

# S-PHM52Q

Code(d) **618633**

Code(e) **620630**

Refractive Index $n_d$	<b>1.61800</b> 1.618000	Abbe Number $\nu_d$	<b>63.32</b>	Dispersion $n_F-n_C$	<b>0.009760</b>
Refractive Index $n_e$	1.620327	Abbe Number $\nu_e$	63.02	Dispersion $n_F-n_{C'}$	0.009843

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.58996
$n_{1970}$	1.97009	1.59514
$n_{1530}$	1.52958	1.60064
$n_{1129}$	1.12864	1.60545
$n_t$	1.01398	1.60703
$n_s$	0.85211	1.60977
$n_{A'}$	0.76819	1.61164
$n_r$	0.70652	1.61334
$n_C$	0.65627	1.61503
$n_{C'}$	0.64385	1.61550
$n_{\text{He-Ne}}$	0.6328	1.61594
$n_D$	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	1.62534
$n_{\text{He-Cd}}$	0.44157	1.62938
$n_g$	0.435835	1.63008
$n_h$	0.404656	1.63448
$n_i$	0.365015	1.64195

Constants of Dispersion Formula	
$A_1$	1.26968750E+00
$A_2$	3.08418136E-01
$A_3$	1.04078976E+00
$B_1$	6.21622949E-03
$B_2$	2.07785265E-02
$B_3$	1.12051250E+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	51.0
Phosphate Resistance PR	4.0

Mechanical Properties	
Young's Modulus E (GPa)	84.0
Rigidity Modulus G (GPa)	32.7
Poisson's Ratio $\sigma$	0.285
Knoop Hardness Hk(Class)	450   5
Abrasion Aa	313

Partial Dispersions	
$n_C-n_t$	0.007997
$n_C-n_{A'}$	0.003394
$n_d-n_C$	0.002971
$n_e-n_C$	0.005298
$n_g-n_d$	0.012085
$n_g-n_F$	0.005296
$n_h-n_g$	0.004390
$n_i-n_g$	0.011862
$n_C-n_t$	0.008469
$n_e-n_{C'}$	0.004826
$n_{F'}-n_e$	0.005017
$n_i-n_{F'}$	0.016603

Relative Partial Dispersions	
$\theta_{C,t}$	0.8194
$\theta_{C,A'}$	0.3477
$\theta_{d,C}$	0.3044
$\theta_{e,C}$	0.5428
$\theta_{g,d}$	1.2382
$\theta_{g,F}$	0.5426
$\theta_{h,g}$	0.4498
$\theta_{i,g}$	1.2154
$\theta'_{C,t}$	0.8604
$\theta'_{e,C'}$	0.4903
$\theta'_{F',e}$	0.5097
$\theta'_{i,F'}$	1.6868

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	-0.0244
$\Delta\theta_{C,A'}$	-0.0049
$\Delta\theta_{g,d}$	0.0050
$\Delta\theta_{g,F}$	0.0036
$\Delta\theta_{i,g}$	0.0206

Thermal Properties	
Strain Point StP (°C)	539
Annealing Point AP (°C)	559
Transformation Temperature Tg (°C)	577
Yield Point At (°C)	614
Softening Point SP (°C)	650
Expansion Coefficients (-30~+70°C)	88
$\alpha$ ( $10^{-7} \text{K}^{-1}$ ) (+100~+300°C)	103
Thermal Conductivity $\lambda$ W/(m·K)	0.738

Coloring			
$\lambda_{80}$	365	$\lambda_5$	325
$\lambda_{70}$			

Internal transmission			
$\lambda_{0.80}$	357	$\lambda_{0.05}$	322

CCI		
B	G	R
0.00	0.31	0.29

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
280	
290	
300	
310	
320	0.02
330	0.17
340	0.44
350	0.69
360	0.85
370	0.924
380	0.961
390	0.978
400	0.986
420	0.991
440	0.992
460	0.994
480	0.996
500	0.997
550	0.998
600	0.998
650	0.997
700	0.997
800	0.998
900	0.998
1000	0.998
1200	0.999
1400	0.995
1600	0.991
1800	0.978
2000	0.960
2200	0.900
2400	0.85

Temperature Coefficients of Refractive Index							
Range of Temperature (°C)	$\Delta n / \Delta T$ relative ( $10^{-6} \text{K}^{-1}$ )						
	t	C'	He-Ne	D	e	F'	g
-40~-20	-0.9	-0.6	-0.6	-0.5	-0.4	-0.1	0.2
-20~ 0	-1.0	-0.7	-0.7	-0.6	-0.4	-0.2	0.1
0~20	-1.1	-0.8	-0.8	-0.6	-0.5	-0.2	0.1
20~40	-1.2	-0.8	-0.8	-0.7	-0.5	-0.2	0.1
40~60	-1.1	-0.8	-0.8	-0.7	-0.5	-0.2	0.1
60~80	-1.1	-0.7	-0.7	-0.6	-0.4	-0.1	0.2

Other Properties	
Photoelastic Constant $\beta$ nm/(cm·10 <sup>5</sup> Pa)	1.41
Specific Gravity d	3.51
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.