S-NPH 7

Code(d) **778239**
Code(e) **786237**

Refractive Index	n_d	**1.77830** 1.778300	Abbe Number	ν_d	**23.91**	Dispersion	n_F-n_C **0.032549**
Refractive Index	n_e	1.785954	Abbe Number	ν_e	23.71	Dispersion	$n_{F'}$-$n_{C'}$ 0.033147

Refractive Indices		
λ(μm)		
n_{2325}	2.32542	1.72077
n_{1970}	1.97009	1.72750
n_{1530}	1.52958	1.73544
n_{1129}	1.12864	1.74406
n_t	1.01398	1.74749
n_s	0.85211	1.75417
$n_{A'}$	0.76819	1.75917
n_r	0.70652	1.76400
n_C	0.65627	1.76902
$n_{C'}$	0.64385	1.77046
$n_{He\text{-}Ne}$	0.6328	1.77182
n_D	0.58929	1.77802
n_d	0.58756	1.77830
n_e	0.54607	1.78595
n_F	0.48613	1.80157
$n_{F'}$	0.47999	1.80361
$n_{He\text{-}Cd}$	0.44157	1.81909
n_g	0.435835	1.82191
n_h	0.404656	1.84053
n_i	0.365015	

Constants of Dispersion Formula	
A_1	1.68236554E+00
A_2	3.39649644E-01
A_3	2.25049208E+00
B_1	1.31431682E-02
B_2	6.45040012E-02
B_3	1.81386300E+02

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

Mechanical Properties		
Young's Modulus E (GPa)	75.3	
Rigidity Modulus G (GPa)	29.6	
Poisson's Ratio σ	0.269	
Knoop Hardness Hk[Class]	350	4
Abrasion Aa	448	

Partial Dispersions	
n_C-n_t	0.021538
n_C-$n_{A'}$	0.009855
n_d-n_C	0.009276
n_e-n_C	0.016930
n_g-n_d	0.043611
n_g-n_F	0.020338
n_h-n_g	0.018622
n_i-n_g	
n_C-n_t	0.022976
n_e-$n_{C'}$	0.015492
n_F-n_e	0.017655
n_i-$n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.6617
$\theta_{C,A'}$	0.3028
$\theta_{d,C}$	0.2850
$\theta_{e,C}$	0.5201
$\theta_{g,d}$	1.3399
$\theta_{g,F}$	0.6248
$\theta_{h,g}$	0.5721
$\theta_{i,g}$	
$\theta'_{C',t}$	0.6932
$\theta'_{e,C'}$	0.4674
$\theta'_{F',e}$	0.5326
$\theta'_{i,F'}$	

Deviation of Relative Dispersions Δθfrom "Normal"	
$\Delta\theta_{C,t}$	0.0029
$\Delta\theta_{C,A'}$	-0.0020
$\Delta\theta_{g,d}$	0.0249
$\Delta\theta_{g,F}$	0.0220
$\Delta\theta_{i,g}$	

Thermal Properties		
Strain Point StP (℃)		520
Annealing Point AP (℃)		541
Transformation Temperature Tg (℃)		569
Yield Point At (℃)		598
Softening Point SP (℃)		630
Expansion Coefficients α (10^{-7} K^{-1})	(-30~+70℃)	109
	(+100~+300℃)	130
Thermal Conductivity λ W/(m·K)		0.826

Coloring			
λ_{80}	420	λ_5	370
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	395	$\lambda_{0.05}$	365

CCI		
B	G	R
0.00	2.61	2.69

Internal Transmittance	
λ(nm)	τ 10mm
280	
290	
300	
310	
320	
330	
340	
350	
360	
370	0.11
380	0.45
390	0.74
400	0.87
420	0.949
440	0.971
460	0.980
480	0.986
500	0.990
550	0.996
600	0.997
650	0.997
700	0.997
800	0.998
900	0.998
1000	0.998
1200	0.999
1400	0.999
1600	0.995
1800	0.984
2000	0.970
2200	0.951
2400	0.920

Temperature Coefficients of Refractive Index							
Range of Temperature (℃)	Δn/ΔT relative ($10^{-6}K^{-1}$)						
	t	C'	He-Ne	D	e	F'	g
-40~-20	-5.3	-4.5	-4.4	-4.1	-3.6	-2.3	-0.8
-20~ 0	-5.5	-4.5	-4.5	-4.1	-3.6	-2.2	-0.5
0~20	-5.6	-4.6	-4.5	-4.1	-3.5	-2.1	-0.3
20~40	-5.6	-4.6	-4.5	-4.1	-3.5	-2.0	-0.1
40~60	-5.7	-4.6	-4.5	-4.1	-3.5	-1.8	0.1
60~80	-5.7	-4.6	-4.5	-4.0	-3.4	-1.6	0.4

Other Properties	
Photoelastic Constant β nm/(cm·10^5Pa)	3.45
Specific Gravity d	3.30
Remarks	

OHARA 23-05

※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.