

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

FDS20-W

870-200

$n_d = 1.86966$   $\nu_d = 20.02$   
 $n_e = 1.87984$   $\nu_e = 19.85$

$n_F - n_C = 0.043441$   
 $n_F' - n_C' = 0.044315$

屈折率 Refractive Index		
	$\lambda$ (nm)	
$n_{1529.6}$	1529.60	1.81361
$n_{1128.64}$	1128.64	1.82501
$n_t$	1013.98	1.82944
$n_s$	852.11	1.83806
$n_{A'}$	768.19	1.84454
$n_r$	706.52	1.85084
$n_C$	656.27	1.85742
$n_{C'}$	643.85	1.85931
$n_{633}$	632.80	1.86110
$n_D$	589.29	1.86929
$n_d$	587.56	1.86966
$n_e$	546.07	1.87984
$n_F$	486.13	1.90086
$n_{F'}$	479.99	1.90362
$n_g$	435.84	1.92881
$n_h$	404.66	1.95509
$n_i$	365.01	2.00828

部分分散 Partial dispersions	
$n_C - n_t$	0.027978
$n_d - n_C$	0.012245
$n_F - n_d$	0.031196
$n_g - n_F$	0.027953
$n_{C'} - n_t$	0.029870
$n_e - n_{C'}$	0.020535
$n_{F'} - n_e$	0.023780
$n_g - n_{F'}$	0.025187

部分分散比 Partial dispersion rates			
$P_{C,t}$	0.6440	$P'_{C,t}$	0.6740
$P_{d,C}$	0.2819	$P'_{d,C}$	0.2336
$P_{e,d}$	0.2344	$P'_{e,d}$	0.2298
$P_{F,e}$	0.4837	$P'_{F,e}$	0.5366
$P_{g,F}$	0.6435	$P'_{g,F}$	0.5684
$P_{h,g}$	0.6050	$P'_{h,g}$	0.5930
$P_{i,h}$	1.2243	$P'_{i,h}$	1.2002

異常分散性 Anomalous dispersions	
$\Delta P_{C,t}$	0.0044
$\Delta P_{C,A'}$	-0.0047
$\Delta P_{g,d}$	0.0354
$\Delta P_{g,F}$	0.0313
$\Delta P_{i,g}$	0.2653

光弾性定数 Photoelastic Constant	
$B (10^{-12}/Pa)$	3.42

比重 Specific Gravity	
$d$	3.37

化学的性質 Chemical Properties	
$D_W$	1
$D_A$	1
$T_{Blue}$	1
$D_{NaOH}$	1
$D_{STPP}$	1
$D_O$	1
$D_H$	1

熱的性質 Thermal Properties	
$T_g (^\circ C)$	589
$T_s (^\circ C)$	642
$T_{10^{14.5}} (^\circ C)$	571
$T_{10^{13}} (^\circ C)$	588
$T_{10^{7.6}} (^\circ C)$	677
$\alpha_{-30/+70^\circ C} (10^{-7}/^\circ C)$	70
$\alpha_{100/300^\circ C} (10^{-7}/^\circ C)$	90
$\lambda [W/(m \cdot K)]$	0.888
$C_p [kJ/(kg \cdot K)]$	0.591

機械的性質 Mechanical Properties	
$H_K$	405 (4)
$F_A$	250
$E$ (GPa)	95
$G$ (GPa)	38.0
$\mu$	0.250
$\sigma_b$ (MPa)	69

内部透過率 Internal Transmittance			
$\lambda$ (nm)	$\tau_{2mm}$	$\tau_{5mm}$	$\tau_{10mm}$
2500	0.917	0.806	0.649
2400	0.934	0.844	0.712
2200	0.953	0.887	0.787
2000	0.984	0.961	0.923
1800	0.991	0.979	0.958
1600	0.996	0.991	0.981
1550	0.997	0.992	0.984
1500	0.996	0.991	0.982
1400	0.998	0.995	0.990
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	0.998
1050	0.999	0.999	0.998
1000	0.999	0.998	0.996
950	0.999	0.998	0.996
900	0.999	0.997	0.995
850	0.999	0.997	0.994
830	0.999	0.997	0.994
800	0.999	0.996	0.993
780	0.999	0.997	0.995
750	0.999	0.997	0.993
700	0.999	0.997	0.993
650	0.999	0.997	0.994
600	0.999	0.997	0.994
550	0.998	0.996	0.992
500	0.998	0.994	0.988
480	0.997	0.993	0.986
460	0.997	0.991	0.983
440	0.995	0.988	0.976
420	0.989	0.974	0.949
400	0.928	0.829	0.687
390	0.739	0.469	0.220
380	0.315	0.056	
370	0.022		
360			
350			
340			
330			
320			
310			
300			
290			
280			

分散式の定数 Constants of dispersion formula	
$A_0$	3.3114745
$A_1$	$-1.9402447 \times 10^{-2}$
$A_2$	$5.1621829 \times 10^{-2}$
$A_3$	$5.8556024 \times 10^{-3}$
$A_4$	$-5.3287332 \times 10^{-4}$
$A_5$	$7.3197844 \times 10^{-5}$

屈折率の温度係数 $dn/dT$ ( $\times 10^{-6}/^\circ C$ )		アッペ数の温度係数 $d\nu/dT$ ( $\times 10^{-3}/^\circ C$ )													
Temperature Coefficient of Refractive Index		Temperature Coefficient of Abbe-number													
	(°C)	$dn/dT$												$d\nu/dT$	
		$n_h$	$n_g$	$n_{F'}$	$n_F$	$n_e$	$n_d$	$n_{633}$	$n_{C'}$	$n_C$	$n_r$	$\nu_e$	$\nu_d$		
$dn/dT$ & $d\nu/dT$ (rel.)	-40 / -20	8.3	4.9	2.5	2.3	0.8	0.2	-0.3	-0.4	-0.5	-0.8	-1.3	-1.3		
	-20 / 0	9.1	5.5	3.0	2.7	1.1	0.5	0.0	-0.1	-0.2	-0.6	-1.4	-1.4		
	0 / 20	9.9	6.1	3.4	3.1	1.4	0.8	0.2	0.1	0.0	-0.3	-1.4	-1.4		
	20 / 40	10.6	6.7	3.8	3.5	1.7	1.0	0.4	0.3	0.2	-0.1	-1.5	-1.5		
	40 / 60	11.3	7.1	4.1	3.8	2.0	1.2	0.6	0.5	0.4	0.0	-1.6	-1.6		
	60 / 80	12.0	7.6	4.4	4.1	2.1	1.3	0.7	0.6	0.5	0.1	-1.6	-1.6		
	80 / 100	12.5	7.9	4.6	4.3	2.2	1.4	0.8	0.6	0.5	0.1	-1.7	-1.7		
	100 / 120	13.0	8.2	4.8	4.4	2.3	1.4	0.7	0.6	0.5	0.0	-1.8	-1.8		
	120 / 140	13.4	8.4	4.8	4.5	2.2	1.3	0.6	0.5	0.3	-0.1	-1.9	-1.8		
	140 / 150	13.6	8.4	4.8	4.4	2.1	1.2	0.5	0.3	0.2	-0.3	-1.9	-1.9		
$dn/dT$ & $d\nu/dT$ (abs.)	-40 / -20	5.6	2.3	-0.1	-0.3	-1.8	-2.4	-2.8	-2.9	-3.0	-3.3	-1.3	-1.3		
	-20 / 0	6.8	3.3	0.7	0.5	-1.1	-1.7	-2.2	-2.3	-2.4	-2.7	-1.4	-1.4		
	0 / 20	7.9	4.1	1.5	1.2	-0.4	-1.1	-1.6	-1.7	-1.8	-2.2	-1.4	-1.4		
	20 / 40	8.9	4.9	2.1	1.9	0.1	-0.6	-1.2	-1.3	-1.4	-1.8	-1.5	-1.5		
	40 / 60	9.8	5.6	2.7	2.4	0.5	-0.2	-0.8	-0.9	-1.0	-1.4	-1.6	-1.6		
	60 / 80	10.6	6.2	3.1	2.8	0.9	0.1	-0.5	-0.7	-0.8	-1.2	-1.7	-1.6		
	80 / 100	11.3	6.7	3.5	3.1	1.1	0.3	-0.4	-0.5	-0.6	-1.0	-1.7	-1.7		
	100 / 120	11.9	7.1	3.7	3.4	1.2	0.4	-0.3	-0.4	-0.5	-1.0	-1.8	-1.8		
	120 / 140	12.4	7.4	3.9	3.5	1.3	0.4	-0.3	-0.4	-0.6	-1.0	-1.9	-1.8		
	140 / 150	12.7	7.6	3.9	3.6	1.3	0.3	-0.4	-0.5	-0.7	-1.1	-1.9	-1.9		

線膨張係数 $\alpha$ ( $\times 10^{-7}/^\circ C$ )	
Coefficient of Thermal Expansion	
(°C)	$\alpha$
-40 / -30	66
-30 / -20	67
-20 / -10	68
-10 / 0	68
0 / 10	69
10 / 20	70
20 / 30	71
30 / 40	71
40 / 50	72
50 / 60	72
60 / 70	73
70 / 80	74
80 / 90	74
90 / 100	75
100 / 110	76
110 / 120	77
120 / 130	78
130 / 140	79
140 / 150	80

着色度 Coloration Code	
$\lambda_{80} (\lambda_{70}) / \lambda_5$	(410) / 385
着色度 Coloration of Internal Transmittance (内部透過率)	
$\lambda_{\tau 80} / \lambda_{\tau 5}$	404 / 383

CCI Color Contribution Index	
CCI (G)	4.05
CCI (R)	4.14

冷却速度による屈折率の変化 Difference of refractive indices by cooling rate	
$\beta_C$	
$\beta_d$	
$\beta_F$	
$\beta_g$	

備考 Remarks						
硝種対照表 Glass Cross Reference Index						
Glass_Type	HOYA	SCHOTT	OHARA	HIKARI	SUMITA	CDGM
Code	FDS20-W					
	870-200					

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