

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	0.0	0.5	3.2	6.8	6.2	17.1
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	24.2	24.0	24.3	26.0	25.9	28.4	31.5	32.2	31.8	31.4	31.3	31.5	31.7	32.1	32.7	33.3	33.6	33.0	31.7	30.3
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	29.8	30.0	30.2	30.1	29.5	29.0	28.9	29.2	30.3	31.5	32.3	32.5	32.1	31.3	30.2	29.0	27.8	26.6	25.5	24.4
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	23.5	22.7	22.0	21.2	20.6	20.0	19.5	19.0	18.5	18.1	17.7	17.3	16.8	16.5	16.1	15.8	15.5	15.2	14.9	14.6
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1120	1140	1160	1180	1200				
T	14.4	14.2	14.0	13.8	13.6	13.4	13.3	13.2	13.1	13.0	12.9	12.8	12.8	12.8	12.9	13.1				

Refractive Index/Absorption coefficient/Reflection coefficient

λnm	400	500	600	700	800	900	1000
n	1.538	1.524	1.517	1.513	1.510	1.508	1.507
K	1.9E-05	1.9E-05	2.4E-05	2.6E-05	3.8E-05	5.3E-05	6.6E-05
P	0.914	0.917	0.919	0.920	0.921	0.921	0.921

Classes of Bubbles and Inclusions

Bubble Class
3

Color Specification

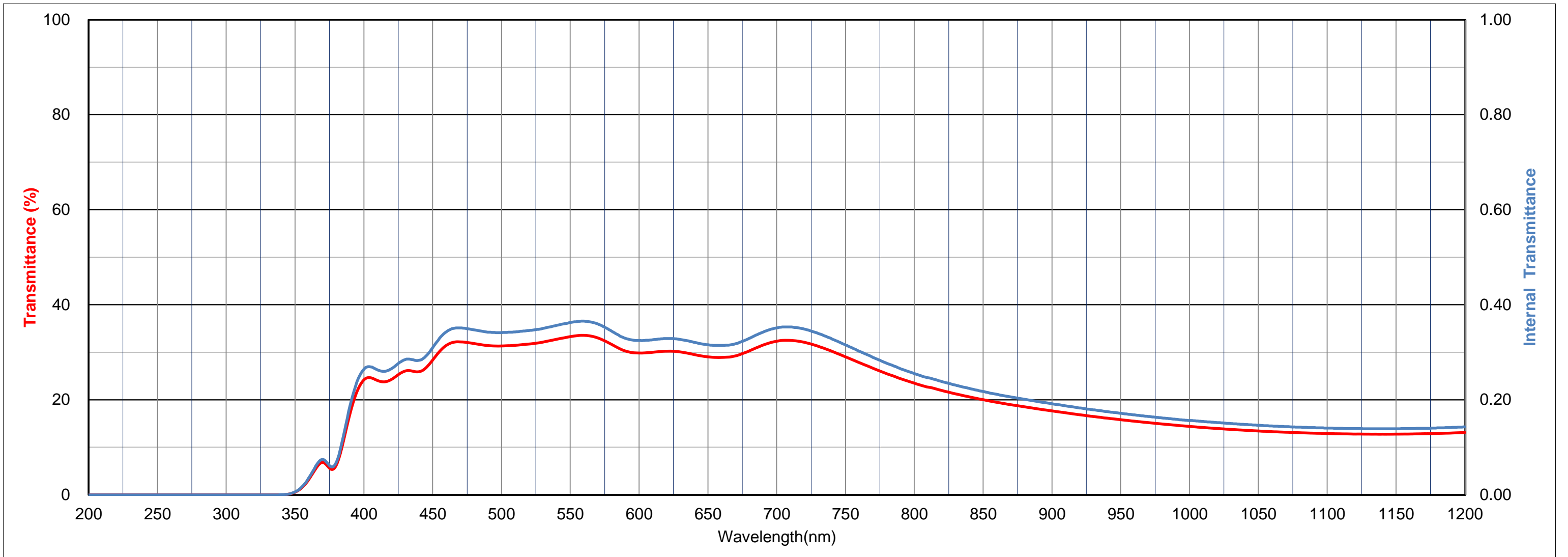
	x	y	Y	λ _d	P _e
A	0.444	0.417	32	560	4
C	0.312	0.332	32	556	5
D65	0.314	0.344	32	556	5

Properties

Chemical		Thermal				Mechanical		Others
D _w	D _A	T _g	T _s	α _{-30/70}	α _{100/300}	H _K	F _A	d
1	2	535	600	62	66	550	100	2.42

Tolerance of Transmittance (T)

Average Transmittance at 400nm-700nm	
T _{av} (%)	OD
30±3	0.52±0.05





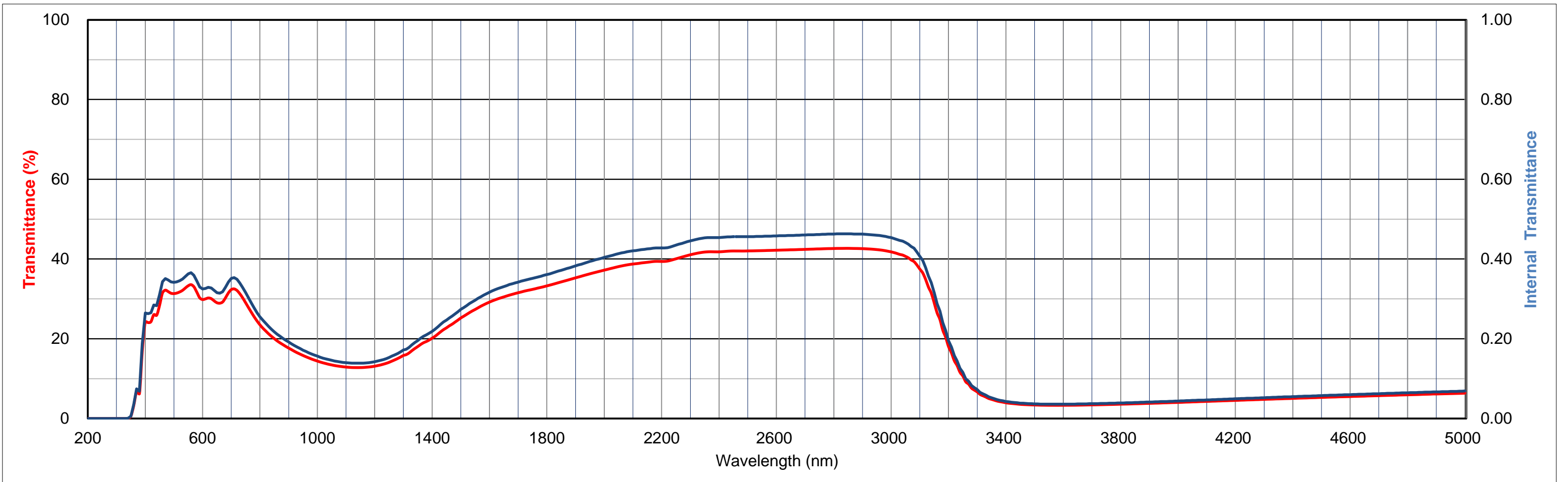
HOYA CANDEO OPTRONICS CORPORATION

Thickness (2.3) mm

ND30

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	0.0	0.5	3.2	6.8	6.2	17.1
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	24.2	24.0	24.3	26.0	25.9	28.4	31.5	32.2	31.8	31.4	31.3	31.5	31.7	32.1	32.7	33.3	33.6	33.0	31.7	30.3
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	29.8	30.0	30.2	30.1	29.5	29.0	28.9	29.2	30.3	31.5	32.3	32.5	32.1	31.3	30.2	29.0	27.8	26.6	25.5	24.4
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	23.5	22.7	22.0	21.2	20.6	20.0	19.5	19.0	18.5	18.1	17.7	17.3	16.8	16.5	16.1	15.8	15.5	15.2	14.9	14.6
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190
T	14.4	14.2	14.0	13.8	13.6	13.4	13.3	13.2	13.1	13.0	12.9	12.8	12.8	12.8	12.8	12.8	12.8	12.9	12.9	13.0
λnm	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390
T	13.1	13.3	13.4	13.6	13.8	14.1	14.4	14.7	15.0	15.4	15.8	16.0	16.5	17.0	17.6	18.0	18.6	19.0	19.3	19.7
λnm	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590
T	20.1	20.6	21.2	21.8	22.3	22.7	23.2	23.7	24.2	24.7	25.2	25.6	26.1	26.5	27.0	27.3	27.8	28.2	28.5	28.9
λnm	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790
T	29.2	29.5	29.8	30.0	30.3	30.5	30.7	31.0	31.1	31.4	31.5	31.7	31.9	32.1	32.2	32.4	32.5	32.7	32.9	33.1
λnm	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
T	33.3	33.4	33.6	33.8	34.1	34.3	34.5	34.7	34.9	35.1	35.3	35.5	35.7	35.9	36.1	36.3	36.5	36.7	36.8	37.0
λnm	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950
T	37.2	38.1	38.7	39.2	39.4	40.0	41.1	41.7	41.8	42.0	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.6	42.4
λnm	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950
T	41.8	40.7	37.5	29.0	18.0	10.6	6.7	4.8	3.9	3.6	3.4	3.3	3.3	3.3	3.4	3.5	3.6	3.7	3.8	3.9
λnm	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950
T	4.0	4.2	4.3	4.4	4.5	4.7	4.8	4.9	5.0	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.1	6.1	6.2
λnm	5000																			
T	6.4																			



All data is mean values of various melts.

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