

Transmittance (T) units: %

λnm	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390
T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.1	8.4	14.0	13.0	27.0
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	34.0	33.4	33.7	35.4	34.9	37.4	40.4	40.9	40.5	40.1	40.1	40.3	40.7	41.1	41.5	41.7	41.6	41.1	40.3	39.8
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	39.7	40.0	40.3	40.3	40.0	39.8	39.9	40.3	41.3	42.5	43.3	43.6	43.5	43.1	42.4	41.7	40.8	39.9	39.0	38.0
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	37.1	36.4	35.7	34.9	34.2	33.5	32.8	32.1	31.5	30.9	30.4	29.8	29.2	28.7	28.2	27.7	27.3	26.8	26.4	26.1
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1120	1140	1160	1180	1200				
T	25.7	25.4	25.1	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.9	23.8	24.0	24.2	24.5	25.0				

Refractive Index/Absorption coefficient/Reflection coefficient

λnm	400	500	600	700	800	900	1000
n	1.509	1.507	1.506	1.506	1.505	1.505	1.505
K	1.2E-05	1.2E-05	1.5E-05	1.5E-05	2.1E-05	2.9E-05	3.7E-05
P	0.921	0.921	0.922	0.922	0.922	0.922	0.922

Classes of Bubbles and Inclusions

Bubble Class
3

Color Specification

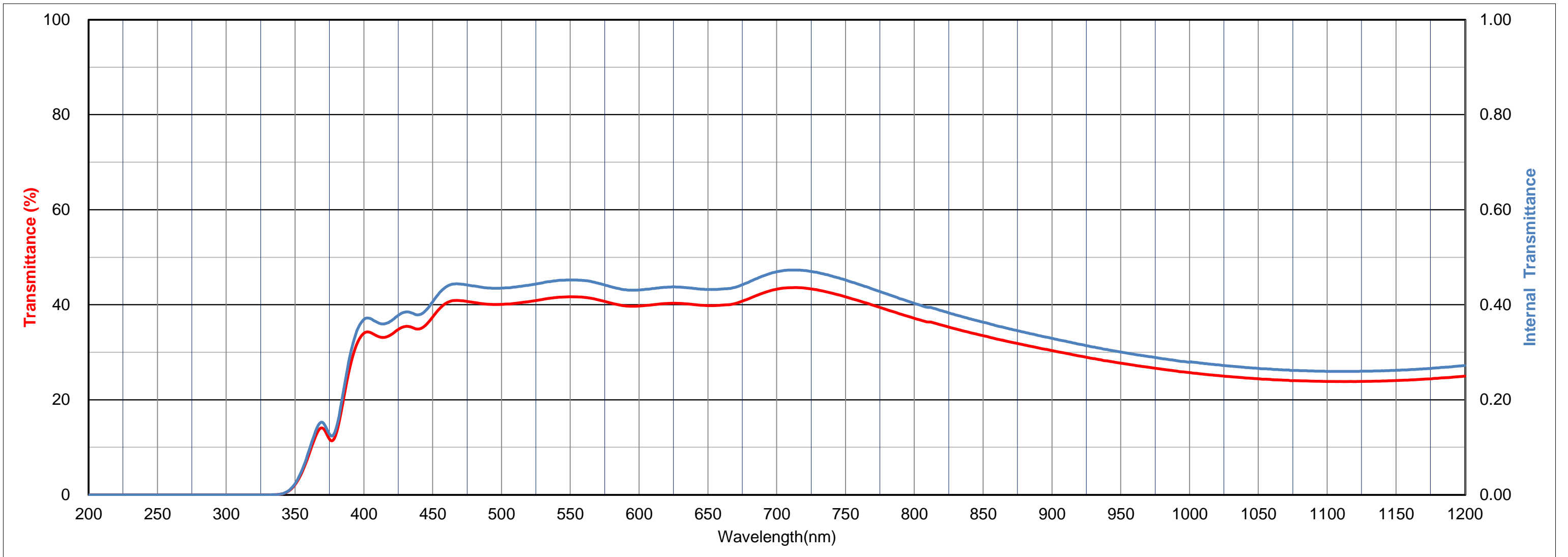
	x	y	Y	λ _d	P _e
A	0.448	0.413	41	573	4
C	0.313	0.327	41	564	4
D65	0.316	0.339	41	563	4

Properties

Chemical		Thermal				Mechanical		Others
D _w	D _A	T _g	T _s	α _{-30/70}	α _{100/300}	H _K	F _A	d
2	3	525	570	61	65	550	100	2.42

Tolerance of Transmittance (T)

Average Transmittance at 400nm-700nm	
Tav(%)	OD
40±4	0.40±0.05





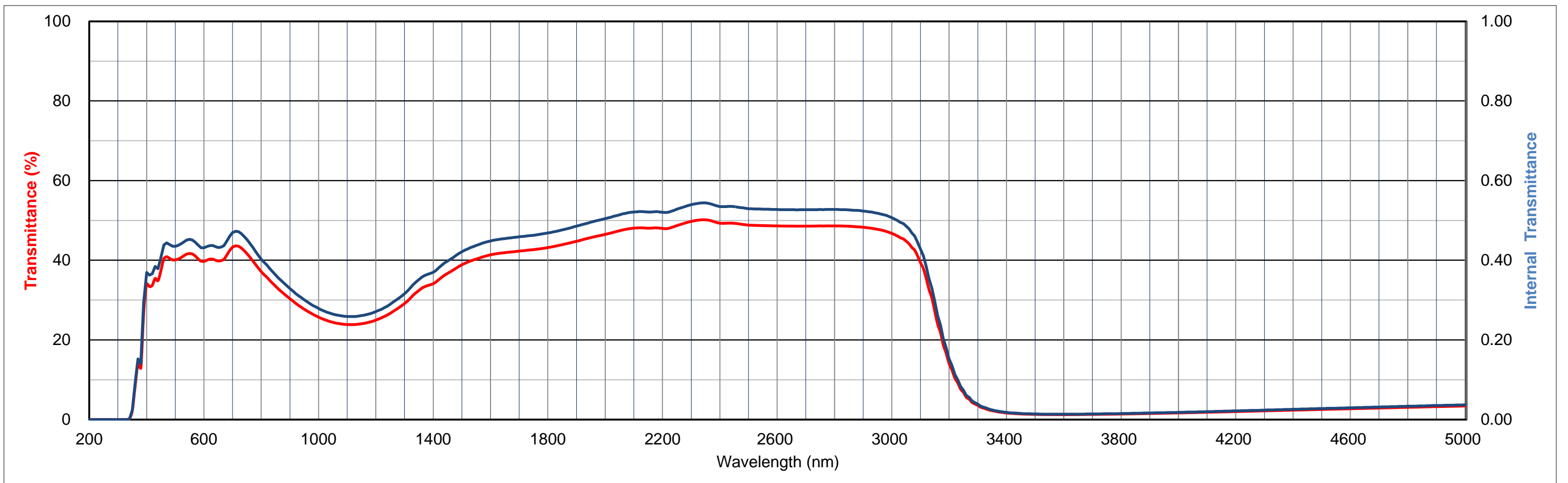
HOYA CANDEO OPTRONICS CORPORATION

Thickness (2.5) mm

ND40

Transmittance (T) units: %

λnm	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390
T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.1	8.4	14.0	13.0	27.0
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	34.0	33.4	33.7	35.4	34.9	37.4	40.4	40.9	40.5	40.1	40.1	40.3	40.7	41.1	41.5	41.7	41.6	41.1	40.3	39.8
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	39.7	40.0	40.3	40.3	40.0	39.8	39.9	40.3	41.3	42.5	43.3	43.6	43.5	43.1	42.4	41.7	40.8	39.9	39.0	38.0
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	37.1	36.4	35.7	34.9	34.2	33.5	32.8	32.1	31.5	30.9	30.4	29.8	29.2	28.7	28.2	27.7	27.3	26.8	26.4	26.1
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190
T	25.7	25.4	25.1	24.9	24.6	24.4	24.2	24.1	24.0	23.9	23.9	23.8	23.8	23.9	24.0	24.1	24.2	24.3	24.5	24.7
λnm	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390
T	25.0	25.3	25.6	25.9	26.3	26.7	27.2	27.6	28.1	28.6	29.1	29.7	30.4	31.2	31.9	32.4	33.0	33.4	33.6	33.8
λnm	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590
T	34.1	34.6	35.2	35.7	36.3	36.7	37.1	37.6	38.0	38.5	38.8	39.2	39.5	39.8	40.1	40.3	40.5	40.8	41.0	41.2
λnm	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790
T	41.4	41.5	41.6	41.7	41.8	41.9	42.0	42.1	42.1	42.2	42.3	42.4	42.4	42.5	42.6	42.7	42.8	42.9	43.0	43.1
λnm	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
T	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	44.6	44.8	44.9	45.1	45.3	45.5	45.7	45.9	46.0	46.2	46.3
λnm	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950
T	46.5	47.4	48.1	48.1	48.0	48.7	49.8	50.2	49.3	49.3	48.8	48.7	48.6	48.6	48.6	48.6	48.6	48.5	48.3	47.8
λnm	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950
T	46.7	44.8	39.4	27.2	14.0	6.8	3.6	2.2	1.7	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.4	1.5	1.5	1.6
λnm	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950
T	1.7	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.2	3.3
λnm	5000																			
T	3.4																			



All data is mean values of various melts.

The content of this catalog is accurate as of April ,2014