PHOTOMETRIC LIGHT REPORT

LED spot | 50mm | black | 5 watt | 38° | 2700K | dimmable

Article number: 175-570

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TRONIX

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Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 175-570. 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 175-570 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 175-570 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	2.5°
Test Distance	0.66 m
Room Temperature and Humidity	22°C +/- 10% – RH 50% +/- 20%
Input Power. Power and Displacement Factors	6.4 W – PF 0.98 – DPF 1.0
Frequency of Input Power	50.1 Hz
Warm-up Time and Variation	Lamp stabilized in 31 min 53 sec –-8.5%

Tested light source

Manufacturer and Order Code	Tronix Lighting – 175-570
Product Description	LED spot | 50mm | black | 5 watt | 38° | 2700K | dimmable

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	434 lm – 0% / 100%
Efficiency	68 lm/W
Energy efficiency class	G
Peak Intensity and Beam Angle	269 cd – 71°
Correlated Colour Temperature	CCT = 2700 K
Colour Shift. CIE duv	Duv -0.0034
Colour Rendering Index	CRI 84.5
Colour Rendering TM30-18	R_f 86.1 – R_g 95.4
Television Lighting Consistency Index	TLCI = 73
Flicker	SVM 0.02 – PstLM 0.06

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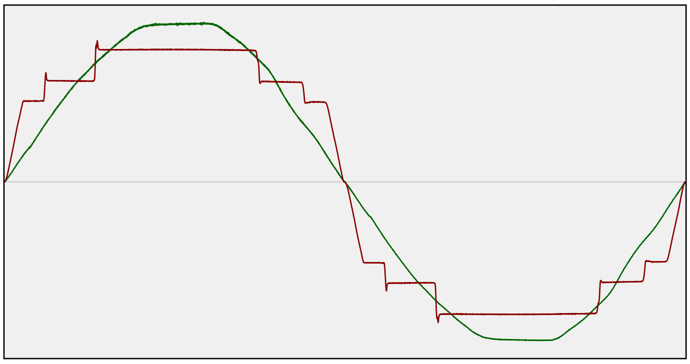
Electrical measurement details

Input Power	
RMS Input voltage feed. V_{RMS}	231 V
RMS Input current feed. I_{RMS}	0.028 A
Total input power	6.4 W
Frequency of input power	50.1 Hz
Power factor	0.98
Displacement power factor	1.0
Total harmonic distortion of the current	21.32%
Total harmonic distortion of the voltage	2.5%

Input Power Curve



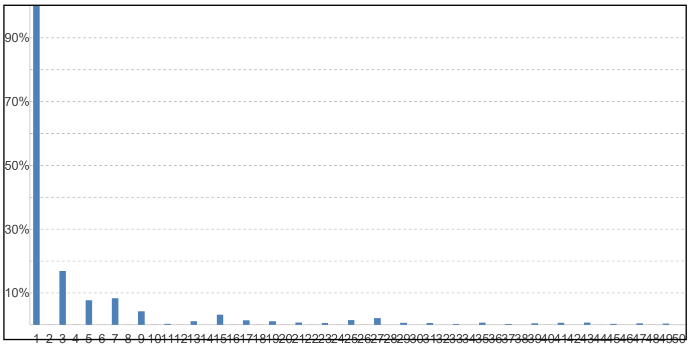
Efficiency

Radiated power efficiency: 21.7%

Lumen efficiency: 68 lm/W

Harmonics	
3rd Harmonic	16.84%
5th Harmonic	7.69%
7th Harmonic	8.32%
9th Harmonic	4.23%
11th Harmonic	0.29%

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	2671 K
CCT shift	+29 K
CCT end	2700 K

Warm-up Results	
Total warmup time	Lamp stabilized in 31 min 53 sec
Warmup variation	-8.5%

Output intensity change during warm-up	
Output start	470 lm
Output change	-37 lm
Output end	434 lm

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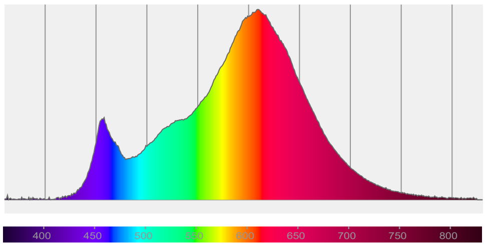
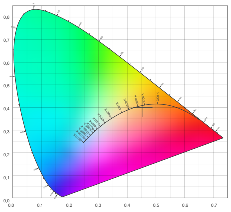
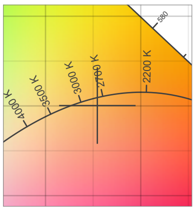
Colour measurement details

Total lumen output	434 lm
Correlated Colour Temperature	2700 K
Colour coordinates CIE 1931	(x;y) = (0.454;0.400)
Colour deviation from BBL	Duv = -0.0034
TM30-18 Colour Fidelity Index	R_f 86.1
TM30-18 Colour Gamut Index	R_g 95.4
Colour Rendering Index (Ra)	CRI 84.5
Colour Rendering Index. (red component)	R9 = 17.1
Colour Quality Scale	CQS = 83.6
Television Lighting Consistency Index	TLCI = 73

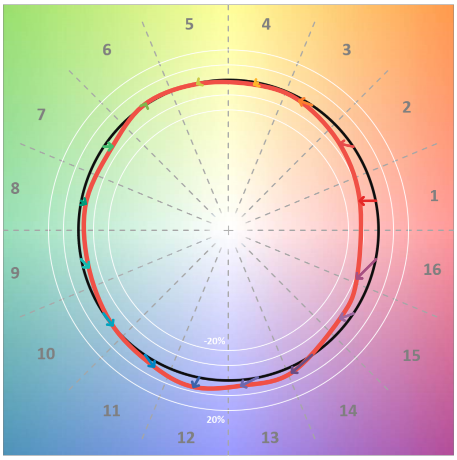


Relative spectral power distribution





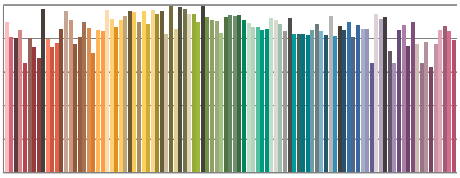
TM30 details



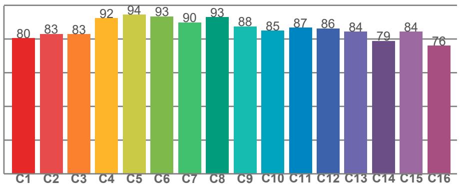
TM30 Colour vectors per hue bin

TM30 Colour distortion

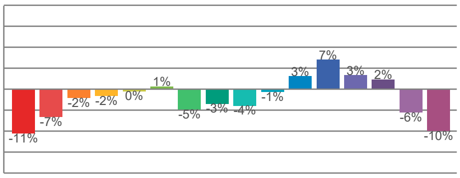
		Shifts (%)	
Hue Bin	R_f	Chroma	Hue
C1	80	-11%	2%
C2	83	-7%	7%
C3	83	-2%	9%
C4	92	-2%	2%
C5	94	0%	1%
C6	93	1%	-1%
C7	90	-5%	-3%
C8	93	-3%	1%
C9	88	-4%	6%
C10	85	-1%	10%
C11	87	3%	9%
C12	86	7%	-2%
C13	84	3%	-12%
C14	79	2%	-18%
C15	84	-6%	-8%
C16	76	-10%	-15%



TM30-18 Rf-values per reference colour

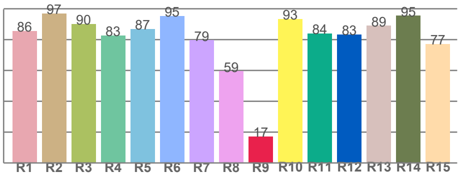


TM30-18 Rf-values per hue bin

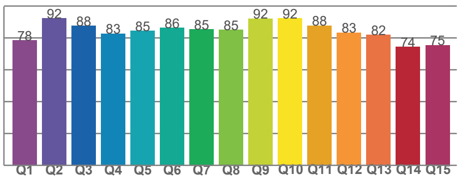


TM30 Chroma shift

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	20000 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)

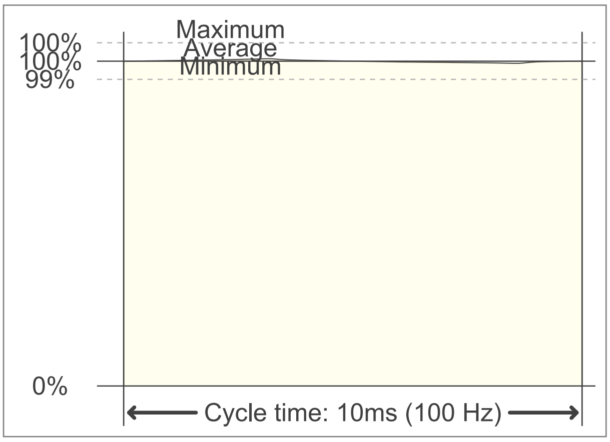
Flicker frequency	100 Hz
Percent flicker	0.96 %
Flicker index	0

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

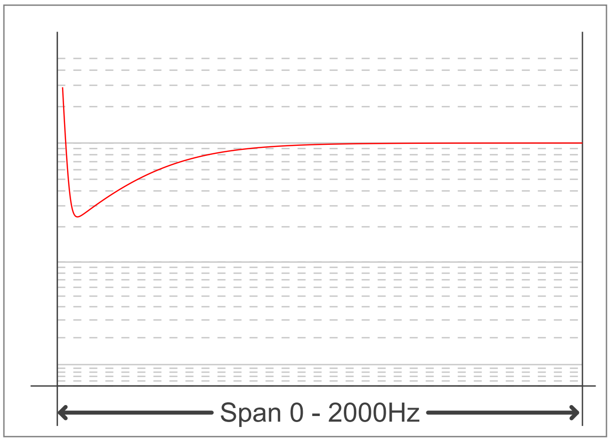
An LED luminaire is considered flicker-free if the SVM value is <= 0.4 and if the PstLM value is <=1.0

PstLM value (F < 80 Hz)	0.06
SVM value (80 < F < 2000 Hz)	0.02

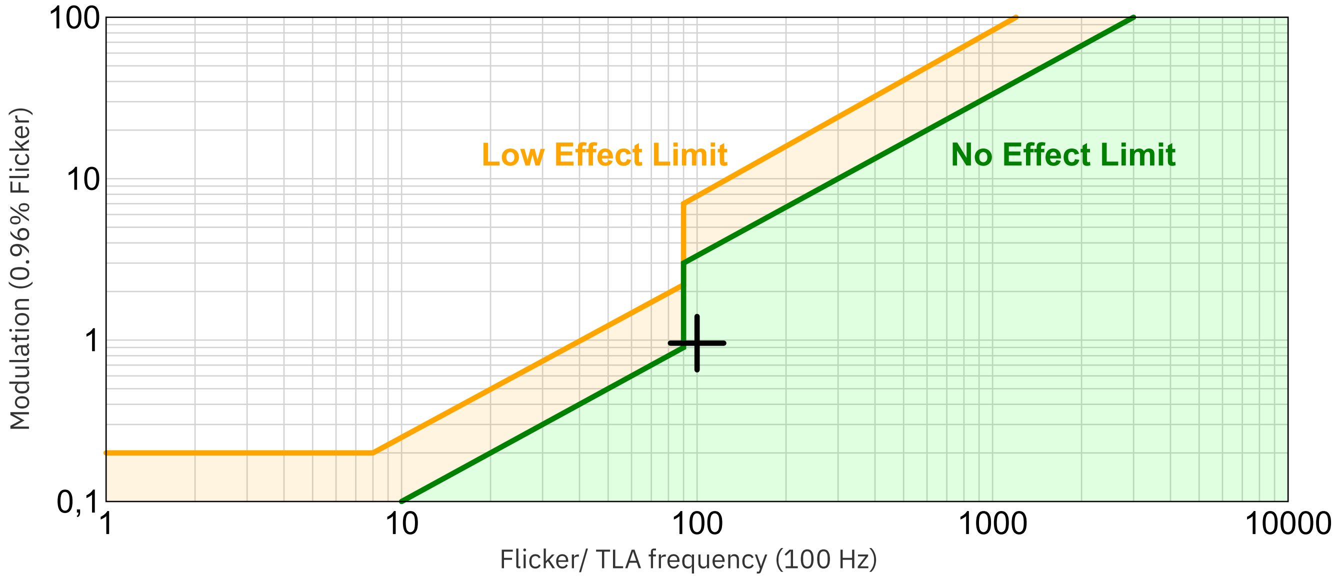
Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



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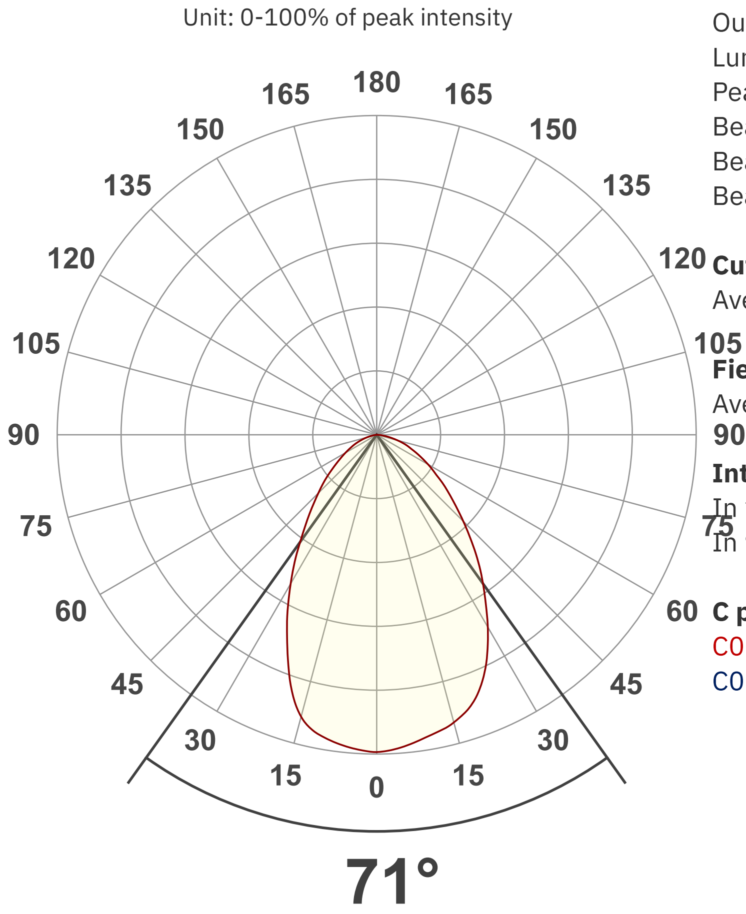
Beam angle

Luminous Intensity diagram



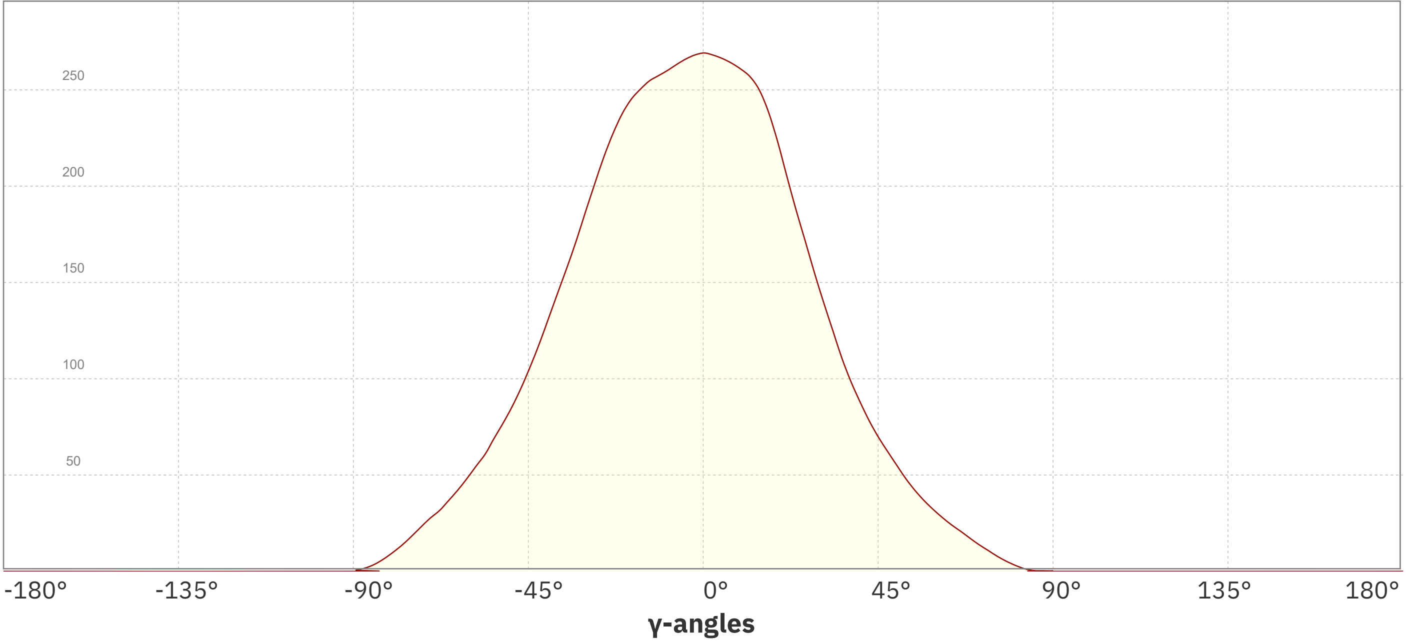
Main Values	
Output (total Lumen)	434 lm
Lumen Up/Down	0% / 100%
Peak Intensity	269 cd
Beam Angle (50%)	71°
Beam Angle (90%)	71°
Beam Angle (10%)	71°
Cut-off Angle	
Average 2.5%	158.6°
Field Angle	
Average 10%	132.8°
Intensity Ratio	
In 120° cone	89.1%
In 90° cone	70.9%

C planes

C000-C180

C090-C270

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



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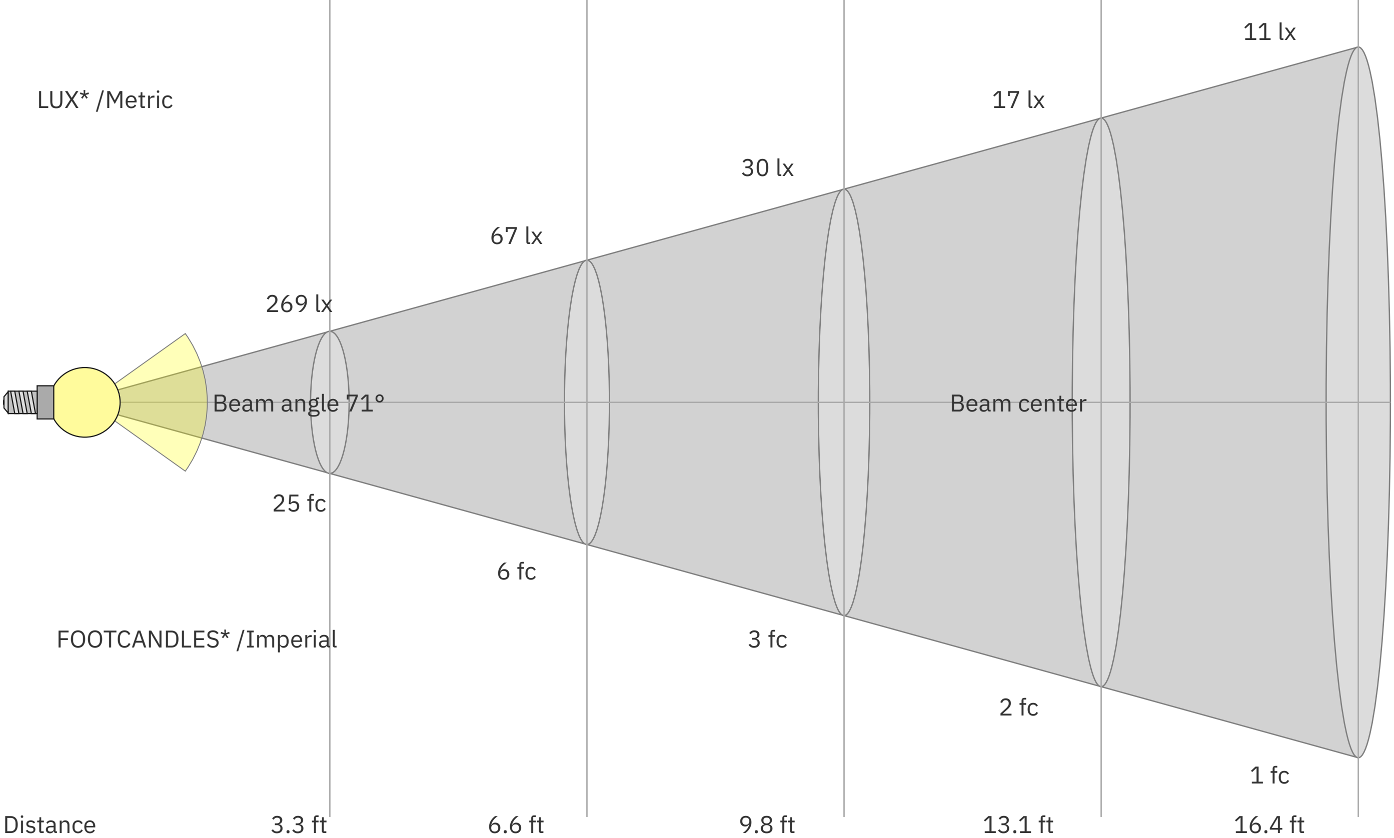
Beam Details

Distance	1 m	2 m	3 m	4 m	5 m
Beam Width	Ø 1.4 m	Ø 2.9 m	Ø 4.3 m	Ø 5.7m	Ø 7.1 m



Distance	3.3 ft	6.6 ft	9.8 ft	13.1 ft	16.4 ft
Beam Width	Ø 4.7 ft	Ø 9.4 ft	Ø 14 ft	Ø 18.7 ft	Ø 23.4 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
269	67	30	17	11	7	5	4	3	3	2	2	2	1	1	1	1	1	1	1	lux
25	6.2	2.8	1.6	1	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	fc

Intensities in 0° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
269	265	259	252	240	218	188	158	130	104	82	65	50	38	28	18	10	3	0	0	cd
100%	99%	96%	94%	89%	81%	70%	59%	48%	39%	31%	24%	19%	14%	10%	7%	4%	1%	0%	0%	of 0°val

Intensities in 90° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
269	265	259	252	240	218	188	158	130	104	82	65	50	38	28	18	10	3	0	0	cd
100%	99%	96%	94%	89%	81%	70%	59%	48%	39%	31%	24%	19%	14%	10%	7%	4%	1%	0%	0%	of 0°val

Intensities in 180° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
269	266	260	247	217	180	146	115	90	70	54	41	31	23	15	9	3	0	0	0	cd
100%	99%	97%	92%	81%	67%	54%	43%	33%	26%	20%	15%	11%	8%	6%	3%	1%	0%	0%	0%	of 0°val

Intensities in 270° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
269	266	260	247	217	180	146	115	90	70	54	41	31	23	15	9	3	0	0	0	cd
100%	99%	97%	92%	81%	67%	54%	43%	33%	26%	20%	15%	11%	8%	6%	3%	1%	0%	0%	0%	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		**Viewed Crosswise** (Viewing direction orthogonal to lamp length axis)					**Viewed Endwise** (Viewing direction parallel to lamp length axis)				
X	**Y**										
	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
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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

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	111	107	104	100	108	105	102	99	101	98	96	97	95	93	93	92	90	88
2	103	96	90	86	100	94	89	85	91	86	83	88	84	81	85	82	79	77
3	95	86	80	74	93	85	79	73	82	77	72	79	75	71	77	73	70	68
4	88	78	71	65	86	77	70	65	75	69	64	72	67	63	70	66	62	60
5	82	71	64	58	80	70	63	57	68	62	57	66	61	56	65	60	56	54
6	77	65	57	52	75	64	57	52	63	56	51	61	55	51	60	54	50	49
7	72	60	52	47	70	59	52	47	58	51	46	56	51	46	55	50	46	44
8	68	56	48	43	66	55	48	43	54	47	42	52	47	42	51	46	42	40
9	64	52	44	39	62	51	44	39	50	43	39	49	43	39	48	43	39	37
10	60	48	41	36	59	48	41	36	47	40	36	46	40	36	45	40	36	34

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