

Light efficiency:

139 Lumen/Watt

Light quality:

CRI: 82,2

Color temperature:

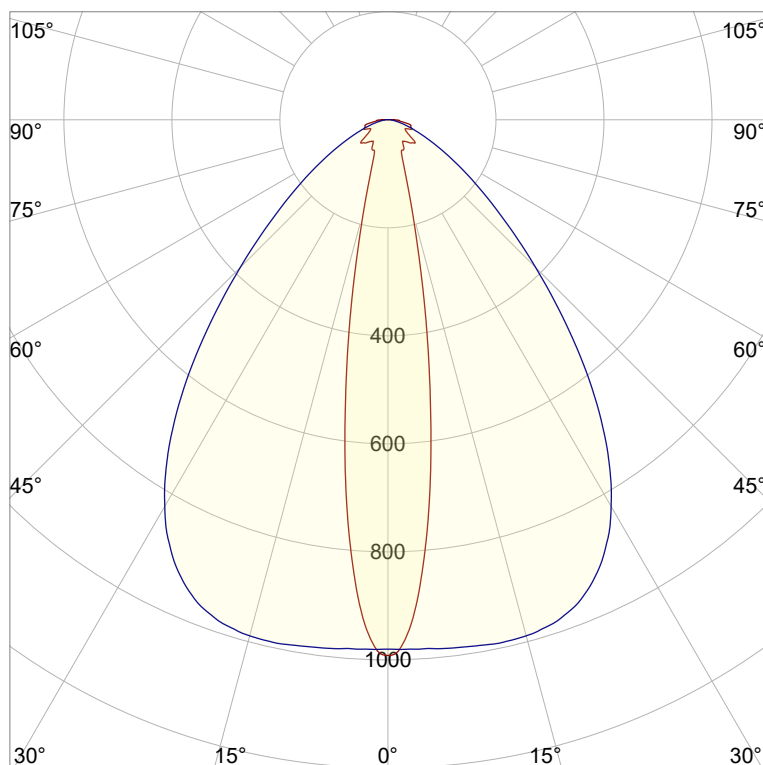
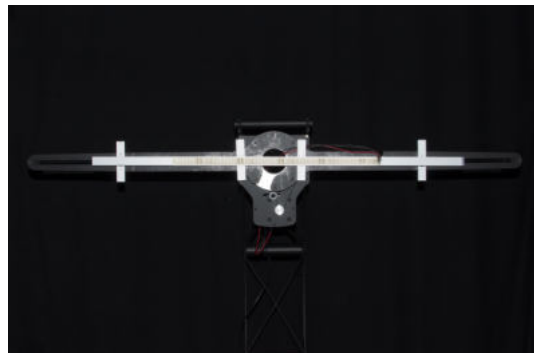
2759 K

Output: 665 lm

Peak: 995 cd

Power: 4,8 W

PF: 1,0



Product name:

Navigator-3_510mm_827_Lens-15°-Frosted

Item number:

NP/L1C/14C/G1/L1C/0510/827/L1F

Date and time:

21.06.2022 12:48:16

Description:

Rank: D60-AC-8GB

Tolerances:

Lumen +/-4%

Candela +/-2,5%

Colour Temp +/-35 Kelvin

CRI +/-0,7

Angular Resolution: 1 Degree Step

Last Calibration 20-09-2021

Tester: Peter Ulrich

Test Site: Lichtlabor

Gaustrasse 13

55411 Bingen am Rhein

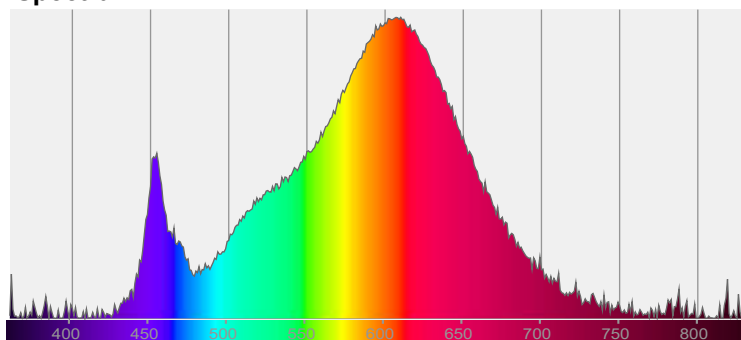


CIE 1931

x: 0,453

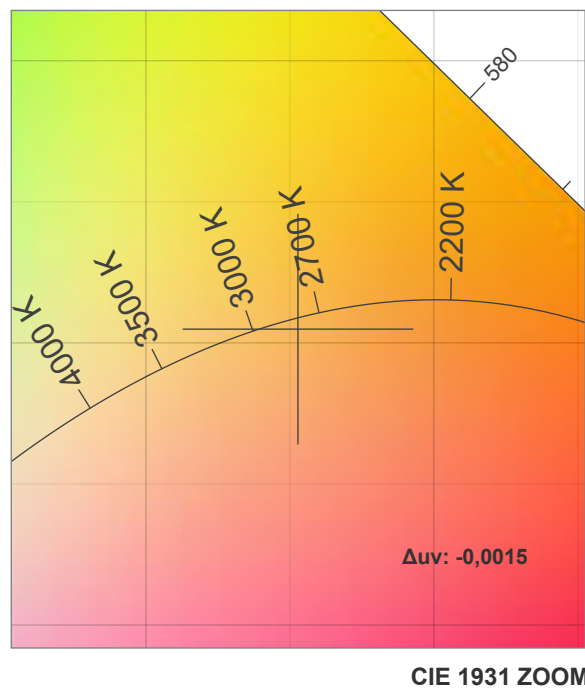
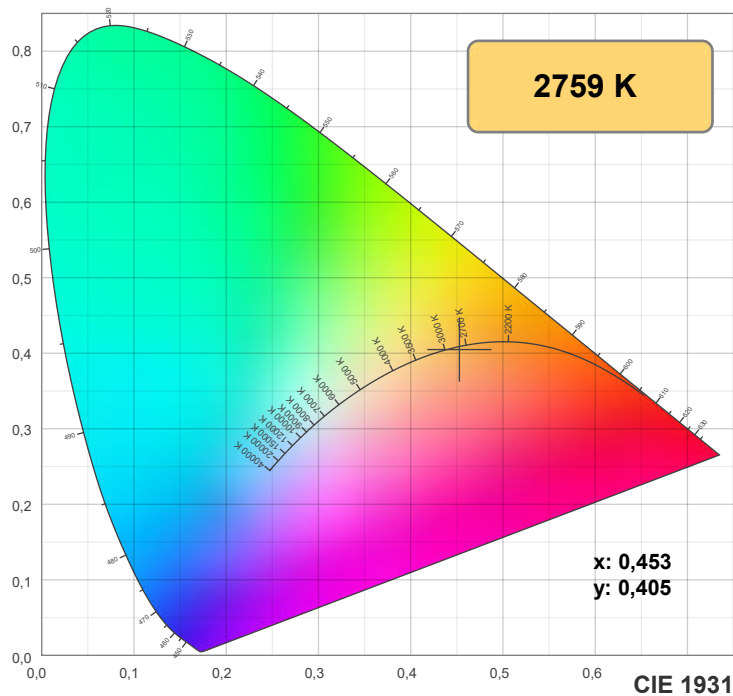
y: 0,405

Spectra



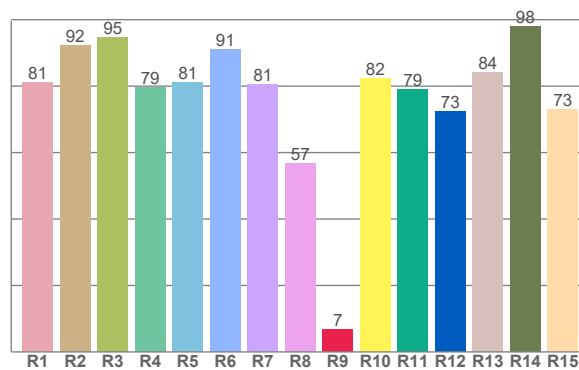
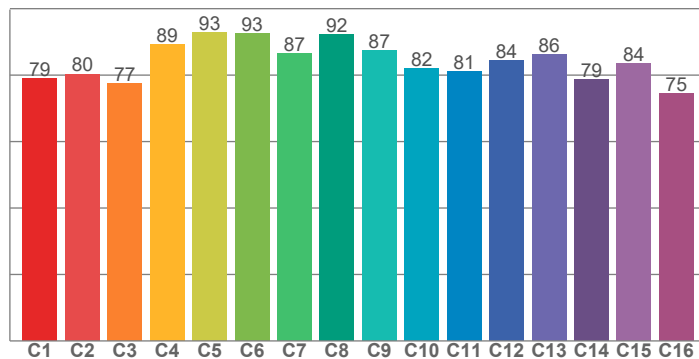
Power

Voltage: 48,0 V
Current: 0,100 A
Frequency: 0 Hz



TM30: 84,0

CRI: 82,2 (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 |
|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|
| 81,2 | 92,2 | 94,7 | 79,5 | 81,2 | 91,1 | 80,6 | 56,8 | 6,9 | 82,5 | 79,0 | 72,5 | 84,0 | 98,0 | 73,0 |

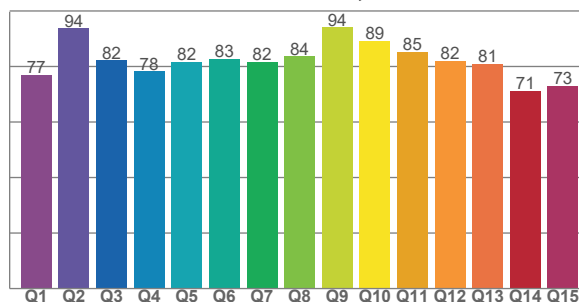
TM30 C values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 79,0 | 80,4 | 77,5 | 89,1 | 92,9 | 92,6 | 86,5 | 92,2 | 87,4 | 82,0 | 81,0 | 84,4 | 86,3 | 78,6 | 83,5 | 74,6 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 76,9 | 93,7 | 82,1 | 78,2 | 81,7 | 82,8 | 81,8 | 83,6 | 94,1 | 89,3 | 85,2 | 81,9 | 80,9 | 71,2 | 72,9 |

CQS: 81,2



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 |
| 2759 K | 82,2 | 6,9 | 84,0 | 95,7 | 81,2 | 0,453 | 0,405 | 0,260 | 0,349 | -0,0015 |

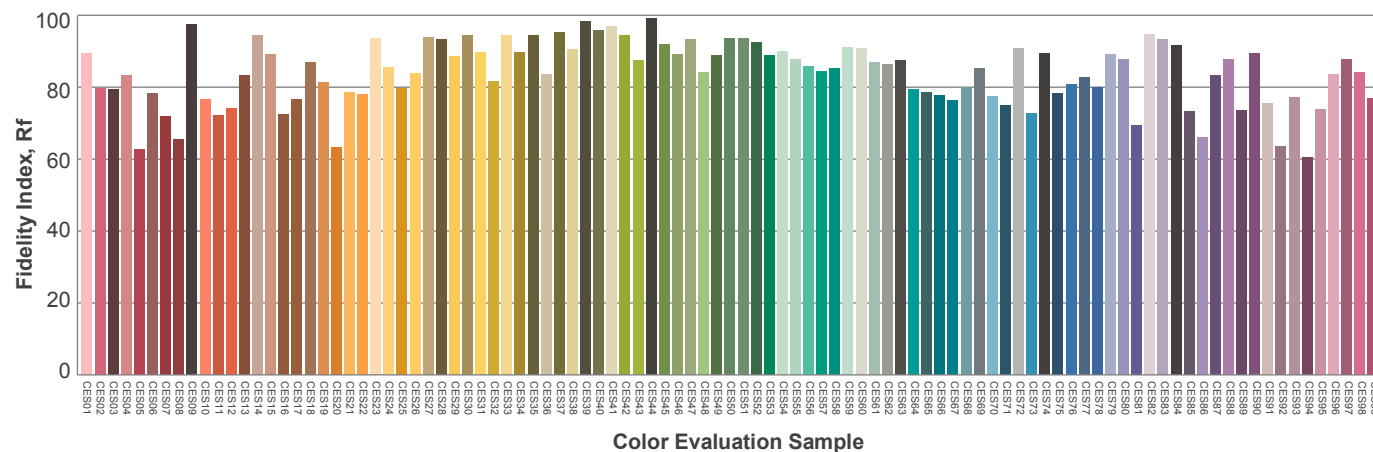
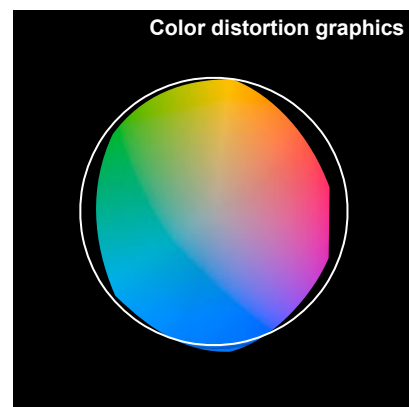
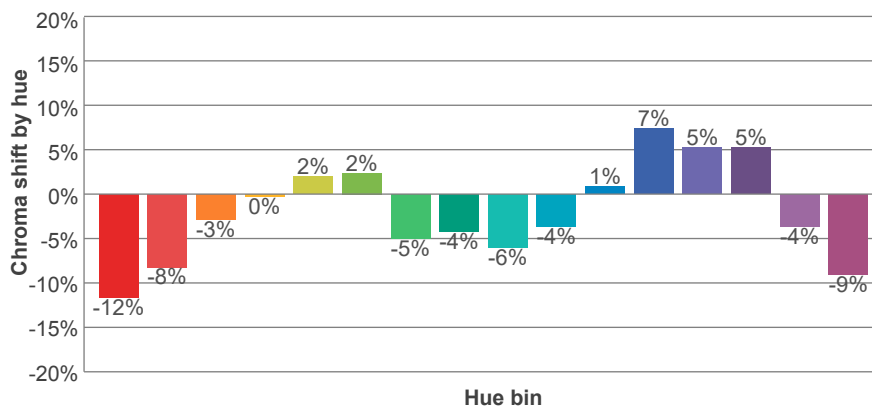
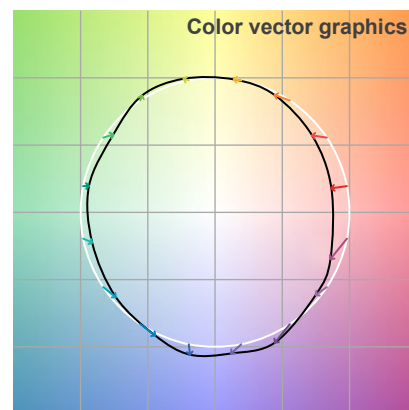
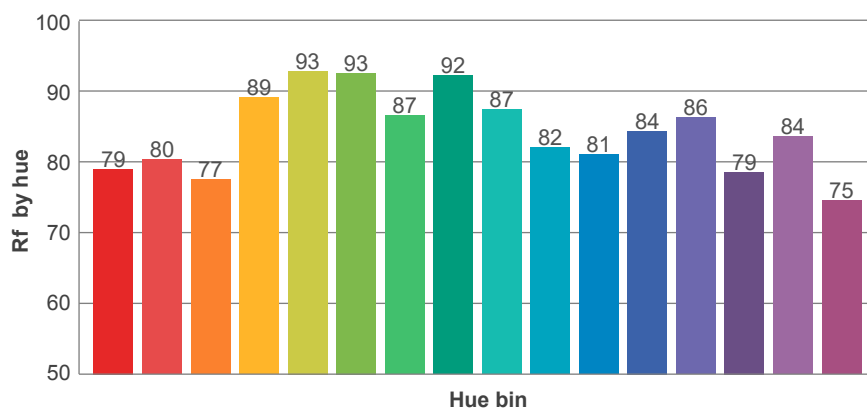
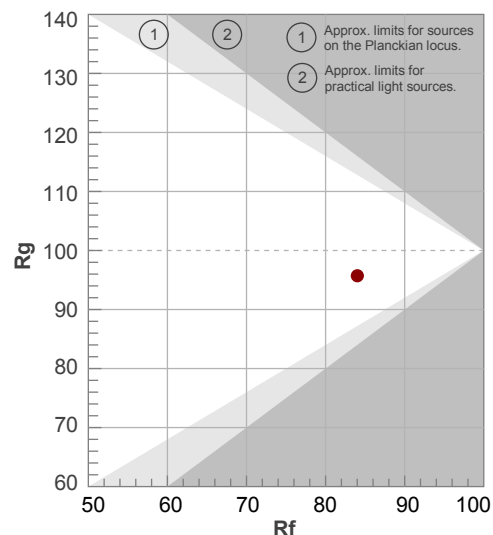
Rf 84,0

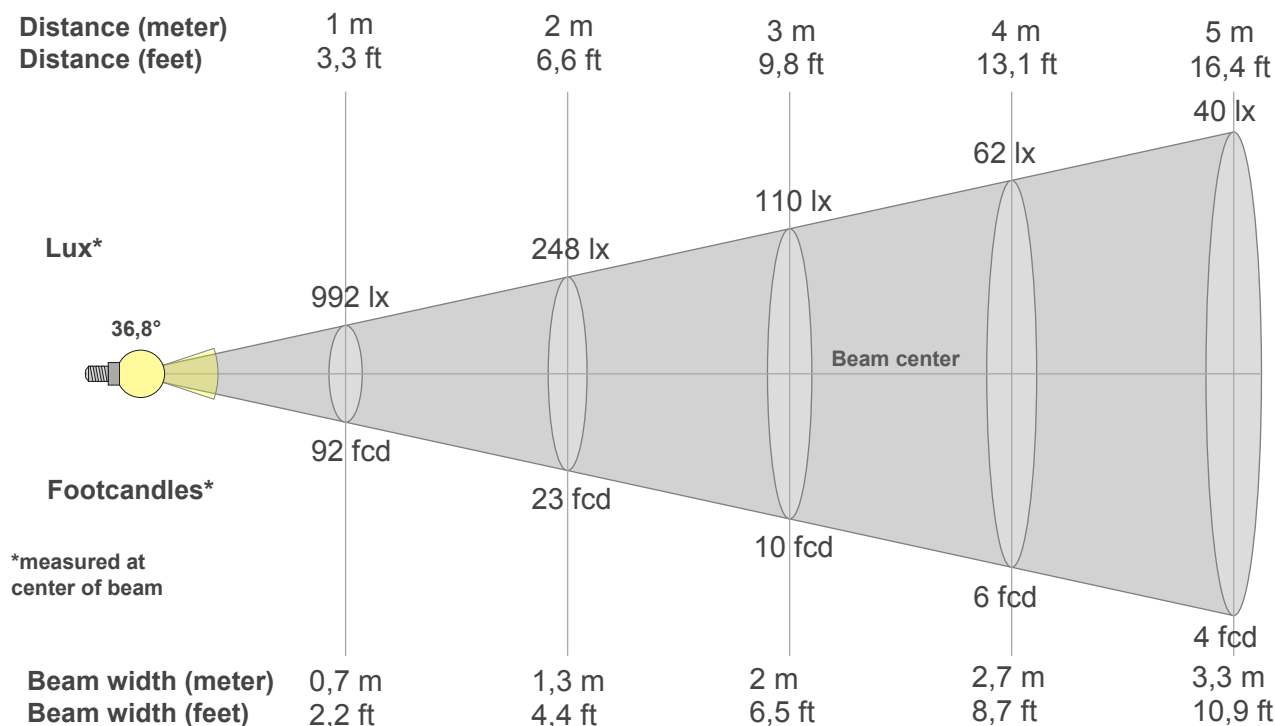
Fidelity index Rf

Rg 95,7

Gammut index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 79 | -12% | 1% |
| 2 | 80 | -8% | 7% |
| 3 | 77 | -3% | 12% |
| 4 | 89 | 0% | 6% |
| 5 | 93 | 2% | 4% |
| 6 | 93 | 2% | -3% |
| 7 | 87 | -5% | -6% |
| 8 | 92 | -4% | -1% |
| 9 | 87 | -6% | 4% |
| 10 | 82 | -4% | 11% |
| 11 | 81 | 1% | 14% |
| 12 | 84 | 7% | 2% |
| 13 | 86 | 5% | -9% |
| 14 | 79 | 5% | -17% |
| 15 | 84 | -4% | -9% |
| 16 | 75 | -9% | -17% |





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 |
| 992lx | 248lx | 110lx | 62lx | 40lx | 28lx | 20lx | 16lx | 12lx | 10lx | 8lx | 7lx | 6lx | 5lx | 4lx | 4lx | 3lx | 3lx | 3lx | 2lx |
| 92,2fcd | 23fcd | 10,2fcd | 5,8fcd | 3,7fcd | 2,6fcd | 1,9fcd | 1,4fcd | 1,1fcd | 0,9fcd | 0,8fcd | 0,6fcd | 0,5fcd | 0,5fcd | 0,4fcd | 0,4fcd | 0,3fcd | 0,3fcd | 0,3fcd | 0,2fcd |

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° |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 992 | 957 | 860 | 724 | 571 | 426 | 301 | 206 | 143 | 104 | 80 | 67 | 62 | 62 | 62 | 58 | 52 | 48 | 50 | 51 |
| 100% | 97% | 87% | 73% | 58% | 43% | 30% | 21% | 14% | 10% | 8% | 7% | 6% | 6% | 6% | 6% | 5% | 5% | 5% | 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° |
|------|-----|-----|-----|-----|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 992 | 981 | 982 | 984 | 986 | 988 | 991 | 990 | 988 | 982 | 971 | 956 | 934 | 905 | 870 | 826 | 777 | 723 | 663 | 600 |
| 100% | 99% | 99% | 99% | 99% | 100% | 100% | 100% | 100% | 99% | 98% | 96% | 94% | 91% | 88% | 83% | 78% | 73% | 67% | 61% |

Intensities in 180° c-plane

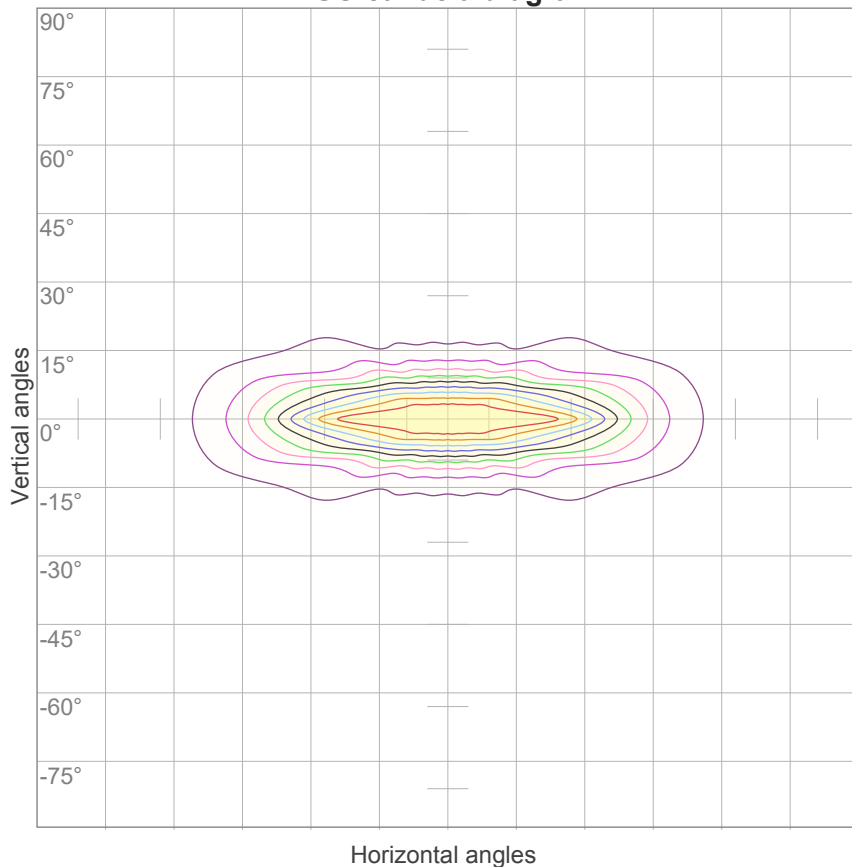
| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 992 | 957 | 860 | 724 | 571 | 426 | 301 | 206 | 143 | 104 | 80 | 67 | 62 | 62 | 62 | 58 | 52 | 48 | 50 | 51 |
| 100% | 97% | 87% | 73% | 58% | 43% | 30% | 21% | 14% | 10% | 8% | 7% | 6% | 6% | 6% | 6% | 5% | 5% | 5% | 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° |
|------|-----|-----|-----|-----|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 992 | 981 | 982 | 984 | 986 | 988 | 991 | 990 | 988 | 982 | 971 | 956 | 934 | 905 | 870 | 826 | 777 | 723 | 663 | 600 |
| 100% | 99% | 99% | 99% | 99% | 100% | 100% | 100% | 100% | 99% | 98% | 96% | 94% | 91% | 88% | 83% | 78% | 73% | 67% | 61% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 36,8° | 68,8° | 156° | 83,9% | 69,2% |

ISO candela diagram



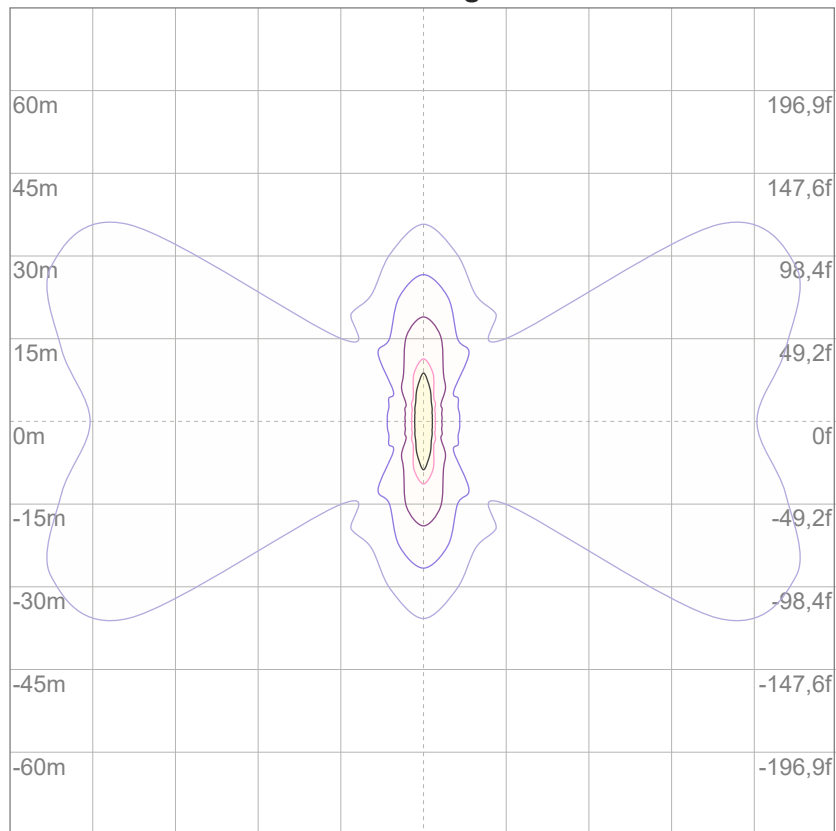
| | |
|-----|--------|
| 10% | 99 cd |
| 20% | 198 cd |
| 30% | 298 cd |
| 40% | 397 cd |
| 50% | 496 cd |
| 60% | 595 cd |
| 70% | 694 cd |
| 80% | 794 cd |
| 90% | 893 cd |

Conditions:

Number of c-planes: 16

Candela at center: 992 cd

ISO lux diagram



| | |
|-----|----------|
| 3% | 0,298 lx |
| 5% | 0,496 lx |
| 10% | 0,992 lx |
| 30% | 2,98 lx |
| 50% | 4,96 lx |

Conditions:

Number of c-planes: 16

Lux at center: 9,92 lx

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

Glare Evaluation According to UGR

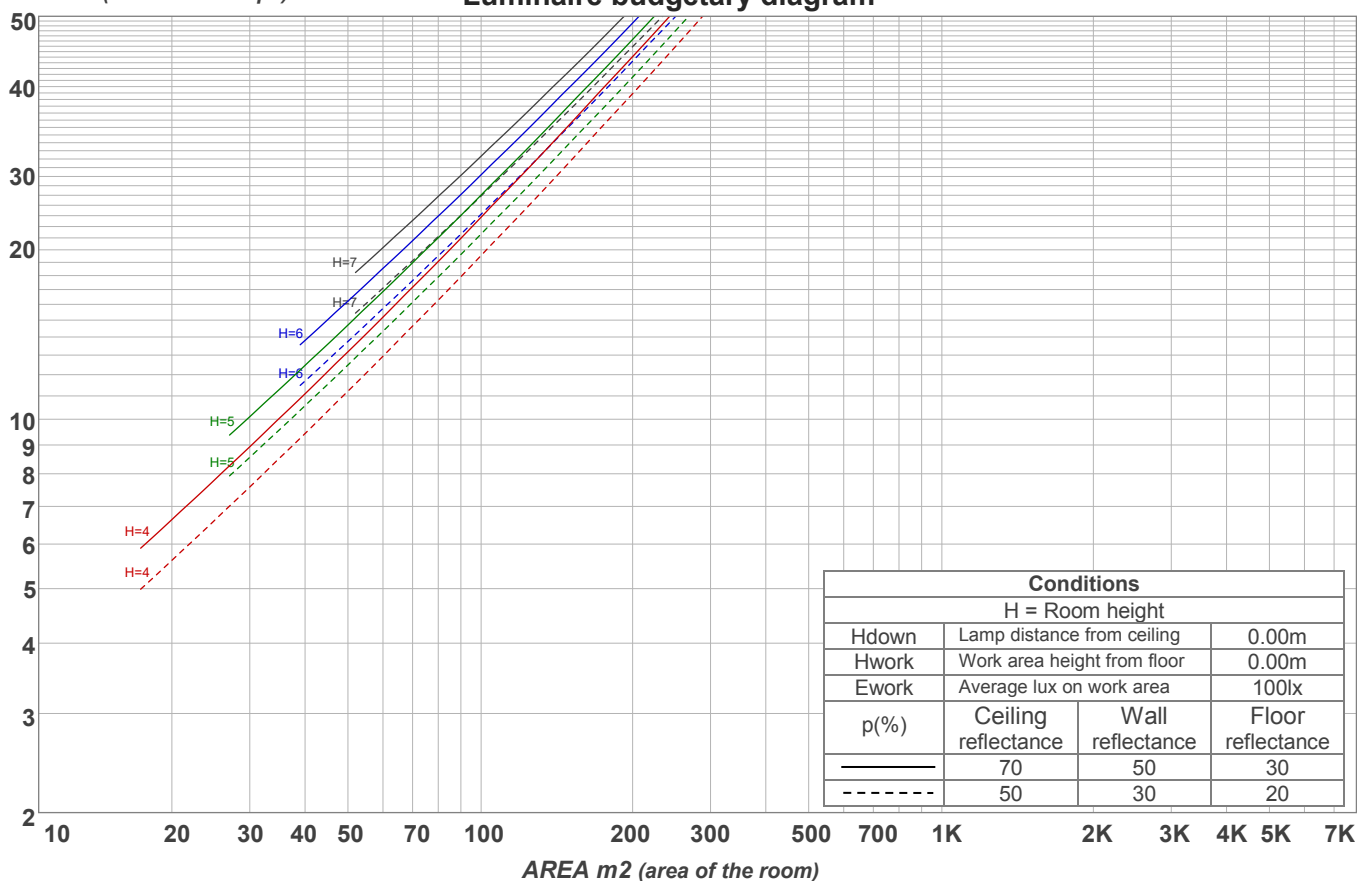
| | | | | | | | | | | | |
|---|-----|---|------|------|------|------|---|------|------|------|------|
| p Ceiling | | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
| p Walls | | 50 | 30 | 50 | 30 | 30 | 50 | 30 | 50 | 30 | 30 |
| p Floor | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Room size X Y | | Viewing direction at right angles to lamp axis | | | | | Viewing direction parallel to lamp axis | | | | |
| 2H | 2H | 13,8 | 14,8 | 14,0 | 15,1 | 15,3 | 22,0 | 22,9 | 22,1 | 23,2 | 23,4 |
| | 3H | 16,3 | 17,3 | 16,7 | 17,6 | 17,8 | 22,5 | 23,5 | 22,9 | 23,8 | 23,9 |
| | 4H | 17,7 | 18,7 | 18,1 | 19,0 | 19,2 | 22,7 | 23,7 | 23,1 | 23,9 | 24,2 |
| | 6H | 19,0 | 19,9 | 19,3 | 20,2 | 20,5 | 22,9 | 23,8 | 23,2 | 24,1 | 24,4 |
| | 8H | 19,3 | 20,2 | 19,7 | 20,5 | 20,9 | 23,0 | 23,8 | 23,3 | 24,1 | 24,5 |
| | 12H | 19,5 | 20,4 | 19,9 | 20,7 | 21,1 | 23,0 | 23,8 | 23,3 | 24,1 | 24,6 |
| 4H | 2H | 14,5 | 15,5 | 14,9 | 15,7 | 16,0 | 21,7 | 22,7 | 22,1 | 23,0 | 23,2 |
| | 3H | 17,3 | 18,1 | 17,7 | 18,5 | 18,9 | 22,5 | 23,3 | 22,8 | 23,6 | 24,1 |
| | 4H | 18,8 | 19,6 | 19,3 | 20,0 | 20,5 | 22,7 | 23,4 | 23,1 | 23,9 | 24,4 |
| | 6H | 20,2 | 21,0 | 20,7 | 21,3 | 21,7 | 22,9 | 23,7 | 23,4 | 24,0 | 24,4 |
| | 8H | 20,7 | 21,4 | 21,2 | 21,7 | 22,1 | 23,0 | 23,7 | 23,5 | 24,1 | 24,4 |
| | 12H | 20,9 | 21,5 | 21,4 | 21,9 | 22,4 | 23,1 | 23,7 | 23,6 | 24,1 | 24,5 |
| 8H | 4H | 19,2 | 19,9 | 19,7 | 20,3 | 20,6 | 22,7 | 23,4 | 23,2 | 23,8 | 24,1 |
| | 6H | 20,9 | 21,4 | 21,4 | 21,9 | 22,4 | 23,1 | 23,6 | 23,6 | 24,0 | 24,6 |
| | 8H | 21,5 | 21,9 | 22,0 | 22,5 | 23,1 | 23,3 | 23,7 | 23,8 | 24,2 | 24,9 |
| | 12H | 21,9 | 22,3 | 22,5 | 22,8 | 23,4 | 23,4 | 23,8 | 24,0 | 24,3 | 24,9 |
| 12H | 4H | 19,2 | 19,8 | 19,7 | 20,2 | 20,7 | 22,7 | 23,3 | 23,2 | 23,7 | 24,2 |
| | 6H | 21,0 | 21,5 | 21,5 | 22,0 | 22,6 | 23,2 | 23,6 | 23,7 | 24,1 | 24,7 |
| | 8H | 21,7 | 22,0 | 22,3 | 22,6 | 23,2 | 23,4 | 23,7 | 23,9 | 24,2 | 24,8 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1.0H | | 0,0 / 0,0 | | | | | 1,4 / -1,4 | | | | |
| S = 1.5H | | 0,2 / -0,2 | | | | | 3,0 / -2,2 | | | | |
| S = 2.0H | | 0,4 / -0,3 | | | | | 4,5 / -2,9 | | | | |
| Standard table | | n/a | | | | | n/a | | | | |
| Correction summand | | n/a | | | | | n/a | | | | |
| Corrected glare indices referring to 665 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 | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 110 | 110 | 110 | 104 | 104 | 104 | 100 | 100 | 100 | 97 |
| 1 | 110 | 106 | 102 | 99 | 107 | 103 | 100 | 97 | 98 | 96 | 93 | 94 | 92 | 90 | 90 | 88 | 87 | 85 |
| 2 | 102 | 95 | 89 | 84 | 99 | 93 | 88 | 83 | 89 | 85 | 81 | 86 | 82 | 79 | 82 | 79 | 77 | 75 |
| 3 | 95 | 86 | 79 | 74 | 92 | 84 | 78 | 73 | 81 | 76 | 72 | 78 | 74 | 70 | 76 | 72 | 69 | 67 |
| 4 | 89 | 79 | 72 | 66 | 86 | 77 | 71 | 65 | 75 | 69 | 64 | 72 | 67 | 63 | 70 | 66 | 62 | 60 |
| 5 | 83 | 73 | 65 | 60 | 81 | 71 | 64 | 59 | 69 | 63 | 58 | 67 | 62 | 58 | 65 | 61 | 57 | 55 |
| 6 | 78 | 67 | 60 | 54 | 76 | 66 | 59 | 54 | 64 | 58 | 54 | 63 | 57 | 53 | 61 | 56 | 52 | 51 |
| 7 | 74 | 63 | 55 | 50 | 72 | 62 | 55 | 50 | 60 | 54 | 49 | 59 | 53 | 49 | 57 | 52 | 48 | 47 |
| 8 | 70 | 59 | 51 | 47 | 68 | 58 | 51 | 46 | 56 | 50 | 46 | 55 | 50 | 46 | 54 | 49 | 45 | 44 |
| 9 | 66 | 55 | 48 | 43 | 65 | 54 | 48 | 43 | 53 | 47 | 43 | 52 | 47 | 43 | 51 | 46 | 42 | 41 |
| 10 | 63 | 52 | 45 | 41 | 62 | 51 | 45 | 41 | 50 | 44 | 40 | 49 | 44 | 40 | 48 | 43 | 40 | 38 |

LAMPS (number of lamps)

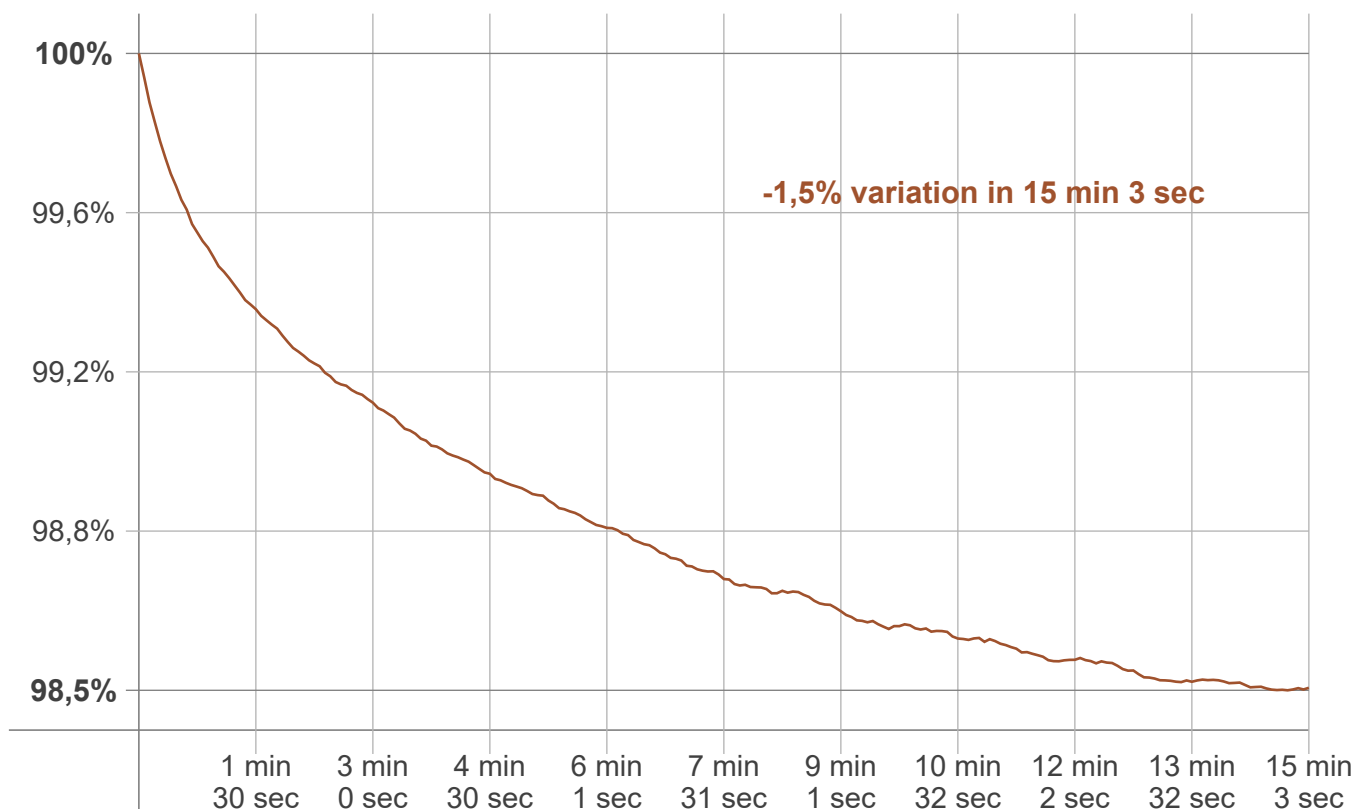
Luminaire budgetary diagram



Zonal Lumen Summary

| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 75,1 lm | 131 lm | 113 lm | 98,6 lm | 79,5 lm | 60,2 lm | 39,5 lm | 32,5 lm | 18,2 lm |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 3,88 lm | 3,45 lm | 1,28 lm | 1,16 lm | 0,905 lm | 0,677 lm | 0,499 lm | 0,305 lm | 4,97 lm |

Warmup curve



Warmup result

| | |
|------------------|---------------------------------|
| Warmup time: | Lamp stabilized in 15 min 3 sec |
| Warmup variation | -1,5% |

Warmup conditions

| | |
|--------------------|--------|
| Stable period: | 15 min |
| Stable change max: | 2,0% |
| Minimum time: | 15 min |

Color temperature change

| CCT start | CCT change | CCT end |
|-----------|------------|---------|
| 2756 K | +3 K | 2759 K |

Output change

| Output start | Output change | Output end |
|--------------|---------------|------------|
| 674 lm | -9 lm | 665 lm |