S-FPM 4

Code(d) **528765**
Code(e) **530760**

Refractive Index	n_d	**1.52841** 1.528410	Abbe Number	ν_d	**76.46**	Dispersion	n_F-n_C	**0.006911**
Refractive Index	n_e	1.530060	Abbe Number	ν_e	76.07	Dispersion	$n_{F'}$-$n_{C'}$	0.006968

Refractive Indices		
λ(μm)		
n_{2325}	2.32542	1.50911
n_{1970}	1.97009	1.51254
n_{1530}	1.52958	1.51625
n_{1129}	1.12864	1.51955
n_t	1.01398	1.52065
n_s	0.85211	1.52258
$n_{A'}$	0.76819	1.52390
n_r	0.70652	1.52510
n_C	0.65627	1.52630
$n_{C'}$	0.64385	1.52664
$n_{He\text{-}Ne}$	0.6328	1.52695
n_D	0.58929	1.52835
n_d	0.58756	1.52841
n_e	0.54607	1.53006
n_F	0.48613	1.53321
$n_{F'}$	0.47999	1.53361
$n_{He\text{-}Cd}$	0.44157	1.53645
n_g	0.435835	1.53694
n_h	0.404656	1.54002
n_i	0.365015	1.54522

Constants of Dispersion Formula	
A_1	6.85585084E-01
A_2	6.23380215E-01
A_3	9.14178386E-01
B_1	2.88172010E-03
B_2	1.24701707E-02
B_3	1.53577200E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	3
Weathering Resistance(Surface) Group W(S)	1
Acid Resistance(Surface) Group SR	51.3
Phosphate Resistance PR	4.3

Mechanical Properties		
Young's Modulus E (GPa)	74.7	
Rigidity Modulus G (GPa)	28.9	
Poisson's Ratio σ	0.295	
Knoop Hardness Hk[Class]	360	4
Abrasion Aa	506	

Partial Dispersions	
n_C-n_t	0.005650
n_C-$n_{A'}$	0.002406
n_d-n_C	0.002107
n_e-n_C	0.003757
n_g-n_d	0.008533
n_g-n_F	0.003729
n_h-n_g	0.003076
n_i-n_g	0.008275
n_C-n_t	0.005985
n_e-$n_{C'}$	0.003422
n_F-n_e	0.003546
n_i-$n_{F'}$	0.011612

Relative Partial Dispersions	
$\theta_{C,t}$	0.8175
$\theta_{C,A'}$	0.3481
$\theta_{d,C}$	0.3049
$\theta_{e,C}$	0.5436
$\theta_{g,d}$	1.2347
$\theta_{g,F}$	0.5396
$\theta_{h,g}$	0.4451
$\theta_{i,g}$	1.1974
$\theta'_{C',t}$	0.8589
$\theta'_{e,C'}$	0.4911
$\theta'_{F',e}$	0.5089
$\theta'_{i,F'}$	1.6665

Deviation of Relative Dispersions Δθfrom "Normal"	
$\Delta\theta_{C,t}$	-0.0879
$\Delta\theta_{C,A'}$	-0.0205
$\Delta\theta_{g,d}$	0.0288
$\Delta\theta_{g,F}$	0.0218
$\Delta\theta_{i,g}$	0.1126

Thermal Properties		
Strain Point StP (℃)		-
Annealing Point AP (℃)		-
Transformation Temperature Tg (℃)		488
Yield Point At (℃)		520
Softening Point SP (℃)		-
Expansion Coefficients α (10^{-7} K^{-1})	(-30~+70℃)	123
	(+100~+300℃)	143
Thermal Conductivity λ W/(m·K)		0.746

Coloring			
λ_{80}	340	λ_5	
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	335	$\lambda_{0.05}$	283

CCI		
B	G	R
0.00	0.14	0.11

Internal Transmittance	
λ(nm)	τ 10mm
280	0.03
290	0.09
300	0.20
310	0.37
320	0.58
330	0.75
340	0.86
350	0.934
360	0.968
370	0.984
380	0.992
390	0.995
400	0.996
420	0.995
440	0.995
460	0.996
480	0.997
500	0.998
550	0.999
600	0.998
650	0.998
700	0.997
800	0.997
900	0.997
1000	0.997
1200	0.998
1400	0.999
1600	0.998
1800	0.998
2000	0.998
2200	0.996
2400	0.995

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	-5.4	-5.2	-5.2	-5.1	-5.0	-4.9	-4.7
-20~ 0	-5.7	-5.5	-5.5	-5.5	-5.4	-5.2	-5.0
0~20	-5.9	-5.8	-5.8	-5.7	-5.6	-5.4	-5.2
20~40	-6.2	-6.0	-6.0	-5.9	-5.8	-5.6	-5.4
40~60	-6.3	-6.1	-6.1	-6.1	-6.0	-5.8	-5.6
60~80	-6.4	-6.2	-6.2	-6.1	-6.1	-5.9	-5.6

Other Properties	
Photoelastic Constant β nm/(cm·10^5Pa)	0.72
Specific Gravity d	3.76
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.