

PHOTOMETRIC TEST REPORT

MINIMA PRO ROUND
ADJUSTABLE - MATT WHITE -
4000467

astro

MINIMA PRO ROUND ADJUSTABLE - MATT

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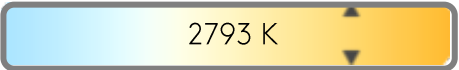
LIGHT EFFICIENCY:



LIGHT QUALITY:



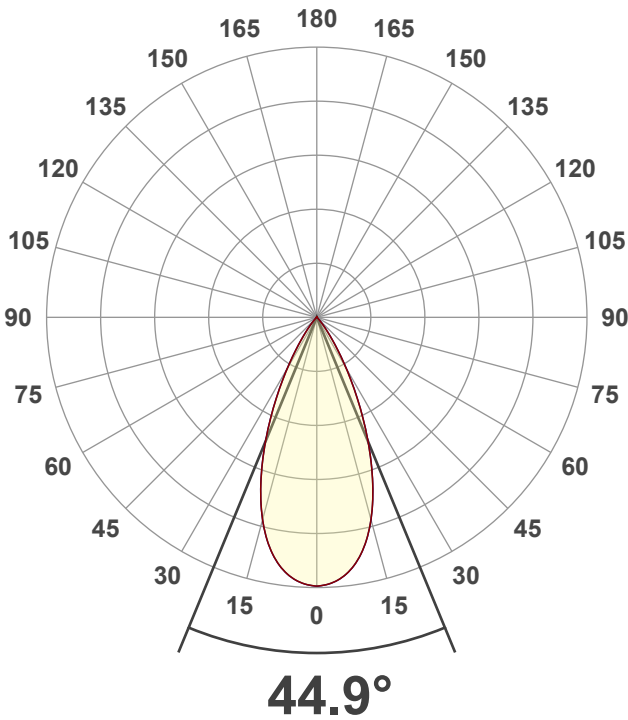
COLOR TEMPERATURE:



OUTPUT: 1173 lm
PEAK: 2087 cd
POWER: 11.7 W
PF: 0.95

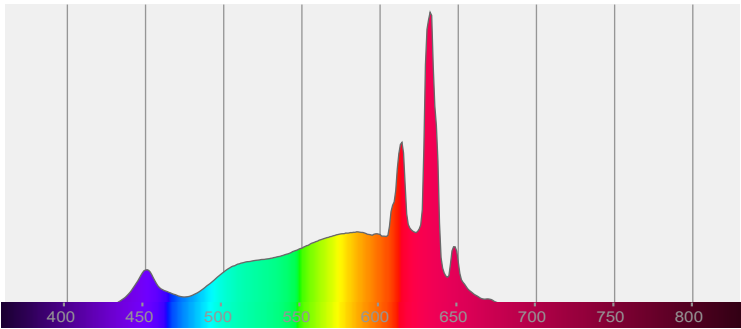


Tracking number: [n/a](#)
Product name:
Minima Pro Round Adjustable - Matt
White - 4000467
Item number:
MRA-MW-HE27G1-50G1-X-D1
Date and time:
17/01/2025 14:43:51
Description:
IP20 LED Downlight

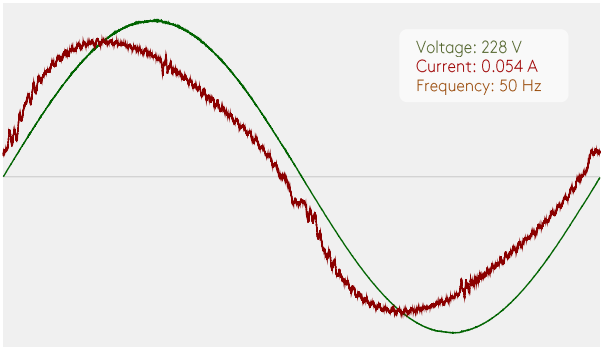


CIE 1931
x: 0.454
y: 0.412

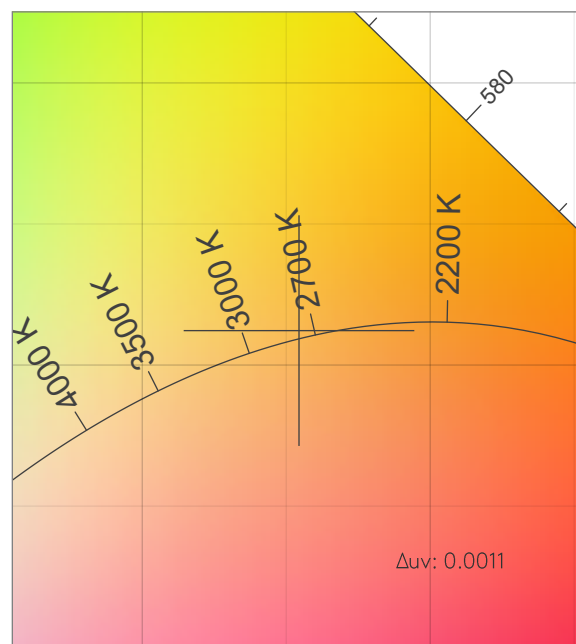
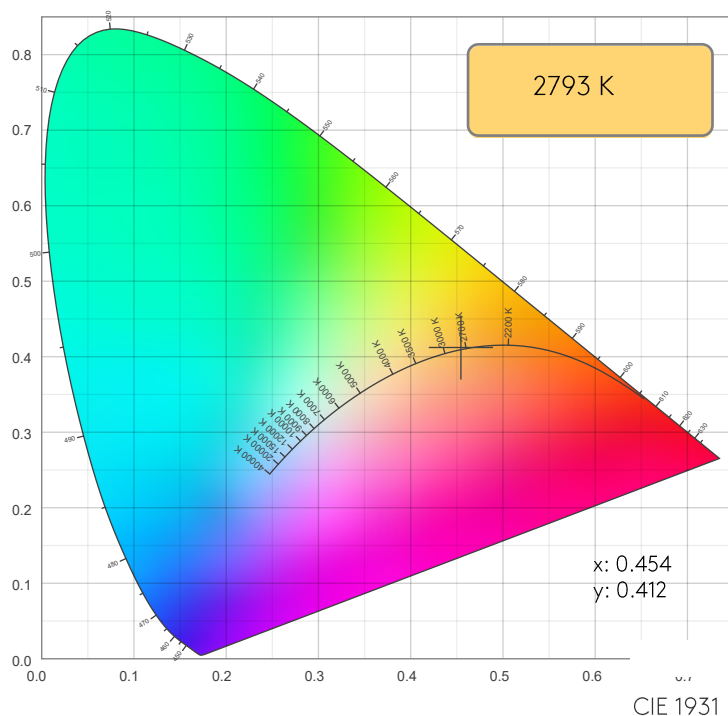
SPECTRA



POWER

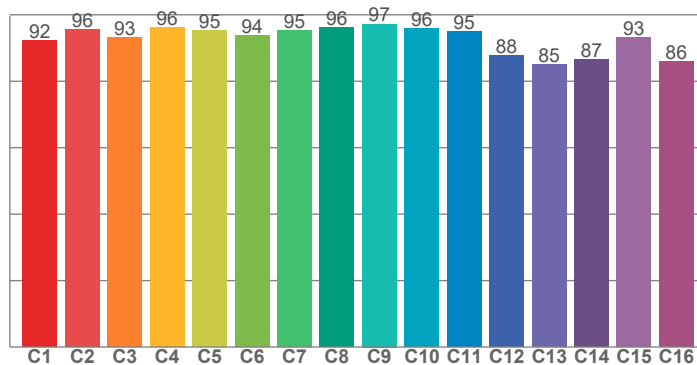


COLOR DETAILS

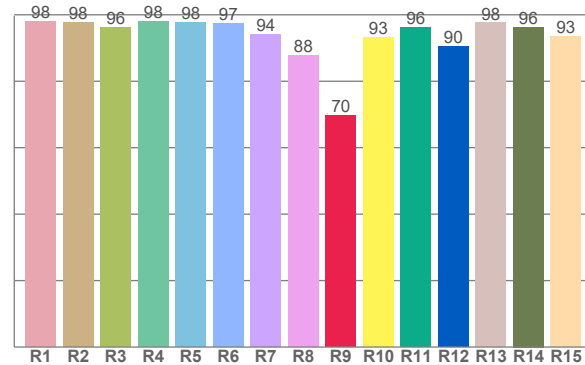


CIE 1931 ZOOM

TM30: 93.2



CRI: 95.9 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 98.1 | 97.8 | 96.3 | 97.9 | 97.7 | 97.3 | 94.1 | 87.8 | 69.7 | 93.1 | 96.2 | 90.5 | 97.6 | 96.3 | 93.4 |

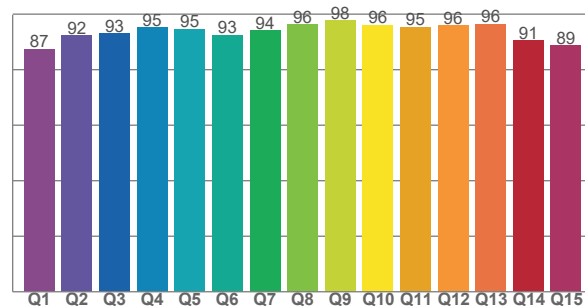
TM30 C values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 92.3 | 95.6 | 93.2 | 96.1 | 95.3 | 93.7 | 95.4 | 96.1 | 97.2 | 95.9 | 94.8 | 87.6 | 85.1 | 86.5 | 93.2 | 86.0 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 87.4 | 92.3 | 93.0 | 95.2 | 94.6 | 92.5 | 94.1 | 96.3 | 97.7 | 96.1 | 95.4 | 95.9 | 96.4 | 90.5 | 88.6 |

CQS: 92.8



COLOR PARAMETERS

| Color temperature | Color rendering index | Red component | Color fidelity | Color gamut | Color quality scale | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate | Color deviation from black body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 2793 K | 95.9 | 69.7 | 93.2 | 100.5 | 92.8 | 0.454 | 0.412 | 0.258 | 0.351 | 0.0011 |

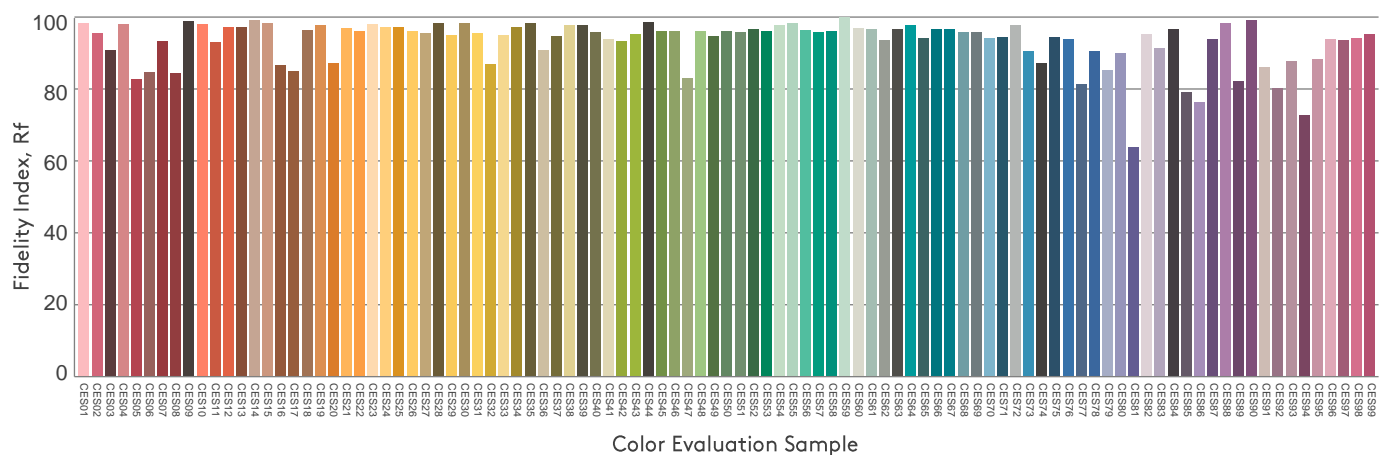
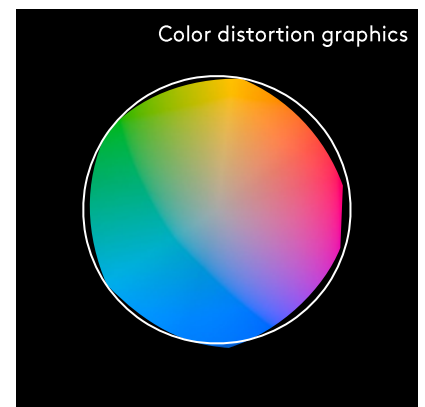
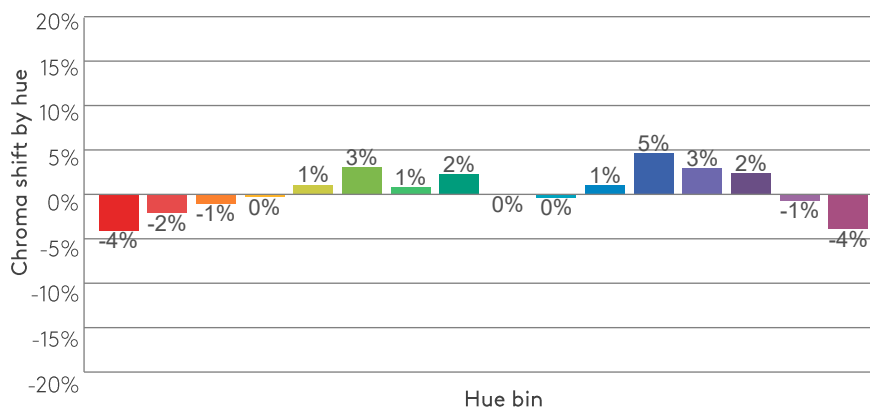
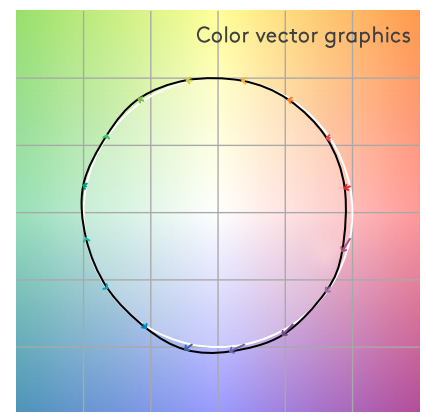
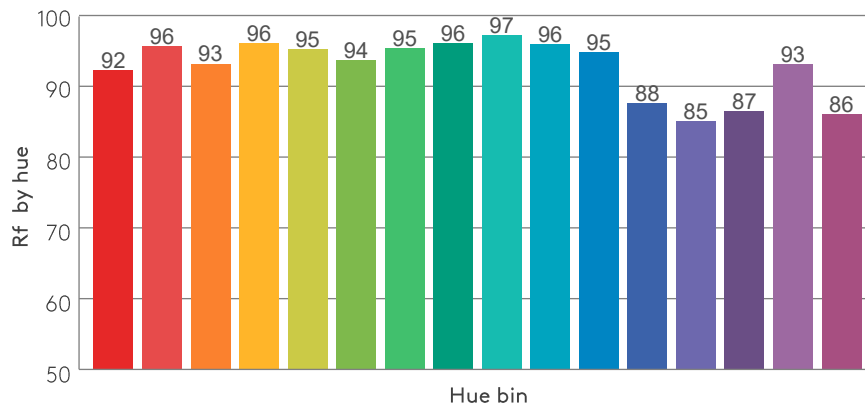
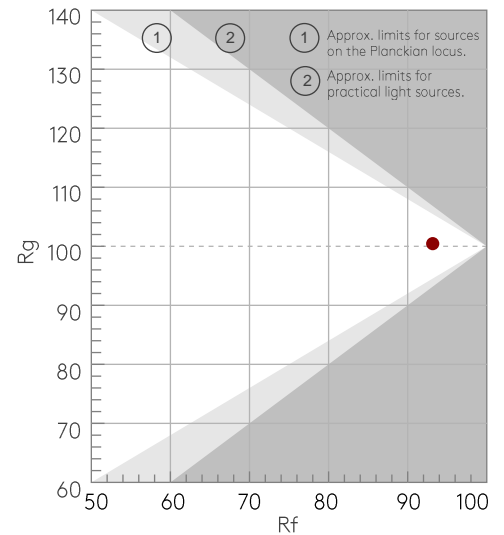
MINIMA PRO ROUND ADJUSTABLE - MATT TM30 DETAILS

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Rf 93.2
Fidelity index Rf

Rg 100.5
Gammut index Rg

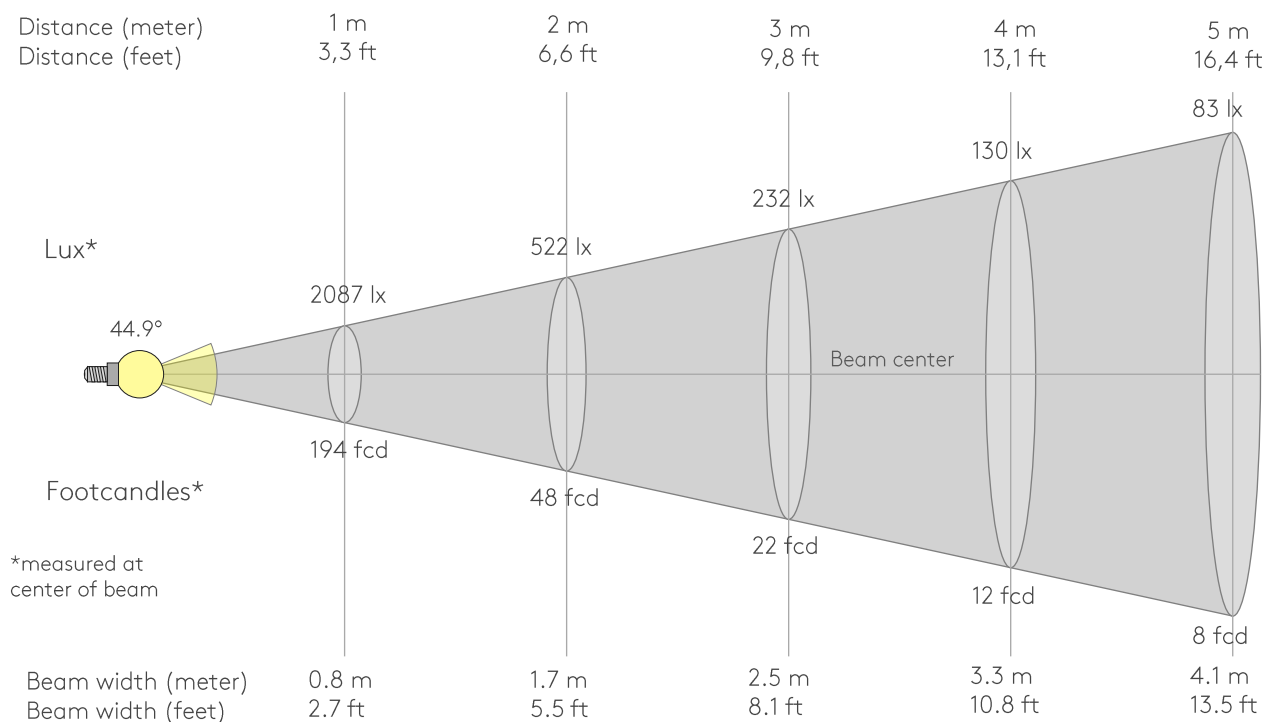
| Hue Bin | Rf | Graphic shifts (%) | |
|---------|----|--------------------|------|
| | | Chroma | Hue |
| 1 | 92 | -4% | -1% |
| 2 | 96 | -2% | 1% |
| 3 | 93 | -1% | 3% |
| 4 | 96 | 0% | 1% |
| 5 | 95 | 1% | 4% |
| 6 | 94 | 3% | 2% |
| 7 | 95 | 1% | -2% |
| 8 | 96 | 2% | 0% |
| 9 | 97 | 0% | 0% |
| 10 | 96 | 0% | 1% |
| 11 | 95 | 1% | 3% |
| 12 | 88 | 5% | -4% |
| 13 | 85 | 3% | -11% |
| 14 | 87 | 2% | -10% |
| 15 | 93 | -1% | -4% |
| 16 | 86 | -4% | -10% |



MINIMA PRO ROUND ADJUSTABLE - MATT

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BEAM DETAILS



Beam intensities from 1-20m

| 1m | 2m | 3m | 4m | 5m | 6m | 7m | 8m | 9m | 10m | 11m | 12m | 13m | 14m | 15m | 16m | 17m | 18m | 19m | 20m |
|----------|---------|---------|---------|--------|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 3.3ft | 6.6ft | 9.8ft | 13.1ft | 16.4ft | 19.7ft | 23ft | 26.2ft | 29.5ft | 32.8ft | 36.1ft | 39.4ft | 42.7ft | 45.9ft | 49.2ft | 52.5ft | 55.8ft | 59.1ft | 62.3ft | 65.6ft |
| 2087lx | 522lx | 232lx | 130lx | 83lx | 58lx | 43lx | 33lx | 26lx | 21lx | 17lx | 14lx | 12lx | 11lx | 9lx | 8lx | 7lx | 6lx | 6lx | 5lx |
| 193.9fcd | 48.5fcd | 21.5fcd | 12.1fcd | 7.8fcd | 5.4fcd | 4fcd | 3fcd | 2.4fcd | 1.9fcd | 1.6fcd | 1.3fcd | 1.1fcd | 1fcd | 0.9fcd | 0.8fcd | 0.7fcd | 0.6fcd | 0.5fcd | 0.5fcd |

Intensities in 0° c-plane

| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2087 | 2078 | 2056 | 2019 | 1965 | 1893 | 1801 | 1689 | 1557 | 1409 | 1248 | 1080 | 912 | 749 | 596 | 459 | 339 | 241 | 165 | 108 |
| 100% | 100% | 99% | 97% | 94% | 91% | 86% | 81% | 75% | 68% | 60% | 52% | 44% | 36% | 29% | 22% | 16% | 12% | 8% | 5% |

Intensities in 90° c-plane

| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2087 | 2078 | 2056 | 2019 | 1965 | 1893 | 1801 | 1689 | 1557 | 1409 | 1248 | 1080 | 912 | 749 | 596 | 459 | 339 | 241 | 165 | 108 |
| 100% | 100% | 99% | 97% | 94% | 91% | 86% | 81% | 75% | 68% | 60% | 52% | 44% | 36% | 29% | 22% | 16% | 12% | 8% | 5% |

Intensities in 180° c-plane

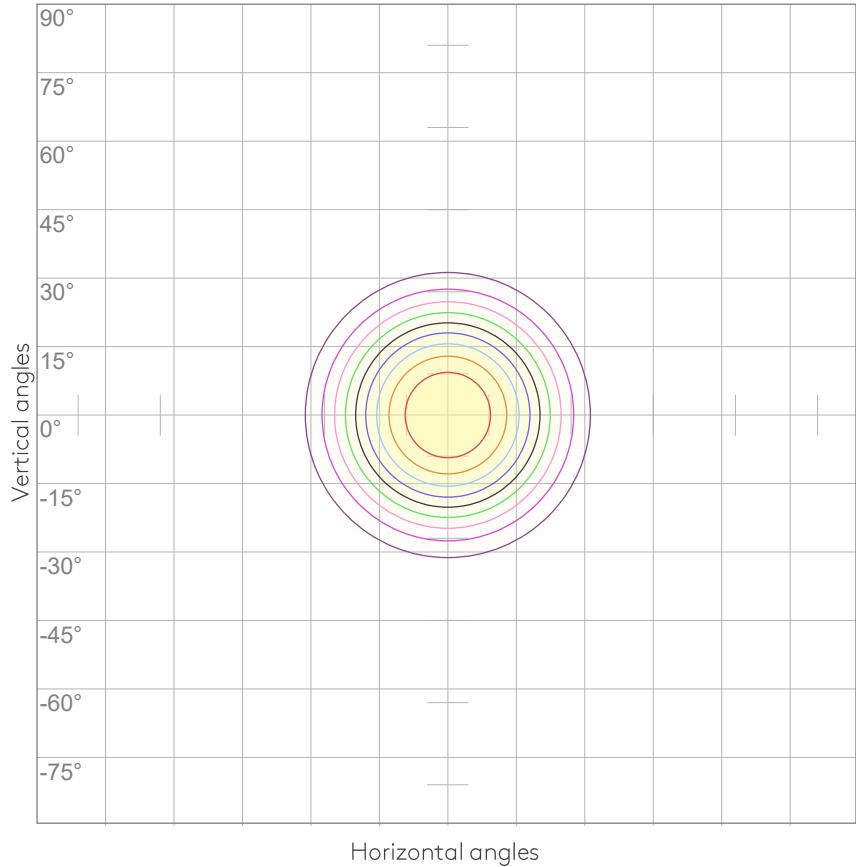
| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2087 | 2078 | 2056 | 2019 | 1965 | 1893 | 1801 | 1689 | 1557 | 1409 | 1248 | 1080 | 912 | 749 | 596 | 459 | 339 | 241 | 165 | 108 |
| 100% | 100% | 99% | 97% | 94% | 91% | 86% | 81% | 75% | 68% | 60% | 52% | 44% | 36% | 29% | 22% | 16% | 12% | 8% | 5% |

Intensities in 270° c-plane

| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2087 | 2078 | 2056 | 2019 | 1965 | 1893 | 1801 | 1689 | 1557 | 1409 | 1248 | 1080 | 912 | 749 | 596 | 459 | 339 | 241 | 165 | 108 |
| 100% | 100% | 99% | 97% | 94% | 91% | 86% | 81% | 75% | 68% | 60% | 52% | 44% | 36% | 29% | 22% | 16% | 12% | 8% | 5% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 44.9° | 69.5° | 82.2° | 99.6% | 98.9% |

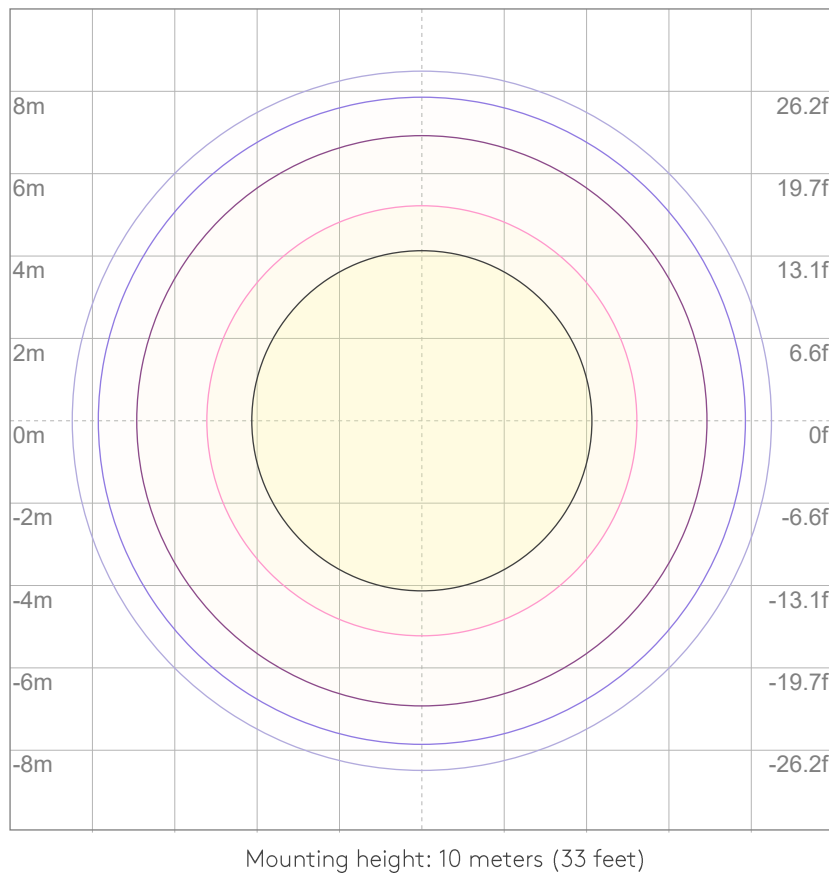
ISO CANDELA DIAGRAM



| | |
|-----|---------|
| 10% | 209 cd |
| 20% | 417 cd |
| 30% | 626 cd |
| 40% | 835 cd |
| 50% | 1043 cd |
| 60% | 1252 cd |
| 70% | 1461 cd |
| 80% | 1669 cd |
| 90% | 1878 cd |

Conditions:
Number of c-planes: 8
Candela at center: 2087 cd

ISO LUX DIAGRAM



| | |
|-----|----------------|
| 3% | 0.626 lx |
| 5% | 1.04 lx |
| 10% | 2.09 lx |
| 30% | 6.26 lx |
| 50% | {LUX_10M50} lx |

Conditions:
Number of c-planes: 8
Lux at center: 20.9 lx

Lux distribution on a surface
when lamp is mounted at 10
meters from the surface.

UGR

GLARE EVALUATION ACCORDING TO UGR

| | | | | | | | | | | | |
|--|-----|--|------|------|------|------|---|------|------|------|------|
| p Ceiling | | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
| p Walls | | 50 | 30 | 50 | 30 | 30 | 50 | 30 | 50 | 30 | 30 |
| p Floor | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Room size X Y | | Viewing direction at right angles to lamp axis | | | | | Viewing direction parallel to lamp axis | | | | |
| 2H | 2H | 19.8 | 20.3 | 19.9 | 20.6 | 20.7 | 19.8 | 20.3 | 19.9 | 20.6 | 20.7 |
| | 3H | 19.5 | 20.2 | 19.9 | 20.4 | 20.6 | 19.5 | 20.2 | 19.9 | 20.4 | 20.6 |
| | 4H | 19.4 | 20.1 | 19.8 | 20.3 | 20.5 | 19.4 | 20.1 | 19.8 | 20.3 | 20.5 |
| | 6H | 19.4 | 20.0 | 19.7 | 20.3 | 20.6 | 19.4 | 20.0 | 19.7 | 20.3 | 20.6 |
| | 8H | 19.4 | 19.9 | 19.7 | 20.2 | 20.6 | 19.4 | 19.9 | 19.7 | 20.2 | 20.6 |
| | 12H | 19.3 | 19.8 | 19.7 | 20.2 | 20.6 | 19.3 | 19.8 | 19.7 | 20.2 | 20.6 |
| 4H | 2H | 19.4 | 20.1 | 19.8 | 20.3 | 20.5 | 19.4 | 20.1 | 19.8 | 20.3 | 20.5 |
| | 3H | 19.3 | 19.8 | 19.7 | 20.2 | 20.6 | 19.3 | 19.8 | 19.7 | 20.2 | 20.6 |
| | 4H | 19.2 | 19.6 | 19.6 | 20.1 | 20.6 | 19.2 | 19.6 | 19.6 | 20.1 | 20.6 |
| | 6H | 19.1 | 19.6 | 19.6 | 19.9 | 20.3 | 19.1 | 19.6 | 19.6 | 19.9 | 20.3 |
| | 8H | 19.0 | 19.5 | 19.6 | 19.8 | 20.2 | 19.0 | 19.5 | 19.6 | 19.8 | 20.2 |
| | 12H | 19.0 | 19.3 | 19.5 | 19.7 | 20.2 | 19.0 | 19.3 | 19.5 | 19.7 | 20.2 |
| 8H | 4H | 19.0 | 19.5 | 19.6 | 19.8 | 20.2 | 19.0 | 19.5 | 19.6 | 19.8 | 20.2 |
| | 6H | 19.0 | 19.3 | 19.5 | 19.7 | 20.3 | 19.0 | 19.3 | 19.5 | 19.7 | 20.3 |
| | 8H | 19.0 | 19.2 | 19.5 | 19.7 | 20.3 | 19.0 | 19.2 | 19.5 | 19.7 | 20.3 |
| | 12H | 18.9 | 19.1 | 19.5 | 19.6 | 20.2 | 18.9 | 19.1 | 19.5 | 19.6 | 20.2 |
| 12H | 4H | 19.0 | 19.3 | 19.5 | 19.7 | 20.2 | 19.0 | 19.3 | 19.5 | 19.7 | 20.2 |
| | 6H | 19.0 | 19.2 | 19.5 | 19.7 | 20.3 | 19.0 | 19.2 | 19.5 | 19.7 | 20.3 |
| | 8H | 18.9 | 19.1 | 19.5 | 19.6 | 20.2 | 18.9 | 19.1 | 19.5 | 19.6 | 20.2 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1.0H | | 6.0 / -14.2 | | | | | 6.0 / -14.2 | | | | |
| S = 1.5H | | 8.8 / -16.1 | | | | | 8.8 / -16.1 | | | | |
| S = 2.0H | | 10.8 / -18.0 | | | | | 10.8 / -18.0 | | | | |
| Standard table | | n/a | | | | | n/a | | | | |
| Correction summand | | n/a | | | | | n/a | | | | |
| Corrected glare indices referring to 1173 lm total luminous flux | | | | | | | | | | | |

MINIMA PRO ROUND ADJUSTABLE - MATT

LIGHT PLANNING

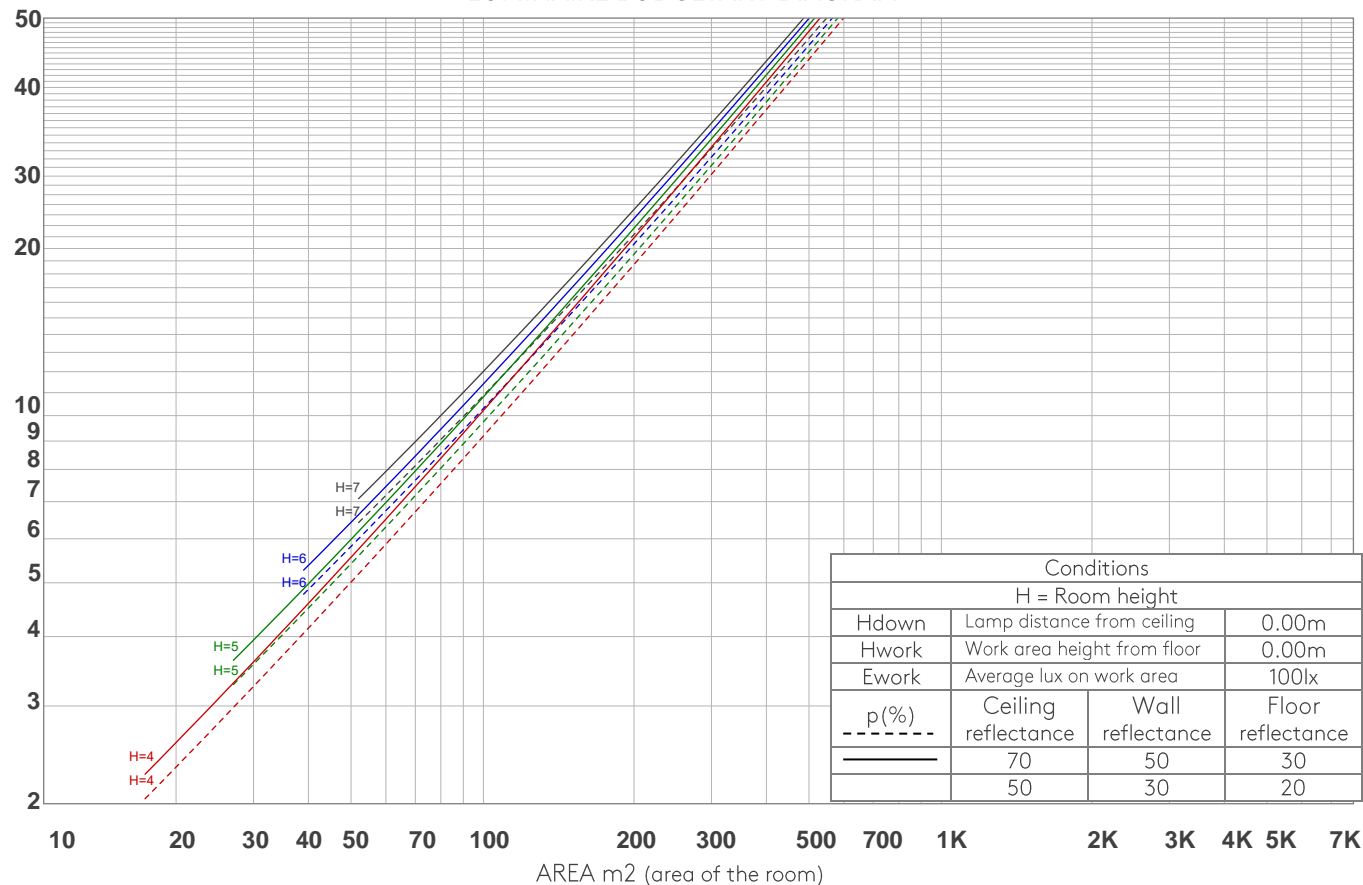
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COEFFICIENTS OF UTILIZATION

| Ceiling reflectance | 80 | | | | 70 | | | | 50 | | | 30 | | | 10 | | | 0 |
|---------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Wall reflectance | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| Floor reflectance | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 0 |
| RCR | (RCR: Room Cavity Ratio) Room Values are expressed as percentage of Lumens delivered to the task surface | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 114 | 112 | 109 | 107 | 112 | 109 | 107 | 106 | 105 | 104 | 102 | 102 | 100 | 99 | 98 | 97 | 96 | 95 |
| 2 | 109 | 105 | 101 | 98 | 107 | 103 | 100 | 97 | 100 | 97 | 95 | 97 | 95 | 93 | 94 | 93 | 91 | 90 |
| 3 | 105 | 99 | 95 | 91 | 103 | 98 | 94 | 91 | 95 | 92 | 89 | 93 | 90 | 88 | 91 | 88 | 86 | 85 |
| 4 | 100 | 94 | 89 | 85 | 99 | 93 | 88 | 85 | 91 | 87 | 84 | 89 | 85 | 83 | 87 | 84 | 82 | 80 |
| 5 | 96 | 89 | 84 | 80 | 95 | 88 | 83 | 80 | 86 | 82 | 79 | 85 | 81 | 78 | 83 | 80 | 78 | 76 |
| 6 | 92 | 84 | 79 | 76 | 91 | 84 | 79 | 75 | 82 | 78 | 75 | 81 | 77 | 74 | 80 | 76 | 74 | 72 |
| 7 | 88 | 80 | 75 | 71 | 87 | 80 | 75 | 71 | 79 | 74 | 71 | 77 | 73 | 71 | 76 | 73 | 70 | 69 |
| 8 | 85 | 77 | 71 | 68 | 84 | 76 | 71 | 68 | 75 | 71 | 67 | 74 | 70 | 67 | 73 | 70 | 67 | 66 |
| 9 | 82 | 73 | 68 | 65 | 81 | 73 | 68 | 64 | 72 | 67 | 64 | 71 | 67 | 64 | 70 | 66 | 64 | 63 |
| 10 | 78 | 70 | 65 | 62 | 78 | 70 | 65 | 61 | 69 | 64 | 61 | 68 | 64 | 61 | 67 | 64 | 61 | 60 |

LAMPS (number of lamps)

LUMINAIRE BUDGETARY DIAGRAM



ZONAL LUMEN SUMMARY

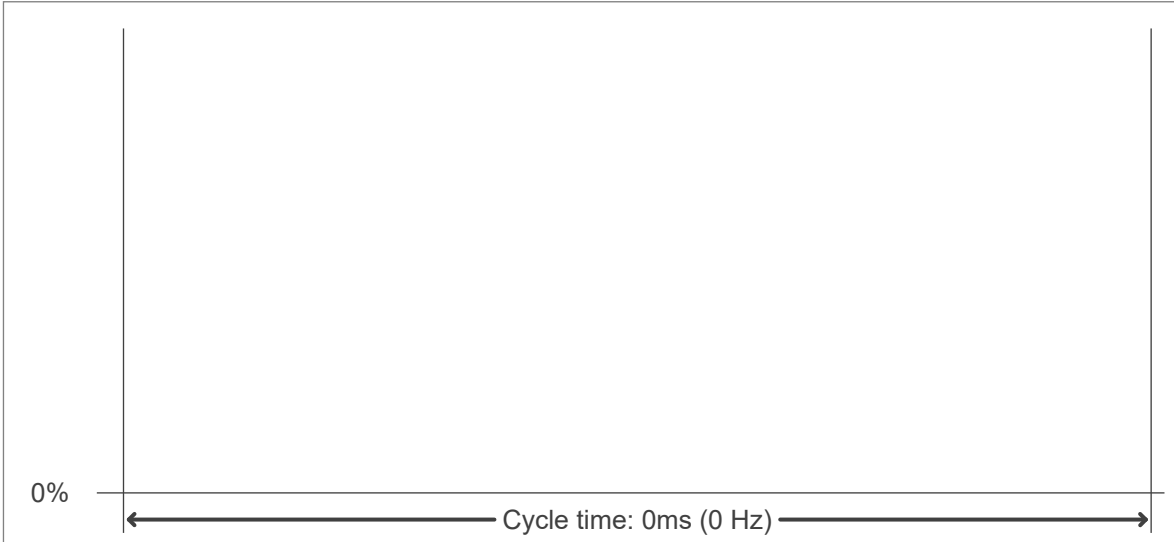
| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 190 lm | 446 lm | 376 lm | 134 lm | 18.8 lm | 3.91 lm | 1.40 lm | 0.359 lm | 0.163 lm |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 0.110 lm | 0.121 lm | 0.161 lm | 0.228 lm | 0.418 lm | 0.583 lm | 0.607 lm | 0.399 lm | 0.123 lm |

FLICKER

FLICKER CURVE (COMPLETE SAMPLED)



FLICKER FRAME (FRAME OF ONE FLICKER)



FLICKER FFT (FREQUENCY SCOPE OF FLICKER)



FLICKER RESULTS:

| | |
|-----------------------|--------|
| Flicker frequency: | n/a Hz |
| Flicker index: | n/a |
| Flicker percentage: | n/a % |
| SVM: (Visual flicker) | n/a |

FLICKER CONDITIONS:

| | |
|--------------|--------------------|
| Sample rate: | n/a samples/second |
|--------------|--------------------|