

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

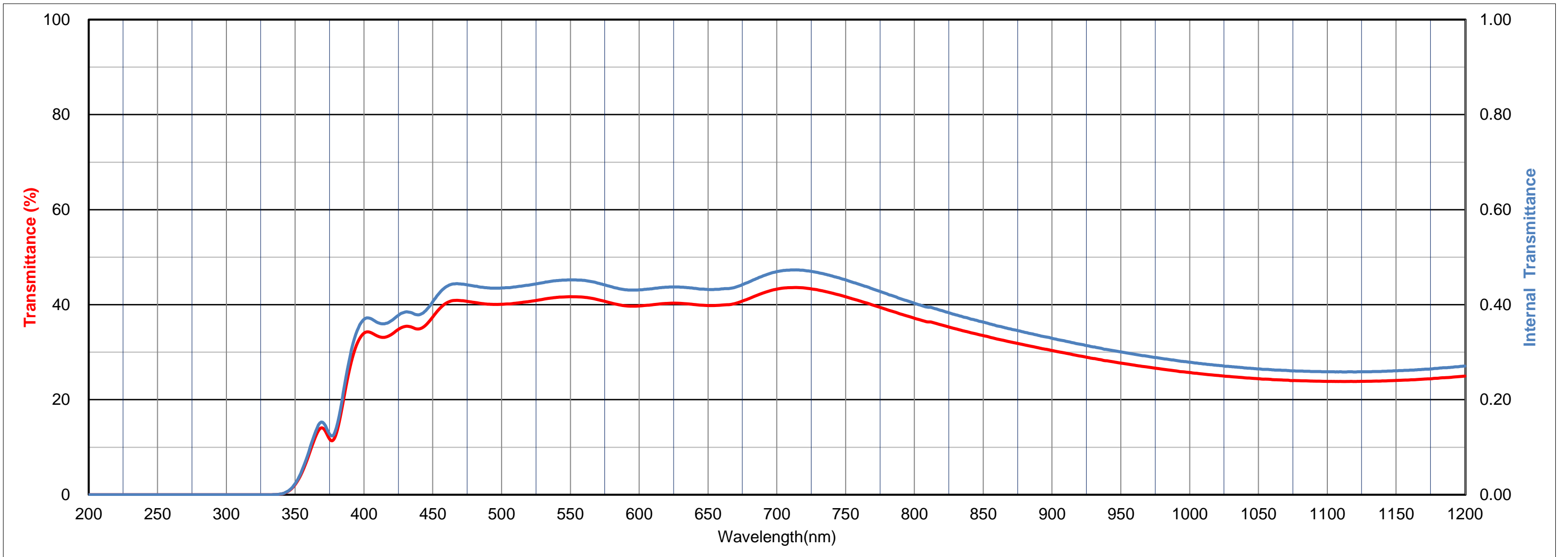
| | | | | | |
|-----|-------|-------|----|----------------|----------------|
| | x | y | Y | λ _d | P _e |
| A | 0.448 | 0.413 | 41 | 573 | 4 |
| C | 0.313 | 0.327 | 41 | 564 | 4 |
| D65 | 0.316 | 0.339 | 41 | 563 | 4 |

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 (2.73) 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 | | | | | | | | | | | | | | | | | | | |

