



PHOTOMETRIC LIGHT REPORT

Article number: 950-086 master

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Lighting



TRONIX



950-086 master

Introduction

Purpose of this Document

This document provides accurate and objective photometric data for Tronix Lighting item 950-086 master. 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 950-086 master 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 950-086 master 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.

950-086 master

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°
1°
1.81 m
22°C +/- 10% – RH 50% +/- 20%
19.5 W – PF 0.94 – DPF 0.94
50 Hz
Not completed – +1.6%

Tested light source

Manufacturer and Order Code
Product Description

Tronix Lighting – 950-086 master

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

2616 lm – 0.01% / 99.99%
134 lm/W
E
755 cd – 129.2°
CCT = 4319 K
Duv -0.0036
CRI 86.1
R_f 83.9 – R_g 97.2
TLCI = 75
SVM n/a – PstLM n/a

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Electrical measurement details

Input Power

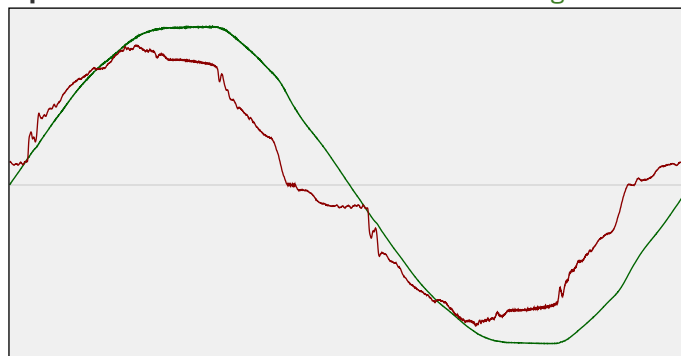
RMS Input voltage feed. V_{RMS} 229 V
 RMS Input current feed. I_{RMS} 0.091 A
 Total input power 19.5 W

Frequency of input power 50 Hz
 Power factor 0.94
 Displacement power factor 0.94

Total harmonic distortion of the current 13.56%
 Total harmonic distortion of the voltage 2.61%

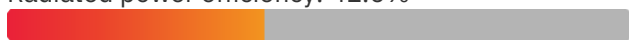
Input Power Curve

Voltage - Current



Efficiency

Radiated power efficiency: 41.6%



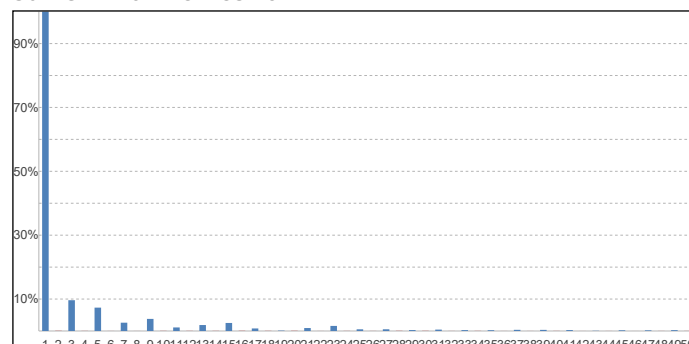
Lumen efficiency: 134 lm/W



Harmonics

3rd Harmonic 9.64%
 5th Harmonic 7.31%
 7th Harmonic 2.6%
 9th Harmonic 3.79%
 11th Harmonic 1.11%

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

15 min CCT start 4321 K
 2.0% CCT shift -2 K
 15 min CCT end 4319 K

Warm-up Results

Total warmup time
 Warmup variation

Not completed
 +1.6%

Output intensity change during warm-up

Output start 2573 lm
 Output change +43 lm
 Output end 2616 lm

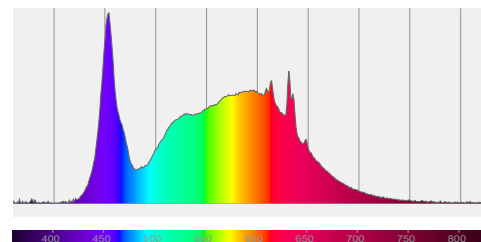
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Colour measurement details

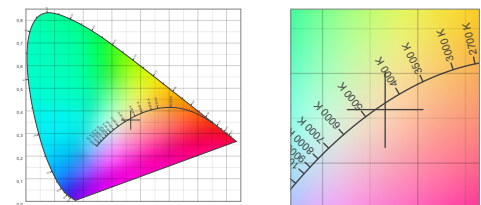
Total lumen output 2616 lm
 Correlated Colour Temperature 4319 K
 Colour coordinates CIE 1931 (x;y) = (0.366;0.360)
 Colour deviation from BBL Duv = -0.0036

TM30-18 Colour Fidelity Index R_f 83.9
 TM30-18 Colour Gamut Index R_g 97.2
 Colour Rendering Index (Ra) CRI 86.1
 Colour Rendering Index. (red component) $R_9 = 27.8$

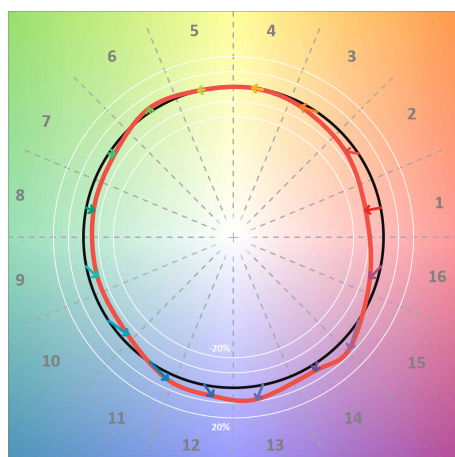
Colour Quality Scale CQS = 82.8
 Television Lighting Consistency Index TLCI = 75



Relative spectral power distribution



TM30 details

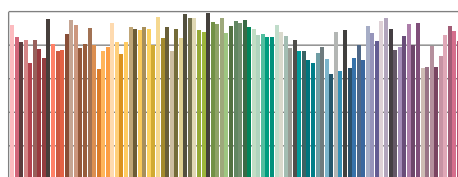


TM30 Colour vectors per hue bin

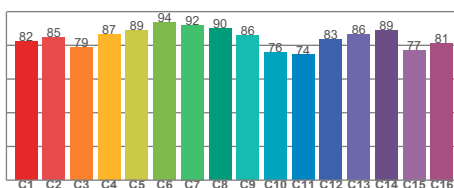


TM30 Colour distortion

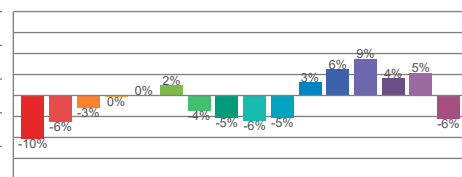
Hue Bin	R_f	Shifts (%)	
		Chroma	Hue
C1	82	-10%	0%
C2	85	-6%	6%
C3	79	-3%	11%
C4	87	0%	7%
C5	89	0%	4%
C6	94	2%	-1%
C7	92	-4%	-2%
C8	90	-5%	1%
C9	86	-6%	8%
C10	76	-5%	15%
C11	74	3%	16%
C12	83	6%	7%
C13	86	9%	-6%
C14	89	4%	-4%
C15	77	5%	-19%
C16	81	-6%	-9%



TM30-18 R_f -values per reference colour

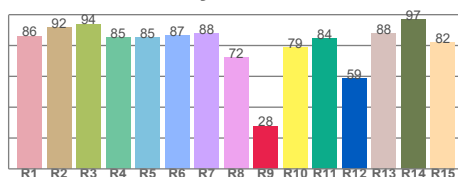


TM30-18 R_f -values per hue bin

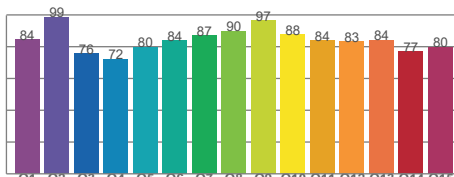


TM30 Chroma shift

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	n/a 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)

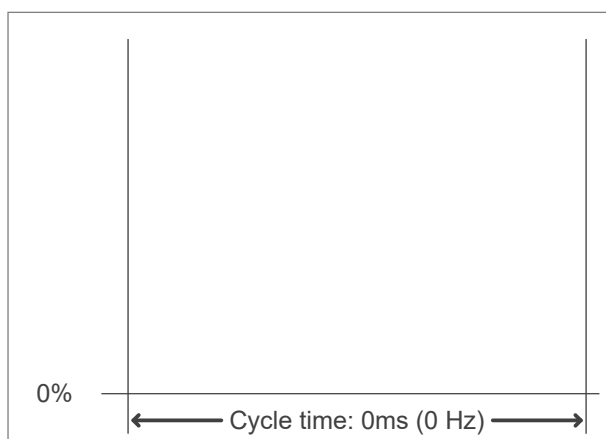
Flicker frequency	n/a Hz
Percent flicker	n/a %
Flicker index	n/a

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)	n/a
SVM value ($80 < F < 2000$ Hz)	n/a

Flicker frame (one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789-2015 Lighting Flicker Risk Zones



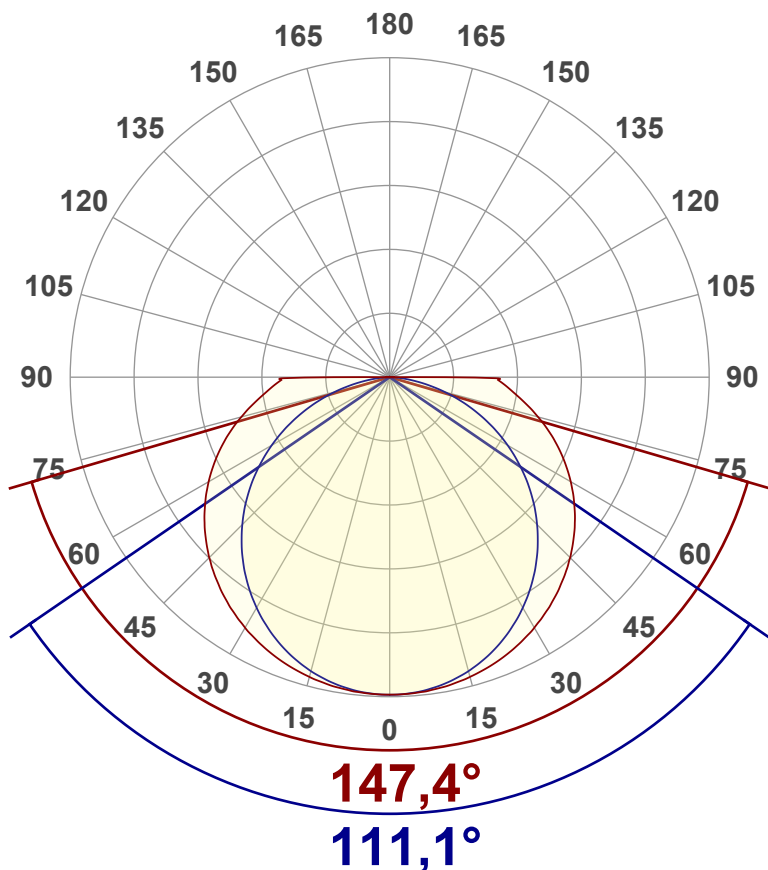
Document revision date: 1-7-2025 Measurement serial: VFR-250128-1535-MS

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Beam angle

Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2616 lm
Lumen Up/Down	0.01% / 99.99%
Peak Intensity	755 cd
Beam Angle (50%)	129.2°
Beam Angle (90%)	111.1°
Beam Angle (10%)	147.4°

Cut-off Angle

Average 2.5%	176.4°
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Field Angle

Average 10%	170.1°
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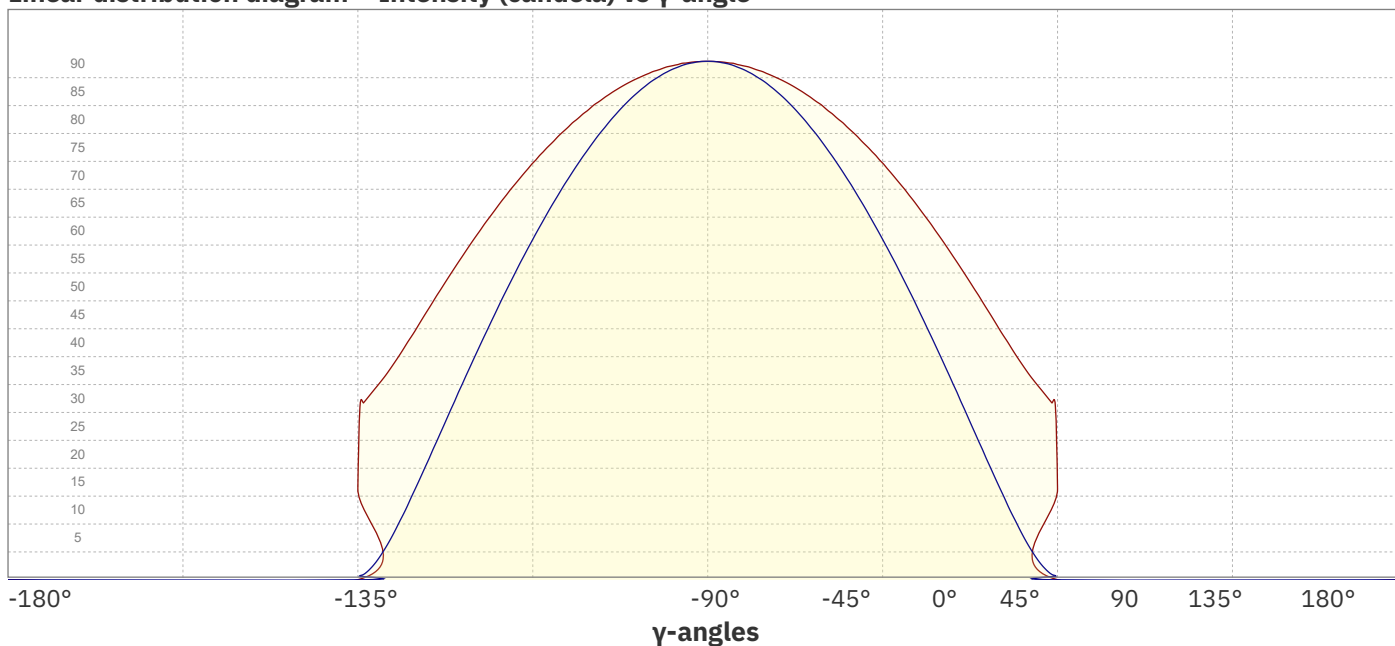
Intensity Ratio

In 120° cone	69.8%
In 90° cone	45.9%

C planes

C000-C180
C090-C270

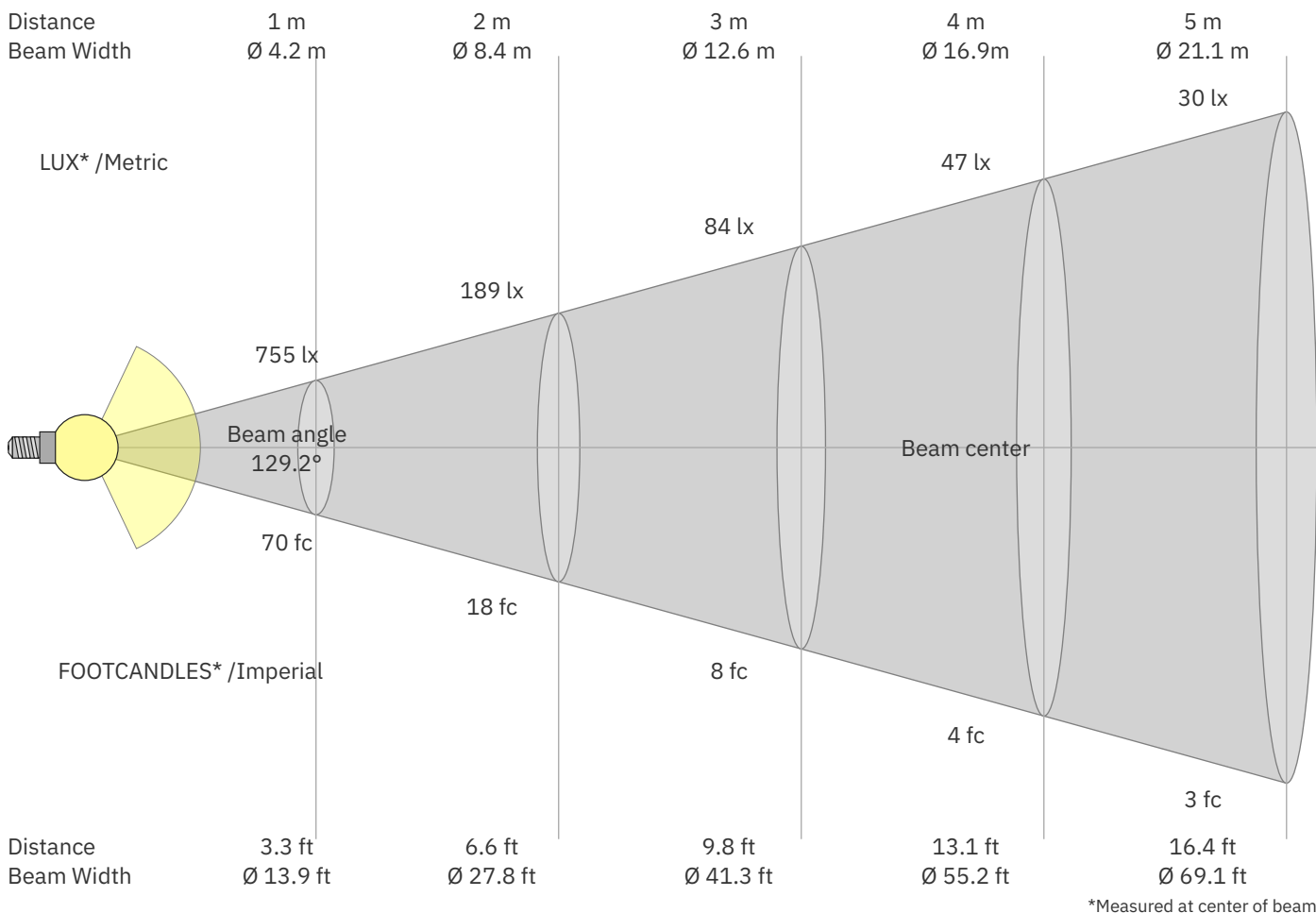
Linear distribution diagram - Intensity (candela) vs γ-angle



Document revision date: 1-7-2025 Measurement serial: VFR-250128-1535-MS

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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
755	189	84	47	30	21	15	12	9	8	6	5	4	4	3	3	3	2	2	2	lux
70.1	17.5	7.8	4.4	2.8	1.9	1.4	1.1	0.9	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	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
755	753	748	738	725	708	688	664	637	607	573	536	497	455	411	365	321	282	124	0	cd
100%	100%	99%	98%	96%	94%	91%	88%	84%	80%	76%	71%	66%	60%	54%	48%	43%	37%	16%	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
755	752	741	724	699	669	633	592	546	496	442	384	324	261	198	135	76	28	1	0	cd
100%	100%	98%	96%	93%	89%	84%	78%	72%	66%	58%	51%	43%	35%	26%	18%	10%	4%	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
755	753	748	738	725	708	688	664	637	607	573	536	497	455	411	365	321	282	124	0	cd
100%	100%	99%	98%	96%	94%	91%	88%	84%	80%	76%	71%	66%	60%	54%	48%	43%	37%	16%	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
755	752	741	724	699	669	633	592	546	496	442	384	324	261	198	135	76	28	1	0	cd
100%	100%	98%	96%	93%	89%	84%	78%	72%	66%	58%	51%	43%	35%	26%	18%	10%	4%	0%	0%	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	
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	119	119	119	119	116	116	116	116	111	111	106	106	106	102	102	102	100	100
1	106	100	95	90	103	98	93	89	94	90	86	90	86	83	86	83	81	78
2	96	86	78	72	93	84	77	71	80	74	69	77	72	67	74	70	66	63
3	87	75	66	58	84	73	65	58	70	63	57	67	61	56	65	59	55	52
4	79	66	56	49	76	64	55	48	62	54	48	59	53	47	57	51	46	44
5	72	58	49	42	70	57	48	41	55	47	41	53	46	40	51	45	40	38
6	67	52	43	36	65	51	42	36	50	42	36	48	41	35	46	40	35	33
7	62	47	38	32	60	47	38	32	45	37	31	43	36	31	42	36	31	29
8	57	43	34	28	56	42	34	28	41	33	28	40	33	28	39	32	27	25
9	54	40	31	25	52	39	31	25	38	30	25	37	30	25	36	29	25	23
10	50	36	28	23	49	36	28	23	35	28	23	34	27	22	33	27	22	20