

S-NPH 5

Code(d) **859227**

Code(e) **868225**

Refractive Index n_d	1.85896 1.858956	Abbe Number ν_d	22.73	Dispersion n_F-n_C	0.037792
Refractive Index n_e	1.867836	Abbe Number ν_e	22.54	Dispersion n_F-n_C'	0.038499

Refractive Indices		
$\lambda(\mu\text{m})$		
n_{2325}	2.32542	1.79247
n_{1970}	1.97009	1.80027
n_{1530}	1.52958	1.80944
n_{1129}	1.12864	1.81938
n_t	1.01398	1.82333
n_s	0.85211	1.83103
$n_{A'}$	0.76819	1.83681
n_r	0.70652	1.84240
n_C	0.65627	1.84821
$n_{C'}$	0.64385	1.84987
$n_{\text{He-Ne}}$	0.6328	1.85145
n_D	0.58929	1.85863
n_d	0.58756	1.85896
n_e	0.54607	1.86784
n_F	0.48613	1.88600
$n_{F'}$	0.47999	1.88837
$n_{\text{He-Cd}}$	0.44157	1.90645
n_g	0.435835	1.90975
n_h	0.404656	1.93160
n_i	0.365015	

Constants of Dispersion Formula	
A_1	1.89108996E+00
A_2	3.95220126E-01
A_3	2.20492127E+00
B_1	1.41164499E-02
B_2	6.62834445E-02
B_3	1.48680700E+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 (10^9N/m^2)	929
Rigidity Modulus G (10^9N/m^2)	370
Poisson's Ratio σ	0.256
Knoop Hardness Hk[Class]	470 5
Abrasion Aa	277
Photoelastic Constant β nm/(cm \cdot 10 5 Pa)	3.18

Partial Dispersions	
n_C-n_t	0.024883
$n_C-n_{A'}$	0.011397
n_d-n_C	0.010747
n_e-n_C	0.019627
n_g-n_d	0.050792
n_g-n_F	0.023747
n_h-n_g	0.021851
n_i-n_g	
n_C-n_t	0.026548
$n_e-n_{C'}$	0.017962
n_F-n_e	0.020537
$n_i-n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.6584
$\theta_{C,A'}$	0.3016
$\theta_{d,C}$	0.2844
$\theta_{e,C}$	0.5193
$\theta_{g,d}$	1.3440
$\theta_{g,F}$	0.6284
$\theta_{h,g}$	0.5782
$\theta_{i,g}$	
$\theta'_{C,t}$	0.6896
$\theta'_{e,C'}$	0.4666
$\theta'_{F,e}$	0.5334
$\theta'_{i,F'}$	

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	0.0051
$\Delta\theta_{C,A'}$	-0.0018
$\Delta\theta_{g,d}$	0.0265
$\Delta\theta_{g,F}$	0.0237
$\Delta\theta_{i,g}$	

Thermal Properties	
Strain Point StP ($^{\circ}\text{C}$)	573
Annealing Point AP ($^{\circ}\text{C}$)	599
Transformation Temperature Tg ($^{\circ}\text{C}$)	609
Yield Point At ($^{\circ}\text{C}$)	651
Softening Point SP ($^{\circ}\text{C}$)	704
Expansion Coefficients (-30~+70 $^{\circ}\text{C}$)	76
α ($10^{-7}/^{\circ}\text{C}$) (+100~+300 $^{\circ}\text{C}$)	84
Thermal Conductivity λ W/(m \cdot K)	0.877

Coloring			
λ_{80}		λ_5	370
λ_{70}	400		

Internal transmission			
$\lambda_{0.80}$	397	$\lambda_{0.05}$	364

CCI		
B	G	R
0.00	3.38	3.62

Internal Transmittance	
$\lambda(\text{nm})$	τ 10mm
280	
290	
300	
310	
320	
330	
340	
350	
360	0.03
370	0.08
380	0.41
390	0.72
400	0.84
420	0.924
440	0.949
460	0.962
480	0.971
500	0.979
550	0.991
600	0.994
650	0.995
700	0.996
800	0.998
900	0.998
1000	0.998
1200	0.999
1400	0.996
1600	0.993
1800	0.984
2000	0.972
2200	0.944
2400	0.915

Temperature Coefficients of Refractive Index							
Range of Temperature ($^{\circ}\text{C}$)	$\Delta n/\Delta T$ relative ($10^{-6}/^{\circ}\text{C}$)						
	t	C'	He-Ne	D	e	F'	g
-40~-20	0.0	1.0	1.1	1.5	2.0	3.5	5.3
-20~ 0	0.0	1.1	1.2	1.6	2.2	3.8	5.8
0~20	0.0	1.2	1.3	1.7	2.4	4.1	6.2
20~40	0.1	1.3	1.4	1.9	2.6	4.4	6.6
40~60	0.2	1.5	1.6	2.1	2.8	4.7	7.0
60~80	0.3	1.7	1.8	2.3	3.1	5.1	7.6

Other Properties	
Bubble Quality Group B	
Specific Gravity d	3.71
Remarks	

OHARA 17-04

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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.