S-PHM52

Code(d) **618634**
Code(e) **620630**

Refractive Index	n_d	**1.61800** 1.618000	Abbe Number	ν_d	**63.33**	Dispersion	n_F-n_C	**0.009758**
Refractive Index	n_e	1.620327	Abbe Number	ν_e	63.02	Dispersion	$n_{F'}$-$n_{C'}$	0.009844

Refractive Indices		
λ(μm)		
n_{2325}	2.32542	1.59108
n_{1970}	1.97009	1.59587
n_{1530}	1.52958	1.60103
n_{1129}	1.12864	1.60561
n_t	1.01398	1.60714
n_s	0.85211	1.60983
$n_{A'}$	0.76819	1.61167
n_r	0.70652	1.61335
n_C	0.65627	1.61504
$n_{C'}$	0.64385	1.61551
$n_{He\text{-}Ne}$	0.6328	1.61595
n_D	0.58929	1.61791
n_d	0.58756	1.61800
n_e	0.54607	1.62033
n_F	0.48613	1.62479
$n_{F'}$	0.47999	1.62535
$n_{He\text{-}Cd}$	0.44157	1.62940
n_g	0.435835	1.63010
n_h	0.404656	1.63451
n_i	0.365015	1.64199

Constants of Dispersion Formula	
A_1	1.09966550E+00
A_2	4.78125422E-01
A_3	1.13214074E+00
B_1	1.32718559E-02
B_2	-6.01649685E-04
B_3	1.30595472E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	4
Weathering Resistance(Surface) Group W(S)	2
Acid Resistance(Surface) Group SR	5.0
Phosphate Resistance PR	4.0

Mechanical Properties		
Young's Modulus E (GPa)	71.5	
Rigidity Modulus G (GPa)	27.7	
Poisson's Ratio σ	0.292	
Knoop Hardness Hk[Class]	390	4
Abrasion Aa	468	

Partial Dispersions	
n_C-n_t	0.007893
n_C-$n_{A'}$	0.003370
n_d-n_C	0.002964
n_e-n_C	0.005291
n_g-n_d	0.012103
n_g-n_F	0.005309
n_h-n_g	0.004403
n_i-n_g	0.011891
n_C-n_t	0.008364
n_e-$n_{C'}$	0.004820
n_F-n_e	0.005024
n_i-$n_{F'}$	0.016643

Relative Partial Dispersions	
$\theta_{C,t}$	0.8089
$\theta_{C,A'}$	0.3454
$\theta_{d,C}$	0.3038
$\theta_{e,C}$	0.5422
$\theta_{g,d}$	1.2403
$\theta_{g,F}$	0.5441
$\theta_{h,g}$	0.4512
$\theta_{i,g}$	1.2186
$\theta'_{C',t}$	0.8497
$\theta'_{e,C'}$	0.4896
$\theta'_{F',e}$	0.5104
$\theta'_{i,F'}$	1.6907

Deviation of Relative Dispersions Δθfrom "Normal"	
$\Delta\theta_{C,t}$	-0.0349
$\Delta\theta_{C,A'}$	-0.0072
$\Delta\theta_{g,d}$	0.0071
$\Delta\theta_{g,F}$	0.0051
$\Delta\theta_{i,g}$	0.0239

Thermal Properties		
Strain Point StP (℃)		-
Annealing Point AP (℃)		-
Transformation Temperature Tg (℃)		587
Yield Point At (℃)		617
Softening Point SP (℃)		-
Expansion Coefficients α (10^{-7} K^{-1})	(-30~+70℃)	101
	(+100~+300℃)	120
Thermal Conductivity λ W/(m·K)		0.599

Coloring			
λ_{80}	370	λ_5	325
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	366	$\lambda_{0.05}$	330

CCI		
B	G	R
0.00	0.55	0.57

Internal Transmittance	
λ(nm)	τ 10mm
280	
290	
300	
310	
320	
330	0.05
340	0.25
350	0.51
360	0.72
370	0.85
380	0.923
390	0.957
400	0.974
420	0.986
440	0.990
460	0.992
480	0.994
500	0.996
550	0.998
600	0.998
650	0.998
700	0.998
800	0.997
900	0.996
1000	0.996
1200	0.996
1400	0.996
1600	0.991
1800	0.979
2000	0.961
2200	0.926
2400	0.89

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	-3.7	-3.6	-3.6	-3.6	-3.4	-3.2	-3.0
-20~ 0	-3.8	-3.7	-3.7	-3.6	-3.5	-3.2	-3.0
0~20	-4.0	-3.7	-3.7	-3.6	-3.5	-3.2	-3.0
20~40	-4.1	-3.7	-3.7	-3.6	-3.5	-3.2	-3.0
40~60	-4.2	-3.8	-3.8	-3.6	-3.5	-3.2	-3.0
60~80	-4.2	-3.8	-3.8	-3.7	-3.6	-3.3	-3.0

Other Properties	
Photoelastic Constant β nm/(cm·10^5Pa)	1.00
Specific Gravity d	3.67
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.