



PHOTOMETRIC LIGHT REPORT

Floodlight pro | 50W | 120° | natural white 4000K

Article number: 146-321



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TRONIX



146-321 Floodlight pro | 50W | 120° | natural white 4000K

Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 146-321. 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 146-321 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 146-321 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.



146-321 Floodlight pro | 50W | 120° | natural white 4000K

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	Vitretek 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	8 planes – 45°
γ (gamma)-Resolution	2.5°
Test Distance	1.81 m
Room Temperature and Humidity	22°C +/- 10% – RH 50% +/- 20%
Input Power. Power and Displacement Factors	51.3 W – PF 0.95 – DPF 0.95
Frequency of Input Power	50 Hz
Warm-up Time and Variation	Lamp stabilized in 25 min 17 sec --5.0%

Tested light source

Manufacturer and Order Code	Tronix Lighting – 146-321
Product Description	Floodlight pro 50W 120° natural white 4000K

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	7052 lm – 0% / 100%
Efficiency	137 lm/W
Energy efficiency class	E
Peak Intensity and Beam Angle	2486 cd – 115.5°
Correlated Colour Temperature	CCT = 4089 K
Colour Shift. CIE duv	Duv -0.0011
Colour Rendering Index	CRI 73.3
Colour Rendering TM30-18	R _f 74.6 – R _g 93.4
Television Lighting Consistency Index	TLCI = 47
Flicker	SVM 1.48 – PstLM 0.11



146-321 Floodlight pro | 50W | 120° | natural white 4000K

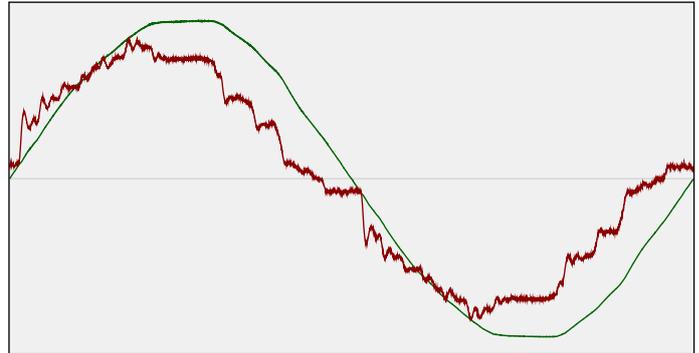
Electrical measurement details

Input Power

RMS Input voltage feed. V_{RMS}	230 V
RMS Input current feed. I_{RMS}	0.235 A
Total input power	51.3 W
Frequency of input power	50 Hz
Power factor	0.95
Displacement power factor	0.95
Total harmonic distortion of the current	10.58%
Total harmonic distortion of the voltage	2.11%

Input Power Curve

Voltage - Current



Efficiency

Radiated power efficiency: 39.7%



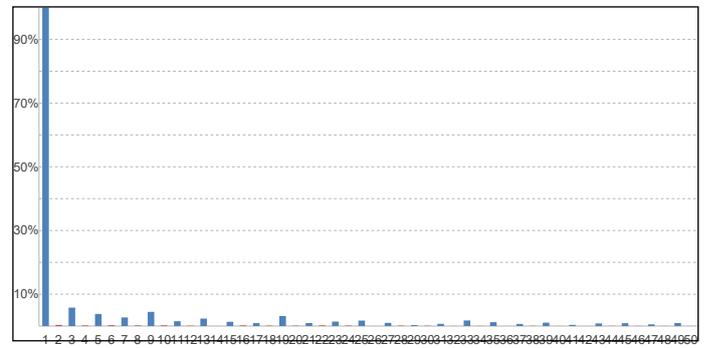
Lumen efficiency: 137 lm/W



Harmonics

3rd Harmonic	5.78%
5th Harmonic	3.79%
7th Harmonic	2.7%
9th Harmonic	4.45%
11th Harmonic	1.53%

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	4065 K
CCT shift	+24 K
CCT end	4089 K

Warm-up Results

Total warmup time	Lamp stabilized in 25 min 17 sec
Warmup variation	-5.0%

Output intensity change during warm-up

Output start	7420 lm
Output change	-367 lm
Output end	7052 lm



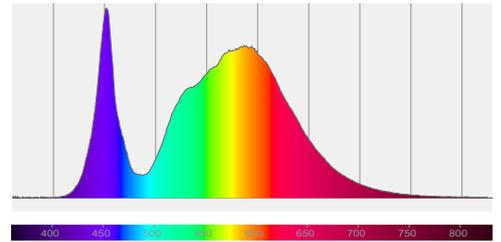
146-321 Floodlight pro | 50W | 120° | natural white 4000K

Colour measurement details

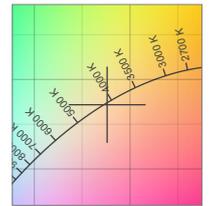
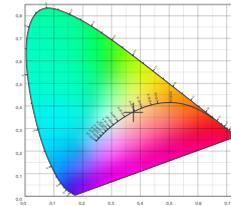
Total lumen output: 7052 lm
 Correlated Colour Temperature: 4089 K
 Colour coordinates CIE 1931: (x;y) = (0.376;0.372)
 Colour deviation from BBL: Duv = -0.0011

TM30-18 Colour Fidelity Index: R_f 74.6
 TM30-18 Colour Gamut Index: R_g 93.4
 Colour Rendering Index (Ra): CRI 73.3
 Colour Rendering Index. (red component): $R_9 = -28.2$

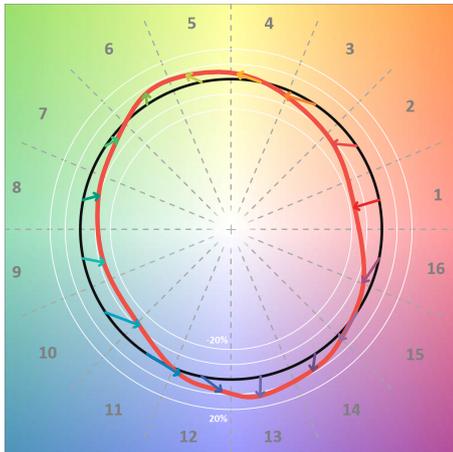
Colour Quality Scale: CQS = 71.4
 Television Lighting Consistency Index: TLCI = 47



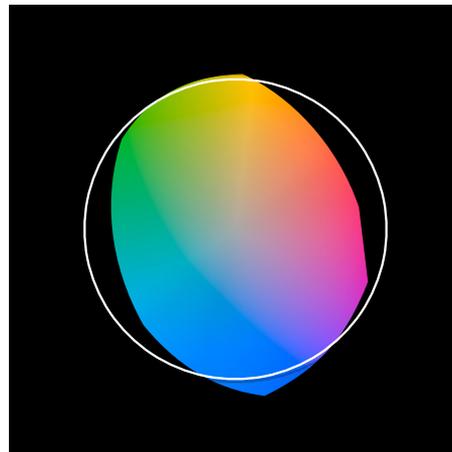
Relative spectral power distribution



TM30 details

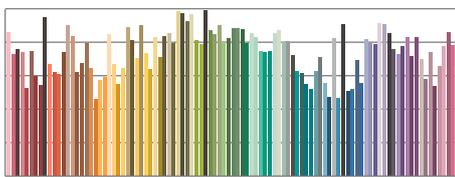


TM30 Colour vectors per hue bin

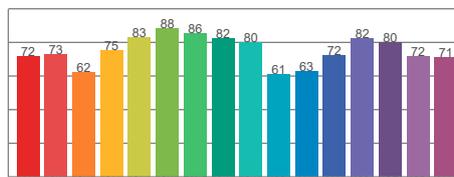


TM30 Colour distortion

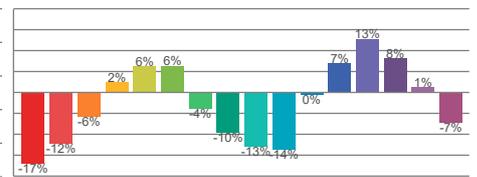
Hue Bin	R_f	Shifts (%)	
		Chroma	Hue
C1	72	-17%	-2%
C2	73	-12%	10%
C3	62	-6%	20%
C4	75	2%	16%
C5	83	6%	9%
C6	88	6%	-3%
C7	86	-4%	-8%
C8	82	-10%	-5%
C9	80	-13%	5%
C10	61	-14%	19%
C11	63	0%	25%
C12	72	7%	14%
C13	82	13%	-3%
C14	80	8%	-7%
C15	72	1%	-21%
C16	71	-7%	-17%



TM30-18 R_f -values per reference colour

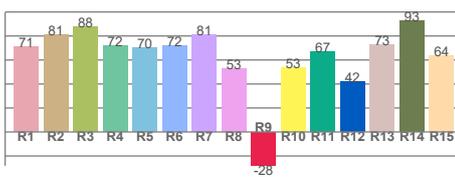


TM30-18 R_f -values per hue bin

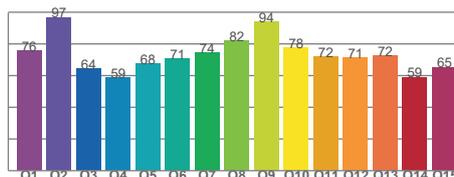


TM30 Chroma shift

Colour Quality details



Colour Rendering Index



Colour Quality 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)

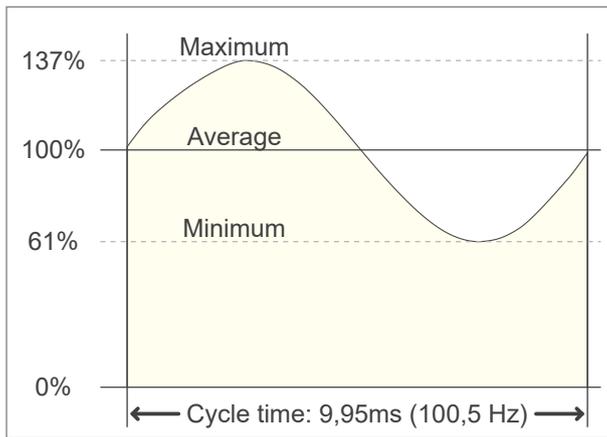
Flicker frequency	100.5 Hz
Percent flicker	38.48 %
Flicker index	0.12

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

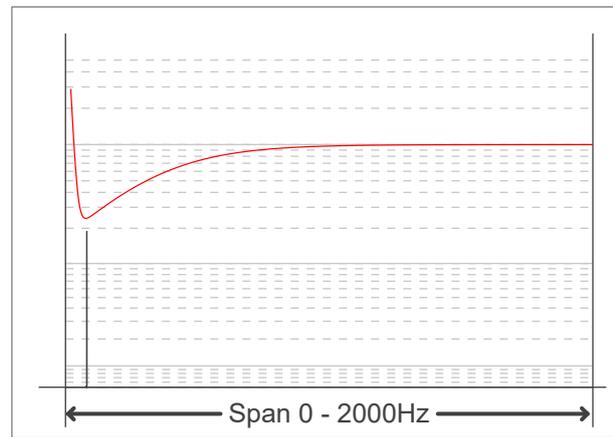
An LED luminaire is considered flicker-free if the SVM value is ≤ 0.4 and if the PstLM value is ≤ 1.0

PstLM value (F < 80 Hz)	0.11
SVM value (80 < F < 2000 Hz)	1.48

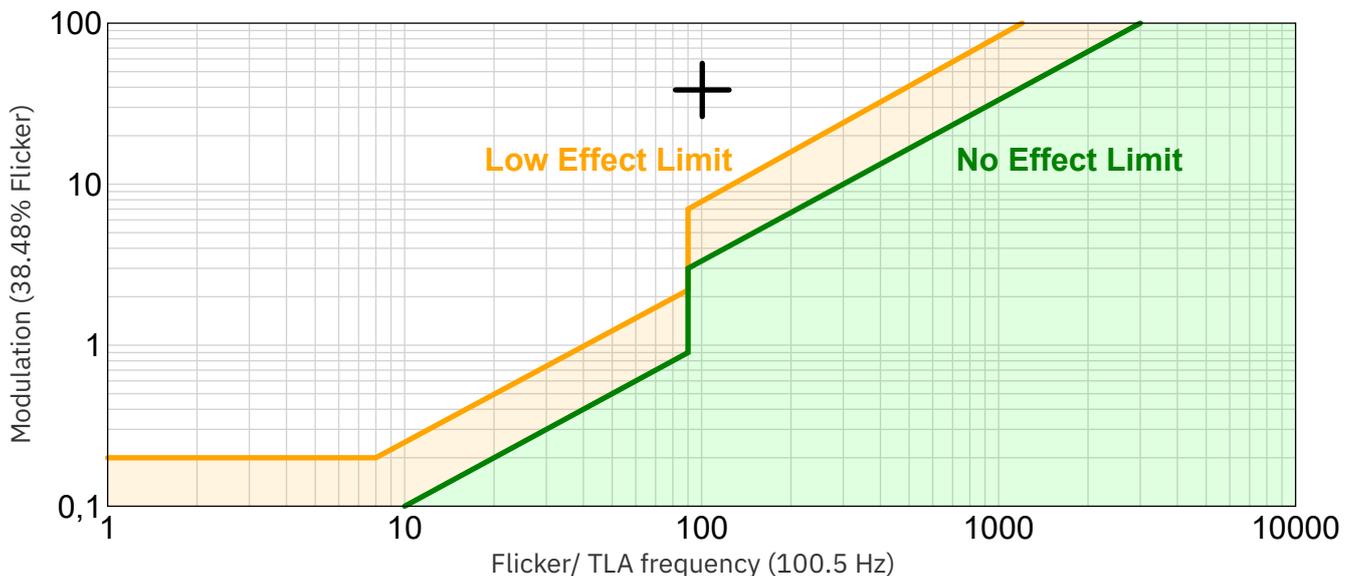
Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



Document revision date: 1-7-2025 Measurement serial: VFR-250219-3093-MS

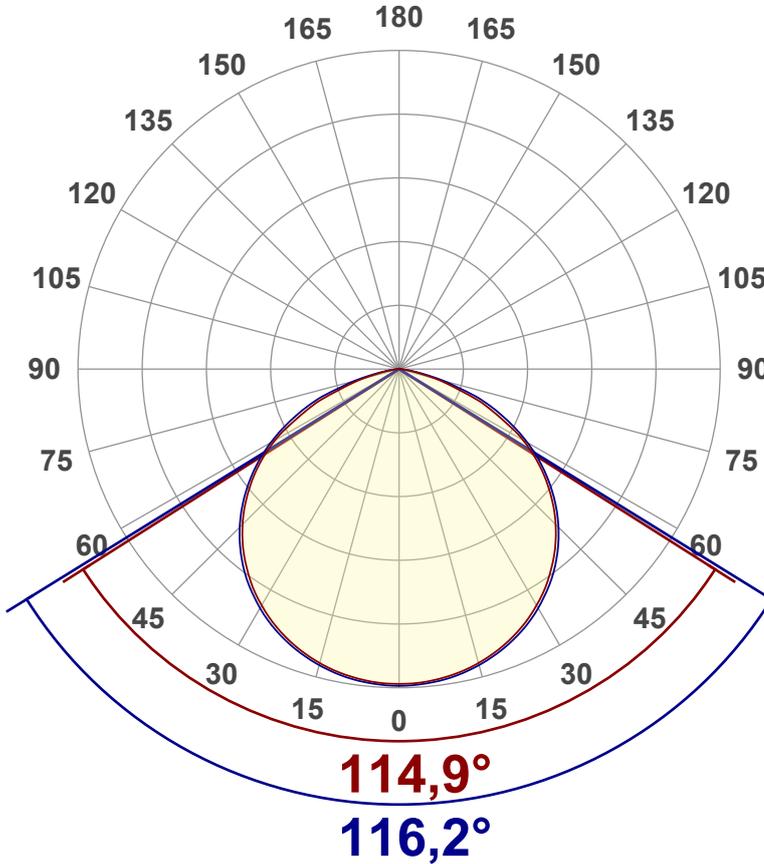


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Beam angle

Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	7052 lm
Lumen Up/Down	0% / 100%
Peak Intensity	2486 cd
Beam Angle (50%)	115.5°
Beam Angle (90%)	116.2°
Beam Angle (10%)	114.9°

Cut-off Angle

Average 2.5%	165°
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Field Angle

Average 10%	153.5°
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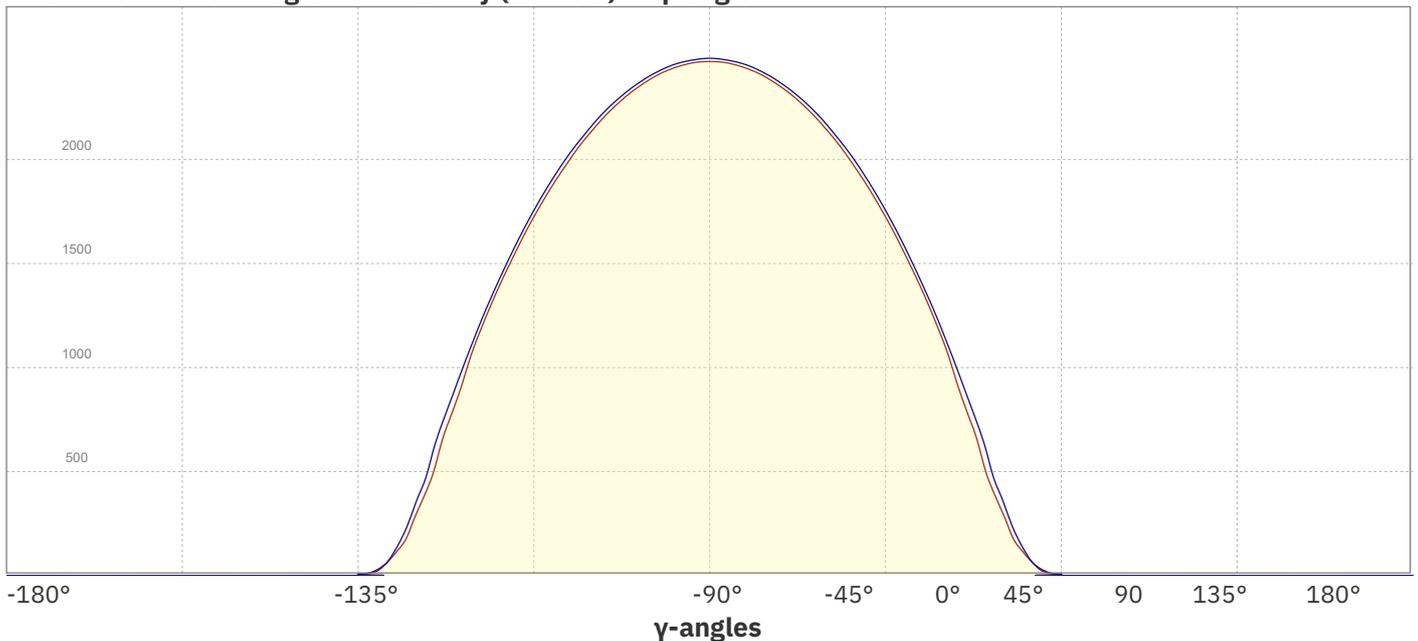
Intensity Ratio

In 120° cone	82.0%
In 90° cone	55.3%

C planes

- C000-C180
- C090-C270

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

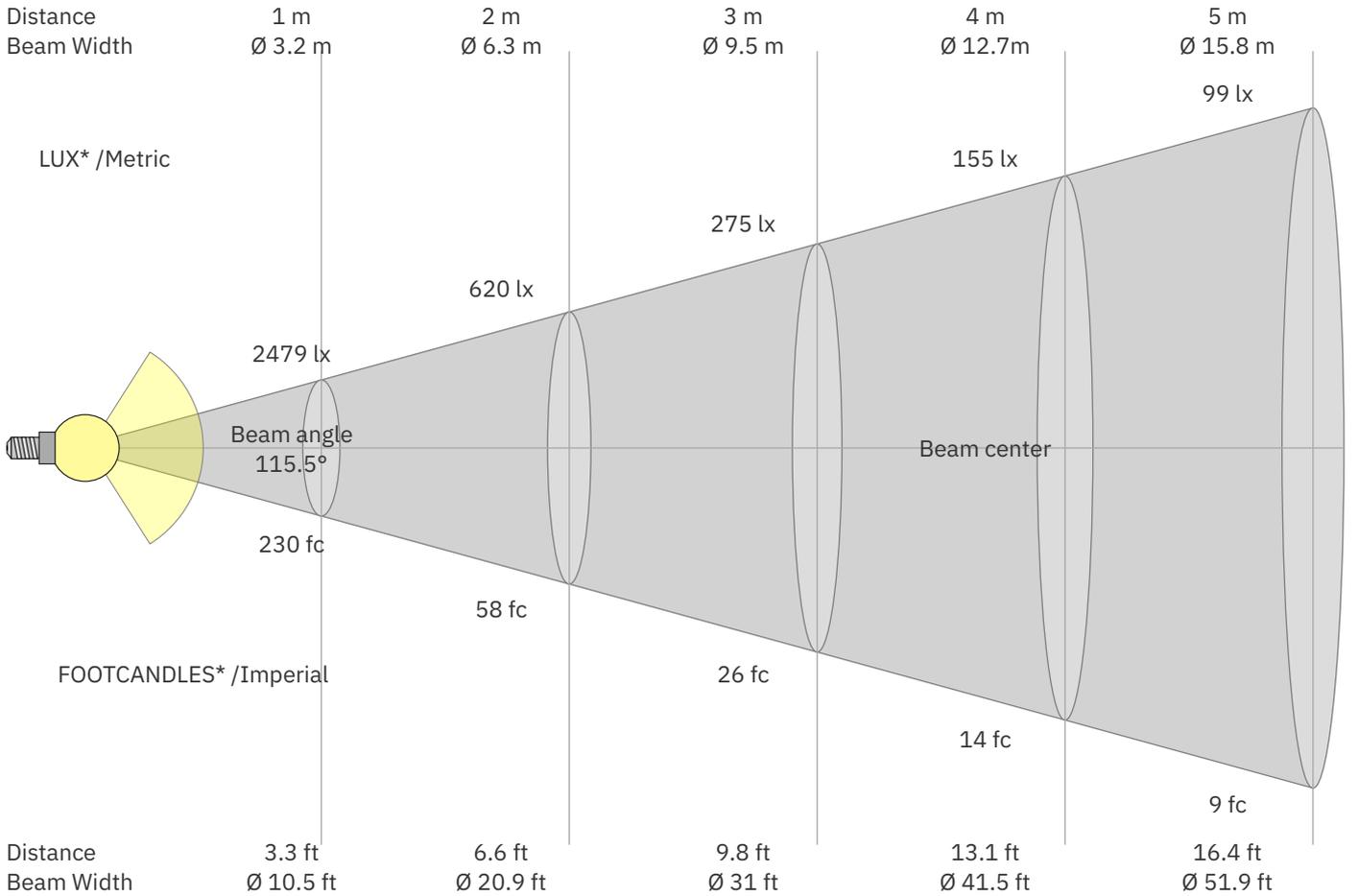


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Beam Details



*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
2479	620	275	155	99	69	51	39	31	25	20	17	15	13	11	10	9	8	7	6	lux
230.3	57.6	25.6	14.4	9.2	6.4	4.7	3.6	2.8	2.3	1.9	1.6	1.4	1.2	1	0.9	0.8	0.7	0.6	0.6	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
2479	2462	2434	2388	2324	2243	2141	2022	1883	1724	1543	1343	1113	833	545	301	118	30	6	0	cd
100%	99%	98%	96%	94%	90%	86%	82%	76%	70%	62%	54%	45%	34%	22%	12%	5%	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
2479	2476	2450	2405	2344	2265	2167	2050	1913	1755	1576	1376	1153	907	648	361	139	26	3	0	cd
100%	100%	99%	97%	95%	91%	87%	83%	77%	71%	64%	55%	47%	37%	26%	15%	6%	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
2479	2462	2434	2388	2324	2243	2141	2022	1883	1724	1543	1343	1113	833	545	301	118	30	6	0	cd
100%	99%	98%	96%	94%	90%	86%	82%	76%	70%	62%	54%	45%	34%	22%	12%	5%	1%	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
2479	2476	2450	2405	2344	2265	2167	2050	1913	1755	1576	1376	1153	907	648	361	139	26	3	0	cd
100%	100%	99%	97%	95%	91%	87%	83%	77%	71%	64%	55%	47%	37%	26%	15%	6%	1%	0%	0%	of 0°val

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Light Planning – UGR table

Uncorrected, comprehensive UGR table according to CIE 117-1995

Reflectances		70	70	50	50	30	70	70	50	50	30
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		Viewed Crosswise					Viewed Endwise				
H = mounting height above eye level		(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
X	Y										
2H	2H	30.4	31.6	30.7	31.9	32.2	30.6	31.8	30.8	32.1	32.3
	3H	31.5	32.8	31.9	33.0	33.2	31.8	33.1	32.2	33.3	33.6
	4H	31.8	33.0	32.2	33.3	33.5	32.2	33.4	32.6	33.6	33.9
	6H	32.0	33.0	32.3	33.3	33.6	32.4	33.4	32.7	33.7	34.1
	8H	31.9	32.9	32.3	33.2	33.7	32.4	33.4	32.7	33.7	34.1
	12H	31.9	32.9	32.3	33.2	33.7	32.3	33.3	32.7	33.6	34.1
4H	2H	31.0	32.2	31.4	32.5	32.7	31.1	32.3	31.5	32.6	32.8
	3H	32.4	33.3	32.7	33.7	34.1	32.7	33.6	33.0	34.0	34.4
	4H	32.7	33.5	33.1	34.0	34.5	33.0	33.9	33.4	34.3	34.8
	6H	32.8	33.6	33.3	34.0	34.4	33.2	34.0	33.7	34.4	34.7
	8H	32.8	33.6	33.3	33.9	34.3	33.2	33.9	33.7	34.3	34.7
	12H	32.8	33.4	33.3	33.8	34.3	33.1	33.8	33.6	34.2	34.7
8H	4H	32.8	33.6	33.3	33.9	34.3	33.1	33.9	33.6	34.3	34.6
	6H	33.0	33.6	33.5	34.0	34.6	33.3	33.9	33.9	34.4	34.9
	8H	33.0	33.5	33.5	34.0	34.7	33.4	33.9	33.9	34.4	35.1
	12H	33.0	33.4	33.6	33.9	34.6	33.4	33.8	34.0	34.3	34.9
12H	4H	32.8	33.4	33.3	33.8	34.3	33.1	33.7	33.6	34.1	34.6
	6H	33.0	33.5	33.5	34.0	34.7	33.4	33.9	33.9	34.4	35.0
	8H	33.0	33.4	33.6	33.9	34.6	33.4	33.8	34.0	34.3	34.9

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

S = 1.0H	0.1 / -0.2	0.1 / -0.2
S = 1.5H	0.3 / -0.5	0.3 / -0.4
S = 2.0H	0.8 / -1.0	0.7 / -0.9

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	106	106	106	102	102	102	100	
1	109	105	101	97	107	103	99	96	99	96	93	95	92	90	91	89	87	85
2	100	92	85	80	97	90	84	79	86	81	77	83	79	75	80	77	74	71
3	91	81	73	66	89	79	72	66	76	70	65	73	68	64	71	66	62	60
4	83	71	63	56	81	70	62	56	68	61	55	65	59	54	63	58	54	51
5	77	64	55	48	74	63	54	48	61	53	48	59	52	47	57	51	47	44
6	71	57	48	42	69	56	48	42	55	47	42	53	46	41	51	45	41	39
7	65	52	43	37	64	51	43	37	50	42	37	48	41	36	47	41	36	34
8	61	47	39	33	59	47	39	33	45	38	33	44	37	33	43	37	32	30
9	57	43	35	30	55	43	35	30	42	34	29	41	34	29	40	34	29	27
10	53	40	32	27	52	39	32	27	39	32	27	38	31	27	37	31	26	25