



PHOTOMETRIC LIGHT REPORT

Batten light flat | 690mm | 18W | IP20 | 3-CCT

Article number: 136-310



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136-310 Batten light flat | 690mm | 18W | IP20 | 3-CCT

Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 136-310. 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 136-310 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 136-310 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	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	4 planes – 90°
γ (gamma)-Resolution	5°
Test Distance	1.81 m
Room Temperature and Humidity	22°C +/- 10% – RH 50% +/- 20%
Input Power. Power and Displacement Factors	16.5 W – PF 0.96 – DPF 0.96
Frequency of Input Power	49.9 Hz
Warm-up Time and Variation	Lamp stabilized in 15 min 9 sec --2.1%

Tested light source

Manufacturer and Order Code	Tronix Lighting – 136-310
Product Description	Batten light flat 690mm 18W IP20 3-CCT

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	2230 lm – 6.04% / 93.96%
Efficiency	135 lm/W
Energy efficiency class	E
Peak Intensity and Beam Angle	636 cd – 122.7°
Correlated Colour Temperature	CCT = 4111 K
Colour Shift. CIE duv	Duv -0.0060
Colour Rendering Index	CRI 87.3
Colour Rendering TM30-18	R _f 85.3 – R _g 96.7
Television Lighting Consistency Index	TLCI = 75
Flicker	SVM 0.02 – PstLM 0.01

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Electrical measurement details

Input Power

RMS Input voltage feed. V_{RMS}

231 V

RMS Input current feed. I_{RMS}

0.075 A

Total input power

16.5 W

Frequency of input power

49.9 Hz

Power factor

0.96

Displacement power factor

0.96

Total harmonic distortion of the current

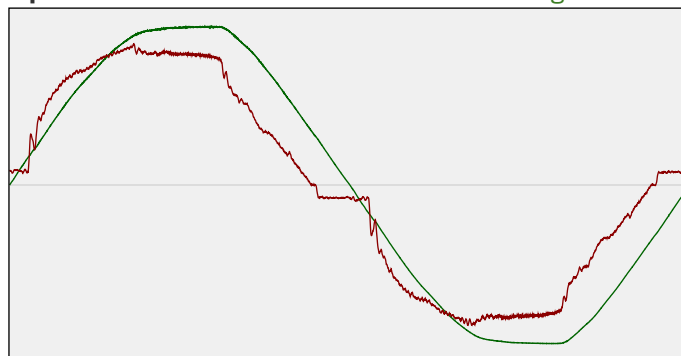
12.21%

Total harmonic distortion of the voltage

2.58%

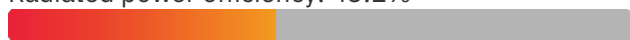
Input Power Curve

Voltage - Current

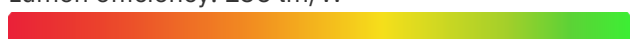


Efficiency

Radiated power efficiency: 43.1%



Lumen efficiency: 135 lm/W



Harmonics

3rd Harmonic

5.71%

5th Harmonic

8.4%

7th Harmonic

2.33%

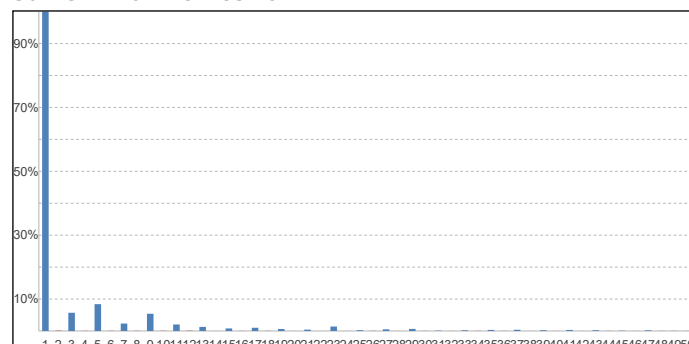
9th Harmonic

5.4%

11th Harmonic

2.04%

Current Harmonics %



Stabilization Details

Warm-up Conditions

Stable period

15 min CCT start

4085 K

Stable change max

2.0% CCT shift

+26 K

Minimum warm-up time

15 min CCT end

4111 K

Colour temperature change during warm-up

Warm-up Results

Total warmup time

Lamp stabilized in 15 min 9 sec

Output intensity change during warm-up

Output start

2271 lm

Warmup variation

-2.1%

Output change

-41 lm

Output end

2230 lm

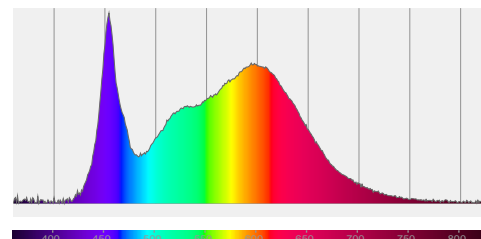
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Colour measurement details

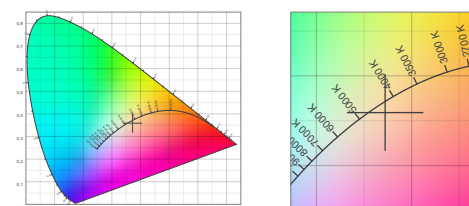
Total lumen output 2230 lm
 Correlated Colour Temperature 4111 K
 Colour coordinates CIE 1931 (x;y) = (0.372;0.359)
 Colour deviation from BBL Duv = -0.0060

TM30-18 Colour Fidelity Index R_f 85.3
 TM30-18 Colour Gamut Index R_g 96.7
 Colour Rendering Index (Ra) CRI 87.3
 Colour Rendering Index. (red component) $R_9 = 28.3$

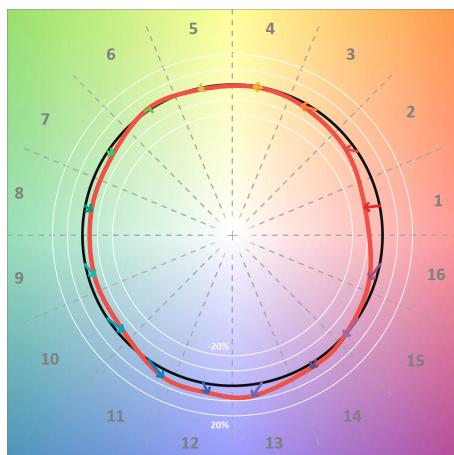
Colour Quality Scale CQS = 83.9
 Television Lighting Consistency Index TLCI = 75



Relative spectral power distribution



TM30 details

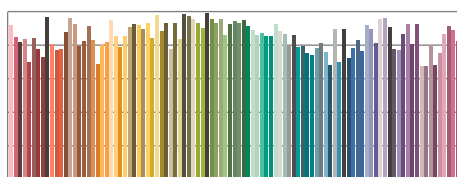


TM30 Colour vectors per hue bin

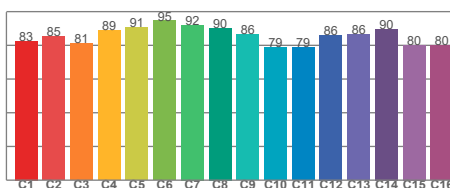


TM30 Colour distortion

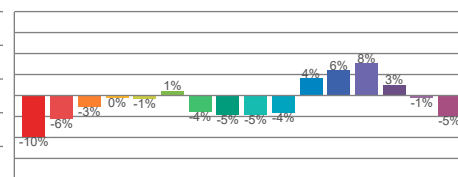
Hue Bin	R_f	Shifts (%)	
		Chroma	Hue
C1	83	-10%	1%
C2	85	-6%	6%
C3	81	-3%	10%
C4	89	0%	5%
C5	91	-1%	3%
C6	95	1%	-1%
C7	92	-4%	-1%
C8	90	-5%	2%
C9	86	-5%	9%
C10	79	-4%	12%
C11	79	4%	14%
C12	86	6%	4%
C13	86	8%	-8%
C14	90	3%	-5%
C15	80	-1%	-14%
C16	80	-5%	-11%



TM30-18 R_f -values per reference colour

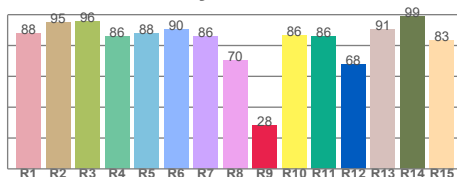


TM30-18 R_f -values per hue bin

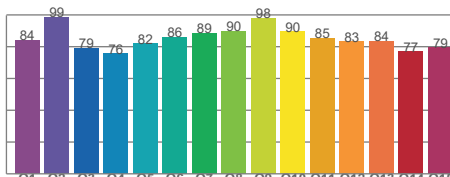


TM30 Chroma shift

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)

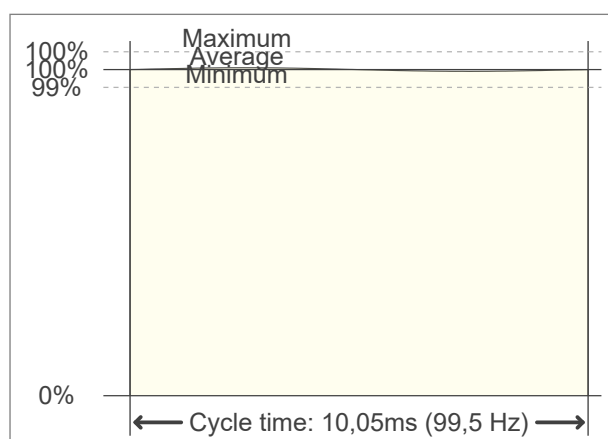
Flicker frequency	99.5 Hz
Percent flicker	0.57 %
Flicker index	0

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

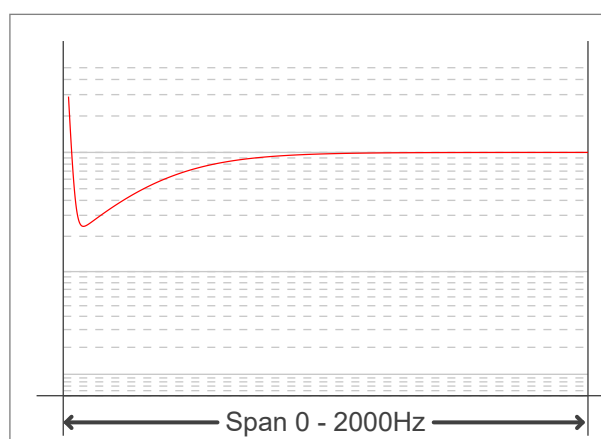
An LED luminaire is considered flicker-free if the SVM value is ≤ 0.4 and if the PstLM value is ≤ 1.0

PstLM value ($F < 80$ Hz)	0.01
SVM value ($80 < F < 2000$ Hz)	0.02

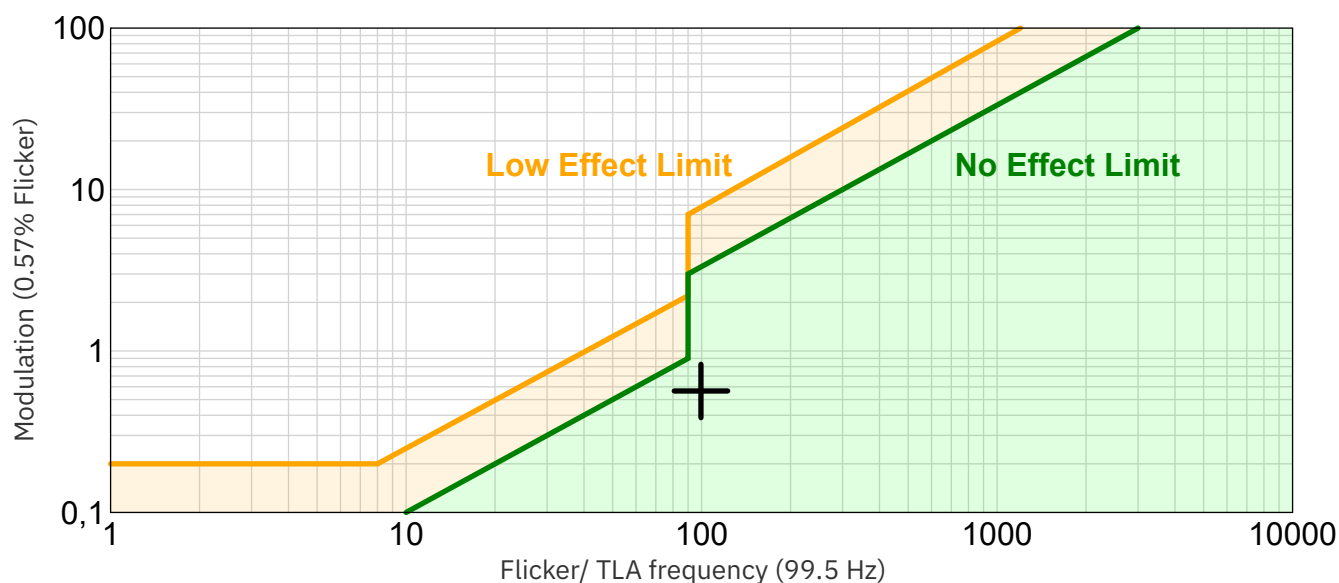
Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



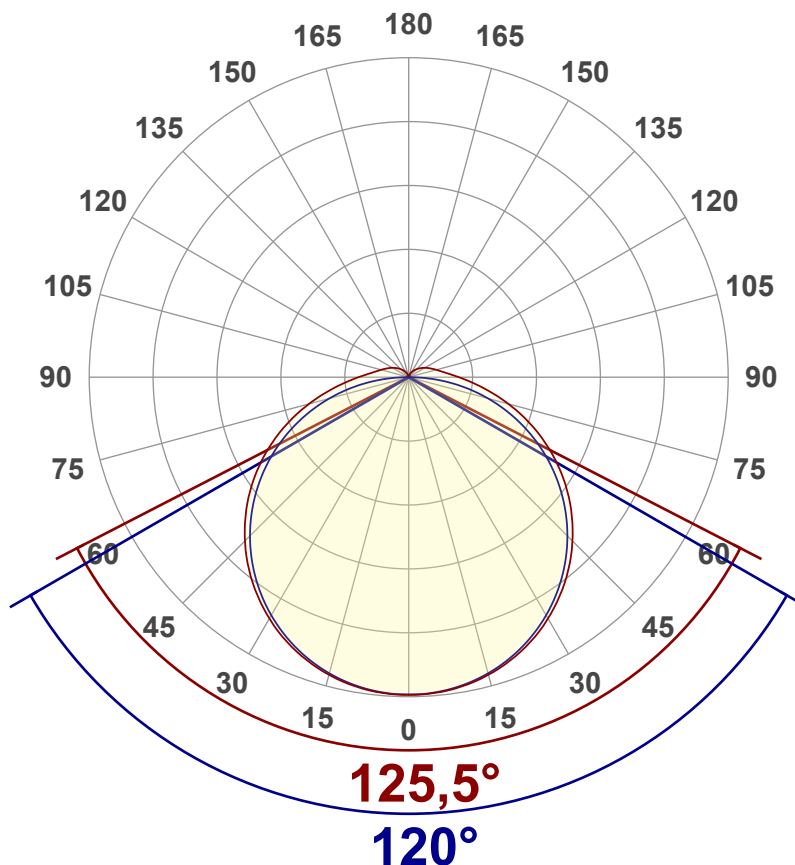
Document revision date: 1-7-2025 Measurement serial: VFR-250403-5229-MS

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Beam angle

Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2230 lm
Lumen Up/Down	6.04% / 93.96%
Peak Intensity	636 cd
Beam Angle (50%)	122.7°
Beam Angle (90%)	120°
Beam Angle (10%)	125.5°

Cut-off Angle

Average 2.5%	232.5°
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Field Angle

Average 10%	185.7°
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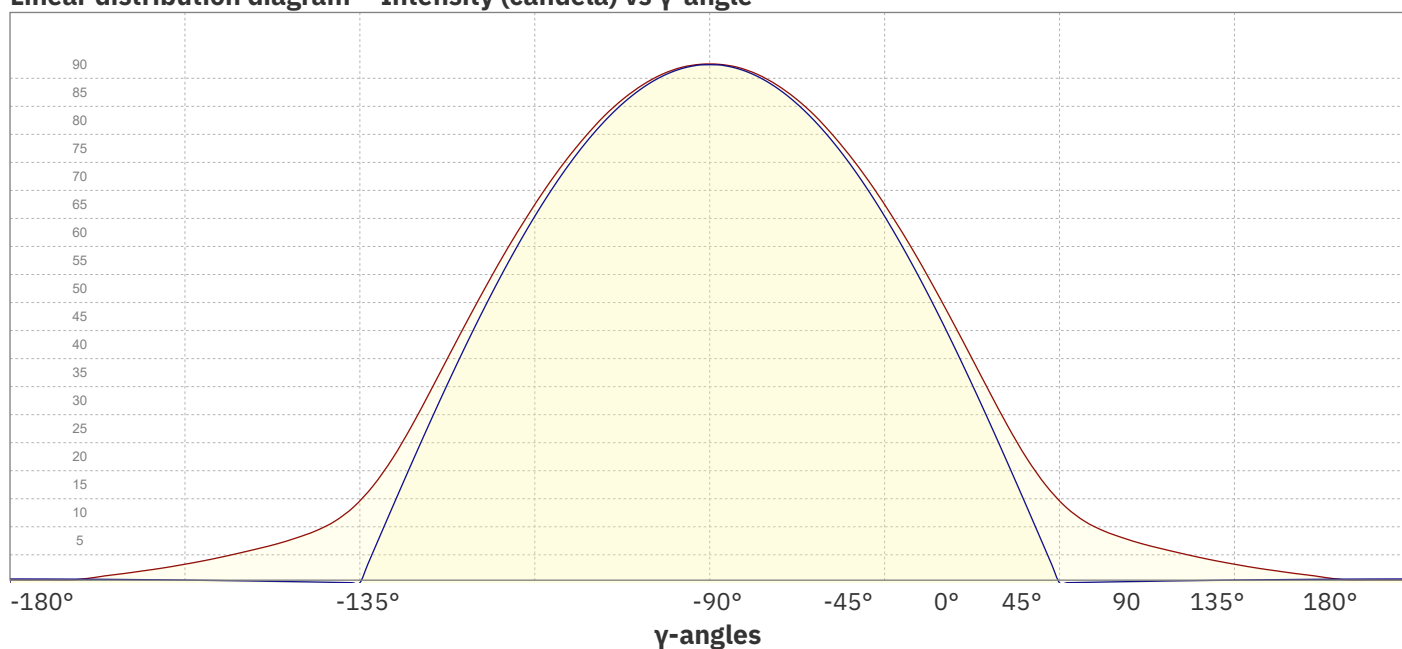
Intensity Ratio

In 120° cone	68.1%
In 90° cone	45.1%

C planes

C000-C180
C090-C270

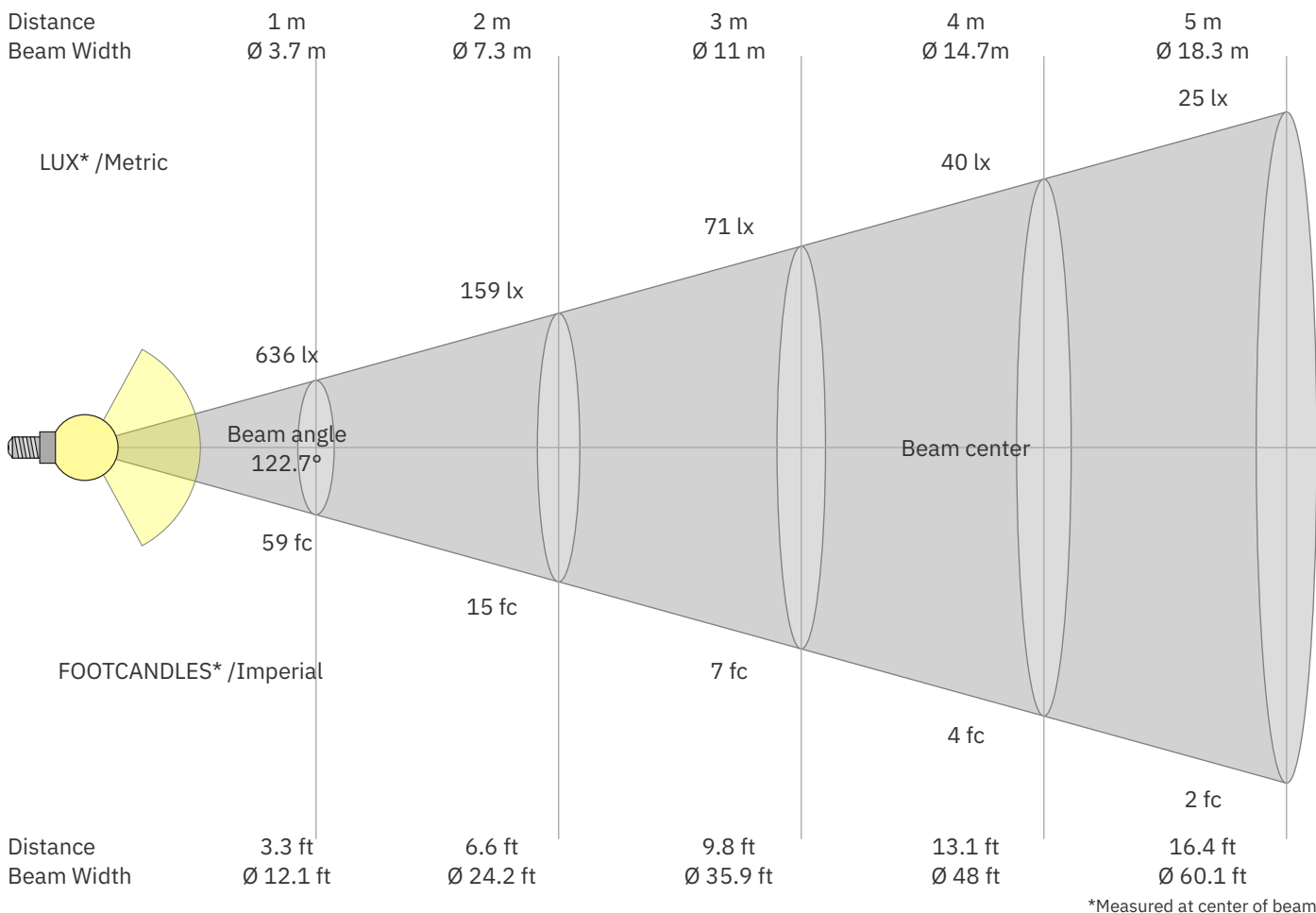
Linear distribution diagram - Intensity (candela) vs γ-angle



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Beam Details



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
636	159	71	40	25	18	13	10	8	6	5	4	4	3	3	2	2	2	2	2	lux
59	14.8	6.6	3.7	2.4	1.6	1.2	0.9	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	fc

Intensities in 0° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
636	629	608	573	524	463	393	315	234	157	101	69	53	41	31	23	16	10	5	4	cd
100%	99%	96%	90%	82%	73%	62%	50%	37%	25%	16%	11%	8%	6%	5%	4%	2%	2%	1%	1%	of 0°val

Intensities in 90° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
636	628	604	566	514	449	374	289	196	99	0	1	1	2	3	3	4	4	4	5	cd
100%	99%	95%	89%	81%	71%	59%	45%	31%	16%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	of 0°val

Intensities in 180° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
636	629	608	573	524	463	393	315	234	157	101	69	53	41	31	23	16	10	5	4	cd
100%	99%	96%	90%	82%	73%	62%	50%	37%	25%	16%	11%	8%	6%	5%	4%	2%	2%	1%	1%	of 0°val

Intensities in 270° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ
636	628	604	566	514	449	374	289	196	99	0	1	1	2	3	3	4	4	4	5	cd
100%	99%	95%	89%	81%	71%	59%	45%	31%	16%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	of 0°val

Light Planning – UGR table

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					Viewed Endwise				
		(Viewing direction orthogonal to lamp length axis)					(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
	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
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						

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	118	118	118	118	114	114	114	114	108	108	108	102	102	102	96	96	96	94
1	106	100	95	91	102	97	93	89	92	88	85	87	84	81	82	80	78	75
2	95	86	79	73	92	84	77	71	79	74	69	75	70	66	71	67	64	61
3	87	75	67	60	84	73	65	59	69	63	57	66	60	55	62	58	53	51
4	79	66	57	50	76	65	56	49	61	54	48	58	52	47	55	50	45	43
5	72	59	50	43	70	58	49	42	55	47	41	52	45	40	50	44	39	37
6	67	53	44	37	64	52	43	37	49	42	36	47	40	35	45	39	34	32
7	62	48	39	33	60	47	38	32	45	37	32	43	36	31	41	35	30	28
8	57	44	35	29	56	43	34	29	41	33	28	39	32	27	37	31	27	25
9	54	40	32	26	52	39	31	26	37	30	25	36	29	25	35	29	24	22
10	50	37	29	23	49	36	28	23	35	28	23	33	27	22	32	26	22	20