

DATA SHEET

HOYA® Holmium Filters



HOYA CANDEO OPTONICS CORPORATION

Thickness 2.50 mm

HY-1

| Transmittance (T) | | units: % | | | | | | | | | | | | | | | | | | | |
|-------------------|---|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| λnm | T | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 290 | 300 | 310 | 320 | 330 | 340 | 350 | 360 | 370 | 380 | 390 |
| λnm | T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 11.5 | 23.9 | 44.8 | 71.2 | 81.0 | 85.5 | 86.1 | 84.7 | 84.6 | 36.3 | 83.2 | 87.6 | 87.6 |
| λnm | T | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 |
| λnm | T | 89.2 | 88.0 | 71.4 | 87.5 | 78.2 | 38.1 | 17.1 | 81.7 | 85.8 | 81.8 | 89.4 | 89.2 | 89.2 | 85.0 | 68.9 | 83.6 | 89.5 | 89.7 | 89.7 | 89.5 |
| λnm | T | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| λnm | T | 89.5 | 89.5 | 89.0 | 85.5 | 75.1 | 78.4 | 83.8 | 88.7 | 89.5 | 89.8 | 89.8 | 89.8 | 89.7 | 89.7 | 89.6 | 89.7 | 89.6 | 89.5 | 89.5 | 89.6 |
| λnm | T | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| λnm | T | 89.7 | 89.7 | 89.8 | 90.0 | 89.8 | 89.9 | 89.7 | 89.7 | 89.0 | 89.3 | 89.7 | 89.5 | 89.6 | 90.2 | 90.2 | 90.3 | 90.4 | 90.4 | 90.4 | 90.5 |
| λnm | T | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1120 | 1140 | 1160 | 1180 | 1200 | | | | |
| λnm | T | 90.5 | 90.5 | 90.5 | 90.6 | 90.6 | 90.5 | 90.6 | 90.6 | 90.6 | 90.5 | 90.4 | 88.9 | 86.2 | 88.1 | 87.8 | 87.5 | | | | |

Refractive Index/Absorption coefficient/Reflection coefficient

| λnm | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
|-----|---------|---------|---------|---------|---------|---------|---------|
| n | 1.517 | 1.511 | 1.509 | 1.508 | 1.508 | 1.507 | 1.507 |
| K | 3.2E-06 | 3.5E-06 | 3.5E-06 | 3.7E-06 | 3.8E-06 | 4.0E-06 | 4.1E-06 |
| P | 0.919 | 0.920 | 0.921 | 0.921 | 0.921 | 0.921 | 0.921 |

Classes of Bubbles and Inclusions

| Bubble Class |
|--------------|
| 3 |

Color Specification

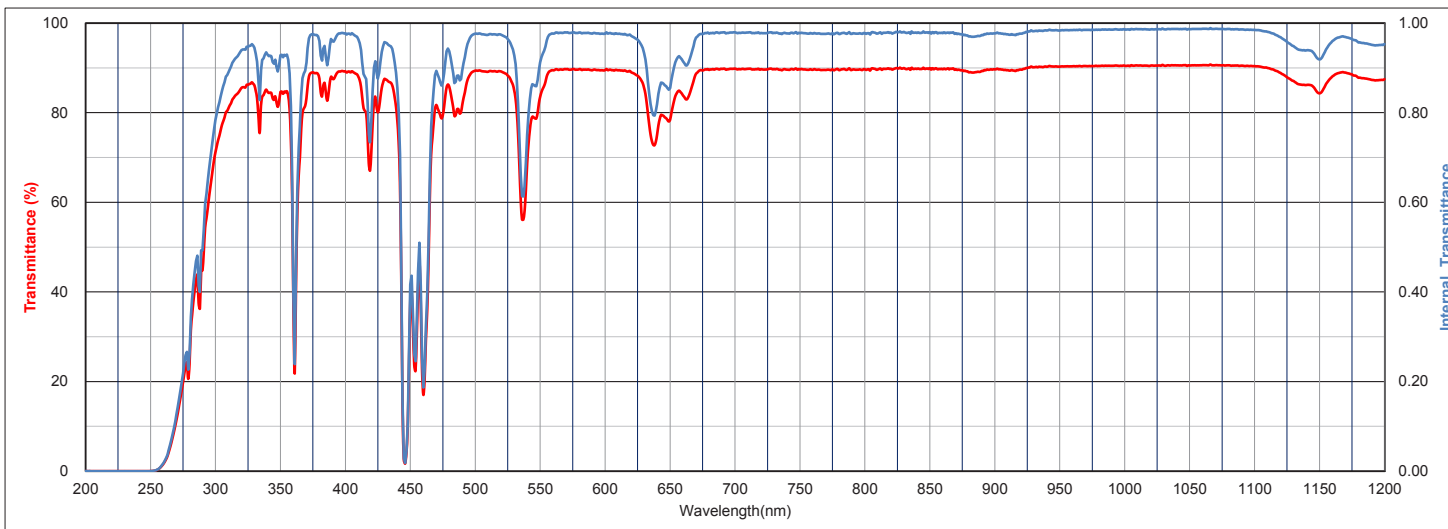
| | x | y | Y | λ _s | P _e |
|-----|-------|-------|----|----------------|----------------|
| A | 0.465 | 0.425 | 86 | 581 | 24 |
| C | 0.337 | 0.360 | 85 | 571 | 19 |
| D65 | 0.340 | 0.373 | 85 | 571 | 20 |

Properties

| Chemical | | Thermal | | | | Mechanical | | Others |
|----------------|----------------|----------------|----------------|---------------------|----------------------|----------------|----------------|--------|
| D _w | D _k | T _g | T _s | α _{-30/70} | α _{100/300} | H _k | F _k | d |
| 4 | 1 | 590 | 640 | 102 | 116 | 520 | 130 | 3.19 |

Tolerance of Transmittance (T)

| Transmittance at 435nm | Transmittance at 445nm |
|------------------------|------------------------|
| T435(%) | T445(%) |
| >80 | <5 |



All data is mean values of various melts.

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

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HOYA

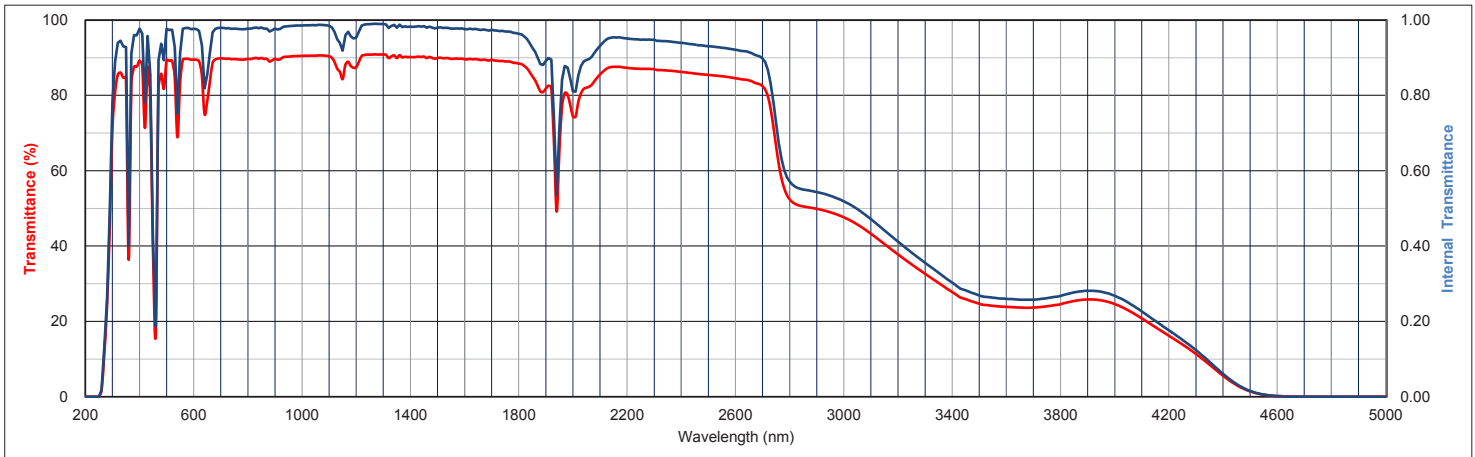
HOYA CANDEO OPTRONICS CORPORATION

Thickness 2.50 mm

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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 | 1.7 | 11.5 | 23.9 | 44.8 | 71.2 | 81.0 | 85.5 | 86.1 | 84.7 | 84.6 | 36.3 | 83.2 | 87.6 | 87.6 |
| λnm | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 |
| T | 89.2 | 88.0 | 71.4 | 87.5 | 78.2 | 38.1 | 17.1 | 81.7 | 85.8 | 81.8 | 89.4 | 89.2 | 89.2 | 85.0 | 68.9 | 83.6 | 89.5 | 89.7 | 89.7 | 89.5 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 89.5 | 89.5 | 89.0 | 85.5 | 75.1 | 78.4 | 83.8 | 88.7 | 89.5 | 89.8 | 89.8 | 89.8 | 89.7 | 89.7 | 89.6 | 89.7 | 89.6 | 89.5 | 89.5 | 89.6 |
| λnm | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 89.7 | 89.7 | 89.8 | 90.0 | 89.8 | 89.9 | 89.7 | 89.7 | 89.0 | 89.3 | 89.7 | 89.5 | 89.6 | 90.2 | 90.2 | 90.3 | 90.4 | 90.4 | 90.4 | 90.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 1120 | 1130 | 1140 | 1150 | 1160 | 1170 | 1180 | 1190 |
| T | 90.5 | 90.5 | 90.5 | 90.6 | 90.6 | 90.5 | 90.6 | 90.6 | 90.6 | 90.5 | 90.4 | 90.0 | 88.9 | 87.1 | 86.2 | 84.3 | 88.1 | 89.0 | 87.8 | 87.3 |
| λnm | 1200 | 1210 | 1220 | 1230 | 1240 | 1250 | 1260 | 1270 | 1280 | 1290 | 1300 | 1310 | 1320 | 1330 | 1340 | 1350 | 1360 | 1370 | 1380 | 1390 |
| T | 87.5 | 89.0 | 90.5 | 90.7 | 90.8 | 90.8 | 90.8 | 90.9 | 90.8 | 90.9 | 90.8 | 90.8 | 89.9 | 90.4 | 90.6 | 89.9 | 90.7 | 90.1 | 90.3 | 90.2 |
| λnm | 1400 | 1410 | 1420 | 1430 | 1440 | 1450 | 1460 | 1470 | 1480 | 1490 | 1500 | 1510 | 1520 | 1530 | 1540 | 1550 | 1560 | 1570 | 1580 | 1590 |
| T | 90.2 | 90.1 | 90.2 | 90.3 | 90.2 | 90.3 | 89.9 | 90.2 | 90.0 | 89.8 | 89.9 | 90.0 | 89.9 | 89.9 | 89.9 | 89.7 | 89.7 | 89.8 | 89.7 | 89.8 |
| λnm | 1600 | 1610 | 1620 | 1630 | 1640 | 1650 | 1660 | 1670 | 1680 | 1690 | 1700 | 1710 | 1720 | 1730 | 1740 | 1750 | 1760 | 1770 | 1780 | 1790 |
| T | 89.6 | 89.6 | 89.7 | 89.6 | 89.7 | 89.5 | 89.4 | 89.5 | 89.4 | 89.5 | 89.5 | 89.3 | 89.2 | 89.1 | 89.2 | 89.0 | 89.0 | 88.9 | 88.7 | 88.6 |
| λnm | 1800 | 1810 | 1820 | 1830 | 1840 | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 |
| T | 88.4 | 88.3 | 87.8 | 87.2 | 86.2 | 85.1 | 84.1 | 82.5 | 81.0 | 80.9 | 81.8 | 82.6 | 82.2 | 67.4 | 49.1 | 65.4 | 77.3 | 80.6 | 80.2 | 77.5 |
| λnm | 2000 | 2050 | 2100 | 2150 | 2200 | 2250 | 2300 | 2350 | 2400 | 2450 | 2500 | 2550 | 2600 | 2650 | 2700 | 2750 | 2800 | 2850 | 2900 | 2950 |
| T | 74.4 | 82.1 | 85.6 | 87.6 | 87.3 | 87.0 | 87.0 | 86.6 | 86.2 | 85.8 | 85.4 | 85.1 | 84.5 | 84.0 | 82.4 | 66.6 | 52.4 | 50.5 | 49.9 | 49.0 |
| λnm | 3000 | 3050 | 3100 | 3150 | 3200 | 3250 | 3300 | 3350 | 3400 | 3450 | 3500 | 3550 | 3600 | 3650 | 3700 | 3750 | 3800 | 3850 | 3900 | 3950 |
| T | 47.6 | 45.7 | 43.3 | 40.5 | 37.8 | 35.2 | 32.6 | 30.2 | 27.8 | 25.9 | 24.7 | 24.1 | 23.9 | 23.7 | 23.7 | 24.0 | 24.6 | 25.4 | 25.8 | 25.6 |
| λnm | 4000 | 4050 | 4100 | 4150 | 4200 | 4250 | 4300 | 4350 | 4400 | 4450 | 4500 | 4550 | 4600 | 4650 | 4700 | 4750 | 4800 | 4850 | 4900 | 4950 |
| T | 24.6 | 22.9 | 20.8 | 18.5 | 16.2 | 13.9 | 11.4 | 8.5 | 5.6 | 3.1 | 1.4 | 0.5 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| λnm | 5000 | | | | | | | | | | | | | | | | | | | |
| T | 0.0 | | | | | | | | | | | | | | | | | | | |



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