S-TIM27

Code(d) **640345**
Code(e) **644342**

Refractive Index n_d	**1.639 80** 1.639 799	Abbe Number ν_d	**34.46**	Dispersion $n_F - n_C$	**0.018 564**
Refractive Index n_e	1.644 189	Abbe Number ν_e	34.20	Dispersion $n_{F'} - n_{C'}$	0.018 835

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.600 36
n_{1970}	1.970 09	1.606 08
n_{1530}	1.529 58	1.612 49
n_{1129}	1.128 64	1.618 78
n_t	1.013 98	1.621 08
n_s	0.852 11	1.625 37
$n_{A'}$	0.768 19	1.628 46
n_r	0.706 52	1.631 38
n_C	0.656 27	1.634 38
$n_{C'}$	0.643 85	1.635 22
$n_{He\text{-}Ne}$	0.632 8	1.636 02
n_D	0.589 29	1.639 64
n_d	0.587 56	1.639 80
n_e	0.546 07	1.644 19
n_F	0.486 13	1.652 94
$n_{F'}$	0.479 99	1.654 06
$n_{He\text{-}Cd}$	0.441 57	1.662 44
n_g	0.435 835	1.663 93
n_h	0.404 656	1.673 61
n_i	0.365 015	

Constants of Dispersion Formula	
A_1	1.416 804 70E+00
A_2	1.967 850 57E-01
A_3	1.680 013 22E+00
B_1	1.007 321 58E-02
B_2	5.376 169 08E-02
B_3	1.646 724 36E+02

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

Mechanical Properties		
Young's Modulus E (GPa)	79.3	
Rigidity Modulus G (GPa)	32.1	
Poisson's Ratio σ	0.236	
Knoop Hardness Hk[Class]	560	6
Abrasion Aa	146	

Partial Dispersions	
$n_C - n_t$	0.013 292
$n_C - n_{A'}$	0.005 916
$n_d - n_C$	0.005 424
$n_e - n_C$	0.009 814
$n_g - n_d$	0.024 134
$n_g - n_F$	0.010 994
$n_h - n_g$	0.009 680
$n_i - n_g$	
$n_{C'} - n_t$	0.014 141
$n_e - n_{C'}$	0.008 965
$n_{F'} - n_e$	0.009 870
$n_i - n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.716 0
$\theta_{C,A'}$	0.318 7
$\theta_{d,C}$	0.292 2
$\theta_{e,C}$	0.528 7
$\theta_{g,d}$	1.300 0
$\theta_{g,F}$	0.592 2
$\theta_{h,g}$	0.521 4
$\theta_{i,g}$	
$\theta'_{C',t}$	0.750 8
$\theta'_{e,C'}$	0.476 0
$\theta'_{F',e}$	0.524 0
$\theta'_{i,F'}$	

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.007 6
$\Delta\theta_{C,A'}$	0.001 1
$\Delta\theta_{g,d}$	0.006 9
$\Delta\theta_{g,F}$	0.006 5
$\Delta\theta_{i,g}$	

Coloring			
λ_{80}	390	λ_5	360
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	385	$\lambda_{0.05}$	360

CCI		
B	G	R
0.00	1.37	1.38

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	
320	
330	
340	
350	
360	0.05
370	0.41
380	0.73
390	0.87
400	0.935
420	0.973
440	0.983
460	0.987
480	0.990
500	0.992
550	0.997
600	0.997
650	0.996
700	0.997
800	0.999
900	0.998
1 000	0.998
1 200	0.998
1 400	0.995
1 600	0.994
1 800	0.984
2 000	0.973
2 200	0.936
2 400	0.919

Thermal Properties		
Strain Point StP (℃)		543
Annealing Point AP (℃)		572
Transformation Temperature Tg (℃)		598
Yield Point At (℃)		638
Softening Point SP (℃)		696
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	85
	(100 ℃ ~ 300 ℃)	102
Thermal Conductivity λ (W/(m·K))		1.04

Linear coefficient of thermal expansion	
Temperature range (℃)	α_l (10^{-7} K^{-1})
-100 ~ -90	68
-90 ~ -80	70
-80 ~ -70	72
-70 ~ -60	74
-60 ~ -50	75
-50 ~ -40	77
-40 ~ -30	78
-30 ~ -20	80
-20 ~ -10	81
-10 ~ 0	83
0 ~ 10	84
10 ~ 20	85
20 ~ 30	87
30 ~ 40	88
40 ~ 50	89
50 ~ 60	90
60 ~ 70	91
70 ~ 80	92
80 ~ 90	93
90 ~ 100	94
100 ~ 110	95
110 ~ 120	96
120 ~ 130	97
130 ~ 140	98
140 ~ 150	99
150 ~ 160	100
160 ~ 170	100
170 ~ 180	101
180 ~ 190	102
190 ~ 200	102
200 ~ 210	103
210 ~ 220	103
220 ~ 230	104
230 ~ 240	104
240 ~ 250	104
250 ~ 260	105
260 ~ 270	105
270 ~ 280	105
280 ~ 290	106
290 ~ 300	106

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	2.83
Specific Gravity *d*	2.76
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	0.6	0.8	1.2	1.4	1.4	1.6	1.8	2.3	2.5	3.2	4.0	-
-60 ~ -40	0.6	0.7	1.1	1.2	1.3	1.5	1.8	2.4	2.5	3.2	4.1	-
-40 ~ -20	0.5	0.7	1.1	1.2	1.3	1.5	1.8	2.5	2.6	3.4	4.3	-
-20 ~ 0	0.5	0.8	1.2	1.3	1.4	1.7	1.9	2.5	2.6	3.6	4.6	-
0 ~ 20	0.6	0.8	1.2	1.4	1.4	1.7	2.0	2.8	2.9	3.8	4.8	-
20 ~ 40	0.6	0.8	1.3	1.5	1.6	1.9	2.2	3.0	3.1	4.0	5.1	-
40 ~ 60	0.7	0.9	1.4	1.7	1.8	2.1	2.4	3.1	3.2	4.2	5.4	-
60 ~ 80	0.8	1.0	1.6	1.8	1.8	2.1	2.5	3.3	3.4	4.4	5.7	-
80 ~ 100	0.8	1.1	1.7	1.9	1.9	2.3	2.6	3.4	3.6	4.7	5.9	-
100 ~ 120	0.9	1.2	1.8	2.0	2.0	2.4	2.8	3.6	3.7	4.9	6.2	-
120 ~ 140	0.9	1.2	1.8	2.0	2.1	2.5	2.9	3.7	3.9	5.1	6.4	-
140 ~ 160	0.8	1.2	1.8	2.0	2.1	2.5	2.9	3.9	3.9	5.3	6.7	-
160 ~ 180	0.9	1.2	1.9	2.1	2.2	2.6	3.0	4.0	4.1	5.4	6.9	-

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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.