

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 | 0.0 | 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 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.7 | 1.9 | 4.6 | 9.0 | 14.1 | 18.0 | 18.8 | 16.0 | 11.3 | 6.7 | 3.4 | 1.5 | 0.6 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 0.2 | 0.1 | 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 | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1120 | 1140 | 1160 | 1180 | 1200 | | | | |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.6 | 0.8 | 1.0 | | | | |

Refractive Index/Absorption coefficient/Reflection coefficient

| | | | | | | | |
|-----|---------|---------|---------|---------|---------|---------|---------|
| λnm | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| n | 1.597 | 1.581 | 1.573 | 1.568 | 1.565 | 1.564 | 1.562 |
| K | 5.6E-04 | 3.7E-05 | 1.0E-04 | 2.2E-04 | 5.3E-04 | 8.0E-04 | 9.4E-04 |
| P | 0.900 | 0.904 | 0.906 | 0.907 | 0.907 | 0.908 | 0.908 |

Classes of Bubbles and Inclusions

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

Color Specification

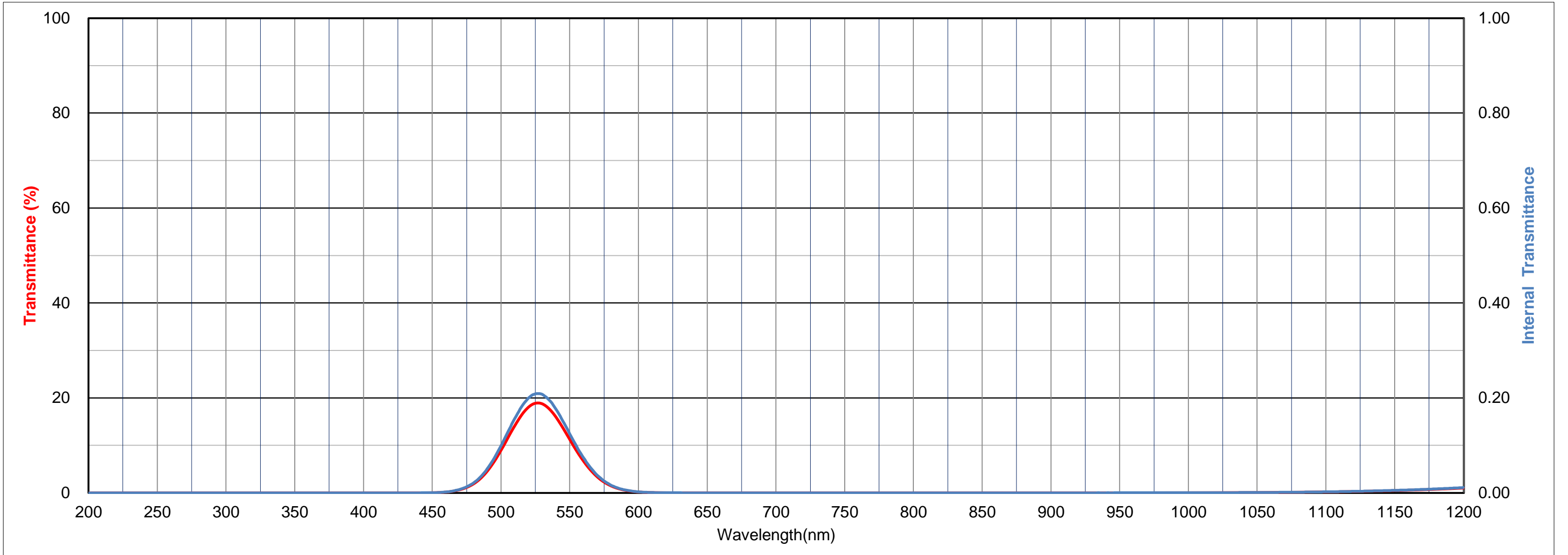
| | | | | | |
|-----|-------|-------|---|----------------|----------------|
| | x | y | Y | λ _d | P _e |
| A | 0.229 | 0.692 | 6 | 527 | 69 |
| C | 0.203 | 0.681 | 7 | 532 | 76 |
| D65 | 0.199 | 0.689 | 8 | 531 | 76 |

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 | 1 | 450 | 495 | 94 | 100 | 500 | 130 | 3.12 |

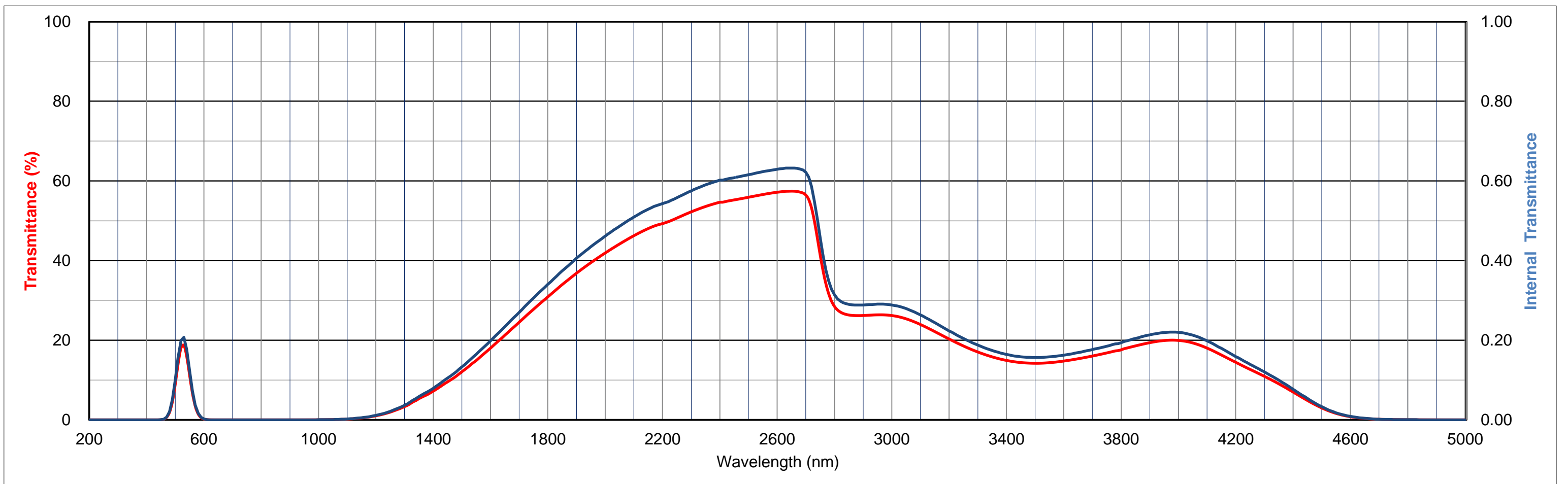
Tolerance of Transmittance (T)

| Maximum Transmittance | Less than 1% Wavelength at Short wave Side | Less than 5% Wavelength at Long wave Side |
|-----------------------|--|---|
| Tmax(%) | λs1(nm) | λl5(nm) |
| 18±3 | >470 | <580 |



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 | 0.0 | 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 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.7 | 1.9 | 4.6 | 9.0 | 14.1 | 18.0 | 18.8 | 16.0 | 11.3 | 6.7 | 3.4 | 1.5 | 0.6 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 0.2 | 0.1 | 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 | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| 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 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 1120 | 1130 | 1140 | 1150 | 1160 | 1170 | 1180 | 1190 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
| λnm | 1200 | 1210 | 1220 | 1230 | 1240 | 1250 | 1260 | 1270 | 1280 | 1290 | 1300 | 1310 | 1320 | 1330 | 1340 | 1350 | 1360 | 1370 | 1380 | 1390 |
| T | 1.0 | 1.2 | 1.3 | 1.5 | 1.7 | 1.9 | 2.2 | 2.5 | 2.7 | 3.0 | 3.3 | 3.6 | 4.1 | 4.5 | 4.9 | 5.3 | 5.7 | 6.0 | 6.4 | 6.8 |
| λnm | 1400 | 1410 | 1420 | 1430 | 1440 | 1450 | 1460 | 1470 | 1480 | 1490 | 1500 | 1510 | 1520 | 1530 | 1540 | 1550 | 1560 | 1570 | 1580 | 1590 |
| T | 7.2 | 7.6 | 8.1 | 8.6 | 9.1 | 9.5 | 10.0 | 10.4 | 11.0 | 11.5 | 12.1 | 12.6 | 13.2 | 13.8 | 14.4 | 14.9 | 15.5 | 16.2 | 16.8 | 17.4 |
| λnm | 1600 | 1610 | 1620 | 1630 | 1640 | 1650 | 1660 | 1670 | 1680 | 1690 | 1700 | 1710 | 1720 | 1730 | 1740 | 1750 | 1760 | 1770 | 1780 | 1790 |
| T | 18.0 | 18.7 | 19.3 | 20.0 | 20.6 | 21.3 | 21.9 | 22.6 | 23.2 | 23.9 | 24.5 | 25.2 | 25.8 | 26.5 | 27.1 | 27.8 | 28.4 | 29.1 | 29.7 | 30.3 |
| λnm | 1800 | 1810 | 1820 | 1830 | 1840 | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 |
| T | 30.9 | 31.5 | 32.1 | 32.7 | 33.4 | 34.0 | 34.5 | 35.1 | 35.7 | 36.3 | 36.8 | 37.4 | 37.9 | 38.4 | 39.0 | 39.5 | 40.0 | 40.5 | 40.9 | 41.4 |
| λnm | 2000 | 2050 | 2100 | 2150 | 2200 | 2250 | 2300 | 2350 | 2400 | 2450 | 2500 | 2550 | 2600 | 2650 | 2700 | 2750 | 2800 | 2850 | 2900 | 2950 |
| T | 41.9 | 44.2 | 46.2 | 48.0 | 49.3 | 50.7 | 52.2 | 53.6 | 54.6 | 55.2 | 55.9 | 56.6 | 57.2 | 57.4 | 56.5 | 41.5 | 28.5 | 26.3 | 26.2 | 26.4 |
| λnm | 3000 | 3050 | 3100 | 3150 | 3200 | 3250 | 3300 | 3350 | 3400 | 3450 | 3500 | 3550 | 3600 | 3650 | 3700 | 3750 | 3800 | 3850 | 3900 | 3950 |
| T | 26.2 | 25.4 | 23.9 | 22.2 | 20.3 | 18.5 | 17.0 | 15.8 | 14.9 | 14.4 | 14.2 | 14.4 | 14.8 | 15.3 | 16.0 | 16.8 | 17.6 | 18.6 | 19.4 | 19.9 |
| λnm | 4000 | 4050 | 4100 | 4150 | 4200 | 4250 | 4300 | 4350 | 4400 | 4450 | 4500 | 4550 | 4600 | 4650 | 4700 | 4750 | 4800 | 4850 | 4900 | 4950 |
| T | 19.9 | 19.3 | 18.0 | 16.3 | 14.4 | 12.7 | 10.9 | 9.0 | 7.0 | 4.9 | 3.0 | 1.6 | 0.8 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| λnm | 5000 | | | | | | | | | | | | | | | | | | | |
| T | 0.0 | | | | | | | | | | | | | | | | | | | |



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 | 0.0 | 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 |
| T | 0.0 | 0.0 | 0.0 | 0.1 | 0.5 | 1.7 | 4.7 | 9.8 | 16.8 | 25.7 | 35.3 | 44.1 | 50.6 | 53.8 | 53.3 | 49.4 | 43.3 | 35.9 | 28.3 | 21.4 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 15.7 | 11.4 | 8.3 | 6.2 | 5.0 | 4.2 | 3.5 | 3.3 | 3.2 | 2.8 | 2.8 | 2.9 | 3.0 | 3.2 | 3.3 | 3.4 | 3.5 | 3.7 | 3.8 | 3.9 |
| λnm | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 4.0 | 4.1 | 4.2 | 4.4 | 4.5 | 4.7 | 4.9 | 5.2 | 5.4 | 5.7 | 6.1 | 6.4 | 6.9 | 7.3 | 7.8 | 8.2 | 8.8 | 9.3 | 9.9 | 10.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1120 | 1140 | 1160 | 1180 | 1200 | | | | |
| T | 11.2 | 11.8 | 12.5 | 13.3 | 14.0 | 14.8 | 15.6 | 16.4 | 17.2 | 18.0 | 18.9 | 20.7 | 22.5 | 24.3 | 26.1 | 28.0 | | | | |

Refractive Index/Absorption coefficient/Reflection coefficient

| | | | | | | | |
|-----|---------|---------|---------|---------|---------|---------|---------|
| λnm | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| n | 1.551 | 1.541 | 1.536 | 1.533 | 1.531 | 1.529 | 1.529 |
| K | 8.8E-05 | 1.5E-05 | 3.4E-05 | 7.8E-05 | 7.9E-05 | 7.7E-05 | 6.5E-05 |
| P | 0.911 | 0.913 | 0.915 | 0.915 | 0.916 | 0.916 | 0.916 |

Classes of Bubbles and Inclusions

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

Color Specification

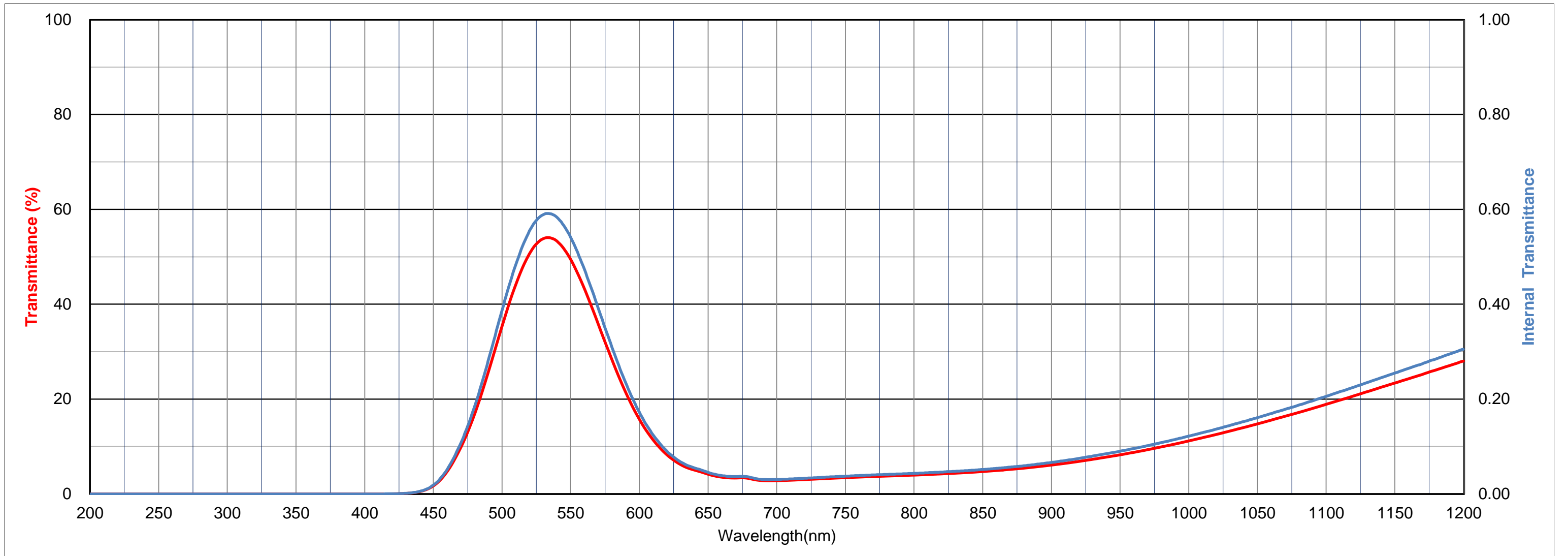
| | | | | | |
|-----|-------|-------|----|----------------|----------------|
| | x | y | Y | λ _d | P _e |
| A | 0.367 | 0.566 | 31 | 551 | 56 |
| C | 0.303 | 0.564 | 35 | 550 | 65 |
| D65 | 0.299 | 0.572 | 35 | 549 | 65 |

Properties

| Chemical | | Thermal | | | | Mechanical | | Others |
|----------------|----------------|----------------|----------------|---------------------|----------------------|----------------|----------------|--------|
| D _w | D _A | T _g | T _s | α _{-30/70} | α _{100/300} | H _K | F _A | d |
| 3 | 1 | 550 | 600 | 87 | 103 | 580 | 140 | 2.60 |

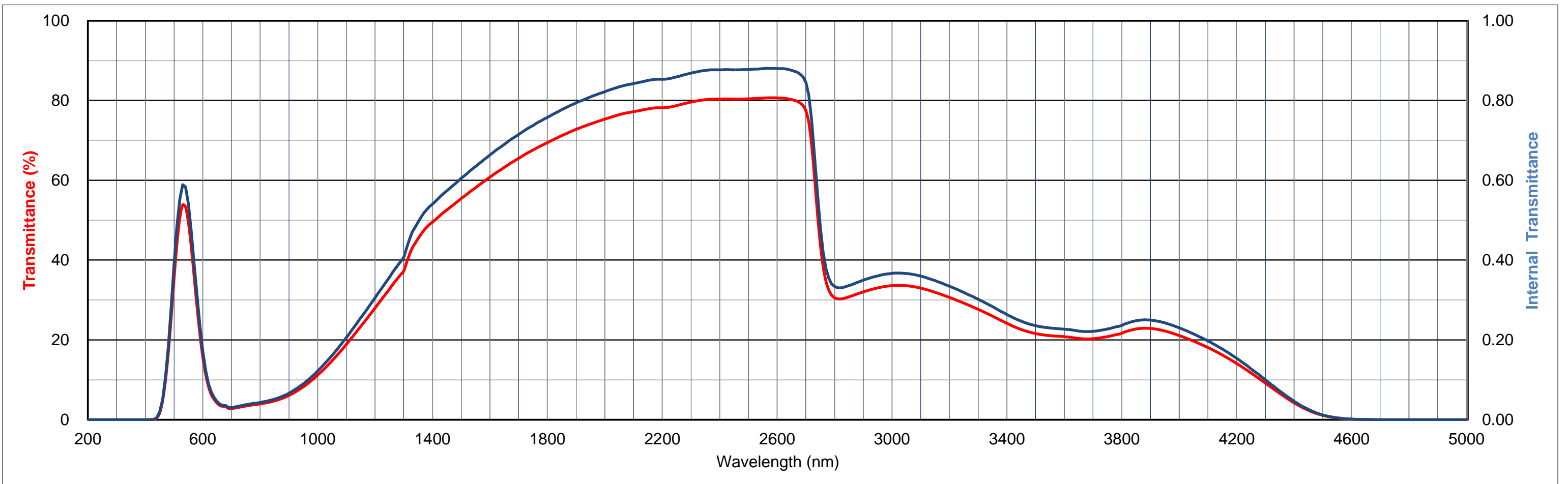
Tolerance of Transmittance (T)

| Maximum Transmittance | Less than 1% Wavelength at Short wave Side | Less than 5% Wavelength at Long wave Side |
|-----------------------|--|---|
| Tmax(%) | λs1(nm) | λl5(nm) |
| 53±3 | >410 | <660 |



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 | 0.0 | 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 |
| T | 0.0 | 0.0 | 0.0 | 0.1 | 0.5 | 1.7 | 4.7 | 9.8 | 16.8 | 25.7 | 35.3 | 44.1 | 50.6 | 53.8 | 53.3 | 49.4 | 43.3 | 35.9 | 28.3 | 21.4 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 15.7 | 11.4 | 8.3 | 6.2 | 5.0 | 4.2 | 3.5 | 3.3 | 3.2 | 2.8 | 2.8 | 2.9 | 3.0 | 3.2 | 3.3 | 3.4 | 3.5 | 3.7 | 3.8 | 3.9 |
| λnm | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 4.0 | 4.1 | 4.2 | 4.4 | 4.5 | 4.7 | 4.9 | 5.2 | 5.4 | 5.7 | 6.1 | 6.4 | 6.9 | 7.3 | 7.8 | 8.2 | 8.8 | 9.3 | 9.9 | 10.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 1120 | 1130 | 1140 | 1150 | 1160 | 1170 | 1180 | 1190 |
| T | 11.2 | 11.8 | 12.5 | 13.3 | 14.0 | 14.8 | 15.6 | 16.4 | 17.2 | 18.0 | 18.9 | 19.8 | 20.7 | 21.6 | 22.5 | 23.4 | 24.3 | 25.2 | 26.1 | 27.1 |
| λnm | 1200 | 1210 | 1220 | 1230 | 1240 | 1250 | 1260 | 1270 | 1280 | 1290 | 1300 | 1310 | 1320 | 1330 | 1340 | 1350 | 1360 | 1370 | 1380 | 1390 |
| T | 28.0 | 29.0 | 29.9 | 30.9 | 31.8 | 32.7 | 33.7 | 34.7 | 35.5 | 36.4 | 37.3 | 39.5 | 41.4 | 43.1 | 44.3 | 45.4 | 46.5 | 47.5 | 48.2 | 49.0 |
| λnm | 1400 | 1410 | 1420 | 1430 | 1440 | 1450 | 1460 | 1470 | 1480 | 1490 | 1500 | 1510 | 1520 | 1530 | 1540 | 1550 | 1560 | 1570 | 1580 | 1590 |
| T | 49.5 | 50.1 | 50.8 | 51.4 | 52.0 | 52.6 | 53.1 | 53.7 | 54.3 | 54.8 | 55.4 | 56.0 | 56.5 | 57.1 | 57.6 | 58.1 | 58.7 | 59.2 | 59.7 | 60.3 |
| λnm | 1600 | 1610 | 1620 | 1630 | 1640 | 1650 | 1660 | 1670 | 1680 | 1690 | 1700 | 1710 | 1720 | 1730 | 1740 | 1750 | 1760 | 1770 | 1780 | 1790 |
| T | 60.8 | 61.3 | 61.8 | 62.3 | 62.7 | 63.2 | 63.7 | 64.2 | 64.6 | 65.1 | 65.5 | 65.9 | 66.4 | 66.8 | 67.2 | 67.6 | 68.0 | 68.4 | 68.7 | 69.1 |
| λnm | 1800 | 1810 | 1820 | 1830 | 1840 | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 |
| T | 69.4 | 69.8 | 70.1 | 70.5 | 70.8 | 71.2 | 71.5 | 71.8 | 72.2 | 72.5 | 72.8 | 73.1 | 73.3 | 73.6 | 73.9 | 74.1 | 74.4 | 74.6 | 74.8 | 75.1 |
| λnm | 2000 | 2050 | 2100 | 2150 | 2200 | 2250 | 2300 | 2350 | 2400 | 2450 | 2500 | 2550 | 2600 | 2650 | 2700 | 2750 | 2800 | 2850 | 2900 | 2950 |
| T | 75.3 | 76.4 | 77.2 | 77.9 | 78.2 | 78.7 | 79.6 | 80.2 | 80.4 | 80.4 | 80.4 | 80.6 | 80.6 | 80.2 | 77.4 | 44.3 | 30.6 | 30.8 | 32.0 | 33.0 |
| λnm | 3000 | 3050 | 3100 | 3150 | 3200 | 3250 | 3300 | 3350 | 3400 | 3450 | 3500 | 3550 | 3600 | 3650 | 3700 | 3750 | 3800 | 3850 | 3900 | 3950 |
| T | 33.6 | 33.6 | 33.0 | 31.9 | 30.6 | 29.2 | 27.7 | 26.0 | 24.2 | 22.6 | 21.6 | 21.1 | 20.8 | 20.4 | 20.3 | 20.8 | 21.7 | 22.7 | 22.9 | 22.2 |
| λnm | 4000 | 4050 | 4100 | 4150 | 4200 | 4250 | 4300 | 4350 | 4400 | 4450 | 4500 | 4550 | 4600 | 4650 | 4700 | 4750 | 4800 | 4850 | 4900 | 4950 |
| T | 21.1 | 19.7 | 18.1 | 16.2 | 14.1 | 11.7 | 9.2 | 6.6 | 4.2 | 2.3 | 1.1 | 0.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| λnm | 5000 | | | | | | | | | | | | | | | | | | | |
| T | 0.0 | | | | | | | | | | | | | | | | | | | |



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 | 0.0 | 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 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 1.0 | 3.6 | 7.9 | 12.5 | 14.9 | 13.9 | 10.6 | 6.7 | 3.6 | 1.6 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 0.7 | 0.3 | 0.1 | 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 | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1120 | 1140 | 1160 | 1180 | 1200 | | | | |
| T | 0.6 | 0.7 | 0.8 | 0.9 | 1.1 | 1.2 | 1.4 | 1.6 | 1.8 | 2.1 | 2.3 | 2.9 | 3.6 | 4.4 | 5.3 | 6.3 | | | | |

Refractive Index/Absorption coefficient/Reflection coefficient

| | | | | | | | |
|-----|---------|---------|---------|---------|---------|---------|---------|
| λnm | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| n | 1.601 | 1.585 | 1.576 | 1.572 | 1.569 | 1.567 | 1.565 |
| K | 1.0E-03 | 8.1E-05 | 1.0E-04 | 2.2E-04 | 2.1E-04 | 2.2E-04 | 1.8E-04 |
| P | 0.899 | 0.903 | 0.905 | 0.906 | 0.907 | 0.907 | 0.907 |

Classes of Bubbles and Inclusions

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

Color Specification

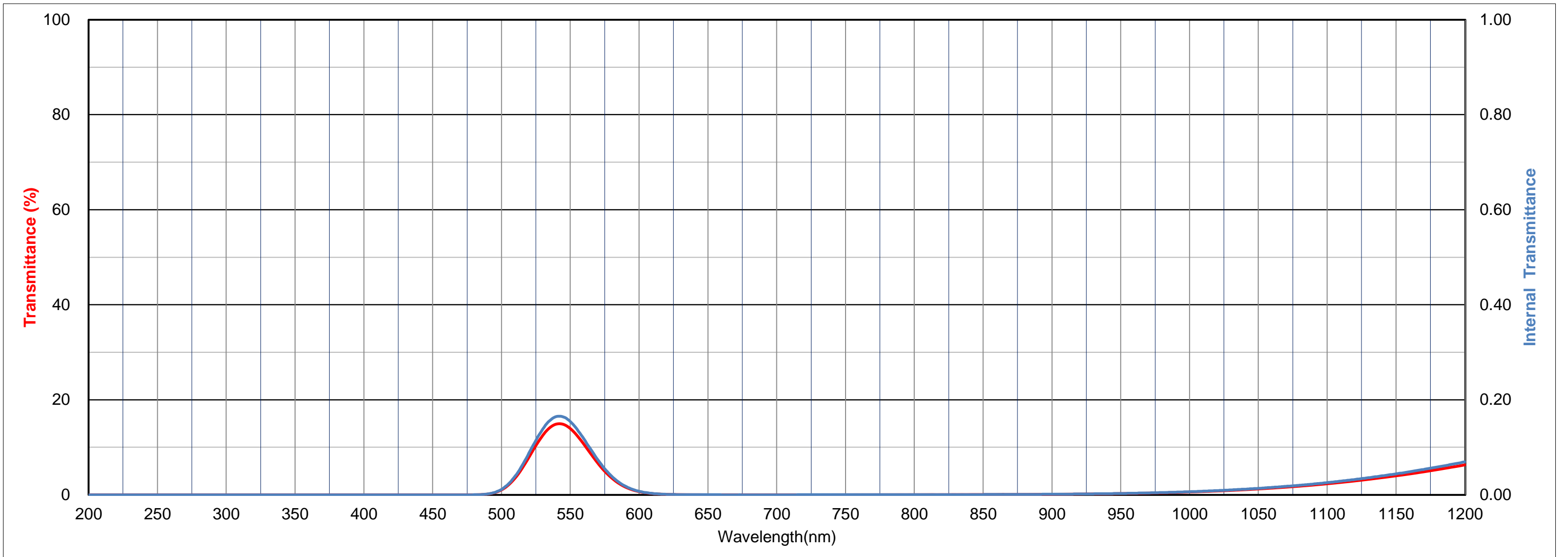
| | | | | | |
|-----|-------|-------|---|----------------|----------------|
| | x | y | Y | λ _d | P _e |
| A | 0.321 | 0.659 | 6 | 551 | 90 |
| C | 0.299 | 0.675 | 7 | 550 | 95 |
| D65 | 0.294 | 0.680 | 7 | 549 | 94 |

Properties

| Chemical | | Thermal | | | | Mechanical | | Others |
|----------------|----------------|----------------|----------------|---------------------|----------------------|----------------|----------------|--------|
| D _w | D _A | T _g | T _s | α _{-30/70} | α _{100/300} | H _K | F _A | d |
| 4 | 1 | 460 | 510 | 92 | 103 | 500 | 130 | 3.10 |

Tolerance of Transmittance (T)

| Maximum Transmittance | Less than 1% Wavelength at Short wave Side | Less than 5% Wavelength at Long wave Side |
|-----------------------|--|---|
| Tmax(%) | λs1(nm) | λl5(nm) |
| 13±3 | >490 | <600 |





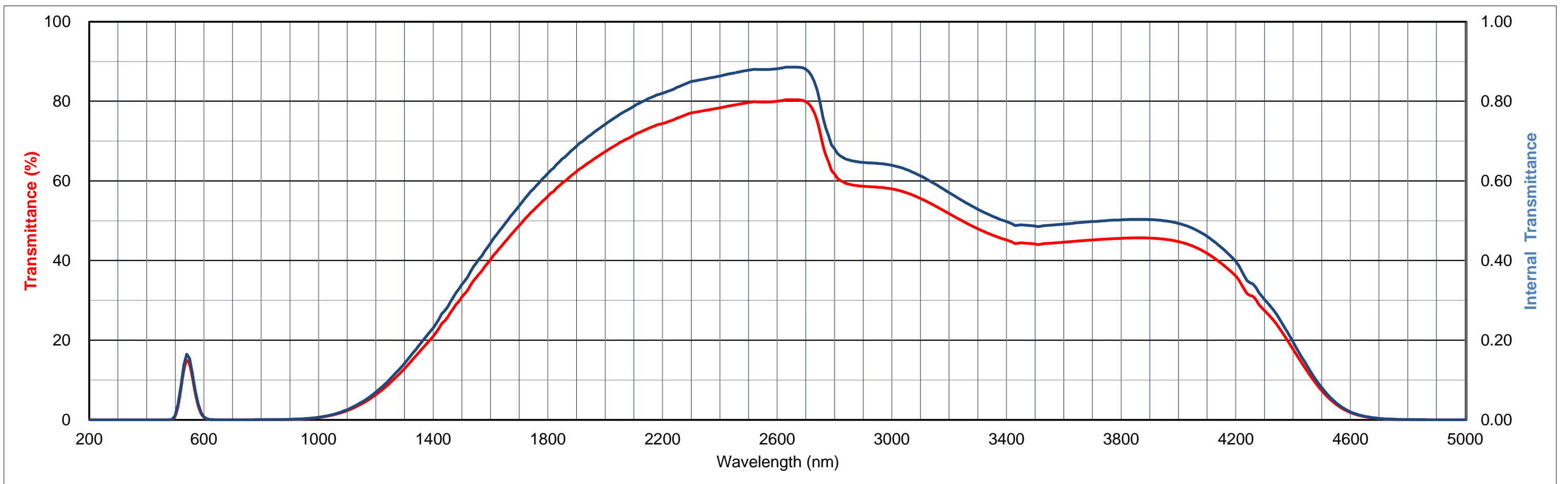
HOYA CANDEO OPTRONICS CORPORATION

Thickness 2.50 mm

G545

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 | 0.0 | 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 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 1.0 | 3.6 | 7.9 | 12.5 | 14.9 | 13.9 | 10.6 | 6.7 | 3.6 | 1.6 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 0.7 | 0.3 | 0.1 | 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 | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 1120 | 1130 | 1140 | 1150 | 1160 | 1170 | 1180 | 1190 |
| T | 0.6 | 0.7 | 0.8 | 0.9 | 1.1 | 1.2 | 1.4 | 1.6 | 1.8 | 2.1 | 2.3 | 2.6 | 2.9 | 3.3 | 3.6 | 4.0 | 4.4 | 4.8 | 5.3 | 5.8 |
| λnm | 1200 | 1210 | 1220 | 1230 | 1240 | 1250 | 1260 | 1270 | 1280 | 1290 | 1300 | 1310 | 1320 | 1330 | 1340 | 1350 | 1360 | 1370 | 1380 | 1390 |
| T | 6.3 | 6.9 | 7.4 | 8.0 | 8.6 | 9.3 | 10.0 | 10.7 | 11.4 | 12.1 | 12.9 | 13.7 | 14.5 | 15.3 | 16.1 | 16.9 | 17.7 | 18.5 | 19.3 | 20.2 |
| λnm | 1400 | 1410 | 1420 | 1430 | 1440 | 1450 | 1460 | 1470 | 1480 | 1490 | 1500 | 1510 | 1520 | 1530 | 1540 | 1550 | 1560 | 1570 | 1580 | 1590 |
| T | 21.0 | 21.9 | 23.0 | 24.2 | 24.8 | 25.7 | 26.9 | 27.9 | 29.0 | 29.8 | 30.8 | 31.7 | 32.5 | 33.8 | 34.9 | 35.7 | 36.6 | 37.4 | 38.5 | 39.3 |
| λnm | 1600 | 1610 | 1620 | 1630 | 1640 | 1650 | 1660 | 1670 | 1680 | 1690 | 1700 | 1710 | 1720 | 1730 | 1740 | 1750 | 1760 | 1770 | 1780 | 1790 |
| T | 40.3 | 41.3 | 42.1 | 43.0 | 43.8 | 44.7 | 45.5 | 46.4 | 47.1 | 48.0 | 48.8 | 49.6 | 50.5 | 51.2 | 52.0 | 52.6 | 53.4 | 54.0 | 54.8 | 55.4 |
| λnm | 1800 | 1810 | 1820 | 1830 | 1840 | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 |
| T | 56.1 | 56.9 | 57.4 | 58.2 | 58.8 | 59.5 | 59.9 | 60.6 | 61.2 | 61.8 | 62.3 | 63.0 | 63.4 | 63.9 | 64.5 | 64.9 | 65.5 | 65.9 | 66.4 | 66.9 |
| λnm | 2000 | 2050 | 2100 | 2150 | 2200 | 2250 | 2300 | 2350 | 2400 | 2450 | 2500 | 2550 | 2600 | 2650 | 2700 | 2750 | 2800 | 2850 | 2900 | 2950 |
| T | 67.3 | 69.6 | 71.5 | 73.2 | 74.4 | 75.8 | 77.1 | 77.7 | 78.3 | 79.0 | 79.7 | 79.8 | 80.0 | 80.4 | 79.9 | 72.1 | 61.8 | 59.2 | 58.7 | 58.4 |
| λnm | 3000 | 3050 | 3100 | 3150 | 3200 | 3250 | 3300 | 3350 | 3400 | 3450 | 3500 | 3550 | 3600 | 3650 | 3700 | 3750 | 3800 | 3850 | 3900 | 3950 |
| T | 58.0 | 57.1 | 55.6 | 53.8 | 51.8 | 49.8 | 48.0 | 46.4 | 45.2 | 44.4 | 44.2 | 44.3 | 44.6 | 44.9 | 45.2 | 45.4 | 45.6 | 45.7 | 45.6 | 45.4 |
| λnm | 4000 | 4050 | 4100 | 4150 | 4200 | 4250 | 4300 | 4350 | 4400 | 4450 | 4500 | 4550 | 4600 | 4650 | 4700 | 4750 | 4800 | 4850 | 4900 | 4950 |
| T | 44.8 | 43.6 | 41.8 | 39.3 | 36.1 | 31.3 | 27.5 | 23.2 | 17.7 | 12.1 | 7.4 | 3.9 | 1.8 | 0.8 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| λnm | 5000 | | | | | | | | | | | | | | | | | | | |
| T | 0.0 | | | | | | | | | | | | | | | | | | | |



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 | 0.3 | 0.1 | 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 |
| T | 0.0 | 0.2 | 0.8 | 2.1 | 5.2 | 11.0 | 20.0 | 30.2 | 40.4 | 50.6 | 59.8 | 67.6 | 73.6 | 77.8 | 80.2 | 80.7 | 79.5 | 77.0 | 73.2 | 68.7 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 63.7 | 59.0 | 54.7 | 51.5 | 50.5 | 49.7 | 49.6 | 52.0 | 54.7 | 54.1 | 57.2 | 61.2 | 65.2 | 69.2 | 72.8 | 76.1 | 78.8 | 81.0 | 82.8 | 84.3 |
| λnm | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 85.4 | 86.2 | 86.6 | 87.1 | 87.4 | 87.8 | 88.0 | 88.2 | 88.3 | 88.5 | 88.6 | 88.7 | 88.9 | 89.0 | 89.0 | 89.1 | 89.2 | 89.3 | 89.3 | 89.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1120 | 1140 | 1160 | 1180 | 1200 | | | | |
| T | 89.5 | 89.6 | 89.6 | 89.7 | 89.7 | 89.8 | 89.9 | 89.9 | 89.9 | 90.0 | 90.1 | 90.2 | 90.2 | 90.3 | 90.4 | 90.4 | | | | |

Refractive Index/Absorption coefficient/Reflection coefficient

| | | | | | | | |
|-----|---------|---------|---------|---------|---------|---------|---------|
| λnm | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| n | 1.538 | 1.530 | 1.525 | 1.523 | 1.521 | 1.520 | 1.519 |
| K | 6.0E-05 | 6.7E-06 | 7.6E-06 | 1.1E-05 | 2.0E-06 | 1.1E-06 | 9.7E-07 |
| P | 0.914 | 0.916 | 0.917 | 0.918 | 0.918 | 0.918 | 0.919 |

Classes of Bubbles and Inclusions

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

Color Specification

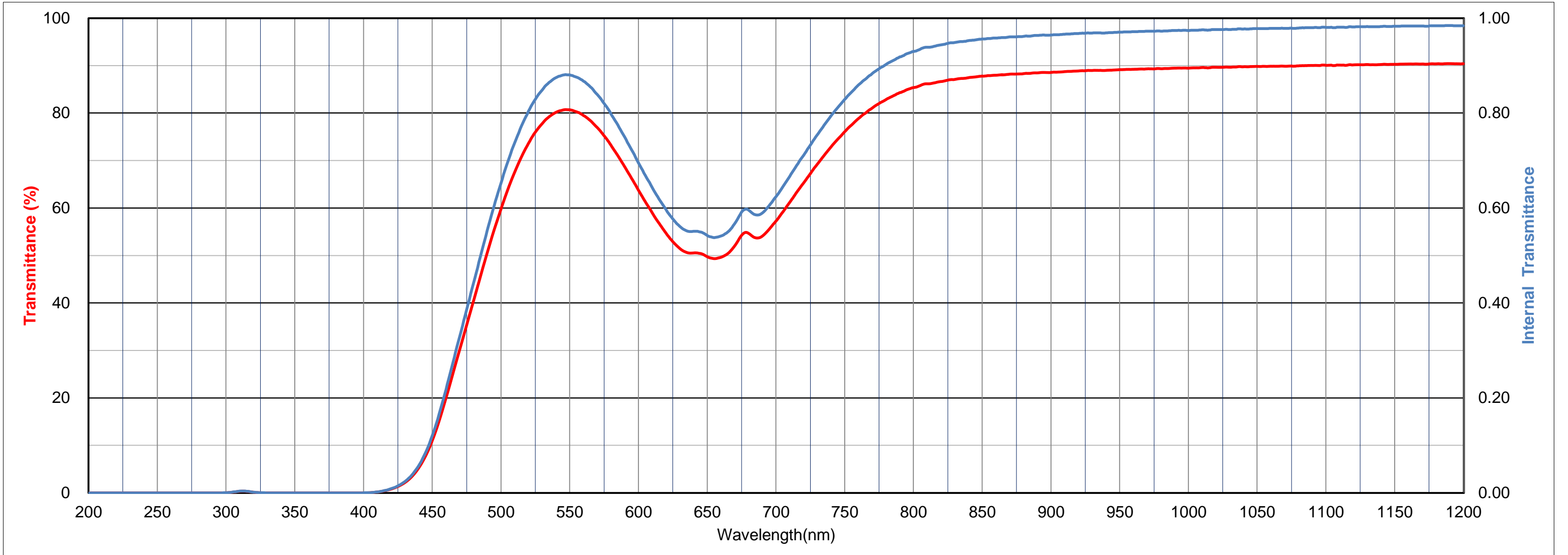
| | | | | | |
|-----|-------|-------|----|----------------|----------------|
| | x | y | Y | λ _d | P _e |
| A | 0.463 | 0.477 | 69 | 574 | 59 |
| C | 0.372 | 0.475 | 70 | 566 | 59 |
| D65 | 0.370 | 0.483 | 70 | 565 | 59 |

Properties

| Chemical | | Thermal | | | | Mechanical | | Others |
|----------------|----------------|----------------|----------------|---------------------|----------------------|----------------|----------------|--------|
| D _w | D _A | T _g | T _s | α _{-30/70} | α _{100/300} | H _K | F _A | d |
| 4 | 1 | 545 | 590 | 90 | 104 | 560 | 130 | 2.58 |

Tolerance of Transmittance (T)

| Maximum Transmittance | Less than 1% Wavelength at Short wave Side | Less than 5% Wavelength at Long wave Side |
|-----------------------|--|---|
| Tmax(%) | λs1(nm) | λl5(nm) |
| 82±3 | >400 | - |





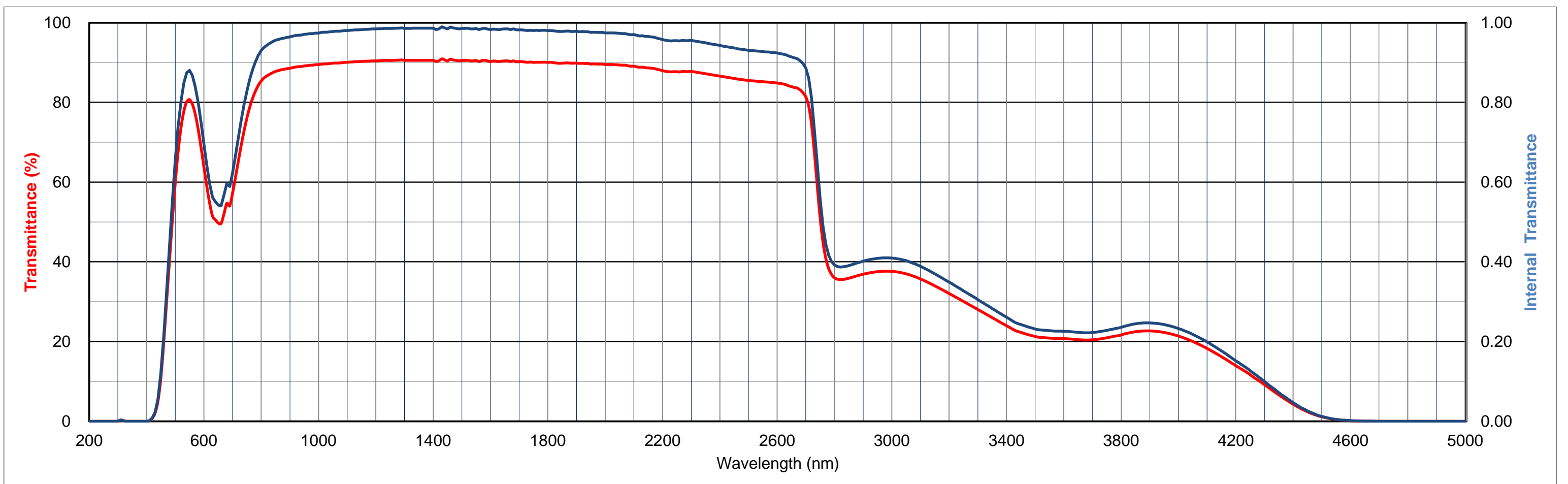
HOYA CANDEO OPTRONICS CORPORATION

Thickness 2.50 mm

G550

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 | 0.3 | 0.1 | 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 |
| T | 0.0 | 0.2 | 0.8 | 2.1 | 5.2 | 11.0 | 20.0 | 30.2 | 40.4 | 50.6 | 59.8 | 67.6 | 73.6 | 77.8 | 80.2 | 80.7 | 79.5 | 77.0 | 73.2 | 68.7 |
| λnm | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | 740 | 750 | 760 | 770 | 780 | 790 |
| T | 63.7 | 59.0 | 54.7 | 51.5 | 50.5 | 49.7 | 49.6 | 52.0 | 54.7 | 54.1 | 57.2 | 61.2 | 65.2 | 69.2 | 72.8 | 76.1 | 78.8 | 81.0 | 82.8 | 84.3 |
| λnm | 800 | 810 | 820 | 830 | 840 | 850 | 860 | 870 | 880 | 890 | 900 | 910 | 920 | 930 | 940 | 950 | 960 | 970 | 980 | 990 |
| T | 85.4 | 86.2 | 86.6 | 87.1 | 87.4 | 87.8 | 88.0 | 88.2 | 88.3 | 88.5 | 88.6 | 88.7 | 88.9 | 89.0 | 89.0 | 89.1 | 89.2 | 89.3 | 89.3 | 89.5 |
| λnm | 1000 | 1010 | 1020 | 1030 | 1040 | 1050 | 1060 | 1070 | 1080 | 1090 | 1100 | 1110 | 1120 | 1130 | 1140 | 1150 | 1160 | 1170 | 1180 | 1190 |
| T | 89.5 | 89.6 | 89.6 | 89.7 | 89.7 | 89.8 | 89.9 | 89.9 | 89.9 | 90.0 | 90.1 | 90.1 | 90.2 | 90.2 | 90.2 | 90.3 | 90.3 | 90.3 | 90.4 | 90.4 |
| λnm | 1200 | 1210 | 1220 | 1230 | 1240 | 1250 | 1260 | 1270 | 1280 | 1290 | 1300 | 1310 | 1320 | 1330 | 1340 | 1350 | 1360 | 1370 | 1380 | 1390 |
| T | 90.4 | 90.5 | 90.5 | 90.5 | 90.5 | 90.5 | 90.5 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 | 90.6 |
| λnm | 1400 | 1410 | 1420 | 1430 | 1440 | 1450 | 1460 | 1470 | 1480 | 1490 | 1500 | 1510 | 1520 | 1530 | 1540 | 1550 | 1560 | 1570 | 1580 | 1590 |
| T | 90.6 | 90.3 | 90.4 | 90.9 | 90.7 | 90.4 | 90.9 | 90.6 | 90.5 | 90.4 | 90.5 | 90.5 | 90.6 | 90.4 | 90.4 | 90.5 | 90.3 | 90.5 | 90.6 | 90.4 |
| λnm | 1600 | 1610 | 1620 | 1630 | 1640 | 1650 | 1660 | 1670 | 1680 | 1690 | 1700 | 1710 | 1720 | 1730 | 1740 | 1750 | 1760 | 1770 | 1780 | 1790 |
| T | 90.3 | 90.4 | 90.3 | 90.2 | 90.3 | 90.4 | 90.4 | 90.3 | 90.4 | 90.2 | 90.2 | 90.2 | 90.1 | 90.1 | 90.1 | 90.0 | 90.1 | 90.1 | 90.1 | 90.1 |
| λnm | 1800 | 1810 | 1820 | 1830 | 1840 | 1850 | 1860 | 1870 | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 |
| T | 90.0 | 90.1 | 90.0 | 89.9 | 89.8 | 89.8 | 89.9 | 89.9 | 89.8 | 89.8 | 89.9 | 89.8 | 89.8 | 89.8 | 89.8 | 89.6 | 89.7 | 89.6 | 89.6 | 89.6 |
| λnm | 2000 | 2050 | 2100 | 2150 | 2200 | 2250 | 2300 | 2350 | 2400 | 2450 | 2500 | 2550 | 2600 | 2650 | 2700 | 2750 | 2800 | 2850 | 2900 | 2950 |
| T | 89.5 | 89.4 | 89.1 | 88.7 | 88.0 | 87.7 | 87.8 | 87.2 | 86.6 | 86.0 | 85.5 | 85.2 | 84.9 | 84.0 | 81.4 | 51.0 | 36.0 | 35.9 | 36.9 | 37.5 |
| λnm | 3000 | 3050 | 3100 | 3150 | 3200 | 3250 | 3300 | 3350 | 3400 | 3450 | 3500 | 3550 | 3600 | 3650 | 3700 | 3750 | 3800 | 3850 | 3900 | 3950 |
| T | 37.6 | 37.0 | 35.7 | 34.0 | 32.1 | 30.1 | 28.0 | 26.0 | 24.0 | 22.3 | 21.3 | 20.9 | 20.7 | 20.5 | 20.4 | 21.0 | 21.7 | 22.5 | 22.7 | 22.3 |
| λnm | 4000 | 4050 | 4100 | 4150 | 4200 | 4250 | 4300 | 4350 | 4400 | 4450 | 4500 | 4550 | 4600 | 4650 | 4700 | 4750 | 4800 | 4850 | 4900 | 4950 |
| T | 21.4 | 20.0 | 18.3 | 16.2 | 14.0 | 11.7 | 9.2 | 6.6 | 4.3 | 2.4 | 1.1 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| λnm | 5000 | | | | | | | | | | | | | | | | | | | |
| T | 0.0 | | | | | | | | | | | | | | | | | | | |



All data is mean values of various melts.

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