S-FTM16

Code(d) **593353**
Code(e) **597350**

Refractive Index n_d	**1.592 70** 1.592 701	Abbe Number ν_d	**35.31**	Dispersion $n_F - n_C$	**0.016 785**
Refractive Index n_e	1.596 670	Abbe Number ν_e	35.03	Dispersion $n_{F'} - n_{C'}$	0.017 031

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.556 03
n_{1970}	1.970 09	1.561 54
n_{1530}	1.529 58	1.567 67
n_{1129}	1.128 64	1.573 57
n_t	1.013 98	1.575 69
n_s	0.852 11	1.579 62
$n_{A'}$	0.768 19	1.582 43
n_r	0.706 52	1.585 08
n_C	0.656 27	1.587 79
$n_{C'}$	0.643 85	1.588 56
$n_{He\text{-}Ne}$	0.632 8	1.589 29
n_D	0.589 29	1.592 55
n_d	0.587 56	1.592 70
n_e	0.546 07	1.596 67
n_F	0.486 13	1.604 58
$n_{F'}$	0.479 99	1.605 59
$n_{He\text{-}Cd}$	0.441 57	1.613 18
n_g	0.435 835	1.614 54
n_h	0.404 656	1.623 34
n_i	0.365 015	1.639 74

Constants of Dispersion Formula	
A_1	1.329 409 07E+00
A_2	1.415 121 25E-01
A_3	1.442 990 68E+00
B_1	1.023 772 87E-02
B_2	5.780 819 56E-02
B_3	1.505 971 39E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	1～2
Acid Resistance(Surface) Group SR	1.0
Phosphate Resistance PR	2.0

Mechanical Properties		
Young's Modulus E (GPa)	65.3	
Rigidity Modulus G (GPa)	26.4	
Poisson's Ratio σ	0.238	
Knoop Hardness Hk[Class]	450	5
Abrasion Aa	181	

Partial Dispersions	
$n_C - n_t$	0.012 104
$n_C - n_{A'}$	0.005 365
$n_d - n_C$	0.004 906
$n_e - n_C$	0.008 875
$n_g - n_d$	0.021 838
$n_g - n_F$	0.009 959
$n_h - n_g$	0.008 800
$n_i - n_g$	0.025 202
$n_{C'} - n_t$	0.012 872
$n_e - n_{C'}$	0.008 107
$n_{F'} - n_e$	0.008 924
$n_i - n_{F'}$	0.034 147

Relative Partial Dispersions	
$\theta_{C,t}$	0.721 1
$\theta_{C,A'}$	0.319 6
$\theta_{d,C}$	0.292 3
$\theta_{e,C}$	0.528 7
$\theta_{g,d}$	1.301 0
$\theta_{g,F}$	0.593 3
$\theta_{h,g}$	0.524 3
$\theta_{i,g}$	1.501 5
$\theta'_{C,t}$	0.755 8
$\theta'_{e,C'}$	0.476 0
$\theta'_{F,e}$	0.524 0
$\theta'_{i,F'}$	2.005 0

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.008 8
$\Delta\theta_{C,A'}$	0.001 0
$\Delta\theta_{g,d}$	0.009 6
$\Delta\theta_{g,F}$	0.009 0
$\Delta\theta_{i,g}$	0.072 1

Coloring			
λ_{80}	380	λ_5	350
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	370	$\lambda_{0.05}$	350

CCI		
B	G	R
0.00	0.43	0.42

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	
320	
330	
340	
350	0.04
360	0.43
370	0.81
380	0.934
390	0.973
400	0.984
420	0.989
440	0.990
460	0.991
480	0.992
500	0.994
550	0.997
600	0.997
650	0.996
700	0.996
800	0.999
900	0.999
1 000	0.999
1 200	0.999
1 400	0.996
1 600	0.994
1 800	0.989
2 000	0.987
2 200	0.959
2 400	0.953

Thermal Properties		
Strain Point StP (℃)		-
Annealing Point AP (℃)		-
Transformation Temperature Tg (℃)		502
Yield Point At (℃)		559
Softening Point SP (℃)		-
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	90
	(100 ℃ ~ 300 ℃)	102
Thermal Conductivity λ (W/(m·K))		0.947

Linear coefficient of thermal expansion	
Temperature range (℃)	α_l (10^{-7} K^{-1})
-100 ～ -90	79
-90 ～ -80	80
-80 ～ -70	81
-70 ～ -60	82
-60 ～ -50	83
-50 ～ -40	84
-40 ～ -30	85
-30 ～ -20	86
-20 ～ -10	86
-10 ～ 0	87
0 ～ 10	88
10 ～ 20	89
20 ～ 30	90
30 ～ 40	91
40 ～ 50	91
50 ～ 60	92
60 ～ 70	93
70 ～ 80	94
80 ～ 90	94
90 ～ 100	95
100 ～ 110	96
110 ～ 120	97
120 ～ 130	97
130 ～ 140	98
140 ～ 150	99
150 ～ 160	99
160 ～ 170	100
170 ～ 180	100
180 ～ 190	101
190 ～ 200	102
200 ～ 210	102
210 ～ 220	103
220 ～ 230	103
230 ～ 240	104
240 ～ 250	104
250 ～ 260	105
260 ～ 270	105
270 ～ 280	106
280 ～ 290	106
290 ～ 300	106

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	3.33
Specific Gravity *d*	2.64
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	-1.5	-1.3	-0.9	-0.8	-0.8	-0.6	-0.4	0.1	0.3	0.9	1.7	3.7
-60 ~ -40	-1.5	-1.4	-1.0	-0.8	-0.8	-0.6	-0.4	0.1	0.2	0.9	1.8	3.8
-40 ~ -20	-1.5	-1.4	-1.0	-0.9	-0.7	-0.5	-0.3	0.3	0.3	1.1	1.9	4.1
-20 ~ 0	-1.5	-1.3	-0.9	-0.8	-0.7	-0.5	-0.1	0.4	0.5	1.3	2.2	4.5
0 ~ 20	-1.4	-1.1	-0.7	-0.6	-0.5	-0.3	0.0	0.6	0.7	1.5	2.5	4.8
20 ~ 40	-1.2	-1.0	-0.6	-0.4	-0.4	-0.1	0.1	0.8	0.9	1.7	2.7	5.2
40 ~ 60	-1.1	-0.9	-0.5	-0.3	-0.3	0.0	0.3	1.0	1.0	2.0	3.1	5.6
60 ~ 80	-1.0	-0.8	-0.3	-0.1	-0.1	0.2	0.5	1.2	1.3	2.2	3.3	5.9
80 ~ 100	-1.0	-0.8	-0.2	0.0	0.1	0.4	0.7	1.4	1.5	2.5	3.6	6.3
100 ~ 120	-0.9	-0.6	0.0	0.1	0.2	0.5	0.8	1.6	1.7	2.7	3.9	6.7
120 ~ 140	-0.8	-0.5	0.0	0.2	0.3	0.6	0.9	1.7	1.8	2.9	4.1	7.0
140 ~ 160	-0.7	-0.5	0.1	0.3	0.3	0.7	1.0	1.8	1.9	3.0	4.3	7.4
160 ~ 180	-0.8	-0.5	0.1	0.4	0.5	0.8	1.2	2.0	2.1	3.2	4.5	7.7

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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.