

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	1.0	7.6	21.1	28.9	24.8	46.2
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	54.8	52.8	52.9	54.9	54.0	57.3	61.2	62.1	62.0	62.0	62.3	62.8	63.2	63.6	63.7	63.7	63.6	63.3	62.7	62.1
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	61.9	61.8	61.6	61.3	60.8	60.3	59.8	59.6	59.5	59.4	59.0	58.4	57.5	56.4	55.2	53.9	52.6	51.3	49.9	48.7
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	47.5	46.4	45.5	44.5	43.6	42.8	42.0	41.2	40.5	39.9	39.2	38.6	38.0	37.4	36.8	36.3	35.8	35.3	34.9	34.5
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1120	1140	1160	1180	1200				
T	34.1	33.9	33.6	33.3	33.0	32.8	32.6	32.5	32.3	32.2	32.2	32.2	32.3	32.6	32.9	33.4				

Refractive Index/Absorption coefficient/Reflection coefficient

λnm	400	500	600	700	800	900	1000
n	1.515	1.511	1.509	1.508	1.508	1.507	1.507
K	9.2E-06	9.2E-06	1.1E-05	1.2E-05	1.7E-05	2.3E-05	3.0E-05
P	0.920	0.920	0.921	0.921	0.921	0.921	0.921

Classes of Bubbles and Inclusions

Bubble Class
3

Color Specification

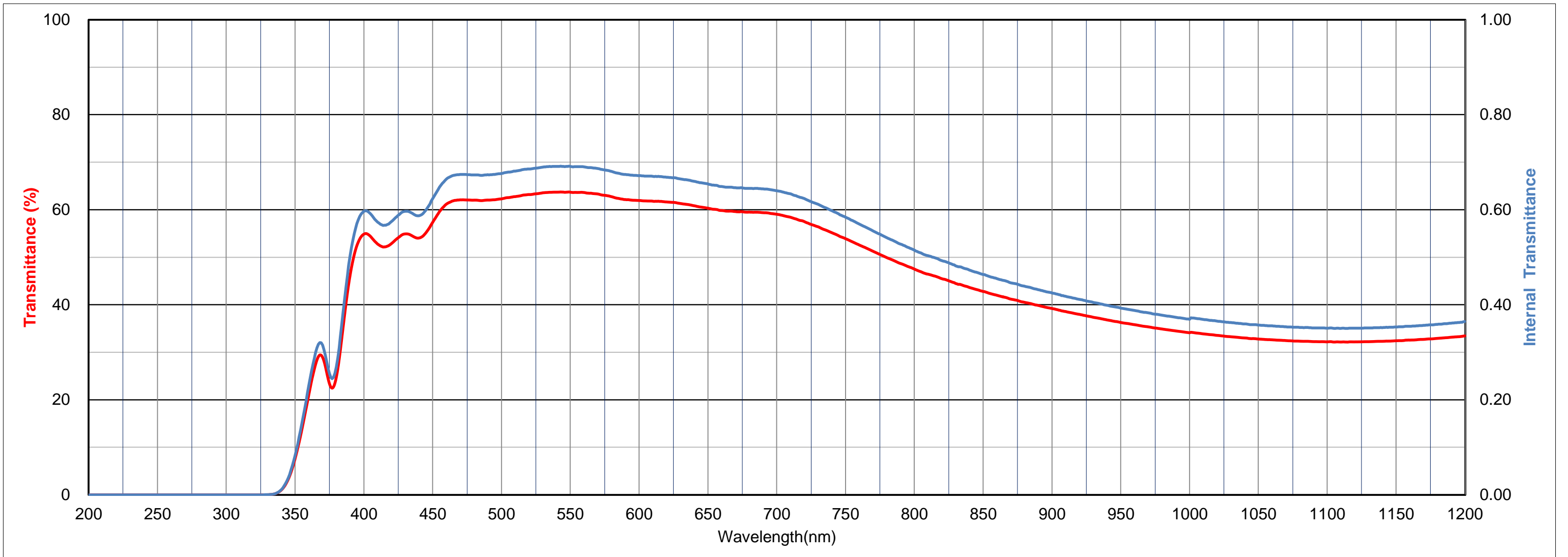
	x	y	Y	λ <sub>d</sub>	P <sub>e</sub>
A	0.448	0.413	63	572	4
C	0.313	0.327	63	563	4
D65	0.316	0.340	63	563	4

Properties

Chemical		Thermal				Mechanical		Others
D <sub>w</sub>	D <sub>A</sub>	T <sub>g</sub>	T <sub>s</sub>	α <sub>-30/70</sub>	α <sub>100/300</sub>	H <sub>K</sub>	F <sub>A</sub>	d
2	4	495	555	62	66	550	90	2.42

Tolerance of Transmittance (T)

Average Transmittance at 400nm-700nm	
T <sub>av</sub> (%)	OD
60±5	0.22±0.04





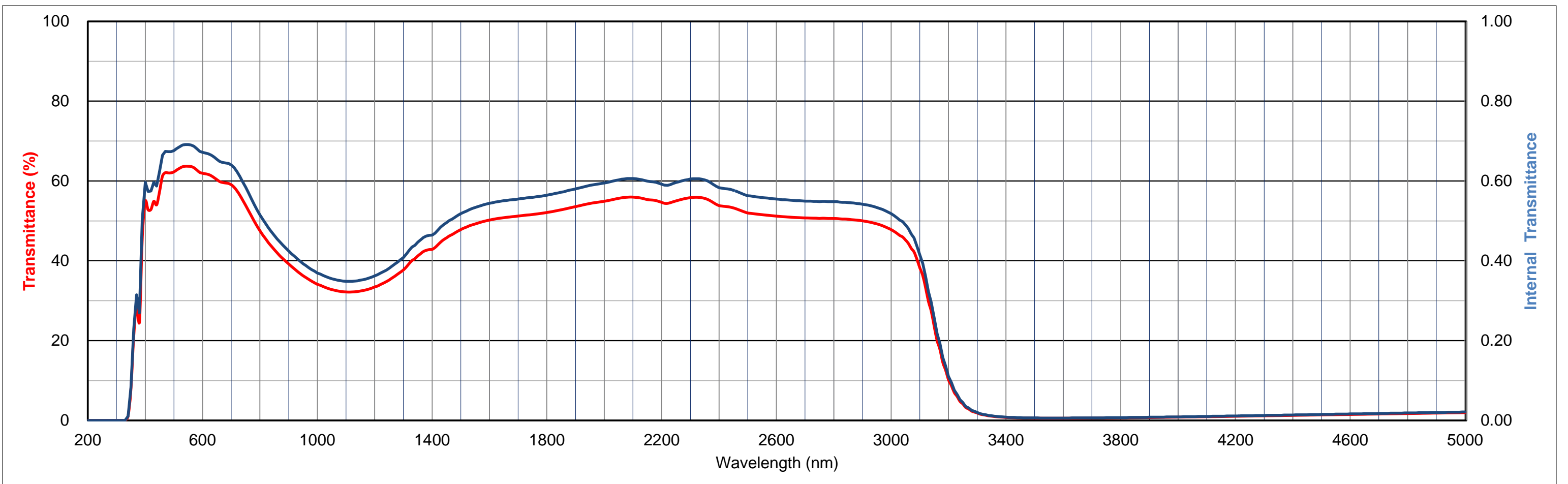
HOYA CANDEO OPTRONICS CORPORATION

Thickness (1.6) mm

ND60

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	1.0	7.6	21.1	28.9	24.8	46.2
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	54.8	52.8	52.9	54.9	54.0	57.3	61.2	62.1	62.0	62.0	62.3	62.8	63.2	63.6	63.7	63.7	63.6	63.3	62.7	62.1
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	61.9	61.8	61.6	61.3	60.8	60.3	59.8	59.6	59.5	59.4	59.0	58.4	57.5	56.4	55.2	53.9	52.6	51.3	49.9	48.7
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	47.5	46.4	45.5	44.5	43.6	42.8	42.0	41.2	40.5	39.9	39.2	38.6	38.0	37.4	36.8	36.3	35.8	35.3	34.9	34.5
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190
T	34.1	33.9	33.6	33.3	33.0	32.8	32.6	32.5	32.3	32.2	32.2	32.2	32.2	32.2	32.3	32.4	32.6	32.7	32.9	33.2
λnm	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390
T	33.4	33.7	34.1	34.4	34.8	35.2	35.7	36.1	36.7	37.2	37.7	38.4	39.3	40.1	40.5	41.2	41.8	42.3	42.6	42.8
λnm	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590
T	42.9	43.3	44.0	44.7	45.3	45.7	46.2	46.6	47.0	47.4	47.8	48.2	48.4	48.8	49.0	49.2	49.5	49.7	49.9	50.1
λnm	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790
T	50.2	50.4	50.5	50.6	50.7	50.8	50.9	51.0	51.1	51.1	51.2	51.3	51.4	51.5	51.5	51.6	51.7	51.8	51.9	52.0
λnm	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
T	52.1	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.3	53.4	53.6	53.7	53.9	54.1	54.2	54.4	54.5	54.6	54.7	54.8
λnm	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950
T	54.9	55.6	56.0	55.3	54.6	55.0	55.8	55.6	53.8	53.3	52.0	51.6	51.2	50.9	50.7	50.6	50.6	50.4	50.0	49.3
λnm	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950
T	47.8	45.2	38.2	23.6	10.2	4.1	1.9	1.1	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8
λnm	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950
T	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9
λnm	5000																			
T	2.0																			



All data is mean values of various melts.

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