i_h}	

異常分散性 Anomalous dispersions	
ΔP_{C_t}	-0.0013
$\Delta P_{C\_A'}$	-0.0074
ΔP_{g_d}	0.0490
ΔP_{g_F}	0.0431
ΔP_{i_g}	

光弾性定数 Photoelastic Constant	
B (10^{-12}/Pa)	3.54

比重 Specific Gravity	
d	3.62

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 (℃)	676
T_s (℃)	721
$T_{10^{14.5}}$ (℃)	639
$T_{10^{13}}$ (℃)	668
$T_{10^{7.6}}$ (℃)	
$\alpha_{-30/+70℃}$ (10^{-7}/℃)	46
$\alpha_{100/300℃}$ (10^{-7}/℃)	59
λ [W/(m·K)]	0.932
C_P [kJ/(kg·K)]	0.562

機械的性質 Mechanical Properties	
H_K	515(5)
F_A	170
E (GPa)	105
G (GPa)	42.2
μ	0.246
σ_b (MPa)	80

内部透過率 Internal Transmittance			
λ (nm)	τ 2mm	τ 5mm	τ 10mm
2500	0.959	0.900	0.811
2400	0.969	0.924	0.855
2200	0.980	0.952	0.906
2000	0.992	0.981	0.960
1800	0.995	0.987	0.973
1600	0.998	0.994	0.988
1550	0.998	0.995	0.989
1500	0.997	0.993	0.987
1400	0.999	0.999	0.997
1300	0.999	0.999	0.999
1200	0.999	0.999	0.999
1100	0.999	0.999	0.999
1060	0.999	0.999	0.999
1050	0.999	0.999	0.999
1000	0.999	0.999	0.999
950	0.999	0.999	0.999
900	0.999	0.999	0.999
850	0.999	0.999	0.999
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	0.999
700	0.999	0.999	0.999
650	0.999	0.999	0.999
600	0.999	0.999	0.997
550	0.998	0.996	0.991
500	0.995	0.988	0.976
480	0.993	0.983	0.967
460	0.990	0.976	0.953
440	0.985	0.963	0.928
420	0.956	0.893	0.797
400	0.698	0.407	0.165
390	0.356	0.076	0.006
380	0.190	0.016	
370			
360			
350			
340			
330			
320			
310			
300			
290			
280			

屈折率の温度係数 dn/dT (×10^{-6}/℃) Temperature Coefficient of Refractive Index
アッベ数の温度係数 dν/dT (×10^{-3}/℃) 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	16.9	12.1	8.6	8.3	6.1	5.2	4.5	4.4	4.3	3.8	-1.1	-1.1
	-20 / 0	17.8	12.7	9.0	8.7	6.4	5.4	4.7	4.6	4.4	3.9	-1.2	-1.2
	0 / 20	18.8	13.4	9.5	9.1	6.7	5.7	4.9	4.8	4.6	4.1	-1.3	-1.3
	20 / 40	19.8	14.1	10.0	9.6	7.0	6.0	5.2	5.0	4.9	4.3	-1.3	-1.3
	40 / 60	20.8	14.8	10.5	10.1	7.4	6.3	5.5	5.3	5.1	4.6	-1.4	-1.4
	60 / 80	21.8	15.5	11.0	10.6	7.8	6.6	5.7	5.6	5.4	4.8	-1.5	-1.4
	80 / 100	22.8	16.2	11.5	11.1	8.1	6.9	6.0	5.8	5.6	5.0	-1.5	-1.5
	100 / 120	23.8	16.9	12.0	11.6	8.5	7.2	6.2	6.1	5.9	5.2	-1.6	-1.6
	120 / 140	24.7	17.6	12.5	12.0	8.8	7.5	6.5	6.3	6.1	5.4	-1.6	-1.6
	140 / 150	25.5	18.1	12.9	12.4	9.1	7.7	6.7	6.5	6.3	5.6	-1.7	-1.7
dn/dT & dν/dT (abs.)	-40 / -20	14.1	9.3	5.8	5.5	3.4	2.5	1.9	1.7	1.6	1.2	-1.2	-1.1
	-20 / 0	15.4	10.3	6.7	6.3	4.1	3.1	2.4	2.3	2.2	1.7	-1.2	-1.2
	0 / 20	16.7	11.3	7.5	7.1	4.7	3.7	3.0	2.8	2.7	2.2	-1.3	-1.3
	20 / 40	17.9	12.3	8.2	7.8	5.3	4.3	3.5	3.3	3.2	2.6	-1.3	-1.3
	40 / 60	19.2	13.2	8.9	8.5	5.9	4.8	3.9	3.8	3.6	3.1	-1.4	-1.4
	60 / 80	20.4	14.1	9.6	9.2	6.4	5.3	4.4	4.2	4.0	3.5	-1.5	-1.5
	80 / 100	21.5	14.9	10.3	9.8	6.9	5.7	4.8	4.6	4.4	3.8	-1.5	-1.5
	100 / 120	22.6	15.8	10.9	10.4	7.4	6.1	5.2	5.0	4.8	4.2	-1.6	-1.6
	120 / 140	23.7	16.6	11.5	11.0	7.8	6.5	5.5	5.3	5.1	4.5	-1.6	-1.6
	140 / 150	24.5	17.2	11.9	11.4	8.1	6.8	5.8	5.6	5.4	4.7	-1.7	-1.7

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

(℃)	α
-40 / -30	44
-30 / -20	45
-20 / -10	45
-10 / 0	45
0 / 10	46
10 / 20	46
20 / 30	46
30 / 40	47
40 / 50	47
50 / 60	48
60 / 70	48
70 / 80	48
80 / 90	49
90 / 100	50
100 / 110	51
120 / 130	52
130 / 140	54
140 / 150	55

着色度 Coloration Code	
λ80(λ70)/λ5	(430)/395
着色度 (内部透過率) Coloration of Internal Transmittance	
λτ80/λτ5	420/395

CCI Color Contribution Index	
CCI(G)	10.13
CCI(R)	10.53

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　プレス品の形状制限がございます。

硝種対照表 Glass Cross Reference Index

	HOYA	SCHOTT	OHARA	HIKARI	SUMITA	CDGM
Glass_Type	FDS165-W					
Code	986-173					

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