

COLOR FILTER GLASS

HEBO-SERIES

Ultraviolet

Yellow

Orange

Red

Infrared

Blue

Green

Violet

Neutral Density

Heat Absorbing

Rising Color

Wavelength Calibrated

Color Filter Glass Types

| | | | |
|----------------------------------|---------------|----------|---------|
| ULTRAVIOLET Page 6/7 | HEBO | Schott | Hoya |
| | UV 280 | ≈ WG 280 | ≈ UV-28 |
| | UV 360 | ≈ WG 360 | ≈ UV-36 |
| ULTRAVIOLET Page 8/9 | HEBO | Schott | Hoya |
| | HU 01 | ≈ UG 11 | ≈ U-340 |
| | HU 02 | ≈ UG 1 | ≈ U-360 |
| | HU 03 | ≈ UG 5 | ≈ U-330 |
| ULTRAVIOLET Page 10/11 | HEBO | Schott | Hoya |
| | HY 01 | ≈ GG 19 | |
| | HY 02 | ≈ GG 10 | |
| YELLOW Page 14/15 | HEBO | Schott | Hoya |
| | Y 460 | ≈ GG 455 | ≈ Y-46 |
| | Y 500 | ≈ GG 495 | ≈ Y-50 |
| | Y 510 | ≈ OG 515 | |
| YELLOW Page 16/17 | HEBO | Schott | Hoya |
| | O 530 | ≈ OG 530 | |
| | O 540 | | ≈ O-54 |
| | O 550 | ≈ OG 550 | |
| | O 565 | ≈ OG 570 | |
| | O 580 | | ≈ O-58 |
| RED Page 18/19 | HEBO | Schott | Hoya |
| | R 600 | | ≈ R-60 |
| | R 610 | ≈ RG 610 | |
| | R 630 | ≈ RG 630 | |
| | R 640 | ≈ RG 645 | ≈ R-64 |
| RED Page 20/21 | HEBO | Schott | Hoya |
| | R 650 | | |
| | R 670 | ≈ RG 665 | |
| | R 700 | ≈ RG 695 | ≈ R-70 |
| | R 720 | ≈ RG 715 | ≈ R-72 |
| INFRARED Page 22/23 | HEBO | Schott | Hoya |
| | IR 760 | | ≈ IR-76 |
| | IR 780 | ≈ RG 780 | |
| | IR 800 | | ≈ IR-80 |
| | IR 830 | ≈ RG 830 | ≈ IR-83 |
| | IR 850 | ≈ RG 850 | ≈ IR-85 |
| INFRARED Page 24/25 | HEBO | Schott | Hoya |
| | HR 01 | | ≈ RM-86 |
| | HR 02 | ≈ RG 7 | ≈ RM-90 |
| | HR 03 | | |
| | | | |
| BLUE Page 26/27 | HEBO | Schott | Hoya |
| | B 01 | | |
| | B 02 | | ≈ B-410 |
| | B 03 | | |
| | B 05 | | ≈ B-440 |
| BLUE Page 28/29 | HEBO | Schott | Hoya |
| | B 09 | | |
| | B 10 | | |
| | B 11 | | ≈ B-460 |
| | B 13 | | |
| | B 14 | ≈ BG 14 | |
| BLUE Page 30/31 | HEBO | Schott | Hoya |
| | B 15 | | |
| | B 38 | ≈ BG 38 | |
| | B 39 | ≈ BG 39 | |
| | B 40 | ≈ BG 40 | |
| BLUE Page 32/33 | HEBO | Schott | Hoya |
| | B 07 | ≈ BG 7 | ≈ B-480 |
| | B 12 | ≈ BG 12 | |
| | B 18 | ≈ BG 18 | |
| | B 25 | ≈ BG 25 | ≈ B-380 |
| GREEN Page 34/35 | HEBO | Schott | Hoya |
| | G 05 | ≈ VG 5 | |
| | G 06 | ≈ VG 6 | |
| | G 13 | | ≈ G-545 |
| | G 16 | | |
| GREEN Page 36/37 | HEBO | Schott | Hoya |
| | G 08 | ≈ VG 8 | ≈ G-533 |
| | G 09 | ≈ VG 9 | |
| | G 10 | ≈ VG 10 | |
| | G 11 | ≈ VG 11 | |
| | G 12 | | ≈ G-550 |

| | | | |
|-----------------------------|-------------|--------|---------|
| VIOLET Page 38/39 | HEBO | Schott | Hoya |
| | V 01 | | ≈ B-390 |
| | V 02 | ≈ BG 3 | |
| | V 03 | | ≈ B-370 |

| | | | |
|--------------------------------------|--------------|--------|---------|
| NEUTRAL DENSITY Page 40/41 | HEBO | Schott | |
| | NF 01 | | ≈ NG 1 |
| | NF 04 | | ≈ NG 4 |
| | NF 05 | | ≈ NG 5 |
| | NF 11 | | ≈ NG 11 |

| | | | |
|-------------------------------------|--------------|--------|---------|
| HEAT ABSORBING Page 42/43 | HEBO | Schott | Hoya |
| | HA 02 | | |
| | HA 03 | ≈ KG 3 | ≈ HA-30 |

| | | | |
|---|--------------|---------|--------|
| RISING COLOR / WAVELENGTH CALIBRATED Page 44/45 | HEBO | Schott | Hoya |
| | RC 01 | | |
| | WL 01 | ≈ BG 20 | ≈ V-10 |

Explanation as to data tables

| | |
|---------------------------|---|
| Y | Tristimulus value |
| A(2856K) | CIE standard illuminant A, Planckian radiator at 2,855.6 K, light from incandescent bulbs |
| D65 | CIE standard illuminant D65, standard daylight |
| x, y | Chromaticity coordinates |
| D_A | Acid durability |
| D_w | Water durability |
| n | Refractive index (He 587.6 nm) |
| α | Mean coefficient of linear thermal expansion |
| T_g (°C) | Transformation temperature |
| T_s (°C) | Sag temperature |
| ρ | Specific gravity (g/cm ³) |
| v | Conversion value |
| (mired) | Micro reciprocal degree |
| λ_t 50% | Edge position (t = 50 %) |
| λ_p | Limit of the passband |
| T_p | Filter factor |
| Homogeneity | Deviance of refractive index acc. to DIN ISO 10110-4 : 2000-02 |
| Striae | Density of striae acc. to DIN ISO 10110-4 : 2000-02 |
| Bubbles | Classification of bubble content from grade 0 to grade 4 |

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All indications and values in this catalogue are standard values.

ALL DATA WITHOUT OBLIGATION.

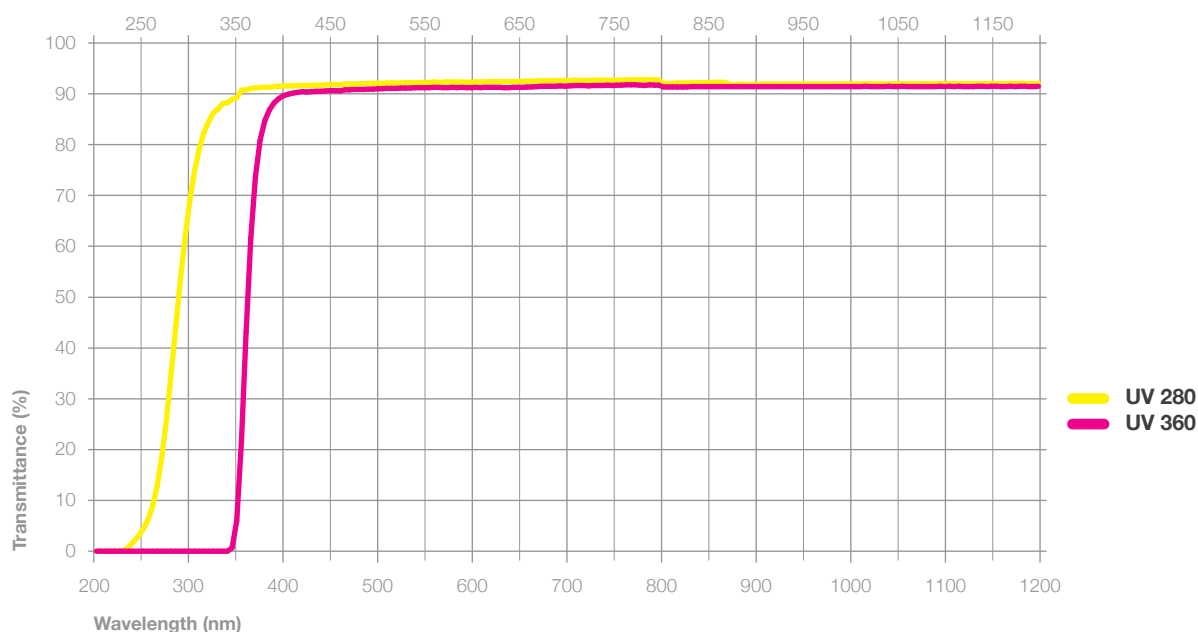
Glass Types

| ULTRAVIOLET | HEBO | Schott | Hoya |
|-------------|--------|----------|---------|
| | UV 280 | ≈ WG 280 | ≈ UV-28 |
| | UV 360 | ≈ WG 360 | ≈ UV-36 |

Ultraviolet Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| UV 280 | 2 mm | 1,512 | 2,52 | 586 | 656 | 81 | 1 | 4 | 2 | 1 | 2 |
| UV 360 | 2 mm | 1,643 | 3,72 | 487 | 546 | 98 | 5 | 4 | 3 | 0 | 1 |

| Type | Thickness | λ _t 50% (nm) | λ _p (nm) | Tλ _p (%) | T _k (nm/°C) |
|--------|-----------|-------------------------|---------------------|---------------------|------------------------|
| UV 280 | 2 mm | 280 ± 9 | 350 | ≥ 89,5 | 0,02 |
| UV 360 | 2 mm | 360 ± 9 | 440 | ≥ 87,0 | 0,08 |



| | UV 280 | UV 360 |
|-----------------|--------|--------------------|
| Thickness (mm) | 2 | 2 |
| Wavelength (nm) | %T | %T |
| 200 | 0,004 | 0,010 |
| 210 | 0,001 | 0,008 |
| 220 | 0,015 | 0,012 |
| 230 | 0,884 | 0,017 |
| 240 | 3,004 | 0,016 |
| 250 | 6,109 | 0,017 |
| 260 | 12,824 | 0,016 |
| 270 | 25,951 | 0,018 |
| 280 | 44,349 | 0,016 |
| 290 | 61,930 | 0,009 |
| 300 | 74,821 | 0,003 |
| 310 | 82,444 | 4·10 ⁻⁴ |
| 320 | 86,277 | 2·10 ⁻⁴ |
| 330 | 88,128 | 6·10 ⁻⁵ |
| 340 | 88,975 | 0,633 |
| 350 | 90,699 | 21,640 |
| 360 | 91,045 | 61,663 |
| 370 | 91,257 | 80,901 |
| 380 | 91,307 | 86,878 |
| 390 | 91,498 | 89,086 |
| 400 | 91,534 | 89,952 |
| 410 | 91,625 | 90,319 |
| 420 | 91,623 | 90,372 |
| 430 | 91,694 | 90,509 |
| 440 | 91,762 | 90,563 |
| 450 | 91,832 | 90,654 |
| 460 | 91,906 | 90,760 |
| 470 | 91,927 | 90,835 |
| 480 | 91,968 | 90,867 |
| 490 | 92,042 | 90,956 |
| 500 | 92,095 | 91,009 |
| 510 | 92,122 | 91,058 |
| 520 | 92,152 | 91,128 |
| 530 | 92,196 | 91,173 |
| 540 | 92,223 | 91,192 |
| 550 | 92,202 | 91,186 |
| 560 | 92,281 | 91,259 |
| 570 | 92,369 | 91,234 |
| 580 | 92,302 | 91,230 |
| 590 | 92,264 | 91,202 |
| 600 | 92,378 | 91,263 |
| 610 | 92,375 | 91,253 |
| 620 | 92,393 | 91,249 |
| 630 | 92,425 | 91,235 |
| 640 | 92,449 | 91,252 |
| 650 | 92,470 | 91,310 |
| 660 | 92,500 | 91,353 |
| 670 | 92,579 | 91,460 |
| 680 | 92,563 | 91,460 |
| 690 | 92,590 | 91,570 |

| | UV 280 | UV 360 |
|-----------------|--------|--------|
| Thickness (mm) | 2 | 2 |
| Wavelength (nm) | %T | %T |
| 700 | 92,661 | 91,564 |
| 710 | 92,649 | 91,624 |
| 720 | 92,623 | 91,585 |
| 730 | 92,715 | 91,666 |
| 740 | 92,671 | 91,690 |
| 750 | 92,680 | 91,687 |
| 760 | 92,733 | 91,747 |
| 770 | 92,756 | 91,798 |
| 780 | 92,679 | 91,650 |
| 790 | 92,774 | 91,706 |
| 800 | 92,053 | 91,340 |
| 810 | 92,056 | 91,358 |
| 820 | 92,104 | 91,376 |
| 830 | 92,144 | 91,391 |
| 840 | 92,204 | 91,429 |
| 850 | 92,199 | 91,408 |
| 900 | 91,875 | 91,449 |
| 950 | 91,935 | 91,437 |
| 1000 | 91,945 | 91,426 |
| 1050 | 91,974 | 91,452 |
| 1065 | 91,955 | 91,437 |
| 1100 | 91,986 | 91,440 |
| 1200 | 92,029 | 91,467 |
| 1300 | 92,073 | 91,483 |
| 1400 | 91,914 | 91,374 |
| 1500 | 92,086 | 91,466 |
| 1600 | 92,117 | 91,422 |
| 1700 | 92,060 | 91,156 |
| 1800 | 92,011 | 90,719 |
| 1900 | 91,941 | 90,240 |
| 2000 | 91,732 | 89,509 |
| 2100 | 91,312 | 88,698 |
| 2200 | 90,831 | 87,207 |
| 2300 | 90,717 | 86,478 |
| 2400 | 90,200 | 85,294 |
| 2500 | 89,287 | 83,853 |
| 2600 | 88,600 | 82,317 |
| 2700 | 84,891 | 78,142 |
| 2800 | 53,450 | 40,665 |
| 2900 | 57,657 | 37,584 |
| 3000 | 58,741 | 34,051 |

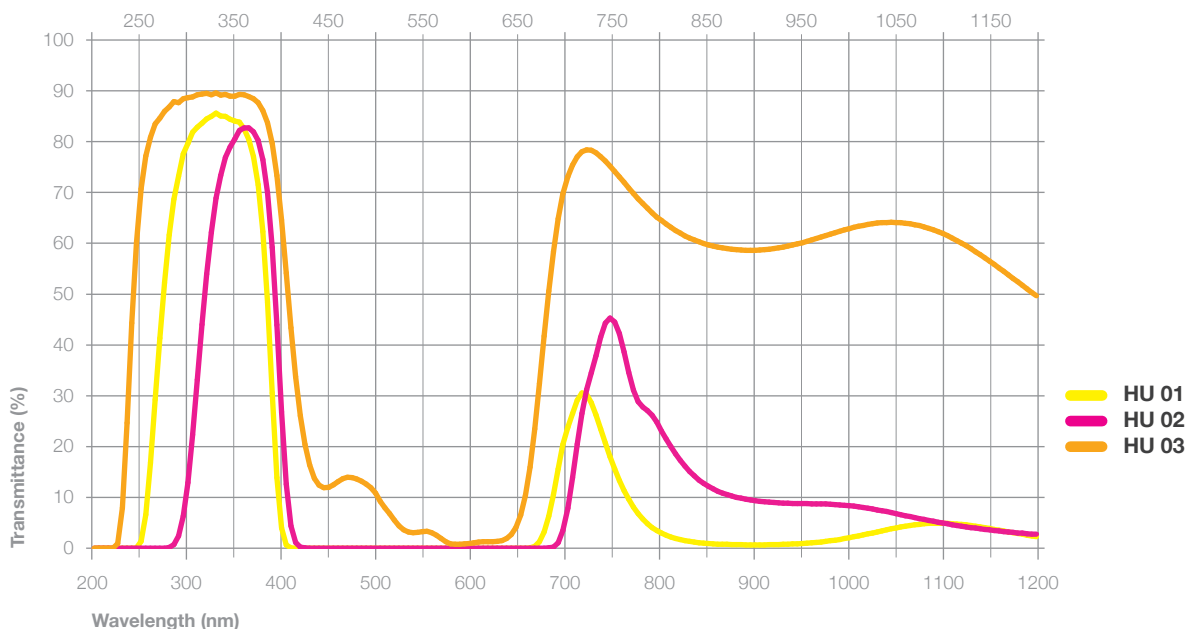
Glass Types

| ULTRAVIOLET | HEBO | Schott | Hoya |
|-------------|-------|---------|---------|
| | HU 01 | ≈ UG 11 | ≈ U-340 |
| | HU 02 | ≈ UG 1 | ≈ U-360 |
| | HU 03 | ≈ UG 5 | ≈ U-330 |

Ultraviolet Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| HU 01 | 1 mm | 1,56 | 2,87 | 529 | 588 | 94 | 4 | 4 | 3 | 0 | 1 |
| HU 02 | 1 mm | 1,520 | 2,65 | 515 | 589 | 97 | 2 | 2 | 3 | 0 | 1 |
| HU 03 | 1 mm | 1,526 | 2,63 | 527 | 616 | 85 | 2 | 3 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| HU 01 | 1 mm | 0,734 | 0,266 | 0,1 | 0,726 | 0,262 | 0,0 |
| HU 02 | 1 mm | 0,532 | 0,171 | 0,9 | 0,231 | 0,032 | 0,4 |
| HU 03 | 1 mm | 0,711 | 0,256 | 0,3 | 0,538 | 0,176 | 0,1 |



| | HU 01 | HU 02 | HU 03 |
|-----------------|--------------------|--------------------|--------------------|
| Thickness (mm) | 1 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T |
| 200 | 5·10 ⁻⁴ | 2·10 ⁻⁴ | 9·10 ⁻⁴ |
| 210 | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁴ |
| 220 | 0,001 | 0,001 | 0,904 |
| 230 | 5·10 ⁻⁴ | 3·10 ⁻⁴ | 24,641 |
| 240 | 0,091 | 6·10 ⁻⁴ | 60,009 |
| 250 | 6,595 | 1·10 ⁻⁴ | 77,202 |
| 260 | 29,262 | 9·10 ⁻⁵ | 83,498 |
| 270 | 52,219 | 0,019 | 85,944 |
| 280 | 68,677 | 0,721 | 87,866 |
| 290 | 77,570 | 6,296 | 88,471 |
| 300 | 81,857 | 22,330 | 88,803 |
| 310 | 83,649 | 43,984 | 89,334 |
| 320 | 84,948 | 62,140 | 89,206 |
| 330 | 85,031 | 73,323 | 89,161 |
| 340 | 84,428 | 78,926 | 88,940 |
| 350 | 83,861 | 82,212 | 89,277 |
| 360 | 80,415 | 82,729 | 88,859 |
| 370 | 71,502 | 80,208 | 87,664 |
| 380 | 48,377 | 69,920 | 83,689 |
| 390 | 13,862 | 43,951 | 73,366 |
| 400 | 0,624 | 12,582 | 54,179 |
| 410 | 0,001 | 1,150 | 33,744 |
| 420 | 4·10 ⁻⁴ | 0,044 | 20,391 |
| 430 | 5·10 ⁻⁵ | 0,001 | 13,747 |
| 440 | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 11,872 |
| 450 | 6·10 ⁻⁴ | 0,001 | 12,445 |
| 460 | 1·10 ⁻⁴ | 8·10 ⁻⁴ | 13,674 |
| 470 | 2·10 ⁻⁴ | 3·10 ⁻⁴ | 13,890 |
| 480 | 3·10 ⁻⁴ | 5·10 ⁻⁵ | 13,208 |
| 490 | 2·10 ⁻⁴ | 7·10 ⁻⁴ | 11,917 |
| 500 | 2·10 ⁻⁴ | 8·10 ⁻⁵ | 9,247 |
| 510 | 6·10 ⁻⁵ | 2·10 ⁻⁴ | 6,791 |
| 520 | 6·10 ⁻⁴ | 4·10 ⁻⁴ | 4,370 |
| 530 | 3·10 ⁻⁴ | 6·10 ⁻⁴ | 3,174 |
| 540 | 6·10 ⁻⁴ | 6·10 ⁻⁵ | 3,100 |
| 550 | 3·10 ⁻⁴ | 5·10 ⁻⁴ | 3,333 |
| 560 | 6·10 ⁻⁴ | 2·10 ⁻⁴ | 2,552 |
| 570 | 2·10 ⁻⁴ | 6·10 ⁻⁴ | 1,249 |
| 580 | 1·10 ⁻⁴ | 7·10 ⁻⁴ | 0,777 |
| 590 | 2·10 ⁻⁴ | 1·10 ⁻⁴ | 0,827 |
| 600 | 2·10 ⁻⁴ | 4·10 ⁻⁴ | 1,044 |
| 610 | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 1,253 |
| 620 | 8·10 ⁻⁴ | 2·10 ⁻⁴ | 1,262 |
| 630 | 2·10 ⁻⁴ | 3·10 ⁻⁵ | 1,499 |
| 640 | 5·10 ⁻⁴ | 0,001 | 2,716 |
| 650 | 0,003 | 4·10 ⁻⁴ | 6,536 |
| 660 | 0,092 | 4·10 ⁻⁵ | 15,974 |
| 670 | 1,279 | 0,001 | 32,367 |
| 680 | 6,314 | 0,036 | 50,592 |
| 690 | 15,619 | 1,086 | 64,814 |

| | HU 01 | HU 02 | HU 03 |
|-----------------|--------|--------|--------|
| Thickness (mm) | 1 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T |
| 700 | 23,807 | 7,843 | 73,122 |
| 710 | 29,133 | 20,503 | 77,040 |
| 720 | 30,281 | 31,162 | 78,398 |
| 730 | 26,243 | 37,877 | 77,786 |
| 740 | 20,677 | 44,299 | 76,213 |
| 750 | 15,571 | 44,520 | 74,148 |
| 760 | 11,362 | 38,618 | 71,973 |
| 770 | 8,095 | 31,085 | 69,839 |
| 780 | 5,722 | 27,794 | 67,803 |
| 790 | 4,071 | 26,166 | 65,983 |
| 800 | 2,941 | 23,043 | 64,510 |
| 810 | 2,193 | 20,012 | 63,147 |
| 820 | 1,678 | 17,306 | 61,984 |
| 830 | 1,345 | 15,126 | 61,039 |
| 840 | 1,084 | 13,427 | 60,288 |
| 850 | 0,936 | 12,173 | 59,709 |
| 900 | 0,652 | 9,344 | 58,630 |
| 950 | 0,918 | 8,789 | 60,127 |
| 1000 | 2,047 | 8,383 | 62,855 |
| 1050 | 3,988 | 6,821 | 64,103 |
| 1065 | 4,459 | 6,214 | 63,848 |
| 1100 | 4,913 | 4,953 | 61,915 |
| 1200 | 2,295 | 2,731 | 49,684 |
| 1300 | 0,861 | 2,647 | 40,732 |
| 1400 | 0,763 | 3,324 | 41,087 |
| 1500 | 0,704 | 2,372 | 39,723 |
| 1600 | 0,808 | 2,971 | 40,501 |
| 1700 | 1,002 | 2,356 | 42,704 |
| 1800 | 0,985 | 1,805 | 43,374 |
| 1900 | 1,078 | 2,227 | 46,075 |
| 2000 | 1,500 | 3,000 | 50,370 |
| 2100 | 2,309 | 3,995 | 54,257 |
| 2200 | 3,568 | 5,573 | 57,101 |
| 2300 | 5,115 | 7,770 | 59,535 |
| 2400 | 6,745 | 10,068 | 61,680 |
| 2500 | 8,027 | 12,011 | 62,635 |
| 2600 | 8,662 | 13,668 | 62,083 |
| 2700 | 9,111 | 15,121 | 61,339 |
| 2800 | 5,906 | 12,238 | 44,154 |
| 2900 | 2,168 | 12,933 | 26,415 |
| 3000 | 1,046 | 14,560 | 19,440 |

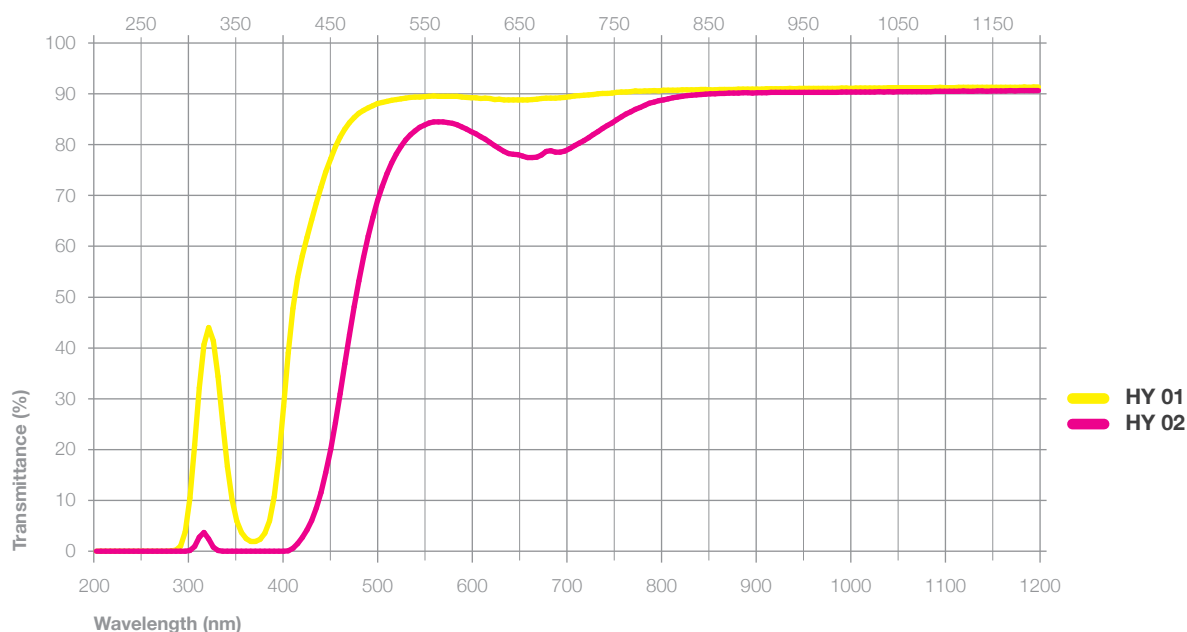
Glass Types

| | | | |
|-------------|--------------|---------|------|
| ULTRAVIOLET | HEBO | Schott | Hoya |
| | HY 01 | ≈ GG 19 | |
| | HY 02 | ≈ GG 10 | |

Ultraviolet Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| HY 01 | 1 mm | 1,54 | 2,78 | 549 | 619 | 107 | 4 | 3 | 3 | 0 | 1 |
| HY 02 | 1 mm | 1,526 | 2,76 | 594 | 667 | 111 | 4 | 3 | 2 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|--------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| HY 01 | 1 mm | 0,459 | 0,423 | 89,0 | 0,331 | 0,366 | 89,0 |
| HY 02 | 1 mm | 0,473 | 0,453 | 82,0 | 0,366 | 0,438 | 81,0 |



| | HY 01 | HY 02 |
|-----------------|--------------------|--------------------|
| Thickness (mm) | 1 | 1 |
| Wavelength (nm) | %T | %T |
| 200 | 0,001 | 0,001 |
| 210 | 4·10 ⁻⁵ | 3·10 ⁻⁵ |
| 220 | 0,001 | 5·10 ⁻⁴ |
| 230 | 0,001 | 0,001 |
| 240 | 2·10 ⁻⁴ | 5·10 ⁻⁴ |
| 250 | 0,001 | 6·10 ⁻⁵ |
| 260 | 2·10 ⁻⁴ | 4·10 ⁻⁴ |
| 270 | 0,007 | 9·10 ⁻⁵ |
| 280 | 0,202 | 5·10 ⁻⁴ |
| 290 | 3,800 | 0,003 |
| 300 | 20,822 | 0,935 |
| 310 | 40,687 | 3,665 |
| 320 | 41,410 | 0,804 |
| 330 | 25,256 | 0,010 |
| 340 | 10,165 | 7·10 ⁻⁵ |
| 350 | 3,657 | 4·10 ⁻⁴ |
| 360 | 1,935 | 0,001 |
| 370 | 2,344 | 2·10 ⁻⁴ |
| 380 | 5,986 | 2·10 ⁻⁴ |
| 390 | 18,331 | 6·10 ⁻⁴ |
| 400 | 39,020 | 0,105 |
| 410 | 53,850 | 1,508 |
| 420 | 61,752 | 4,186 |
| 430 | 68,513 | 8,473 |
| 440 | 74,612 | 15,464 |
| 450 | 79,571 | 25,317 |
| 460 | 83,091 | 36,828 |
| 470 | 85,343 | 48,114 |
| 480 | 86,731 | 57,824 |
| 490 | 87,679 | 65,716 |
| 500 | 88,309 | 71,823 |
| 510 | 88,731 | 76,382 |
| 520 | 89,048 | 79,686 |
| 530 | 89,280 | 81,950 |
| 540 | 89,395 | 83,404 |
| 550 | 89,523 | 84,271 |
| 560 | 89,529 | 84,509 |
| 570 | 89,508 | 84,368 |
| 580 | 89,530 | 83,934 |
| 590 | 89,300 | 83,068 |
| 600 | 89,247 | 82,161 |
| 610 | 89,138 | 81,069 |
| 620 | 88,889 | 79,774 |
| 630 | 88,785 | 78,646 |
| 640 | 88,811 | 78,132 |
| 650 | 88,814 | 77,761 |
| 660 | 88,908 | 77,443 |
| 670 | 89,113 | 77,979 |
| 680 | 89,167 | 78,816 |
| 690 | 89,219 | 78,504 |

| | HY 01 | HY 02 |
|-----------------|--------|--------|
| Thickness (mm) | 1 | 1 |
| Wavelength (nm) | %T | %T |
| 700 | 89,443 | 79,233 |
| 710 | 89,652 | 80,278 |
| 720 | 89,788 | 81,358 |
| 730 | 89,972 | 82,591 |
| 740 | 90,105 | 83,776 |
| 750 | 90,270 | 84,922 |
| 760 | 90,386 | 86,004 |
| 770 | 90,547 | 86,944 |
| 780 | 90,592 | 87,739 |
| 790 | 90,637 | 88,396 |
| 800 | 90,719 | 88,814 |
| 810 | 90,730 | 89,214 |
| 820 | 90,754 | 89,517 |
| 830 | 90,784 | 89,731 |
| 840 | 90,823 | 89,862 |
| 850 | 90,817 | 89,980 |
| 900 | 90,953 | 90,242 |
| 950 | 91,078 | 90,321 |
| 1000 | 91,105 | 90,350 |
| 1050 | 91,179 | 90,421 |
| 1065 | 91,189 | 90,397 |
| 1100 | 91,224 | 90,484 |
| 1200 | 91,356 | 90,663 |
| 1300 | 91,387 | 90,762 |
| 1400 | 91,443 | 90,750 |
| 1500 | 91,470 | 90,911 |
| 1600 | 91,482 | 91,009 |
| 1700 | 91,395 | 91,016 |
| 1800 | 91,280 | 90,998 |
| 1900 | 91,148 | 90,977 |
| 2000 | 91,015 | 90,877 |
| 2100 | 90,779 | 90,694 |
| 2200 | 90,287 | 90,212 |
| 2300 | 90,054 | 90,012 |
| 2400 | 89,775 | 89,771 |
| 2500 | 89,285 | 89,252 |
| 2600 | 88,677 | 88,876 |
| 2700 | 87,121 | 87,016 |
| 2800 | 60,767 | 58,274 |
| 2900 | 54,491 | 53,385 |
| 3000 | 50,370 | 49,959 |

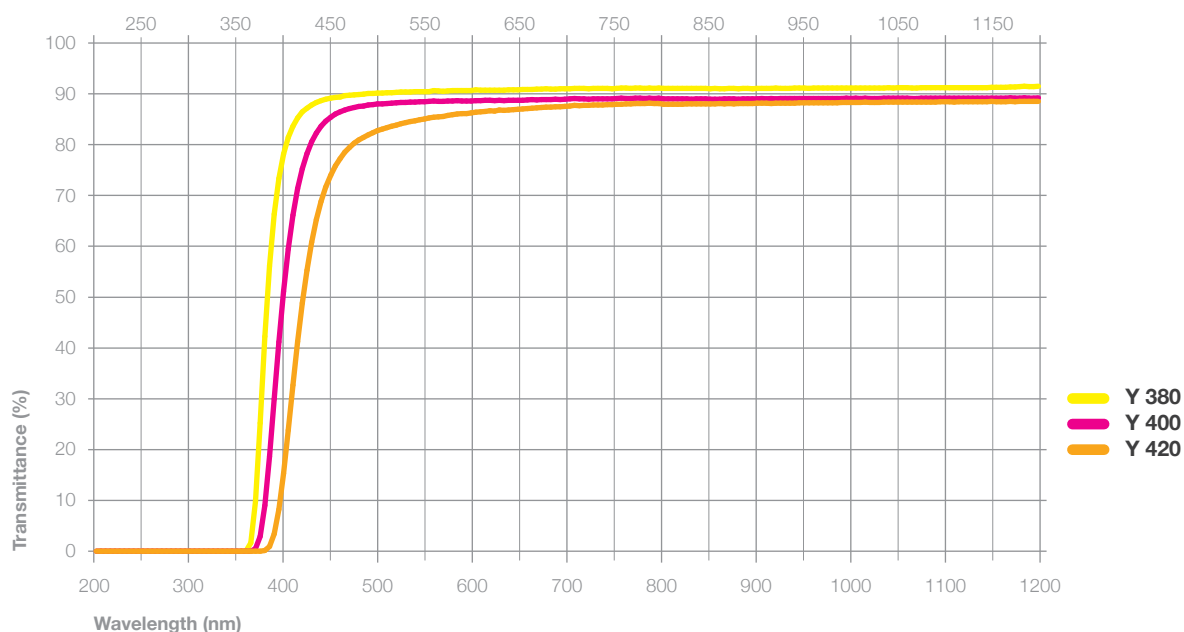
Glass Types

| | | | |
|---------------|--------------|----------|--------|
| YELLOW | HEBO | Schott | Hoya |
| | Y 380 | ≈ GG 375 | ≈ L-38 |
| | Y 400 | ≈ GG 400 | ≈ L-40 |
| | Y 420 | ≈ GG 420 | ≈ L-42 |

Yellow Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| Y 380 | 2 mm | 1,55 | 2,85 | 487 | 546 | 98 | 1 | 2 | 2 | 1 | 1 |
| Y 400 | 2 mm | 1,632 | 3,65 | 497 | 555 | 95 | 1 | 1 | 2 | 1 | 1 |
| Y 420 | 2 mm | 1,632 | 3,69 | 497 | 555 | 95 | 2 | 3 | 2 | 1 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | | λ _t 50% (nm) | λ _p (nm) | T _{λp} (%) | T _k (nm/°C) |
|--------------|-----------|----------|-------|------|-----------------|-------|------|-------------------------|---------------------|---------------------|------------------------|
| | | x | y | Y(%) | x | y | Y(%) | | | | |
| Y 380 | 2 mm | | | | | | | 380 ± 9 | 500 | ≥ 86,0 | 0,06 |
| Y 400 | 2 mm | 0,449 | 0,409 | 89 | 0,314 | 0,332 | 89 | 400 ± 9 | 560 | ≥ 86,0 | 0,07 |
| Y 420 | 2 mm | 0,450 | 0,412 | 89 | 0,317 | 0,340 | 89 | 420 ± 9 | 560 | ≥ 86,0 | 0,07 |



| | Y 380 | Y 400 | Y 420 |
|-----------------|--------------------|--------------------|--------------------|
| Thickness (mm) | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 200 | 8·10 ⁻⁴ | 0,001 | 8·10 ⁻⁴ |
| 210 | 8·10 ⁻⁴ | 4·10 ⁻⁴ | 6·10 ⁻⁴ |
| 220 | 0,002 | 0,001 | 8·10 ⁻⁴ |
| 230 | 0,002 | 0,002 | 9·10 ⁻⁴ |
| 240 | 0,001 | 0,001 | 8·10 ⁻⁴ |
| 250 | 0,001 | 0,001 | 0,001 |
| 260 | 8·10 ⁻⁴ | 4·10 ⁻⁵ | 4·10 ⁻⁴ |
| 270 | 0,001 | 2·10 ⁻⁴ | 0,001 |
| 280 | 5·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 290 | 2·10 ⁻⁴ | 5·10 ⁻⁴ | 5·10 ⁻⁴ |
| 300 | 5·10 ⁻⁴ | 9·10 ⁻⁴ | 5·10 ⁻⁴ |
| 310 | 9·10 ⁻⁴ | 7·10 ⁻⁵ | 0,001 |
| 320 | 7·10 ⁻⁴ | 6·10 ⁻⁵ | 3·10 ⁻⁴ |
| 330 | 2·10 ⁻⁴ | 6·10 ⁻⁵ | 4·10 ⁻⁴ |
| 340 | 4·10 ⁻⁴ | 5·10 ⁻⁴ | 2·10 ⁻⁴ |
| 350 | 8·10 ⁻⁴ | 0,001 | 9·10 ⁻⁴ |
| 360 | 1,647 | 0,025 | 8·10 ⁻⁴ |
| 370 | 25,262 | 2,896 | 0,008 |
| 380 | 56,164 | 18,648 | 0,932 |
| 390 | 73,324 | 41,157 | 8,200 |
| 400 | 81,414 | 59,492 | 23,786 |
| 410 | 85,293 | 71,334 | 41,226 |
| 420 | 87,136 | 78,266 | 55,315 |
| 430 | 88,310 | 82,317 | 65,241 |
| 440 | 88,945 | 84,620 | 71,678 |
| 450 | 89,332 | 86,006 | 75,806 |
| 460 | 89,629 | 86,844 | 78,505 |
| 470 | 89,799 | 87,348 | 80,286 |
| 480 | 89,929 | 87,630 | 81,462 |
| 490 | 90,057 | 87,862 | 82,367 |
| 500 | 90,175 | 88,040 | 83,075 |
| 510 | 90,230 | 88,168 | 83,635 |
| 520 | 90,334 | 88,297 | 84,121 |
| 530 | 90,395 | 88,357 | 84,518 |
| 540 | 90,460 | 88,419 | 84,880 |
| 550 | 90,463 | 88,549 | 85,247 |
| 560 | 90,554 | 88,538 | 85,488 |
| 570 | 90,608 | 88,556 | 85,739 |
| 580 | 90,629 | 88,638 | 86,017 |
| 590 | 90,631 | 88,561 | 86,124 |
| 600 | 90,757 | 88,675 | 86,387 |
| 610 | 90,709 | 88,717 | 86,562 |
| 620 | 90,719 | 88,628 | 86,603 |
| 630 | 90,736 | 88,668 | 86,737 |
| 640 | 90,801 | 88,708 | 86,896 |
| 650 | 90,846 | 88,746 | 87,020 |
| 660 | 90,871 | 88,839 | 87,202 |
| 670 | 90,955 | 88,886 | 87,302 |
| 680 | 90,933 | 88,864 | 87,387 |
| 690 | 90,989 | 88,897 | 87,490 |

| | Y 380 | Y 400 | Y 420 |
|-----------------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 700 | 91,018 | 88,979 | 87,628 |
| 710 | 91,041 | 89,000 | 87,698 |
| 720 | 91,015 | 88,976 | 87,732 |
| 730 | 91,080 | 88,984 | 87,821 |
| 740 | 91,059 | 89,020 | 87,862 |
| 750 | 91,101 | 89,059 | 87,923 |
| 760 | 91,107 | 89,099 | 88,004 |
| 770 | 91,147 | 89,133 | 88,067 |
| 780 | 91,042 | 89,085 | 88,074 |
| 790 | 91,079 | 89,101 | 88,091 |
| 800 | 91,076 | 89,034 | 87,919 |
| 810 | 91,066 | 89,019 | 87,947 |
| 820 | 91,068 | 89,018 | 87,966 |
| 830 | 91,037 | 88,974 | 87,995 |
| 840 | 91,036 | 88,985 | 88,030 |
| 850 | 91,027 | 88,978 | 88,026 |
| 900 | 91,088 | 89,031 | 88,152 |
| 950 | 91,147 | 89,094 | 88,253 |
| 1000 | 91,137 | 89,115 | 88,297 |
| 1050 | 91,208 | 89,123 | 88,359 |
| 1065 | 91,163 | 89,101 | 88,375 |
| 1100 | 91,198 | 89,147 | 88,413 |
| 1200 | 91,482 | 89,195 | 88,522 |
| 1300 | 91,512 | 89,228 | 88,603 |
| 1400 | 91,392 | 89,179 | 88,614 |
| 1500 | 91,514 | 89,200 | 88,662 |
| 1600 | 91,456 | 89,186 | 88,669 |
| 1700 | 91,238 | 88,991 | 88,475 |
| 1800 | 90,874 | 88,656 | 88,150 |
| 1900 | 90,513 | 88,290 | 87,852 |
| 2000 | 89,970 | 87,815 | 87,370 |
| 2100 | 89,127 | 87,310 | 86,790 |
| 2200 | 87,799 | 86,087 | 85,426 |
| 2300 | 87,316 | 85,247 | 84,548 |
| 2400 | 86,113 | 84,624 | 83,816 |
| 2500 | 84,346 | 83,182 | 81,906 |
| 2600 | 81,768 | 81,309 | 78,874 |
| 2700 | 74,549 | 76,248 | 71,279 |
| 2800 | 36,690 | 44,229 | 35,297 |
| 2900 | 34,079 | 37,809 | 28,686 |
| 3000 | 31,213 | 34,116 | 25,421 |

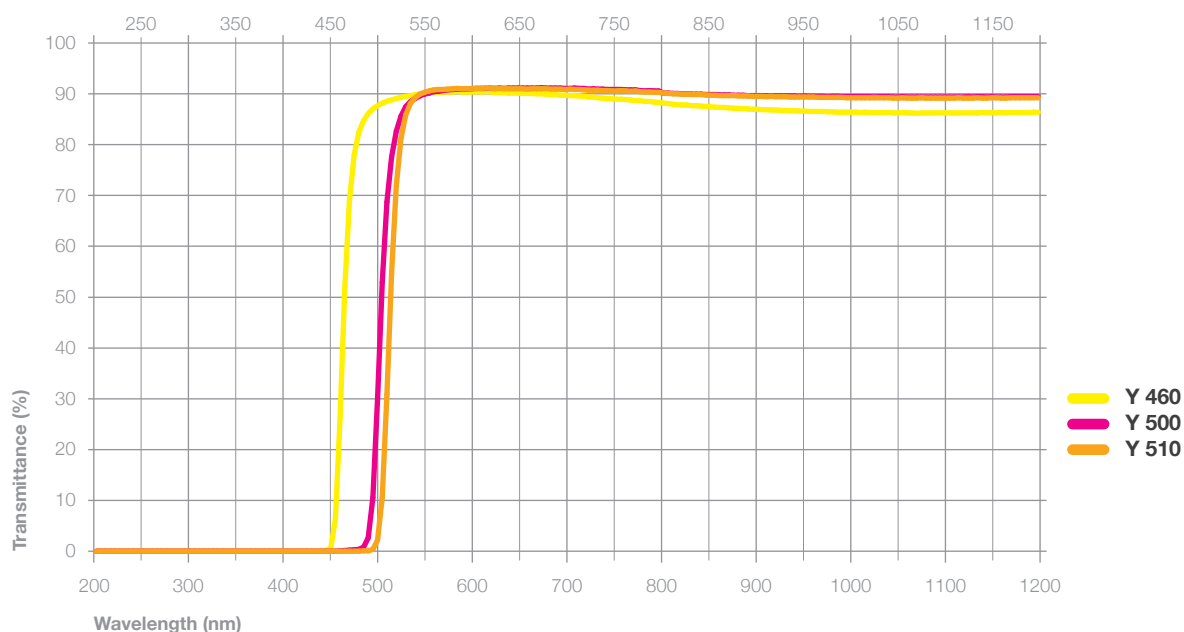
Glass Types

| | | | |
|---------------|--------------|----------|--------|
| YELLOW | HEBO | Schott | Hoya |
| | Y 460 | ≈ GG 455 | ≈ Y-46 |
| | Y 500 | ≈ GG 495 | ≈ Y-50 |
| | Y 510 | ≈ OG 515 | |

Yellow Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| Y 460 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 1 | 3 | 2 | 1 | 1 |
| Y 500 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 1 | 3 | 2 | 1 | 1 |
| Y 510 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 2 | 2 | 2 | 1 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | | λ _t 50% (nm) | λ _p (nm) | T _{λp} (%) | T _k (nm/°C) |
|--------------|-----------|----------|-------|------|-----------------|-------|------|-------------------------|---------------------|---------------------|------------------------|
| | | x | y | Y(%) | x | y | Y(%) | | | | |
| Y 460 | 2 mm | 0,470 | 0,439 | 89 | 0,354 | 0,416 | 88 | 460 ± 9 | 560 | ≥ 89,5 | 0,08 |
| Y 500 | 2 mm | 0,508 | 0,473 | 88 | 0,434 | 0,525 | 85 | 500 ± 9 | 580 | ≥ 89,5 | 0,10 |
| Y 510 | 2 mm | 0,527 | 0,467 | 84 | 0,468 | 0,521 | 78 | 510 ± 9 | 600 | ≥ 89,5 | 0,11 |



| | Y 460 | Y 500 | Y 510 |
|-----------------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 200 | 0,009 | 0,004 | 0,004 |
| 210 | 0,007 | 0,004 | 0,004 |
| 220 | 0,009 | 0,005 | 0,005 |
| 230 | 0,010 | 0,005 | 0,006 |
| 240 | 0,010 | 0,005 | 0,005 |
| 250 | 0,011 | 0,004 | 0,005 |
| 260 | 0,011 | 0,004 | 0,005 |
| 270 | 0,012 | 0,004 | 0,005 |
| 280 | 0,012 | 0,004 | 0,006 |
| 290 | 0,012 | 0,005 | 0,005 |
| 300 | 0,014 | 0,006 | 0,007 |
| 310 | 0,014 | 0,006 | 0,005 |
| 320 | 0,014 | 0,006 | 0,007 |
| 330 | 0,016 | 0,005 | 0,007 |
| 340 | 0,016 | 0,005 | 0,006 |
| 350 | 0,014 | 0,005 | 0,007 |
| 360 | 0,014 | 0,005 | 0,007 |
| 370 | 0,014 | 0,006 | 0,007 |
| 380 | 0,013 | 0,004 | 0,006 |
| 390 | 0,013 | 0,005 | 0,006 |
| 400 | 0,013 | 0,004 | 0,006 |
| 410 | 0,013 | 0,004 | 0,006 |
| 420 | 0,014 | 0,005 | 0,006 |
| 430 | 0,014 | 0,006 | 0,006 |
| 440 | 0,037 | 0,006 | 0,006 |
| 450 | 6,413 | 0,023 | 0,007 |
| 460 | 51,834 | 0,119 | 0,017 |
| 470 | 77,961 | 0,259 | 0,027 |
| 480 | 84,698 | 0,761 | 0,038 |
| 490 | 87,025 | 10,585 | 0,357 |
| 500 | 88,144 | 52,921 | 10,661 |
| 510 | 88,835 | 77,591 | 54,845 |
| 520 | 89,314 | 85,635 | 81,261 |
| 530 | 89,686 | 88,459 | 88,099 |
| 540 | 89,908 | 89,555 | 89,921 |
| 550 | 90,175 | 90,124 | 90,606 |
| 560 | 90,258 | 90,529 | 90,825 |
| 570 | 90,363 | 90,763 | 90,928 |
| 580 | 90,471 | 90,899 | 91,061 |
| 590 | 90,362 | 90,952 | 90,982 |
| 600 | 90,441 | 91,105 | 91,087 |
| 610 | 90,443 | 91,076 | 91,112 |
| 620 | 90,234 | 91,085 | 90,982 |
| 630 | 90,208 | 91,096 | 90,967 |
| 640 | 90,164 | 91,116 | 90,981 |
| 650 | 90,106 | 91,123 | 90,978 |
| 660 | 90,087 | 91,130 | 91,018 |
| 670 | 89,988 | 91,180 | 90,996 |
| 680 | 89,843 | 91,121 | 90,922 |
| 690 | 89,747 | 91,117 | 90,917 |

| | Y 460 | Y 500 | Y 510 |
|-----------------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 700 | 89,656 | 91,083 | 90,907 |
| 710 | 89,587 | 91,047 | 90,878 |
| 720 | 89,358 | 90,962 | 90,721 |
| 730 | 89,261 | 90,941 | 90,724 |
| 740 | 89,092 | 90,868 | 90,648 |
| 750 | 88,966 | 90,825 | 90,596 |
| 760 | 88,872 | 90,809 | 90,556 |
| 770 | 88,689 | 90,770 | 90,539 |
| 780 | 88,549 | 90,597 | 90,394 |
| 790 | 88,407 | 90,600 | 90,322 |
| 800 | 88,132 | 90,149 | 90,136 |
| 810 | 87,956 | 90,079 | 90,037 |
| 820 | 87,835 | 90,037 | 89,968 |
| 830 | 87,682 | 89,950 | 89,879 |
| 840 | 87,571 | 89,927 | 89,838 |
| 850 | 87,433 | 89,838 | 89,715 |
| 900 | 86,969 | 89,679 | 89,532 |
| 950 | 86,629 | 89,550 | 89,397 |
| 1000 | 86,397 | 89,438 | 89,254 |
| 1050 | 86,273 | 89,372 | 89,178 |
| 1065 | 86,251 | 89,381 | 89,177 |
| 1100 | 86,237 | 89,377 | 89,172 |
| 1200 | 86,383 | 89,471 | 89,251 |
| 1300 | 86,726 | 89,635 | 89,408 |
| 1400 | 87,044 | 89,632 | 89,447 |
| 1500 | 87,860 | 90,106 | 89,914 |
| 1600 | 88,518 | 90,352 | 90,204 |
| 1700 | 88,783 | 90,358 | 90,232 |
| 1800 | 88,663 | 90,113 | 90,031 |
| 1900 | 88,343 | 89,775 | 89,696 |
| 2000 | 87,831 | 89,254 | 89,182 |
| 2100 | 87,201 | 88,583 | 88,545 |
| 2200 | 86,031 | 87,259 | 87,261 |
| 2300 | 85,742 | 86,871 | 86,869 |
| 2400 | 85,242 | 86,234 | 86,319 |
| 2500 | 84,027 | 84,910 | 85,059 |
| 2600 | 83,165 | 83,901 | 84,174 |
| 2700 | 78,842 | 79,295 | 79,721 |
| 2800 | 35,098 | 34,869 | 35,733 |
| 2900 | 33,240 | 33,253 | 34,092 |
| 3000 | 31,061 | 31,050 | 32,009 |

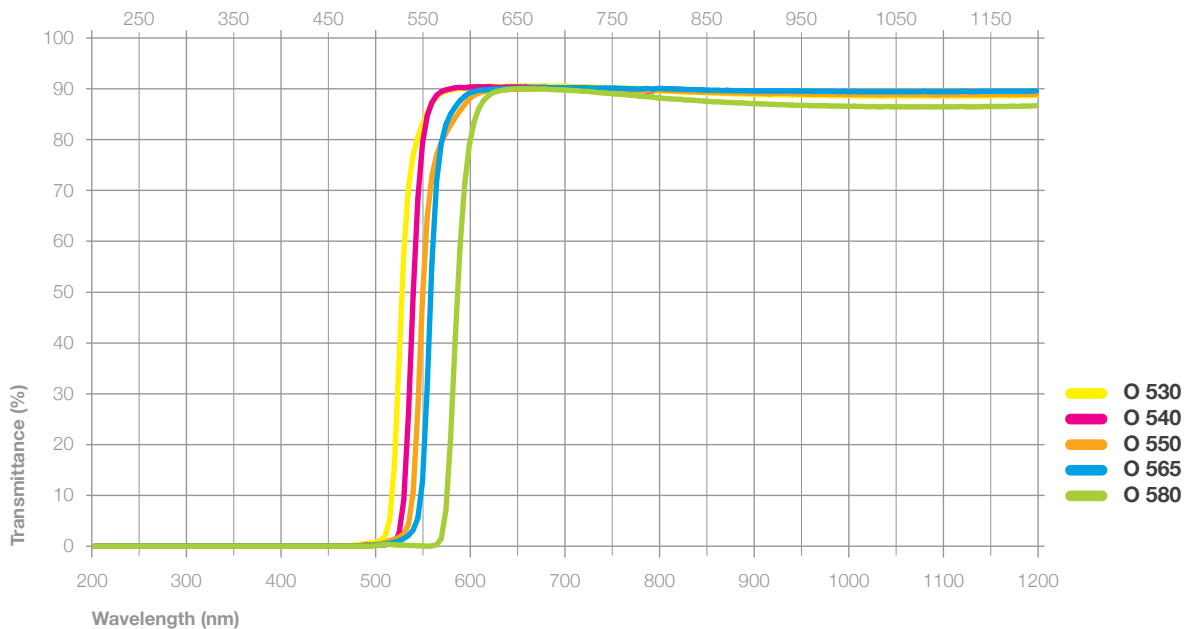
Glass Types

| | | | |
|---------------|--------------|----------|------|
| ORANGE | HEBO | Schott | Hoya |
| | O 530 | ≈ OG 530 | |
| | O 540 | ≈ O-54 | |
| | O 550 | ≈ OG 550 | |
| | O 565 | ≈ OG 570 | |
| | O 580 | ≈ O-58 | |

Orange Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| O 530 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 3 | 2 | 2 | 1 | 1 |
| O 540 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 3 | 2 | 2 | 1 | 1 |
| O 550 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 3 | 2 | 2 | 1 | 1 |
| O 565 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 3 | 2 | 2 | 1 | 1 |
| O 580 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | | λ _t 50% (nm) | λ _p (nm) | Tλ _p (%) | T _k (nm/°C) |
|--------------|-----------|----------|-------|------|-----------------|-------|------|-------------------------|---------------------|---------------------|------------------------|
| | | x | y | Y(%) | x | y | Y(%) | | | | |
| O 530 | 2 mm | 0,549 | 0,448 | 82,2 | 0,504 | 0,492 | 70,2 | 530 ± 9 | 620 | ≥ 88,7 | 0,12 |
| O 540 | 2 mm | 0,572 | 0,427 | 72,9 | 0,537 | 0,461 | 59,3 | 540 ± 9 | 630 | ≥ 88,7 | 0,13 |
| O 550 | 2 mm | 0,594 | 0,405 | 63,6 | 0,569 | 0,430 | 48,4 | 550 ± 9 | 640 | ≥ 88,7 | 0,13 |
| O 565 | 2 mm | 0,622 | 0,377 | 51,6 | 0,605 | 0,395 | 36,7 | 565 ± 9 | 655 | ≥ 88,7 | 0,14 |
| O 580 | 2 mm | 0,658 | 0,342 | 35,9 | 0,649 | 0,351 | 23,3 | 580 ± 9 | 680 | ≥ 88,7 | 0,15 |



| | O 530 | O 540 | O 550 | O 565 | O 580 |
|-----------------|--------|--------|--------------------|--------------------|--------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 200 | 0,003 | 0,004 | 0,002 | 0,001 | 0,001 |
| 210 | 0,003 | 0,003 | 0,002 | 0,002 | 0,001 |
| 220 | 0,002 | 0,002 | 0,001 | 0,002 | 0,001 |
| 230 | 0,003 | 0,003 | 0,001 | 0,002 | 0,002 |
| 240 | 0,003 | 0,003 | 9·10 ⁻⁴ | 0,001 | 0,001 |
| 250 | 0,002 | 0,004 | 0,001 | 0,001 | 0,001 |
| 260 | 0,003 | 0,003 | 0,001 | 0,001 | 0,001 |
| 270 | 0,002 | 0,002 | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ |
| 280 | 0,002 | 0,003 | 6·10 ⁻⁴ | 0,001 | 6·10 ⁻⁴ |
| 290 | 0,001 | 0,003 | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 0,001 |
| 300 | 0,002 | 0,003 | 0,001 | < 10 ⁻⁵ | 0,001 |
| 310 | 0,003 | 0,004 | 0,001 | 4·10 ⁻⁴ | 0,001 |
| 320 | 0,002 | 0,005 | 0,001 | 1·10 ⁻⁴ | 2·10 ⁻⁴ |
| 330 | 0,004 | 0,005 | 0,002 | 0,001 | 0,003 |
| 340 | 0,004 | 0,003 | 0,001 | 0,001 | 0,002 |
| 350 | 0,003 | 0,003 | 1·10 ⁻⁴ | 0,001 | 0,001 |
| 360 | 0,003 | 0,003 | 7·10 ⁻⁴ | 5·10 ⁻⁴ | 0,001 |
| 370 | 0,002 | 0,003 | 8·10 ⁻⁴ | 0,001 | 0,001 |
| 380 | 0,003 | 0,004 | 0,001 | 9·10 ⁻⁴ | 0,001 |
| 390 | 0,002 | 0,003 | 3·10 ⁻⁴ | 7·10 ⁻⁴ | 9·10 ⁻⁴ |
| 400 | 0,002 | 0,003 | 3·10 ⁻⁴ | 1·10 ⁻⁴ | 0,001 |
| 410 | 0,003 | 0,003 | 4·10 ⁻⁴ | 0,001 | 0,001 |
| 420 | 0,004 | 0,004 | 0,002 | 0,002 | 0,002 |
| 430 | 0,003 | 0,003 | 0,001 | 3·10 ⁻⁴ | 0,001 |
| 440 | 0,004 | 0,004 | 0,002 | 0,002 | 0,001 |
| 450 | 0,006 | 0,003 | 0,002 | 0,001 | 0,001 |
| 460 | 0,019 | 0,004 | 0,004 | 0,002 | 0,001 |
| 470 | 0,077 | 0,013 | 0,013 | 0,008 | 0,001 |
| 480 | 0,264 | 0,057 | 0,058 | 0,031 | 0,001 |
| 490 | 0,559 | 0,182 | 0,161 | 0,096 | 0,007 |
| 500 | 0,856 | 0,227 | 0,344 | 0,220 | 0,077 |
| 510 | 2,034 | 0,273 | 0,768 | 0,408 | 0,324 |
| 520 | 15,971 | 0,808 | 1,416 | 0,771 | 0,316 |
| 530 | 57,739 | 9,165 | 2,426 | 1,509 | 0,184 |
| 540 | 77,057 | 49,486 | 10,598 | 3,168 | 0,106 |
| 550 | 83,125 | 79,305 | 49,076 | 12,774 | 0,035 |
| 560 | 87,127 | 87,319 | 72,870 | 55,541 | 0,060 |
| 570 | 89,176 | 89,426 | 79,384 | 79,327 | 1,511 |
| 580 | 89,815 | 90,041 | 82,891 | 85,060 | 21,406 |
| 590 | 90,079 | 90,271 | 85,661 | 87,664 | 58,755 |
| 600 | 90,296 | 90,392 | 88,041 | 89,199 | 78,940 |
| 610 | 90,411 | 90,402 | 89,178 | 89,711 | 86,118 |
| 620 | 90,506 | 90,411 | 89,555 | 89,856 | 88,565 |
| 630 | 90,415 | 90,286 | 89,752 | 89,957 | 89,485 |
| 640 | 90,513 | 90,382 | 89,821 | 90,051 | 89,840 |
| 650 | 90,520 | 90,358 | 89,891 | 90,086 | 90,000 |
| 660 | 90,556 | 90,364 | 89,962 | 90,144 | 90,032 |
| 670 | 90,499 | 90,305 | 90,018 | 90,199 | 89,989 |
| 680 | 90,618 | 90,302 | 90,011 | 90,272 | 90,007 |
| 690 | 90,509 | 90,225 | 90,009 | 90,218 | 89,861 |

| | O 530 | O 540 | O 550 | O 565 | O 580 |
|-----------------|--------|--------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 700 | 90,564 | 90,247 | 90,028 | 90,254 | 89,826 |
| 710 | 90,461 | 90,149 | 89,976 | 90,200 | 89,650 |
| 720 | 90,414 | 90,066 | 89,988 | 90,221 | 89,544 |
| 730 | 90,335 | 90,007 | 89,945 | 90,175 | 89,421 |
| 740 | 90,246 | 89,904 | 89,844 | 90,143 | 89,233 |
| 750 | 90,225 | 89,870 | 89,898 | 90,140 | 89,059 |
| 760 | 90,151 | 89,814 | 89,768 | 90,068 | 88,912 |
| 770 | 90,114 | 89,742 | 89,703 | 90,007 | 88,730 |
| 780 | 90,058 | 89,639 | 89,602 | 89,937 | 88,561 |
| 790 | 89,993 | 89,613 | 89,707 | 90,055 | 88,459 |
| 800 | 89,627 | 90,036 | 89,708 | 90,104 | 88,230 |
| 810 | 89,575 | 89,936 | 89,680 | 90,026 | 88,113 |
| 820 | 89,481 | 89,925 | 89,608 | 89,958 | 87,967 |
| 830 | 89,398 | 89,850 | 89,500 | 89,861 | 87,829 |
| 840 | 89,283 | 89,733 | 89,454 | 89,836 | 87,713 |
| 850 | 89,197 | 89,662 | 89,340 | 89,775 | 87,577 |
| 900 | 88,942 | 89,423 | 89,124 | 89,611 | 87,090 |
| 950 | 88,772 | 89,266 | 88,999 | 89,553 | 86,776 |
| 1000 | 88,677 | 89,164 | 88,896 | 89,492 | 86,597 |
| 1050 | 88,586 | 89,071 | 88,854 | 89,454 | 86,469 |
| 1065 | 88,593 | 89,065 | 88,878 | 89,445 | 86,471 |
| 1100 | 88,584 | 89,046 | 88,836 | 89,448 | 86,456 |
| 1200 | 88,704 | 89,127 | 88,937 | 89,560 | 86,642 |
| 1300 | 88,847 | 89,309 | 89,115 | 89,698 | 86,982 |
| 1400 | 88,932 | 89,372 | 89,166 | 89,697 | 87,351 |
| 1500 | 89,450 | 89,882 | 89,667 | 90,144 | 88,158 |
| 1600 | 89,781 | 90,182 | 89,936 | 90,345 | 88,783 |
| 1700 | 89,833 | 90,225 | 89,939 | 90,320 | 89,033 |
| 1800 | 89,592 | 89,973 | 89,666 | 90,006 | 88,915 |
| 1900 | 89,197 | 89,609 | 89,275 | 89,597 | 88,634 |
| 2000 | 88,684 | 89,109 | 88,711 | 89,069 | 88,242 |
| 2100 | 88,025 | 88,317 | 88,037 | 88,397 | 87,772 |
| 2200 | 86,699 | 87,144 | 86,630 | 87,004 | 86,676 |
| 2300 | 86,201 | 86,766 | 86,095 | 86,464 | 86,485 |
| 2400 | 85,726 | 86,124 | 85,597 | 85,963 | 86,078 |
| 2500 | 84,401 | 84,811 | 84,229 | 84,573 | 84,874 |
| 2600 | 83,433 | 83,792 | 83,177 | 83,551 | 84,105 |
| 2700 | 78,985 | 79,300 | 78,743 | 78,999 | 79,881 |
| 2800 | 35,457 | 34,387 | 35,770 | 35,392 | 35,235 |
| 2900 | 33,726 | 32,578 | 34,039 | 33,638 | 33,490 |
| 3000 | 31,419 | 30,360 | 31,620 | 31,274 | 31,780 |

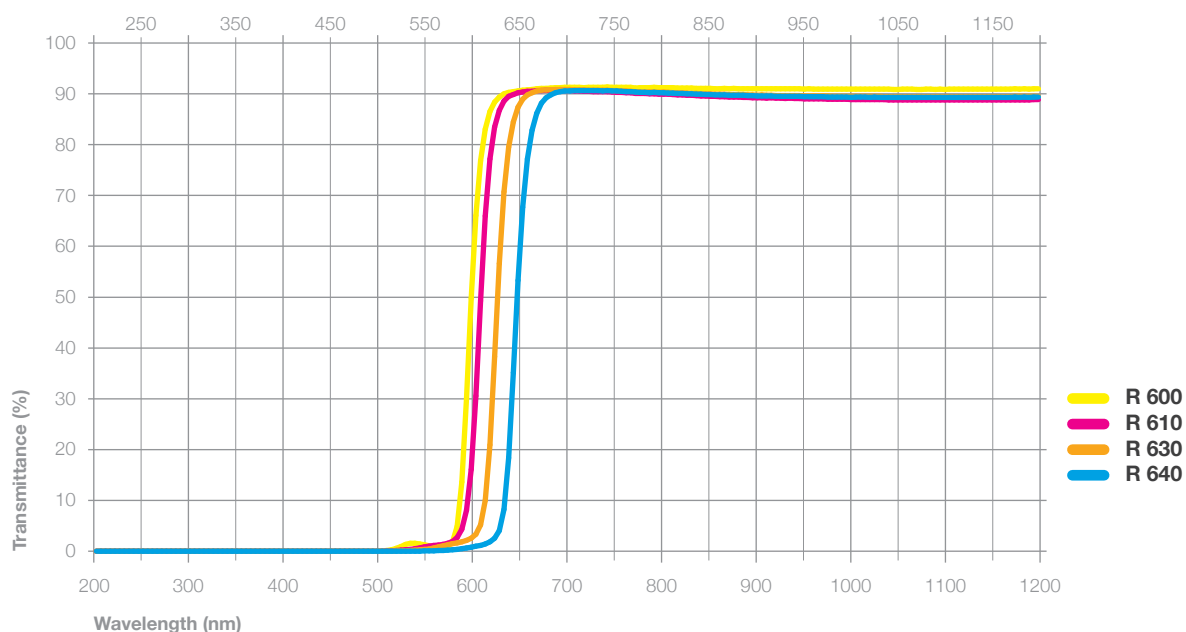
Glass Types

| | | | |
|------------|--------------|----------|--------|
| RED | HEBO | Schott | Hoya |
| | R 600 | | ≈ R-60 |
| | R 610 | ≈ RG 610 | |
| | R 630 | ≈ RG 630 | |
| | R 640 | ≈ RG 645 | ≈ R-64 |

Red Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| R 600 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |
| R 610 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |
| R 630 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |
| R 640 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | | λ _t 50% (nm) | λ _p (nm) | Tλ _p (%) | T _k (nm/°C) |
|--------------|-----------|----------|-------|------|-----------------|-------|------|-------------------------|---------------------|---------------------|------------------------|
| | | x | y | Y(%) | x | y | Y(%) | | | | |
| R 600 | 2 mm | 0,680 | 0,319 | 27,0 | 0,675 | 0,325 | 16,5 | 600 ± 9 | 685 | ≥ 88,7 | 0,16 |
| R 610 | 2 mm | 0,695 | 0,305 | 18,4 | 0,690 | 0,310 | 10,7 | 610 ± 9 | 695 | ≥ 88,7 | 0,16 |
| R 630 | 2 mm | 0,713 | 0,287 | 10,4 | 0,711 | 0,289 | 5,5 | 630 ± 9 | 710 | ≥ 88,7 | 0,17 |
| R 640 | 2 mm | 0,724 | 0,276 | 5,0 | 0,723 | 0,277 | 2,4 | 640 ± 9 | 720 | ≥ 88,7 | 0,17 |



| | R 600 | R 610 | R 630 | R 640 |
|-----------------|--------------------|--------------------|--------------------|--------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 200 | 0,001 | 0,001 | 3·10 ⁻⁴ | 1·10 ⁻⁴ |
| 210 | 0,002 | 8·10 ⁻⁴ | 5·10 ⁻⁵ | 4·10 ⁻⁴ |
| 220 | 1·10 ⁻⁴ | 6·10 ⁻⁴ | 5·10 ⁻⁴ | 0,001 |
| 230 | 0,002 | 0,001 | 0,001 | 1·10 ⁻⁴ |
| 240 | 6·10 ⁻⁴ | 7·10 ⁻⁴ | 1·10 ⁻⁴ | 8·10 ⁻⁴ |
| 250 | 1·10 ⁻³ | 1·10 ⁻⁴ | 0,001 | 5·10 ⁻⁵ |
| 260 | 5·10 ⁻⁴ | 0,001 | 7·10 ⁻⁴ | 4·10 ⁻⁴ |
| 270 | 0,001 | 0,001 | 5·10 ⁻⁴ | 8·10 ⁻⁵ |
| 280 | 0,001 | 4·10 ⁻⁴ | 8·10 ⁻⁴ | 0,001 |
| 290 | 8·10 ⁻⁴ | 4·10 ⁻⁴ | 0,001 | 3·10 ⁻⁴ |
| 300 | 0,001 | 0,001 | 0,001 | 7·10 ⁻⁴ |
| 310 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 5·10 ⁻⁵ | 8·10 ⁻⁴ |
| 320 | 8·10 ⁻⁴ | 0,001 | 8·10 ⁻⁴ | 6·10 ⁻⁴ |
| 330 | 4·10 ⁻⁴ | 3·10 ⁻⁵ | 6·10 ⁻⁵ | 0,001 |
| 340 | 6·10 ⁻⁴ | 4·10 ⁻⁵ | 0,001 | 4·10 ⁻⁴ |
| 350 | 0,001 | 0,001 | 0,001 | 5·10 ⁻⁴ |
| 360 | 0,001 | 0,001 | 3·10 ⁻⁴ | 1·10 ⁻⁴ |
| 370 | 0,001 | 0,001 | 9·10 ⁻⁴ | 1·10 ⁻⁴ |
| 380 | 0,001 | 6·10 ⁻⁴ | 7·10 ⁻⁵ | 5·10 ⁻⁴ |
| 390 | 0,001 | 0,001 | 8·10 ⁻⁴ | 6·10 ⁻⁴ |
| 400 | 2·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ |
| 410 | 0,001 | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ |
| 420 | 8·10 ⁻⁴ | 8·10 ⁻⁴ | 3·10 ⁻⁴ | 8·10 ⁻⁴ |
| 430 | 9·10 ⁻⁴ | 7·10 ⁻⁴ | 6·10 ⁻⁴ | 2·10 ⁻⁴ |
| 440 | 0,002 | 0,001 | 7·10 ⁻⁴ | 3·10 ⁻⁴ |
| 450 | 0,003 | 4·10 ⁻⁴ | 2·10 ⁻⁴ | 0,001 |
| 460 | 0,006 | 0,001 | 2·10 ⁻⁴ | 1·10 ⁻⁴ |
| 470 | 0,007 | 0,003 | 3·10 ⁻⁴ | 2·10 ⁻⁴ |
| 480 | 0,008 | 0,005 | 0,001 | 8·10 ⁻⁵ |
| 490 | 0,016 | 0,010 | 0,005 | 6·10 ⁻⁵ |
| 500 | 0,064 | 0,030 | 0,008 | 7·10 ⁻⁵ |
| 510 | 0,283 | 0,084 | 0,022 | 0,001 |
| 520 | 0,944 | 0,192 | 0,058 | 0,003 |
| 530 | 1,582 | 0,379 | 0,137 | 0,011 |
| 540 | 1,424 | 0,673 | 0,258 | 0,031 |
| 550 | 1,077 | 0,984 | 0,459 | 0,066 |
| 560 | 0,772 | 1,196 | 0,819 | 0,119 |
| 570 | 0,904 | 1,534 | 1,287 | 0,211 |
| 580 | 4,870 | 2,708 | 1,624 | 0,383 |
| 590 | 30,102 | 8,050 | 2,102 | 0,653 |
| 600 | 66,067 | 30,550 | 3,300 | 0,961 |
| 610 | 83,069 | 66,009 | 10,019 | 1,451 |
| 620 | 88,353 | 83,455 | 38,281 | 2,533 |
| 630 | 90,006 | 88,599 | 70,696 | 8,231 |
| 640 | 90,429 | 89,888 | 84,467 | 35,141 |
| 650 | 90,691 | 90,366 | 88,910 | 67,656 |
| 660 | 90,841 | 90,534 | 90,247 | 82,851 |
| 670 | 91,046 | 90,665 | 90,721 | 88,150 |
| 680 | 91,107 | 90,652 | 90,799 | 89,828 |
| 690 | 91,219 | 90,651 | 90,851 | 90,411 |

| | R 600 | R 610 | R 630 | R 640 |
|-----------------|--------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 700 | 91,256 | 90,612 | 90,825 | 90,594 |
| 710 | 91,282 | 90,550 | 90,786 | 90,623 |
| 720 | 91,277 | 90,474 | 90,712 | 90,626 |
| 730 | 91,290 | 90,432 | 90,701 | 90,612 |
| 740 | 91,361 | 90,430 | 90,711 | 90,611 |
| 750 | 91,304 | 90,321 | 90,661 | 90,568 |
| 760 | 91,283 | 90,230 | 90,573 | 90,398 |
| 770 | 91,164 | 90,088 | 90,457 | 90,333 |
| 780 | 91,204 | 90,044 | 90,377 | 90,257 |
| 790 | 91,250 | 89,981 | 90,361 | 90,261 |
| 800 | 91,211 | 89,961 | 90,348 | 90,207 |
| 810 | 91,180 | 89,869 | 90,250 | 90,130 |
| 820 | 91,131 | 89,761 | 90,194 | 90,057 |
| 830 | 91,123 | 89,692 | 90,107 | 89,985 |
| 840 | 91,067 | 89,590 | 90,038 | 89,912 |
| 850 | 91,064 | 89,529 | 89,987 | 89,849 |
| 900 | 91,000 | 89,222 | 89,736 | 89,597 |
| 950 | 90,961 | 89,017 | 89,611 | 89,455 |
| 1000 | 90,897 | 88,864 | 89,479 | 89,333 |
| 1050 | 90,890 | 88,790 | 89,440 | 89,287 |
| 1065 | 90,901 | 88,811 | 89,454 | 89,301 |
| 1100 | 90,892 | 88,794 | 89,446 | 89,284 |
| 1200 | 90,990 | 88,849 | 89,504 | 89,377 |
| 1300 | 91,099 | 89,008 | 89,652 | 89,535 |
| 1400 | 91,013 | 89,101 | 89,717 | 89,631 |
| 1500 | 91,239 | 89,608 | 90,156 | 90,060 |
| 1600 | 91,310 | 89,942 | 90,412 | 90,363 |
| 1700 | 91,186 | 89,988 | 90,411 | 90,384 |
| 1800 | 90,872 | 89,721 | 90,142 | 90,136 |
| 1900 | 90,570 | 89,339 | 89,794 | 89,799 |
| 2000 | 90,186 | 88,786 | 89,292 | 89,314 |
| 2100 | 89,614 | 88,056 | 88,603 | 88,694 |
| 2200 | 88,434 | 86,648 | 87,281 | 87,450 |
| 2300 | 88,115 | 86,198 | 86,867 | 87,090 |
| 2400 | 87,534 | 85,522 | 86,217 | 86,464 |
| 2500 | 86,325 | 84,169 | 84,897 | 85,196 |
| 2600 | 85,490 | 83,117 | 83,913 | 84,234 |
| 2700 | 81,383 | 78,460 | 79,440 | 80,104 |
| 2800 | 37,039 | 34,059 | 34,837 | 37,728 |
| 2900 | 34,917 | 32,368 | 33,053 | 35,880 |
| 3000 | 32,723 | 30,042 | 30,791 | 33,473 |

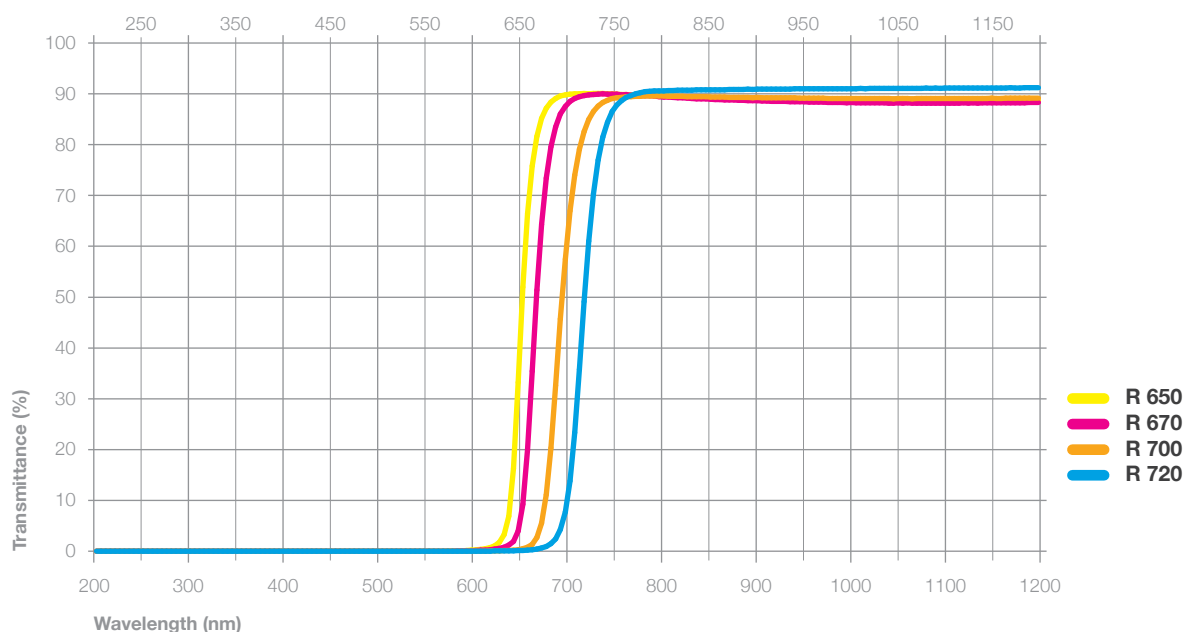
Glass Types

| | | | |
|------------|--------------|----------|--------|
| RED | HEBO | Schott | Hoya |
| | R 650 | | |
| | R 670 | ≈ RG 665 | |
| | R 700 | ≈ RG 695 | ≈ R-70 |
| | R 720 | ≈ RG 715 | ≈ R-72 |

Red Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| R 650 | 2 mm | 1,52 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |
| R 670 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |
| R 700 | 2 mm | 1,523 | 2,64 | 527 | 605 | 103 | 1 | 2 | 2 | 1 | 1 |
| R 720 | 2 mm | 1,523 | 2,77 | 534 | 592 | 111 | 4 | 4 | 2 | 1 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | | λ _t 50% (nm) | λ _p (nm) | Tλ _p (%) | T _k (nm/°C) |
|--------------|-----------|----------|-------|------|-----------------|-------|------|-------------------------|---------------------|---------------------|------------------------|
| | | x | y | Y(%) | x | y | Y(%) | | | | |
| R 650 | 2 mm | 0,728 | 0,272 | 3,2 | 0,728 | 0,272 | 1,5 | 650 ± 9 | 730 | ≥ 88,5 | 0,17 |
| R 670 | 2 mm | 0,731 | 0,269 | 1,1 | 0,730 | 0,270 | 0,5 | 670 ± 9 | 750 | ≥ 87,5 | 0,17 |
| R 700 | 2 mm | 0,735 | 0,265 | 0,0 | 0,735 | 0,265 | 0,0 | 700 ± 9 | 800 | ≥ 79,8 | 0,18 |
| R 720 | 2 mm | | | | | | | 720 ± 9 | 810 | ≥ 80,0 | 0,18 |



| | R 650 | R 670 | R 700 | R 720 |
|-----------------|--------------------|--------------------|---------------------|---------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 200 | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 8·10 ⁻⁴ | 1·10 ⁻⁴ |
| 210 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 7·10 ⁻⁴ |
| 220 | 0,001 | 0,001 | 0,001 | 0,001 |
| 230 | 2·10 ⁻⁴ | 8·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ |
| 240 | 0,001 | 0,001 | 0,001 | 0,001 |
| 250 | 1·10 ⁻⁴ | 9·10 ⁻⁴ | 5·10 ⁻⁴ | <1·10 ⁻⁵ |
| 260 | 1·10 ⁻⁴ | 1·10 ⁻⁴ | <1·10 ⁻⁵ | 4·10 ⁻⁴ |
| 270 | 3·10 ⁻⁴ | 8·10 ⁻⁴ | 5·10 ⁻⁴ | 1·10 ⁻⁴ |
| 280 | 4·10 ⁻⁴ | 6·10 ⁻⁵ | 7·10 ⁻⁵ | 4·10 ⁻⁴ |
| 290 | 5·10 ⁻⁴ | 5·10 ⁻⁴ | 6·10 ⁻⁵ | 2·10 ⁻⁴ |
| 300 | 4·10 ⁻⁴ | 2·10 ⁻⁴ | 7·10 ⁻⁵ | 8·10 ⁻⁴ |
| 310 | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 8·10 ⁻⁴ |
| 320 | 2·10 ⁻⁴ | 4·10 ⁻⁴ | 7·10 ⁻⁵ | 9·10 ⁻⁵ |
| 330 | 7·10 ⁻⁴ | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 2·10 ⁻⁴ |
| 340 | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 6·10 ⁻⁴ | 9·10 ⁻⁴ |
| 350 | 5·10 ⁻⁵ | 2·10 ⁻⁴ | 0,001 | 2·10 ⁻⁴ |
| 360 | 7·10 ⁻⁴ | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ |
| 370 | 1·10 ⁻⁴ | 7·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ |
| 380 | 2·10 ⁻⁴ | 7·10 ⁻⁴ | 2·10 ⁻⁴ | 6·10 ⁻⁴ |
| 390 | 1·10 ⁻⁴ | 0,001 | <1·10 ⁻⁵ | 7·10 ⁻⁴ |
| 400 | 7·10 ⁻⁴ | 7·10 ⁻⁴ | 8·10 ⁻⁴ | 4·10 ⁻⁴ |
| 410 | 7·10 ⁻⁴ | 8·10 ⁻⁴ | 5·10 ⁻⁴ | 3·10 ⁻⁴ |
| 420 | 4·10 ⁻⁴ | 6·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 430 | 7·10 ⁻⁴ | 5·10 ⁻⁴ | 6·10 ⁻⁴ | 2·10 ⁻⁴ |
| 440 | 2·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 5·10 ⁻⁵ |
| 450 | 7·10 ⁻⁴ | 6·10 ⁻⁴ | 5·10 ⁻⁴ | 0,001 |
| 460 | 6·10 ⁻⁴ | 2·10 ⁻⁵ | 4·10 ⁻⁴ | 4·10 ⁻⁴ |
| 470 | 4·10 ⁻⁴ | 4·10 ⁻⁵ | 2·10 ⁻⁴ | 4·10 ⁻⁵ |
| 480 | 6·10 ⁻⁵ | 3·10 ⁻⁴ | 5·10 ⁻⁵ | 5·10 ⁻⁴ |
| 490 | 6·10 ⁻⁴ | 6·10 ⁻⁵ | 3·10 ⁻⁴ | 0,001 |
| 500 | 7·10 ⁻⁵ | 3·10 ⁻⁴ | 7·10 ⁻⁴ | 5·10 ⁻⁵ |
| 510 | 7·10 ⁻⁵ | 6·10 ⁻⁵ | 6·10 ⁻⁵ | 8·10 ⁻⁴ |
| 520 | 8·10 ⁻⁴ | 6·10 ⁻⁴ | 0,001 | 9·10 ⁻⁴ |
| 530 | 8·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁴ |
| 540 | 0,003 | 2·10 ⁻⁴ | 6·10 ⁻⁵ | 7·10 ⁻⁵ |
| 550 | 0,009 | 0,002 | 7·10 ⁻⁵ | 2·10 ⁻⁴ |
| 560 | 0,019 | 0,005 | 4·10 ⁻⁵ | 5·10 ⁻⁴ |
| 570 | 0,034 | 0,014 | 0,001 | 9·10 ⁻⁴ |
| 580 | 0,058 | 0,026 | 0,003 | 0,001 |
| 590 | 0,102 | 0,050 | 0,008 | 0,005 |
| 600 | 0,188 | 0,094 | 0,014 | 0,009 |
| 610 | 0,359 | 0,177 | 0,025 | 0,018 |
| 620 | 0,700 | 0,314 | 0,045 | 0,028 |
| 630 | 1,802 | 0,576 | 0,082 | 0,046 |
| 640 | 6,863 | 1,178 | 0,155 | 0,078 |
| 650 | 33,246 | 3,940 | 0,315 | 0,129 |
| 660 | 66,373 | 19,971 | 0,771 | 0,230 |
| 670 | 81,673 | 51,390 | 2,685 | 0,435 |
| 680 | 87,168 | 73,424 | 11,092 | 0,930 |
| 690 | 89,096 | 83,502 | 32,603 | 2,442 |

| | R 650 | R 670 | R 700 | R 720 |
|-----------------|--------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 700 | 89,768 | 87,541 | 57,495 | 7,731 |
| 710 | 89,993 | 89,082 | 74,016 | 23,312 |
| 720 | 90,050 | 89,677 | 82,580 | 49,125 |
| 730 | 90,073 | 89,873 | 86,515 | 70,290 |
| 740 | 90,088 | 89,991 | 88,305 | 81,498 |
| 750 | 90,009 | 89,955 | 89,061 | 86,522 |
| 760 | 89,868 | 89,824 | 89,332 | 88,655 |
| 770 | 89,798 | 89,751 | 89,462 | 89,664 |
| 780 | 89,756 | 89,662 | 89,536 | 90,184 |
| 790 | 89,790 | 89,638 | 89,606 | 90,513 |
| 800 | 89,618 | 89,450 | 89,575 | 90,585 |
| 810 | 89,542 | 89,341 | 89,546 | 90,648 |
| 820 | 89,448 | 89,230 | 89,481 | 90,694 |
| 830 | 89,398 | 89,152 | 89,472 | 90,736 |
| 840 | 89,299 | 89,049 | 89,422 | 90,757 |
| 850 | 89,239 | 88,984 | 89,410 | 90,799 |
| 900 | 88,953 | 88,638 | 89,237 | 90,866 |
| 950 | 88,764 | 88,442 | 89,158 | 90,977 |
| 1000 | 88,604 | 88,254 | 89,078 | 90,995 |
| 1050 | 88,565 | 88,181 | 89,035 | 91,067 |
| 1065 | 88,544 | 88,202 | 89,082 | 91,089 |
| 1100 | 88,543 | 88,187 | 89,070 | 91,102 |
| 1200 | 88,634 | 88,284 | 89,181 | 91,209 |
| 1300 | 88,814 | 88,515 | 89,355 | 91,252 |
| 1400 | 88,933 | 88,684 | 89,438 | 91,250 |
| 1500 | 89,486 | 89,266 | 89,907 | 91,405 |
| 1600 | 89,858 | 89,673 | 90,173 | 91,451 |
| 1700 | 89,916 | 89,785 | 90,189 | 91,376 |
| 1800 | 89,696 | 89,568 | 89,927 | 91,221 |
| 1900 | 89,357 | 89,217 | 89,585 | 91,075 |
| 2000 | 88,847 | 88,713 | 89,088 | 90,896 |
| 2100 | 88,192 | 88,034 | 88,426 | 90,568 |
| 2200 | 86,940 | 86,744 | 87,053 | 89,878 |
| 2300 | 86,536 | 86,372 | 86,684 | 89,682 |
| 2400 | 85,908 | 85,758 | 86,063 | 89,280 |
| 2500 | 84,645 | 84,476 | 84,705 | 88,532 |
| 2600 | 83,691 | 83,544 | 83,747 | 88,014 |
| 2700 | 79,398 | 79,204 | 79,133 | 85,370 |
| 2800 | 36,225 | 35,137 | 33,189 | 49,652 |
| 2900 | 34,068 | 33,113 | 31,421 | 47,144 |
| 3000 | 31,616 | 30,692 | 29,322 | 44,934 |

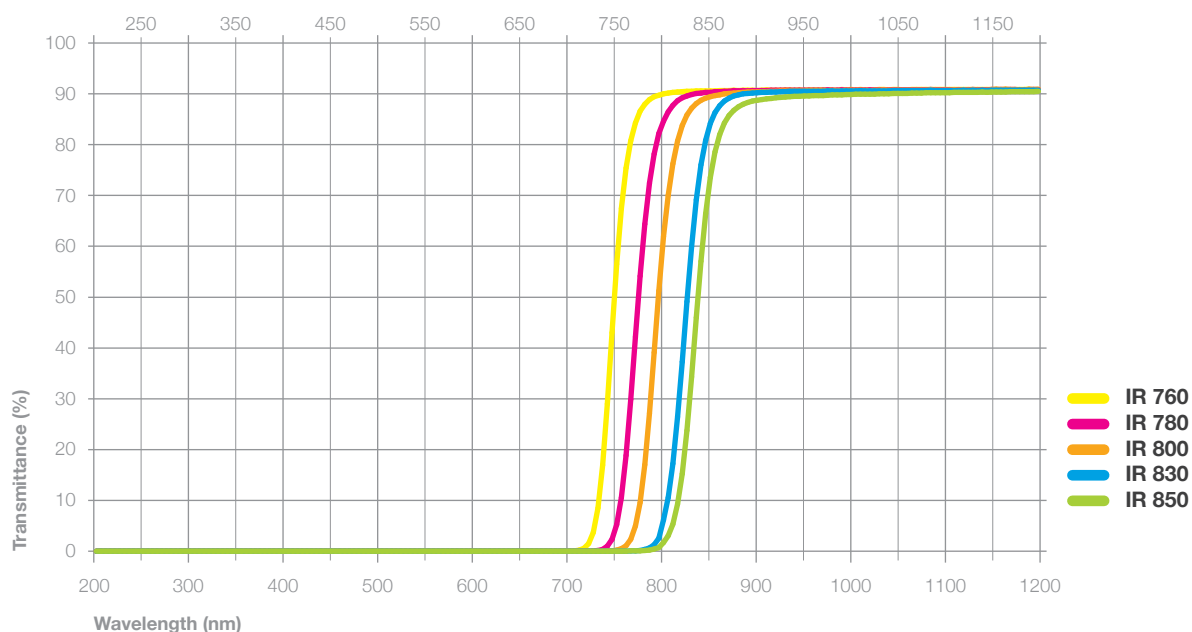
Glass Types

| INFRARED | HEBO | Schott | Hoya |
|----------|--------|----------|---------|
| | IR 760 | | ≈ IR-76 |
| | IR 780 | ≈ RG 780 | |
| | IR 800 | | ≈ IR-80 |
| | IR 830 | ≈ RG 830 | ≈ IR-83 |
| | IR 850 | ≈ RG 850 | ≈ IR-85 |

Infrared Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| IR 760 | 2 mm | 1,53 | 2,77 | 534 | 592 | 111 | 4 | 4 | 2 | 1 | 1 |
| IR 780 | 2 mm | 1,532 | 2,77 | 534 | 592 | 111 | 4 | 4 | 2 | 1 | 1 |
| IR 800 | 2 mm | 1,520 | 3,05 | 559 | 615 | 98 | 4 | 4 | 2 | 1 | 1 |
| IR 830 | 2 mm | 1,520 | 3,05 | 559 | 615 | 98 | 4 | 4 | 2 | 1 | 1 |
| IR 850 | 2 mm | 1,520 | 3,05 | 559 | 615 | 98 | 4 | 4 | 2 | 1 | 1 |

| Type | Thickness | λ _t 50% (nm) | λ _p (nm) | Tλ _p (%) | T _k (nm/°C) |
|--------|-----------|-------------------------|---------------------|---------------------|------------------------|
| IR 760 | 2 mm | 760 ± 9 | 850 | ≥ 83,6 | 0,20 |
| IR 780 | 2 mm | 780 ± 9 | 870 | ≥ 83,6 | 0,22 |
| IR 800 | 2 mm | 800 ± 9 | 900 | ≥ 83,6 | 0,22 |
| IR 830 | 2 mm | 830 ± 9 | 930 | ≥ 83,6 | 0,23 |
| IR 850 | 2 mm | 850 ± 9 | 950 | ≥ 80,0 | 0,24 |



| | IR 760 | IR 780 | IR 800 | IR 830 | IR 850 |
|-----------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 200 | 5·10 ⁻⁴ | 8·10 ⁻⁴ | 8·10 ⁻⁴ | 3·10 ⁻⁵ | 3·10 ⁻⁴ |
| 210 | 5·10 ⁻⁴ | 0,001 | 6·10 ⁻⁴ | 5·10 ⁻⁴ | 0,001 |
| 220 | 6·10 ⁻⁴ | 6·10 ⁻⁴ | 0,001 | 0,001 | 4·10 ⁻⁴ |
| 230 | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁵ | 5·10 ⁻⁴ |
| 240 | <1·10 ⁻⁵ | 7·10 ⁻⁴ | 5·10 ⁻⁴ | 5·10 ⁻⁴ | 3·10 ⁻⁴ |
| 250 | 0,001 | 7·10 ⁻⁴ | 3·10 ⁻⁵ | 3·10 ⁻⁴ | 6·10 ⁻⁴ |
| 260 | 3·10 ⁻⁴ | 0,001 | 4·10 ⁻⁴ | 7·10 ⁻⁴ | 2·10 ⁻⁴ |
| 270 | 7·10 ⁻⁴ | 0,001 | 4·10 ⁻⁴ | 5·10 ⁻⁴ | 0,001 |
| 280 | 8·10 ⁻⁴ | 6·10 ⁻⁴ | 4·10 ⁻⁴ | 5·10 ⁻⁴ | 1·10 ⁻⁴ |
| 290 | 1·10 ⁻⁵ | 1·10 ⁻⁴ | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ |
| 300 | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 6·10 ⁻⁴ | 3·10 ⁻⁴ |
| 310 | 0,001 | 4·10 ⁻⁴ | 0,001 | 0,001 | 0,001 |
| 320 | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁵ | 2·10 ⁻⁴ | 4·10 ⁻⁴ |
| 330 | 7·10 ⁻⁴ | 0,001 | 0,001 | 0,001 | 0,001 |
| 340 | 0,001 | 7·10 ⁻⁴ | 0,001 | 0,001 | 6·10 ⁻⁴ |
| 350 | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 6·10 ⁻⁴ |
| 360 | 2·10 ⁻⁴ | 9·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 3·10 ⁻⁴ |
| 370 | 8·10 ⁻⁵ | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 3·10 ⁻⁴ |
| 380 | 5·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 0,001 | 7·10 ⁻⁴ |
| 390 | 5·10 ⁻⁵ | 0,001 | 9·10 ⁻⁴ | 6·10 ⁻⁴ | 3·10 ⁻⁴ |
| 400 | 6·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 5·10 ⁻⁴ |
| 410 | 4·10 ⁻⁴ | <1·10 ⁻⁵ | 8·10 ⁻⁴ | 7·10 ⁻⁵ | 1·10 ⁻⁴ |
| 420 | 0,001 | 0,001 | 0,001 | 0,001 | 0,001 |
| 430 | 7·10 ⁻⁵ | <1·10 ⁻⁵ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 1·10 ⁻⁴ |
| 440 | 4·10 ⁻⁴ | 7·10 ⁻⁴ | <1·10 ⁻⁵ | 8·10 ⁻⁴ | 1·10 ⁻⁵ |
| 450 | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 4·10 ⁻⁴ |
| 460 | 7·10 ⁻⁴ | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 6·10 ⁻⁴ | 8·10 ⁻⁴ |
| 470 | 8·10 ⁻⁵ | 1·10 ⁻⁴ | <1·10 ⁻⁵ | 4·10 ⁻⁴ | 5·10 ⁻⁴ |
| 480 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 0,001 | 1·10 ⁻⁴ |
| 490 | 2·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ |
| 500 | 6·10 ⁻⁴ | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 9·10 ⁻⁴ | 5·10 ⁻⁴ |
| 510 | 3·10 ⁻⁴ | 9·10 ⁻⁴ | 1·10 ⁻⁴ | 5·10 ⁻⁴ | 9·10 ⁻⁴ |
| 520 | 6·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 5·10 ⁻⁴ |
| 530 | 6·10 ⁻⁵ | 5·10 ⁻⁴ | 5·10 ⁻⁴ | 0,001 | <1·10 ⁻⁵ |
| 540 | 8·10 ⁻⁵ | 5·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 6·10 ⁻⁴ |
| 550 | 3·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁵ | 7·10 ⁻⁴ | 4·10 ⁻⁴ |
| 560 | 0,001 | 3·10 ⁻⁴ | 2·10 ⁻⁴ | <1·10 ⁻⁵ | 4·10 ⁻⁴ |
| 570 | 5·10 ⁻⁵ | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 2·10 ⁻⁴ | 7·10 ⁻⁴ |
| 580 | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 3·10 ⁻⁴ |
| 590 | 2·10 ⁻⁴ | 2·10 ⁻⁵ | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ |
| 600 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 5·10 ⁻⁴ |
| 610 | 5·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 0,001 | 6·10 ⁻⁴ |
| 620 | 4·10 ⁻⁴ | 8·10 ⁻⁴ | 8·10 ⁻⁴ | 3·10 ⁻⁴ | 0,001 |
| 630 | 0,001 | 1·10 ⁻⁴ | 6·10 ⁻⁴ | 1·10 ⁻⁴ | 6·10 ⁻⁴ |
| 640 | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 7·10 ⁻⁴ | 5·10 ⁻⁴ |
| 650 | 8·10 ⁻⁵ | 6·10 ⁻⁴ | 0,001 | 5·10 ⁻⁴ | 2·10 ⁻⁴ |
| 660 | 8·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁵ | <1·10 ⁻⁵ | 5·10 ⁻⁴ |
| 670 | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 5·10 ⁻⁴ |
| 680 | 0,001 | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 5·10 ⁻⁴ | 3·10 ⁻⁴ |
| 690 | 0,004 | 5·10 ⁻⁴ | 1·10 ⁻⁴ | 5·10 ⁻⁴ | 5·10 ⁻⁴ |

| | IR 760 | IR 780 | IR 800 | IR 830 | IR 850 |
|-----------------|--------|--------------------|--------------------|--------------------|--------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 700 | 0,028 | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 1·10 ⁻⁴ |
| 710 | 0,197 | 0,003 | 8·10 ⁻⁴ | 2·10 ⁻⁵ | 0,001 |
| 720 | 1,466 | 0,021 | 0,002 | 5·10 ⁻⁴ | 0,001 |
| 730 | 8,483 | 0,143 | 0,011 | 0,003 | 0,004 |
| 740 | 29,005 | 0,971 | 0,043 | 0,005 | 0,007 |
| 750 | 56,472 | 5,251 | 0,207 | 0,012 | 0,015 |
| 760 | 75,417 | 18,829 | 1,072 | 0,031 | 0,028 |
| 770 | 84,290 | 42,153 | 4,936 | 0,094 | 0,060 |
| 780 | 87,933 | 64,376 | 16,976 | 0,328 | 0,143 |
| 790 | 89,416 | 78,188 | 39,133 | 1,272 | 0,401 |
| 800 | 89,977 | 84,595 | 61,926 | 6,138 | 1,699 |
| 810 | 90,285 | 87,735 | 76,286 | 17,243 | 5,347 |
| 820 | 90,455 | 89,192 | 83,790 | 37,256 | 15,224 |
| 830 | 90,494 | 89,870 | 87,173 | 59,946 | 34,290 |
| 840 | 90,577 | 90,163 | 88,697 | 76,048 | 57,022 |
| 850 | 90,581 | 90,317 | 89,435 | 84,174 | 73,553 |
| 900 | 90,666 | 90,625 | 90,382 | 90,228 | 88,765 |
| 950 | 90,735 | 90,738 | 90,588 | 90,488 | 89,559 |
| 1000 | 90,831 | 90,774 | 90,681 | 90,570 | 89,893 |
| 1050 | 90,828 | 90,782 | 90,727 | 90,630 | 90,092 |
| 1065 | 90,849 | 90,802 | 90,725 | 90,626 | 90,135 |
| 1100 | 90,854 | 90,792 | 90,731 | 90,656 | 90,247 |
| 1200 | 90,930 | 90,854 | 90,818 | 90,742 | 90,470 |
| 1300 | 90,937 | 90,873 | 90,842 | 90,754 | 90,602 |
| 1400 | 90,914 | 90,847 | 90,808 | 90,744 | 90,642 |
| 1500 | 90,984 | 90,907 | 90,844 | 90,800 | 90,729 |
| 1600 | 90,971 | 90,891 | 90,860 | 90,792 | 90,738 |
| 1700 | 90,885 | 90,811 | 90,736 | 90,695 | 90,640 |
| 1800 | 90,773 | 90,684 | 90,611 | 90,585 | 90,520 |
| 1900 | 90,701 | 90,570 | 90,492 | 90,488 | 90,453 |
| 2000 | 90,601 | 90,487 | 90,384 | 90,402 | 90,341 |
| 2100 | 90,480 | 90,377 | 90,010 | 90,298 | 90,230 |
| 2200 | 90,051 | 89,861 | 89,708 | 89,826 | 89,726 |
| 2300 | 89,665 | 89,486 | 89,297 | 89,448 | 89,360 |
| 2400 | 88,958 | 88,763 | 88,574 | 88,712 | 88,644 |
| 2500 | 88,488 | 88,301 | 88,048 | 88,252 | 88,131 |
| 2600 | 87,651 | 87,333 | 87,065 | 87,329 | 87,212 |
| 2700 | 85,570 | 85,139 | 84,692 | 85,134 | 84,926 |
| 2800 | 56,378 | 53,517 | 49,319 | 54,935 | 50,534 |
| 2900 | 48,180 | 44,289 | 40,442 | 45,792 | 42,440 |
| 3000 | 43,409 | 39,142 | 35,691 | 40,706 | 38,048 |

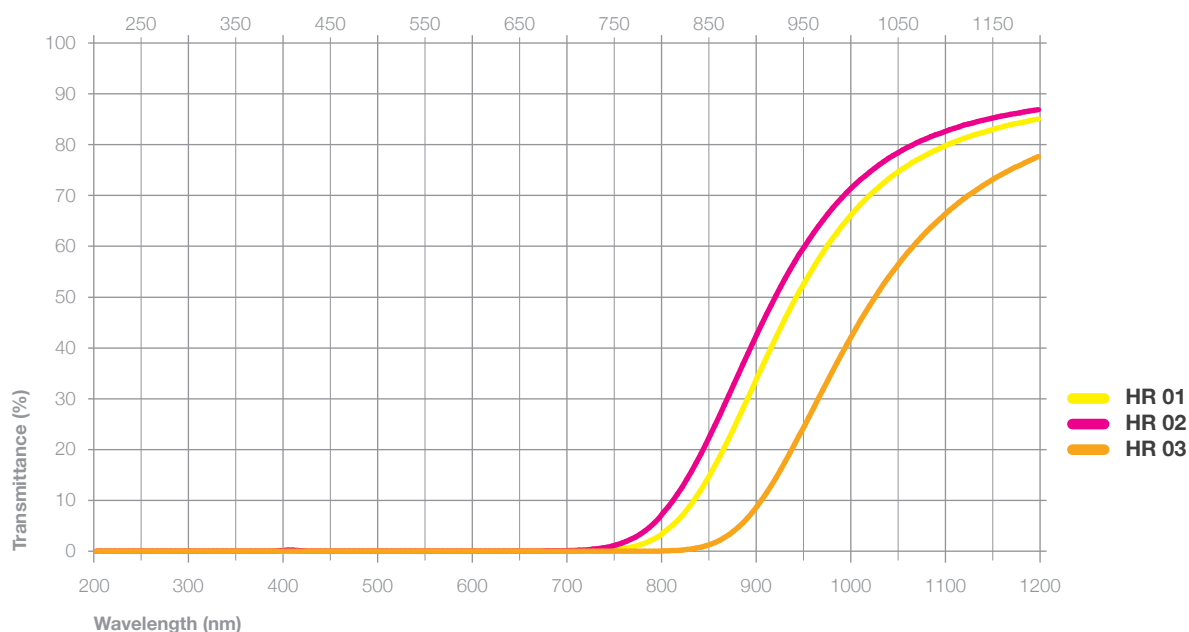
Glass Types

| | | | |
|-----------------|--------------|--------|---------|
| INFRARED | HEBO | Schott | Hoya |
| | HR 01 | | ≈ RM-86 |
| | HR 02 | ≈ RG 7 | ≈ RM-90 |
| | HR 03 | | |

Infrared Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| HR 01 | 2 mm | 1,53 | 2,53 | 1 | 3 | 3 | 1 | 1 | 3 | 0 | 1 |
| HR 02 | 1 mm | 1,525 | 2,53 | 1 | 3 | 3 | 1 | 1 | 3 | 0 | 1 |
| HR 03 | 2 mm | 1,525 | 2,53 | 1 | 3 | 3 | 1 | 1 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|--------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| HR 01 | 2 mm | 0,612 | 0,260 | 0,2 | 0,325 | 0,111 | 0,1 |
| HR 02 | 1 mm | | | | | | |
| HR 03 | 2 mm | | | | | | |



| | HR 01 | HR 02 | HR 03 |
|-----------------|---------------------|--------------------|--------------------|
| Thickness (mm) | 2 | 1 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 200 | 3·10 ⁻⁴ | 3·10 ⁻⁵ | 1·10 ⁻⁴ |
| 210 | <1·10 ⁻⁵ | 6·10 ⁻⁴ | 6·10 ⁻⁴ |
| 220 | 7·10 ⁻⁴ | 4·10 ⁻⁴ | 0,001 |
| 230 | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ |
| 240 | 1·10 ⁻⁵ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 250 | 2·10 ⁻⁵ | 0,001 | 1·10 ⁻⁴ |
| 260 | 8·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 270 | 7·10 ⁻⁴ | 8·10 ⁻⁴ | 8·10 ⁻⁴ |
| 280 | 1·10 ⁻⁴ | 1·10 ⁻⁵ | 4·10 ⁻⁴ |
| 290 | 3·10 ⁻⁴ | 1·10 ⁻⁴ | 8·10 ⁻⁴ |
| 300 | 5·10 ⁻⁴ | 6·10 ⁻⁴ | 1·10 ⁻⁴ |
| 310 | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 3·10 ⁻⁴ |
| 320 | 1·10 ⁻⁴ | 0,001 | 6·10 ⁻⁴ |
| 330 | 0,004 | 0,006 | 0,001 |
| 340 | 0,016 | 0,006 | 0,001 |
| 350 | 0,005 | 6·10 ⁻⁴ | 0,001 |
| 360 | 0,001 | 8·10 ⁻⁵ | 7·10 ⁻⁵ |
| 370 | 0,002 | 5·10 ⁻⁵ | 2·10 ⁻⁴ |
| 380 | 0,014 | 0,003 | 2·10 ⁻⁴ |
| 390 | 0,108 | 0,047 | 0,001 |
| 400 | 0,224 | 0,187 | 4·10 ⁻⁴ |
| 410 | 0,069 | 0,116 | 0,001 |
| 420 | 0,006 | 0,017 | 0,001 |
| 430 | 2·10 ⁻⁴ | 0,001 | 2·10 ⁻⁴ |
| 440 | 5·10 ⁻⁴ | 3·10 ⁻⁵ | 3·10 ⁻⁴ |
| 450 | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 7·10 ⁻⁴ |
| 460 | 5·10 ⁻⁴ | 2·10 ⁻⁴ | 5·10 ⁻⁴ |
| 470 | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 3·10 ⁻⁴ |
| 480 | 5·10 ⁻⁴ | 1·10 ⁻⁴ | 7·10 ⁻⁵ |
| 490 | 6·10 ⁻⁴ | 2·10 ⁻⁴ | 4·10 ⁻⁴ |
| 500 | 4·10 ⁻⁴ | 6·10 ⁻⁴ | 0,001 |
| 510 | 4·10 ⁻⁴ | 7·10 ⁻⁴ | 8·10 ⁻⁴ |
| 520 | 2·10 ⁻⁴ | 3·10 ⁻⁵ | 3·10 ⁻⁴ |
| 530 | 2·10 ⁻⁵ | 2·10 ⁻⁴ | 5·10 ⁻⁵ |
| 540 | 1·10 ⁻⁵ | 2·10 ⁻⁴ | 0,001 |
| 550 | 3·10 ⁻⁴ | 7·10 ⁻⁴ | 3·10 ⁻⁴ |
| 560 | 0,001 | 3·10 ⁻⁵ | 3·10 ⁻⁴ |
| 570 | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁴ |
| 580 | 4·10 ⁻⁴ | 0,001 | 2·10 ⁻⁴ |
| 590 | 2·10 ⁻⁴ | 4·10 ⁻⁴ | 0,001 |
| 600 | 6·10 ⁻⁴ | 8·10 ⁻⁴ | 2·10 ⁻⁴ |
| 610 | 4·10 ⁻⁴ | 0,001 | 5·10 ⁻⁵ |
| 620 | 8·10 ⁻⁴ | 0,001 | 5·10 ⁻⁵ |
| 630 | 4·10 ⁻⁴ | 0,005 | 7·10 ⁻⁴ |
| 640 | 6·10 ⁻⁴ | 0,007 | 3·10 ⁻⁴ |
| 650 | 0,001 | 0,011 | 0,001 |
| 660 | 0,001 | 0,016 | 4·10 ⁻⁴ |
| 670 | 0,002 | 0,027 | 3·10 ⁻⁵ |
| 680 | 0,004 | 0,044 | 9·10 ⁻⁵ |
| 690 | 0,007 | 0,067 | 9·10 ⁻⁴ |

| | HR 01 | HR 02 | HR 03 |
|-----------------|--------|--------|--------------------|
| Thickness (mm) | 2 | 1 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 700 | 0,015 | 0,110 | 8·10 ⁻⁵ |
| 710 | 0,029 | 0,184 | 2·10 ⁻⁴ |
| 720 | 0,057 | 0,306 | 0,001 |
| 730 | 0,109 | 0,503 | 4·10 ⁻⁵ |
| 740 | 0,199 | 0,803 | 3·10 ⁻⁴ |
| 750 | 0,351 | 1,251 | 0,001 |
| 760 | 0,600 | 1,894 | 7·10 ⁻⁴ |
| 770 | 0,990 | 2,784 | 0,002 |
| 780 | 1,569 | 3,980 | 0,007 |
| 790 | 2,394 | 5,519 | 0,018 |
| 800 | 3,662 | 7,629 | 0,053 |
| 810 | 5,154 | 9,932 | 0,122 |
| 820 | 7,026 | 12,628 | 0,239 |
| 830 | 9,354 | 15,726 | 0,455 |
| 840 | 12,078 | 19,167 | 0,788 |
| 850 | 15,173 | 22,873 | 1,353 |
| 900 | 34,154 | 42,776 | 8,865 |
| 950 | 52,781 | 59,907 | 24,606 |
| 1000 | 66,191 | 71,421 | 42,203 |
| 1050 | 74,626 | 78,409 | 56,375 |
| 1065 | 76,438 | 79,902 | 59,768 |
| 1100 | 79,739 | 82,589 | 66,287 |
| 1200 | 85,080 | 86,895 | 77,647 |
| 1300 | 87,630 | 88,886 | 83,316 |
| 1400 | 88,972 | 89,965 | 86,434 |
| 1500 | 89,862 | 90,594 | 88,262 |
| 1600 | 90,336 | 90,988 | 89,385 |
| 1700 | 90,440 | 91,105 | 89,896 |
| 1800 | 90,311 | 91,120 | 90,065 |
| 1900 | 90,100 | 91,077 | 90,064 |
| 2000 | 89,723 | 90,940 | 89,895 |
| 2100 | 89,429 | 90,824 | 89,756 |
| 2200 | 88,031 | 90,184 | 88,636 |
| 2300 | 87,553 | 89,994 | 88,339 |
| 2400 | 87,174 | 89,758 | 87,915 |
| 2500 | 85,918 | 89,136 | 86,856 |
| 2600 | 84,948 | 88,666 | 86,041 |
| 2700 | 81,705 | 86,942 | 83,135 |
| 2800 | 43,602 | 62,271 | 44,292 |
| 2900 | 37,649 | 57,974 | 38,157 |
| 3000 | 37,674 | 58,160 | 38,021 |

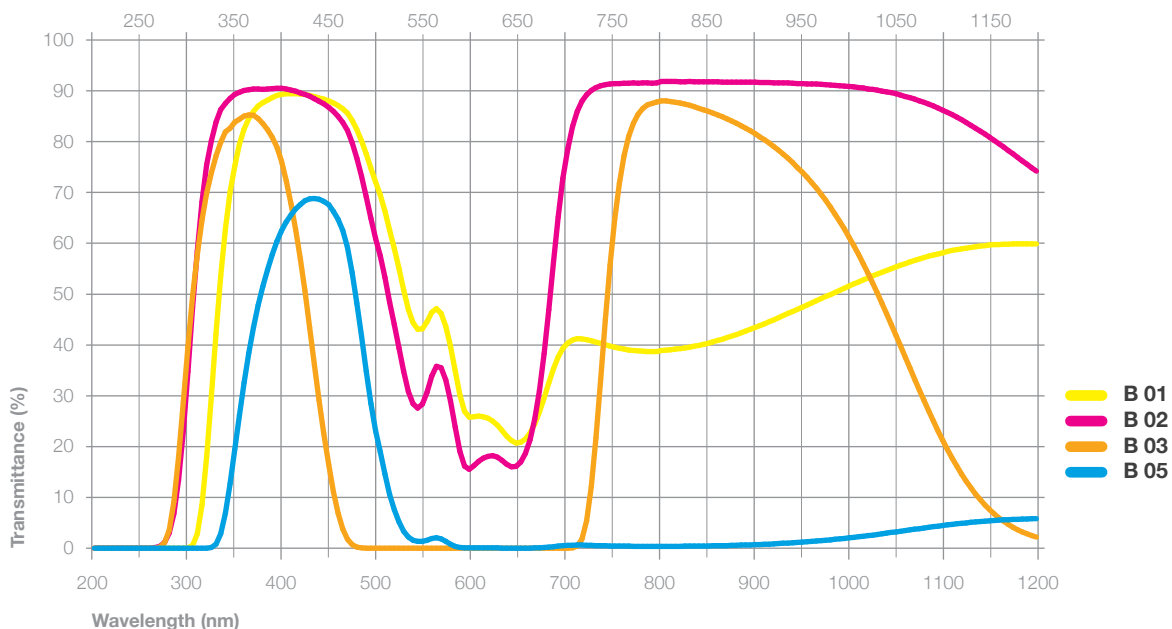
Glass Types

| | | | |
|-------------|-------------|--------|---------|
| BLUE | HEBO | Schott | Hoya |
| | B 01 | | |
| | B 02 | | ≈ B-410 |
| | B 03 | | |
| | B 05 | | ≈ B-440 |

Blue Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| B 01 | 2 mm | 1,52 | 2,51 | 477 | 550 | 93 | 1 | 3 | 3 | 0 | 1 |
| B 02 | 2 mm | 1,52 | 2,51 | 477 | 550 | 93 | 1 | 3 | 3 | 0 | 1 |
| B 03 | 2 mm | 1,52 | 2,51 | 525 | 577 | 91 | 1 | 3 | 3 | 0 | 1 |
| B 05 | 2 mm | 1,52 | 2,52 | 477 | 550 | 93 | 1 | 2 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| B 01 | 2 mm | 0,354 | 0,379 | 44,8 | 0,235 | 0,258 | 49,0 |
| B 02 | 2 mm | 0,322 | 0,334 | 28,8 | 0,210 | 0,206 | 32,6 |
| B 03 | 2 mm | 0,159 | 0,042 | 0,80 | 0,156 | 0,028 | 1,8 |
| B 05 | 2 mm | 0,143 | 0,106 | 2,80 | 0,146 | 0,146 | 5,2 |



| | B 01 | B 02 | B 03 | B 05 |
|-----------------|--------|--------------------|---------------------|--------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 200 | 0,012 | 3·10 ⁻⁴ | 8·10 ⁻⁴ | 5·10 ⁻⁴ |
| 210 | 0,012 | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ |
| 220 | 0,010 | 3·10 ⁻⁴ | 5·10 ⁻⁴ | 6·10 ⁻⁴ |
| 230 | 0,009 | 0,001 | 7·10 ⁻⁴ | 1·10 ⁻⁴ |
| 240 | 0,008 | 0,001 | 4·10 ⁻⁴ | 1·10 ⁻⁴ |
| 250 | 0,006 | 0,009 | 4·10 ⁻⁴ | 7·10 ⁻⁴ |
| 260 | 0,005 | 0,112 | 0,034 | 4·10 ⁻⁴ |
| 270 | 0,004 | 1,127 | 1,084 | 1·10 ⁻⁵ |
| 280 | 0,004 | 6,787 | 9,111 | 7·10 ⁻⁴ |
| 290 | 0,004 | 22,953 | 28,648 | 6·10 ⁻⁴ |
| 300 | 0,559 | 47,459 | 49,675 | 6·10 ⁻⁴ |
| 310 | 8,487 | 68,164 | 64,545 | 7·10 ⁻⁴ |
| 320 | 29,854 | 80,190 | 73,874 | 0,120 |
| 330 | 53,562 | 86,339 | 79,905 | 2,828 |
| 340 | 70,100 | 88,503 | 82,616 | 12,673 |
| 350 | 79,527 | 89,734 | 84,375 | 26,139 |
| 360 | 84,538 | 90,225 | 85,279 | 38,444 |
| 370 | 87,024 | 90,337 | 84,561 | 47,820 |
| 380 | 88,176 | 90,332 | 82,371 | 54,779 |
| 390 | 89,051 | 90,506 | 78,964 | 60,356 |
| 400 | 89,430 | 90,345 | 72,259 | 64,237 |
| 410 | 89,430 | 89,911 | 62,740 | 66,777 |
| 420 | 89,284 | 89,322 | 50,587 | 68,356 |
| 430 | 88,874 | 88,481 | 36,171 | 68,804 |
| 440 | 88,353 | 87,423 | 22,617 | 68,265 |
| 450 | 87,629 | 85,951 | 11,029 | 66,264 |
| 460 | 86,487 | 83,800 | 3,779 | 62,540 |
| 470 | 84,162 | 79,774 | 0,694 | 54,204 |
| 480 | 80,189 | 73,231 | 0,069 | 41,753 |
| 490 | 74,794 | 64,937 | 0,004 | 28,458 |
| 500 | 69,560 | 57,519 | 6·10 ⁻⁴ | 18,984 |
| 510 | 62,580 | 48,402 | 5·10 ⁻⁴ | 10,576 |
| 520 | 55,038 | 39,417 | 4·10 ⁻⁴ | 5,182 |
| 530 | 47,018 | 30,848 | 4·10 ⁻⁴ | 2,164 |
| 540 | 43,099 | 27,598 | 3·10 ⁻⁴ | 1,320 |
| 550 | 44,547 | 30,713 | 4·10 ⁻⁴ | 1,556 |
| 560 | 47,124 | 35,755 | 5·10 ⁻⁴ | 2,082 |
| 570 | 43,680 | 33,131 | 4·10 ⁻⁴ | 1,348 |
| 580 | 34,942 | 23,864 | 3·10 ⁻⁴ | 0,387 |
| 590 | 26,914 | 16,154 | 2·10 ⁻⁴ | 0,088 |
| 600 | 25,861 | 16,221 | 6·10 ⁻⁴ | 0,068 |
| 610 | 25,863 | 17,693 | 1·10 ⁻⁴ | 0,067 |
| 620 | 25,038 | 18,183 | 3·10 ⁻⁴ | 0,053 |
| 630 | 23,185 | 17,306 | <1·10 ⁻⁵ | 0,032 |
| 640 | 21,157 | 16,020 | 5·10 ⁻⁴ | 0,019 |
| 650 | 20,815 | 16,929 | 9·10 ⁻⁴ | 0,017 |
| 660 | 22,692 | 21,367 | 2·10 ⁻⁴ | 0,027 |
| 670 | 26,812 | 31,003 | 0,001 | 0,064 |
| 680 | 32,509 | 46,912 | 1·10 ⁻⁴ | 0,179 |
| 690 | 37,615 | 65,151 | 5·10 ⁻⁴ | 0,390 |

| | B 01 | B 02 | B 03 | B 05 |
|-----------------|--------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 700 | 40,410 | 78,666 | 0,005 | 0,561 |
| 710 | 41,214 | 85,946 | 0,410 | 0,612 |
| 720 | 41,053 | 89,234 | 5,411 | 0,584 |
| 730 | 40,568 | 90,671 | 21,770 | 0,531 |
| 740 | 40,016 | 91,210 | 44,908 | 0,481 |
| 750 | 39,519 | 91,398 | 64,725 | 0,441 |
| 760 | 39,179 | 91,483 | 77,219 | 0,412 |
| 770 | 38,914 | 91,536 | 83,635 | 0,389 |
| 780 | 38,784 | 91,548 | 86,532 | 0,377 |
| 790 | 38,707 | 91,493 | 87,554 | 0,369 |
| 800 | 38,912 | 91,822 | 88,036 | 0,387 |
| 810 | 39,034 | 91,817 | 87,897 | 0,372 |
| 820 | 39,253 | 91,811 | 87,588 | 0,377 |
| 830 | 39,572 | 91,839 | 87,157 | 0,410 |
| 840 | 39,914 | 91,759 | 86,544 | 0,436 |
| 850 | 40,356 | 91,761 | 85,963 | 0,458 |
| 900 | 43,429 | 91,686 | 81,560 | 0,705 |
| 950 | 47,421 | 91,442 | 74,003 | 1,191 |
| 1000 | 51,572 | 90,836 | 61,182 | 2,043 |
| 1050 | 55,351 | 89,405 | 41,887 | 3,199 |
| 1065 | 56,321 | 88,657 | 35,406 | 3,594 |
| 1100 | 58,142 | 86,189 | 21,193 | 4,461 |
| 1200 | 59,895 | 74,213 | 2,197 | 5,809 |
| 1300 | 61,394 | 67,089 | 0,438 | 7,237 |
| 1400 | 66,283 | 69,095 | 0,414 | 11,760 |
| 1500 | 66,602 | 64,670 | 0,266 | 12,751 |
| 1600 | 70,239 | 67,512 | 0,419 | 17,909 |
| 1700 | 72,019 | 67,879 | 0,523 | 21,323 |
| 1800 | 73,415 | 68,482 | 0,506 | 24,773 |
| 1900 | 77,675 | 74,327 | 1,233 | 35,190 |
| 2000 | 81,108 | 79,029 | 3,447 | 46,397 |
| 2100 | 83,059 | 81,926 | 6,725 | 54,604 |
| 2200 | 83,627 | 82,983 | 11,000 | 60,772 |
| 2300 | 84,340 | 83,995 | 17,593 | 66,091 |
| 2400 | 84,506 | 84,323 | 25,118 | 69,503 |
| 2500 | 83,914 | 83,561 | 30,676 | 70,702 |
| 2600 | 83,183 | 82,526 | 33,800 | 70,841 |
| 2700 | 80,659 | 79,860 | 30,521 | 69,263 |
| 2800 | 56,353 | 55,113 | 4,256 | 48,288 |
| 2900 | 52,991 | 50,265 | 5,407 | 45,327 |
| 3000 | 49,620 | 46,481 | 8,001 | 42,663 |

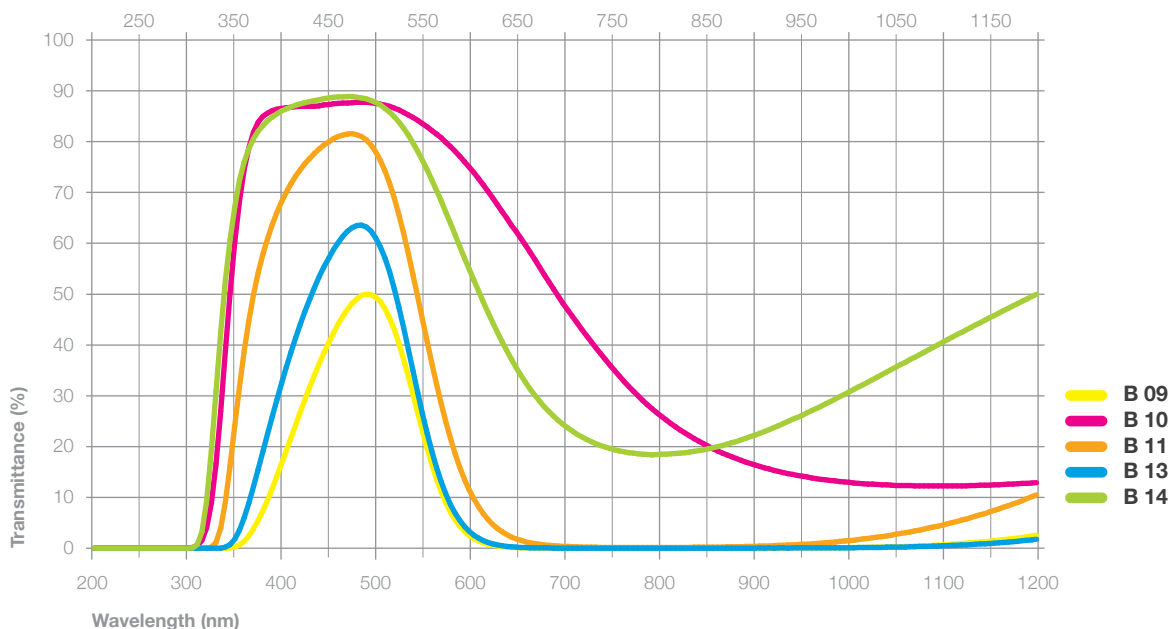
Glass Types

| | | | |
|-------------|-------------|---------|---------|
| BLUE | HEBO | Schott | Hoya |
| | B 09 | | |
| | B 10 | | |
| | B 11 | | ≈ B-460 |
| | B 13 | | |
| | B 14 | ≈ BG 14 | |

Blue Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| B 09 | 2 mm | 1,52 | 2,56 | 460 | 532 | 89 | 1 | 2 | 3 | 0 | 1 |
| B 10 | 1 mm | 1,529 | 2,63 | 540 | 606 | 84 | 1 | 2 | 4 | 0 | 1 |
| B 11 | 2 mm | 1,517 | 2,59 | 506 | 572 | 91 | 1 | 2 | 3 | 0 | 1 |
| B 13 | 2 mm | 1,522 | 2,61 | 490 | 555 | 90 | 1 | 2 | 3 | 0 | 1 |
| B 14 | 1 mm | 1,514 | 2,57 | 477 | 550 | 93 | 1 | 2 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| B 09 | 2 mm | 0,187 | 0,391 | 14,8 | 0,156 | 0,256 | 20,3 |
| B 10 | 1 mm | 0,409 | 0,417 | 74,4 | 0,283 | 0,324 | 76,6 |
| B 11 | 2 mm | 0,269 | 0,406 | 36,2 | 0,194 | 0,271 | 44,2 |
| B 13 | 2 mm | 0,189 | 0,377 | 17,3 | 0,157 | 0,242 | 23,7 |
| B 14 | 1 mm | 0,328 | 0,412 | 52,0 | 0,226 | 0,290 | 59,1 |



| | B 09 | B 10 | B 11 | B 13 | B 14 |
|-----------------|---------------------|--------------------|--------------------|---------------------|--------------------|
| Thickness (mm) | 2 | 1 | 2 | 2 | 1 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 200 | 2·10 ⁻⁴ | 3·10 ⁻⁴ | 0,001 | 1·10 ⁻⁴ | 0,007 |
| 210 | 3·10 ⁻⁴ | 0,002 | 0,001 | 6·10 ⁻⁴ | 0,008 |
| 220 | 3·10 ⁻⁴ | 0,002 | 6·10 ⁻⁴ | 2·10 ⁻⁴ | 0,004 |
| 230 | 6·10 ⁻⁴ | 0,002 | 6·10 ⁻⁴ | 8·10 ⁻⁴ | 0,003 |
| 240 | 4·10 ⁻⁴ | 0,002 | 8·10 ⁻⁴ | 3·10 ⁻⁴ | 0,002 |
| 250 | <1·10 ⁻⁵ | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 6·10 ⁻⁴ | 0,001 |
| 260 | <1·10 ⁻⁵ | 4·10 ⁻⁴ | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 0,002 |
| 270 | 3·10 ⁻⁴ | 8·10 ⁻⁴ | 4·10 ⁻⁴ | 7·10 ⁻⁴ | 0,001 |
| 280 | 6·10 ⁻⁴ | 0,001 | 3·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 290 | 1·10 ⁻⁵ | 0,010 | 1·10 ⁻⁴ | 7·10 ⁻⁴ | 9·10 ⁻⁴ |
| 300 | 4·10 ⁻⁴ | 0,154 | 1·10 ⁻⁴ | <1·10 ⁻⁵ | 0,071 |
| 310 | 4·10 ⁻⁴ | 1,557 | 0,001 | 4·10 ⁻⁴ | 3,280 |
| 320 | <1·10 ⁻⁵ | 8,873 | 0,189 | 6·10 ⁻⁴ | 19,188 |
| 330 | 0,001 | 26,951 | 3,987 | 0,027 | 42,438 |
| 340 | 0,065 | 50,244 | 16,200 | 0,693 | 60,705 |
| 350 | 0,642 | 68,269 | 31,690 | 3,538 | 72,344 |
| 360 | 2,419 | 78,765 | 44,754 | 8,890 | 78,576 |
| 370 | 5,490 | 83,822 | 54,184 | 15,545 | 82,070 |
| 380 | 9,449 | 85,623 | 60,905 | 22,452 | 84,116 |
| 390 | 14,146 | 86,360 | 66,058 | 29,227 | 85,441 |
| 400 | 19,164 | 86,699 | 70,051 | 35,570 | 86,449 |
| 410 | 24,268 | 86,871 | 73,199 | 41,377 | 87,159 |
| 420 | 29,271 | 86,971 | 75,681 | 46,626 | 87,691 |
| 430 | 34,008 | 86,975 | 77,661 | 51,265 | 88,090 |
| 440 | 38,355 | 87,210 | 79,282 | 55,299 | 88,432 |
| 450 | 42,315 | 87,486 | 80,578 | 58,723 | 88,697 |
| 460 | 45,621 | 87,604 | 81,294 | 61,352 | 88,824 |
| 470 | 48,173 | 87,672 | 81,560 | 63,079 | 88,854 |
| 480 | 49,741 | 87,770 | 81,007 | 63,549 | 88,621 |
| 490 | 49,900 | 87,691 | 79,346 | 62,423 | 88,121 |
| 500 | 48,523 | 87,381 | 76,357 | 59,296 | 87,213 |
| 510 | 45,306 | 86,954 | 71,800 | 54,340 | 85,806 |
| 520 | 40,253 | 86,248 | 65,579 | 47,358 | 83,837 |
| 530 | 33,785 | 85,226 | 57,968 | 39,141 | 81,282 |
| 540 | 26,640 | 84,186 | 49,444 | 30,628 | 78,121 |
| 550 | 19,719 | 82,931 | 40,724 | 22,671 | 74,496 |
| 560 | 13,694 | 81,510 | 32,371 | 15,925 | 70,481 |
| 570 | 8,952 | 79,894 | 24,894 | 10,678 | 66,129 |
| 580 | 5,552 | 78,099 | 18,597 | 6,863 | 61,680 |
| 590 | 3,288 | 76,074 | 13,527 | 4,253 | 57,082 |
| 600 | 1,882 | 73,886 | 9,678 | 2,568 | 52,761 |
| 610 | 1,045 | 71,495 | 6,795 | 1,509 | 48,508 |
| 620 | 0,566 | 68,925 | 4,704 | 0,869 | 44,452 |
| 630 | 0,303 | 66,262 | 3,235 | 0,495 | 40,649 |
| 640 | 0,162 | 63,600 | 2,226 | 0,283 | 37,174 |
| 650 | 0,088 | 61,017 | 1,545 | 0,163 | 34,102 |
| 660 | 0,050 | 58,272 | 1,085 | 0,096 | 31,359 |
| 670 | 0,027 | 55,355 | 0,777 | 0,058 | 28,953 |
| 680 | 0,017 | 52,441 | 0,570 | 0,036 | 26,896 |
| 690 | 0,011 | 49,582 | 0,430 | 0,023 | 25,124 |

| | B 09 | B 10 | B 11 | B 13 | B 14 |
|-----------------|--------|--------|--------|--------|--------|
| Thickness (mm) | 2 | 1 | 2 | 2 | 1 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 700 | 0,007 | 46,869 | 0,334 | 0,016 | 23,658 |
| 710 | 0,005 | 44,283 | 0,269 | 0,012 | 22,415 |
| 720 | 0,004 | 41,795 | 0,222 | 0,008 | 21,390 |
| 730 | 0,003 | 39,414 | 0,190 | 0,006 | 20,565 |
| 740 | 0,001 | 37,115 | 0,166 | 0,004 | 19,891 |
| 750 | 0,001 | 34,911 | 0,150 | 0,003 | 19,365 |
| 760 | 0,001 | 32,829 | 0,140 | 0,004 | 18,965 |
| 770 | 0,001 | 30,877 | 0,133 | 0,004 | 18,675 |
| 780 | 0,001 | 29,071 | 0,130 | 0,003 | 18,510 |
| 790 | 0,001 | 27,404 | 0,129 | 0,002 | 18,386 |
| 800 | 0,013 | 25,926 | 0,151 | 0,013 | 18,488 |
| 810 | 0,012 | 24,542 | 0,140 | 0,011 | 18,534 |
| 820 | 0,002 | 23,277 | 0,153 | 0,007 | 18,681 |
| 830 | 0,015 | 22,110 | 0,167 | 0,020 | 18,917 |
| 840 | 0,020 | 21,031 | 0,197 | 0,021 | 19,200 |
| 850 | 0,031 | 20,051 | 0,200 | 0,027 | 19,562 |
| 900 | 0,022 | 16,363 | 0,378 | 0,030 | 22,279 |
| 950 | 0,041 | 14,158 | 0,752 | 0,039 | 26,182 |
| 1000 | 0,122 | 12,940 | 1,505 | 0,101 | 30,758 |
| 1050 | 0,292 | 12,362 | 2,732 | 0,213 | 35,635 |
| 1065 | 0,379 | 12,298 | 3,214 | 0,279 | 37,113 |
| 1100 | 0,668 | 12,228 | 4,560 | 0,461 | 40,511 |
| 1200 | 2,580 | 12,912 | 10,458 | 1,758 | 49,995 |
| 1300 | 6,747 | 14,845 | 19,156 | 4,797 | 58,484 |
| 1400 | 13,337 | 18,590 | 29,449 | 10,047 | 65,575 |
| 1500 | 21,758 | 24,482 | 39,956 | 17,251 | 71,260 |
| 1600 | 30,890 | 30,992 | 49,534 | 25,577 | 75,725 |
| 1700 | 39,789 | 35,347 | 57,666 | 34,137 | 79,142 |
| 1800 | 47,826 | 36,577 | 64,198 | 42,211 | 81,696 |
| 1900 | 54,796 | 36,340 | 69,322 | 49,397 | 83,653 |
| 2000 | 60,560 | 36,499 | 73,164 | 55,442 | 85,080 |
| 2100 | 65,349 | 37,745 | 76,163 | 60,559 | 86,184 |
| 2200 | 68,065 | 39,738 | 77,579 | 64,102 | 86,669 |
| 2300 | 71,113 | 42,239 | 79,215 | 67,274 | 87,223 |
| 2400 | 73,735 | 44,156 | 80,240 | 69,777 | 87,605 |
| 2500 | 74,521 | 45,266 | 80,349 | 71,294 | 87,620 |
| 2600 | 75,372 | 46,020 | 80,340 | 72,366 | 87,554 |
| 2700 | 72,639 | 45,327 | 78,159 | 71,537 | 86,648 |
| 2800 | 28,995 | 25,360 | 48,361 | 47,775 | 72,154 |
| 2900 | 26,136 | 26,154 | 44,717 | 42,539 | 69,730 |
| 3000 | 27,887 | 27,350 | 43,901 | 38,891 | 67,742 |

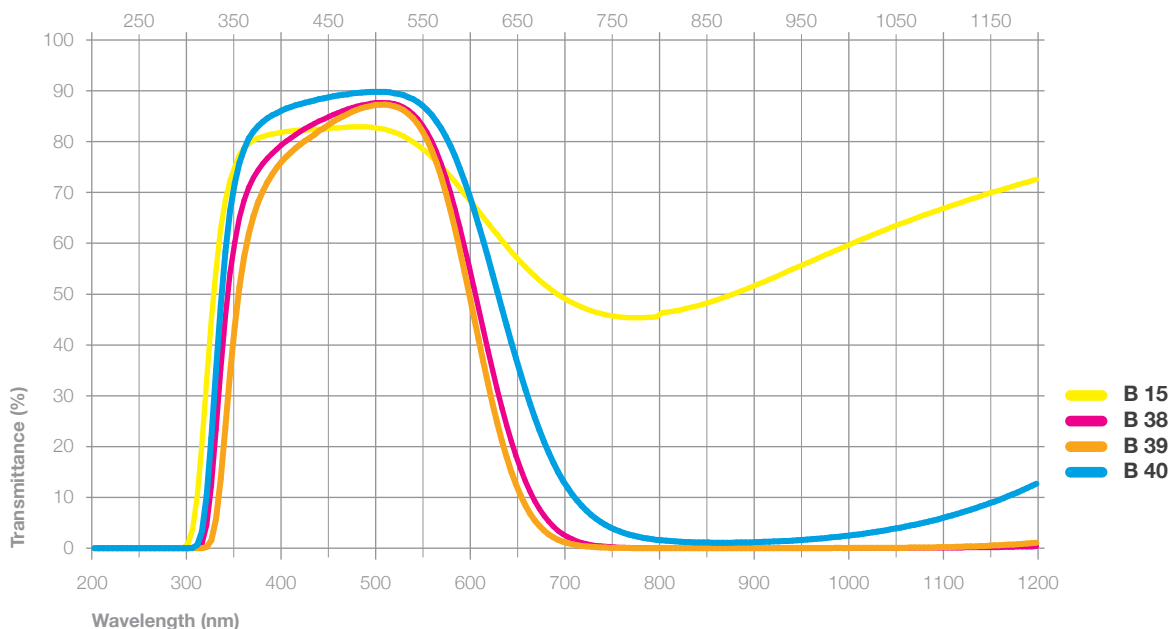
Glass Types

| | | | |
|-------------|-------------|---------|------|
| BLUE | HEBO | Schott | Hoya |
| | B 15 | | |
| | B 38 | ≈ BG 38 | |
| | B 39 | ≈ BG 39 | |
| | B 40 | ≈ BG 40 | |

Blue Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| B 15 | 1 mm | 1,52 | 2,5 | 490 | 555 | 90 | 1 | 3 | 4 | 0 | 1 |
| B 38 | 2 mm | 1,535 | 2,86 | 421 | 463 | 100 | 1 | 3 | 3 | 0 | 1 |
| B 39 | 1 mm | 1,550 | 2,75 | 417 | 489 | 94 | 1 | 3 | 3 | 0 | 1 |
| B 40 | 1 mm | 1,540 | 2,75 | 419 | 492 | 95 | 1 | 3 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------------|-----------|----------|-------|-------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| B 15 | 1 mm | 0,400 | 0,413 | 75,2 | 0,274 | 0,315 | 78,3 |
| B 38 | 2 mm | 0,345 | 0,439 | 62,10 | 0,244 | 0,326 | 68,8 |
| B 39 | 1 mm | 0,364 | 0,431 | 66,0 | 0,255 | 0,321 | 73,0 |
| B 40 | 1 mm | 0,404 | 0,422 | 77,0 | 0,282 | 0,327 | 82,0 |



| | B 15 | B 38 | B 39 | B 40 |
|-----------------|-------------|---------------------|--------------------|---------------------|
| Thickness (mm) | 1 | 2 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T | %T |
| 200 | 0,019 | 5·10 ⁻⁴ | 4·10 ⁻⁵ | 1·10 ⁻⁴ |
| 210 | 0,020 | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁴ |
| 220 | 0,014 | 5·10 ⁻⁴ | 6·10 ⁻⁴ | 2·10 ⁻⁴ |
| 230 | 0,012 | <1·10 ⁻⁵ | 3·10 ⁻⁴ | 4·10 ⁻⁴ |
| 240 | 0,010 | 7·10 ⁻⁴ | 0,001 | <1·10 ⁻⁵ |
| 250 | 0,008 | <1·10 ⁻⁵ | 0,001 | 6·10 ⁻⁴ |
| 260 | 0,006 | 8·10 ⁻⁴ | 5·10 ⁻⁴ | 3·10 ⁻⁴ |
| 270 | 0,006 | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 280 | 0,004 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 6·10 ⁻⁴ |
| 290 | 0,106 | 7·10 ⁻⁴ | 6·10 ⁻⁴ | 3·10 ⁻⁴ |
| 300 | 3,736 | 0,002 | 7·10 ⁻⁴ | 0,048 |
| 310 | 20,613 | 0,955 | 0,011 | 3,359 |
| 320 | 44,954 | 12,256 | 1,567 | 21,707 |
| 330 | 62,973 | 35,120 | 13,615 | 47,615 |
| 340 | 72,384 | 54,234 | 34,411 | 66,407 |
| 350 | 77,403 | 65,033 | 51,487 | 75,823 |
| 360 | 79,588 | 71,004 | 61,846 | 80,616 |
| 370 | 80,710 | 74,410 | 68,086 | 83,083 |
| 380 | 81,281 | 76,751 | 72,068 | 84,633 |
| 390 | 81,671 | 78,538 | 74,881 | 85,637 |
| 400 | 82,020 | 80,067 | 77,056 | 86,500 |
| 410 | 82,227 | 81,391 | 78,705 | 87,159 |
| 420 | 82,317 | 82,564 | 80,144 | 87,696 |
| 430 | 82,399 | 83,585 | 81,393 | 88,071 |
| 440 | 82,426 | 84,425 | 82,649 | 88,496 |
| 450 | 82,684 | 85,357 | 83,959 | 88,949 |
| 460 | 82,797 | 86,038 | 84,996 | 89,242 |
| 470 | 82,916 | 86,684 | 85,887 | 89,484 |
| 480 | 82,945 | 87,188 | 86,597 | 89,670 |
| 490 | 82,853 | 87,515 | 87,046 | 89,778 |
| 500 | 82,589 | 87,686 | 87,276 | 89,792 |
| 510 | 82,171 | 87,621 | 87,193 | 89,703 |
| 520 | 81,496 | 87,139 | 86,664 | 89,399 |
| 530 | 80,507 | 86,158 | 85,474 | 88,760 |
| 540 | 79,307 | 84,449 | 83,499 | 87,798 |
| 550 | 77,867 | 81,806 | 80,350 | 86,266 |
| 560 | 76,116 | 78,012 | 75,882 | 84,012 |
| 570 | 74,147 | 72,925 | 69,964 | 81,021 |
| 580 | 72,051 | 66,645 | 62,701 | 77,077 |
| 590 | 69,682 | 59,255 | 54,333 | 72,191 |
| 600 | 67,478 | 51,335 | 45,556 | 66,693 |
| 610 | 65,163 | 43,086 | 36,706 | 60,510 |
| 620 | 62,790 | 34,982 | 28,361 | 53,860 |
| 630 | 60,543 | 27,570 | 21,078 | 47,157 |
| 640 | 58,306 | 21,022 | 15,041 | 40,494 |
| 650 | 56,279 | 15,562 | 10,323 | 34,210 |
| 660 | 54,456 | 11,137 | 6,831 | 28,433 |
| 670 | 52,717 | 7,731 | 4,360 | 23,243 |
| 680 | 51,212 | 5,211 | 2,703 | 18,770 |
| 690 | 49,908 | 3,420 | 1,634 | 14,977 |

| | B 15 | B 38 | B 39 | B 40 |
|-----------------|-------------|-------------|-------------|-------------|
| Thickness (mm) | 1 | 2 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T | %T |
| 700 | 48,765 | 2,191 | 0,968 | 11,842 |
| 710 | 47,804 | 1,379 | 0,569 | 9,334 |
| 720 | 47,049 | 0,854 | 0,334 | 7,335 |
| 730 | 46,435 | 0,527 | 0,196 | 5,784 |
| 740 | 45,942 | 0,323 | 0,116 | 4,584 |
| 750 | 45,637 | 0,198 | 0,071 | 3,676 |
| 760 | 45,434 | 0,123 | 0,045 | 2,983 |
| 770 | 45,328 | 0,078 | 0,029 | 2,465 |
| 780 | 45,349 | 0,051 | 0,019 | 2,066 |
| 790 | 45,452 | 0,032 | 0,014 | 1,772 |
| 800 | 46,280 | 0,031 | 0,023 | 1,562 |
| 810 | 46,536 | 0,019 | 0,016 | 1,395 |
| 820 | 46,881 | 0,016 | 0,014 | 1,269 |
| 830 | 47,324 | 0,013 | 0,017 | 1,194 |
| 840 | 47,779 | 0,009 | 0,018 | 1,138 |
| 850 | 48,310 | 0,007 | 0,015 | 1,109 |
| 900 | 51,707 | 0,018 | 0,021 | 1,184 |
| 950 | 55,705 | 0,011 | 0,020 | 1,620 |
| 1000 | 59,708 | 0,022 | 0,053 | 2,497 |
| 1050 | 63,467 | 0,024 | 0,094 | 3,894 |
| 1065 | 64,520 | 0,043 | 0,114 | 4,436 |
| 1100 | 66,818 | 0,057 | 0,206 | 5,951 |
| 1200 | 72,558 | 0,346 | 1,080 | 12,675 |
| 1300 | 77,027 | 1,452 | 4,182 | 23,368 |
| 1400 | 80,304 | 4,787 | 11,518 | 36,784 |
| 1500 | 82,711 | 11,590 | 23,205 | 50,079 |
| 1600 | 84,439 | 21,718 | 37,098 | 61,570 |
| 1700 | 85,622 | 32,668 | 49,935 | 69,765 |
| 1800 | 86,415 | 42,032 | 60,055 | 74,986 |
| 1900 | 86,919 | 49,080 | 67,461 | 78,287 |
| 2000 | 87,282 | 53,492 | 72,300 | 79,961 |
| 2100 | 87,555 | 55,840 | 75,349 | 80,750 |
| 2200 | 87,246 | 53,221 | 74,497 | 77,816 |
| 2300 | 87,322 | 51,275 | 74,561 | 76,666 |
| 2400 | 87,286 | 50,996 | 75,703 | 77,134 |
| 2500 | 86,910 | 46,501 | 73,418 | 74,035 |
| 2600 | 86,562 | 36,350 | 66,990 | 66,606 |
| 2700 | 85,039 | 28,289 | 61,308 | 60,210 |
| 2800 | 65,127 | 1,078 | 14,468 | 11,627 |
| 2900 | 62,415 | 0,012 | 1,308 | 0,900 |
| 3000 | 61,215 | 0,013 | 0,603 | 0,404 |

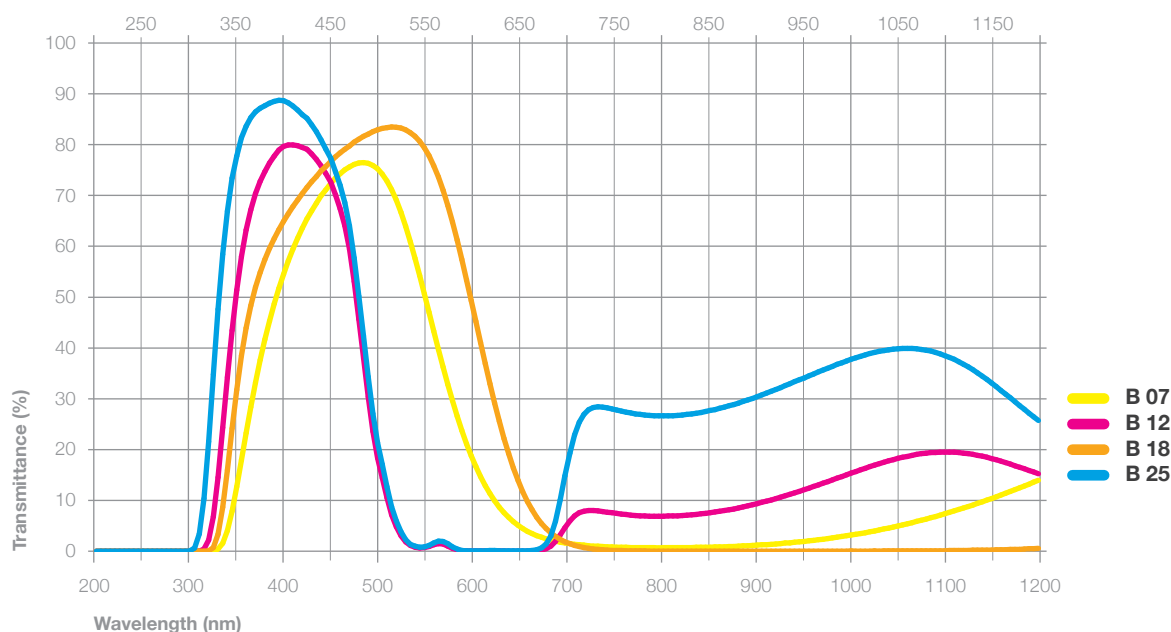
Glass Types

| | | | |
|-------------|-------------|---------|---------|
| BLUE | HEBO | Schott | Hoya |
| | B 07 | ≈ BG 7 | ≈ B-480 |
| | B 12 | ≈ BG 12 | |
| | B 18 | ≈ BG 18 | |
| | B 25 | ≈ BG 25 | ≈ B-380 |

Blue Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| B 07 | 1 mm | 1,52 | 2,56 | 477 | 550 | 93 | 1 | 2 | 3 | 0 | 1 |
| B 12 | 1 mm | 1,513 | 2,56 | 477 | 550 | 93 | 4 | 3 | 3 | 0 | 1 |
| B 18 | 1 mm | 1,536 | 2,82 | 549 | 624 | 74 | 4 | 4 | 4 | 0 | 1 |
| B 25 | 1 mm | 1,517 | 2,56 | 477 | 550 | 93 | 1 | 2 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| B 07 | 1 mm | 0,306 | 0,440 | 10,0 | 0,207 | 0,229 | 51,2 |
| B 12 | 1 mm | 0,148 | 0,084 | 1,4 | 0,148 | 0,053 | 4,75 |
| B 18 | 1 mm | 0,375 | 0,452 | 57,2 | 0,266 | 0,356 | 61,8 |
| B 25 | 1 mm | 0,158 | 0,093 | 2,1 | 0,151 | 0,070 | 4,5 |



| | B 07 | B 12 | B 18 | B 25 |
|-----------------|---------------------|---------------------|---------------------|--------------------|
| Thickness (mm) | 1 | 1 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T | %T |
| 200 | 6·10 ⁻⁴ | 1·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁵ |
| 210 | 0,001 | 2·10 ⁻⁵ | 4·10 ⁻⁴ | 3·10 ⁻⁴ |
| 220 | 2·10 ⁻⁴ | 5·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁴ |
| 230 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 3·10 ⁻⁴ |
| 240 | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 4·10 ⁻⁴ |
| 250 | 3·10 ⁻⁴ | <1·10 ⁻⁵ | <1·10 ⁻⁵ | 4·10 ⁻⁴ |
| 260 | 1·10 ⁻⁵ | 7·10 ⁻⁴ | 7·10 ⁻⁴ | 5·10 ⁻⁴ |
| 270 | 1·10 ⁻⁵ | <1·10 ⁻⁵ | 1·10 ⁻⁴ | 4·10 ⁻⁴ |
| 280 | 4·10 ⁻⁴ | 0,001 | 4·10 ⁻⁴ | 8·10 ⁻⁴ |
| 290 | 0,001 | <1·10 ⁻⁵ | 4·10 ⁻⁴ | 0,001 |
| 300 | <1·10 ⁻⁵ | 0,001 | 0,001 | 0,650 |
| 310 | 2·10 ⁻⁴ | 0,404 | 6·10 ⁻⁴ | 10,346 |
| 320 | 0,057 | 6,793 | 0,703 | 34,794 |
| 330 | 1,577 | 24,336 | 8,621 | 58,396 |
| 340 | 7,834 | 43,444 | 24,150 | 73,403 |
| 350 | 17,917 | 57,966 | 38,448 | 81,348 |
| 360 | 28,376 | 67,197 | 48,352 | 85,312 |
| 370 | 37,615 | 72,766 | 54,879 | 87,139 |
| 380 | 45,301 | 76,413 | 59,590 | 88,156 |
| 390 | 51,730 | 78,919 | 63,304 | 88,716 |
| 400 | 57,103 | 79,960 | 66,400 | 88,225 |
| 410 | 61,595 | 79,808 | 69,134 | 86,847 |
| 420 | 65,382 | 79,067 | 71,600 | 85,182 |
| 430 | 68,486 | 77,076 | 73,728 | 82,534 |
| 440 | 71,113 | 74,332 | 75,707 | 79,164 |
| 450 | 73,404 | 70,130 | 77,578 | 74,702 |
| 460 | 75,048 | 64,060 | 79,110 | 68,625 |
| 470 | 76,135 | 53,083 | 80,492 | 57,658 |
| 480 | 76,497 | 38,056 | 81,628 | 42,301 |
| 490 | 75,925 | 23,617 | 82,537 | 27,062 |
| 500 | 74,202 | 14,443 | 83,174 | 17,084 |
| 510 | 71,176 | 7,153 | 83,471 | 8,707 |
| 520 | 66,687 | 3,067 | 83,251 | 3,819 |
| 530 | 60,904 | 1,098 | 82,381 | 1,379 |
| 540 | 54,186 | 0,647 | 80,647 | 0,810 |
| 550 | 46,972 | 0,895 | 77,796 | 1,132 |
| 560 | 39,684 | 1,497 | 73,608 | 1,990 |
| 570 | 32,809 | 1,019 | 68,055 | 1,471 |
| 580 | 26,564 | 0,255 | 61,247 | 0,400 |
| 590 | 21,128 | 0,048 | 53,375 | 0,081 |
| 600 | 16,620 | 0,042 | 45,185 | 0,078 |
| 610 | 12,895 | 0,053 | 36,930 | 0,102 |
| 620 | 9,906 | 0,050 | 29,098 | 0,106 |
| 630 | 7,589 | 0,035 | 22,213 | 0,081 |
| 640 | 5,804 | 0,022 | 16,399 | 0,055 |
| 650 | 4,466 | 0,024 | 11,722 | 0,064 |
| 660 | 3,471 | 0,054 | 8,131 | 0,151 |
| 670 | 2,730 | 0,214 | 5,474 | 0,628 |
| 680 | 2,186 | 0,980 | 3,593 | 3,005 |
| 690 | 1,783 | 3,180 | 2,305 | 10,048 |

| | B 07 | B 12 | B 18 | B 25 |
|-----------------|-------------|-------------|-------------|-------------|
| Thickness (mm) | 1 | 1 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T | %T |
| 700 | 1,484 | 5,937 | 1,453 | 19,308 |
| 710 | 1,261 | 7,556 | 0,906 | 25,380 |
| 720 | 1,093 | 8,026 | 0,560 | 27,853 |
| 730 | 0,968 | 7,941 | 0,346 | 28,397 |
| 740 | 0,873 | 7,685 | 0,216 | 28,184 |
| 750 | 0,803 | 7,421 | 0,134 | 27,767 |
| 760 | 0,750 | 7,194 | 0,087 | 27,357 |
| 770 | 0,712 | 7,025 | 0,057 | 27,026 |
| 780 | 0,686 | 6,910 | 0,037 | 26,787 |
| 790 | 0,673 | 6,853 | 0,026 | 26,661 |
| 800 | 0,690 | 6,897 | 0,034 | 26,632 |
| 810 | 0,683 | 6,928 | 0,010 | 26,674 |
| 820 | 0,695 | 7,023 | 0,010 | 26,807 |
| 830 | 0,729 | 7,176 | 0,018 | 27,036 |
| 840 | 0,764 | 7,348 | 0,022 | 27,318 |
| 850 | 0,805 | 7,579 | 0,015 | 27,689 |
| 900 | 1,195 | 9,368 | 0,022 | 30,404 |
| 950 | 1,930 | 12,098 | 0,013 | 34,106 |
| 1000 | 3,174 | 15,347 | 0,040 | 37,748 |
| 1050 | 4,964 | 18,258 | 0,057 | 39,849 |
| 1065 | 5,617 | 18,867 | 0,067 | 39,899 |
| 1100 | 7,352 | 19,497 | 0,102 | 38,517 |
| 1200 | 13,978 | 15,259 | 0,534 | 25,712 |
| 1300 | 22,613 | 13,148 | 2,062 | 19,330 |
| 1400 | 32,050 | 17,714 | 6,099 | 23,860 |
| 1500 | 41,561 | 15,633 | 13,585 | 19,611 |
| 1600 | 50,129 | 20,519 | 23,960 | 24,219 |
| 1700 | 57,516 | 22,409 | 35,137 | 25,617 |
| 1800 | 63,597 | 24,836 | 45,310 | 27,447 |
| 1900 | 68,528 | 36,355 | 53,692 | 39,250 |
| 2000 | 72,389 | 48,887 | 59,956 | 52,117 |
| 2100 | 75,476 | 57,704 | 64,434 | 60,730 |
| 2200 | 77,538 | 64,479 | 65,424 | 67,080 |
| 2300 | 79,308 | 70,055 | 66,816 | 72,176 |
| 2400 | 80,727 | 73,317 | 68,667 | 75,036 |
| 2500 | 81,558 | 74,203 | 67,532 | 75,604 |
| 2600 | 82,044 | 73,876 | 62,123 | 74,919 |
| 2700 | 81,507 | 72,595 | 57,069 | 73,405 |
| 2800 | 66,110 | 59,427 | 12,350 | 62,086 |
| 2900 | 62,497 | 57,008 | 1,592 | 60,727 |
| 3000 | 59,774 | 55,418 | 1,072 | 59,288 |

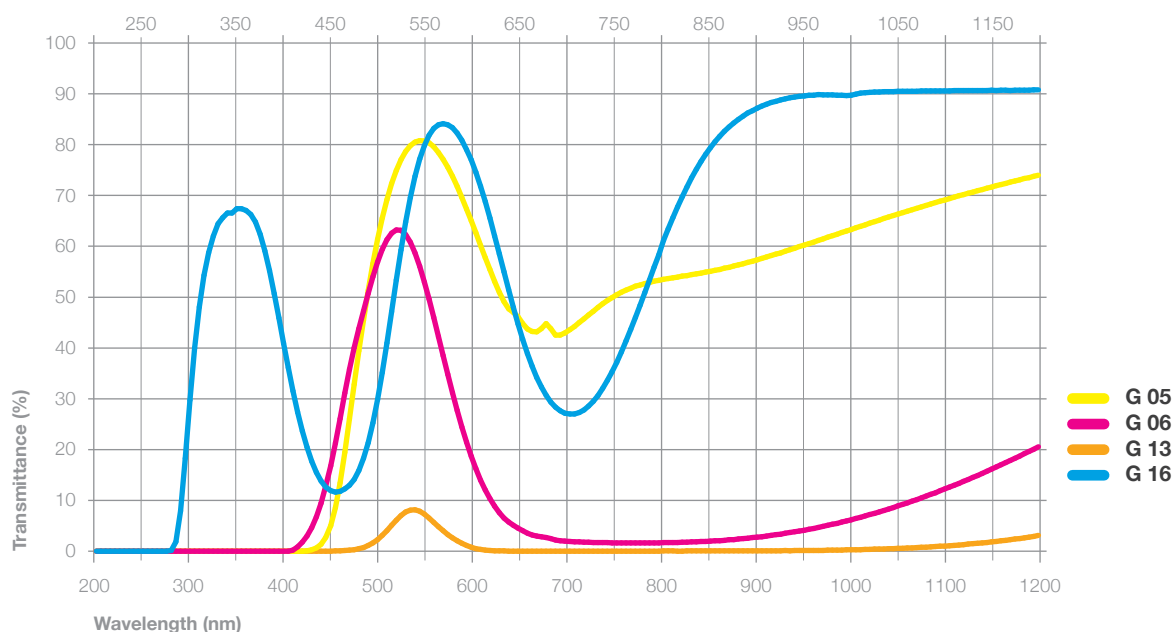
Glass Types

| | | | |
|--------------|-------------|---------|------|
| GREEN | HEBO | Schott | Hoya |
| | G 05 | ≈ VG 5 | |
| | G 06 | ≈ VG 6 | |
| | G 13 | ≈ G-545 | |
| | G 16 | | |

Green Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| G 05 | 1 mm | 1,55 | 2,85 | 458 | 526 | 104 | 1 | 2 | 3 | 0 | 1 |
| G 06 | 2 mm | 1,547 | 2,85 | 458 | 526 | 104 | 1 | 2 | 3 | 0 | 1 |
| G 13 | 2 mm | 1,527 | 2,53 | 597 | 663 | 98 | 1 | 3 | 3 | 0 | 1 |
| G 16 | 2 mm | 1,535 | 2,84 | 421 | 463 | 100 | 4 | 4 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| G 05 | 1 mm | 0,455 | 0,477 | 73,4 | 0,362 | 0,476 | 73,5 |
| G 06 | 2 mm | 0,377 | 0,543 | 40,9 | 0,299 | 0,536 | 44,8 |
| G 13 | 2 mm | 0,352 | 0,568 | 15,2 | 0,284 | 0,554 | 16,9 |
| G 16 | 2 mm | 0,484 | 0,476 | 74,0 | 0,405 | 0,483 | 70,2 |



| | G 05 | G 06 | G 13 | G 16 |
|-----------------|--------------------|---------------------|--------------------|--------------------|
| Thickness (mm) | 1 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 200 | 5·10 ⁻⁴ | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 0,002 |
| 210 | 1·10 ⁻⁴ | 5·10 ⁻⁴ | 1·10 ⁻⁴ | 0,002 |
| 220 | 0,001 | 0,001 | 8·10 ⁻⁴ | 6·10 ⁻⁴ |
| 230 | 4·10 ⁻⁴ | 7·10 ⁻⁴ | 1·10 ⁻⁴ | 1·10 ⁻⁴ |
| 240 | 7·10 ⁻⁴ | 2·10 ⁻⁴ | 8·10 ⁻⁴ | 7·10 ⁻⁴ |
| 250 | 5·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 1·10 ⁻⁴ |
| 260 | 1·10 ⁻⁴ | 0,001 | 2·10 ⁻⁴ | 2·10 ⁻⁵ |
| 270 | 5·10 ⁻⁴ | 3·10 ⁻⁴ | 5·10 ⁻⁴ | 0,002 |
| 280 | 1·10 ⁻⁴ | 4·10 ⁻⁴ | 1·10 ⁻⁴ | 1,816 |
| 290 | 4·10 ⁻⁴ | 2·10 ⁻⁵ | 4·10 ⁻⁴ | 18,271 |
| 300 | 5·10 ⁻⁴ | 8·10 ⁻⁴ | 0,001 | 39,962 |
| 310 | 3·10 ⁻⁵ | 4·10 ⁻⁴ | 2·10 ⁻⁴ | 54,292 |
| 320 | 7·10 ⁻⁴ | 3·10 ⁻⁴ | 1·10 ⁻⁴ | 61,980 |
| 330 | 0,001 | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 65,607 |
| 340 | 4·10 ⁻⁴ | 0,001 | 4·10 ⁻⁴ | 66,573 |
| 350 | 0,001 | 2·10 ⁻⁴ | 8·10 ⁻⁵ | 67,388 |
| 360 | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 2·10 ⁻⁴ | 66,232 |
| 370 | 2·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 62,360 |
| 380 | 3·10 ⁻⁴ | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 55,199 |
| 390 | 1·10 ⁻⁴ | <1·10 ⁻⁵ | 0,001 | 45,892 |
| 400 | 8·10 ⁻⁴ | 0,035 | 2·10 ⁻⁴ | 36,136 |
| 410 | 0,004 | 0,830 | 4·10 ⁻⁵ | 27,367 |
| 420 | 0,097 | 3,011 | 0,003 | 20,447 |
| 430 | 0,609 | 6,738 | 0,007 | 15,530 |
| 440 | 2,689 | 12,816 | 0,015 | 12,644 |
| 450 | 8,567 | 21,286 | 0,039 | 11,629 |
| 460 | 19,440 | 31,126 | 0,115 | 12,227 |
| 470 | 32,813 | 40,027 | 0,312 | 14,117 |
| 480 | 45,501 | 47,277 | 0,736 | 18,269 |
| 490 | 56,639 | 54,010 | 1,608 | 25,220 |
| 500 | 65,557 | 59,395 | 3,088 | 35,158 |
| 510 | 72,342 | 62,594 | 5,069 | 47,143 |
| 520 | 77,060 | 63,114 | 7,011 | 59,267 |
| 530 | 79,806 | 60,796 | 8,088 | 69,627 |
| 540 | 80,812 | 56,030 | 7,847 | 77,158 |
| 550 | 80,349 | 49,579 | 6,523 | 81,861 |
| 560 | 78,446 | 42,228 | 4,811 | 83,880 |
| 570 | 75,575 | 34,773 | 3,275 | 83,920 |
| 580 | 71,781 | 27,708 | 2,044 | 82,307 |
| 590 | 67,358 | 21,452 | 1,110 | 79,029 |
| 600 | 62,641 | 16,234 | 0,521 | 74,554 |
| 610 | 57,767 | 12,029 | 0,222 | 68,790 |
| 620 | 53,057 | 8,847 | 0,093 | 62,029 |
| 630 | 49,105 | 6,551 | 0,043 | 54,986 |
| 640 | 46,957 | 5,112 | 0,027 | 47,995 |
| 650 | 44,757 | 4,010 | 0,017 | 41,703 |
| 660 | 43,221 | 3,214 | 0,012 | 36,407 |
| 670 | 43,779 | 2,800 | 0,012 | 32,282 |
| 680 | 43,764 | 2,460 | 0,013 | 29,362 |
| 690 | 42,505 | 2,054 | 0,010 | 27,615 |

| | G 05 | G 06 | G 13 | G 16 |
|-----------------|-------------|-------------|-------------|-------------|
| Thickness (mm) | 1 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T |
| 700 | 43,589 | 1,907 | 0,011 | 26,971 |
| 710 | 44,992 | 1,813 | 0,011 | 27,290 |
| 720 | 46,494 | 1,752 | 0,013 | 28,538 |
| 730 | 47,976 | 1,708 | 0,014 | 30,645 |
| 740 | 49,331 | 1,676 | 0,016 | 33,567 |
| 750 | 50,443 | 1,654 | 0,017 | 37,156 |
| 760 | 51,392 | 1,637 | 0,018 | 41,365 |
| 770 | 52,128 | 1,628 | 0,017 | 45,986 |
| 780 | 52,640 | 1,622 | 0,020 | 50,864 |
| 790 | 53,154 | 1,633 | 0,020 | 55,888 |
| 800 | 53,512 | 1,680 | 0,045 | 61,148 |
| 810 | 53,815 | 1,701 | 0,042 | 65,604 |
| 820 | 54,122 | 1,745 | 0,034 | 69,763 |
| 830 | 54,412 | 1,807 | 0,042 | 73,473 |
| 840 | 54,727 | 1,889 | 0,036 | 76,690 |
| 850 | 55,082 | 1,985 | 0,050 | 79,399 |
| 900 | 57,329 | 2,755 | 0,062 | 87,171 |
| 950 | 60,220 | 4,138 | 0,123 | 89,595 |
| 1000 | 63,310 | 6,182 | 0,274 | 89,741 |
| 1050 | 66,330 | 8,895 | 0,555 | 90,480 |
| 1065 | 67,211 | 9,833 | 0,659 | 90,538 |
| 1100 | 69,132 | 12,246 | 1,027 | 90,584 |
| 1200 | 73,973 | 20,557 | 3,089 | 90,758 |
| 1300 | 77,805 | 30,199 | 7,154 | 90,837 |
| 1400 | 80,720 | 39,902 | 12,629 | 90,787 |
| 1500 | 83,019 | 48,763 | 18,870 | 90,118 |
| 1600 | 84,713 | 56,365 | 24,971 | 89,618 |
| 1700 | 85,899 | 62,567 | 29,933 | 88,132 |
| 1800 | 86,716 | 67,409 | 33,423 | 86,002 |
| 1900 | 87,211 | 71,133 | 36,106 | 84,155 |
| 2000 | 87,546 | 73,857 | 38,798 | 82,060 |
| 2100 | 87,644 | 76,012 | 41,946 | 80,282 |
| 2200 | 87,239 | 76,861 | 44,944 | 76,197 |
| 2300 | 87,139 | 77,643 | 48,569 | 72,110 |
| 2400 | 86,930 | 78,190 | 51,837 | 70,919 |
| 2500 | 86,352 | 78,133 | 54,282 | 66,895 |
| 2600 | 85,832 | 77,845 | 56,493 | 59,616 |
| 2700 | 83,836 | 76,017 | 56,687 | 52,758 |
| 2800 | 58,693 | 51,538 | 31,372 | 17,939 |
| 2900 | 56,141 | 43,140 | 30,218 | 1,182 |
| 3000 | 53,223 | 38,141 | 32,177 | 0,198 |

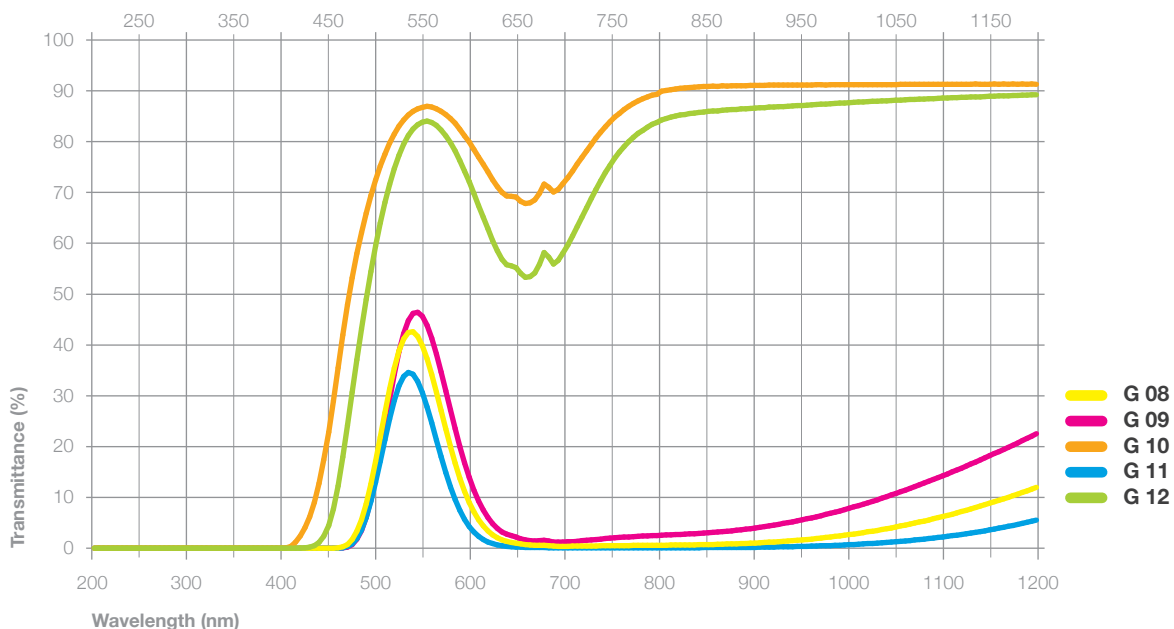
Glass Types

| GREEN | HEBO | Schott | Hoya |
|-------|------|---------|---------|
| | G 08 | ≈ VG 8 | ≈ G-533 |
| | G 09 | ≈ VG 9 | |
| | G 10 | ≈ VG 10 | |
| | G 11 | ≈ VG 11 | |
| | G 12 | | ≈ G-550 |

Green Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| G 08 | 2 mm | 1,55 | 2,85 | 458 | 526 | 104 | 1 | 2 | 3 | 0 | 1 |
| G 09 | 2 mm | 1,524 | 2,52 | 535 | 599 | 96 | 1 | 3 | 3 | 0 | 1 |
| G 10 | 2 mm | 1,547 | 2,85 | 458 | 526 | 104 | 1 | 2 | 3 | 0 | 1 |
| G 11 | 2 mm | 1,524 | 2,52 | 535 | 599 | 96 | 1 | 2 | 3 | 0 | 1 |
| G 12 | 2 mm | 1,547 | 2,85 | 458 | 526 | 104 | 1 | 3 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| G 08 | 2 mm | 0,360 | 0,603 | 25,6 | 0,308 | 0,629 | 28,4 |
| G 09 | 2 mm | 0,328 | 0,593 | 24,6 | 0,268 | 0,586 | 28,2 |
| G 10 | 2 mm | 0,462 | 0,452 | 86,7 | 0,353 | 0,429 | 85,2 |
| G 11 | 2 mm | 0,250 | 0,669 | 9,7 | 0,216 | 0,658 | 11,9 |
| G 12 | 2 mm | 0,472 | 0,477 | 79,2 | 0,383 | 0,495 | 77,6 |



| | G 08 | G 09 | G 10 | G 11 | G 12 |
|-----------------|--------------------|---------------------|--------------------|---------------------|--------------------|
| Thickness (mm) | 2 | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 200 | 6·10 ⁻⁵ | 4·10 ⁻⁴ | 0,001 | 9·10 ⁻⁵ | 0,001 |
| 210 | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 0,001 | 1·10 ⁻⁴ | 0,001 |
| 220 | 0,002 | 6·10 ⁻⁴ | 0,001 | 0,001 | 3·10 ⁻⁴ |
| 230 | 4·10 ⁻⁴ | 4·10 ⁻⁴ | 0,003 | <1·10 ⁻⁵ | 0,001 |
| 240 | 0,001 | 3·10 ⁻⁴ | 0,002 | 4·10 ⁻⁴ | 6·10 ⁻⁴ |
| 250 | 6·10 ⁻⁴ | 1·10 ⁻⁴ | 0,003 | 2·10 ⁻⁴ | 0,001 |
| 260 | 3·10 ⁻⁴ | 4·10 ⁻⁴ | 0,002 | 3·10 ⁻⁴ | 0,001 |
| 270 | 1·10 ⁻⁴ | 4·10 ⁻⁴ | 0,001 | 1·10 ⁻⁴ | 0,001 |
| 280 | 1·10 ⁻⁴ | 1·10 ⁻⁴ | 0,001 | 5·10 ⁻⁴ | 1·10 ⁻⁴ |
| 290 | 7·10 ⁻⁴ | 6·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁴ |
| 300 | 2·10 ⁻⁵ | 0,001 | 8·10 ⁻⁴ | 5·10 ⁻⁴ | 8·10 ⁻⁴ |
| 310 | 2·10 ⁻⁵ | 4·10 ⁻⁴ | 7·10 ⁻⁴ | 7·10 ⁻⁴ | 7·10 ⁻⁴ |
| 320 | 7·10 ⁻⁴ | 2·10 ⁻⁴ | 0,006 | 7·10 ⁻⁴ | 1·10 ⁻⁴ |
| 330 | 3·10 ⁻⁴ | 6·10 ⁻⁴ | 0,004 | 0,001 | 5·10 ⁻⁴ |
| 340 | 2·10 ⁻⁴ | 6·10 ⁻⁵ | 1·10 ⁻⁴ | 3·10 ⁻⁴ | 6·10 ⁻⁴ |
| 350 | 7·10 ⁻⁵ | <1·10 ⁻⁵ | 0,001 | 2·10 ⁻⁴ | 4·10 ⁻⁴ |
| 360 | 4·10 ⁻⁴ | 3·10 ⁻⁴ | 2·10 ⁻⁴ | 4·10 ⁻⁴ | 5·10 ⁻⁴ |
| 370 | 5·10 ⁻⁵ | 3·10 ⁻⁴ | 9·10 ⁻⁴ | 6·10 ⁻⁴ | 3·10 ⁻⁵ |
| 380 | 6·10 ⁻⁴ | 8·10 ⁻⁴ | 6·10 ⁻⁴ | 5·10 ⁻⁴ | 5·10 ⁻⁵ |
| 390 | 2·10 ⁻⁴ | 5·10 ⁻⁴ | 9·10 ⁻⁴ | 3·10 ⁻⁴ | 3·10 ⁻⁵ |
| 400 | 6·10 ⁻⁴ | <1·10 ⁻⁵ | 0,057 | 2·10 ⁻⁴ | 4·10 ⁻⁴ |
| 410 | 3·10 ⁻⁴ | <1·10 ⁻⁵ | 1,179 | 2·10 ⁻⁴ | 0,003 |
| 420 | 3·10 ⁻⁴ | 3·10 ⁻⁴ | 4,055 | 6·10 ⁻⁴ | 0,081 |
| 430 | 2·10 ⁻⁴ | 0,001 | 9,024 | 2·10 ⁻⁴ | 0,516 |
| 440 | 3·10 ⁻⁴ | 0,001 | 17,338 | 1·10 ⁻⁴ | 2,354 |
| 450 | 0,013 | 0,001 | 28,994 | 0,002 | 7,707 |
| 460 | 0,254 | 0,058 | 41,930 | 0,089 | 17,897 |
| 470 | 1,704 | 0,735 | 53,231 | 0,881 | 30,699 |
| 480 | 5,621 | 3,466 | 62,076 | 3,602 | 43,127 |
| 490 | 12,643 | 9,567 | 69,387 | 9,186 | 54,456 |
| 500 | 21,849 | 18,718 | 75,186 | 17,074 | 63,987 |
| 510 | 31,326 | 29,205 | 79,703 | 25,450 | 71,614 |
| 520 | 38,808 | 38,663 | 83,035 | 31,958 | 77,343 |
| 530 | 42,423 | 44,804 | 85,258 | 34,573 | 81,235 |
| 540 | 41,647 | 46,442 | 86,496 | 32,831 | 83,342 |
| 550 | 37,272 | 43,861 | 86,955 | 27,815 | 84,026 |
| 560 | 30,682 | 38,187 | 86,467 | 21,290 | 83,170 |
| 570 | 23,441 | 30,993 | 85,330 | 14,895 | 81,181 |
| 580 | 16,722 | 23,506 | 83,625 | 9,562 | 78,188 |
| 590 | 11,180 | 16,799 | 81,164 | 5,685 | 74,209 |
| 600 | 7,126 | 11,415 | 78,481 | 3,182 | 69,796 |
| 610 | 4,373 | 7,496 | 75,519 | 1,701 | 65,121 |
| 620 | 2,639 | 4,853 | 72,478 | 0,891 | 60,558 |
| 630 | 1,629 | 3,211 | 70,019 | 0,479 | 56,842 |
| 640 | 1,156 | 2,466 | 69,214 | 0,303 | 55,576 |
| 650 | 0,815 | 1,871 | 68,270 | 0,189 | 54,058 |
| 660 | 0,608 | 1,501 | 67,931 | 0,128 | 53,408 |
| 670 | 0,553 | 1,483 | 69,834 | 0,107 | 55,814 |
| 680 | 0,494 | 1,408 | 71,004 | 0,090 | 57,271 |
| 690 | 0,387 | 1,175 | 70,620 | 0,064 | 56,596 |

| | G 08 | G 09 | G 10 | G 11 | G 12 |
|-----------------|--------|--------|--------|--------|--------|
| Thickness (mm) | 2 | 2 | 2 | 2 | 2 |
| Wavelength (nm) | %T | %T | %T | %T | %T |
| 700 | 0,385 | 1,249 | 72,924 | 0,062 | 59,684 |
| 710 | 0,401 | 1,381 | 75,594 | 0,062 | 63,262 |
| 720 | 0,424 | 1,536 | 78,189 | 0,064 | 66,983 |
| 730 | 0,452 | 1,711 | 80,695 | 0,067 | 70,594 |
| 740 | 0,478 | 1,880 | 82,953 | 0,070 | 73,932 |
| 750 | 0,500 | 2,036 | 84,811 | 0,071 | 76,726 |
| 760 | 0,518 | 2,170 | 86,317 | 0,074 | 79,027 |
| 770 | 0,534 | 2,285 | 87,524 | 0,074 | 80,872 |
| 780 | 0,549 | 2,386 | 88,425 | 0,078 | 82,225 |
| 790 | 0,563 | 2,463 | 89,133 | 0,079 | 83,381 |
| 800 | 0,595 | 2,570 | 89,907 | 0,090 | 84,277 |
| 810 | 0,605 | 2,648 | 90,231 | 0,089 | 84,815 |
| 820 | 0,612 | 2,724 | 90,479 | 0,098 | 85,231 |
| 830 | 0,653 | 2,800 | 90,638 | 0,100 | 85,532 |
| 840 | 0,677 | 2,905 | 90,778 | 0,100 | 85,758 |
| 850 | 0,729 | 3,049 | 90,833 | 0,124 | 85,944 |
| 900 | 1,013 | 3,972 | 91,061 | 0,170 | 86,586 |
| 950 | 1,651 | 5,573 | 91,143 | 0,347 | 87,124 |
| 1000 | 2,665 | 7,850 | 91,181 | 0,683 | 87,649 |
| 1050 | 4,186 | 10,775 | 91,243 | 1,270 | 88,143 |
| 1065 | 4,729 | 11,751 | 91,250 | 1,505 | 88,286 |
| 1100 | 6,233 | 14,256 | 91,266 | 2,219 | 88,565 |
| 1200 | 11,966 | 22,506 | 91,316 | 5,502 | 89,219 |
| 1300 | 19,505 | 31,639 | 91,344 | 10,843 | 89,725 |
| 1400 | 27,895 | 40,567 | 91,248 | 17,856 | 89,976 |
| 1500 | 36,409 | 48,817 | 91,351 | 25,818 | 90,314 |
| 1600 | 44,363 | 55,928 | 91,309 | 33,935 | 90,488 |
| 1700 | 51,367 | 61,824 | 91,114 | 41,635 | 90,413 |
| 1800 | 57,312 | 66,549 | 90,763 | 48,491 | 90,120 |
| 1900 | 62,214 | 70,285 | 90,378 | 54,418 | 89,766 |
| 2000 | 66,082 | 73,082 | 89,861 | 59,320 | 89,260 |
| 2100 | 69,035 | 75,146 | 89,231 | 63,241 | 88,592 |
| 2200 | 70,798 | 76,091 | 88,027 | 66,047 | 87,245 |
| 2300 | 72,622 | 77,195 | 87,360 | 68,668 | 86,543 |
| 2400 | 73,837 | 77,866 | 86,610 | 70,600 | 85,737 |
| 2500 | 74,207 | 77,789 | 85,431 | 71,699 | 84,412 |
| 2600 | 74,514 | 77,698 | 84,450 | 72,638 | 83,339 |
| 2700 | 71,774 | 75,022 | 81,246 | 70,903 | 79,835 |
| 2800 | 32,187 | 39,219 | 48,317 | 34,620 | 43,695 |
| 2900 | 29,680 | 35,626 | 45,028 | 32,142 | 40,385 |
| 3000 | 26,888 | 32,141 | 41,196 | 29,304 | 36,741 |

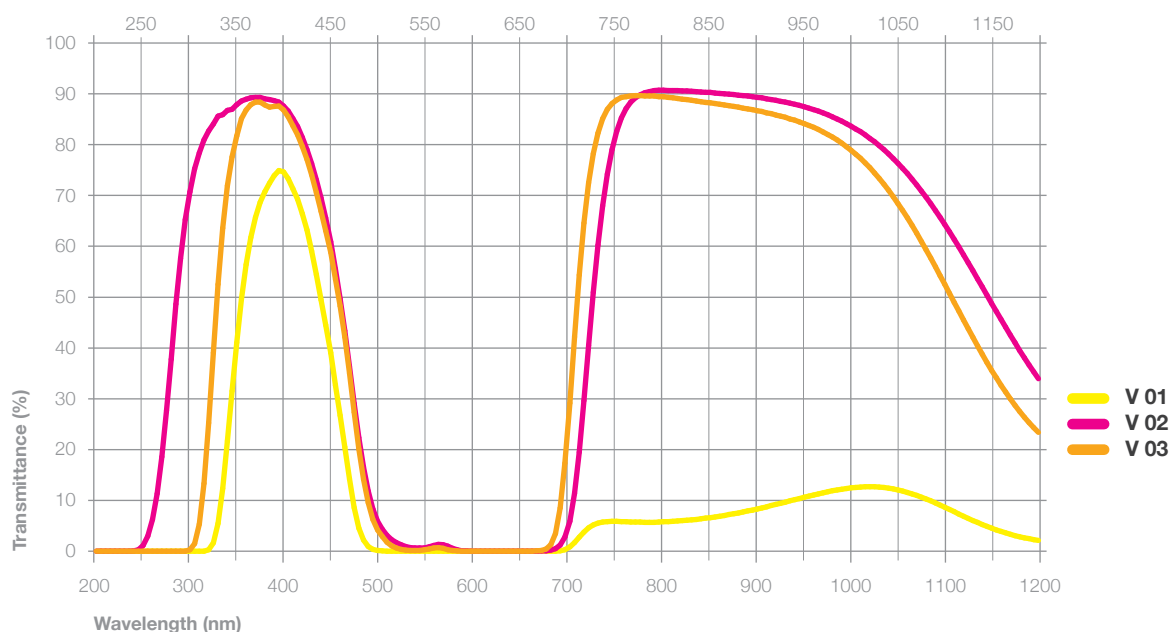
Glass Types

| | | | |
|---------------|-------------|--------|---------|
| VIOLET | HEBO | Schott | Hoya |
| | V 01 | | ≈ B-390 |
| | V 02 | ≈ BG 3 | |
| | V 03 | | ≈ B-370 |

Violet Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|-------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| V 01 | 2 mm | 1,52 | 2,53 | 519 | 589 | 89 | 1 | 3 | 3 | 0 | 1 |
| V 02 | 1 mm | 1,495 | 2,40 | 551 | 655 | 58 | 1 | 2 | 3 | 0 | 1 |
| V 03 | 2 mm | 1,495 | 2,40 | 538 | 636 | 57 | 1 | 2 | 3 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|-------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| V 01 | 2 mm | 0,519 | 0,018 | 0,2 | 0,160 | 0,016 | 0,6 |
| V 02 | 1 mm | 0,152 | 0,034 | 1,0 | 0,154 | 0,027 | 1,4 |
| V 03 | 2 mm | 0,165 | 0,011 | 0,1 | 0,166 | 0,010 | 0,2 |



| | V 01 | V 02 | V 03 |
|-----------------|--------------------|--------------------|--------------------|
| Thickness (mm) | 2 | 1 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 200 | 3·10 ⁻⁴ | 9·10 ⁻⁵ | 9·10 ⁻⁴ |
| 210 | 5·10 ⁻⁴ | 2·10 ⁻⁴ | 6·10 ⁻⁵ |
| 220 | 0,001 | 4·10 ⁻⁴ | 0,001 |
| 230 | 8·10 ⁻⁴ | 0,003 | 7·10 ⁻⁴ |
| 240 | 6·10 ⁻⁴ | 0,294 | 9·10 ⁻⁴ |
| 250 | 2·10 ⁻⁴ | 3,008 | 5·10 ⁻⁴ |
| 260 | 1·10 ⁻⁴ | 11,353 | 9·10 ⁻⁵ |
| 270 | 0,001 | 27,735 | 4·10 ⁻⁴ |
| 280 | 3·10 ⁻⁴ | 48,600 | 7·10 ⁻⁴ |
| 290 | 4·10 ⁻⁴ | 65,270 | 0,027 |
| 300 | 0,001 | 75,251 | 1,487 |
| 310 | 0,022 | 80,908 | 13,305 |
| 320 | 1,655 | 84,059 | 39,036 |
| 330 | 12,339 | 85,922 | 63,554 |
| 340 | 31,542 | 86,984 | 77,626 |
| 350 | 49,576 | 88,614 | 85,092 |
| 360 | 61,722 | 89,224 | 87,853 |
| 370 | 68,663 | 89,329 | 88,384 |
| 380 | 72,422 | 88,878 | 87,362 |
| 390 | 74,933 | 88,375 | 87,614 |
| 400 | 73,308 | 86,607 | 85,456 |
| 410 | 69,229 | 83,541 | 81,939 |
| 420 | 63,243 | 79,053 | 77,135 |
| 430 | 54,408 | 73,052 | 70,620 |
| 440 | 44,539 | 65,554 | 63,075 |
| 450 | 32,698 | 55,497 | 53,605 |
| 460 | 20,492 | 43,365 | 42,165 |
| 470 | 8,574 | 29,061 | 27,388 |
| 480 | 2,187 | 16,517 | 14,209 |
| 490 | 0,378 | 8,320 | 6,261 |
| 500 | 0,068 | 4,287 | 2,880 |
| 510 | 0,006 | 2,258 | 1,036 |
| 520 | 4·10 ⁻⁴ | 1,266 | 0,380 |
| 530 | 7·10 ⁻⁵ | 0,742 | 0,162 |
| 540 | 7·10 ⁻⁵ | 0,602 | 0,169 |
| 550 | 8·10 ⁻⁴ | 0,820 | 0,413 |
| 560 | 8·10 ⁻⁴ | 1,321 | 0,679 |
| 570 | 6·10 ⁻⁴ | 1,001 | 0,306 |
| 580 | 9·10 ⁻⁴ | 0,273 | 0,045 |
| 590 | 8·10 ⁻⁴ | 0,043 | 0,007 |
| 600 | 9·10 ⁻⁴ | 0,017 | 0,006 |
| 610 | 3·10 ⁻⁴ | 0,016 | 0,011 |
| 620 | 0,001 | 0,021 | 0,014 |
| 630 | 6·10 ⁻⁴ | 0,020 | 0,012 |
| 640 | 3·10 ⁻⁴ | 0,016 | 0,009 |
| 650 | 5·10 ⁻⁴ | 0,012 | 0,010 |
| 660 | 4·10 ⁻⁴ | 0,017 | 0,028 |
| 670 | 0,001 | 0,042 | 0,150 |
| 680 | 6·10 ⁻⁴ | 0,195 | 1,251 |
| 690 | 0,073 | 1,172 | 8,518 |

| | V 01 | V 02 | V 03 |
|-----------------|--------|--------|--------|
| Thickness (mm) | 2 | 1 | 2 |
| Wavelength (nm) | %T | %T | %T |
| 700 | 0,848 | 5,887 | 29,130 |
| 710 | 2,773 | 19,487 | 54,365 |
| 720 | 4,585 | 40,494 | 72,514 |
| 730 | 5,532 | 60,250 | 82,311 |
| 740 | 5,843 | 74,233 | 86,949 |
| 750 | 5,859 | 82,652 | 88,824 |
| 760 | 5,789 | 87,101 | 89,469 |
| 770 | 5,717 | 89,262 | 89,652 |
| 780 | 5,688 | 90,232 | 89,611 |
| 790 | 5,704 | 90,665 | 89,595 |
| 800 | 5,792 | 90,686 | 89,425 |
| 810 | 5,886 | 90,658 | 89,215 |
| 820 | 6,009 | 90,592 | 88,963 |
| 830 | 6,166 | 90,502 | 88,715 |
| 840 | 6,370 | 90,376 | 88,471 |
| 850 | 6,621 | 90,295 | 88,228 |
| 900 | 8,304 | 89,286 | 86,650 |
| 950 | 10,605 | 87,420 | 84,143 |
| 1000 | 12,467 | 83,621 | 78,897 |
| 1050 | 12,065 | 76,341 | 68,410 |
| 1065 | 11,292 | 73,232 | 64,105 |
| 1100 | 8,641 | 64,290 | 52,483 |
| 1200 | 2,114 | 33,981 | 23,414 |
| 1300 | 1,437 | 19,243 | 17,880 |
| 1400 | 1,945 | 19,229 | 18,893 |
| 1500 | 1,164 | 16,306 | 14,235 |
| 1600 | 2,107 | 17,743 | 17,953 |
| 1700 | 2,288 | 19,478 | 18,318 |
| 1800 | 2,721 | 19,875 | 19,252 |
| 1900 | 6,403 | 27,083 | 27,530 |
| 2000 | 13,454 | 37,797 | 37,968 |
| 2100 | 21,481 | 46,203 | 46,697 |
| 2200 | 30,379 | 52,747 | 54,106 |
| 2300 | 39,821 | 60,006 | 61,220 |
| 2400 | 46,401 | 65,875 | 65,534 |
| 2500 | 48,638 | 68,837 | 66,389 |
| 2600 | 48,619 | 70,111 | 66,007 |
| 2700 | 46,606 | 65,190 | 63,002 |
| 2800 | 24,052 | 22,061 | 30,391 |
| 2900 | 22,111 | 24,906 | 27,798 |
| 3000 | 23,351 | 30,432 | 29,424 |

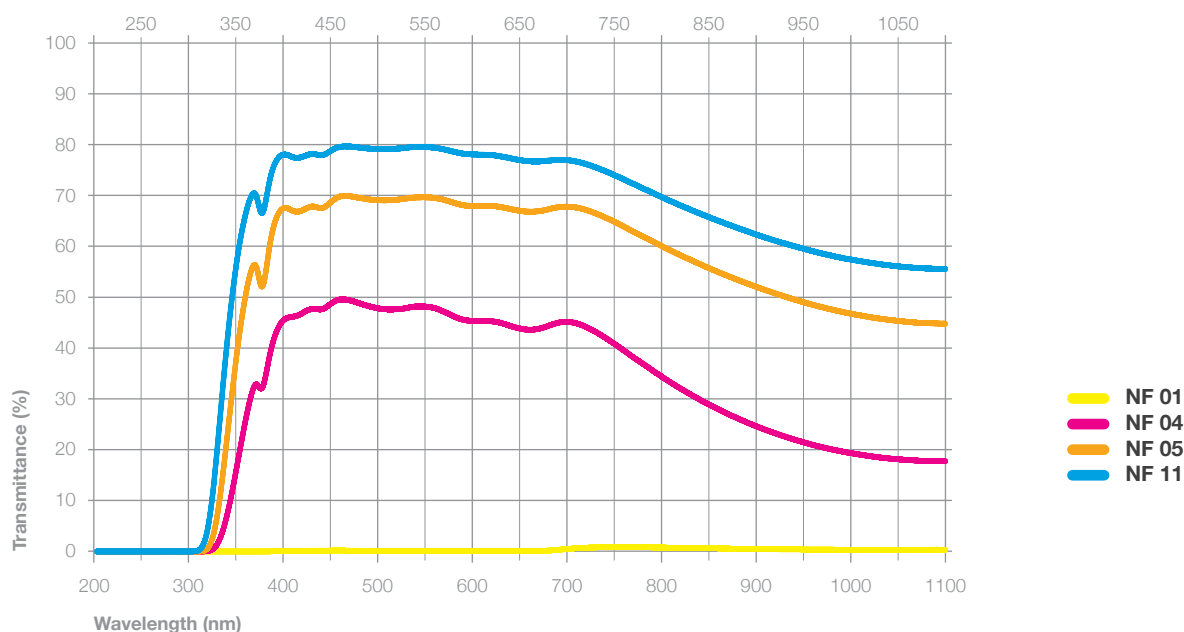
Glass Types

| | | |
|------------------------|--------------|---------|
| NEUTRAL DENSITY | HEBO | Schott |
| | NF 01 | ≈ NG 1 |
| | NF 04 | ≈ NG 4 |
| | NF 05 | ≈ NG 5 |
| | NF 11 | ≈ NG 11 |

Neutral Density Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| NF 01 | 1 mm | 1,53 | 2,46 | 469 | 582 | 65 | 5 | 3 | 3 | 0 | 1 |
| NF 04 | 1 mm | 1,502 | 2,41 | 469 | 582 | 65 | 5 | 3 | 3 | 0 | 1 |
| NF 05 | 1 mm | 1,502 | 2,41 | 469 | 582 | 65 | 5 | 3 | 3 | 0 | 1 |
| NF 11 | 1 mm | 1,502 | 2,41 | 469 | 582 | 65 | 5 | 3 | 3 | 0 | 1 |

| Type | Thickness | v (mired) | |
|--------------|-----------|-----------|---------|
| | | Standard | Range |
| NF 01 | 1 mm | 1,0 | 0 - 4 |
| NF 04 | 1 mm | 50,0 | 43 - 57 |
| NF 05 | 1 mm | 68,0 | 61 - 75 |
| NF 11 | 1 mm | 81,0 | 74 - 88 |



| | NF 01 | NF 04 | NF 05 | NF 11 |
|-----------------|--------|--------|--------|--------|
| Thickness (mm) | 1 | 1 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T | %T |
| 190 | 0,004 | 0,003 | 0,003 | 0,010 |
| 200 | 0,001 | 0,002 | 0,003 | 0,004 |
| 210 | 0,001 | 0,004 | 0,002 | 0,005 |
| 220 | 0,001 | 0,002 | 0,002 | 0,003 |
| 230 | 0,000 | 0,002 | 0,001 | 0,003 |
| 240 | 0,000 | 0,001 | 0,002 | 0,003 |
| 250 | 0,001 | 0,004 | 0,005 | 0,007 |
| 260 | 0,001 | 0,001 | 0,002 | 0,006 |
| 270 | -0,001 | 0,002 | 0,002 | 0,008 |
| 280 | 0,001 | 0,003 | 0,004 | 0,008 |
| 290 | 0,005 | 0,003 | 0,006 | 0,015 |
| 300 | 0,000 | 0,005 | 0,009 | 0,013 |
| 310 | 0,002 | 0,006 | 0,013 | 0,174 |
| 320 | 0,000 | 0,063 | 0,578 | 4,184 |
| 330 | 0,004 | 1,335 | 6,636 | 19,454 |
| 340 | 0,009 | 6,568 | 21,104 | 39,572 |
| 350 | 0,002 | 15,574 | 37,303 | 55,728 |
| 360 | 0,003 | 25,491 | 50,040 | 66,137 |
| 370 | -0,001 | 32,629 | 56,415 | 70,482 |
| 380 | 0,011 | 33,269 | 53,182 | 67,520 |
| 390 | 0,028 | 41,629 | 63,953 | 75,774 |
| 400 | 0,065 | 45,444 | 67,531 | 78,135 |
| 410 | 0,102 | 46,188 | 67,112 | 77,653 |
| 420 | 0,136 | 46,867 | 67,136 | 77,664 |
| 430 | 0,170 | 47,699 | 67,900 | 78,244 |
| 440 | 0,177 | 47,643 | 67,635 | 78,011 |
| 450 | 0,196 | 48,683 | 68,705 | 78,823 |
| 460 | 0,208 | 49,588 | 69,881 | 79,648 |
| 470 | 0,189 | 49,429 | 69,964 | 79,746 |
| 480 | 0,156 | 48,881 | 69,641 | 79,529 |
| 490 | 0,126 | 48,294 | 69,341 | 79,324 |
| 500 | 0,107 | 47,866 | 69,171 | 79,236 |
| 510 | 0,093 | 47,642 | 69,156 | 79,229 |
| 520 | 0,091 | 47,661 | 69,271 | 79,316 |
| 530 | 0,098 | 47,897 | 69,479 | 79,482 |
| 540 | 0,112 | 48,193 | 69,699 | 79,621 |
| 550 | 0,116 | 48,189 | 69,732 | 79,612 |
| 560 | 0,104 | 47,894 | 69,602 | 79,499 |
| 570 | 0,081 | 47,195 | 69,250 | 79,167 |
| 580 | 0,062 | 46,300 | 68,683 | 78,720 |
| 590 | 0,052 | 45,615 | 68,188 | 78,336 |
| 600 | 0,054 | 45,392 | 68,033 | 78,174 |
| 610 | 0,060 | 45,395 | 68,045 | 78,120 |
| 620 | 0,067 | 45,313 | 68,041 | 78,046 |
| 630 | 0,072 | 44,974 | 67,821 | 77,785 |
| 640 | 0,071 | 44,404 | 67,452 | 77,418 |
| 650 | 0,076 | 43,882 | 67,080 | 77,061 |
| 660 | 0,089 | 43,650 | 66,897 | 76,819 |
| 670 | 0,124 | 43,823 | 66,984 | 76,797 |
| 680 | 0,204 | 44,385 | 67,346 | 76,949 |

| | NF 01 | NF 04 | NF 05 | NF 11 |
|-----------------|-------|--------|--------|--------|
| Thickness (mm) | 1 | 1 | 1 | 1 |
| Wavelength (nm) | %T | %T | %T | %T |
| 690 | 0,348 | 44,971 | 67,756 | 77,083 |
| 700 | 0,526 | 45,168 | 67,890 | 77,033 |
| 710 | 0,688 | 44,898 | 67,720 | 76,760 |
| 720 | 0,802 | 44,217 | 67,261 | 76,281 |
| 730 | 0,874 | 43,251 | 66,605 | 75,654 |
| 740 | 0,911 | 42,127 | 65,819 | 74,929 |
| 750 | 0,926 | 40,879 | 64,929 | 74,126 |
| 760 | 0,927 | 39,581 | 63,978 | 73,264 |
| 770 | 0,917 | 38,237 | 63,001 | 72,390 |
| 780 | 0,899 | 36,964 | 62,068 | 71,508 |
| 790 | 0,875 | 35,689 | 61,101 | 70,651 |
| 800 | 0,849 | 34,435 | 60,159 | 69,810 |
| 810 | 0,819 | 33,227 | 59,225 | 68,951 |
| 820 | 0,783 | 32,076 | 58,319 | 68,128 |
| 830 | 0,749 | 30,985 | 57,480 | 67,346 |
| 840 | 0,715 | 29,933 | 56,624 | 66,577 |
| 850 | 0,681 | 28,938 | 55,804 | 65,825 |
| 860 | 0,647 | 27,984 | 55,011 | 65,097 |
| 870 | 0,616 | 27,079 | 54,256 | 64,401 |
| 880 | 0,585 | 26,233 | 53,515 | 63,722 |
| 890 | 0,558 | 25,425 | 52,810 | 63,073 |
| 900 | 0,529 | 24,657 | 52,131 | 62,425 |
| 910 | 0,502 | 23,932 | 51,457 | 61,781 |
| 920 | 0,479 | 23,263 | 50,828 | 61,193 |
| 930 | 0,459 | 22,635 | 50,224 | 60,660 |
| 940 | 0,442 | 22,042 | 49,631 | 60,110 |
| 950 | 0,424 | 21,493 | 49,091 | 59,612 |
| 960 | 0,410 | 20,977 | 48,557 | 59,111 |
| 970 | 0,402 | 20,522 | 48,089 | 58,656 |
| 980 | 0,389 | 20,086 | 47,636 | 58,225 |
| 990 | 0,375 | 19,705 | 47,214 | 57,821 |
| 1000 | 0,367 | 19,365 | 46,832 | 57,478 |
| 1010 | 0,360 | 19,057 | 46,490 | 57,167 |
| 1020 | 0,354 | 18,768 | 46,163 | 56,855 |
| 1030 | 0,351 | 18,521 | 45,877 | 56,587 |
| 1040 | 0,346 | 18,316 | 45,631 | 56,344 |
| 1050 | 0,352 | 18,137 | 45,419 | 56,131 |
| 1060 | 0,354 | 17,999 | 45,227 | 55,960 |
| 1070 | 0,357 | 17,893 | 45,057 | 55,802 |
| 1080 | 0,357 | 17,818 | 44,949 | 55,693 |
| 1090 | 0,364 | 17,785 | 44,907 | 55,662 |
| 1100 | 0,372 | 17,792 | 44,839 | 55,620 |

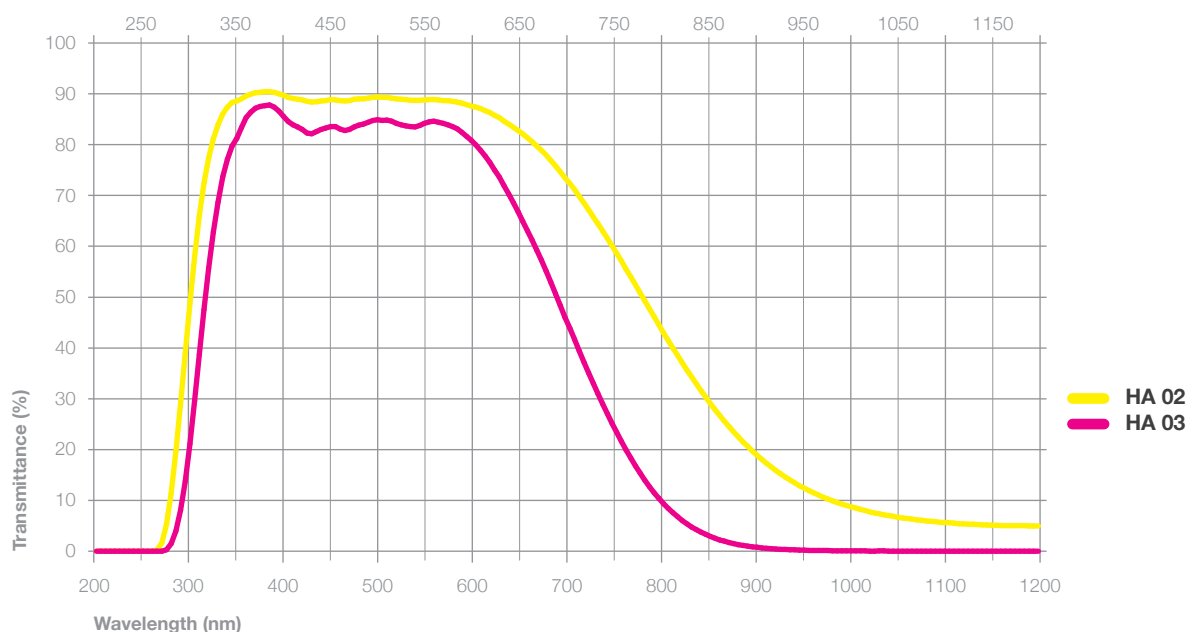
Glass Types

| | | | |
|---------------------------|--------------|--------|---------|
| HEAT ABSORBING | HEBO | Schott | Hoya |
| | HA 02 | | |
| | HA 03 | ≈ KG 3 | ≈ HA-30 |

Heat Absorbing Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm ³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|------------------------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| HA 02 | 2 mm | 1,51 | 2,54 | 587 | 656 | 59 | 3 | 2 | 4 | 0 | 1 |
| HA 03 | 2 mm | 1,512 | 2,55 | 587 | 656 | 59 | 2 | 3 | 4 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|--------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| HA 02 | 2 mm | 0,440 | 0,441 | 93,9 | 0,331 | 0,331 | 92,9 |
| HA 03 | 2 mm | 0,440 | 0,413 | 86,5 | 0,311 | 0,334 | 87,4 |



| | HA 02 | HA 03 |
|-----------------|--------------------|--------------------|
| Thickness (mm) | 2 | 2 |
| Wavelength (nm) | %T | %T |
| 200 | 0,001 | 8·10 ⁻⁴ |
| 210 | 3·10 ⁻⁴ | 2·10 ⁻⁴ |
| 220 | 0,001 | 5·10 ⁻⁴ |
| 230 | 0,001 | 0,002 |
| 240 | 4·10 ⁻⁴ | 6·10 ⁻⁴ |
| 250 | 4·10 ⁻⁴ | 7·10 ⁻⁴ |
| 260 | 0,257 | 8·10 ⁻⁴ |
| 270 | 5,316 | 0,288 |
| 280 | 19,641 | 3,999 |
| 290 | 39,011 | 13,765 |
| 300 | 57,968 | 29,632 |
| 310 | 72,430 | 47,530 |
| 320 | 81,126 | 62,757 |
| 330 | 86,021 | 73,659 |
| 340 | 88,274 | 79,725 |
| 350 | 89,006 | 83,329 |
| 360 | 89,965 | 86,387 |
| 370 | 90,308 | 87,503 |
| 380 | 90,434 | 87,804 |
| 390 | 89,985 | 86,640 |
| 400 | 89,331 | 84,549 |
| 410 | 88,970 | 83,469 |
| 420 | 88,499 | 82,270 |
| 430 | 88,465 | 82,555 |
| 440 | 88,661 | 83,273 |
| 450 | 88,833 | 83,587 |
| 460 | 88,574 | 82,753 |
| 470 | 88,933 | 83,519 |
| 480 | 89,023 | 84,077 |
| 490 | 89,293 | 84,773 |
| 500 | 89,269 | 84,787 |
| 510 | 89,190 | 84,613 |
| 520 | 88,935 | 83,928 |
| 530 | 88,741 | 83,524 |
| 540 | 88,714 | 83,736 |
| 550 | 88,886 | 84,493 |
| 560 | 88,824 | 84,434 |
| 570 | 88,676 | 83,914 |
| 580 | 88,393 | 83,114 |
| 590 | 87,860 | 81,676 |
| 600 | 87,380 | 79,961 |
| 610 | 86,695 | 77,757 |
| 620 | 85,753 | 75,005 |
| 630 | 84,643 | 71,948 |
| 640 | 83,434 | 68,586 |
| 650 | 82,118 | 64,950 |
| 660 | 80,564 | 61,203 |
| 670 | 78,860 | 57,252 |
| 680 | 76,912 | 52,956 |
| 690 | 74,728 | 48,402 |

| | HA 02 | HA 03 |
|-----------------|--------|--------|
| Thickness (mm) | 2 | 2 |
| Wavelength (nm) | %T | %T |
| 700 | 72,330 | 43,858 |
| 710 | 69,829 | 39,393 |
| 720 | 67,178 | 35,063 |
| 730 | 64,414 | 30,979 |
| 740 | 61,555 | 27,065 |
| 750 | 58,606 | 23,361 |
| 760 | 55,525 | 19,928 |
| 770 | 52,410 | 16,797 |
| 780 | 49,220 | 13,972 |
| 790 | 46,122 | 11,500 |
| 800 | 42,928 | 9,328 |
| 810 | 39,982 | 7,564 |
| 820 | 37,091 | 6,040 |
| 830 | 34,290 | 4,767 |
| 840 | 31,619 | 3,753 |
| 850 | 29,072 | 2,897 |
| 900 | 18,877 | 0,760 |
| 950 | 12,408 | 0,187 |
| 1000 | 8,702 | 0,058 |
| 1050 | 6,675 | 0,016 |
| 1065 | 6,290 | 0,011 |
| 1100 | 5,649 | 0,020 |
| 1200 | 4,969 | 0,022 |
| 1300 | 5,288 | 0,002 |
| 1400 | 6,372 | 0,041 |
| 1500 | 8,373 | 0,051 |
| 1600 | 11,282 | 0,090 |
| 1700 | 13,998 | 0,206 |
| 1800 | 15,155 | 0,291 |
| 1900 | 14,640 | 0,272 |
| 2000 | 13,587 | 0,194 |
| 2100 | 12,894 | 0,186 |
| 2200 | 12,444 | 0,144 |
| 2300 | 13,575 | 0,183 |
| 2400 | 15,864 | 0,280 |
| 2500 | 17,980 | 0,484 |
| 2600 | 18,981 | 0,807 |
| 2700 | 19,392 | 1,221 |
| 2800 | 1,716 | 0,776 |
| 2900 | 0,230 | 0,525 |
| 3000 | 0,153 | 0,455 |

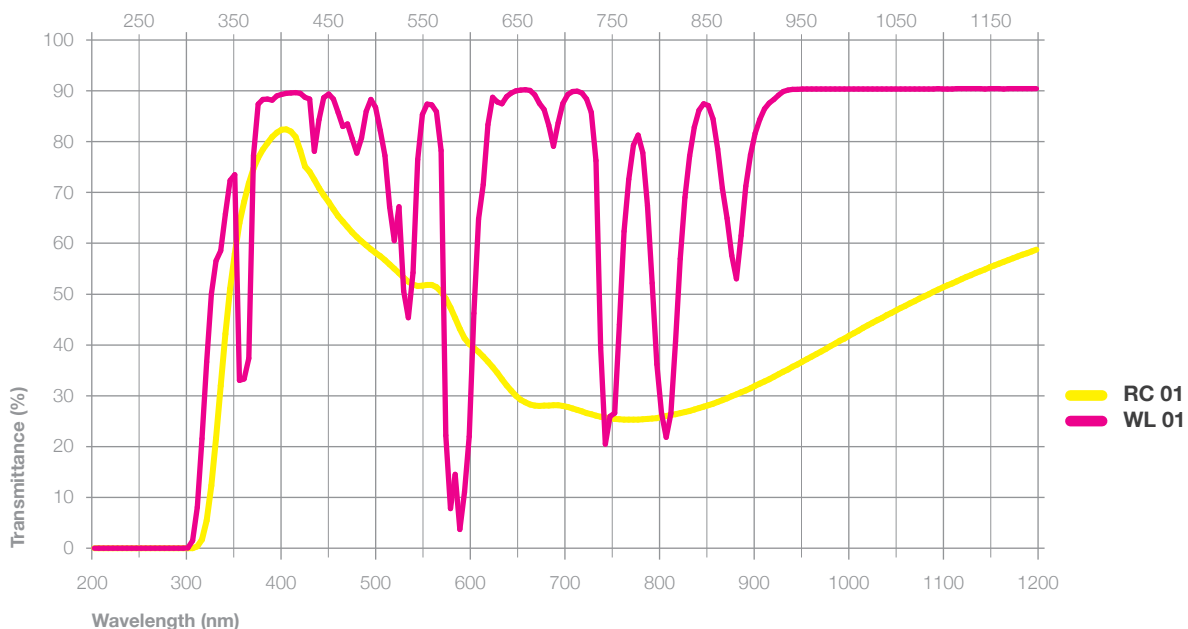
Glass Types

| | | | |
|---|--------------|---------|--------|
| RISING COLOR / WAVELENGTH CALIBRATED | HEBO | Schott | Hoya |
| | RC 01 | | |
| | WL 01 | ≈ BG 20 | ≈ V-10 |

Rising Color and Wavelength Calibrated Glass Characteristics

| Type | Thickness | n (587,6 nm) | ρ (g/cm³) | T _g (°C) | T _s (°C) | α × 10 ⁻⁷ (°C) | D _A | D _W | Bubbles | Homogeneity | Striae |
|--------------|-----------|--------------|-----------|---------------------|---------------------|---------------------------|----------------|----------------|---------|-------------|--------|
| RC 01 | 1 mm | 1,52 | 2,57 | 602 | 672 | 102 | 2 | 4 | 3 | 0 | 1 |
| WL 01 | 1 mm | 1,537 | 2,81 | 598 | 669 | 90 | 2 | 1 | 4 | 0 | 1 |

| Type | Thickness | A(2856K) | | | D ₆₅ | | |
|--------------|-----------|----------|-------|------|-----------------|-------|------|
| | | x | y | Y(%) | x | y | Y(%) |
| RC 01 | 1 mm | | | | | | |
| WL 01 | 1 mm | 0,443 | 0,387 | 64,1 | 0,291 | 0,305 | 64,6 |



| | RC 01 | WL 01 |
|-----------------|----------------------|----------------------|
| Thickness (mm) | 1 | 1 |
| Wavelength (nm) | %T | %T |
| 200 | 0,003 | 0,001 |
| 210 | 0,001 | 1 · 10 ⁻⁴ |
| 220 | 0,001 | 0,001 |
| 230 | 0,004 | 0,002 |
| 240 | 0,003 | 0,001 |
| 250 | 0,003 | 0,001 |
| 260 | 0,001 | 4 · 10 ⁻⁴ |
| 270 | 0,001 | 0,001 |
| 280 | 5 · 10 ⁻⁴ | 0,002 |
| 290 | 0,001 | 0,001 |
| 300 | 0,032 | 1,521 |
| 310 | 1,691 | 21,513 |
| 320 | 12,300 | 49,940 |
| 330 | 31,986 | 58,558 |
| 340 | 51,001 | 72,374 |
| 350 | 64,015 | 33,046 |
| 360 | 71,767 | 37,342 |
| 370 | 76,821 | 87,387 |
| 380 | 79,763 | 88,349 |
| 390 | 81,790 | 88,983 |
| 400 | 82,391 | 89,489 |
| 410 | 80,968 | 89,630 |
| 420 | 75,119 | 88,738 |
| 430 | 72,492 | 78,107 |
| 440 | 69,452 | 88,690 |
| 450 | 66,666 | 88,358 |
| 460 | 64,252 | 83,022 |
| 470 | 62,171 | 80,588 |
| 480 | 60,351 | 80,728 |
| 490 | 58,848 | 88,280 |
| 500 | 57,471 | 82,237 |
| 510 | 55,826 | 67,156 |
| 520 | 54,164 | 67,165 |
| 530 | 52,420 | 45,352 |
| 540 | 51,617 | 76,460 |
| 550 | 51,821 | 87,419 |
| 560 | 51,357 | 85,930 |
| 570 | 49,117 | 22,170 |
| 580 | 45,316 | 14,520 |
| 590 | 41,321 | 11,031 |
| 600 | 39,416 | 46,191 |
| 610 | 37,737 | 71,584 |
| 620 | 35,619 | 88,729 |
| 630 | 33,259 | 87,466 |
| 640 | 30,942 | 89,579 |
| 650 | 29,230 | 90,180 |
| 660 | 28,311 | 90,103 |
| 670 | 28,015 | 87,516 |
| 680 | 28,088 | 83,173 |
| 690 | 28,108 | 83,695 |

| | RC 01 | WL 01 |
|-----------------|--------|--------|
| Thickness (mm) | 1 | 1 |
| Wavelength (nm) | %T | %T |
| 700 | 27,776 | 89,289 |
| 710 | 27,213 | 89,903 |
| 720 | 26,610 | 88,404 |
| 730 | 26,088 | 76,238 |
| 740 | 25,711 | 20,487 |
| 750 | 25,456 | 26,605 |
| 760 | 25,323 | 62,387 |
| 770 | 25,289 | 79,287 |
| 780 | 25,362 | 77,821 |
| 790 | 25,523 | 52,152 |
| 800 | 25,884 | 26,590 |
| 810 | 26,189 | 26,524 |
| 820 | 26,581 | 56,978 |
| 830 | 27,026 | 77,190 |
| 840 | 27,585 | 86,211 |
| 850 | 28,142 | 87,127 |
| 900 | 31,932 | 81,660 |
| 950 | 36,683 | 90,336 |
| 1000 | 41,789 | 90,343 |
| 1050 | 46,764 | 90,363 |
| 1065 | 48,192 | 90,360 |
| 1100 | 51,284 | 90,394 |
| 1200 | 58,728 | 90,447 |
| 1300 | 65,072 | 90,448 |
| 1400 | 70,472 | 90,326 |
| 1500 | 73,987 | 90,165 |
| 1600 | 77,492 | 86,786 |
| 1700 | 79,678 | 88,816 |
| 1800 | 81,429 | 89,927 |
| 1900 | 83,455 | 89,990 |
| 2000 | 84,991 | 89,870 |
| 2100 | 86,061 | 89,583 |
| 2200 | 86,372 | 88,488 |
| 2300 | 86,975 | 83,295 |
| 2400 | 87,279 | 69,719 |
| 2500 | 87,123 | 74,364 |
| 2600 | 87,003 | 78,878 |
| 2700 | 85,650 | 82,293 |
| 2800 | 64,734 | 54,296 |
| 2900 | 61,952 | 49,942 |
| 3000 | 62,500 | 47,935 |