

PHOTOMETRIC TEST REPORT

MINIMA PRO SQUARE
ADJUSTABLE - MATT WHITE -
4001315

astro

MINIMA PRO SQUARE ADJUSTABLE - MATT

astro

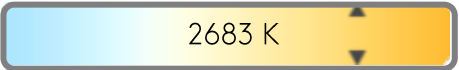
LIGHT EFFICIENCY:



LIGHT QUALITY:



COLOR TEMPERATURE:



OUTPUT: 1226 lm
PEAK: 4186 cd
POWER: 11.9 W
PF: 0.95



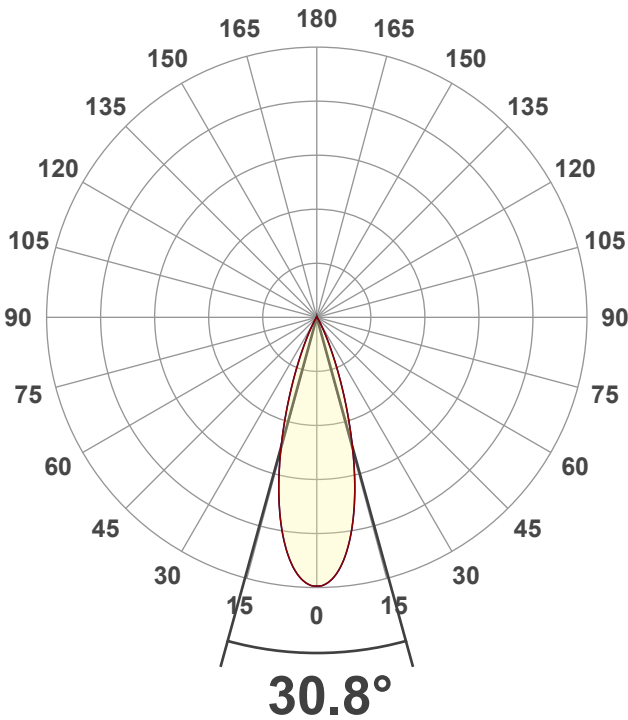
Tracking number: [n/a](#)

Product name:
Minima Pro Square Adjustable - Matt
White - 4001315

Item number:
MSA-MW-HE27G1-30G1-X-D1

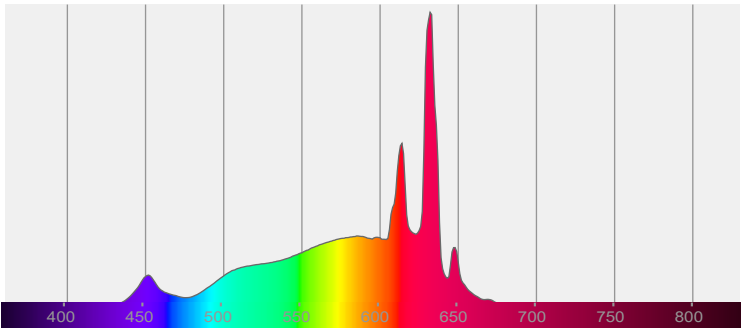
Date and time:
04/02/2025 08:50:19

Description:
IP20 LED Downlight

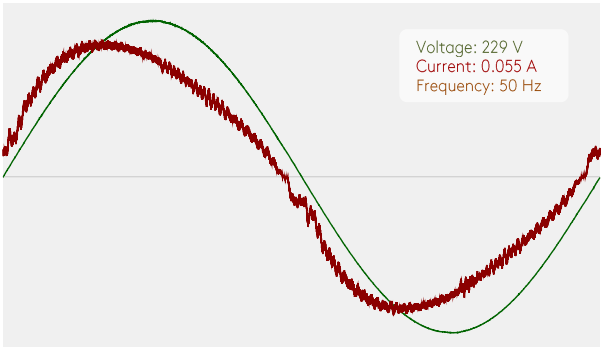


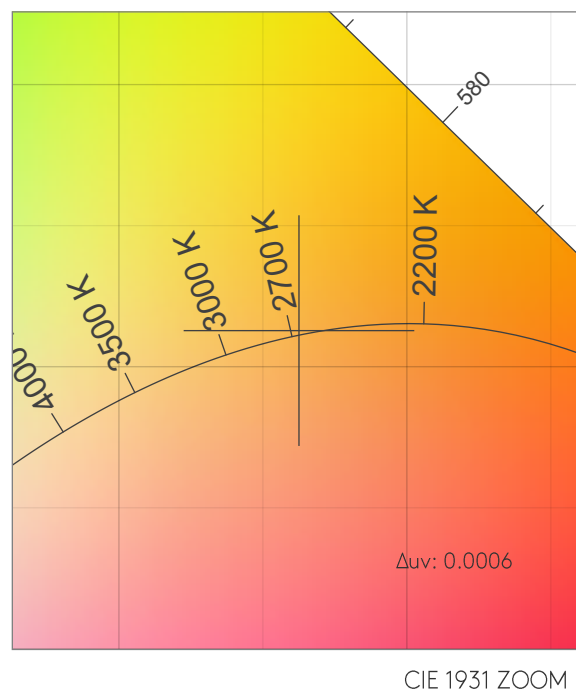
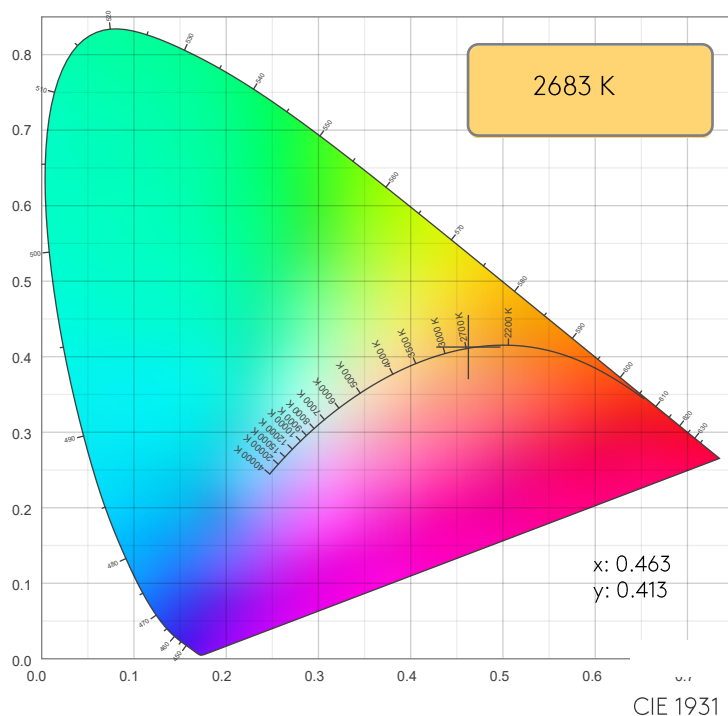
CIE 1931
x: 0.463
y: 0.413

SPECTRA

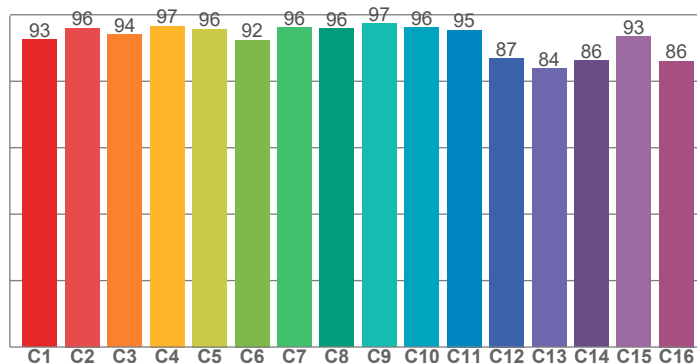


POWER

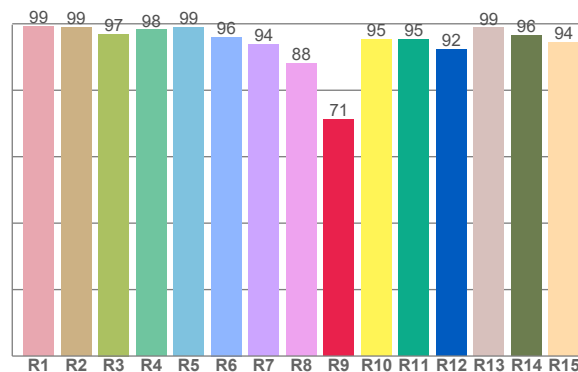




TM30: 93.3



CRI: 96.2 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 99.2 | 98.8 | 96.9 | 98.2 | 98.9 | 96.0 | 93.8 | 88.1 | 71.1 | 95.2 | 95.2 | 92.2 | 98.8 | 96.5 | 94.3 |

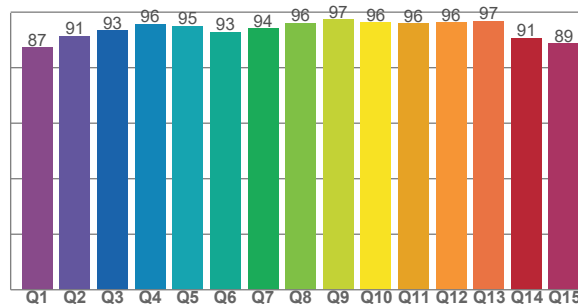
TM30 C values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 92.6 | 96.0 | 94.0 | 96.6 | 95.7 | 92.4 | 96.2 | 95.9 | 97.4 | 96.3 | 95.4 | 87.0 | 83.8 | 86.2 | 93.4 | 86.1 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 87.2 | 91.4 | 93.5 | 95.7 | 95.1 | 92.8 | 94.1 | 96.1 | 97.3 | 96.2 | 95.8 | 96.2 | 96.7 | 90.6 | 88.7 |

CQS: 92.8



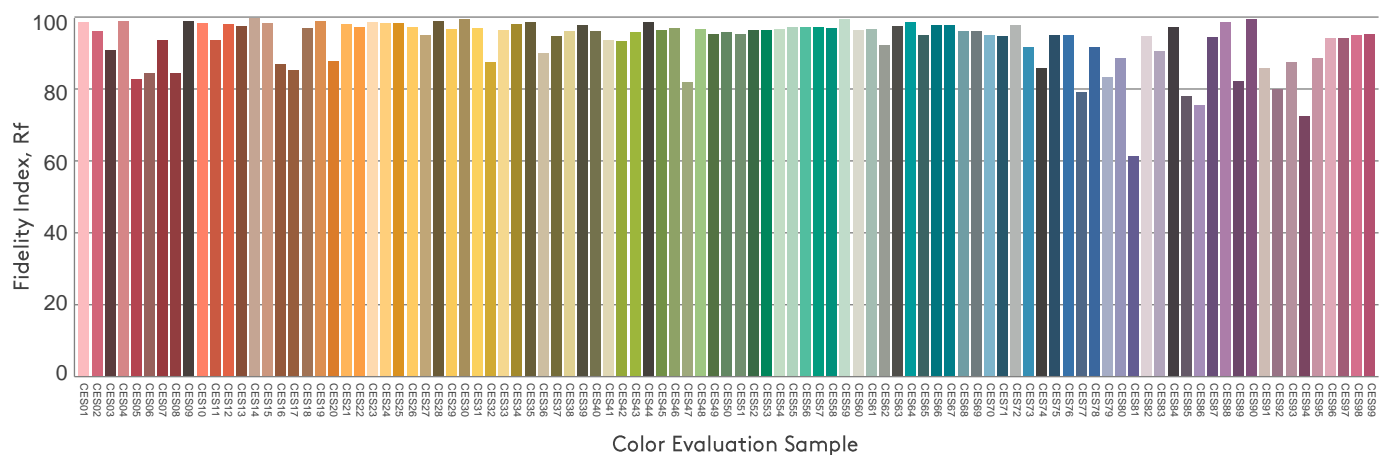
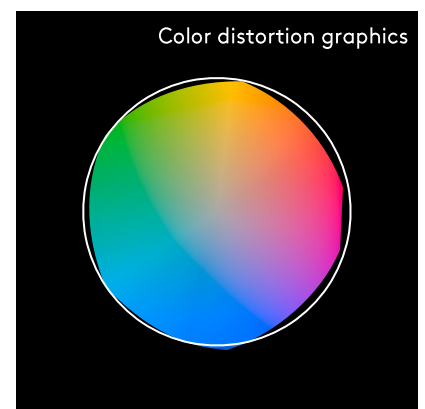
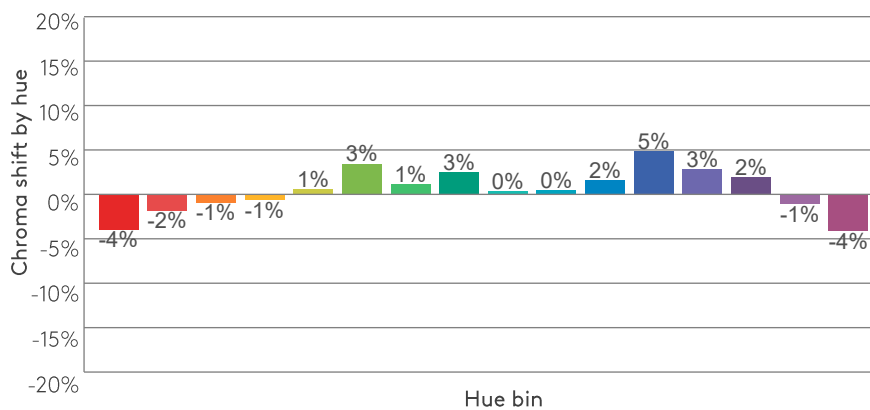
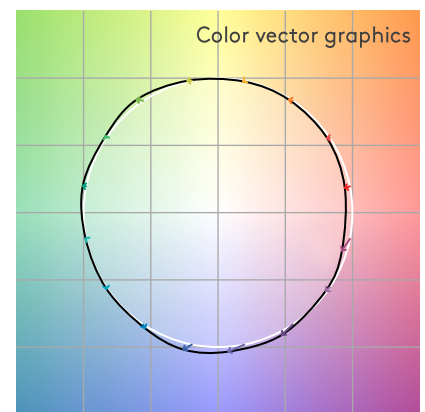
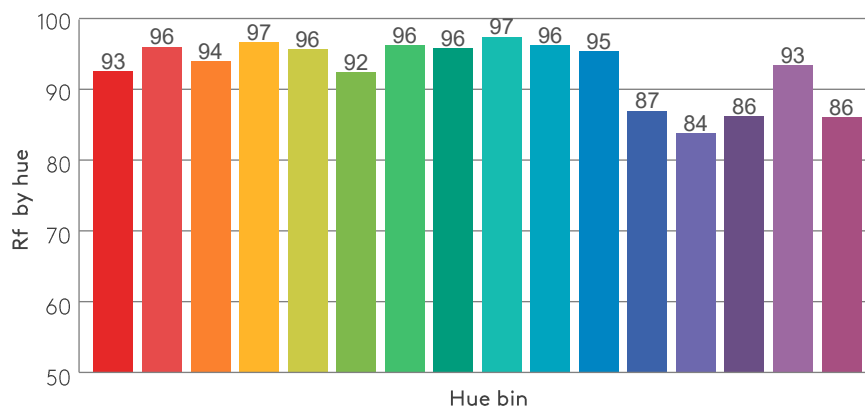
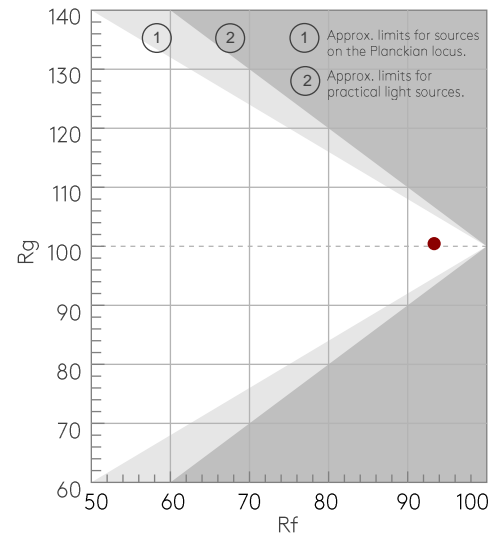
COLOR PARAMETERS

| 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 |
| 2683 K | 96.2 | 71.1 | 93.3 | 100.5 | 92.8 | 0.463 | 0.413 | 0.263 | 0.352 | 0.0006 |

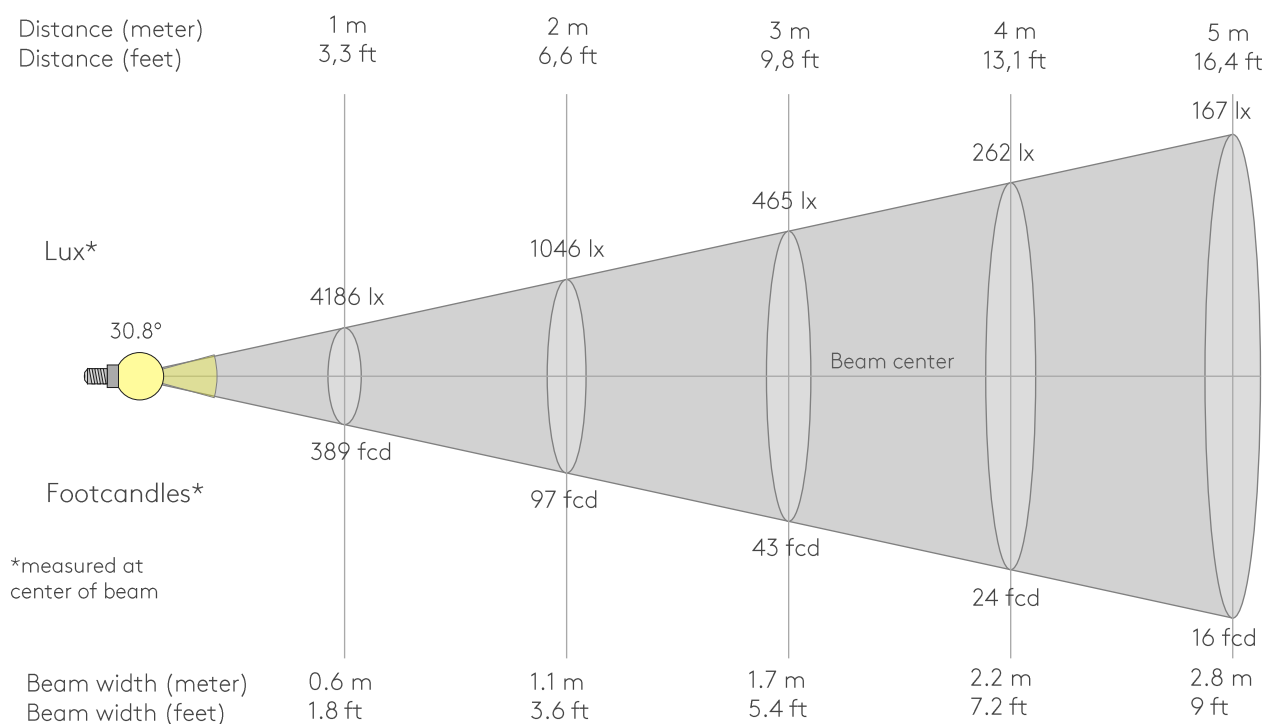
Rf 93.3
Fidelity index Rf

Rg 100.5
Gammut index Rg

| Hue Bin | Rf | Graphic shifts (%) | |
|---------|----|--------------------|------|
| | | Chroma | Hue |
| 1 | 93 | -4% | 0% |
| 2 | 96 | -2% | 1% |
| 3 | 94 | -1% | 3% |
| 4 | 97 | -1% | 1% |
| 5 | 96 | 1% | 3% |
| 6 | 92 | 3% | 4% |
| 7 | 96 | 1% | -1% |
| 8 | 96 | 3% | 0% |
| 9 | 97 | 0% | 0% |
| 10 | 96 | 0% | 1% |
| 11 | 95 | 2% | 2% |
| 12 | 87 | 5% | -5% |
| 13 | 84 | 3% | -13% |
| 14 | 86 | 2% | -11% |
| 15 | 93 | -1% | -4% |
| 16 | 86 | -4% | -10% |



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 |
| 4186lx | 1046lx | 465lx | 262lx | 167lx | 116lx | 85lx | 65lx | 52lx | 42lx | 35lx | 29lx | 25lx | 21lx | 19lx | 16lx | 14lx | 13lx | 12lx | 10lx |
| 388.9fcd | 97.2fcd | 43.2fcd | 24.3fcd | 15.6fcd | 10.8fcd | 7.9fcd | 6.1fcd | 4.8fcd | 3.9fcd | 3.2fcd | 2.7fcd | 2.3fcd | 2fcd | 1.7fcd | 1.5fcd | 1.3fcd | 1.2fcd | 1.1fcd | 1fcd |

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° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4186 | 4154 | 4039 | 3843 | 3571 | 3233 | 2840 | 2407 | 1957 | 1523 | 1128 | 791 | 526 | 335 | 204 | 126 | 83 | 57 | 40 | 28 |
| 100% | 99% | 96% | 92% | 85% | 77% | 68% | 58% | 47% | 36% | 27% | 19% | 13% | 8% | 5% | 3% | 2% | 1% | 1% | 1% |

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° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4186 | 4154 | 4039 | 3843 | 3571 | 3233 | 2840 | 2407 | 1957 | 1523 | 1128 | 791 | 526 | 335 | 204 | 126 | 83 | 57 | 40 | 28 |
| 100% | 99% | 96% | 92% | 85% | 77% | 68% | 58% | 47% | 36% | 27% | 19% | 13% | 8% | 5% | 3% | 2% | 1% | 1% | 1% |

Intensities in 180° c-plane

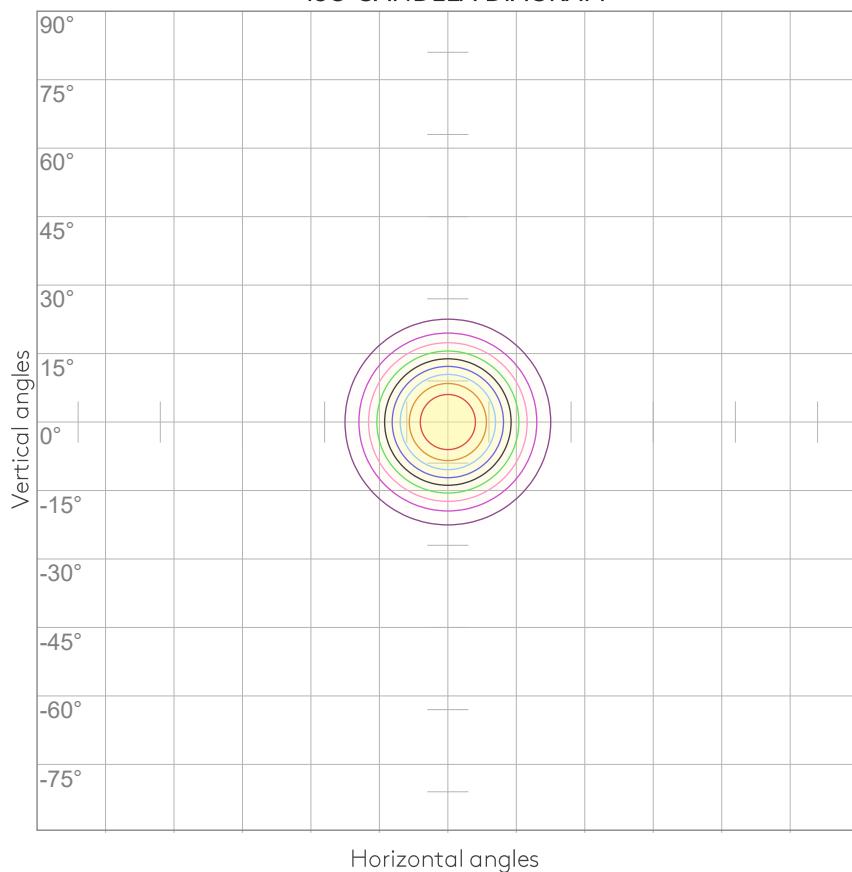
| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4186 | 4154 | 4039 | 3843 | 3571 | 3233 | 2840 | 2407 | 1957 | 1523 | 1128 | 791 | 526 | 335 | 204 | 126 | 83 | 57 | 40 | 28 |
| 100% | 99% | 96% | 92% | 85% | 77% | 68% | 58% | 47% | 36% | 27% | 19% | 13% | 8% | 5% | 3% | 2% | 1% | 1% | 1% |

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° |
|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 4186 | 4154 | 4039 | 3843 | 3571 | 3233 | 2840 | 2407 | 1957 | 1523 | 1128 | 791 | 526 | 335 | 204 | 126 | 83 | 57 | 40 | 28 |
| 100% | 99% | 96% | 92% | 85% | 77% | 68% | 58% | 47% | 36% | 27% | 19% | 13% | 8% | 5% | 3% | 2% | 1% | 1% | 1% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 30.8° | 50.1° | 61.6° | 98.0% | 97.3% |

ISO CANDELA DIAGRAM



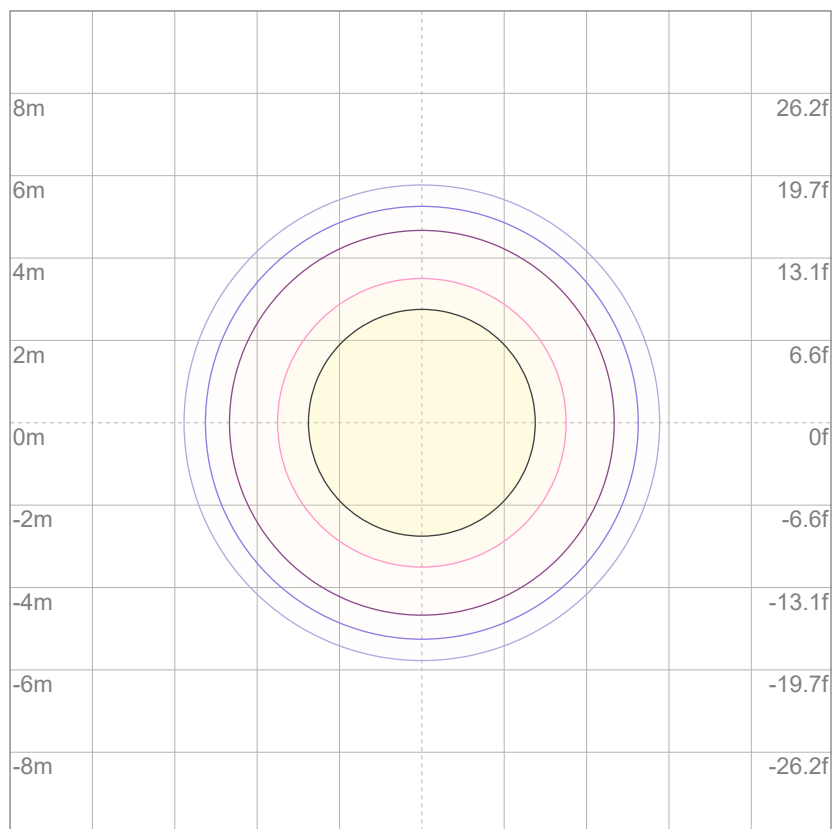
| | |
|-----|---------|
| 10% | 419 cd |
| 20% | 837 cd |
| 30% | 1256 cd |
| 40% | 1674 cd |
| 50% | 2093 cd |
| 60% | 2511 cd |
| 70% | 2930 cd |
| 80% | 3349 cd |
| 90% | 3767 cd |

Conditions:

Number of c-planes: 8

Candela at center: 4186 cd

ISO LUX DIAGRAM



Mounting height: 10 meters (33 feet)

| | |
|-----|----------------|
| 3% | 1.26 lx |
| 5% | 2.09 lx |
| 10% | 4.19 lx |
| 30% | 12.6 lx |
| 50% | {LUX_10M50} lx |

Conditions:

Number of c-planes: 8

Lux at center: 41.9 lx

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

UGR

GLARE EVALUATION ACCORDING TO UGR

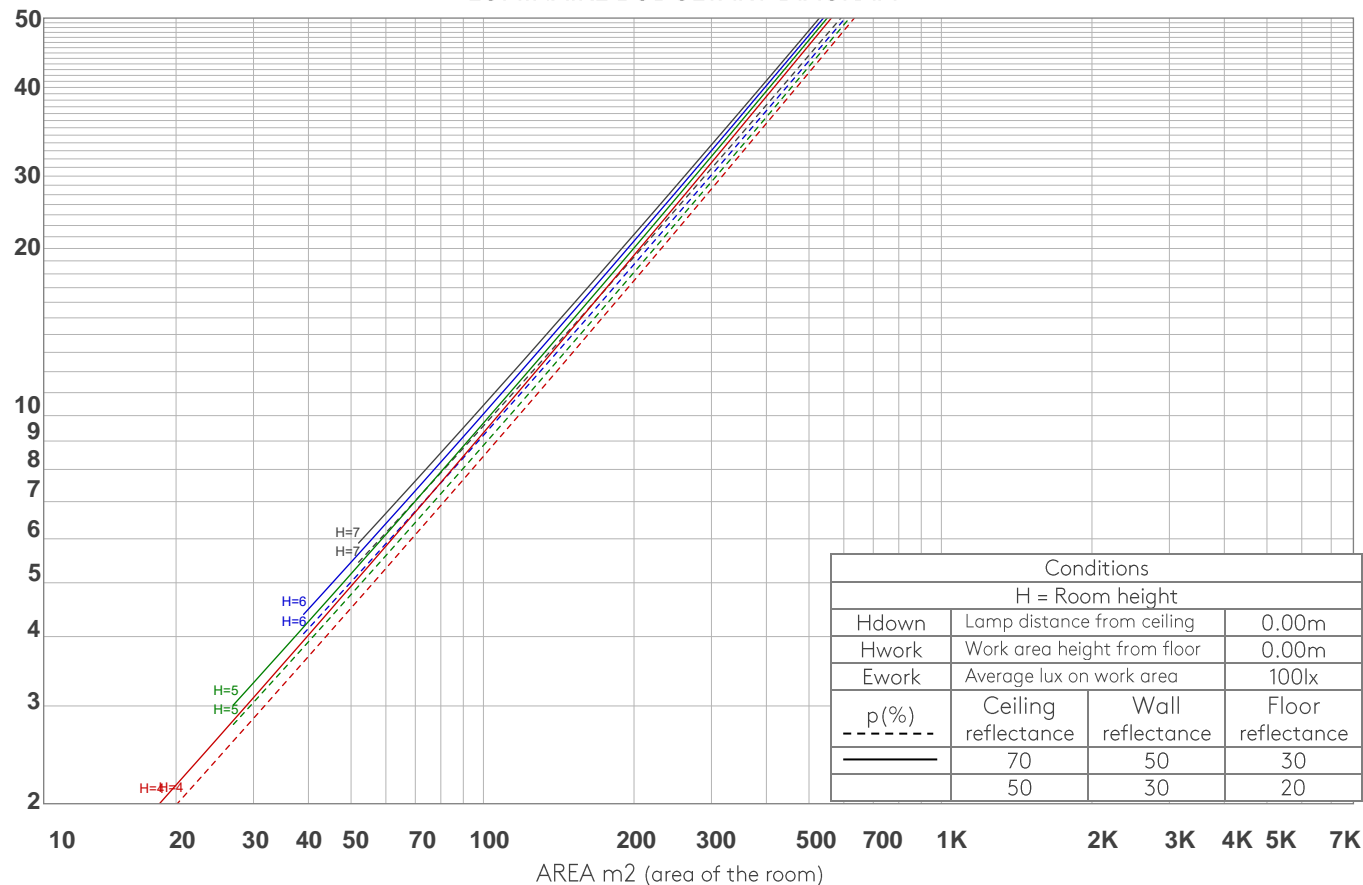
| | | | | | | | | | | | |
|--|-----|--|------|------|------|------|---|------|------|------|------|
| p Ceiling | | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
| p Walls | | 50 | 30 | 50 | 30 | 30 | 50 | 30 | 50 | 30 | 30 |
| p Floor | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Room size X Y | | Viewing direction at right angles to lamp axis | | | | | Viewing direction parallel to lamp axis | | | | |
| 2H | 2H | 11.5 | 11.9 | 11.6 | 12.1 | 12.3 | 11.5 | 11.9 | 11.6 | 12.1 | 12.3 |
| | 3H | 11.7 | 12.2 | 12.0 | 12.4 | 12.6 | 11.7 | 12.2 | 12.0 | 12.4 | 12.6 |
| | 4H | 11.9 | 12.5 | 12.3 | 12.7 | 13.0 | 11.9 | 12.5 | 12.3 | 12.7 | 13.0 |
| | 6H | 12.5 | 13.0 | 12.8 | 13.3 | 13.7 | 12.5 | 13.0 | 12.8 | 13.3 | 13.7 |
| | 8H | 12.9 | 13.4 | 13.3 | 13.7 | 14.1 | 12.9 | 13.4 | 13.3 | 13.7 | 14.1 |
| | 12H | 13.5 | 13.9 | 13.9 | 14.3 | 14.7 | 13.5 | 13.9 | 13.9 | 14.3 | 14.7 |
| 4H | 2H | 11.3 | 11.9 | 11.8 | 12.2 | 12.4 | 11.3 | 11.9 | 11.8 | 12.2 | 12.4 |
| | 3H | 11.9 | 12.3 | 12.3 | 12.7 | 13.1 | 11.9 | 12.3 | 12.3 | 12.7 | 13.1 |
| | 4H | 12.3 | 12.7 | 12.7 | 13.1 | 13.7 | 12.3 | 12.7 | 12.7 | 13.1 | 13.7 |
| | 6H | 13.1 | 13.5 | 13.6 | 13.9 | 14.3 | 13.1 | 13.5 | 13.6 | 13.9 | 14.3 |
| | 8H | 13.7 | 14.1 | 14.2 | 14.4 | 14.8 | 13.7 | 14.1 | 14.2 | 14.4 | 14.8 |
| | 12H | 14.5 | 14.8 | 15.0 | 15.2 | 15.7 | 14.5 | 14.8 | 15.0 | 15.2 | 15.7 |
| 8H | 4H | 12.5 | 12.9 | 13.0 | 13.3 | 13.6 | 12.5 | 12.9 | 13.0 | 13.3 | 13.6 |
| | 6H | 13.6 | 13.8 | 14.1 | 14.3 | 14.9 | 13.6 | 13.8 | 14.1 | 14.3 | 14.9 |
| | 8H | 14.4 | 14.6 | 15.0 | 15.2 | 15.8 | 14.4 | 14.6 | 15.0 | 15.2 | 15.8 |
| | 12H | 15.5 | 15.7 | 16.1 | 16.2 | 16.8 | 15.5 | 15.7 | 16.1 | 16.2 | 16.8 |
| 12H | 4H | 12.5 | 12.8 | 13.0 | 13.3 | 13.7 | 12.5 | 12.8 | 13.0 | 13.3 | 13.7 |
| | 6H | 13.8 | 14.0 | 14.3 | 14.5 | 15.2 | 13.8 | 14.0 | 14.3 | 14.5 | 15.2 |
| | 8H | 14.7 | 14.9 | 15.3 | 15.4 | 16.0 | 14.7 | 14.9 | 15.3 | 15.4 | 16.0 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1.0H | | 1.3 / -0.5 | | | | | 1.3 / -0.5 | | | | |
| S = 1.5H | | 2.7 / -0.5 | | | | | 2.7 / -0.5 | | | | |
| S = 2.0H | | 4.0 / -0.8 | | | | | 4.0 / -0.8 | | | | |
| Standard table | | n/a | | | | | n/a | | | | |
| Correction summand | | n/a | | | | | n/a | | | | |
| Corrected glare indices referring to 1226 lm total luminous flux | | | | | | | | | | | |

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 | 110 | 110 | 110 | 105 | 105 | 105 | 101 | 101 | 101 | 99 |
| 1 | 114 | 112 | 110 | 108 | 112 | 110 | 108 | 106 | 106 | 104 | 103 | 102 | 101 | 100 | 98 | 97 | 97 | 95 |
| 2 | 110 | 107 | 103 | 101 | 108 | 105 | 102 | 99 | 101 | 99 | 97 | 98 | 97 | 95 | 95 | 94 | 93 | 91 |
| 3 | 107 | 102 | 98 | 95 | 105 | 100 | 97 | 94 | 98 | 95 | 92 | 95 | 93 | 91 | 93 | 91 | 89 | 88 |
| 4 | 103 | 97 | 93 | 90 | 101 | 96 | 92 | 89 | 94 | 91 | 88 | 92 | 89 | 87 | 90 | 88 | 86 | 85 |
| 5 | 100 | 94 | 89 | 86 | 98 | 93 | 89 | 86 | 91 | 87 | 85 | 89 | 86 | 84 | 88 | 85 | 83 | 82 |
| 6 | 97 | 90 | 86 | 82 | 95 | 89 | 85 | 82 | 88 | 84 | 82 | 86 | 83 | 81 | 85 | 82 | 80 | 79 |
| 7 | 94 | 87 | 82 | 79 | 92 | 86 | 82 | 79 | 85 | 81 | 79 | 84 | 81 | 78 | 83 | 80 | 78 | 77 |
| 8 | 91 | 84 | 80 | 77 | 90 | 83 | 79 | 76 | 82 | 79 | 76 | 81 | 78 | 76 | 80 | 77 | 75 | 74 |
| 9 | 88 | 81 | 77 | 74 | 87 | 81 | 77 | 74 | 80 | 76 | 74 | 79 | 76 | 73 | 78 | 75 | 73 | 72 |
| 10 | 86 | 79 | 75 | 72 | 85 | 78 | 74 | 72 | 78 | 74 | 71 | 77 | 73 | 71 | 76 | 73 | 71 | 70 |

LAMPS (number of lamps)

LUMINAIRE BUDGETARY DIAGRAM



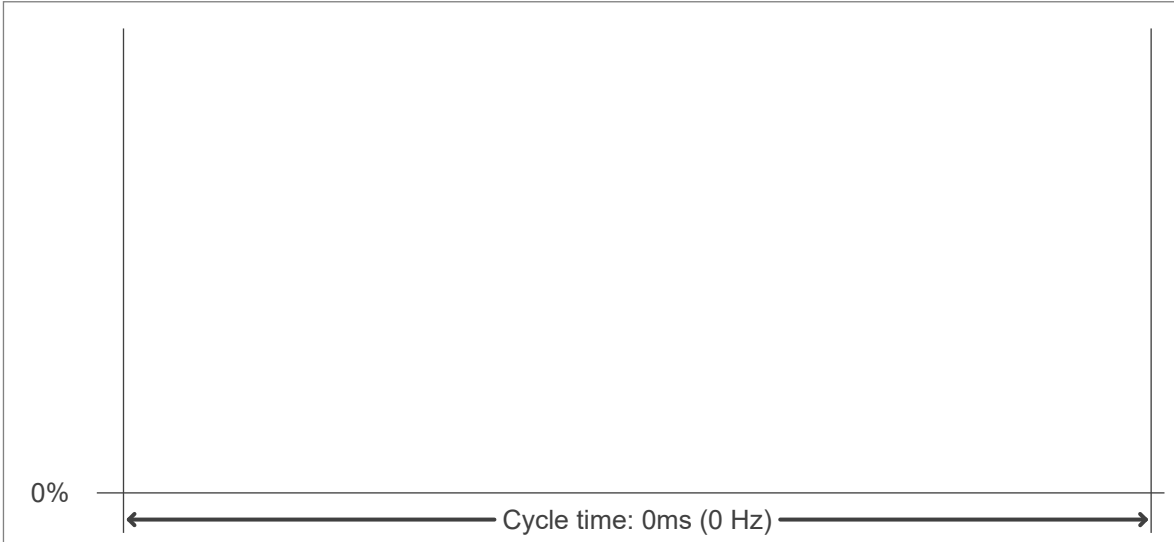
ZONAL LUMEN SUMMARY

| | | | | | | | | |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
| 354 lm | 585 lm | 213 lm | 33.6 lm | 10.3 lm | 5.42 lm | 3.32 lm | 2.45 lm | 2.39 lm |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 2.40 lm | 2.34 lm | 2.23 lm | 2.07 lm | 1.97 lm | 1.91 lm | 1.68 lm | 1.10 lm | 0.326 lm |

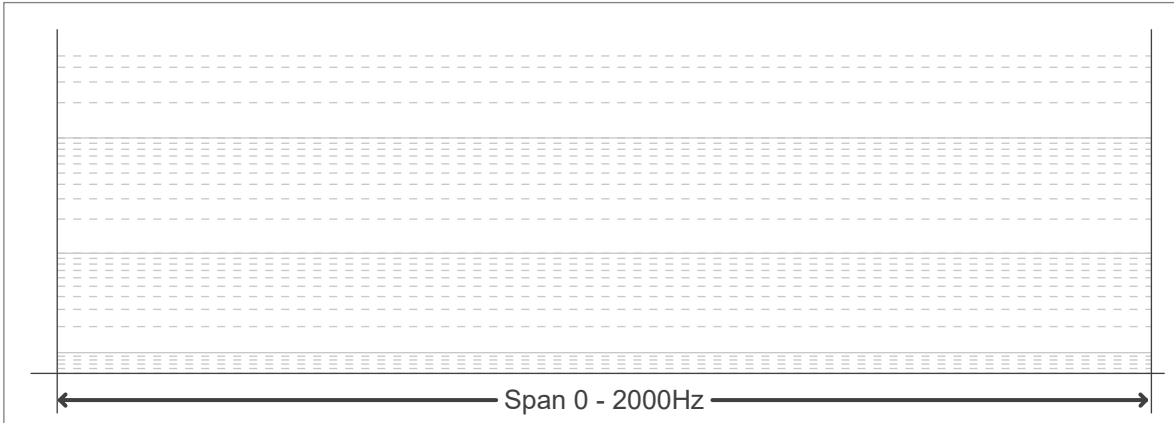
FLICKER CURVE (COMPLETE SAMPLED)



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 |
|--------------|--------------------|