

S-NPH 2

Code(d) **923189**

Code(e) **934187**

Refractive Index n_d	1.92286	Abbe Number ν_d	18.90	Dispersion n_F-n_C	0.048838
	1.922860				
Refractive Index n_e	1.934291	Abbe Number ν_e	18.74	Dispersion n_F-n_C'	0.049853

Refractive Indices		
$\lambda(\mu\text{m})$		
n_{2325}	2.32542	1.84214
n_{1970}	1.97009	1.85093
n_{1530}	1.52958	1.86146
n_{1129}	1.12864	1.87327
n_t	1.01398	1.87807
n_s	0.85211	1.88758
$n_{A'}$	0.76819	1.89479
n_f	0.70652	1.90181
n_C	0.65627	1.90916
$n_{C'}$	0.64385	1.91127
$n_{\text{He-Ne}}$	0.6328	1.91327
n_D	0.58929	1.92245
n_d	0.58756	1.92286
n_e	0.54607	1.93429
n_F	0.48613	1.95800
$n_{F'}$	0.47999	1.96112
$n_{\text{He-Cd}}$	0.44157	1.98526
n_g	0.435835	1.98972
n_h	0.404656	2.01976
n_i	0.365015	

Constants of Dispersion Formula	
A_1	2.03869510E+00
A_2	4.37269641E-01
A_3	2.96711461E+00
B_1	1.70796224E-02
B_2	7.49254813E-02
B_3	1.74155354E+02

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

Mechanical Properties	
Young's Modulus E (GPa)	99.1
Rigidity Modulus G (GPa)	39.7
Poisson's Ratio σ	0.249
Knoop Hardness Hk(Class)	450 5
Abrasion Aa	237

Partial Dispersions	
n_C-n_t	0.031086
$n_C-n_{A'}$	0.014367
n_d-n_C	0.013702
n_e-n_C	0.025133
n_g-n_d	0.066857
n_g-n_F	0.031721
n_h-n_g	0.030046
n_i-n_g	
n_C-n_t	0.033200
$n_e-n_{C'}$	0.023019
$n_{F'}-n_e$	0.026834
$n_i-n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.6365
$\theta_{C,A'}$	0.2942
$\theta_{d,C}$	0.2806
$\theta_{e,C}$	0.5146
$\theta_{g,d}$	1.3690
$\theta_{g,F}$	0.6495
$\theta_{h,g}$	0.6152
$\theta_{i,g}$	
$\theta'_{C,t}$	0.6660
$\theta'_{e,C}$	0.4617
$\theta'_{F,e}$	0.5383
$\theta'_{i,F'}$	

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta \theta_{C,t}$	0.0012
$\Delta \theta_{C,A'}$	-0.0045
$\Delta \theta_{g,d}$	0.0436
$\Delta \theta_{g,F}$	0.0386
$\Delta \theta_{i,g}$	

Thermal Properties	
Strain Point StP (°C)	604
Annealing Point AP (°C)	631
Transformation Temperature Tg (°C)	650
Yield Point At (°C)	676
Softening Point SP (°C)	716
Expansion Coefficients (-30~+70°C)	67
α (10^{-7}K^{-1}) (+100~+300°C)	83
Thermal Conductivity λ W/(m·K)	0.969

Coloring			
λ_{80}		λ_5	390
λ_{70}	440		

Internal transmission			
$\lambda_{0.80}$	433	$\lambda_{0.05}$	391

CCI		
B	G	R
0.00	12.87	13.51

Internal Transmittance	
$\lambda(\text{nm})$	τ 10mm
280	
290	
300	
310	
320	
330	
340	
350	
360	
370	
380	
390	0.02
400	0.24
420	0.70
440	0.85
460	0.910
480	0.936
500	0.953
550	0.978
600	0.988
650	0.990
700	0.993
800	0.996
900	0.996
1000	0.996
1200	0.997
1400	0.997
1600	0.996
1800	0.992
2000	0.988
2200	0.977
2400	0.961

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	-0.6	0.4	0.5	1.2	1.8	3.8	6.6
-20~ 0	-0.6	0.6	0.7	1.4	2.1	4.3	7.4
0~20	-0.4	0.9	1.0	1.8	2.5	4.8	8.1
20~40	-0.2	1.1	1.3	2.1	2.8	5.4	8.8
40~60	0.0	1.4	1.5	2.3	3.2	5.9	9.6
60~80	0.2	1.6	1.8	2.7	3.6	6.4	10.3

Other Properties	
Photoelastic Constant β nm/(cm·10 ⁹ Pa)	3.31
Specific Gravity d	3.58
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.