S-NBM52

Code(d) **622411**
Code(e) **626408**

Refractive Index n_d	**1.622 05** 1.622 050	Abbe Number ν_d	**41.08**	Dispersion $n_F - n_C$	**0.015 143**
Refractive Index n_e	1.625 645	Abbe Number ν_e	40.84	Dispersion $n_{F'} - n_{C'}$	0.015 320

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.583 73
n_{1970}	1.970 09	1.590 30
n_{1530}	1.529 58	1.597 37
n_{1129}	1.128 64	1.603 75
n_t	1.013 98	1.605 92
n_s	0.852 11	1.609 80
$n_{A'}$	0.768 19	1.612 50
n_r	0.706 52	1.615 01
n_C	0.656 27	1.617 54
$n_{C'}$	0.643 85	1.618 25
$n_{He\text{-}Ne}$	0.632 8	1.618 92
n_D	0.589 29	1.621 92
n_d	0.587 56	1.622 05
n_e	0.546 07	1.625 64
n_F	0.486 13	1.632 68
$n_{F'}$	0.479 99	1.633 57
$n_{He\text{-}Cd}$	0.441 57	1.640 14
n_g	0.435 835	1.641 30
n_h	0.404 656	1.648 68
n_i	0.365 015	1.661 82

Constants of Dispersion Formula	
A_1	1.397 992 04E+00
A_2	1.722 380 41E-01
A_3	1.217 429 91E+00
B_1	9.461 136 86E-03
B_2	4.440 777 36E-02
B_3	1.053 139 30E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	3
Acid Resistance(Surface) Group SR	1.0
Phosphate Resistance PR	1.0

Mechanical Properties		
Young's Modulus E (GPa)	80.8	
Rigidity Modulus G (GPa)	32.5	
Poisson's Ratio σ	0.243	
Knoop Hardness Hk[Class]	540	5
Abrasion Aa	120	

Partial Dispersions	
$n_C - n_t$	0.011 617
$n_C - n_{A'}$	0.005 036
$n_d - n_C$	0.004 511
$n_e - n_C$	0.008 106
$n_g - n_d$	0.019 249
$n_g - n_F$	0.008 617
$n_h - n_g$	0.007 384
$n_i - n_g$	0.020 524
$n_{C'} - n_t$	0.012 329
$n_e - n_{C'}$	0.007 394
$n_{F'} - n_e$	0.007 926
$n_i - n_{F'}$	0.028 252

Relative Partial Dispersions	
$\theta_{C,t}$	0.767 2
$\theta_{C,A'}$	0.332 6
$\theta_{d,C}$	0.297 9
$\theta_{e,C}$	0.535 3
$\theta_{g,d}$	1.271 1
$\theta_{g,F}$	0.569 0
$\theta_{h,g}$	0.487 6
$\theta_{i,g}$	1.355 3
$\theta'_{C,t}$	0.804 8
$\theta'_{e,C'}$	0.482 6
$\theta'_{F,e}$	0.517 4
$\theta'_{i,F'}$	1.844 1

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.027 8
$\Delta\theta_{C,A'}$	0.007 0
$\Delta\theta_{g,d}$	-0.008 3
$\Delta\theta_{g,F}$	-0.006 0
$\Delta\theta_{i,g}$	-0.025 7

Coloring			
λ_{80}	355	λ_5	320
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	346	$\lambda_{0.05}$	320

CCI		
B	G	R
0.00	0.24	0.25

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	
320	0.04
330	0.33
340	0.69
350	0.86
360	0.933
370	0.962
380	0.976
390	0.984
400	0.989
420	0.993
440	0.994
460	0.996
480	0.997
500	0.998
550	0.999
600	0.999
650	0.999
700	0.999
800	0.999
900	0.999
1 000	0.999
1 200	0.999
1 400	0.984
1 600	0.991
1 800	0.984
2 000	0.967
2 200	0.87
2 400	0.75

Thermal Properties		
Strain Point StP (℃)		541
Annealing Point AP (℃)		568
Transformation Temperature Tg (℃)		584
Yield Point At (℃)		645
Softening Point SP (℃)		701
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	74
	(100 ℃ ~ 300 ℃)	87
Thermal Conductivity λ (W/(m·K))		0.957

Linear coefficient of thermal expansion	
Temperature range (℃)	α_l (10^{-7} K^{-1})
-100 ~ -90	61
-90 ~ -80	62
-80 ~ -70	64
-70 ~ -60	65
-60 ~ -50	66
-50 ~ -40	67
-40 ~ -30	68
-30 ~ -20	69
-20 ~ -10	71
-10 ~ 0	72
0 ~ 10	73
10 ~ 20	74
20 ~ 30	75
30 ~ 40	76
40 ~ 50	76
50 ~ 60	77
60 ~ 70	78
70 ~ 80	79
80 ~ 90	80
90 ~ 100	81
100 ~ 110	81
110 ~ 120	82
120 ~ 130	83
130 ~ 140	83
140 ~ 150	84
150 ~ 160	85
160 ~ 170	85
170 ~ 180	86
180 ~ 190	86
190 ~ 200	87
200 ~ 210	87
210 ~ 220	88
220 ~ 230	88
230 ~ 240	88
240 ~ 250	89
250 ~ 260	89
260 ~ 270	89
270 ~ 280	90
280 ~ 290	90
290 ~ 300	90

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	3.62
Specific Gravity *d*	2.86
Remarks	

Temperature Coefficients of Refractive Index

Range of Temperature (℃)	$\Delta n_{rel}/\Delta T$ (10^{-6} K^{-1})											
	1550	t	r	C	C'	d	e	F	F'	g	h	i
-80 ~ -60	1.9	2.1	2.4	2.5	2.5	2.8	2.9	3.3	3.4	3.9	4.5	5.7
-60 ~ -40	1.7	2.0	2.3	2.4	2.5	2.6	2.8	3.3	3.4	3.9	4.4	5.6
-40 ~ -20	1.7	2.0	2.3	2.4	2.5	2.7	2.9	3.3	3.3	4.0	4.5	5.8
-20 ~ 0	1.8	2.0	2.4	2.5	2.6	2.8	3.0	3.4	3.5	4.0	4.6	6.0
0 ~ 20	2.0	2.1	2.5	2.6	2.6	2.9	3.1	3.5	3.6	4.3	4.9	6.2
20 ~ 40	2.1	2.3	2.6	2.8	2.8	3.0	3.2	3.7	3.8	4.5	5.1	6.5
40 ~ 60	2.2	2.4	2.8	2.9	2.9	3.2	3.5	4.0	4.0	4.6	5.3	6.7
60 ~ 80	2.4	2.5	3.0	3.1	3.1	3.4	3.6	4.1	4.2	4.8	5.5	7.1
80 ~ 100	2.5	2.7	3.1	3.3	3.3	3.5	3.8	4.3	4.4	5.0	5.7	7.2
100 ~ 120	2.6	2.8	3.3	3.4	3.5	3.7	4.0	4.5	4.6	5.2	6.0	7.5
120 ~ 140	2.7	3.0	3.4	3.5	3.6	3.8	4.1	4.6	4.7	5.4	6.1	7.7
140 ~ 160	2.8	3.0	3.5	3.7	3.7	4.0	4.2	4.8	4.9	5.6	6.4	8.1
160 ~ 180	2.9	3.2	3.7	3.8	3.9	4.1	4.4	5.0	5.1	5.8	6.6	8.3

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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.