



PHOTOMETRIC LIGHT REPORT

Batten light | 603mm | 20W | IP20 | 3-CCT

Article number: 136-301



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TRONIX

136-301 Batten light | 603mm | 20W | IP20 | 3-CCT

Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 136-301. 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 136-301 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 136-301 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.

136-301 Batten light | 603mm | 20W | IP20 | 3-CCT

Laboratory and equipment

Laboratory owner and location
Gonio spectrometer system and type
Spectrometer manufacturer and model

Flicker meter manufacturer and model
Oscilloscope manufacturer and model
Power meter manufacturer and model

Power source manufacturer and model

Datalogger Manufacturer and Model

Tronix Lighting BV. Uden. The Netherlands
Viso Systems Type C. horizontal
(Gonio) Ocean Optics STS VIS
(Sphere) Admesy HERA VIS 380–780nm
Viso Systems LabFlicker
Tektronix MDO3024 oscilloscope (4 Channels. 200 MHz)
Vitretek PA900 Precision Multi-Channel Harmonic Power Analyzer
(DC) Keithley Source Measure Unit SMU-2420 3A DC Source Meter
(AC) Chroma 61601 AC Source
Omega 8-Channel Thermocouple Thermometer/Data Logger

Measurement conditions gonio spectrometer

Number of C-planes and Resolution
 γ (gamma)-Resolution
Test Distance
Room Temperature and Humidity
Input Power. Power and Displacement Factors
Frequency of Input Power
Warm-up Time and Variation

4 planes – 90°
5°
1.81 m
22°C +/- 10% – RH 50% +/- 20%
35.5 W – PF 0.92 – DPF 0.94
50 Hz
Lamp stabilized in 25 min 36 sec --8.9%

Tested light source

Manufacturer and Order Code
Product Description

Tronix Lighting – 136-301
Batten light | 603mm | 20W | IP20 | 3-CCT

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)
Efficiency
Energy efficiency class
Peak Intensity and Beam Angle
Correlated Colour Temperature
Colour Shift. CIE duv
Colour Rendering Index
Colour Rendering TM30-18
Television Lighting Consistency Index
Flicker

4658 lm – 12.19% / 87.81%
131 lm/W
E
1157 cd – 130.3°
CCT = 4446 K
Duv -0.0053
CRI 88.9
R_f 86.5 – R_g 98.7
TLCI = 79
SVM 2.08 – PstLM 0.14

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Electrical measurement details

Input Power

RMS Input voltage feed. V_{RMS}

230 V

RMS Input current feed. I_{RMS}

0.167 A

Total input power

35.5 W

Frequency of input power

50 Hz

Power factor

0.92

Displacement power factor

0.94

Total harmonic distortion of the current

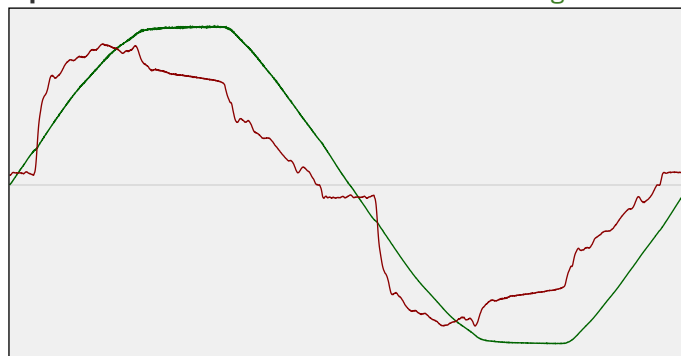
19.82%

Total harmonic distortion of the voltage

2.71%

Input Power Curve

Voltage - Current



Efficiency

Radiated power efficiency: 42.3%



Lumen efficiency: 131 lm/W



Harmonics

3rd Harmonic

12.14%

5th Harmonic

11.6%

7th Harmonic

3.65%

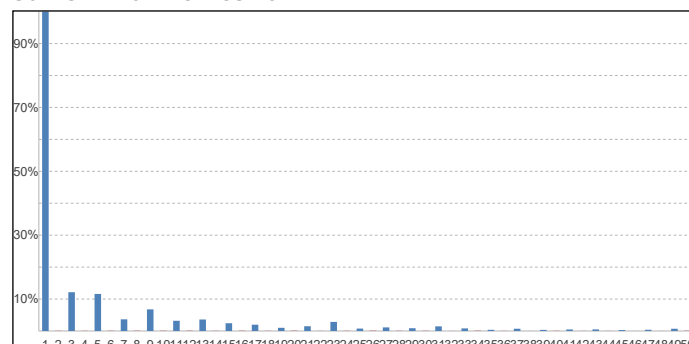
9th Harmonic

6.77%

11th Harmonic

3.2%

Current Harmonics %



Stabilization Details

Warm-up Conditions

Stable period

15 min CCT start

4426 K

Stable change max

2.0% CCT shift

+20 K

Minimum warm-up time

15 min CCT end

4446 K

Colour temperature change during warm-up

Warm-up Results

Total warmup time

Lamp stabilized in 25 min 36 sec

Output intensity change during warm-up

Output start

5095 lm

Warmup variation

-8.9% Output change

-436 lm

Output end

4658 lm

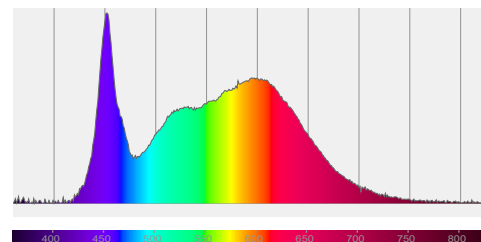
136-301 Batten light | 603mm | 20W | IP20 | 3-CCT

Colour measurement details

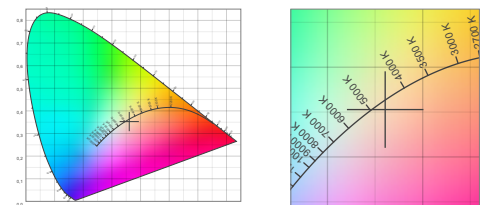
Total lumen output 4658 lm
 Correlated Colour Temperature 4446 K
 Colour coordinates CIE 1931 (x;y) = (0.361;0.353)
 Colour deviation from BBL Duv = -0.0053

TM30-18 Colour Fidelity Index R_f 86.5
 TM30-18 Colour Gamut Index R_g 98.7
 Colour Rendering Index (Ra) CRI 88.9
 Colour Rendering Index. (red component) $R_9 = 36.0$

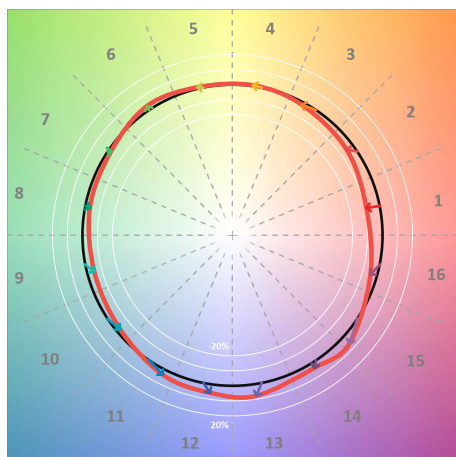
Colour Quality Scale CQS = 85.5
 Television Lighting Consistency Index TLCI = 79



Relative spectral power distribution



TM30 details

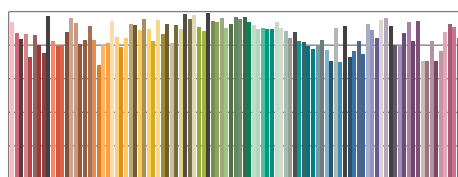


TM30 Colour vectors per hue bin

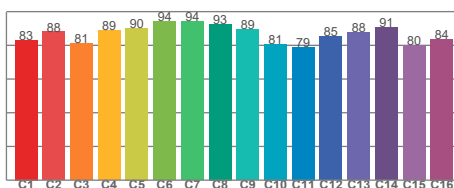


TM30 Colour distortion

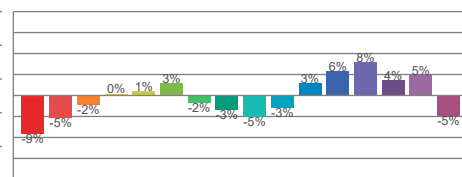
Hue Bin	R_f	Shifts (%)	
		Chroma	Hue
C1	83	-9%	0%
C2	88	-5%	5%
C3	81	-2%	10%
C4	89	0%	6%
C5	90	1%	4%
C6	94	3%	0%
C7	94	-2%	-2%
C8	93	-3%	1%
C9	89	-5%	6%
C10	81	-3%	11%
C11	79	3%	13%
C12	85	6%	6%
C13	88	8%	-5%
C14	91	4%	-4%
C15	80	5%	-17%
C16	84	-5%	-8%



TM30-18 R_f -values per reference colour

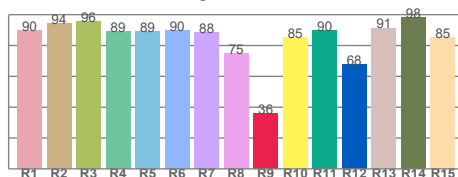


TM30-18 R_f -values per hue bin

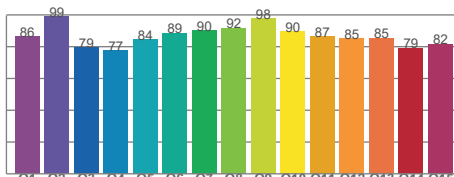


TM30 Chroma shift

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)

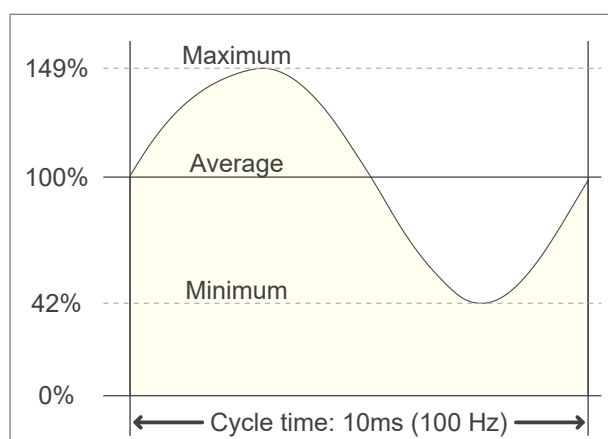
Flicker frequency	100 Hz
Percent flicker	56.08 %
Flicker index	0.17

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

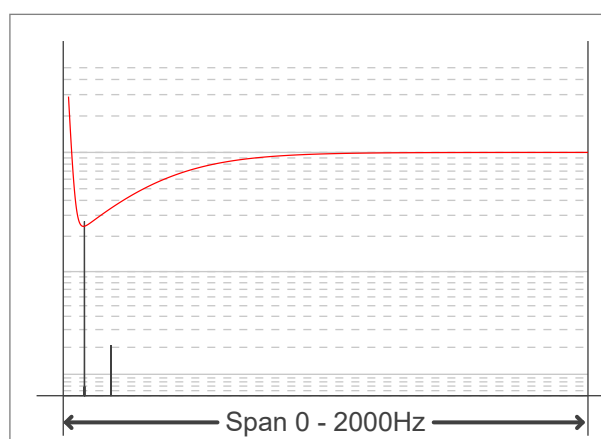
An LED luminaire is considered flicker-free if the SVM value is ≤ 0.4 and if the PstLM value is ≤ 1.0

PstLM value ($F < 80$ Hz)	0.14
SVM value ($80 < F < 2000$ Hz)	2.08

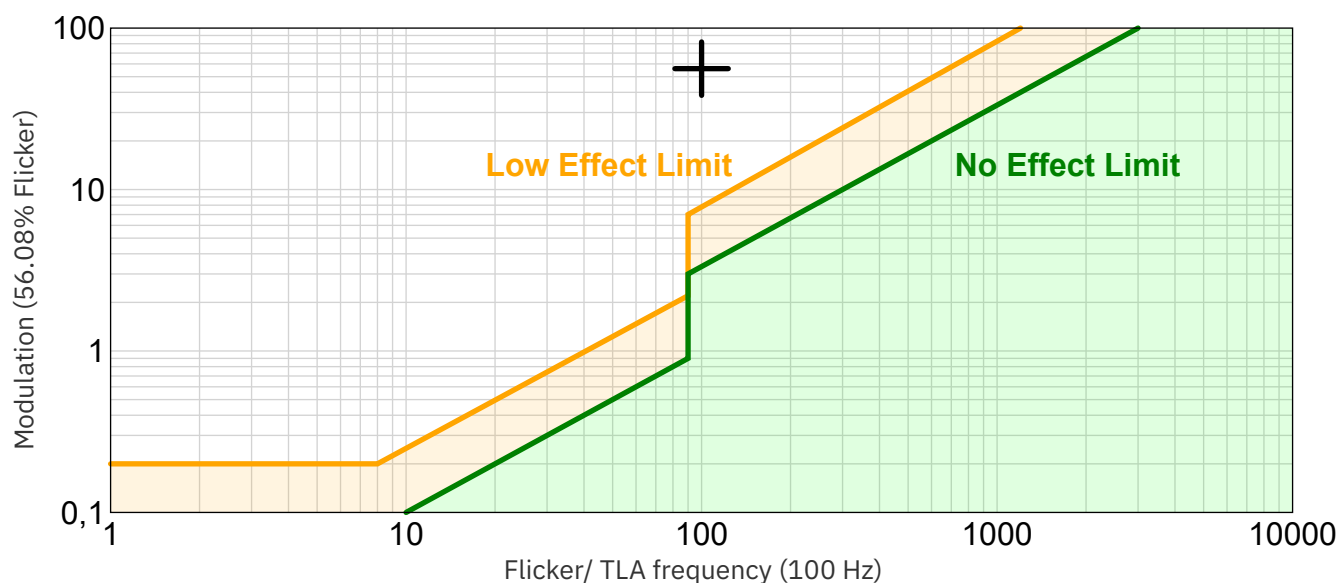
Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



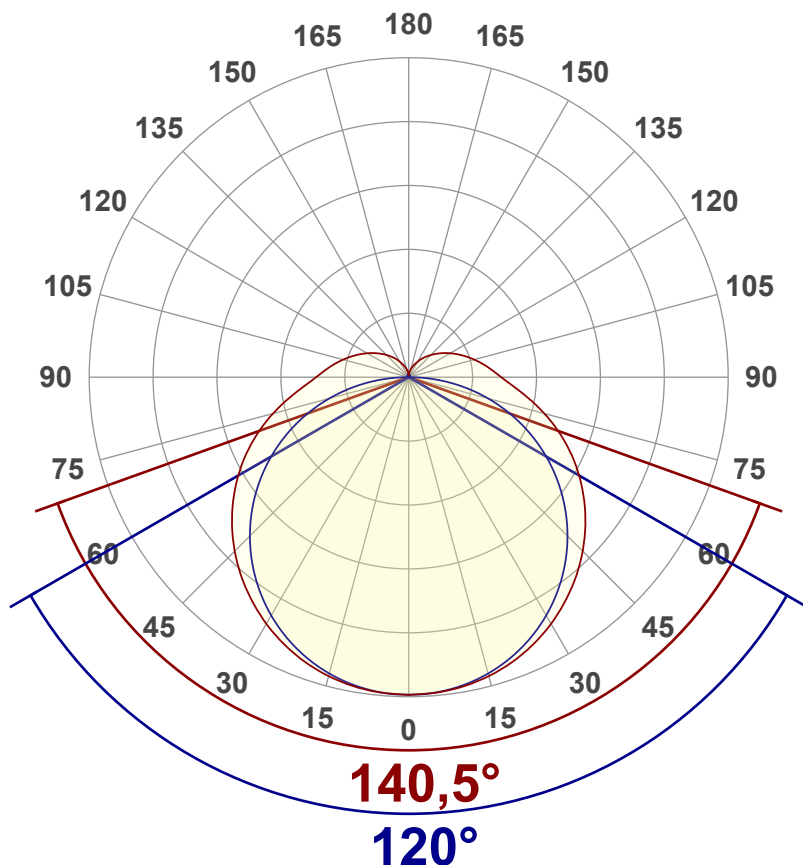
Document revision date: 1-7-2025 Measurement serial: VFR-250403-5275-MS

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Beam angle

Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	4658 lm
Lumen Up/Down	12.19% / 87.81%
Peak Intensity	1157 cd
Beam Angle (50%)	130.3°
Beam Angle (90%)	120°
Beam Angle (10%)	140.5°

Cut-off Angle

Average 2.5%	254.5°
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Field Angle

Average 10%	218.9°
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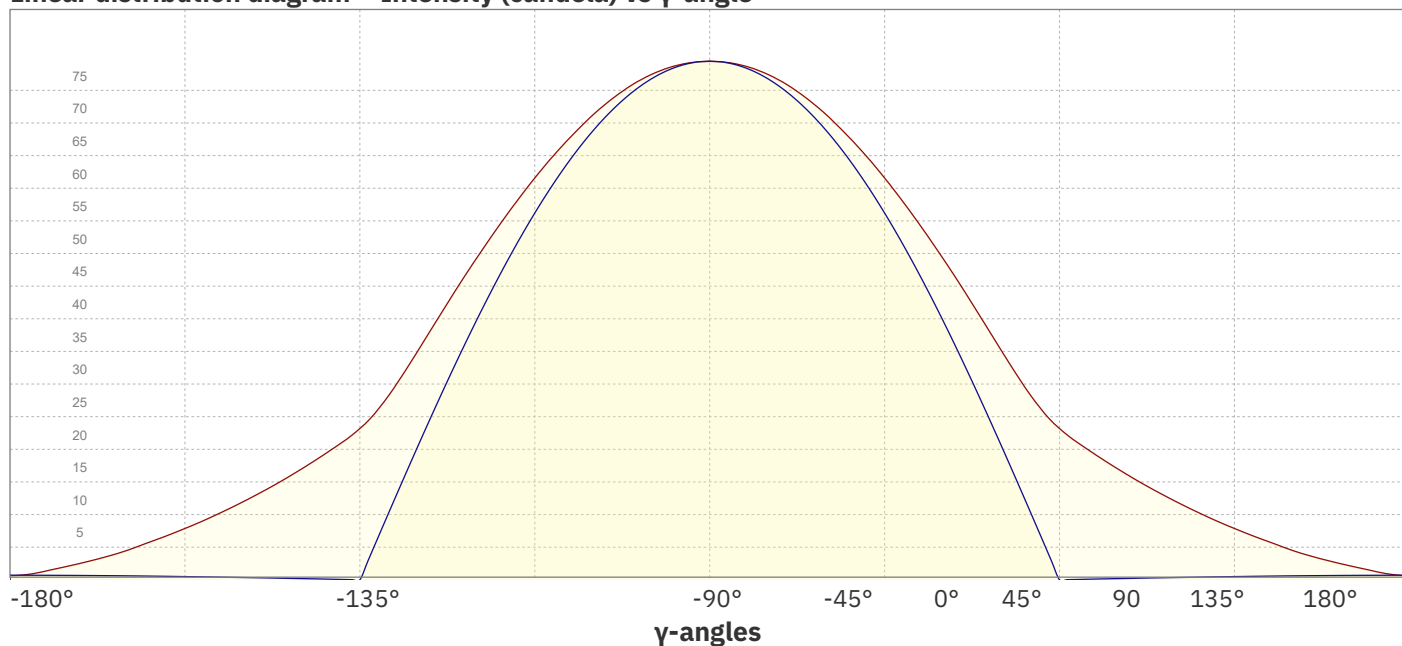
Intensity Ratio

In 120° cone	60.8%
In 90° cone	39.8%

C planes

C000-C180
C090-C270

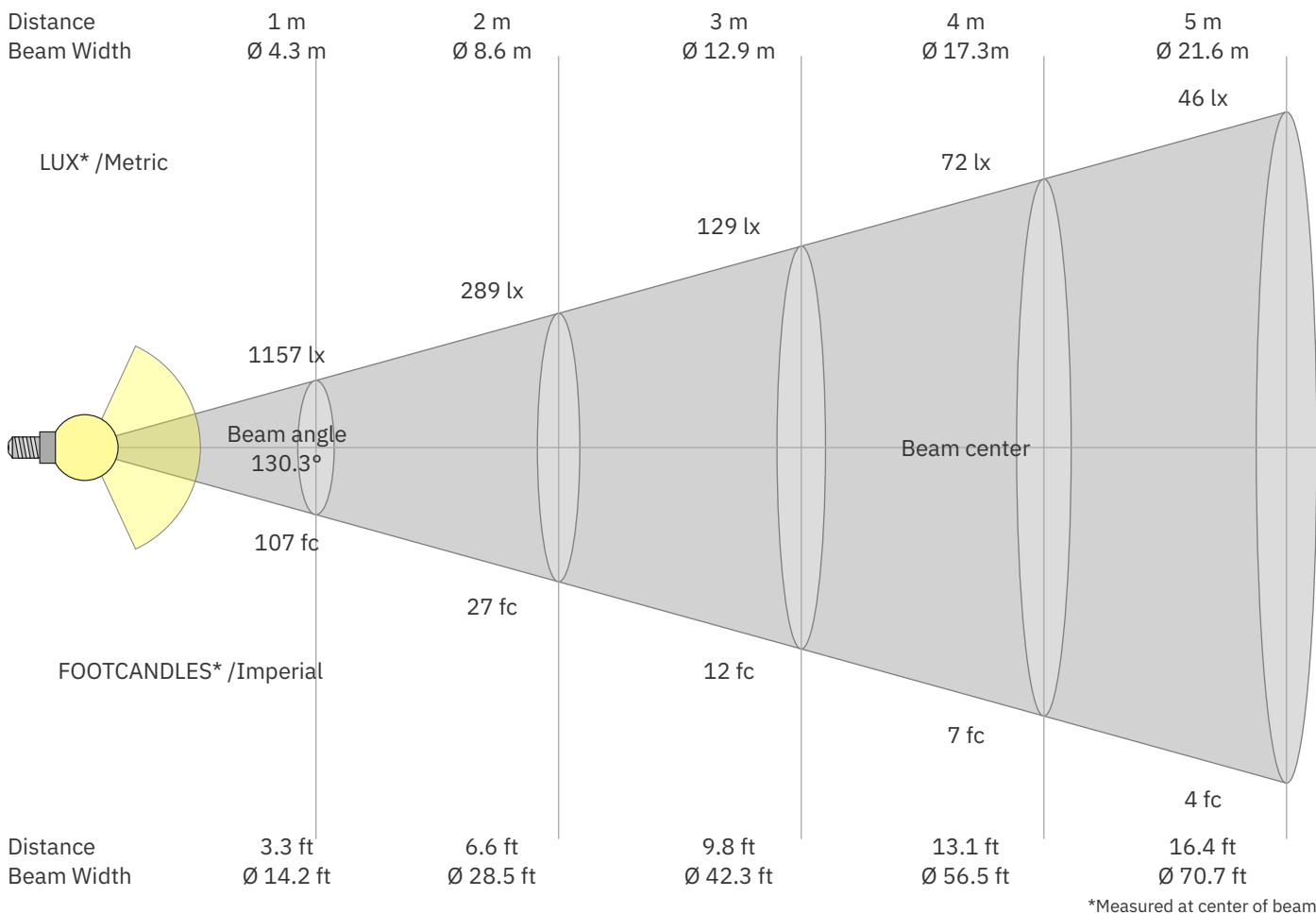
Linear distribution diagram - Intensity (candela) vs γ-angle



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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
1157	289	129	72	46	32	24	18	14	12	10	8	7	6	5	5	4	4	3	3	lux
107.5	26.9	11.9	6.7	4.3	3	2.2	1.7	1.3	1.1	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	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
1157	1146	1114	1059	986	896	793	678	554	432	339	281	232	188	149	115	84	57	37	19	cd
100%	99%	96%	92%	85%	77%	69%	59%	48%	37%	29%	24%	20%	16%	13%	10%	7%	5%	3%	2%	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
1157	1143	1101	1031	936	818	680	525	358	181	0	2	3	5	6	7	8	9	10	10	cd
100%	99%	95%	89%	81%	71%	59%	45%	31%	16%	0%	0%	0%	0%	1%	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
1157	1146	1114	1059	986	896	793	678	554	432	339	281	232	188	149	115	84	57	37	19	cd
100%	99%	96%	92%	85%	77%	69%	59%	48%	37%	29%	24%	20%	16%	13%	10%	7%	5%	3%	2%	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
1157	1143	1101	1031	936	818	680	525	358	181	0	2	3	5	6	7	8	9	10	10	cd
100%	99%	95%	89%	81%	71%	59%	45%	31%	16%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	of 0°val

Light Planning – UGR table

Reflectances	70	70	50	50	30	70	70	50	50	30
ρ Ceiling	50	30	50	30	30	50	30	50	30	30
ρ Walls	20	20	20	20	20	20	20	20	20	20
ρ Floor										
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	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	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	116	116	116	116	112	112	112	112	104	104	104	97	97	97	91	91	91	88
1	104	98	93	88	100	95	90	86	88	84	81	82	79	76	76	74	72	69
2	93	84	77	70	89	81	74	68	76	70	65	70	66	62	66	62	58	55
3	85	73	64	57	81	71	62	56	66	59	53	61	56	51	57	53	48	46
4	77	64	55	48	74	62	53	47	58	51	45	54	48	43	51	45	41	38
5	71	57	48	41	68	55	46	40	52	44	38	48	42	37	45	40	35	33
6	65	51	42	35	62	50	41	34	46	39	33	44	37	32	41	35	31	28
7	60	46	37	31	58	45	36	30	42	35	29	40	33	28	37	31	27	25
8	56	42	33	27	54	41	33	27	38	31	26	36	30	25	34	28	24	22
9	52	38	30	24	50	37	29	24	35	28	23	33	27	22	31	26	22	20
10	49	35	27	22	47	34	27	22	33	26	21	31	25	20	29	24	20	18