

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
T	0.01	0.02	0.03	0.04	0.04	0.06	0.08	0.08	0.08	0.07	0.06	0.06	0.06	0.07	0.07	0.08	0.07	0.06	0.06	0.05
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
T	0.06	0.07	0.08	0.09	0.09	0.11	0.13	0.16	0.25	0.39	0.57	0.78	0.98	1.14	1.29	1.41	1.51	1.60	1.68	1.74
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
T	1.80	1.85	1.89	1.92	1.93	1.94	1.94	1.92	1.91	1.89	1.87	1.84	1.80	1.77	1.74	1.71	1.68	1.65	1.63	1.60
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1120	1140	1160	1180	1200				
T	1.58	1.56	1.55	1.54	1.53	1.52	1.52	1.52	1.52	1.53	1.54	1.57	1.63	1.70	1.80	1.93				

Refractive Index/Absorption coefficient/Reflection coefficient

λnm	400	500	600	700	800	900	1000
n	1.534	1.520	1.513	1.509	1.506	1.504	1.503
K	9.2E-05	8.5E-05	1.0E-04	8.4E-05	7.4E-05	8.2E-05	9.5E-05
P	0.915	0.918	0.920	0.921	0.922	0.922	0.922

Classes of Bubbles and Inclusions

Bubble Class
3

Color Specification

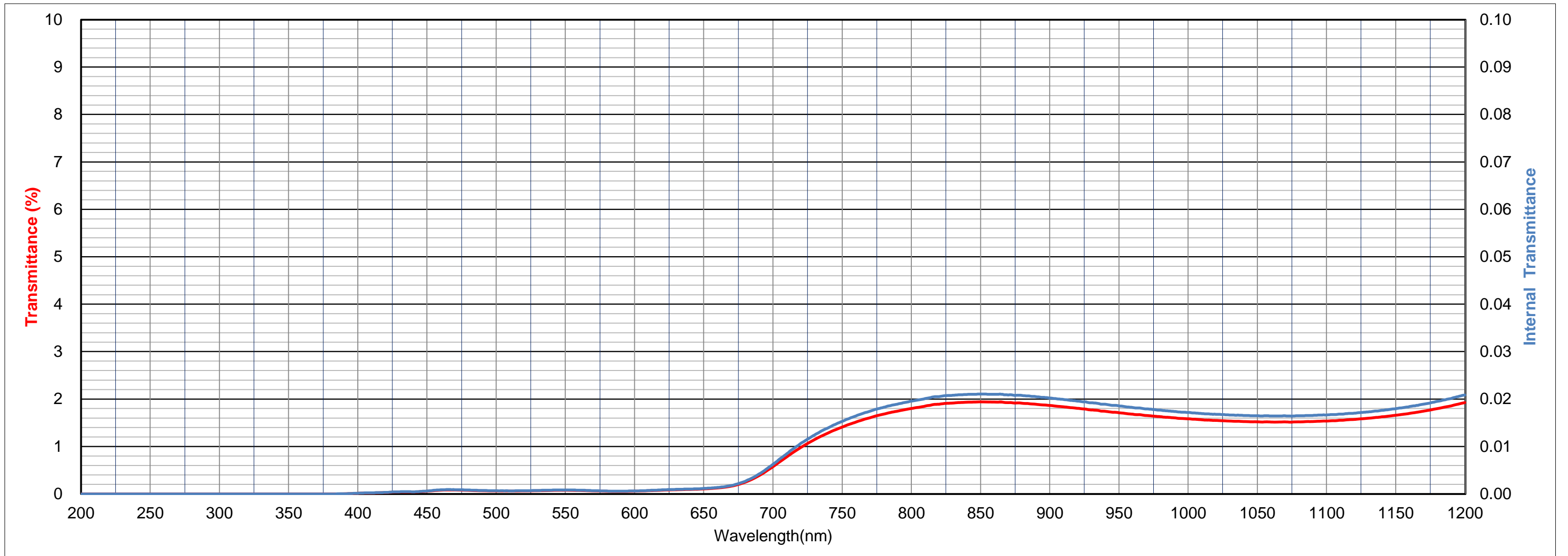
	x	y	Y	λ <sub>d</sub>	P <sub>e</sub>
A	-	-	-	-	-
C	-	-	-	-	-
D65	-	-	-	-	-

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
1	3	490	565	-	65	530	100	2.41

Tolerance of Transmittance (T)

Average Transmittance at 400nm-700nm	
Tav(%)	OD
0.1±0.05	3 ±0.3





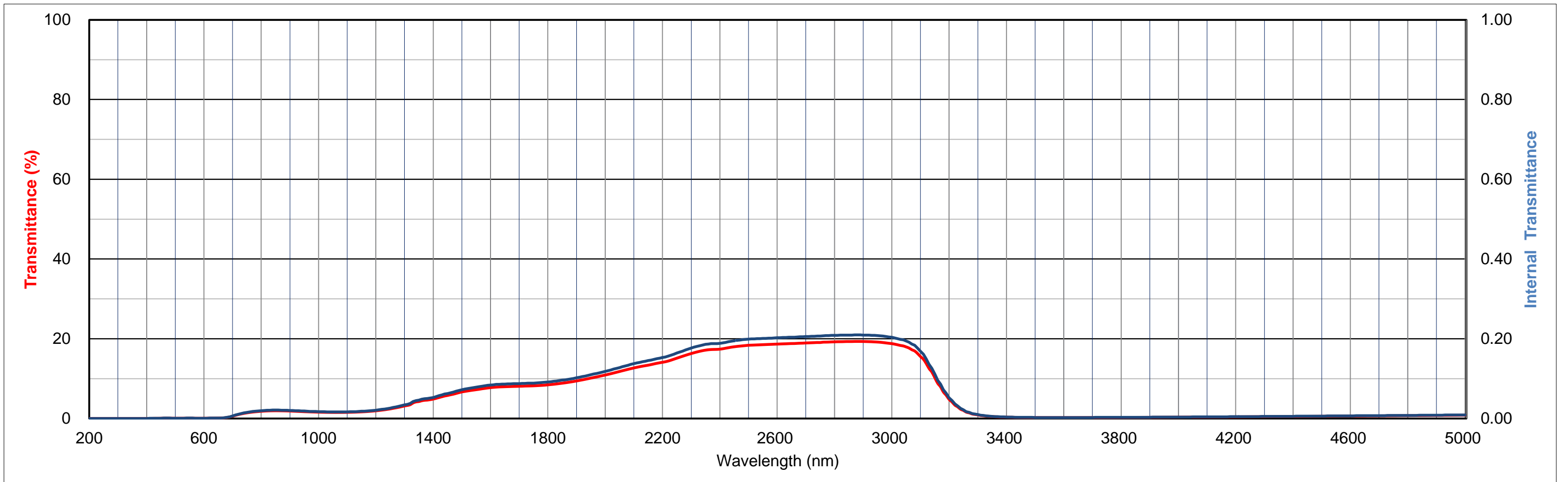
HOYA CANDEO OPTRONICS CORPORATION

Thickness (3.1) mm

ND0.1

Transmittance (T) units: %

λnm	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350	360	370	380	390
τ	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	0.0	0.0	0.0	0.0	0.0
λnm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590
τ	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
λnm	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790
τ	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0.6	0.8	1.0	1.1	1.3	1.4	1.5	1.6	1.7	1.7
λnm	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990
τ	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.6	1.6
λnm	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190
τ	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.9
λnm	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390
τ	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.7	2.8	3.0	3.1	3.3	3.5	3.9	4.2	4.2	4.4	4.6	4.6	4.7
λnm	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590
τ	4.9	5.1	5.3	5.4	5.6	5.8	5.9	6.1	6.3	6.5	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.7
λnm	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790
τ	7.7	7.8	7.9	7.9	7.9	8.0	8.0	8.0	8.0	8.1	8.1	8.1	8.1	8.2	8.2	8.2	8.2	8.3	8.3	8.4
λnm	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
τ	8.4	8.5	8.6	8.7	8.8	8.8	8.9	9.0	9.2	9.3	9.4	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7
λnm	2000	2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600	2650	2700	2750	2800	2850	2900	2950
τ	10.9	11.8	12.7	13.4	14.1	15.1	16.3	17.1	17.4	18.0	18.4	18.5	18.7	18.8	18.9	19.1	19.2	19.3	19.3	19.2
λnm	3000	3050	3100	3150	3200	3250	3300	3350	3400	3450	3500	3550	3600	3650	3700	3750	3800	3850	3900	3950
τ	18.8	17.9	15.5	10.2	4.8	2.0	0.9	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
λnm	4000	4050	4100	4150	4200	4250	4300	4350	4400	4450	4500	4550	4600	4650	4700	4750	4800	4850	4900	4950
τ	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8
λnm	5000																			
τ	0.8																			



All data is mean values of various melts.

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