

Tested Light Source - 1_PHOT_NINETY-NINE-1750lmChip-3000K-WallWash-HoneycombLouvre_2309

Laboratory and Equipment

Laboratory Owner and Location

Goniospectrometer System and Type

Spectrometer Manufacturer and Model

Factorylux, Greenhill Mills, Hebden Bridge, HX7 5QF, UK

BaseSpion – Type C, horizontal

Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

Number of C-planes and Resolution

γ (gamma)-Resolution

Test Distance

Input Power, Power and Displ. Factors

Input RMS Voltage and Current

Frequency of Input Power

24 planes – 15°

1.5°

1.50 m

13.4 W – PF 0.98 – DPF 0.99

240 V – 0.057 A

50.1 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

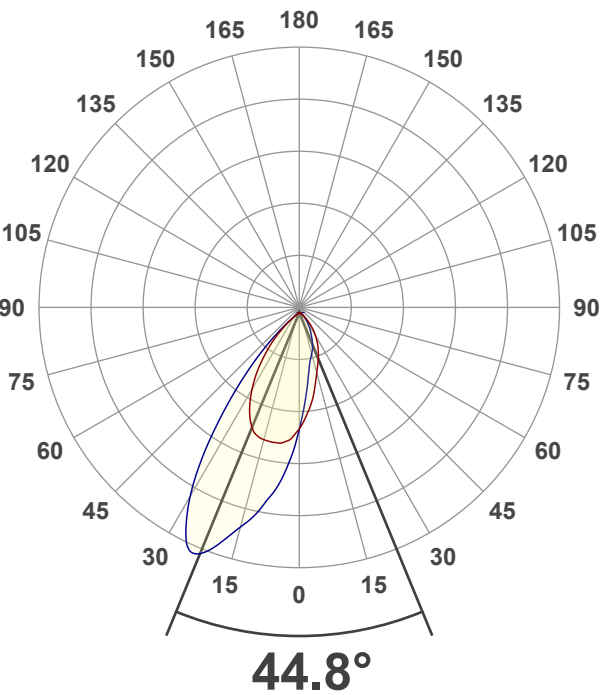
461 lm

34 lm/W

748 cd – 44.8°

CRI 92.4

Light Intensity Distribution



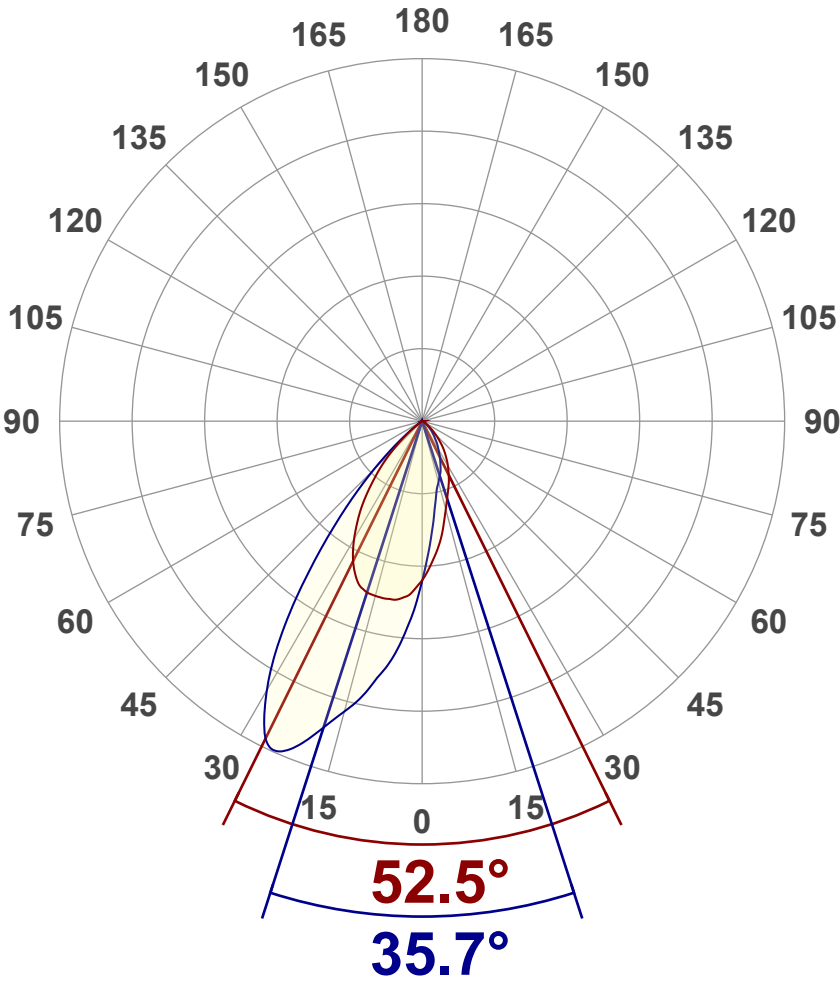
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	461 lm
Peak Intensity	748 cd
Beam Angle (50%)	44.8°
Beam Angle (90%)	35.7°
Beam Angle (10%)	57.8°

Cut-off Angle

Average 2,5%	107.1°
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Field Angle

Average 10%	86.7°
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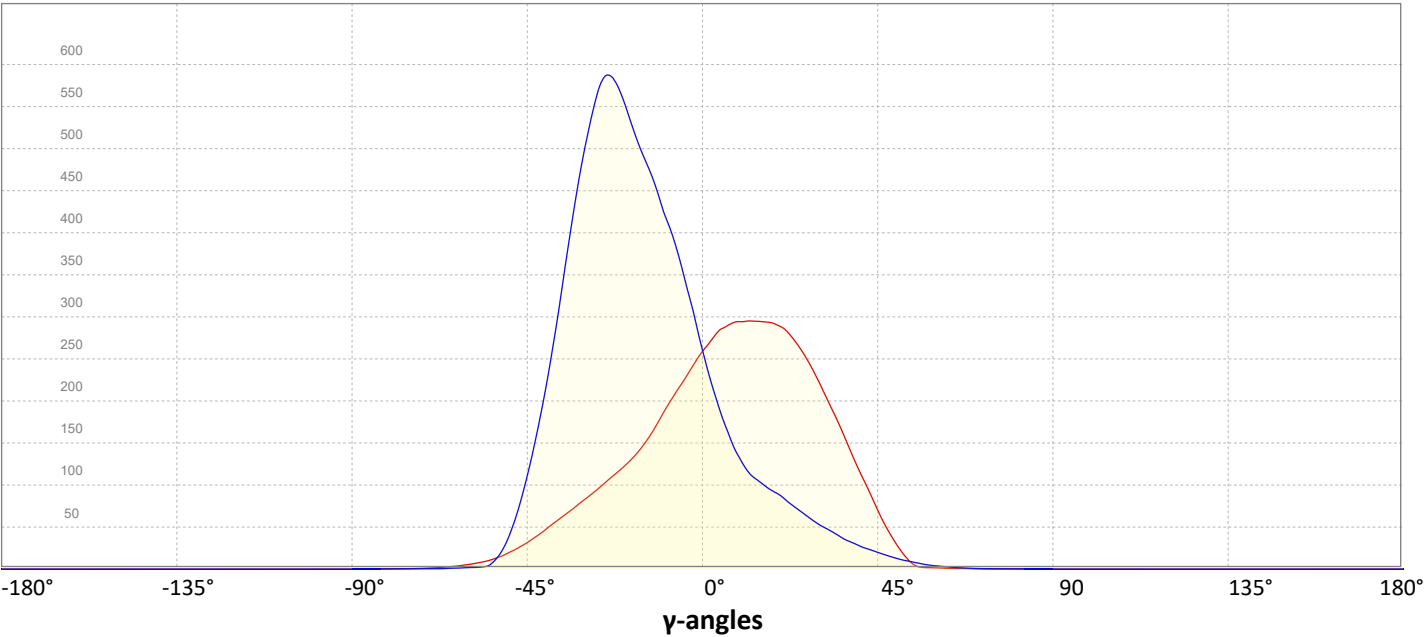
Intensity Ratio

In 120° cone	99.3%
In 90° cone	92.8%

C000-C180

C090-C270

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

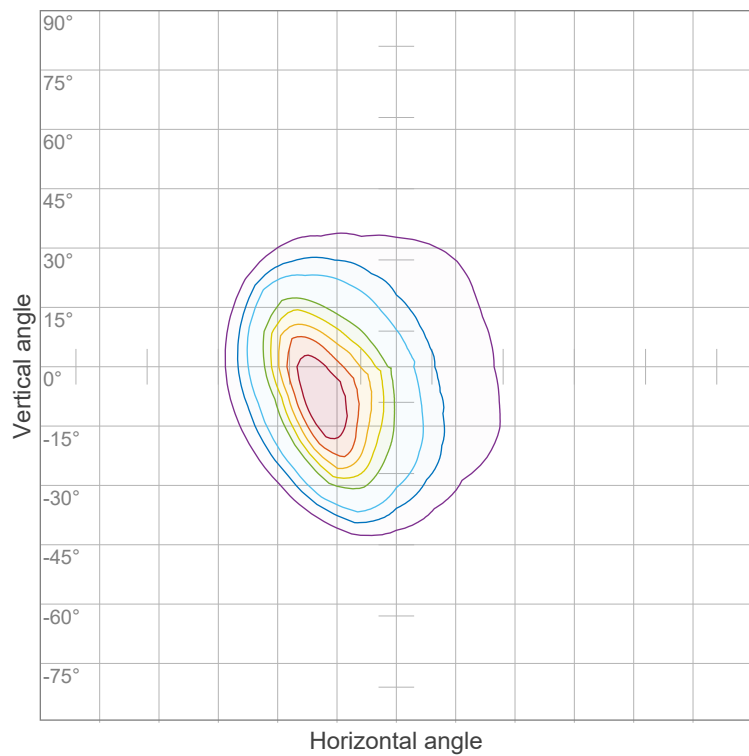


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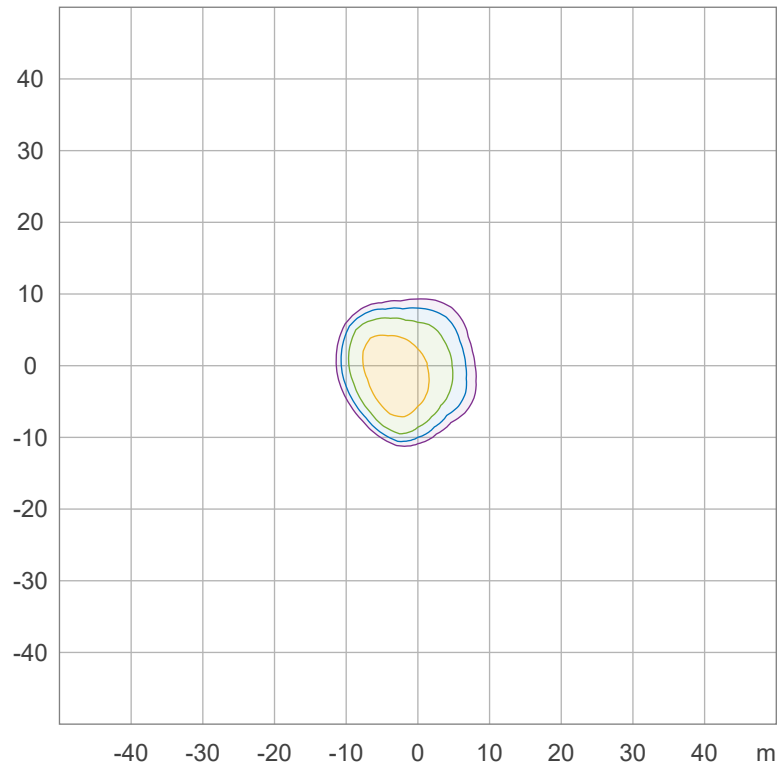
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)

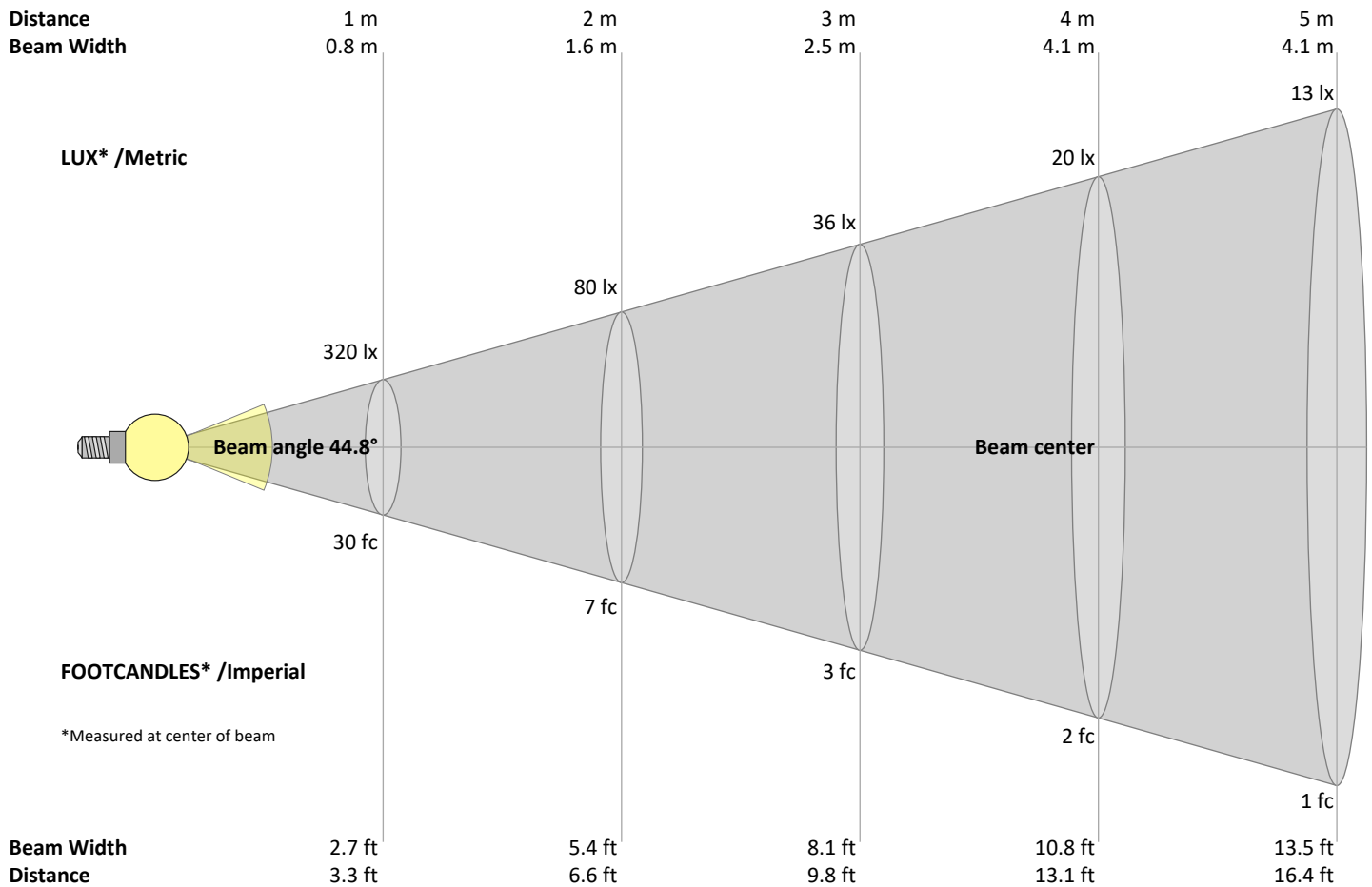


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Beam Details



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
320	80	36	20	13	9	7	5	4	3	3	2	2	2	1	1	1	1	1	1	lux
29.7	7.4	3.3	1.9	1.2	0.8	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	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
320	300	282	264	247	228	208	190	174	161	150	140	131	121	111	102	94	85	76	68	cd
100%	94%	88%	83%	77%	71%	65%	59%	55%	50%	47%	44%	41%	38%	35%	32%	29%	26%	24%	21%	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
320	276	239	207	178	157	140	130	121	114	107	98	89	81	72	65	58	52	45	40	cd
100%	86%	75%	65%	56%	49%	44%	41%	38%	36%	34%	31%	28%	25%	23%	20%	18%	16%	14%	12%	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
320	331	345	353	358	360	361	361	360	358	353	344	330	313	293	271	247	224	199	172	cd
100%	104%	108%	110%	112%	113%	113%	113%	112%	112%	110%	107%	103%	98%	92%	85%	77%	70%	62%	54%	of 0°val

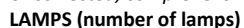
Intensities in 270° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
320	365	409	453	490	520	556	585	612	644	677	705	717	707	670	618	558	487	412	338	cd
100%	114%	128%	142%	153%	163%	174%	183%	191%	201%	212%	220%	224%	221%	209%	193%	174%	152%	129%	106%	of 0°val

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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	113	110	107	105	110	108	105	103	104	102	100	100	98	97	96	95	94	92
2	107	101	97	93	104	99	95	92	96	93	90	93	90	88	90	88	86	84
3	100	93	88	83	98	92	87	83	89	85	81	87	83	80	84	81	79	77
4	94	86	80	75	93	85	79	75	83	78	74	81	76	73	79	75	72	71
5	89	80	73	68	87	79	73	68	77	71	67	75	70	67	73	69	66	65
6	84	74	67	62	82	73	67	62	71	66	62	70	65	61	69	64	61	59
7	79	69	62	57	77	68	62	57	66	61	57	65	60	56	64	60	56	54
8	74	64	57	53	73	63	57	52	62	56	52	61	56	52	60	55	52	50
9	70	60	53	49	69	59	53	48	58	52	48	57	52	48	56	51	48	46
10	66	56	49	45	65	55	49	45	54	49	45	54	48	45	53	48	45	43

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Zonal Lumen Summary

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	31 lm	6.6%
10-20°	91 lm	19.7%
20-30°	141 lm	30.6%
30-40°	127 lm	27.6%
40-50°	59 lm	12.7%
50-60°	10 lm	2.1%
60-70°	2 lm	0.5%
70-80°	1 lm	0.1%
80-90°	0 lm	0.1%
90-100°	0 lm	0.0%
100-110°	0 lm	0.0%
110-120°	0 lm	0.0%
120-130°	0 lm	0.0%
130-140°	0 lm	0.0%
140-150°	0 lm	0.0%
150-160°	0 lm	0.0%
160-170°	0 lm	0.0%
170-180°	0 lm	0.0%
Total	461 lm	100.0%

Intensity peaks

Max intensity	748 cd
Intensity, 90°	0 cd
Intensity, 0°	320 cd

Zonal Lumen summary

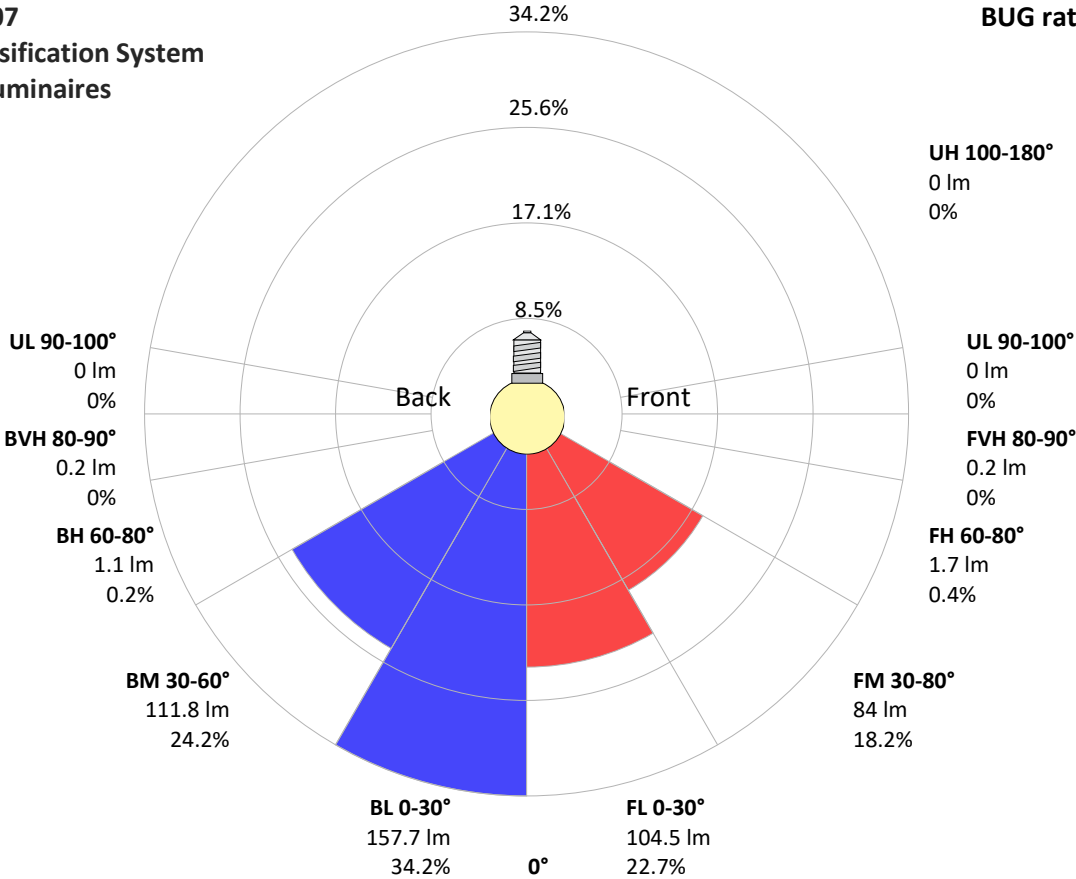
Zone (γ)	Lumen	% Total
0-30°	262 lm	56.9%
0-40°	389 lm	84.5%
0-60°	458 lm	99.3%
60-90°	3 lm	0.7%
70-100°	1 lm	0.2%
90-120°	0 lm	0.0%
0-90°	461 lm	100.0%
90-180°	0 lm	0.0%
0-180°	461 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	104 lm	22.7%
Medium(30-60°)	84 lm	18.2%
High(60-80°)	2 lm	0.4%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	158 lm	34.2%
Medium(30-60°)	112 lm	24.2%
High(60-80°)	1 lm	0.2%
Very high(80-90°)	0 lm	0.0%
Uplight		
Low(90-100°)	0 lm	0.0%
High(100-180°)	0 lm	0.0%

IESNA TM-15-07
Luminaire Classification System
For Outdoor Luminaires

BUG rating B1 U1 G0



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Power Details

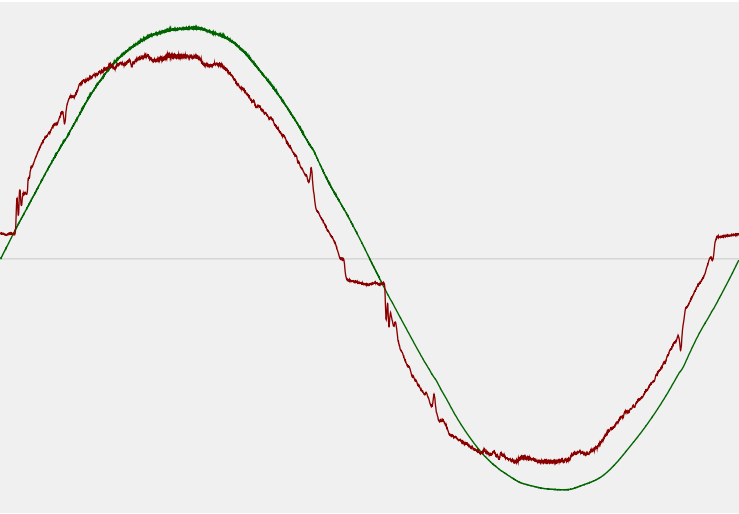
Input Power

Power feed to light source	13.4 W
Frequency of input power	50.1 Hz
RMS Input voltage feed, V_{RMS}	240 V
RMS Input current feed, I_{RMS}	0.057 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	13.64 VA
Displacement factor of AC power feed	0.99
Power factor of AC current feed	0.98
Total harmonic distortion of the current	6.63%
Total harmonic distortion of the voltage	1.12%

Efficiency

Radiated power efficiency	12.6%
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Lumen efficiency	34 lm/W
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Input Power Curve



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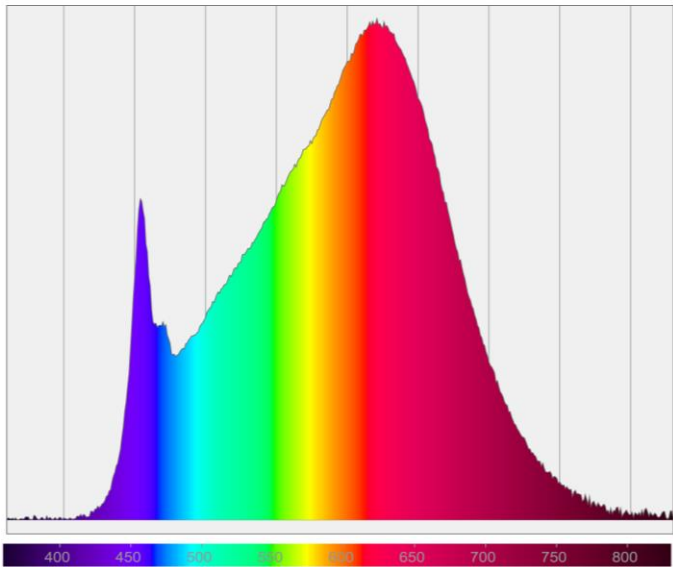
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Color Measurements

Correlated Color Temperature	CCT = 3000 K
Color Rendering TM30-18	R _f 91.0 – R _g 97.7
Color Shift, CIE duv	Duv ±0.0003

Spectral distribution



Color details

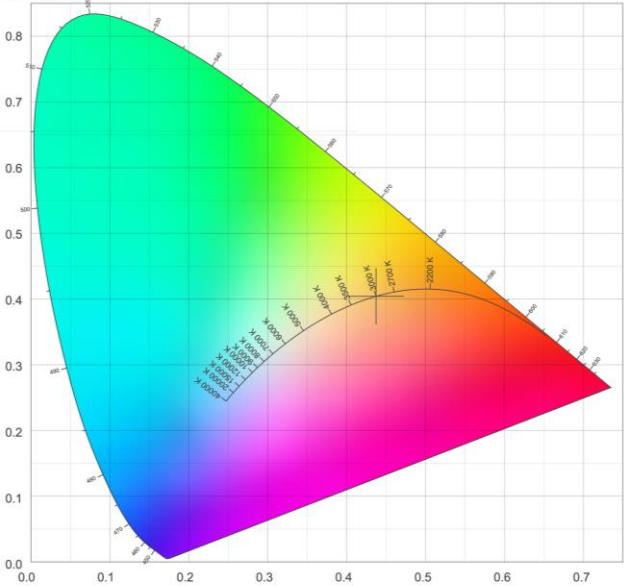
Correlated Color Temperature	CCT = 3000 K	Color coordinates CIE 1931	(x;y) = (0.437;0.404)
Color Rendering Index	CRI 94.1	Color coordinate CIEs 1960	(u;v) = (0.251;0.348)
Color Rendering Index, R9 (red component)	R9 = 68.6	Color deviation from BBL	Duv = ±0.0003
Color Rendering TM30-18	R _f 91.0 – R _g 97.7	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.251;0.251)
Color Quality Scale	CQS = 91.8		

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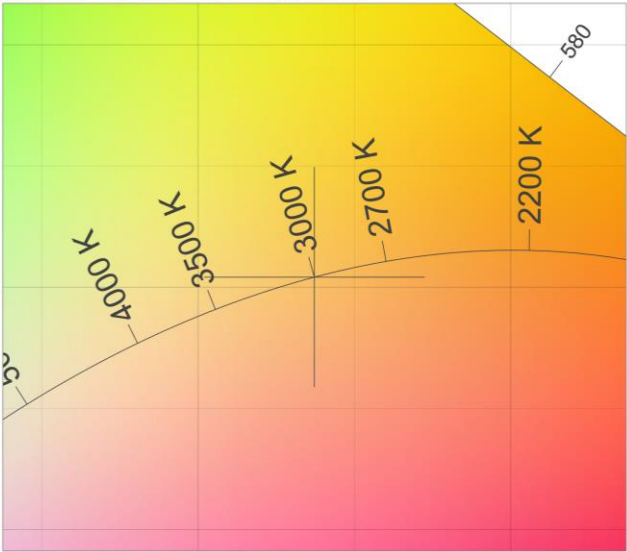
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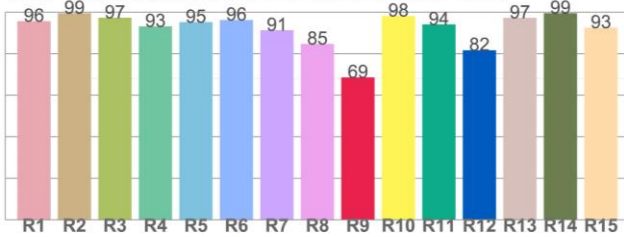
CIE 1931



CIE 1931 – zoomed on Planckian locus



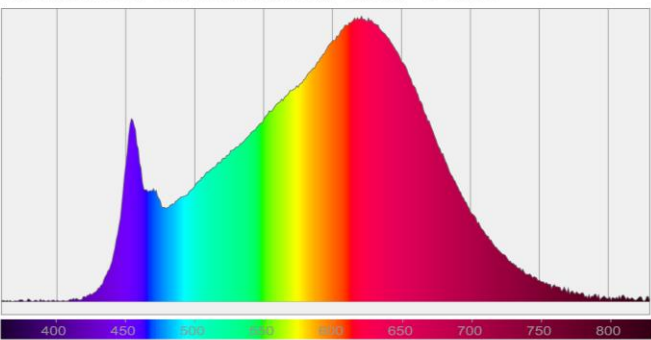
Color Rendering Index per reference color (CIE 1995)



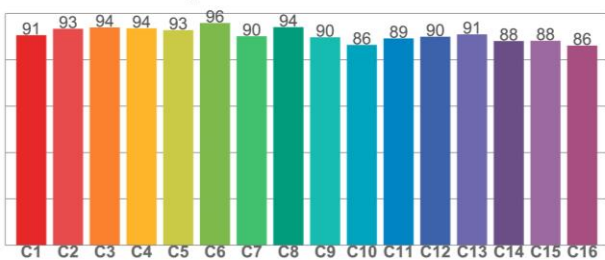
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
95.7	99.5	97.3	93.1	95.2	96.2	91.3	84.6	68.6	98.2	94.1	81.6	97.2	99.5	92.5

Spectral power distribution (SPD) / W/nm – 0-100%



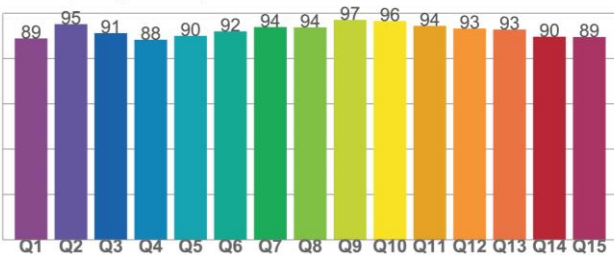
TM30-18 Rf-values per hue bin



TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.6	93.4	93.9	93.6	92.8	95.9	90.1	94.0	89.7	86.4	89.2	89.9	90.9	88.1	88.2	86.1

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
88.8	95.1	91.2	88.2	89.9	91.9	93.8	93.7	97.0	96.5	94.4	93.2	92.8	89.6	89.5