PHOTOMETRIC LIGHT REPORT

Downlight | Ø167mm | black | 5-CCT | 360mA | no driver

Article number: 136-507

Go to the webshop of Tronix Lighting

TRONIX

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Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 136-507. All information is based on actual measurements taken from standard production units. No modifications were made to enhance performance results. In some cases. minor adjustments—such as temporary removal of covers. cables. or mounting features—were necessary for testing purposes. These did not influence product performance.

Test Methodology

Testing was conducted using randomly selected. unopened samples from regular inventory. All tests comply with the LM-79-19 standard. the recognized method for photometric and electrical measurements of LED and OLED luminaires. This standard. an update of IES LM-79-2008. outlines environmental test conditions. stabilization procedures. measurement methods. and approved instruments. It uses absolute photometry. meaning results directly reflect the performance of the tested product. without comparison to rated lamp standards.

Product 136-507 was tested using:

- A photogoniometer to measure luminous intensity distribution at various angles
- An integrating sphere to determine total luminous flux and colour characteristics

Compliance & Certification

Item 136-507 meets the requirements of the following EU directives. Tronix Lighting certifies that all relevant tests were executed in accordance with the applicable standards. and the CE mark is applied accordingly:

- General Product Safety – Directive 2023/988/EC
- Low Voltage Directive (LVD) – Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) – Directive 2004/108/EC
- Ecodesign – Directive 2009/125/EC
- RoHS 3 – Directive 2011/65/EU + Amendment 2015/863/EU

Recycling & Sustainability

Tronix Lighting is affiliated with national recycling systems for electrical and electronic waste. The luminaire is over 90% recyclable when disposed of as electronic waste at end of life. In addition. Tronix Lighting participates in national packaging recycling schemes. ensuring full compliance with both the WEEE and packaging directives.

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Laboratory and equipment

Laboratory owner and location	Tronix Lighting BV. Uden. The Netherlands
Gonio spectrometer system and type	Viso Systems Type C. horizontal
Spectrometer manufacturer and model	(Gonio) Ocean Optics STS VIS (Sphere) Admesy HERA VIS 380–780nm
Flicker meter manufacturer and model	Viso Systems LabFlicker
Oscilloscope manufacturer and model	Tektronix MDO3024 oscilloscope (4 Channels. 200 MHz)
Power meter manufacturer and model	Vitrek PA900 Precision Multi-Channel Harmonic Power Analyzer
Power source manufacturer and model	(DC) Keithley Source Measure Unit SMU-2420 3A DC Source Meter (AC) Chroma 61601 AC Source
Datalogger Manufacturer and Model	Omega 8-Channel Thermocouple Thermometer/Data Logger

Measurement conditions gonio spectrometer

Number of C-planes and Resolution	2 planes – 180°
γ (gamma)-Resolution	2°
Test Distance	1.81 m
Room Temperature and Humidity	22°C +/- 10% – RH 50% +/- 20%
Input Power. Power and Displacement Factors	12.2 W – PF 1.0 – DPF 0.44
Frequency of Input Power	0 Hz
Warm-up Time and Variation	Lamp stabilized in 15 min 1 sec –+0.9%

Tested light source

Manufacturer and Order Code	Tronix Lighting – 136-507
Product Description	Downlight | Ø167mm | black | 5-CCT | 360mA | no driver

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	1383 lm – 0% / 100%
Efficiency	114 lm/W
Energy efficiency class	E
Peak Intensity and Beam Angle	1383 cd – 63.2°
Correlated Colour Temperature	CCT = 3556 K
Colour Shift. CIE duv	Duv -0.0051
Colour Rendering Index	CRI 95.9
Colour Rendering TM30-18	R_f 93.2 – R_g 103.2
Television Lighting Consistency Index	TLCI = 90
Flicker	SVM n/a – PstLM n/a

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Electrical measurement details

Input Power

RMS Input voltage feed. V_{RMS}	33.8 V
RMS Input current feed. I_{RMS}	0.360 A
Total input power	12.2 W
Frequency of input power	0 Hz
Power factor	1.0
Displacement power factor	0.44
Total harmonic distortion of the current	0%
Total harmonic distortion of the voltage	0%

Input Power Curve

Voltage - Current

Efficiency

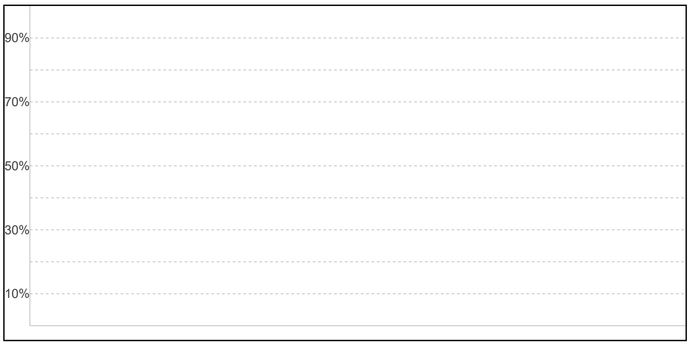
Radiated power efficiency: 36.5%

Lumen efficiency: 114 lm/W

Harmonics

3rd Harmonic	n/a
5th Harmonic	n/a
7th Harmonic	n/a
9th Harmonic	n/a
11th Harmonic	n/a

Current Harmonics %



Stabilization Details

Warm-up Conditions

Stable period	15 min
Stable change max	2.0%
Minimum warm-up time	15 min

Colour temperature change during warm-up

CCT start	3545 K
CCT shift	+11 K
CCT end	3556 K

Warm-up Results

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	+0.9%

Output intensity change during warm-up

Output start	1371 lm
Output change	+12 lm
Output end	1383 lm

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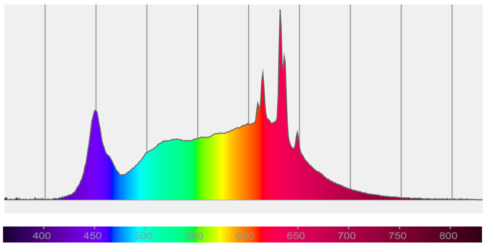
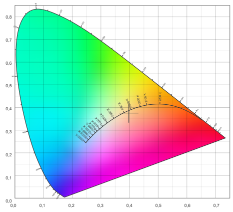
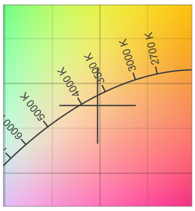
Colour measurement details

Total lumen output	1383 lm
Correlated Colour Temperature	3556 K
Colour coordinates CIE 1931	(x;y) = (0.397;0.375)
Colour deviation from BBL	Duv = -0.0051
TM30-18 Colour Fidelity Index	R_f 93.2
TM30-18 Colour Gamut Index	R_g 103.2
Colour Rendering Index (Ra)	CRI 95.9
Colour Rendering Index. (red component)	R9 = 85.0
Colour Quality Scale	CQS = 95.1
Television Lighting Consistency Index	TLCI = 90

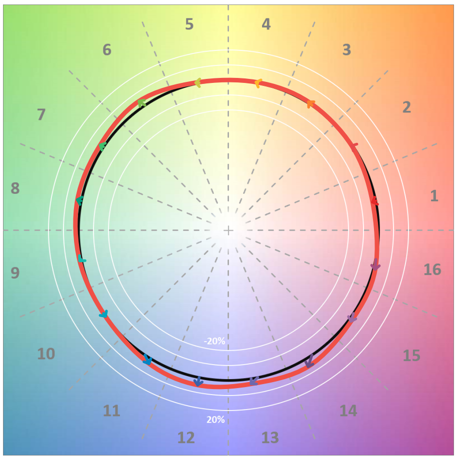


Relative spectral power distribution





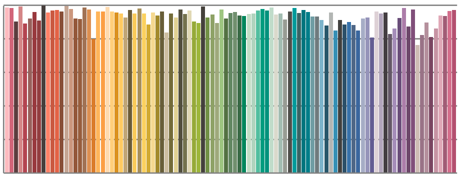
TM30 details



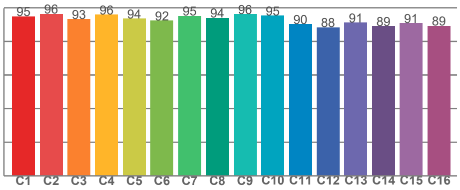
TM30 Colour vectors per hue bin

TM30 Colour distortion

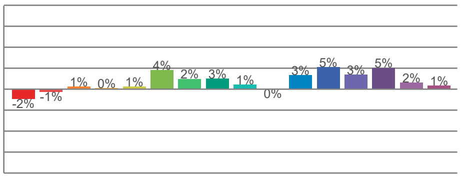
Hue Bin	R_f	Shifts (%)	
		Chroma	Hue
C1	95	-2%	0%
C2	96	-1%	1%
C3	93	1%	3%
C4	96	0%	1%
C5	94	1%	2%
C6	92	4%	2%
C7	95	2%	0%
C8	94	3%	0%
C9	96	1%	1%
C10	95	0%	2%
C11	90	3%	5%
C12	88	5%	0%
C13	91	3%	-5%
C14	89	5%	-6%
C15	91	2%	-5%
C16	89	1%	-7%



TM30-18 Rf-values per reference colour

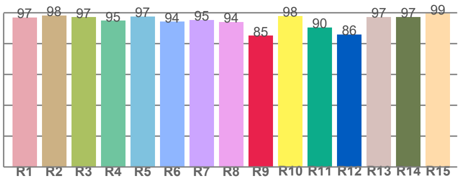


TM30-18 Rf-values per hue bin

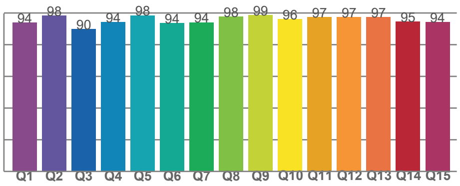


TM30 Chroma shift

Colour Quality details



Colour Rendering Index



Colour Qualitity Scale

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Flicker / temporal light artefacts details

Measurement conditions

Flicker meter type	Viso Systems LabFLicker
Flicker/TLA sample rate	n/a samples/s
Measurement time	5x 180 seconds (15 minutes) for PstLM. 1.2 sec for all other indices

Flicker indices according to Illuminating Engineering Society (IES)

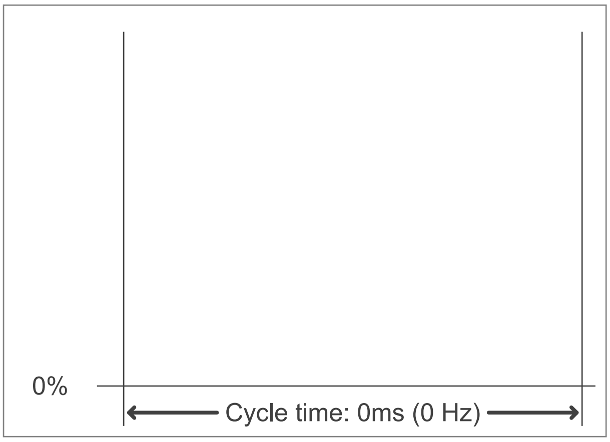
Flicker frequency	n/a Hz
Percent flicker	n/a %
Flicker index	n/a

TLA indices (according IEC TR 61547-1. EN 61000-3-3 and EN 61000-4-15)

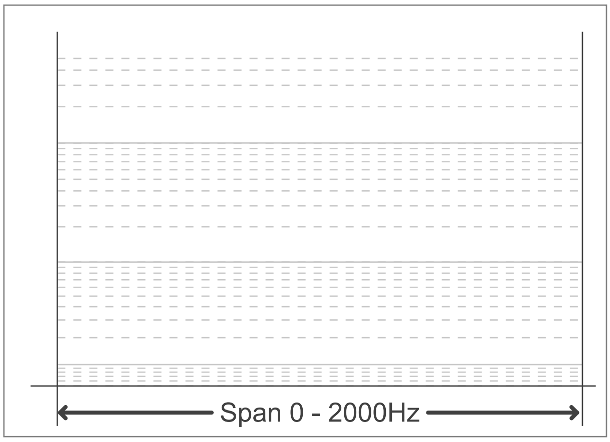
An LED luminaire is considered flicker-free if the SVM value is <= 0.4 and if the PstLM value is <=1.0

PstLM value (F < 80 Hz)	n/a
SVM value (80 < F < 2000 Hz)	n/a

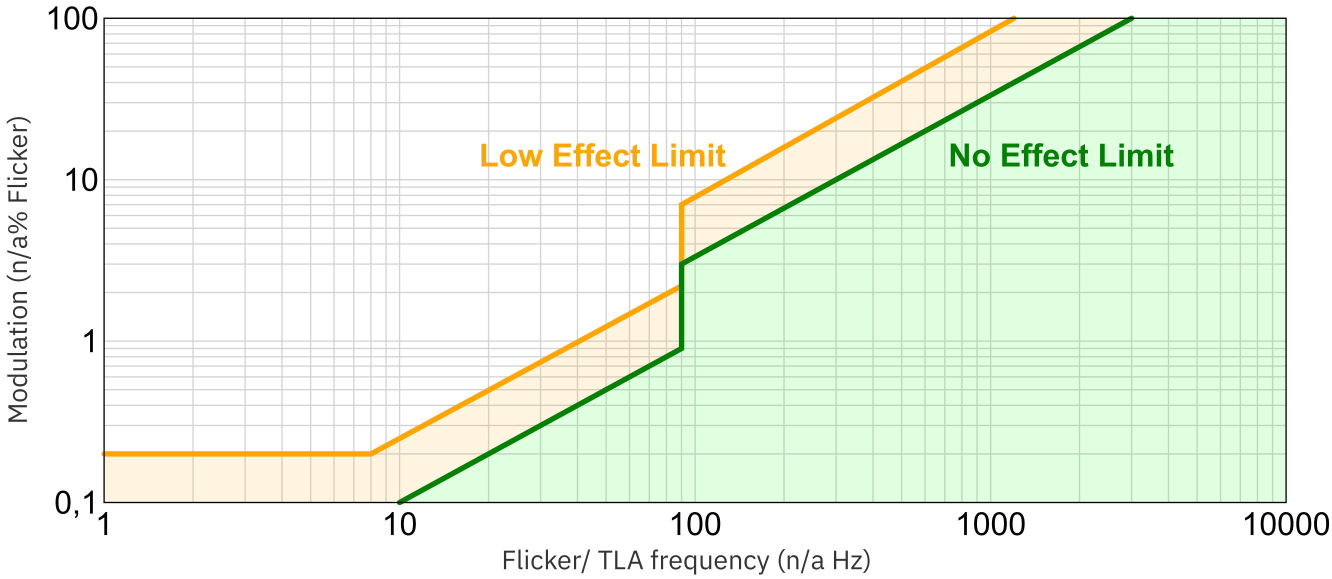
Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



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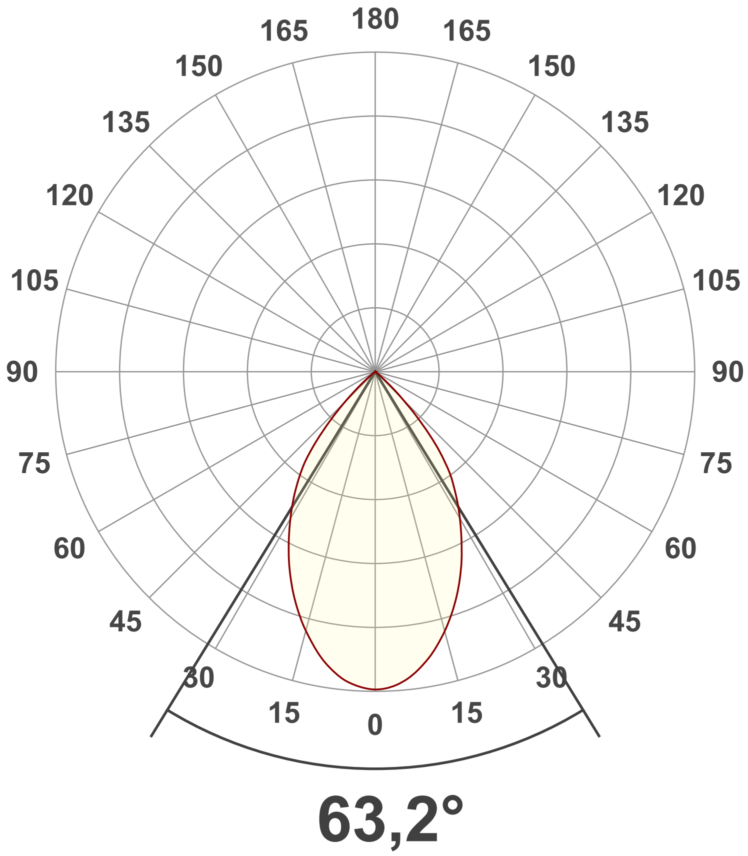
Beam angle

Luminous Intensity diagram

Unit: 0-100% of peak intensity



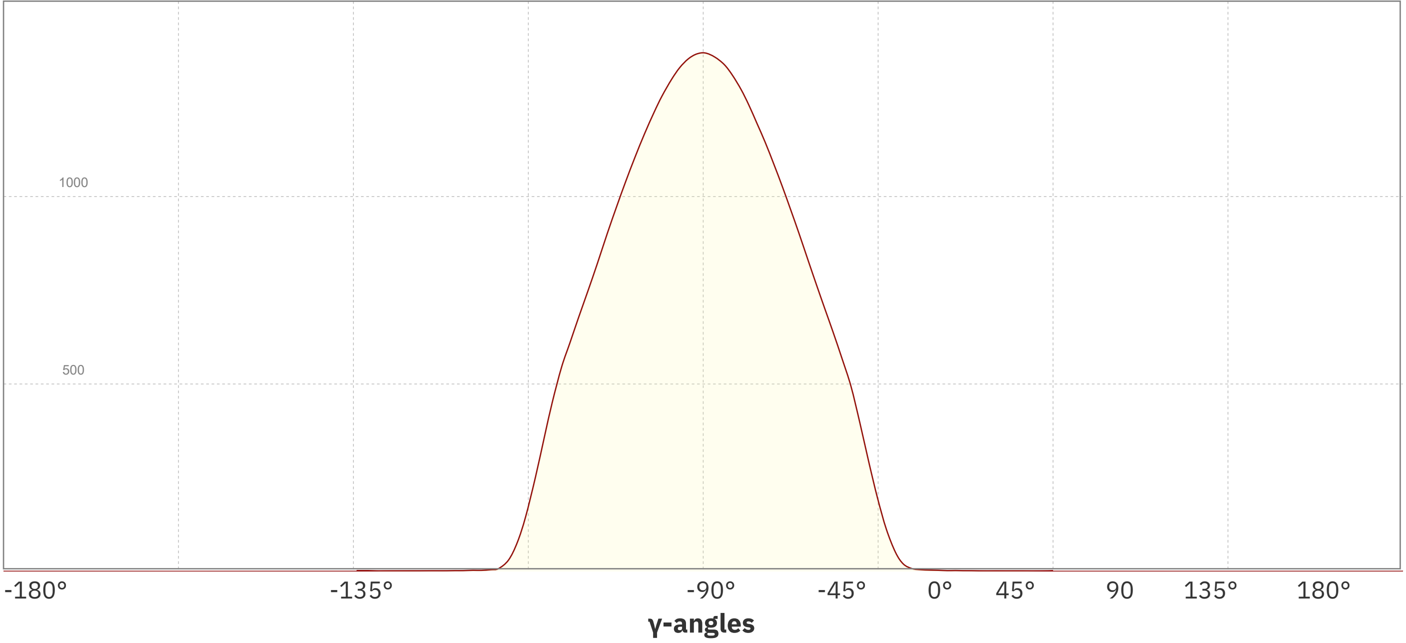
Main Values	
Output (total Lumen)	1383 lm
Lumen Up/Down	0% / 100%
Peak Intensity	1383 cd
Beam Angle (50%)	63.2°
Beam Angle (90%)	63.2°
Beam Angle (10%)	63.2°
Cut-off Angle	
Average 2.5%	100.4°
Field Angle	
Average 10%	92.3°
Intensity Ratio	
In 120° cone	99.6%
In 90° cone	96.2%

C planes

C000-C180

C090-C270

Linear distribution diagram - Intensity (candela) vs γ-angle



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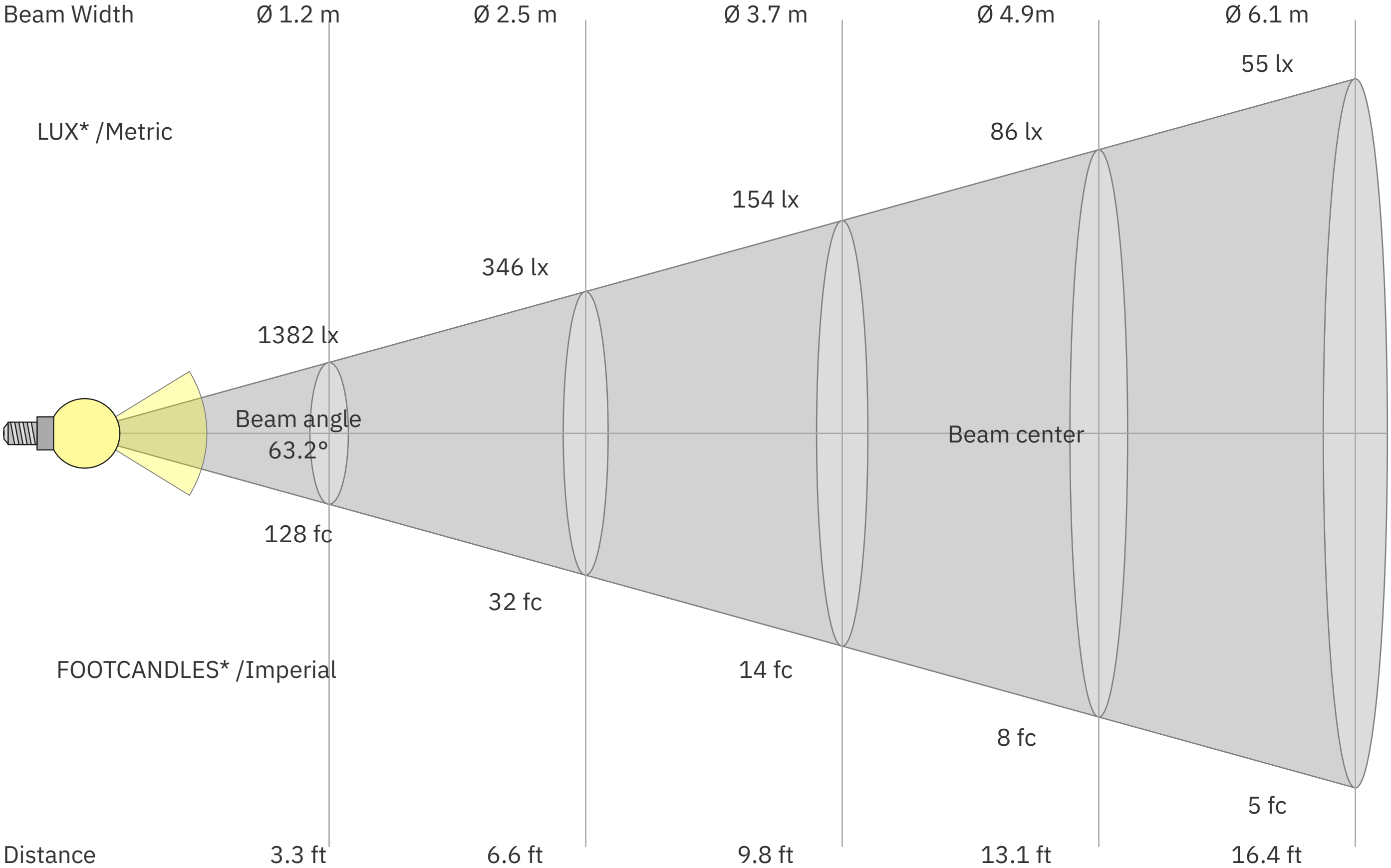
Beam Details

Distance	1 m	2 m	3 m	4 m	5 m
Beam Width	Ø 1.2 m	Ø 2.5 m	Ø 3.7 m	Ø 4.9m	Ø 6.1 m



Distance	3.3 ft	6.6 ft	9.8 ft	13.1 ft	16.4 ft
Beam Width	Ø 4.1 ft	Ø 8.1 ft	Ø 12.1 ft	Ø 16.1 ft	Ø 20.2 ft

*Measured at center of beam

Beam intensities from 1 – 20 m

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	m
3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6	ft
1382	346	154	86	55	38	28	22	17	14	11	10	8	7	6	5	5	4	4	3	lux
128.4	32.1	14.3	8	5.1	3.6	2.6	2	1.6	1.3	1.1	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.4	0.3	fc

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°	γ
1382	1379	1366	1344	1315	1279	1238	1193	1144	1093	1038	981	922	860	798	738	679	618	558	483	cd
100%	100%	99%	97%	95%	93%	90%	86%	83%	79%	75%	71%	67%	62%	58%	53%	49%	45%	40%	35%	of 0°val

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°	γ
1382	1379	1366	1344	1315	1279	1238	1193	1144	1093	1038	981	922	860	798	738	679	618	558	483	cd
100%	100%	99%	97%	95%	93%	90%	86%	83%	79%	75%	71%	67%	62%	58%	53%	49%	45%	40%	35%	of 0°val

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°	γ
1382	1377	1364	1344	1315	1280	1238	1191	1143	1091	1036	979	921	860	799	739	680	620	558	494	cd
100%	100%	99%	97%	95%	93%	90%	86%	83%	79%	75%	71%	67%	62%	58%	53%	49%	45%	40%	36%	of 0°val

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°	γ
1382	1377	1364	1344	1315	1280	1238	1191	1143	1091	1036	979	921	860	799	739	680	620	558	494	cd
100%	100%	99%	97%	95%	93%	90%	86%	83%	79%	75%	71%	67%	62%	58%	53%	49%	45%	40%	36%	of 0°val

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Light Planning – UGR table

Uncorrected. comprehensive UGR table according to CIE 117-1995

Reflectances										
ρ Ceiling	70	70	50	50	30	70	70	50	50	30
ρ Walls	50	30	50	30	30	50	30	50	30	30
ρ Floor	20	20	20	20	20	20	20	20	20	20
Room size H = mounting height above eye level **X** **Y**	**Viewed Crosswise** (Viewing direction orthogonal to lamp length axis)					**Viewed Endwise** (Viewing direction parallel to lamp length axis)				
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
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n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Variations with the observer position for the luminaire spacings. S:

n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a

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 Lumen 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	108	105	111	108	106	104	104	102	101	100	99	98	97	96	95	93
2	107	102	98	94	105	100	97	93	97	94	91	94	92	89	91	89	88	86
3	102	95	90	85	99	93	89	85	91	87	83	88	85	82	86	83	81	79
4	96	88	82	78	94	87	82	77	85	80	76	83	79	76	81	77	75	73
5	91	82	76	71	89	81	75	71	79	74	70	77	73	70	76	72	69	68
6	86	76	70	66	84	76	70	65	74	69	65	73	68	65	71	67	64	63
7	81	71	65	61	80	71	65	61	69	64	60	68	63	60	67	63	60	58
8	77	67	61	56	76	66	60	56	65	60	56	64	59	56	63	59	55	54
9	73	63	57	52	72	62	56	52	61	56	52	60	55	52	60	55	52	50
10	69	59	53	49	68	59	53	49	58	52	49	57	52	49	56	52	48	47

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