S-TIH13

Code(d) **741278**
Code(e) **747276**

Refractive Index n_d	**1.740 77** 1.740 769	Abbe Number ν_d	**27.79**	Dispersion $n_F - n_C$	**0.026 657**
Refractive Index n_e	1.747 055	Abbe Number ν_e	27.56	Dispersion $n_{F'} - n_{C'}$	0.027 102

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.690 62
n_{1970}	1.970 09	1.696 93
n_{1530}	1.529 58	1.704 25
n_{1129}	1.128 64	1.711 93
n_t	1.013 98	1.714 90
n_s	0.852 11	1.720 62
$n_{A'}$	0.768 19	1.724 85
n_r	0.706 52	1.728 90
n_C	0.656 27	1.733 09
$n_{C'}$	0.643 85	1.734 28
$n_{He\text{-}Ne}$	0.632 8	1.735 41
n_D	0.589 29	1.740 54
n_d	0.587 56	1.740 77
n_e	0.546 07	1.747 05
n_F	0.486 13	1.759 75
$n_{F'}$	0.479 99	1.761 39
$n_{He\text{-}Cd}$	0.441 57	1.773 76
n_g	0.435 835	1.775 99
n_h	0.404 656	1.790 59
n_i	0.365 015	

Constants of Dispersion Formula	
A_1	1.622 246 74E+00
A_2	2.938 445 89E-01
A_3	1.992 251 64E+00
B_1	1.183 683 86E-02
B_2	5.902 080 25E-02
B_3	1.719 599 76E+02

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

Mechanical Properties		
Young's Modulus E (GPa)	89.9	
Rigidity Modulus G (GPa)	36.0	
Poisson's Ratio σ	0.249	
Knoop Hardness Hk[Class]	590	6
Abrasion Aa	167	

Partial Dispersions	
$n_C - n_t$	0.018 185
$n_C - n_{A'}$	0.008 244
$n_d - n_C$	0.007 680
$n_e - n_C$	0.013 966
$n_g - n_d$	0.035 225
$n_g - n_F$	0.016 248
$n_h - n_g$	0.014 593
$n_i - n_g$	
$n_{C'} - n_t$	0.019 380
$n_e - n_{C'}$	0.012 771
$n_{F'} - n_e$	0.014 331
$n_i - n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.682 2
$\theta_{C,A'}$	0.309 3
$\theta_{d,C}$	0.288 1
$\theta_{e,C}$	0.523 9
$\theta_{g,d}$	1.321 4
$\theta_{g,F}$	0.609 5
$\theta_{h,g}$	0.547 4
$\theta_{i,g}$	
$\theta'_{C,t}$	0.715 1
$\theta'_{e,C'}$	0.471 2
$\theta'_{F,e}$	0.528 8
$\theta'_{i,F'}$	

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.005 1
$\Delta\theta_{C,A'}$	-0.000 2
$\Delta\theta_{g,d}$	0.014 4
$\Delta\theta_{g,F}$	0.013 0
$\Delta\theta_{i,g}$	

Coloring			
λ_{80}	415	λ_5	365
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	400	$\lambda_{0.05}$	368

CCI		
B	G	R
0.00	3.64	3.67

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	
320	
330	
340	
350	
360	
370	0.08
380	0.38
390	0.64
400	0.80
420	0.921
440	0.957
460	0.970
480	0.978
500	0.984
550	0.993
600	0.993
650	0.991
700	0.994
800	0.997
900	0.998
1 000	0.997
1 200	0.998
1 400	0.994
1 600	0.993
1 800	0.983
2 000	0.974
2 200	0.944
2 400	0.920

Thermal Properties		
Strain Point StP (℃)		573
Annealing Point AP (℃)		595
Transformation Temperature Tg (℃)		619
Yield Point At (℃)		656
Softening Point SP (℃)		700
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	83
	(100 ℃ ~ 300 ℃)	101
Thermal Conductivity λ (W/(m·K))		1.03

Linear coefficient of thermal expansion	
Temperature range (℃)	α_l (10^{-7} K^{-1})
-100 ~ -90	68
-90 ~ -80	69
-80 ~ -70	71
-70 ~ -60	72
-60 ~ -50	73
-50 ~ -40	75
-40 ~ -30	76
-30 ~ -20	78
-20 ~ -10	79
-10 ~ 0	80
0 ~ 10	82
10 ~ 20	83
20 ~ 30	84
30 ~ 40	85
40 ~ 50	87
50 ~ 60	88
60 ~ 70	89
70 ~ 80	90
80 ~ 90	91
90 ~ 100	92
100 ~ 110	93
110 ~ 120	94
120 ~ 130	95
130 ~ 140	96
140 ~ 150	97
150 ~ 160	98
160 ~ 170	99
170 ~ 180	100
180 ~ 190	101
190 ~ 200	102
200 ~ 210	102
210 ~ 220	103
220 ~ 230	104
230 ~ 240	105
240 ~ 250	105
250 ~ 260	106
260 ~ 270	107
270 ~ 280	107
280 ~ 290	108
290 ~ 300	108

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	2.83
Specific Gravity d	3.10
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	0.0	0.2	0.7	0.8	1.0	1.3	1.6	2.4	2.6	3.7	5.1	-
-60 ~ -40	-0.1	0.1	0.7	0.9	1.0	1.3	1.6	2.5	2.6	3.8	5.3	-
-40 ~ -20	0.0	0.2	0.7	0.9	1.0	1.4	1.8	2.7	2.8	4.0	5.7	-
-20 ~ 0	0.1	0.4	0.9	1.1	1.2	1.6	2.0	3.0	3.1	4.4	6.1	-
0 ~ 20	0.2	0.5	1.1	1.3	1.4	1.7	2.2	3.2	3.3	4.7	6.5	-
20 ~ 40	0.3	0.6	1.3	1.5	1.6	2.0	2.4	3.4	3.5	5.1	6.9	-
40 ~ 60	0.4	0.7	1.4	1.7	1.7	2.2	2.6	3.8	3.9	5.4	7.3	-
60 ~ 80	0.5	0.9	1.6	1.9	2.0	2.4	2.9	4.0	4.1	5.7	7.7	-
80 ~ 100	0.6	1.0	1.7	2.0	2.1	2.6	3.1	4.2	4.4	6.0	8.1	-
100 ~ 120	0.7	1.1	1.8	2.1	2.2	2.7	3.3	4.5	4.6	6.3	8.5	-
120 ~ 140	0.7	1.1	2.0	2.3	2.4	2.9	3.4	4.6	4.8	6.6	8.8	-
140 ~ 160	0.8	1.2	2.0	2.3	2.4	2.9	3.5	4.8	4.9	6.8	9.1	-
160 ~ 180	0.8	1.2	2.0	2.3	2.4	2.9	3.5	4.8	5.0	6.9	9.3	-

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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.