

S-NPH 1W

Code(d) **808228**

Code(e) **816226**

Refractive Index n_d	1.80809 1.808095	Abbe Number ν_d	22.76	Dispersion n_F-n_C	0.035504
Refractive Index n_e	1.816434	Abbe Number ν_e	22.57	Dispersion $n_F-n_{C'}$	0.036174

Refractive Indices		
$\lambda(\mu\text{m})$		
n_{2325}	2.32542	1.74455
n_{1970}	1.97009	1.75226
n_{1530}	1.52958	1.76125
n_{1129}	1.12864	1.77084
n_t	1.01398	1.77459
n_s	0.85211	1.78187
$n_{A'}$	0.76819	1.78731
n_r	0.70652	1.79256
n_C	0.65627	1.79801
$n_{C'}$	0.64385	1.79957
$n_{\text{He-Ne}}$	0.6328	1.80105
n_D	0.58929	1.80779
n_d	0.58756	1.80809
n_e	0.54607	1.81643
n_F	0.48613	1.83351
$n_{F'}$	0.47999	1.83575
$n_{\text{He-Cd}}$	0.44157	1.85279
n_g	0.435835	1.85590
n_h	0.404656	1.87658
n_i	0.365015	

Constants of Dispersion Formula	
A_1	1.75156623E+00
A_2	3.64006304E-01
A_3	2.47874141E+00
B_1	1.35004681E-02
B_2	6.68245147E-02
B_3	1.70756006E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	1~2
Acid Resistance(Surface) Group SR	1.0
Phosphate Resistance PR	1.0

Mechanical Properties	
Young's Modulus E (GPa)	89.3
Rigidity Modulus G (GPa)	35.7
Poisson's Ratio σ	0.250
Knoop Hardness Hk(Class)	460 5
Abrasion Aa	320

Partial Dispersions	
n_C-n_t	0.023420
$n_C-n_{A'}$	0.010701
n_d-n_C	0.010086
n_e-n_C	0.018425
n_g-n_d	0.047809
n_g-n_F	0.022391
n_h-n_g	0.020676
n_i-n_g	
n_C-n_t	0.024983
$n_e-n_{C'}$	0.016862
$n_{F'}-n_e$	0.019312
$n_i-n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.6596
$\theta_{C,A'}$	0.3014
$\theta_{d,C}$	0.2841
$\theta_{e,C}$	0.5190
$\theta_{g,d}$	1.3466
$\theta_{g,F}$	0.6307
$\theta_{h,g}$	0.5824
$\theta_{i,g}$	
$\theta'_{C,t}$	0.6906
$\theta'_{e,C'}$	0.4661
$\theta'_{F',e}$	0.5339
$\theta'_{i,F'}$	

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	0.0061
$\Delta\theta_{C,A'}$	-0.0020
$\Delta\theta_{g,d}$	0.0292
$\Delta\theta_{g,F}$	0.0261
$\Delta\theta_{i,g}$	

Thermal Properties	
Strain Point StP (°C)	516
Annealing Point AP (°C)	547
Transformation Temperature Tg (°C)	552
Yield Point At (°C)	589
Softening Point SP (°C)	645
Expansion Coefficients (-30~+70°C)	83
α (10^{-7}K^{-1}) (+100~+300°C)	104
Thermal Conductivity λ W/(m·K)	0.882

Coloring			
λ_{80}	420	λ_5	375
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	395	$\lambda_{0.05}$	372

CCI		
B	G	R
0.00	2.65	2.84

Internal Transmittance	
$\lambda(\text{nm})$	τ 10mm
280	
290	
300	
310	
320	
330	
340	
350	
360	
370	
380	0.28
390	0.67
400	0.87
420	0.956
440	0.972
460	0.978
480	0.983
500	0.986
550	0.993
600	0.996
650	0.997
700	0.998
800	0.999
900	0.999
1000	0.999
1200	0.999
1400	0.996
1600	0.994
1800	0.986
2000	0.973
2200	0.932
2400	0.88

Temperature Coefficients of Refractive Index							
Range of Temperature (°C)	$\Delta n / \Delta T$ relative (10^{-6}K^{-1})						
	t	C'	He-Ne	D	e	F'	g
-40~-20	-1.9	-1.2	-1.1	-0.7	-0.2	1.2	3.0
-20~ 0	-1.9	-1.1	-1.0	-0.6	0.0	1.5	3.4
0~20	-1.8	-0.9	-0.8	-0.4	0.2	1.8	3.8
20~40	-1.8	-0.8	-0.7	-0.3	0.4	2.1	4.3
40~60	-1.8	-0.7	-0.6	-0.1	0.6	2.4	4.7
60~80	-1.7	-0.5	-0.4	0.1	0.8	2.7	5.1

Other Properties	
Photoelastic Constant β nm/(cm \cdot 10 5 Pa)	3.23
Specific Gravity d	3.29
Remarks	

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※The name of the glass type is the model number assigned based on the main components of the composition: large, medium, small refractive index and serial number.