



PHOTOMETRIC LIGHT REPORT

AR111 | 12 watt | 2700K | 48° | dimmable

Article number: 175-325



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TRONIX



175-325 AR111 | 12 watt | 2700K | 48° | dimmable

Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 175-325. 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 175-325 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 175-325 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.

175-325 AR111 | 12 watt | 2700K | 48° | dimmable

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°
4.5°
1.14 m
22°C +/- 10% – RH 50% +/- 20%
10.0 W – PF 0.99 – DPF 0.99
50 Hz
Lamp stabilized in 15 min 25 sec --3.0%

Tested light source

Manufacturer and Order Code
Product Description

Tronix Lighting – 175-325
AR111 | 12 watt | 2700K | 48° | dimmable

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

822 lm – 0.15% / 99.85%
82 lm/W
F
1287 cd – 47.1°
CCT = 2696 K
Duv -0.0017
CRI 94.3
R_f 91.0 – R_g 101.6
TLCI = 79
SVM 0.01 – PstLM 0.04

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Electrical measurement details

Input Power

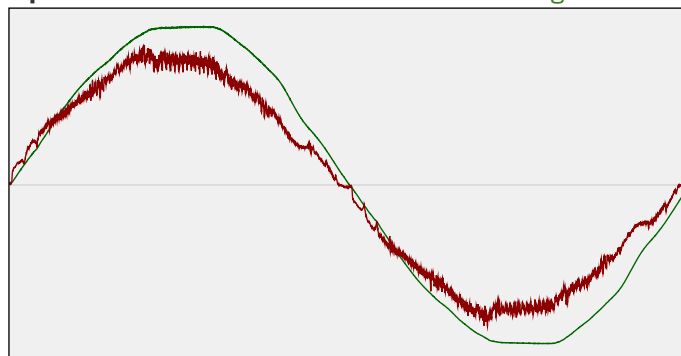
RMS Input voltage feed. V_{RMS} 232 V
 RMS Input current feed. I_{RMS} 0.044 A
 Total input power 10.0 W

Frequency of input power 50 Hz
 Power factor 0.99
 Displacement power factor 0.99

Total harmonic distortion of the current 3.93%
 Total harmonic distortion of the voltage 2.26%

Input Power Curve

Voltage - Current



Efficiency

Radiated power efficiency: 24.0%



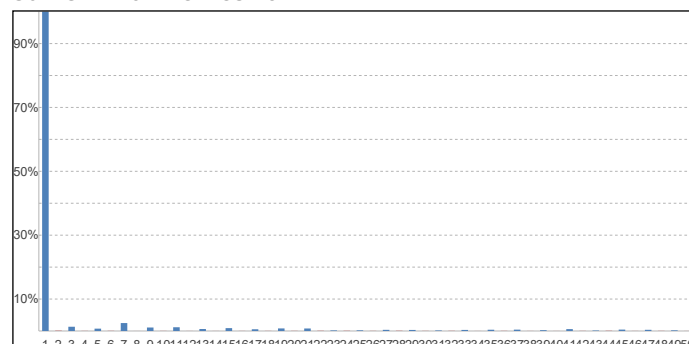
Lumen efficiency: 82 lm/W



Harmonics

3rd Harmonic 1.33%
 5th Harmonic 0.73%
 7th Harmonic 2.48%
 9th Harmonic 1.09%
 11th Harmonic 1.17%

Current Harmonics %



Stabilization Details

Warm-up Conditions

Stable period	15 min	CCT start	2750 K
Stable change max	2.0%	CCT shift	-54 K
Minimum warm-up time	15 min	CCT end	2696 K

Colour temperature change during warm-up

Warm-up Results

Total warmup time	Lamp stabilized in 15 min 25 sec	Output start	843 lm
Warmup variation	-3.0%	Output change	-22 lm
		Output end	822 lm

Output intensity change during warm-up

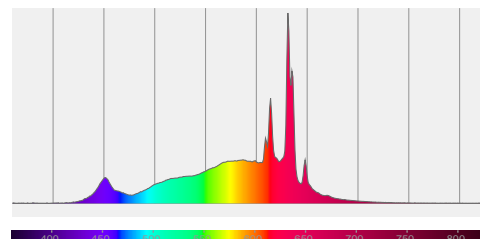
175-325 AR111 | 12 watt | 2700K | 48° | dimmable

Colour measurement details

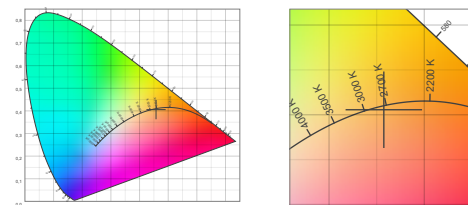
Total lumen output 822 lm
 Correlated Colour Temperature 2696 K
 Colour coordinates CIE 1931 (x;y) = (0.458;0.406)
 Colour deviation from BBL Duv = -0.0017

TM30-18 Colour Fidelity Index R_f 91.0
 TM30-18 Colour Gamut Index R_g 101.6
 Colour Rendering Index (Ra) CRI 94.3
 Colour Rendering Index. (red component) $R_9 = 65.3$

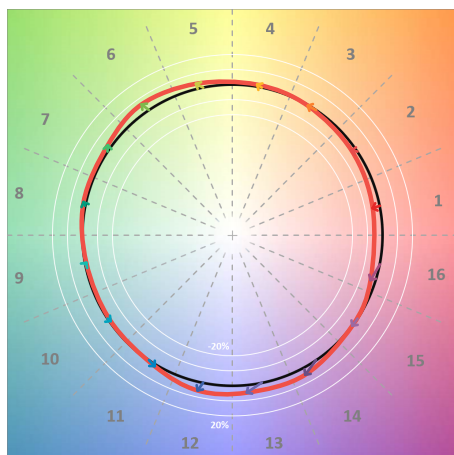
Colour Quality Scale CQS = 90.3
 Television Lighting Consistency Index TLCI = 79



Relative spectral power distribution



TM30 details

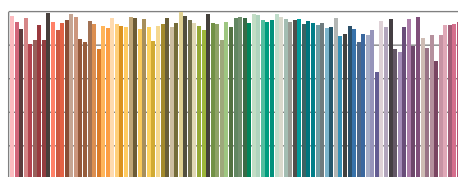


TM30 Colour vectors per hue bin

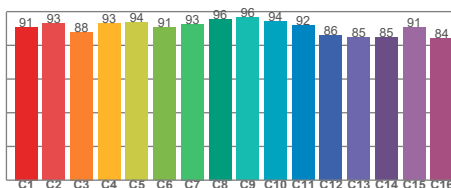


TM30 Colour distortion

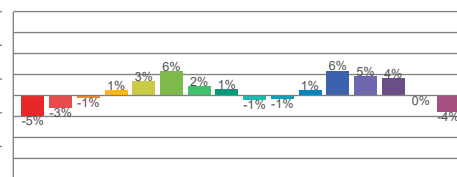
Hue Bin	R_f	Shifts (%)	
		Chroma	Hue
C1	91	-5%	-1%
C2	93	-3%	3%
C3	88	-1%	6%
C4	93	1%	3%
C5	94	3%	4%
C6	91	6%	2%
C7	93	2%	-4%
C8	96	1%	-2%
C9	96	-1%	-1%
C10	94	-1%	3%
C11	92	1%	5%
C12	86	6%	-3%
C13	85	5%	-11%
C14	85	4%	-11%
C15	91	0%	-6%
C16	84	-4%	-11%



TM30-18 R_f -values per reference colour

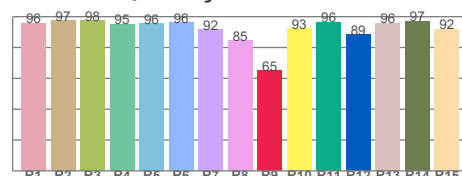


TM30-18 R_f -values per hue bin

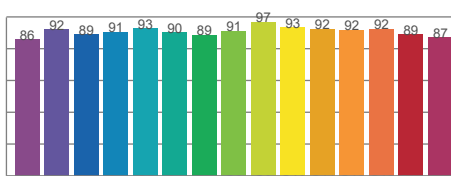


TM30 Chroma shift

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)

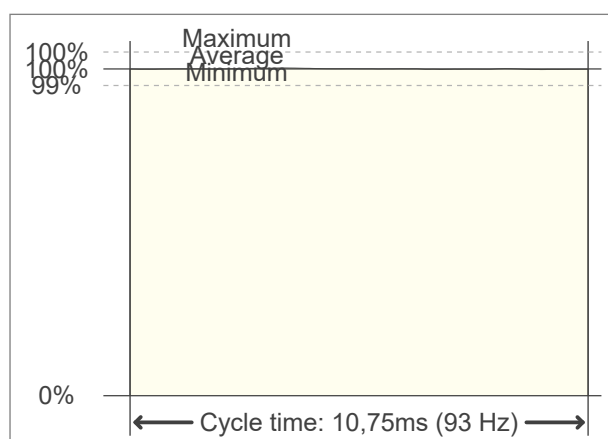
Flicker frequency	93.02 Hz
Percent flicker	0.39 %
Flicker index	0

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

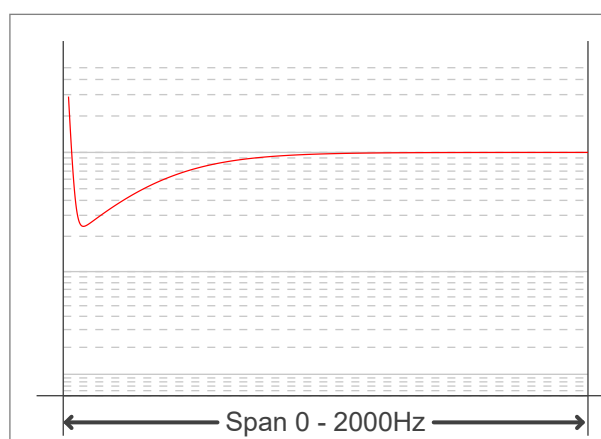
An LED luminaire is considered flicker-free if the SVM value is ≤ 0.4 and if the PstLM value is ≤ 1.0

PstLM value ($F < 80$ Hz)	0.04
SVM value ($80 < F < 2000$ Hz)	0.01

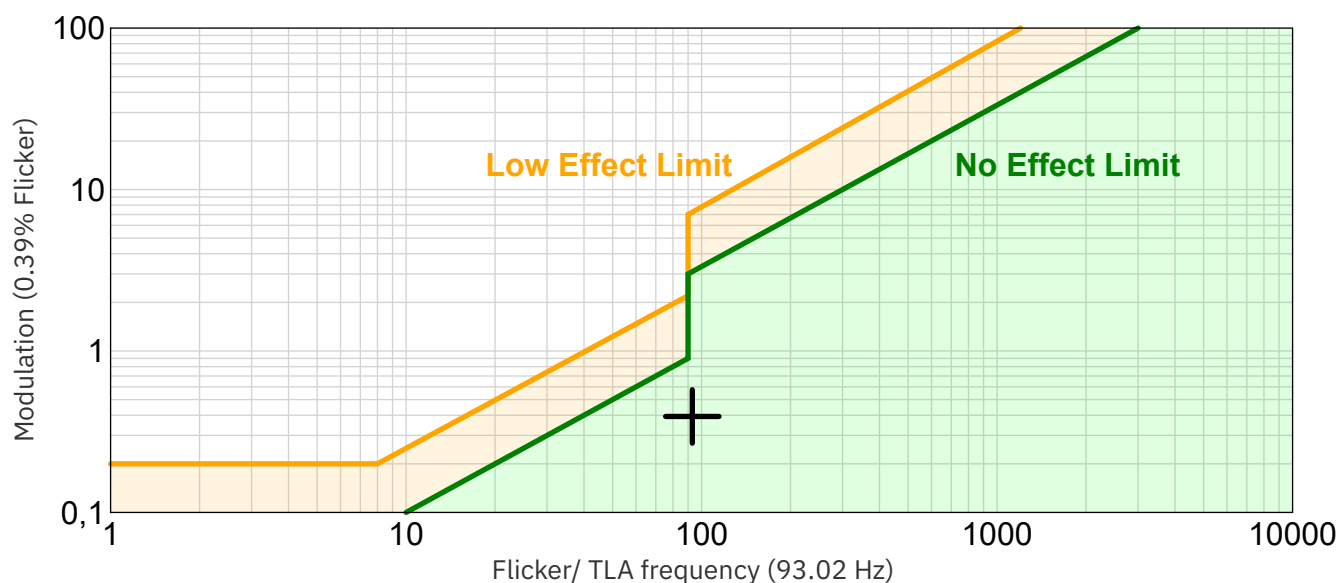
Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



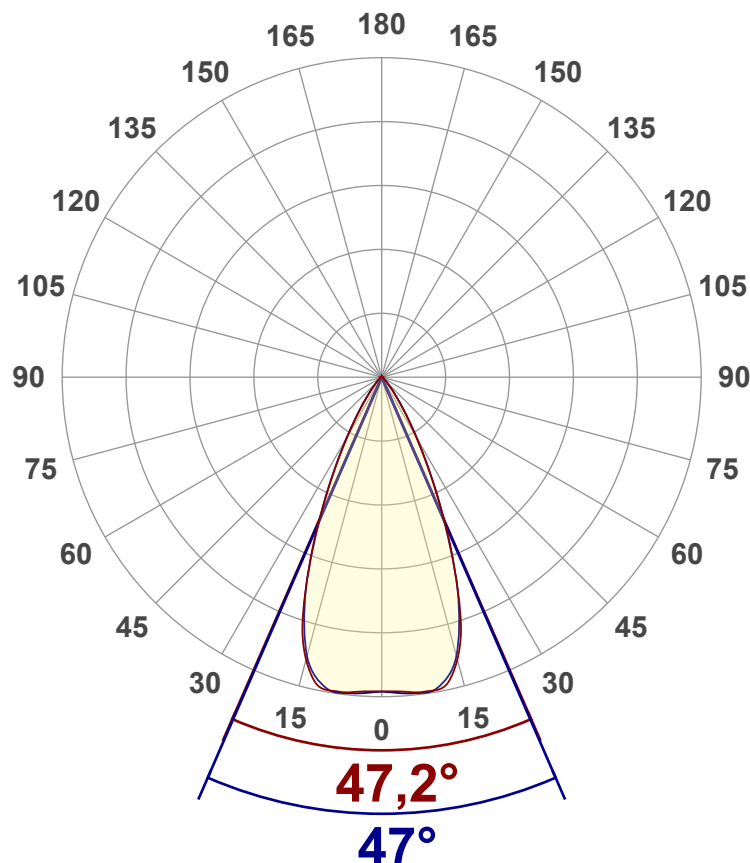
Document revision date: 17-7-2025 Measurement serial: VFR-250710-10423-SW

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Beam angle

Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	822 lm
Lumen Up/Down	0.15% / 99.85%
Peak Intensity	1287 cd
Beam Angle (50%)	47.1°
Beam Angle (90%)	47°
Beam Angle (10%)	47.2°

Cut-off Angle

Average 2.5%	89.9°
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Field Angle

Average 10%	71.1°
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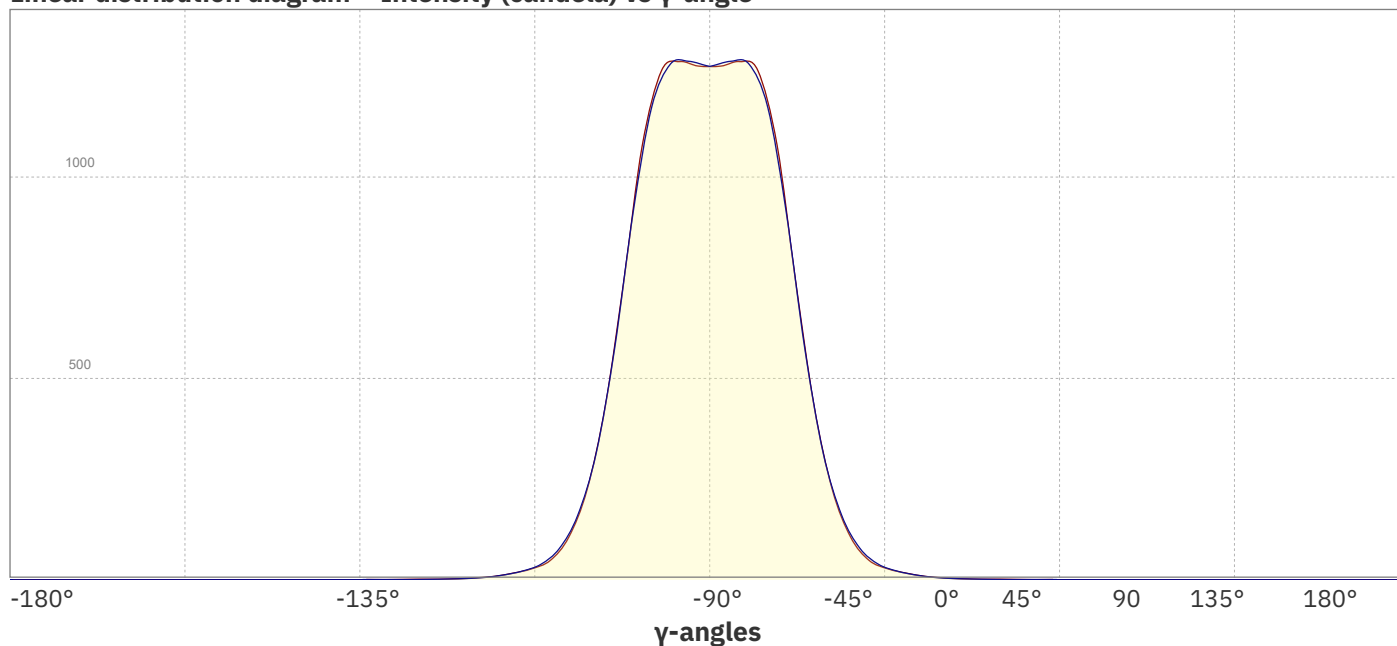
Intensity Ratio

In 120° cone	99.3%
In 90° cone	97.1%

C planes

C000-C180
C090-C270

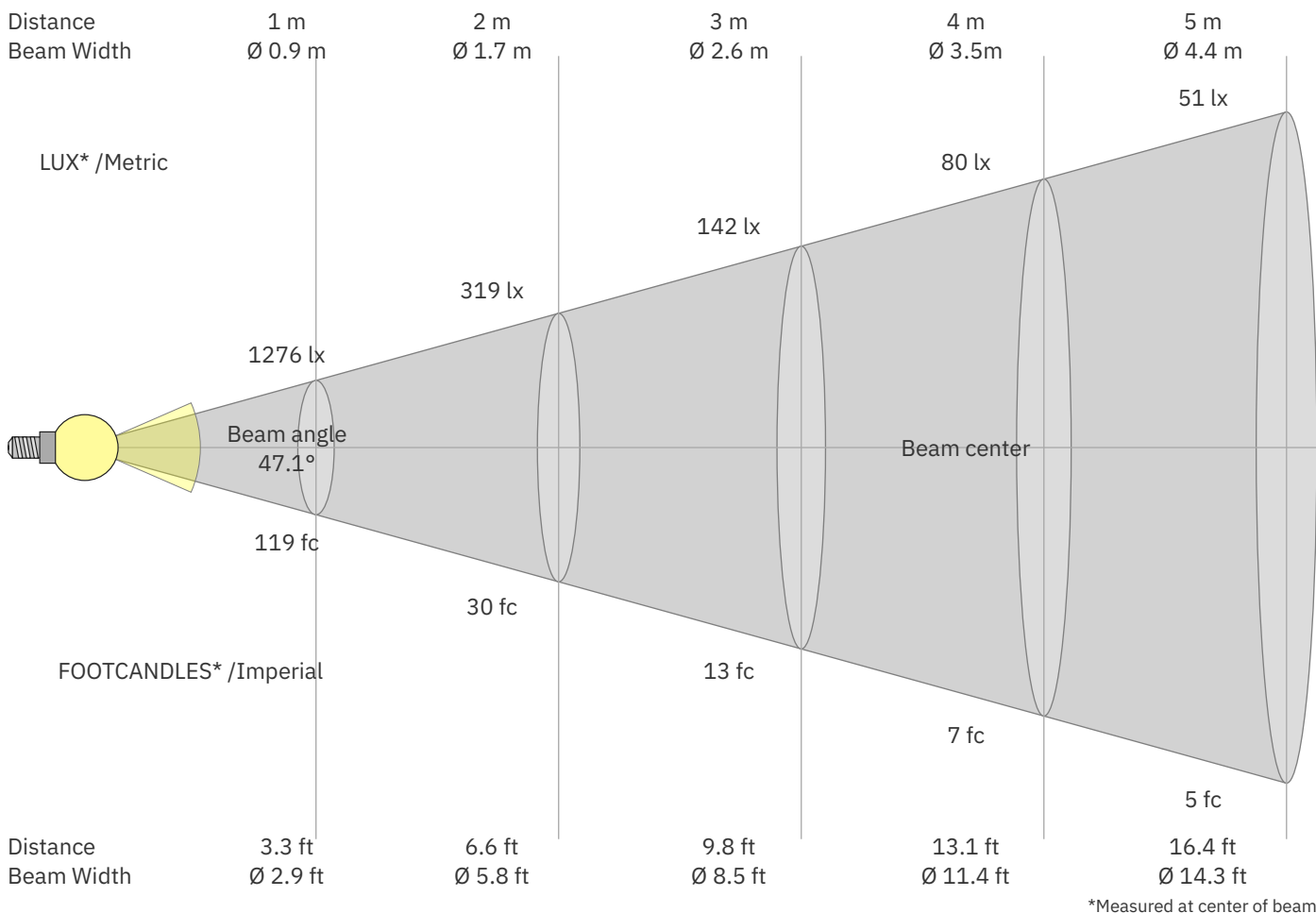
Linear distribution diagram - Intensity (candela) vs γ-angle



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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
1276	319	142	80	51	35	26	20	16	13	11	9	8	7	6	5	4	4	4	3	lux
118.5	29.6	13.2	7.4	4.7	3.3	2.4	1.9	1.5	1.2	1	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.3	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
1276	1275	1278	1283	1285	1276	1266	1204	1129	1032	890	749	618	487	381	292	212	162	112	85	cd
100%	100%	100%	101%	101%	100%	99%	94%	88%	81%	70%	59%	48%	38%	30%	23%	17%	13%	9%	7%	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
1276	1279	1284	1286	1283	1281	1238	1194	1114	1005	890	748	606	490	380	289	223	159	124	89	cd
100%	100%	101%	101%	101%	100%	97%	94%	87%	79%	70%	59%	48%	38%	30%	23%	18%	12%	10%	7%	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
1276	1275	1278	1283	1285	1276	1266	1204	1129	1032	890	749	618	487	381	292	212	162	112	85	cd
100%	100%	100%	101%	101%	100%	99%	94%	88%	81%	70%	59%	48%	38%	30%	23%	17%	13%	9%	7%	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
1276	1279	1284	1286	1283	1281	1238	1194	1114	1005	890	748	606	490	380	289	223	159	124	89	cd
100%	100%	101%	101%	101%	100%	97%	94%	87%	79%	70%	59%	48%	38%	30%	23%	18%	12%	10%	7%	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	13.3	13.9	13.4	14.1	14.3	13.6	14.2	13.7	14.4	14.6
	3H	13.0	13.8	13.4	14.0	14.1	13.3	14.0	13.7	14.2	14.4
	4H	13.0	13.7	13.4	13.9	14.1	13.2	13.9	13.6	14.2	14.4
	6H	13.0	13.6	13.3	13.9	14.2	13.2	13.8	13.5	14.1	14.5
	8H	13.0	13.5	13.3	13.9	14.2	13.2	13.8	13.5	14.1	14.5
	12H	12.9	13.5	13.3	13.8	14.3	13.1	13.7	13.5	14.1	14.5
4H	2H	12.9	13.7	13.3	13.9	14.1	13.2	13.9	13.6	14.2	14.4
	3H	12.9	13.5	13.2	13.8	14.2	13.1	13.7	13.5	14.1	14.5
	4H	12.8	13.3	13.2	13.7	14.3	13.0	13.6	13.4	14.0	14.5
	6H	12.7	13.3	13.2	13.7	14.0	12.9	13.5	13.4	13.9	14.2
	8H	12.7	13.3	13.2	13.6	14.0	12.9	13.5	13.4	13.8	14.2
	12H	12.7	13.1	13.2	13.5	14.0	12.9	13.3	13.4	13.7	14.2
8H	4H	12.6	13.2	13.2	13.5	13.9	12.9	13.4	13.4	13.8	14.1
	6H	12.6	13.0	13.1	13.5	14.0	12.9	13.2	13.4	13.7	14.2
	8H	12.7	13.0	13.2	13.5	14.1	12.9	13.2	13.4	13.7	14.3
	12H	12.7	13.0	13.2	13.5	14.1	12.8	13.1	13.4	13.6	14.2
12H	4H	12.6	13.0	13.1	13.4	13.9	12.8	13.3	13.3	13.7	14.1
	6H	12.6	13.0	13.2	13.5	14.1	12.8	13.2	13.4	13.7	14.3
	8H	12.6	12.9	13.2	13.4	14.0	12.8	13.1	13.4	13.6	14.2
Variations with the observer position for the luminaire spacings. S:											
S = 1.0H		4.8 / -5.5					4.9 / -6.3				
S = 1.5H		7.4 / -7.1					7.5 / -8.1				
S = 2.0H		9.3 / -7.9					9.5 / -9.0				

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	114	111	109	107	112	109	107	105	105	104	102	101	100	99	98	97	96	94
2	109	105	101	98	107	103	100	97	100	97	95	97	94	93	94	92	91	89
3	104	98	94	90	102	97	93	90	94	91	88	92	89	87	90	87	85	84
4	100	93	88	84	98	92	87	84	90	86	83	88	84	82	86	83	81	79
5	95	88	83	79	94	87	82	78	85	81	78	84	80	77	82	79	76	75
6	91	83	78	74	90	83	78	74	81	77	73	80	76	73	79	75	72	71
7	88	79	74	70	86	79	74	70	77	73	70	76	72	69	75	72	69	68
8	84	75	70	66	83	75	70	66	74	69	66	73	69	66	72	68	65	64
9	81	72	67	63	80	72	66	63	71	66	63	70	66	63	69	65	62	61
10	77	69	64	60	76	68	63	60	68	63	60	67	63	60	66	62	60	58