

Light efficiency:

84 Lumen/Watt

Light quality:

CRI: 93,3

Color temperature:

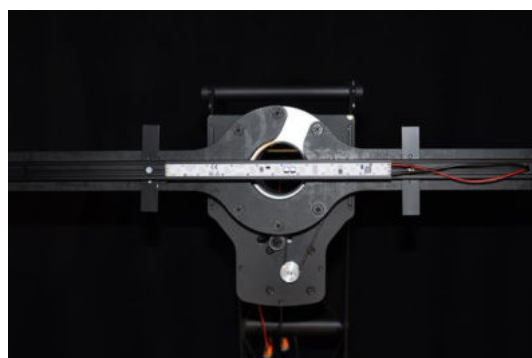
2990 K

Output: 523 lm

Peak: 2260 cd

Power: 6,2 W

PF: 1,0



Product name:

Focus-4-F1C-D0258-930-LSMF-10772

Item number:

FLNP-F1C-D0258-930-LSMF-10772

Date and time:

08.12.2020 12:54:53

Description:

Rank: P4-7D2

Bestromung: 220mA

Toleranzen:

Lumen +/-4%

Candela +/-2,5%

Colour Temp +/-35 Grad K

CRI +/-0,7

Angular Resolution 1 Grad Step

Last Calibration 20.05.2019

Abstand:248mm

Pruefer:

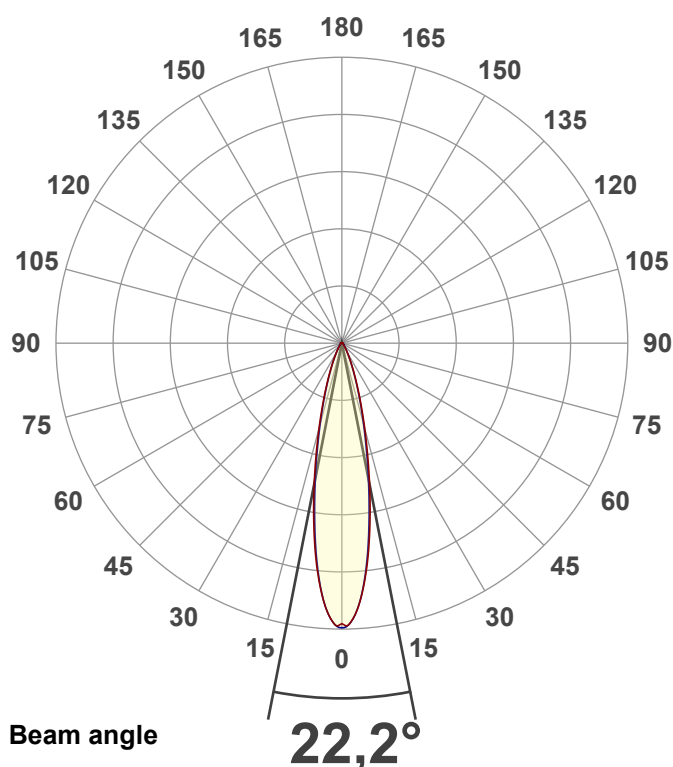
Peter Ulrich

Pruefort:

Lichtlabor

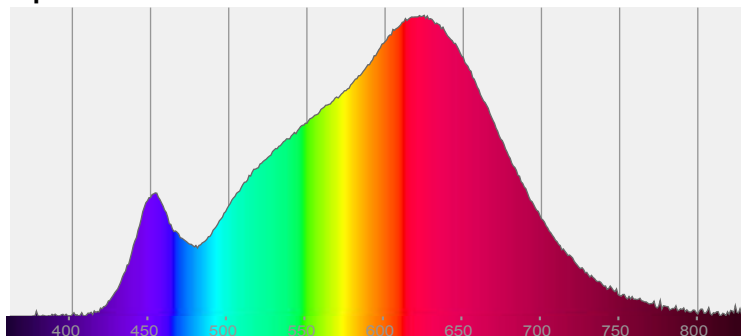
Gaustrasse13

55411 Bingen am Rhein

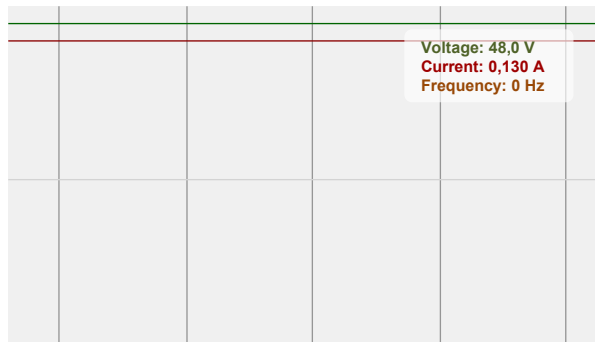


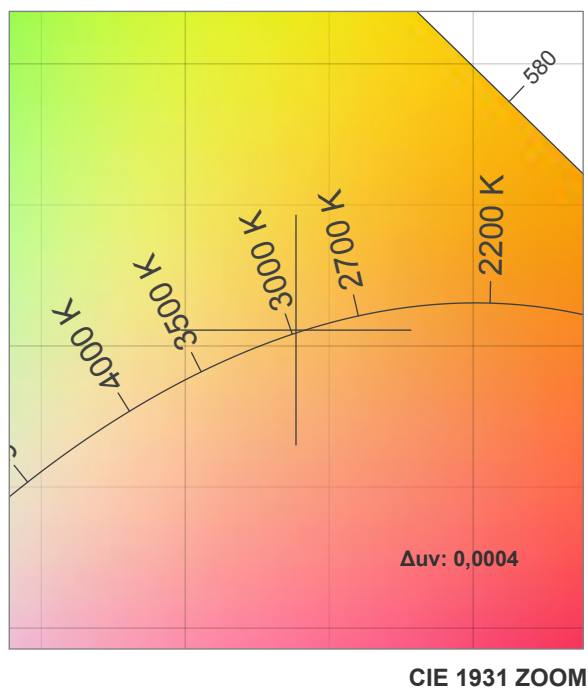
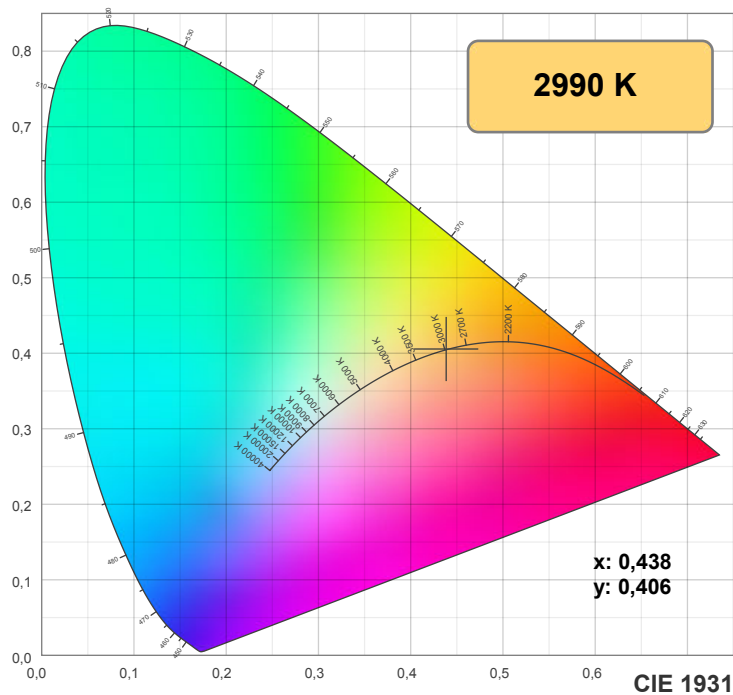
CIE 1931
x: 0,438
y: 0,406

Spectra

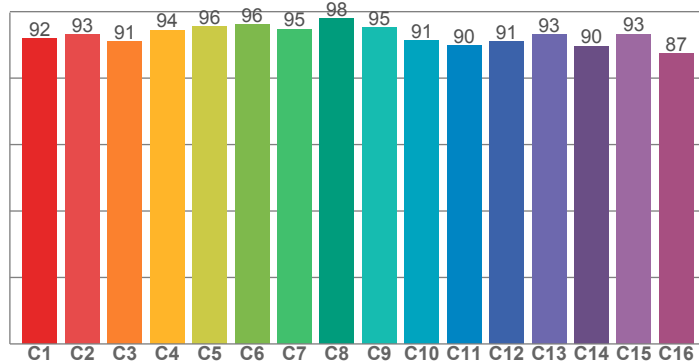


Power

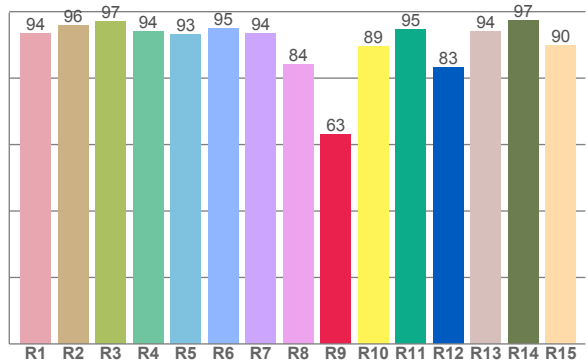




TM30: 92,7



CRI: 93,3 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 93,5 | 96,0 | 96,9 | 94,0 | 93,0 | 95,0 | 93,5 | 84,2 | 63,2 | 89,4 | 94,5 | 83,3 | 94,2 | 97,5 | 89,8 |

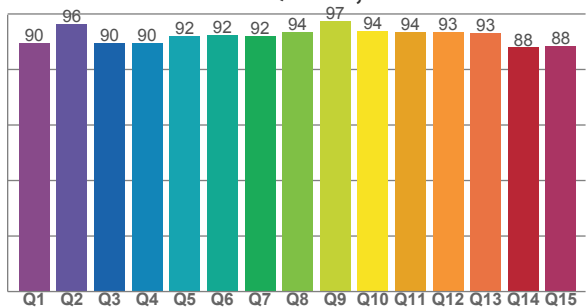
TM30 C values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 91,8 | 93,1 | 91,0 | 94,4 | 95,5 | 96,2 | 94,8 | 97,9 | 95,2 | 91,3 | 89,7 | 91,0 | 93,2 | 89,7 | 93,2 | 87,3 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 89,5 | 96,4 | 89,5 | 89,5 | 92,0 | 92,4 | 92,1 | 93,6 | 97,5 | 94,0 | 93,6 | 93,5 | 93,3 | 87,9 | 88,4 |

CQS: 91,6



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 |
| 2990 K | 93,3 | 63,2 | 92,7 | 99,4 | 91,6 | 0,438 | 0,406 | 0,251 | 0,348 | 0,0004 |

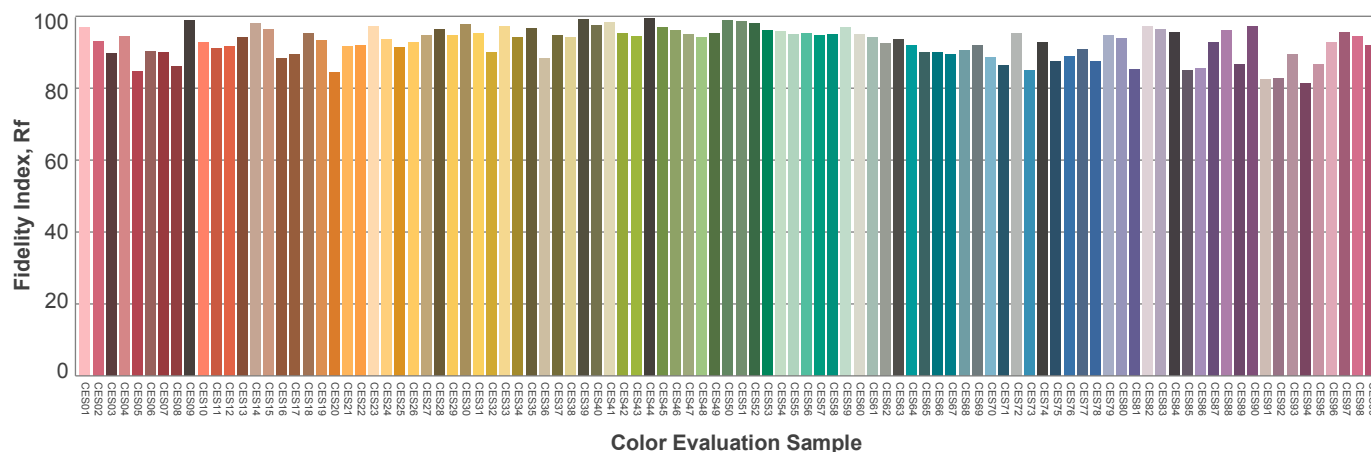
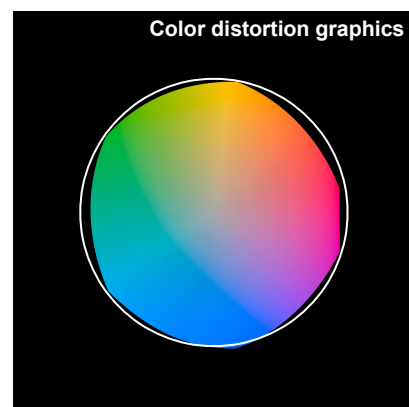
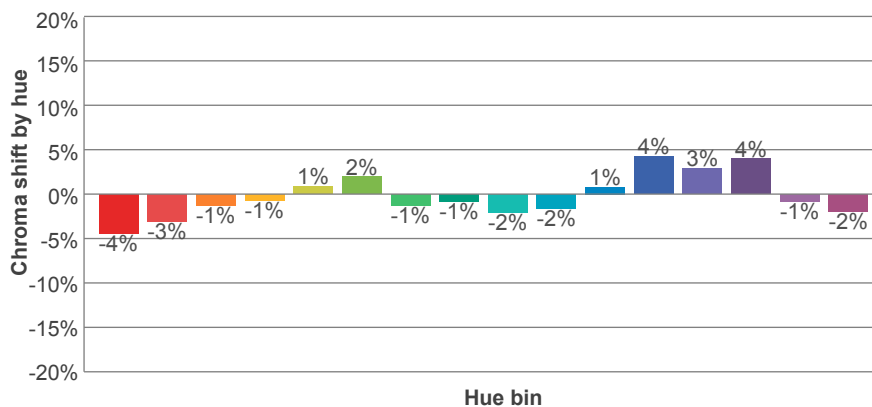
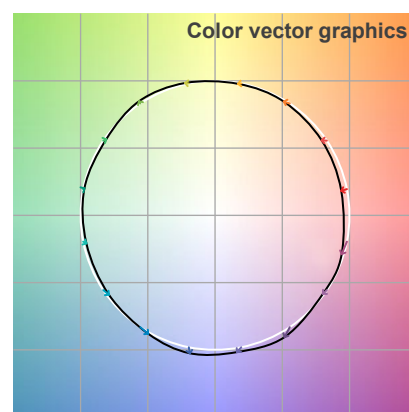
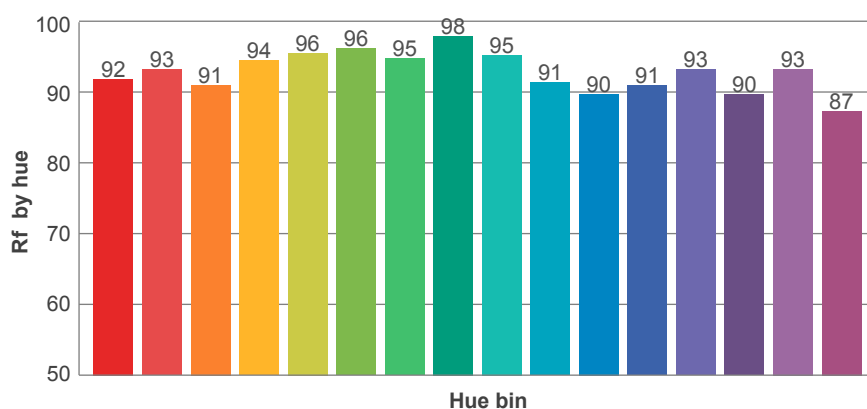
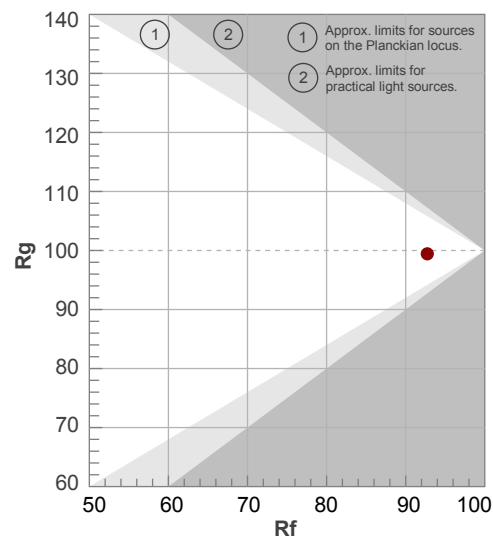
Rf 92,7

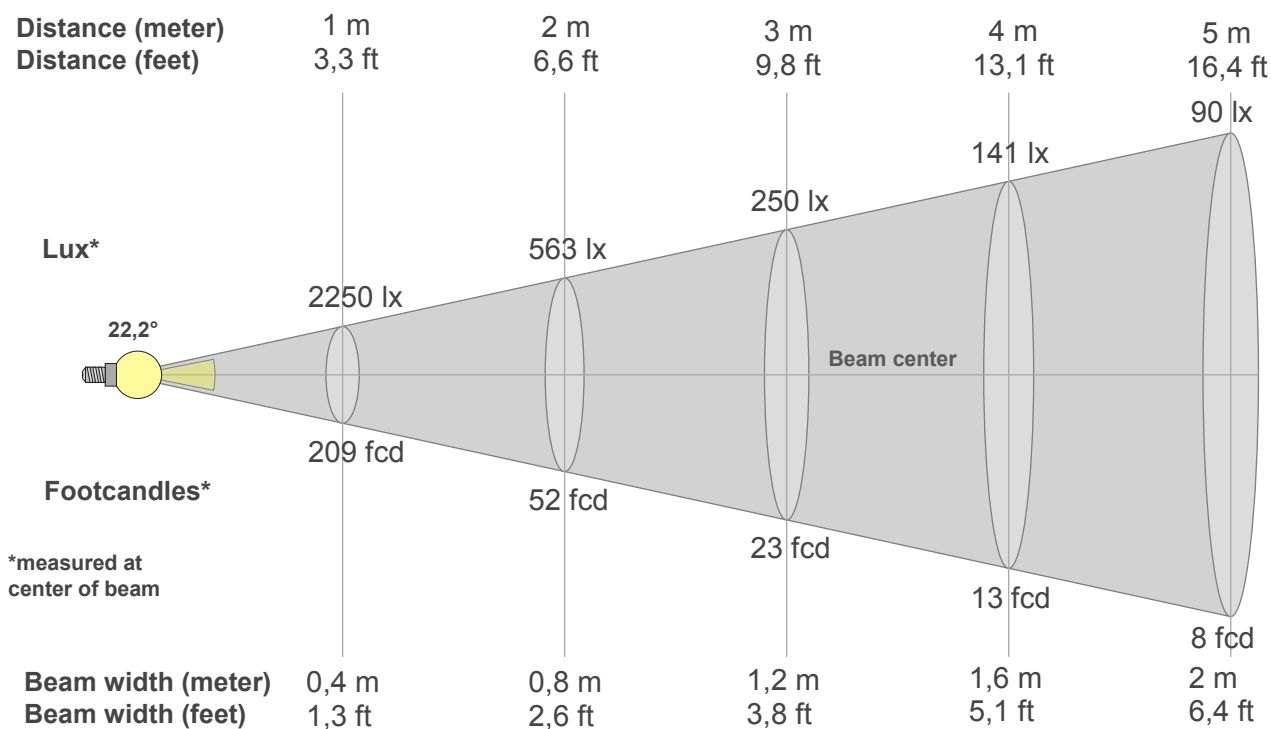
Fidelity index Rf

Rg 99,4

Gammut index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 92 | -4% | 0% |
| 2 | 93 | -3% | 2% |
| 3 | 91 | -1% | 4% |
| 4 | 94 | -1% | 2% |
| 5 | 96 | 1% | 3% |
| 6 | 96 | 2% | 0% |
| 7 | 95 | -1% | -2% |
| 8 | 98 | -1% | -1% |
| 9 | 95 | -2% | 2% |
| 10 | 91 | -2% | 5% |
| 11 | 90 | 1% | 8% |
| 12 | 91 | 4% | 2% |
| 13 | 93 | 3% | -4% |
| 14 | 90 | 4% | -7% |
| 15 | 93 | -1% | -4% |
| 16 | 87 | -2% | -10% |





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 |
| 2250lx | 563lx | 250lx | 141lx | 90lx | 63lx | 46lx | 35lx | 28lx | 23lx | 19lx | 16lx | 13lx | 11lx | 10lx | 9lx | 8lx | 7lx | 6lx | 6lx |
| 209,1fcd | 52,3fcd | 23,2fcd | 13,1fcd | 8,4fcd | 5,8fcd | 4,3fcd | 3,3fcd | 2,6fcd | 2,1fcd | 1,7fcd | 1,5fcd | 1,2fcd | 1,1fcd | 0,9fcd | 0,8fcd | 0,7fcd | 0,6fcd | 0,6fcd | 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° |
|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2250 | 2199 | 2051 | 1828 | 1563 | 1286 | 1024 | 798 | 612 | 466 | 351 | 265 | 200 | 152 | 116 | 90 | 70 | 56 | 44 | 37 |
| 100% | 98% | 91% | 81% | 69% | 57% | 46% | 35% | 27% | 21% | 16% | 12% | 9% | 7% | 5% | 4% | 3% | 2% | 2% | 2% |

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° |
|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2250 | 2198 | 2044 | 1808 | 1524 | 1237 | 978 | 757 | 581 | 440 | 332 | 250 | 188 | 143 | 110 | 86 | 69 | 56 | 46 | 38 |
| 100% | 98% | 91% | 80% | 68% | 55% | 43% | 34% | 26% | 20% | 15% | 11% | 8% | 6% | 5% | 4% | 3% | 2% | 2% | 2% |

Intensities in 180° c-plane

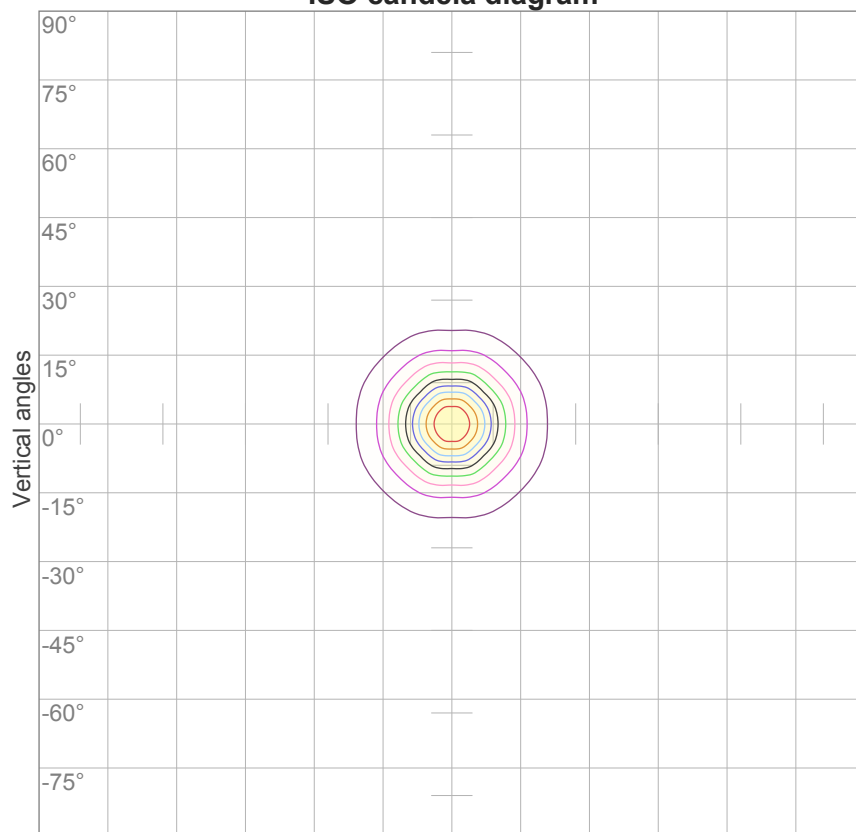
| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2250 | 2199 | 2051 | 1828 | 1563 | 1286 | 1024 | 798 | 612 | 466 | 351 | 265 | 200 | 152 | 116 | 90 | 70 | 56 | 44 | 37 |
| 100% | 98% | 91% | 81% | 69% | 57% | 46% | 35% | 27% | 21% | 16% | 12% | 9% | 7% | 5% | 4% | 3% | 2% | 2% | 2% |

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° |
|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2250 | 2198 | 2044 | 1808 | 1524 | 1237 | 978 | 757 | 581 | 440 | 332 | 250 | 188 | 143 | 110 | 86 | 69 | 56 | 46 | 38 |
| 100% | 98% | 91% | 80% | 68% | 55% | 43% | 34% | 26% | 20% | 15% | 11% | 8% | 6% | 5% | 4% | 3% | 2% | 2% | 2% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 22,2° | 46,6° | 68,2° | 96,7% | 92,8% |

ISO candela diagram



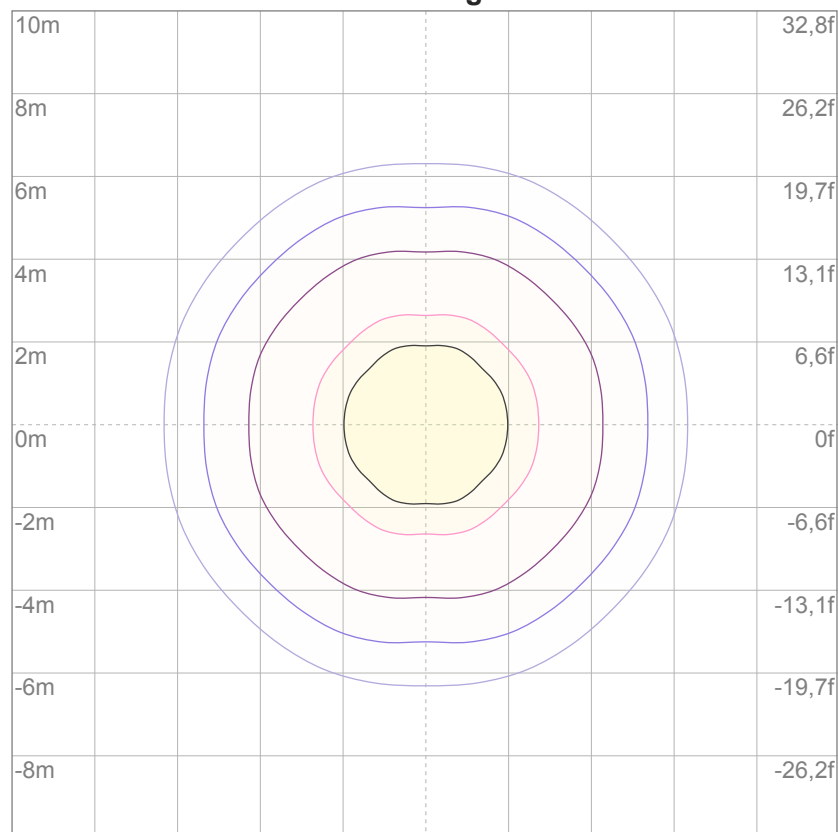
| | |
|-----|---------|
| 10% | 225 cd |
| 20% | 450 cd |
| 30% | 675 cd |
| 40% | 900 cd |
| 50% | 1125 cd |
| 60% | 1350 cd |
| 70% | 1575 cd |
| 80% | 1800 cd |
| 90% | 2025 cd |

Conditions:

Number of c-planes: 16

Candela at center: 2250 cd

ISO lux diagram



| | |
|-----|----------|
| 3% | 0,675 lx |
| 5% | 1,13 lx |
| 10% | 2,25 lx |
| 30% | 6,75 lx |
| 50% | 11,3 lx |

Conditions:

Number of c-planes: 16

Lux at center: 22,5 lx

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

Glare Evaluation According to UGR

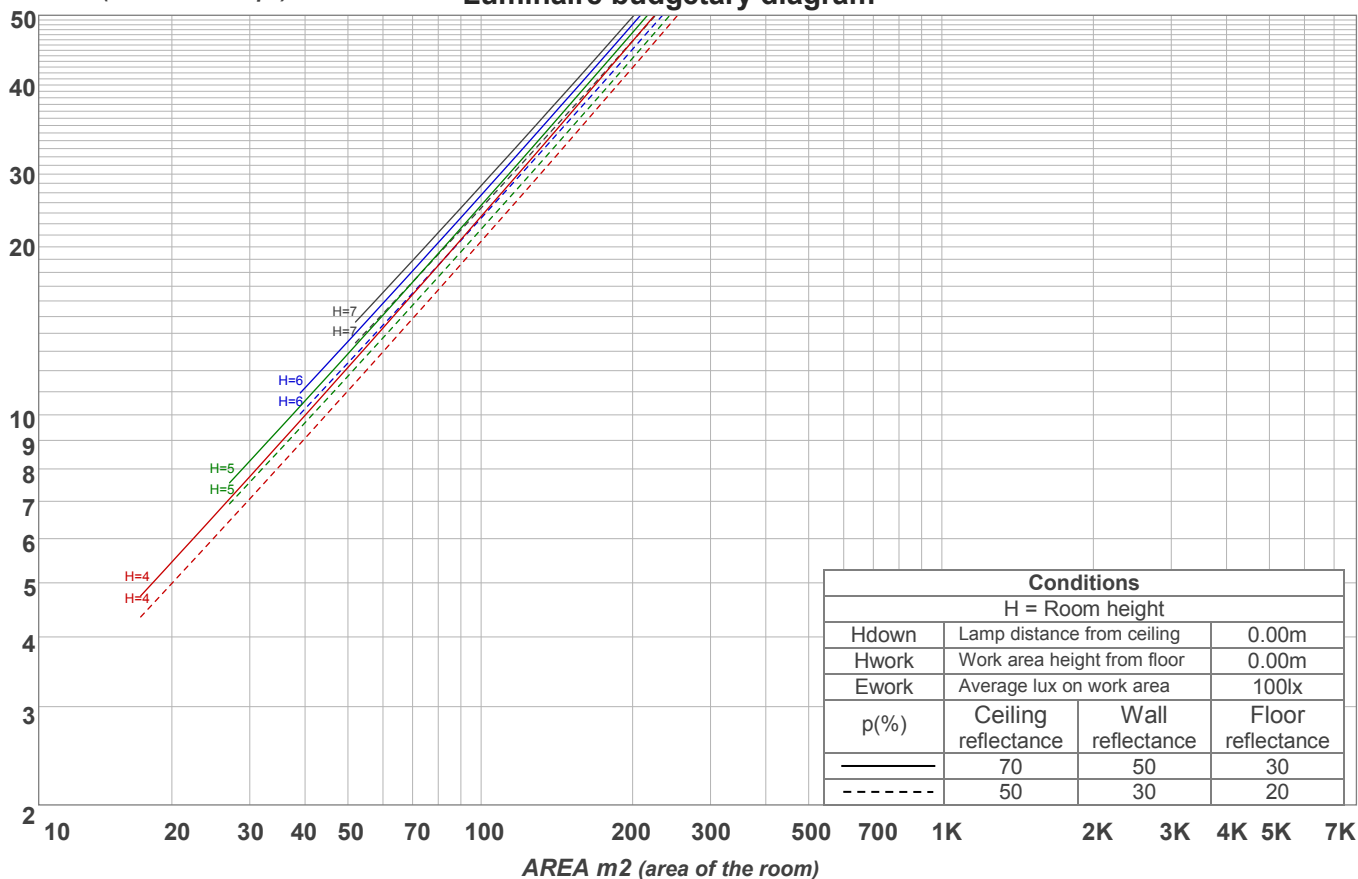
| | | | | | | | | | | | |
|---|-----|---|------|------|------|------|---|------|------|------|------|
| p Ceiling | | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
| p Walls | | 50 | 30 | 50 | 30 | 30 | 50 | 30 | 50 | 30 | 30 |
| p Floor | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Room size X Y | | Viewing direction at right angles to lamp axis | | | | | Viewing direction parallel to lamp axis | | | | |
| 2H | 2H | 11,3 | 11,8 | 11,4 | 12,0 | 12,2 | 13,4 | 13,9 | 13,4 | 14,1 | 14,3 |
| | 3H | 11,8 | 12,4 | 12,1 | 12,6 | 12,8 | 14,3 | 15,0 | 14,7 | 15,2 | 15,4 |
| | 4H | 12,0 | 12,6 | 12,4 | 12,8 | 13,1 | 14,8 | 15,4 | 15,2 | 15,6 | 15,9 |
| | 6H | 12,2 | 12,7 | 12,4 | 13,0 | 13,3 | 15,1 | 15,6 | 15,4 | 15,9 | 16,3 |
| | 8H | 12,2 | 12,7 | 12,5 | 13,0 | 13,4 | 15,2 | 15,7 | 15,5 | 16,0 | 16,4 |
| | 12H | 12,1 | 12,6 | 12,5 | 13,0 | 13,4 | 15,2 | 15,7 | 15,6 | 16,1 | 16,5 |
| 4H | 2H | 11,6 | 12,2 | 11,9 | 12,4 | 12,7 | 13,3 | 14,0 | 13,7 | 14,2 | 14,4 |
| | 3H | 12,4 | 12,9 | 12,8 | 13,3 | 13,7 | 14,7 | 15,2 | 15,0 | 15,5 | 15,9 |
| | 4H | 12,6 | 13,1 | 13,1 | 13,5 | 14,0 | 15,1 | 15,6 | 15,5 | 16,0 | 16,5 |
| | 6H | 12,8 | 13,3 | 13,3 | 13,7 | 14,0 | 15,5 | 16,0 | 16,0 | 16,3 | 16,7 |
| | 8H | 12,8 | 13,3 | 13,4 | 13,7 | 14,0 | 15,6 | 16,1 | 16,1 | 16,4 | 16,8 |
| | 12H | 12,8 | 13,2 | 13,3 | 13,6 | 14,1 | 15,7 | 16,0 | 16,2 | 16,4 | 16,9 |
| 8H | 4H | 12,8 | 13,3 | 13,3 | 13,6 | 14,0 | 15,1 | 15,6 | 15,6 | 15,9 | 16,3 |
| | 6H | 13,1 | 13,4 | 13,6 | 13,9 | 14,4 | 15,6 | 15,9 | 16,1 | 16,4 | 16,9 |
| | 8H | 13,2 | 13,5 | 13,7 | 14,0 | 14,6 | 15,8 | 16,1 | 16,3 | 16,6 | 17,2 |
| | 12H | 13,3 | 13,5 | 13,8 | 14,0 | 14,6 | 16,0 | 16,2 | 16,5 | 16,7 | 17,3 |
| 12H | 4H | 12,8 | 13,2 | 13,3 | 13,6 | 14,0 | 15,1 | 15,4 | 15,6 | 15,9 | 16,3 |
| | 6H | 13,2 | 13,4 | 13,7 | 13,9 | 14,6 | 15,6 | 15,9 | 16,1 | 16,4 | 17,0 |
| | 8H | 13,3 | 13,5 | 13,8 | 14,0 | 14,6 | 15,8 | 16,0 | 16,4 | 16,5 | 17,1 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1.0H | | 1,2 / -0,8 | | | | | 1,0 / -0,5 | | | | |
| S = 1.5H | | 2,7 / -1,2 | | | | | 2,0 / -1,0 | | | | |
| S = 2.0H | | 4,0 / -1,6 | | | | | 3,0 / -1,6 | | | | |
| Standard table | | n/a | | | | | n/a | | | | |
| Correction summand | | n/a | | | | | n/a | | | | |
| Corrected glare indices referring to 523 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 | 114 | 112 | 109 | 107 | 112 | 109 | 107 | 105 | 105 | 104 | 102 | 102 | 100 | 99 | 98 | 97 | 96 | 94 |
| 2 | 109 | 105 | 102 | 99 | 107 | 103 | 100 | 97 | 100 | 98 | 95 | 97 | 95 | 93 | 94 | 93 | 91 | 90 |
| 3 | 105 | 100 | 95 | 92 | 103 | 98 | 94 | 91 | 96 | 92 | 90 | 93 | 91 | 88 | 91 | 89 | 87 | 85 |
| 4 | 101 | 95 | 90 | 87 | 99 | 94 | 89 | 86 | 92 | 88 | 85 | 90 | 87 | 84 | 88 | 85 | 83 | 82 |
| 5 | 97 | 91 | 86 | 82 | 96 | 90 | 85 | 82 | 88 | 84 | 81 | 86 | 83 | 80 | 85 | 82 | 80 | 78 |
| 6 | 94 | 87 | 82 | 78 | 93 | 86 | 82 | 78 | 85 | 81 | 78 | 83 | 80 | 77 | 82 | 79 | 77 | 75 |
| 7 | 91 | 83 | 79 | 75 | 90 | 83 | 78 | 75 | 82 | 78 | 75 | 81 | 77 | 74 | 80 | 76 | 74 | 73 |
| 8 | 88 | 80 | 76 | 72 | 87 | 80 | 75 | 72 | 79 | 75 | 72 | 78 | 74 | 72 | 77 | 74 | 71 | 70 |
| 9 | 85 | 78 | 73 | 70 | 84 | 77 | 73 | 70 | 76 | 72 | 70 | 76 | 72 | 69 | 75 | 72 | 69 | 68 |
| 10 | 83 | 75 | 71 | 68 | 82 | 75 | 70 | 68 | 74 | 70 | 67 | 73 | 70 | 67 | 73 | 69 | 67 | 66 |

LAMPS (number of lamps)

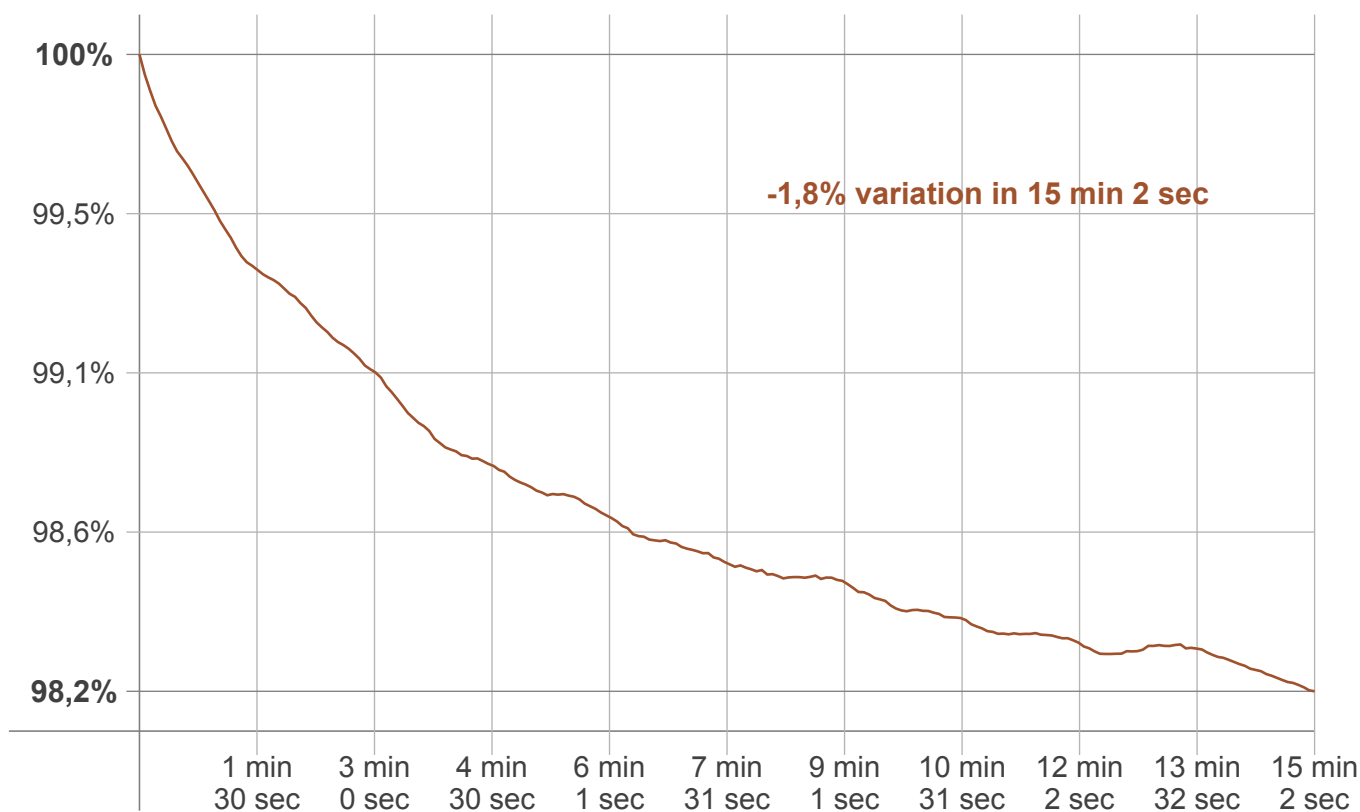
Luminaire budgetary diagram



Zonal Lumen Summary

| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 163 lm | 195 lm | 85,4 lm | 33,2 lm | 16,9 lm | 12,7 lm | 8,92 lm | 4,99 lm | 1,85 lm |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 0,608 lm | 0,226 lm | 0,199 lm | 0,180 lm | 0,132 lm | 0,094 lm | 0,069 lm | 0,042 lm | 0,014 lm |

Warmup curve



Warmup result

| | |
|------------------|--------------|
| Warmup time: | 15 min 2 sec |
| Warmup variation | -1,8% |

Warmup conditions

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

Color temperature change

| CCT start | CCT change | CCT end |
|-----------|------------|---------|
| 3012 K | -22 K | 2990 K |

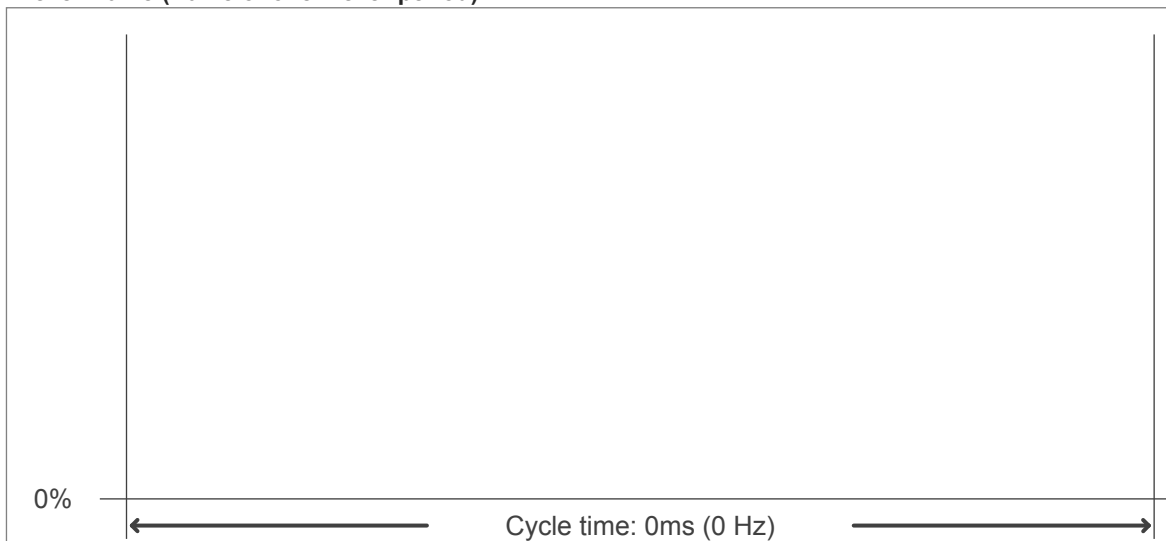
Output change

| Output start | Output change | Output end |
|--------------|---------------|------------|
| 532 lm | -9 lm | 523 lm |

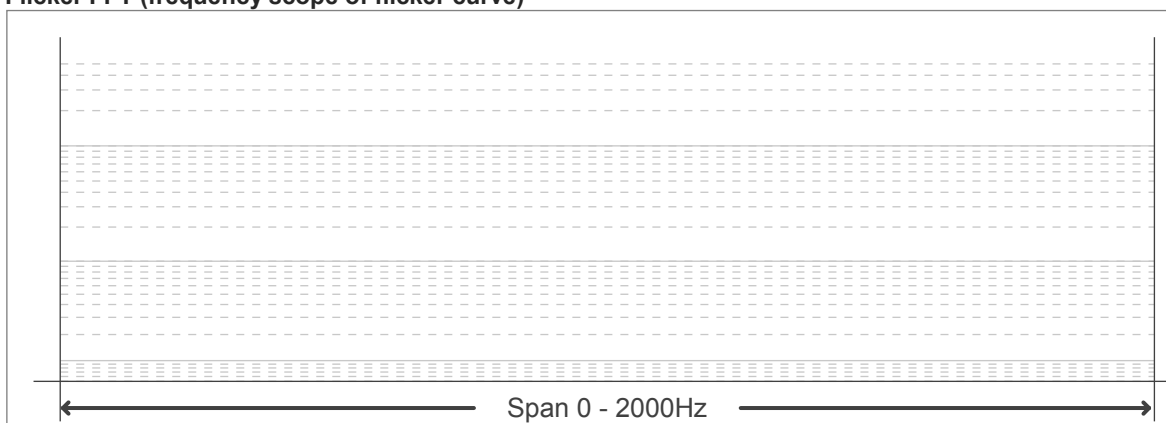
Flicker curve (complete sampled flicker signal)



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