

Introduction

These tests were carried out by the Orluna Innovations Team using calibrated Goniophotometric equipment. We have strict standards regarding the performance and testing of luminaires, and every luminaire has been tested in the environment that we recommend.

Standards

We always ensure the following:

- Every luminaire is tested at its recommended case temperature of 85°C – a cold test (25°C) isn't an accurate test;
- Every luminaire uses production components and is presented as an average of product performance rather than a “best case”;
- When testing for the light output ratio of a bezel, the same engine is used between bezel tests to ensure a true comparison;
- We adhere to all available standards including CIE 1931, IESNA TM-30-15, CIE 177:2007, SPIE5941.

Equipment & Tolerances

Orluna testing is carried out using a Viso Lightspion calibrated by Viso. In-depth testing by DTU (The Danish University of Photonics) has shown that the maximum tolerance of this test equipment is 2.18%.

Environment

Every one of our test luminaires is pre-heated until light output is stable (less than a 2% drop over 15 minutes) to ensure that performance in testing is fully indicative of performance in reality. The Viso Lightspion monitors light level fluctuation over time to ensure that a luminaire has reached a stable point before continuing. It also eliminates ambient light to ensure that other light sources do not impact the testing, and we ensure that the environment does not contain any source of natural light.

Disclaimer

This information is provided to be informative and to give the fullest view of our luminaires and testing. As with all electronic devices, some variation may occur in delivered products. The LEDs we use have a maximum light output tolerance of 7% (+/- 3.5%) and the environment will always play a role in performance. Heat in particular has an impact on lumen output, CCT and colour rendering, and a variation from our test conditions (such as extreme cold or extreme heat) will provide different results. The results found here should be used to indicate the expected performance of the product but should not be relied upon as a warranty of performance or to indicate the applicability of similar products. If you have any questions about performance of your luminaires we will always look to help you and will replace any products that aren't performing in line with our extensive warranty, so please get in touch.

Light efficiency:

47 Lumen/Watt

Light quality:

CRI: 92.4

Color temperature:

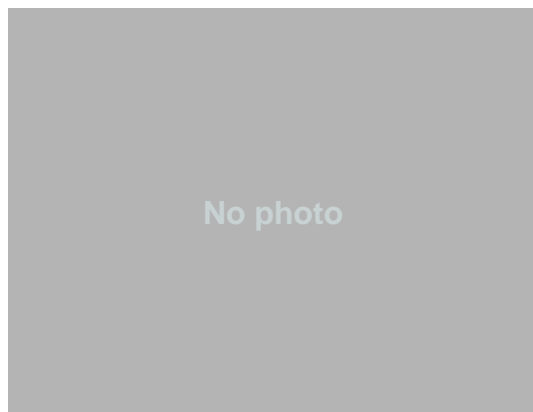
2949 K

Output: 221 lm

Peak: 1107 cd

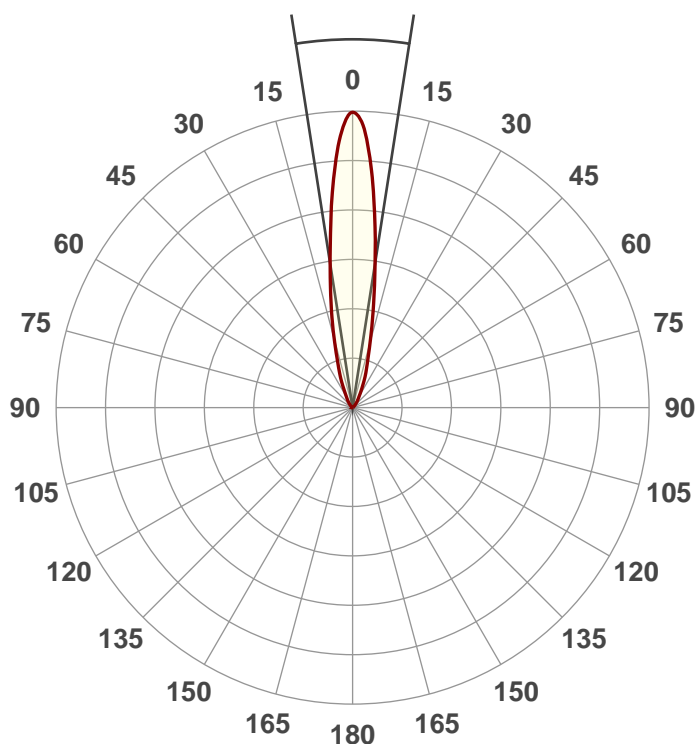
Power: 4.7 W

PF: 0.9



Beam angle

17.7°



Product Name:

Arc 200 3000K + 10Å°

Item Number:

Date and Time:

09/08/2017 10:20:33

Description:

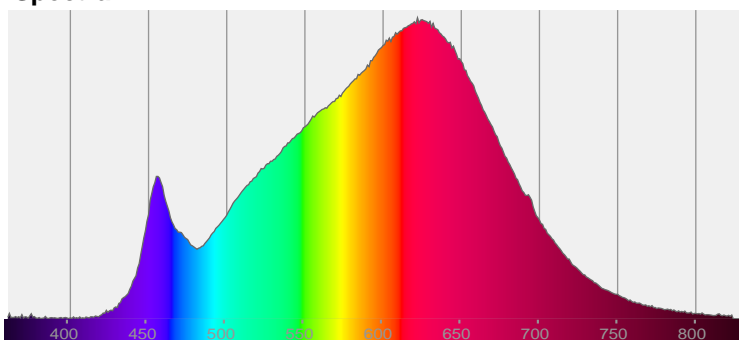


CIE 1931

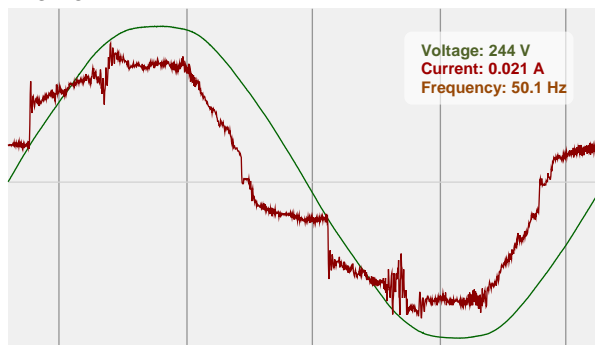
x: 0.444

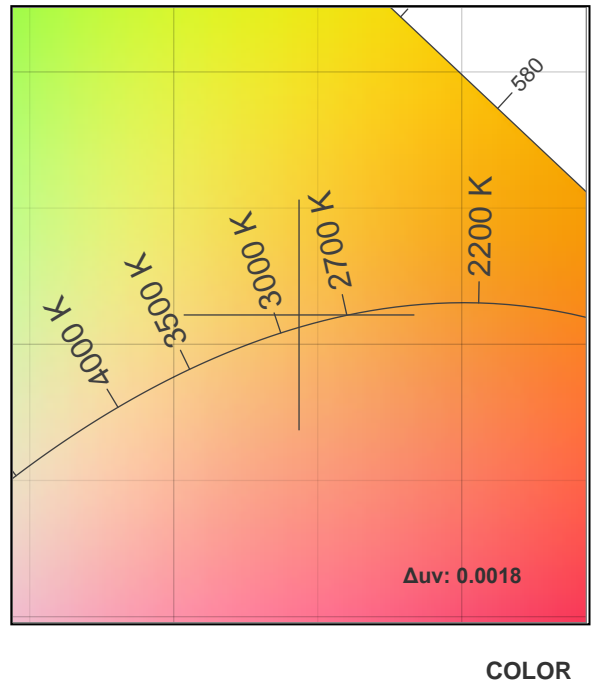
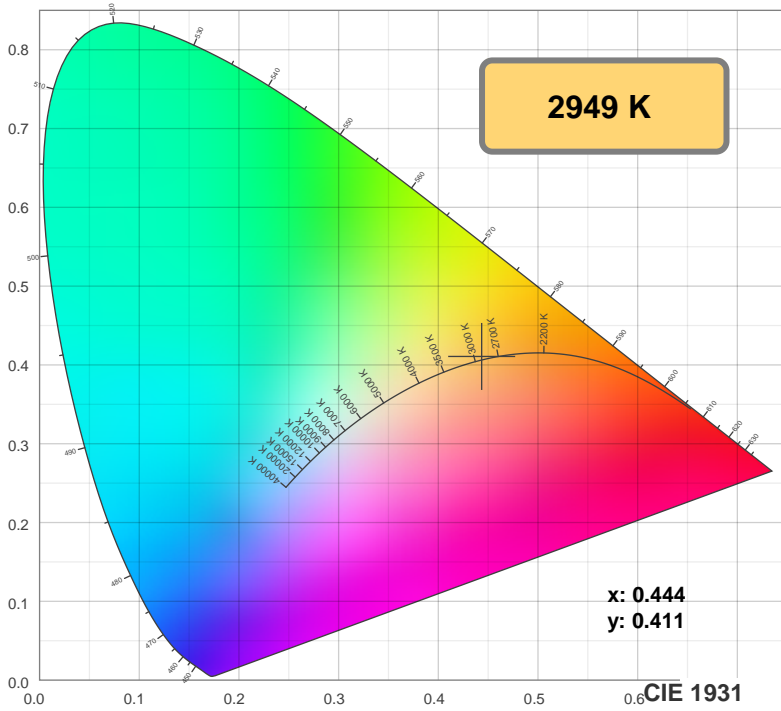
y: 0.411

Spectra

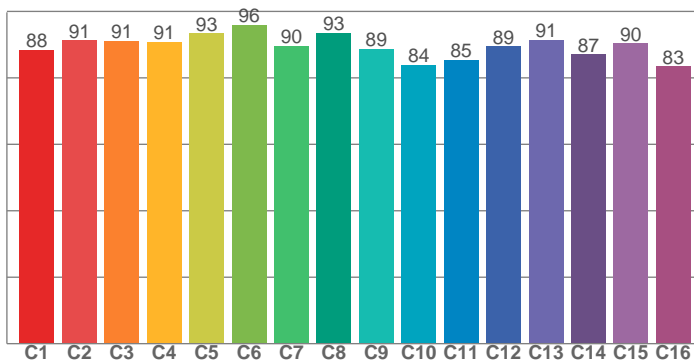


Power

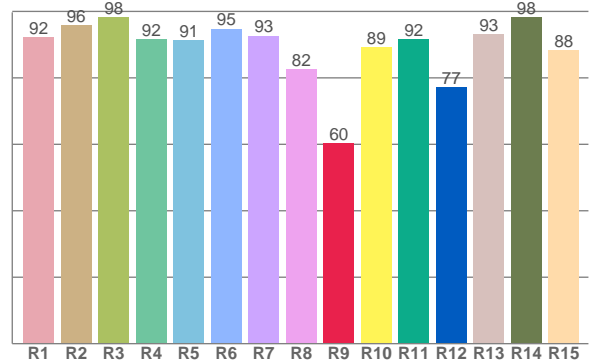




TM30: 89.5



CRI: 92.4 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 92.3 | 95.9 | 98.1 | 91.6 | 91.3 | 94.8 | 92.7 | 82.5 | 60.3 | 89.2 | 91.6 | 77.2 | 93.2 | 98.2 | 88.3 |

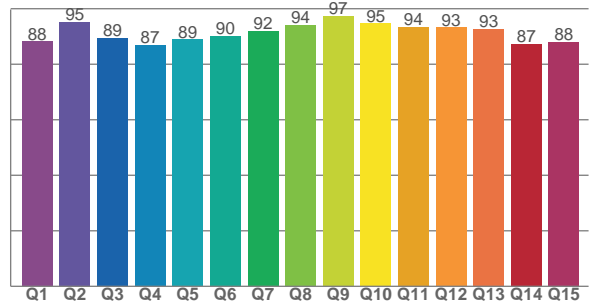
TM30 C values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 88.5 | 91.3 | 91.2 | 90.9 | 93.4 | 95.9 | 89.6 | 93.5 | 88.7 | 83.9 | 85.4 | 89.4 | 91.4 | 87.1 | 90.4 | 83.4 |

CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 88.2 | 95.3 | 89.5 | 86.9 | 88.9 | 90.2 | 92.0 | 94.1 | 97.3 | 94.6 | 93.5 | 93.2 | 92.8 | 87.2 | 88.0 |

CQS: 90.8



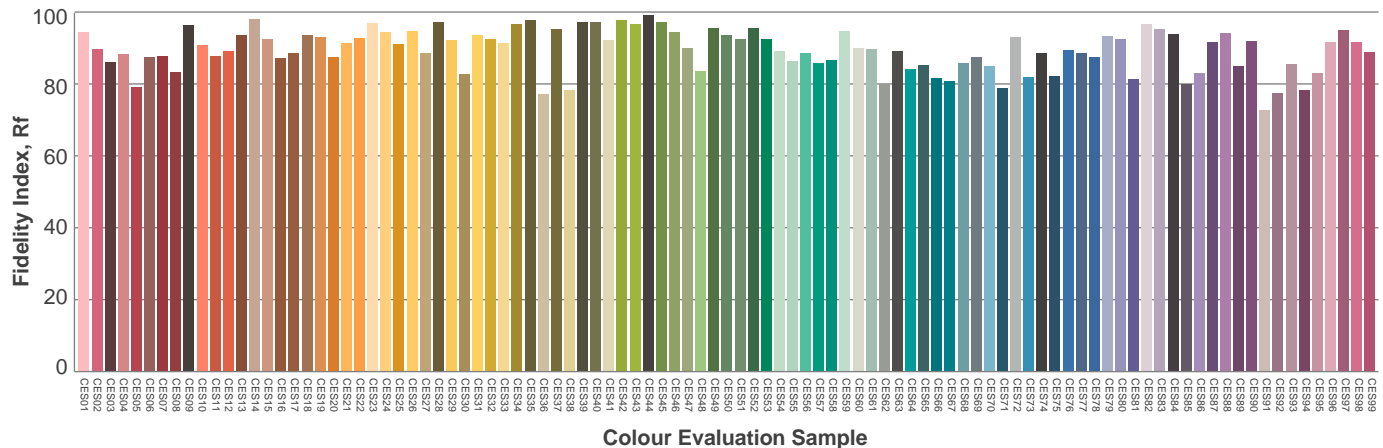
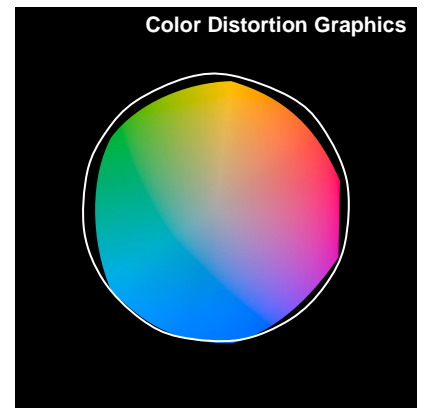
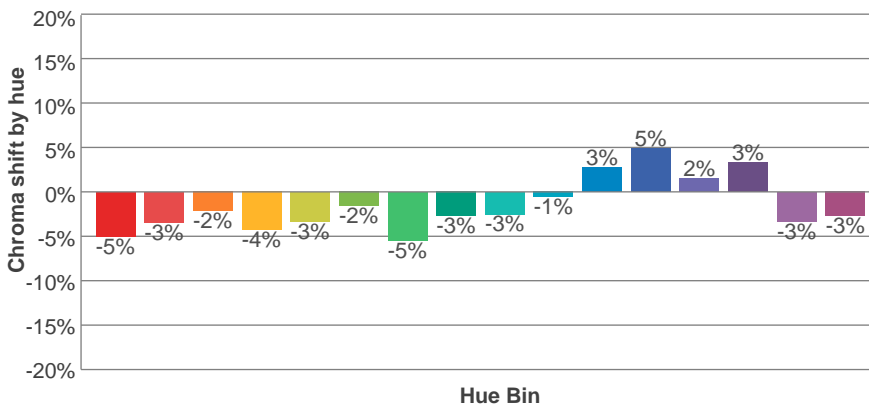
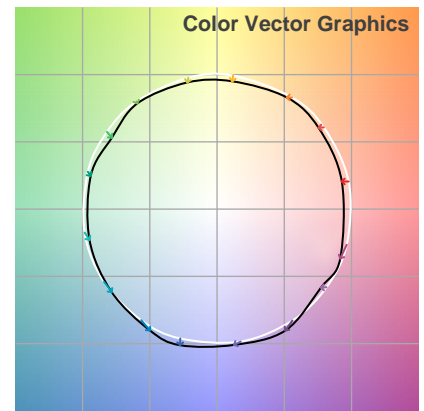
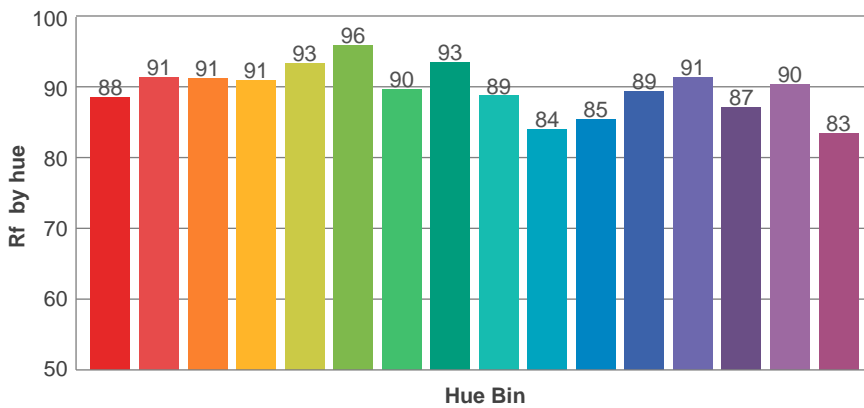
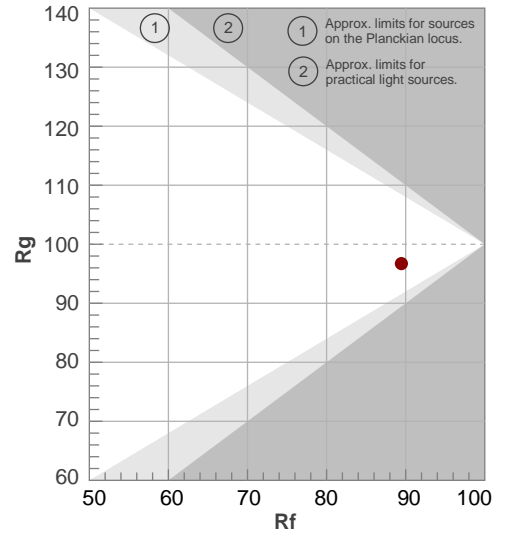
Color parameters

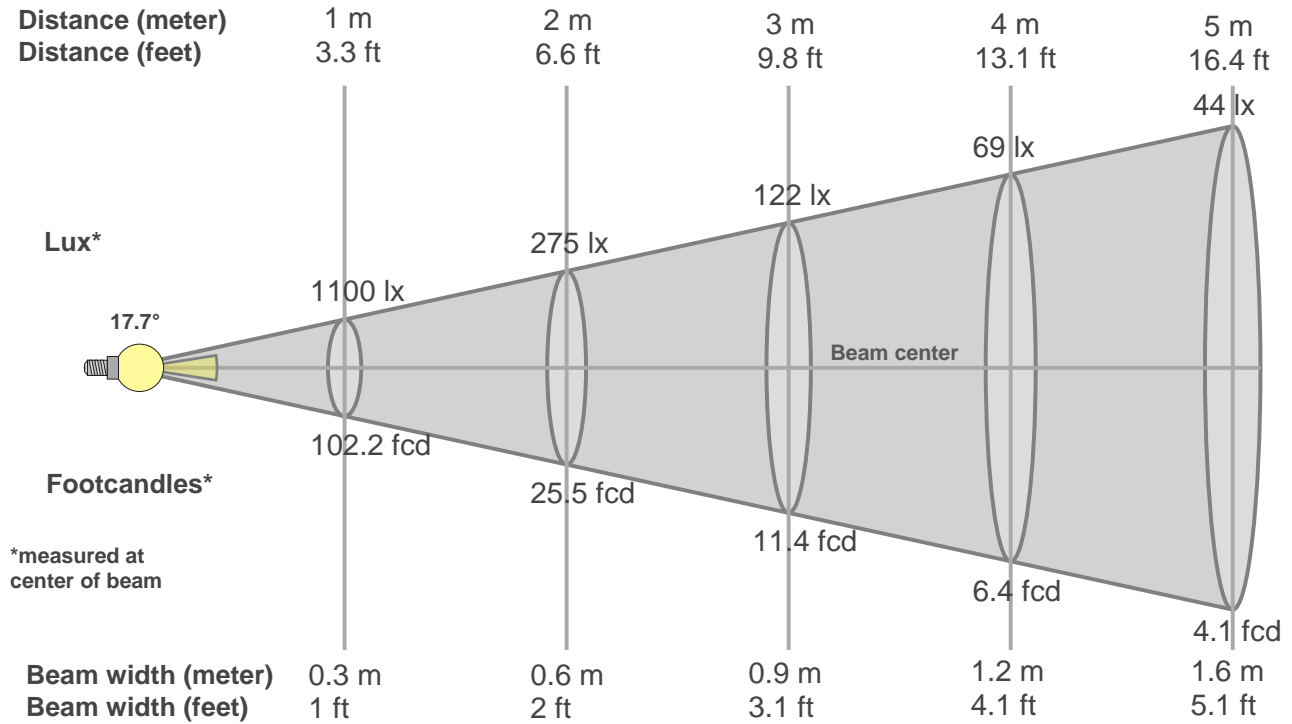
| Colour Temperature | Colour Rendering Index | Red Component | Colour Fidelity | Colour Gamut | Colour Quality Scale | Colour Coordinate CIE 1931 | Colour Coordinate CIE 1931 | Colour Coordinate | Colour Coordinate | Colour Deviation from Black Body |
|--------------------|------------------------|---------------|-----------------|--------------|----------------------|----------------------------|----------------------------|-------------------|-------------------|----------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 2949 K | 92.4 | 60.3 | 89.5 | 96.7 | 90.8 | 0.444 | 0.411 | 0.252 | 0.350 | 0.0018 |

Rf 89.5
Fidelity Index Rf

Rg 96.7
Gamut Index Rg

| Hue Bin | R _f | Graphic Shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 88 | -5% | 1% |
| 2 | 91 | -3% | 2% |
| 3 | 91 | -2% | 3% |
| 4 | 91 | -4% | 0% |
| 5 | 93 | -3% | 1% |
| 6 | 96 | -2% | 0% |
| 7 | 90 | -5% | 2% |
| 8 | 93 | -3% | 3% |
| 9 | 89 | -3% | 6% |
| 10 | 84 | -1% | 9% |
| 11 | 85 | 3% | 10% |
| 12 | 89 | 5% | 1% |
| 13 | 91 | 2% | -5% |
| 14 | 87 | 3% | -8% |
| 15 | 90 | -3% | -2% |
| 16 | 83 | -3% | -11% |





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 |
| 1100lx | 275lx | 122lx | 69lx | 44lx | 31lx | 22lx | 17lx | 14lx | 11lx | 9lx | 8lx | 7lx | 6lx | 5lx | 4lx | 4lx | 3lx | 3lx | 3lx |
| 102.2fcd | 25.5fcd | 11.4fcd | 6.4fcd | 4.1fcd | 2.8fcd | 2.1fcd | 1.6fcd | 1.3fcd | 1fcd | 0.8fcd | 0.7fcd | 0.6fcd | 0.5fcd | 0.5fcd | 0.4fcd | 0.4fcd | 0.3fcd | 0.3fcd | 0.3fcd |

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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1100 | 1040 | 917 | 762 | 605 | 485 | 388 | 306 | 237 | 183 | 148 | 120 | 94 | 71 | 56 | 46 | 39 | 33 | 28 | 24 |
| 100% | 95% | 83% | 69% | 55% | 44% | 35% | 28% | 22% | 17% | 13% | 11% | 9% | 6% | 5% | 4% | 4% | 3% | 3% | 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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1100 | 1040 | 917 | 762 | 605 | 485 | 388 | 306 | 237 | 183 | 148 | 120 | 94 | 71 | 56 | 46 | 39 | 33 | 28 | 24 |
| 100% | 95% | 83% | 69% | 55% | 44% | 35% | 28% | 22% | 17% | 13% | 11% | 9% | 6% | 5% | 4% | 4% | 3% | 3% | 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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1100 | 1064 | 932 | 774 | 616 | 478 | 371 | 291 | 229 | 184 | 151 | 125 | 99 | 79 | 62 | 49 | 41 | 34 | 29 | 24 |
| 100% | 97% | 85% | 70% | 56% | 44% | 34% | 26% | 21% | 17% | 14% | 11% | 9% | 7% | 6% | 4% | 4% | 3% | 3% | 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° |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1100 | 1064 | 932 | 774 | 616 | 478 | 371 | 291 | 229 | 184 | 151 | 125 | 99 | 79 | 62 | 49 | 41 | 34 | 29 | 24 |
| 100% | 97% | 85% | 70% | 56% | 44% | 34% | 26% | 21% | 17% | 14% | 11% | 9% | 7% | 6% | 4% | 4% | 3% | 3% | 2% |

| Beam Angle 50% | Field Angle 10% | Cut-off Angle 2.5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
|----------------|-----------------|--------------------|------------------------------|-----------------------------|
| 17.7° | 45.7° | 72.6° | 97.7% | 93.9% |

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 | 24.5 | 25.3 | 24.8 | 25.5 | 25.7 | 24.5 | 25.2 | 24.8 | 25.4 | 25.6 |
| | 3H | 25.3 | 25.9 | 25.6 | 26.2 | 26.4 | 25.2 | 25.9 | 25.5 | 26.1 | 26.3 |
| | 4H | 25.5 | 26.1 | 25.8 | 26.4 | 26.7 | 25.5 | 26.1 | 25.8 | 26.3 | 26.6 |
| | 6H | 25.6 | 26.2 | 26.0 | 26.5 | 26.8 | 25.6 | 26.2 | 25.9 | 26.4 | 26.7 |
| | 8H | 25.7 | 26.2 | 26.0 | 26.5 | 26.8 | 25.6 | 26.1 | 25.9 | 26.4 | 26.7 |
| 12H | 25.7 | 26.2 | 26.0 | 26.5 | 26.8 | 25.6 | 26.1 | 25.9 | 26.4 | 26.7 | |
| 4H | 2H | 24.8 | 25.4 | 25.1 | 25.7 | 25.9 | 24.8 | 25.4 | 25.1 | 25.6 | 25.9 |
| | 3H | 25.7 | 26.2 | 26.1 | 26.5 | 26.8 | 25.6 | 26.2 | 26.0 | 26.5 | 26.8 |
| | 4H | 26.1 | 26.5 | 26.4 | 26.8 | 27.2 | 26.0 | 26.4 | 26.4 | 26.8 | 27.1 |
| | 6H | 26.3 | 26.6 | 26.7 | 27.0 | 27.4 | 26.2 | 26.5 | 26.6 | 26.9 | 27.3 |
| | 8H | 26.3 | 26.6 | 26.7 | 27.0 | 27.4 | 26.2 | 26.5 | 26.6 | 26.9 | 27.3 |
| 12H | 26.3 | 26.6 | 26.7 | 27.0 | 27.4 | 26.2 | 26.5 | 26.6 | 26.9 | 27.3 | |
| 8H | 4H | 26.2 | 26.5 | 26.6 | 26.9 | 27.3 | 26.1 | 26.4 | 26.5 | 26.8 | 27.2 |
| | 6H | 26.4 | 26.7 | 26.9 | 27.1 | 27.5 | 26.3 | 26.6 | 26.8 | 27.0 | 27.4 |
| | 8H | 26.5 | 26.7 | 26.9 | 27.1 | 27.6 | 26.4 | 26.6 | 26.8 | 27.0 | 27.5 |
| | 12H | 26.5 | 26.7 | 27.0 | 27.1 | 27.6 | 26.4 | 26.6 | 26.9 | 27.0 | 27.5 |
| 12H | 4H | 26.1 | 26.4 | 26.6 | 26.8 | 27.2 | 26.1 | 26.3 | 26.5 | 26.8 | 27.2 |
| | 6H | 26.4 | 26.6 | 26.9 | 27.1 | 27.5 | 26.3 | 26.5 | 26.8 | 27.0 | 27.4 |
| | 8H | 26.5 | 26.6 | 27.0 | 27.1 | 27.6 | 26.4 | 26.5 | 26.9 | 27.0 | 27.5 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1.0H | +1.3 / -1.1 | | | | | +1.4 / -1.2 | | | | | |
| S = 1.5H | +2.9 / -1.4 | | | | | +3.0 / -1.4 | | | | | |
| S = 2.0H | +4.3 / -1.7 | | | | | +4.5 / -1.9 | | | | | |
| Standard table | BK03 | | | | | BK03 | | | | | |
| Correction summand | 8.6 | | | | | 8.6 | | | | | |
| Corrected glare indices referring to 221lm total luminous flux | | | | | | | | | | | |