

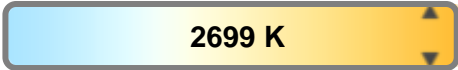
Light efficiency:



Light quality:



Color temperature:

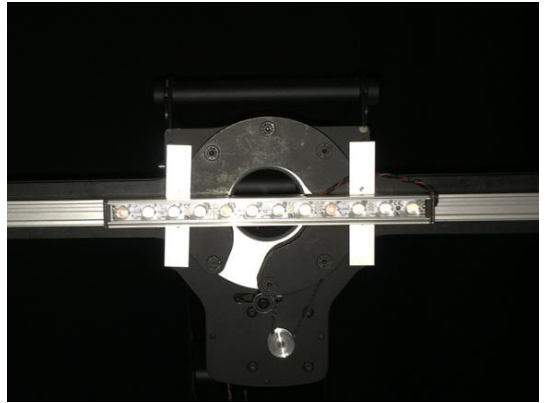


Output: 208 lm

Peak: 367 cd

Power: 7,0 W

PF: 0,81



Product name:

FLNP-F4CH-C-258-W-927-10773

Item number:

FLNP-F4CH-C-258-W-927-10773

Date and time:

15.02.2019 13:40:53

Description:

Toleranzen:

Lumen +/-4%

Candela +/-2,5%

Colour Temp +/-35 Grad K

CRI +/-0,7

Angular Resolution 1 Grad step

Last Calibration 06-06-2018

Pruefer:

Mourad Benzineb

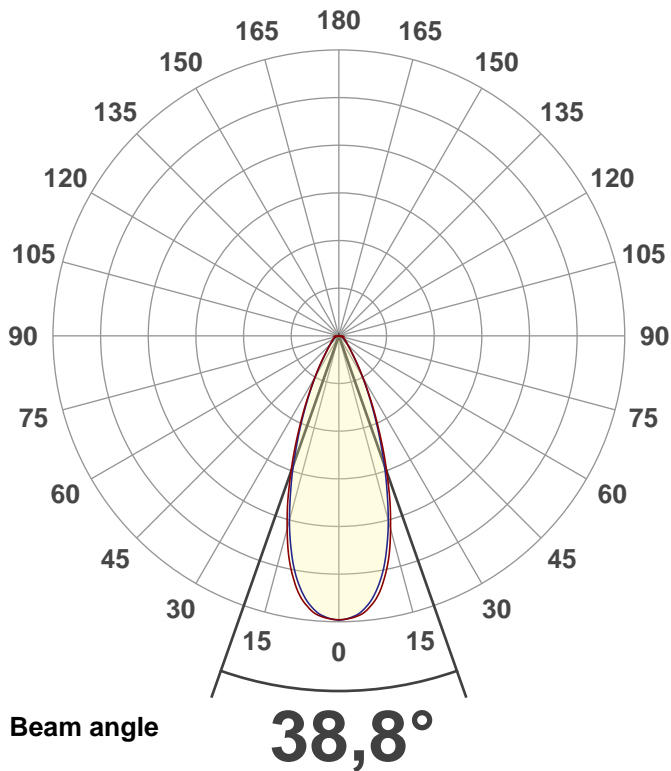
Master of Engineering

Pruefort:

Lichtlabor

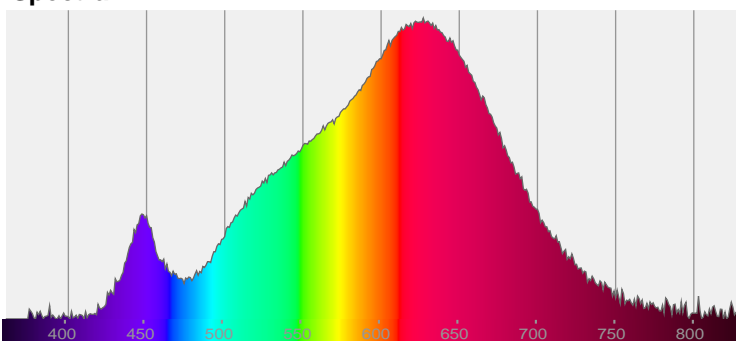
Gaustrasse13-15

55411 Bingen am Rhein

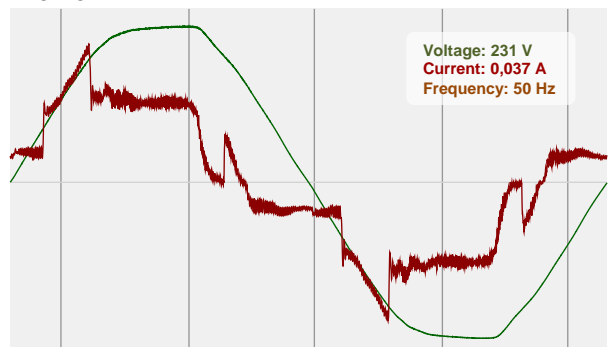


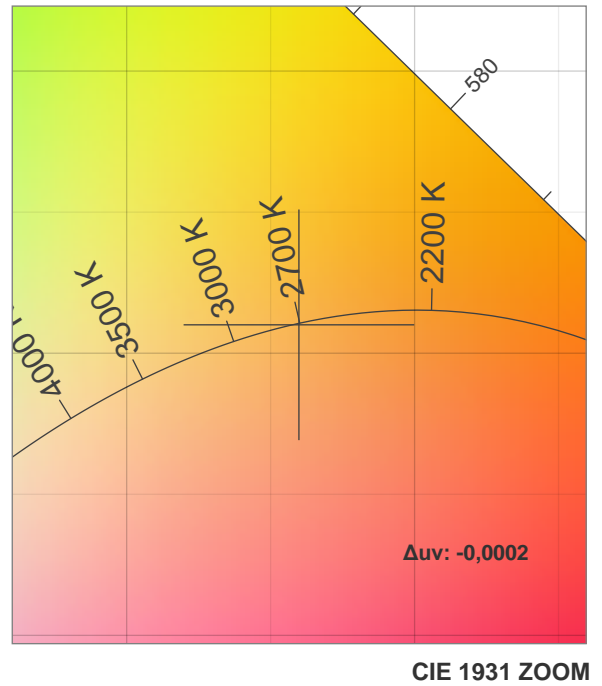
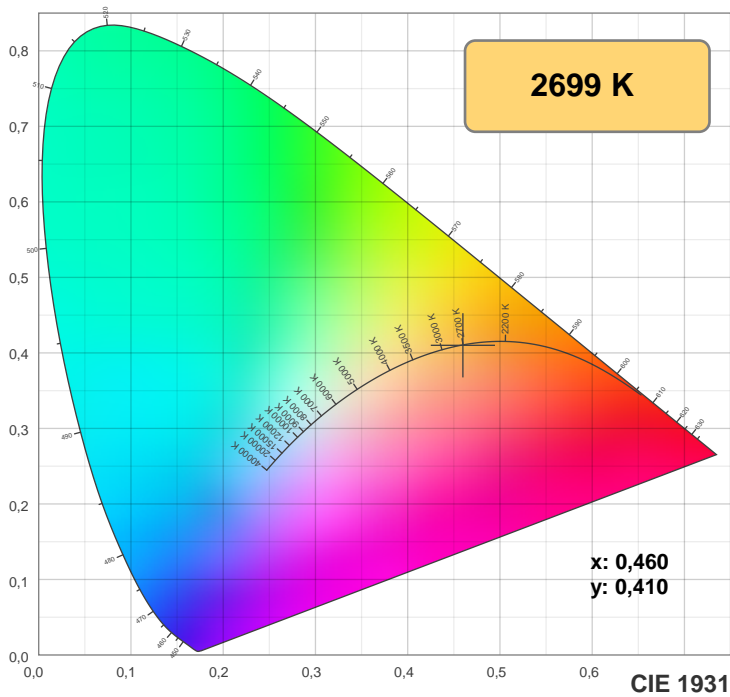
CIE 1931
x: 0,460
y: 0,410

Spectra

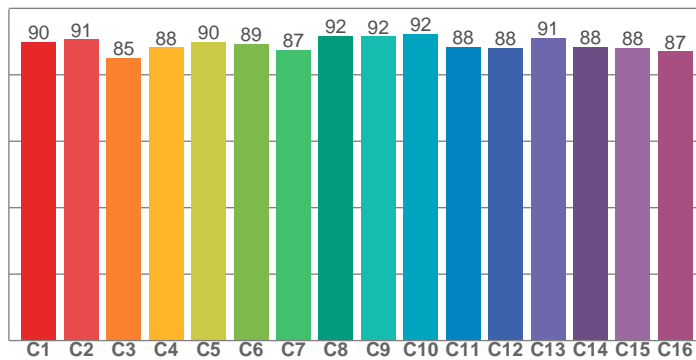


Power

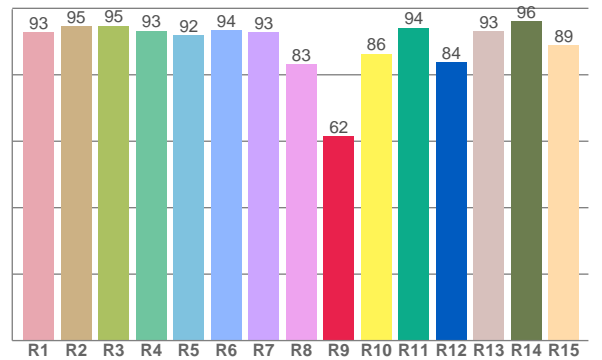




TM30: 89,3



CRI: 92,1 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 92,8 | 94,6 | 94,8 | 93,2 | 92,0 | 93,5 | 92,7 | 83,3 | 61,6 | 86,3 | 94,2 | 83,7 | 93,1 | 96,1 | 88,9 |

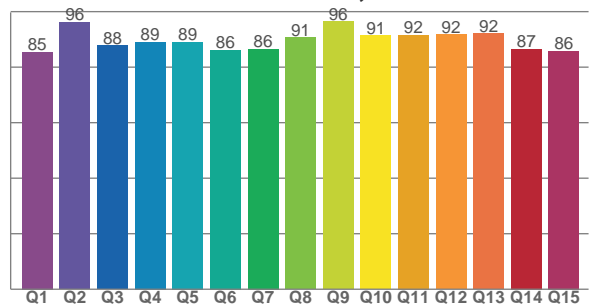
TM30 C values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 89,9 | 90,6 | 85,0 | 88,3 | 90,0 | 89,3 | 87,4 | 91,7 | 91,6 | 92,3 | 88,4 | 88,1 | 91,0 | 88,3 | 88,2 | 87,0 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85,4 | 96,2 | 87,8 | 89,0 | 89,1 | 86,2 | 86,5 | 90,7 | 96,5 | 91,3 | 91,6 | 91,8 | 92,1 | 86,6 | 85,9 |

CQS: 89,1



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 |
| 2699 K | 92,1 | 61,6 | 89,3 | 102,1 | 89,1 | 0,460 | 0,410 | 0,263 | 0,351 | -0,0002 |

TM30 details

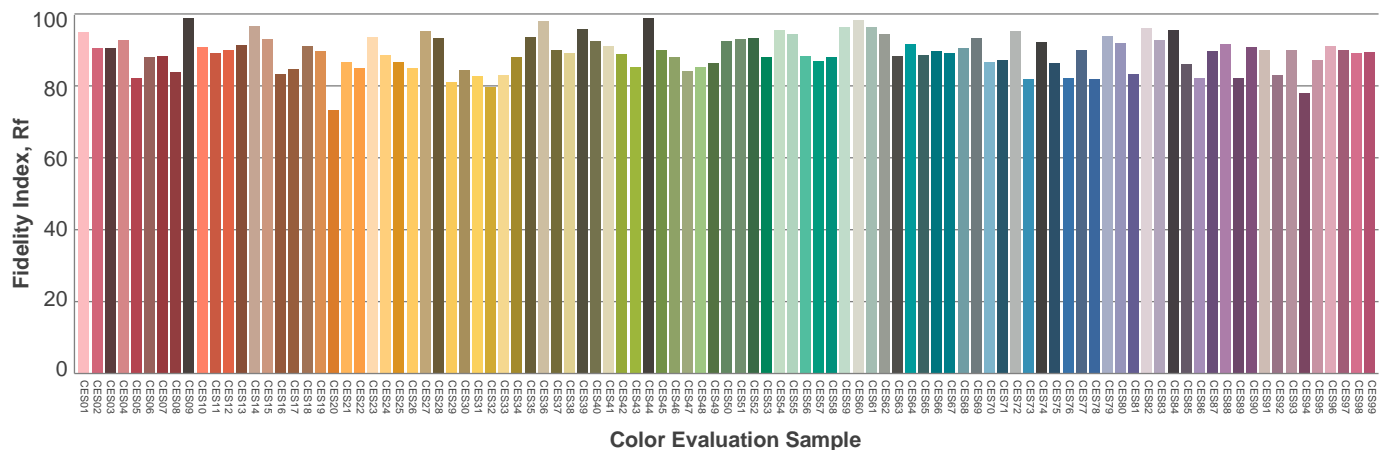
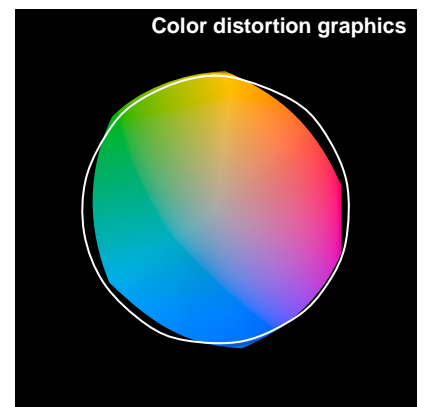
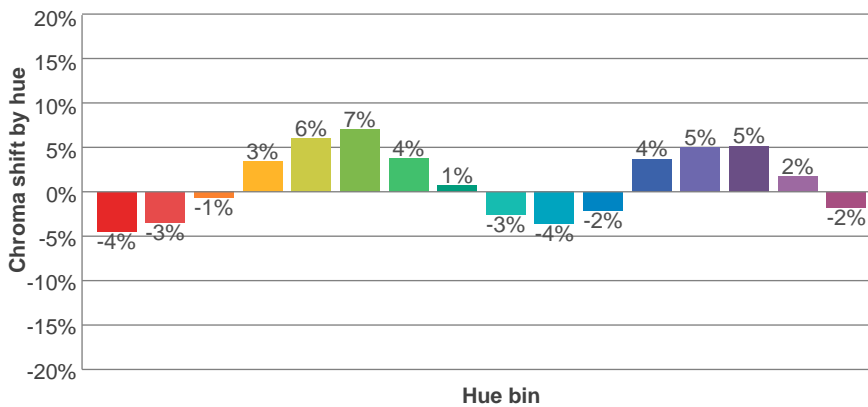
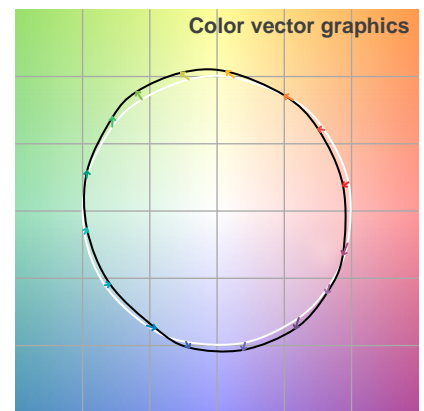
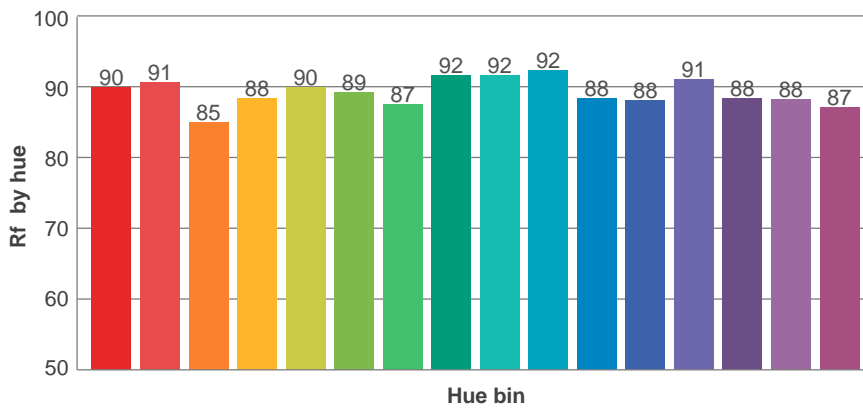
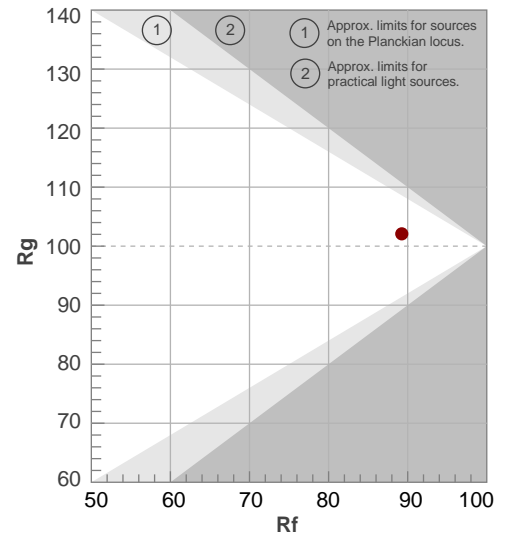
Rf 89,3

Fidelity index Rf

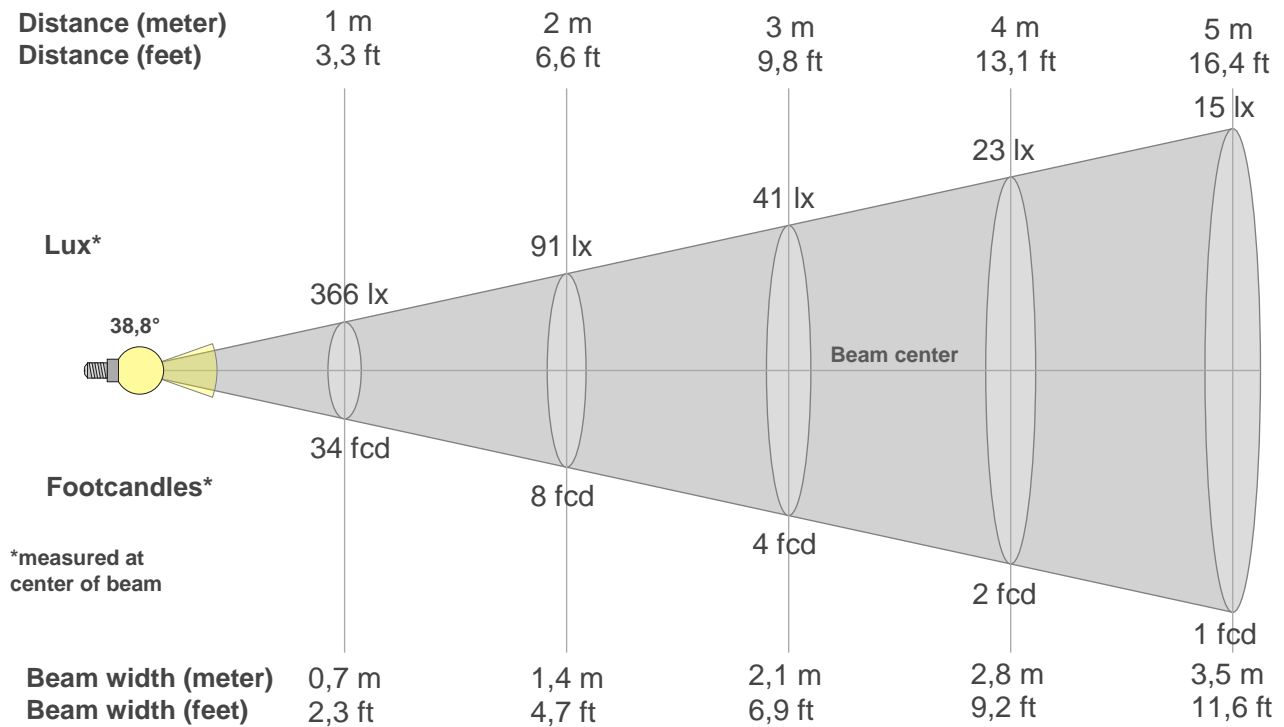
Rg 102,1

Gammut index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|-----|
| | | Chroma | Hue |
| 1 | 90 | -4% | -2% |
| 2 | 91 | -3% | 3% |
| 3 | 85 | -1% | 7% |
| 4 | 88 | 3% | 6% |
| 5 | 90 | 6% | 5% |
| 6 | 89 | 7% | 0% |
| 7 | 87 | 4% | -6% |
| 8 | 92 | 1% | -5% |
| 9 | 92 | -3% | -4% |
| 10 | 92 | -4% | 1% |
| 11 | 88 | -2% | 6% |
| 12 | 88 | 4% | 3% |
| 13 | 91 | 5% | -3% |
| 14 | 88 | 5% | -6% |
| 15 | 88 | 2% | -6% |
| 16 | 87 | -2% | -9% |



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 |
| 366lx | 91lx | 41lx | 23lx | 15lx | 10lx | 7lx | 6lx | 5lx | 4lx | 3lx | 3lx | 2lx | 2lx | 2lx | 1lx | 1lx | 1lx | 1lx | 1lx |
| 34fcd | 8,5fcd | 3,8fcd | 2,1fcd | 1,4fcd | 0,9fcd | 0,7fcd | 0,5fcd | 0,4fcd | 0,3fcd | 0,3fcd | 0,2fcd | 0,2fcd | 0,2fcd | 0,2fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd |

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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 366 | 365 | 362 | 355 | 343 | 325 | 302 | 273 | 242 | 209 | 177 | 146 | 119 | 97 | 78 | 62 | 50 | 40 | 33 | 27 |
| 100% | 100% | 99% | 97% | 94% | 89% | 82% | 75% | 66% | 57% | 48% | 40% | 33% | 26% | 21% | 17% | 14% | 11% | 9% | 7% |

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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 366 | 364 | 359 | 350 | 335 | 316 | 291 | 262 | 230 | 198 | 167 | 139 | 114 | 93 | 75 | 60 | 48 | 38 | 31 | 26 |
| 100% | 100% | 98% | 96% | 92% | 86% | 79% | 72% | 63% | 54% | 46% | 38% | 31% | 25% | 20% | 16% | 13% | 10% | 8% | 7% |

Intensities in 180° c-plane

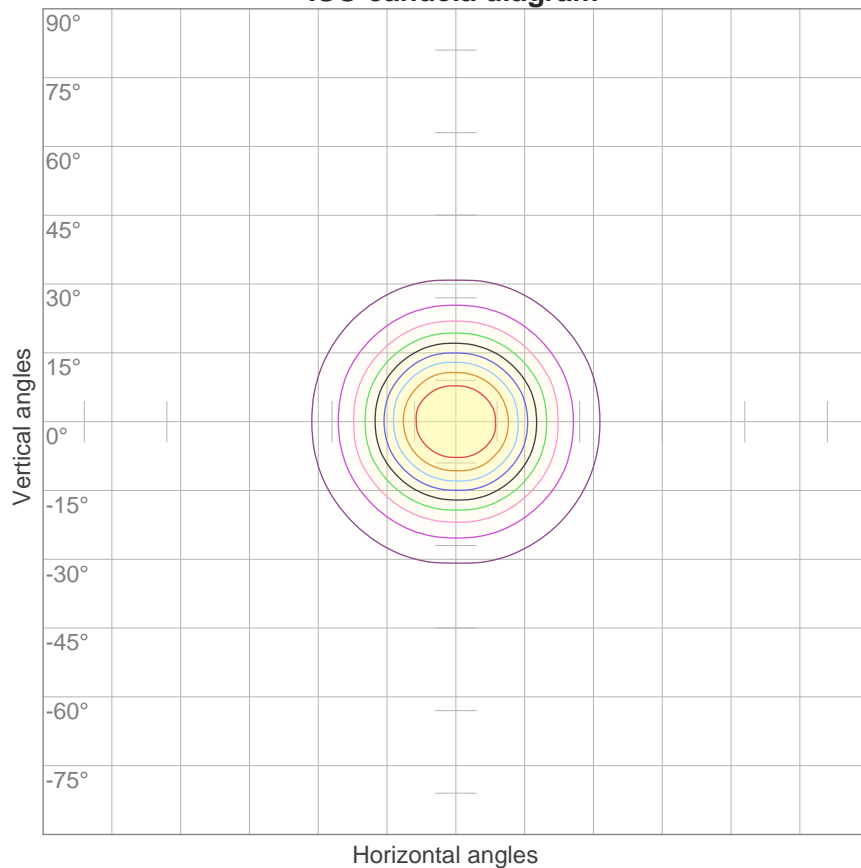
| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 366 | 365 | 362 | 355 | 343 | 325 | 302 | 273 | 242 | 209 | 177 | 146 | 119 | 97 | 78 | 62 | 50 | 40 | 33 | 27 |
| 100% | 100% | 99% | 97% | 94% | 89% | 82% | 75% | 66% | 57% | 48% | 40% | 33% | 26% | 21% | 17% | 14% | 11% | 9% | 7% |

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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 366 | 364 | 359 | 350 | 335 | 316 | 291 | 262 | 230 | 198 | 167 | 139 | 114 | 93 | 75 | 60 | 48 | 38 | 31 | 26 |
| 100% | 100% | 98% | 96% | 92% | 86% | 79% | 72% | 63% | 54% | 46% | 38% | 31% | 25% | 20% | 16% | 13% | 10% | 8% | 7% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 38,8° | 69,9° | 111,7° | 94,3% | 87,5% |

ISO candela diagram



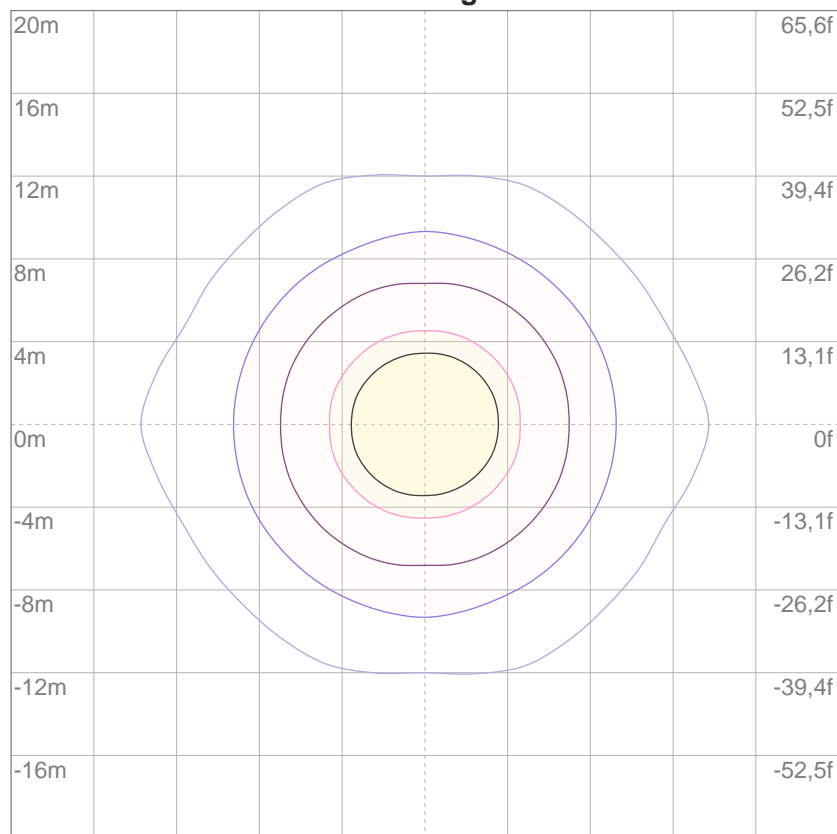
| | |
|-----|--------|
| 10% | 37 cd |
| 20% | 73 cd |
| 30% | 110 cd |
| 40% | 146 cd |
| 50% | 183 cd |
| 60% | 220 cd |
| 70% | 256 cd |
| 80% | 293 cd |
| 90% | 329 cd |

Conditions:

Number of c-planes: 16

Candela at center: 366 cd

ISO lux diagram



| | |
|-----|----------|
| 3% | 0,110 lx |
| 5% | 0,183 lx |
| 10% | 0,366 lx |
| 30% | 1,10 lx |
| 50% | 1,83 lx |

Conditions:

Number of c-planes: 16

Lux at center: 3,66 lx

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

Glare Evaluation According to UGR

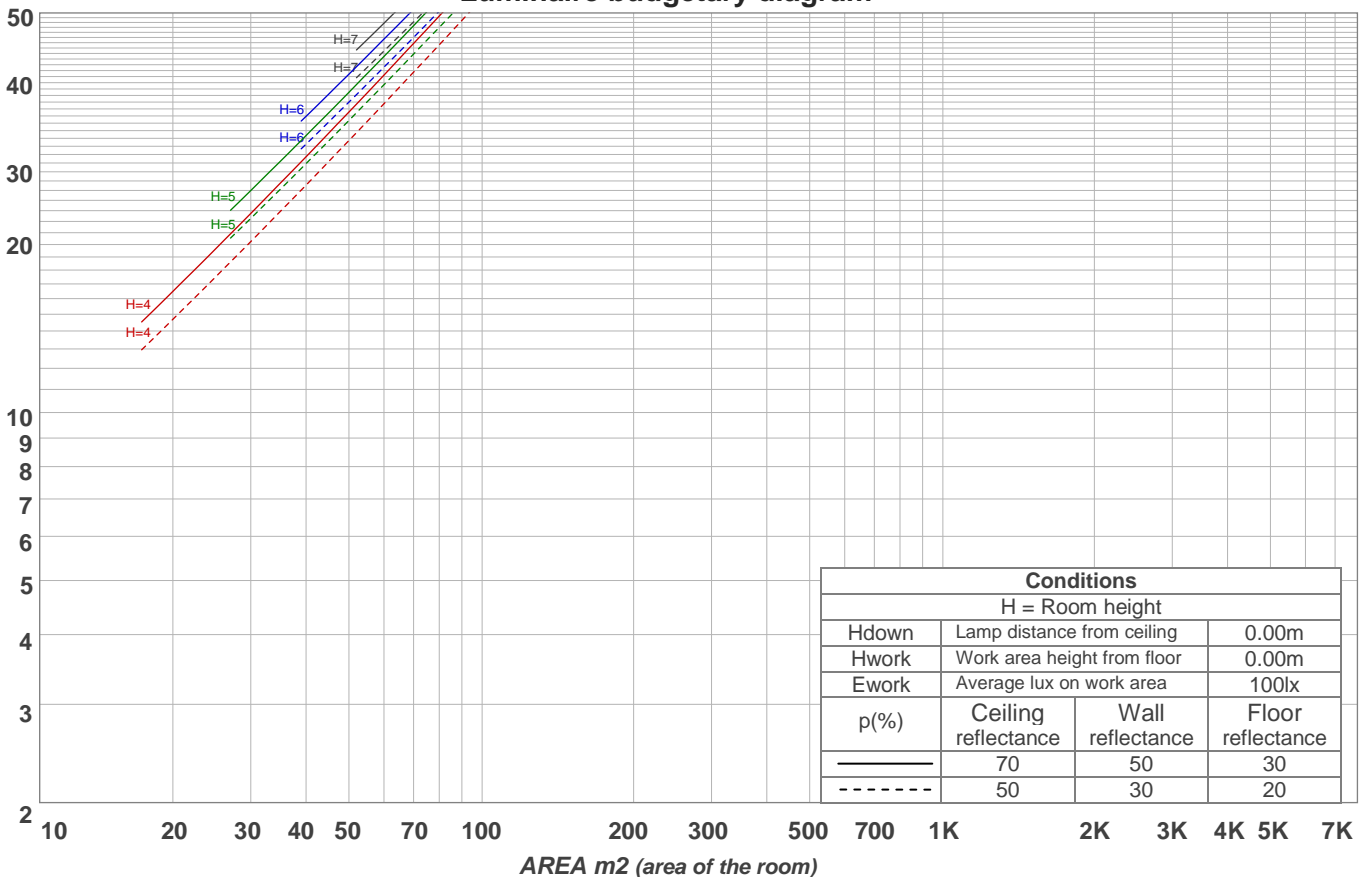
| | | | | | | | | | | | |
|---|-----|---|------|------|------|------|---|------|------|------|------|
| p Ceiling | | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
| p Walls | | 50 | 30 | 50 | 30 | 30 | 50 | 30 | 50 | 30 | 30 |
| p Floor | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Room size X Y | | Viewing direction at right angles to lamp axis | | | | | Viewing direction parallel to lamp axis | | | | |
| 2H | 2H | 13,2 | 14,0 | 13,4 | 14,2 | 14,4 | 12,8 | 13,6 | 13,0 | 13,8 | 14,0 |
| | 3H | 14,4 | 15,1 | 14,7 | 15,4 | 15,6 | 13,9 | 14,7 | 14,2 | 14,9 | 15,2 |
| | 4H | 14,8 | 15,5 | 15,1 | 15,7 | 16,0 | 14,4 | 15,1 | 14,7 | 15,4 | 15,6 |
| | 6H | 15,0 | 15,6 | 15,3 | 15,9 | 16,2 | 14,7 | 15,4 | 15,1 | 15,7 | 15,9 |
| | 8H | 15,1 | 15,7 | 15,4 | 16,0 | 16,3 | 14,8 | 15,5 | 15,2 | 15,8 | 16,1 |
| | 12H | 15,1 | 15,7 | 15,4 | 16,0 | 16,3 | 15,0 | 15,5 | 15,3 | 15,8 | 16,2 |
| 4H | 2H | 13,7 | 14,4 | 14,0 | 14,6 | 14,9 | 13,3 | 14,0 | 13,7 | 14,3 | 14,6 |
| | 3H | 15,1 | 15,7 | 15,4 | 16,0 | 16,3 | 14,8 | 15,4 | 15,1 | 15,7 | 16,0 |
| | 4H | 15,6 | 16,1 | 16,0 | 16,5 | 16,8 | 15,4 | 15,9 | 15,8 | 16,2 | 16,6 |
| | 6H | 16,0 | 16,4 | 16,4 | 16,8 | 17,2 | 15,8 | 16,2 | 16,2 | 16,6 | 17,0 |
| | 8H | 16,1 | 16,5 | 16,5 | 16,9 | 17,3 | 15,9 | 16,3 | 16,4 | 16,7 | 17,1 |
| | 12H | 16,2 | 16,5 | 16,6 | 16,9 | 17,3 | 16,1 | 16,4 | 16,5 | 16,8 | 17,3 |
| 8H | 4H | 15,9 | 16,3 | 16,3 | 16,7 | 17,1 | 15,7 | 16,1 | 16,1 | 16,4 | 16,9 |
| | 6H | 16,4 | 16,7 | 16,8 | 17,1 | 17,6 | 16,2 | 16,5 | 16,6 | 16,9 | 17,4 |
| | 8H | 16,6 | 16,8 | 17,1 | 17,3 | 17,8 | 16,4 | 16,7 | 16,9 | 17,1 | 17,6 |
| | 12H | 16,7 | 17,0 | 17,2 | 17,4 | 17,9 | 16,6 | 16,8 | 17,1 | 17,3 | 17,8 |
| 12H | 4H | 15,9 | 16,2 | 16,3 | 16,7 | 17,1 | 15,7 | 16,0 | 16,1 | 16,4 | 16,9 |
| | 6H | 16,4 | 16,7 | 16,9 | 17,1 | 17,6 | 16,2 | 16,5 | 16,7 | 16,9 | 17,4 |
| | 8H | 16,7 | 16,9 | 17,2 | 17,3 | 17,8 | 16,5 | 16,7 | 17,0 | 17,2 | 17,7 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1,0H | | +0,6 / -0,4 | | | | | +0,6 / -0,4 | | | | |
| S = 1,5H | | +1,4 / -0,5 | | | | | +1,3 / -0,7 | | | | |
| S = 2,0H | | +2,3 / -0,8 | | | | | +2,2 / -1,1 | | | | |
| Standard table | | BK05 | | | | | BK05 | | | | |
| Correction summand | | -0,8 | | | | | -1,1 | | | | |
| Corrected glare indices referring to 208 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 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 113 | 110 | 107 | 105 | 110 | 108 | 105 | 103 | 104 | 102 | 100 | 100 | 98 | 97 | 96 | 95 | 94 | 92 |
| 2 | 107 | 102 | 97 | 94 | 105 | 100 | 96 | 93 | 97 | 93 | 91 | 94 | 91 | 89 | 91 | 89 | 87 | 85 |
| 3 | 102 | 95 | 90 | 85 | 99 | 93 | 89 | 85 | 91 | 87 | 83 | 88 | 85 | 82 | 86 | 83 | 81 | 79 |
| 4 | 96 | 89 | 83 | 79 | 95 | 88 | 82 | 78 | 85 | 81 | 77 | 83 | 79 | 76 | 81 | 78 | 75 | 74 |
| 5 | 92 | 83 | 78 | 73 | 90 | 82 | 77 | 73 | 81 | 76 | 72 | 79 | 75 | 71 | 77 | 74 | 71 | 69 |
| 6 | 88 | 79 | 73 | 68 | 86 | 78 | 72 | 68 | 76 | 71 | 68 | 75 | 71 | 67 | 74 | 70 | 67 | 65 |
| 7 | 84 | 75 | 69 | 64 | 82 | 74 | 68 | 64 | 73 | 68 | 64 | 71 | 67 | 64 | 70 | 66 | 63 | 62 |
| 8 | 80 | 71 | 65 | 61 | 79 | 70 | 65 | 61 | 69 | 64 | 60 | 68 | 64 | 60 | 67 | 63 | 60 | 59 |
| 9 | 77 | 67 | 62 | 58 | 76 | 67 | 61 | 58 | 66 | 61 | 57 | 65 | 60 | 57 | 64 | 60 | 57 | 56 |
| 10 | 74 | 64 | 59 | 55 | 73 | 64 | 59 | 55 | 63 | 58 | 55 | 62 | 58 | 55 | 62 | 57 | 54 | 53 |

LAMPS (number of lamps)

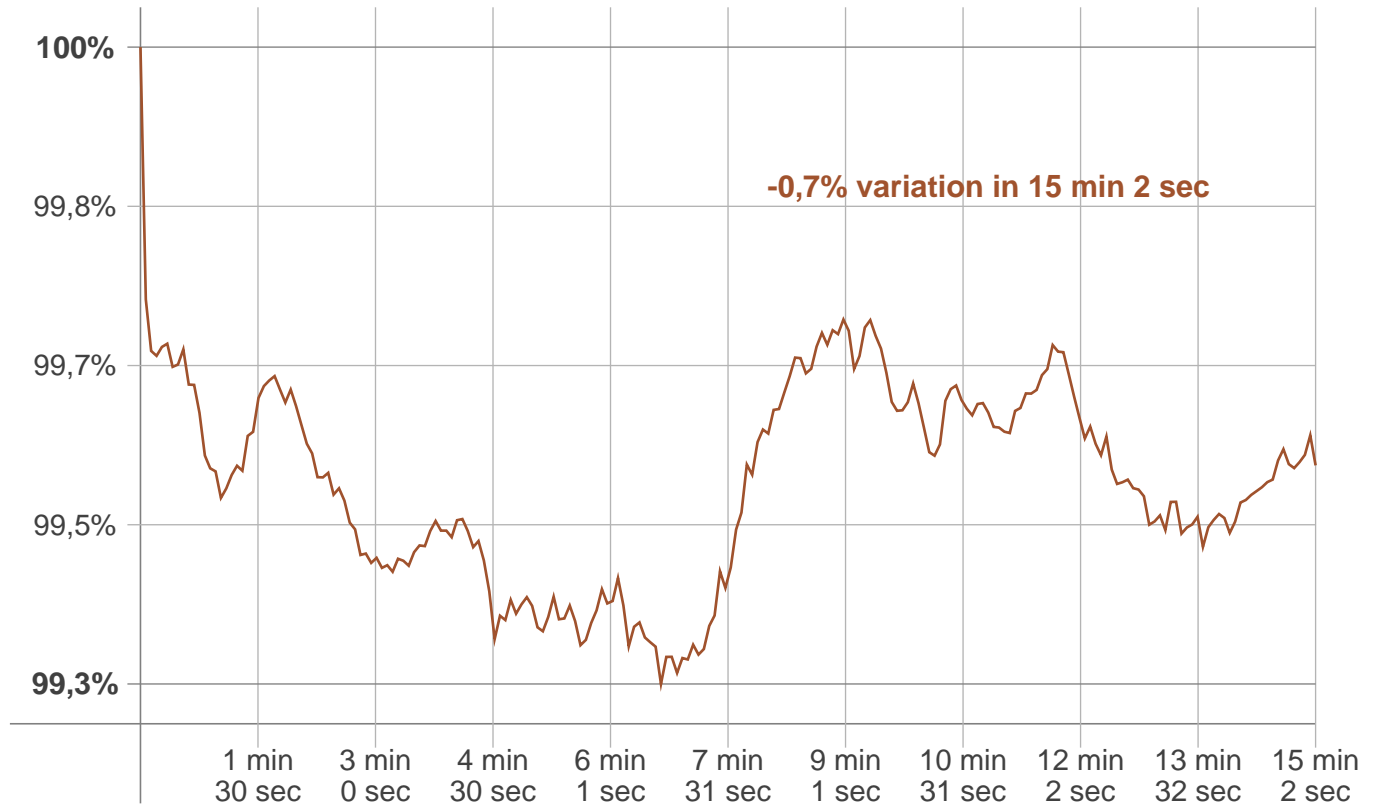
Luminaire budgetary diagram



Zonal Lumen Summary

| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| {LUM0-10} | 69,0 lm | 49,7 lm | 23,6 lm | 12,4 lm | 8,56 lm | 6,56 lm | 3,68 lm | 1,15 lm |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 0,149 lm | 0,114 lm | 0,107 lm | 0,097 lm | 0,038 lm | 0,000 lm | 0,000 lm | 0,000 lm | 0,000 lm |

Warmup curve



Warmup result

| | |
|------------------|--------------|
| Warmup time: | 15 min 2 sec |
| Warmup variation | -0,7% |

Warmup conditions

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

Color temperature change

| | | |
|-----------|------------|---------|
| CCT start | CCT change | CCT end |
| 2701 K | -2 K | 2699 K |

Output change

| | | |
|--------------|---------------|------------|
| Output start | Output change | Output end |
| 208 lm | lm | 208 lm |

Flicker curve (complete sampled flicker signal)



Flicker frame (frame of one flicker period)



Flicker FFT (frequency scope of flicker curve)



Flicker results:

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

Flicker conditions:

| | |
|--------------|-----------------------|
| Sample rate: | 60.000 samples/second |
|--------------|-----------------------|