

Tested Light Source - 1_PHOT_SKIN+BONES-4050lmChip-2700K-Spreader-HoneycombLouve_2303

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

16 planes – 22.5°

1°

1.50 m

41.4 W – PF 0.97 – DPF 0.97

242 V – 0.177 A

50 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

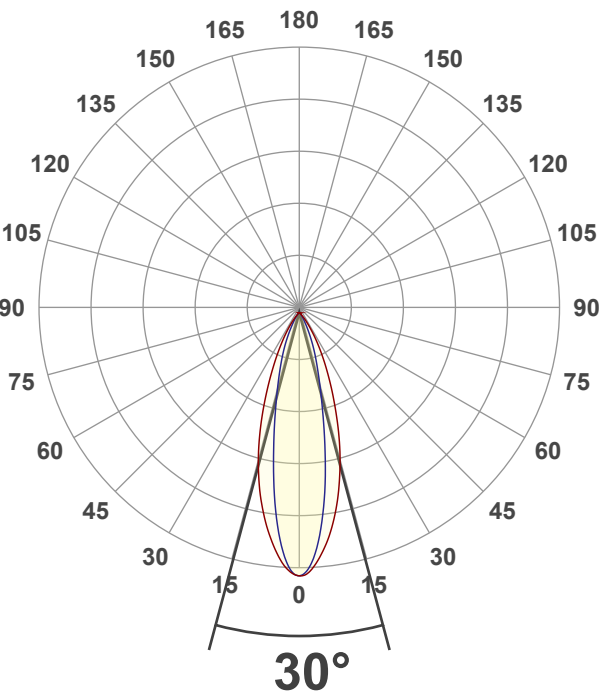
2057 lm

50 lm/W

5619 cd – 30°

CRI 92.6

Light Intensity Distribution



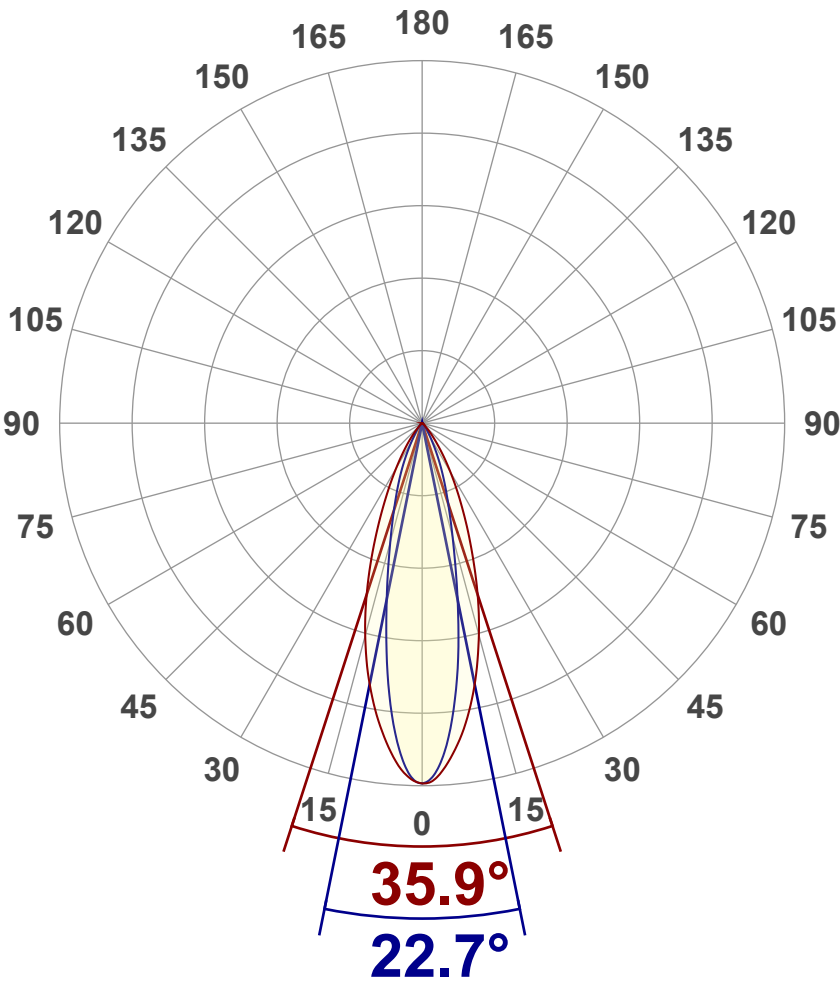
Goniophotometry Report

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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2057 lm
Peak Intensity	5619 cd
Beam Angle (50%)	30°
Beam Angle (90%)	22.7°
Beam Angle (10%)	35.9°

Cut-off Angle

Average 2,5%	78.9°
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Field Angle

Average 10%	59.9°
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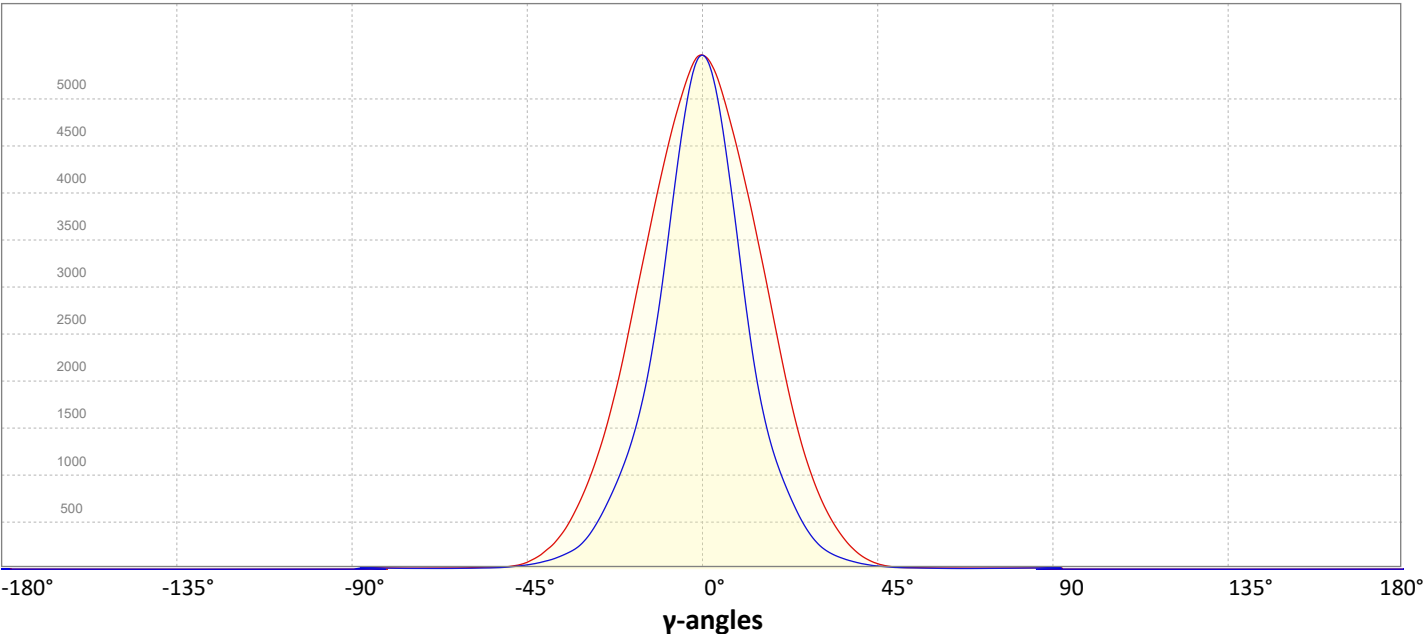
Intensity Ratio

In 120° cone	98.2%
In 90° cone	96.5%

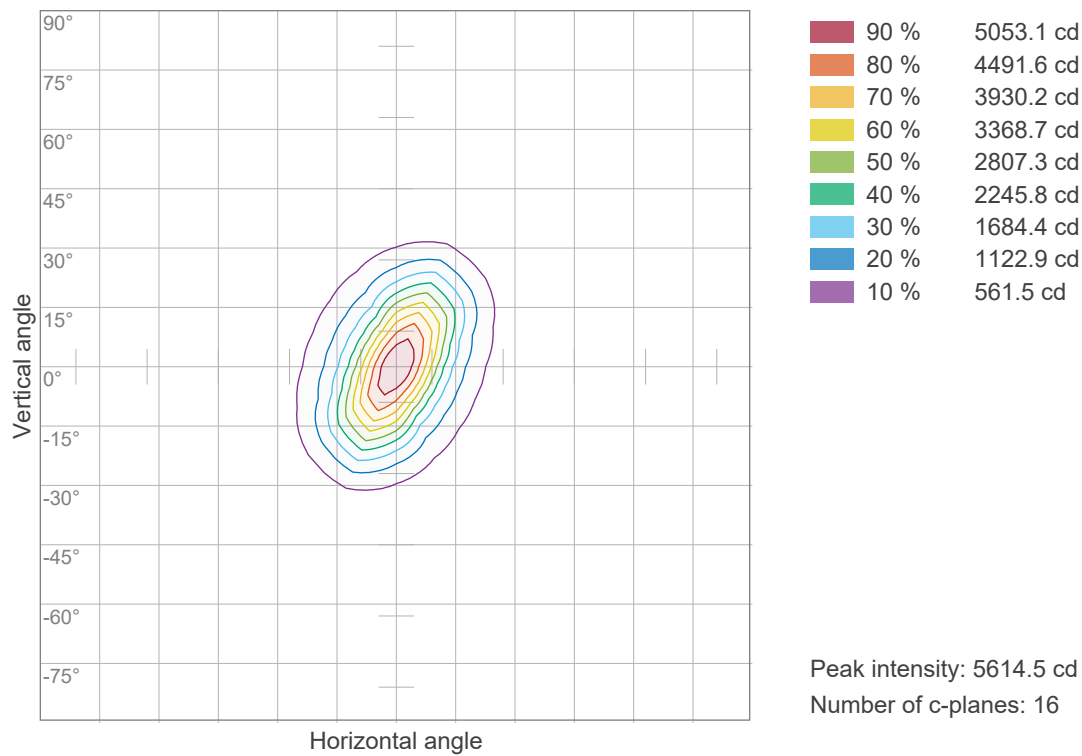
C000-C180

C090-C270

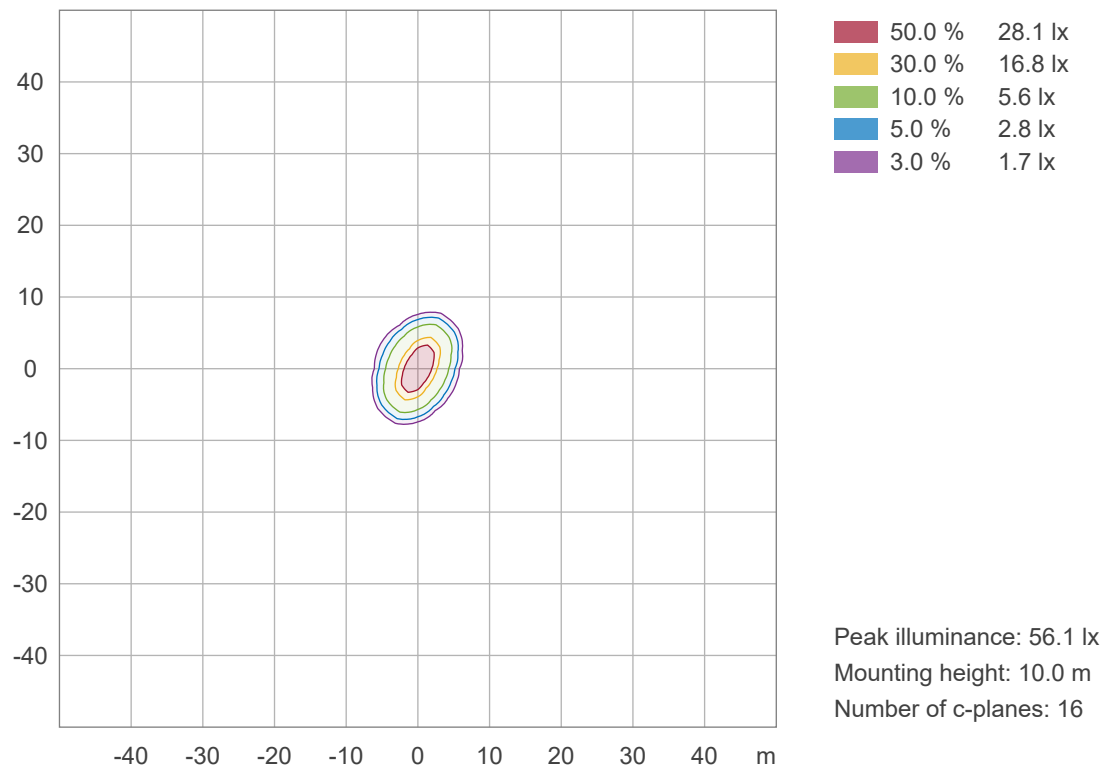
Linear distribution diagram - Intensity (candela) vs γ-angle



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)

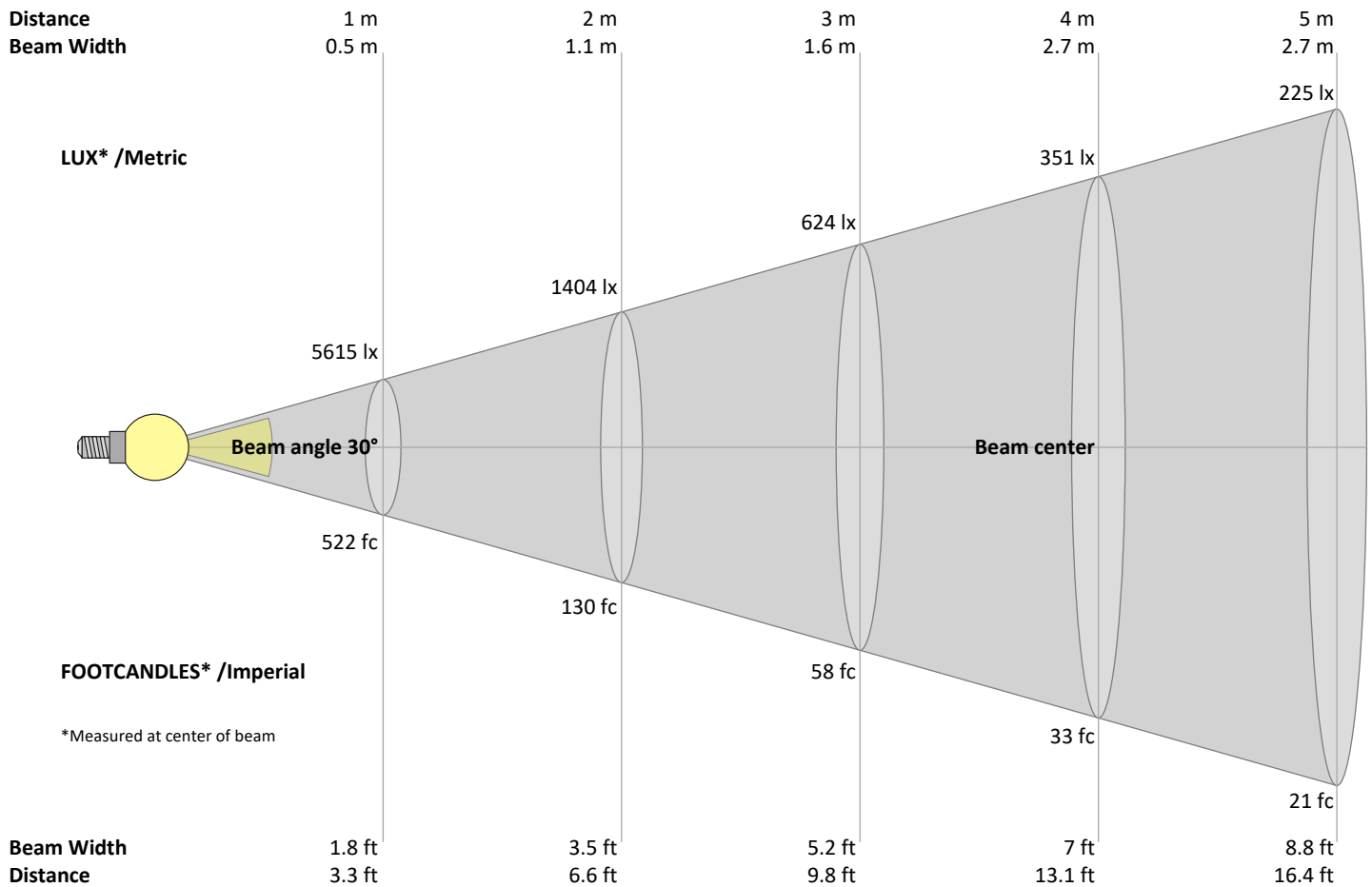


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Beam Details



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
5615	1404	624	351	225	156	115	88	69	56	46	39	33	29	25	22	19	17	16	14	lux
521.6	130.4	58	32.6	20.9	14.5	10.6	8.2	6.4	5.2	4.3	3.6	3.1	2.7	2.3	2	1.8	1.6	1.4	1.3	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
5615	5555	5350	5080	4770	4414	4031	3621	3214	2795	2378	1997	1661	1364	1108	886	694	529	394	288	cd
100%	99%	95%	90%	85%	79%	72%	64%	57%	50%	42%	36%	30%	24%	20%	16%	12%	9%	7%	5%	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
5615	5478	5112	4572	3942	3260	2612	2062	1638	1310	1057	843	654	491	361	263	197	151	118	91	cd
100%	98%	91%	81%	70%	58%	47%	37%	29%	23%	19%	15%	12%	9%	6%	5%	4%	3%	2%	2%	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
5615	5536	5346	5068	4750	4403	4034	3635	3224	2795	2369	1964	1602	1290	1031	810	628	477	353	252	cd
100%	99%	95%	90%	85%	78%	72%	65%	57%	50%	42%	35%	29%	23%	18%	14%	11%	8%	6%	4%	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
5615	5491	5104	4549	3897	3224	2632	2133	1738	1423	1167	951	761	590	444	326	243	190	150	116	cd
100%	98%	91%	81%	69%	57%	47%	38%	31%	25%	21%	17%	14%	11%	8%	6%	4%	3%	3%	2%	of 0°val

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LAMPS (number of lamps)

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	442 lm	21.5%
10-20°	748 lm	36.3%
20-30°	530 lm	25.8%
30-40°	223 lm	10.8%
40-50°	61 lm	2.9%
50-60°	16 lm	0.8%
60-70°	10 lm	0.5%
70-80°	12 lm	0.6%
80-90°	14 lm	0.7%
90-100°	1 lm	0.1%
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	2057 lm	100.0%

Intensity peaks

Max intensity	5619 cd
Intensity, 90°	0 cd
Intensity, 0°	5615 cd

Zonal Lumen summary

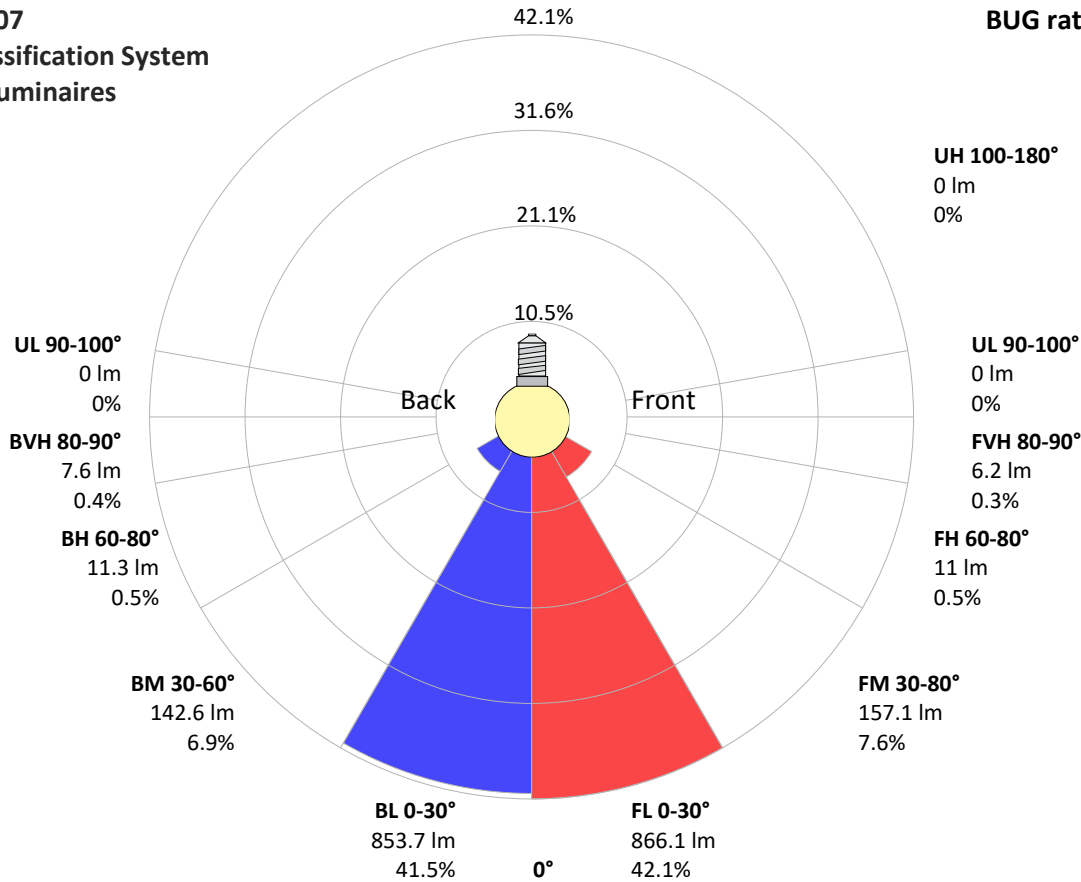
Zone (γ)	Lumen	% Total
0-30°	1720 lm	83.6%
0-40°	1943 lm	94.4%
0-60°	2019 lm	98.2%
60-90°	36 lm	1.8%
70-100°	27 lm	1.3%
90-120°	1 lm	0.1%
0-90°	2056 lm	99.9%
90-180°	1 lm	0.1%
0-180°	2057 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	866 lm	42.1%
Medium(30-60°)	157 lm	7.6%
High(60-80°)	11 lm	0.5%
Very high(80-90°)	6 lm	0.3%
Back light		
Low(0-30°)	854 lm	41.5%
Medium(30-60°)	143 lm	6.9%
High(60-80°)	11 lm	0.5%
Very high(80-90°)	8 lm	0.4%
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 B2 U1 G0



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Power Details

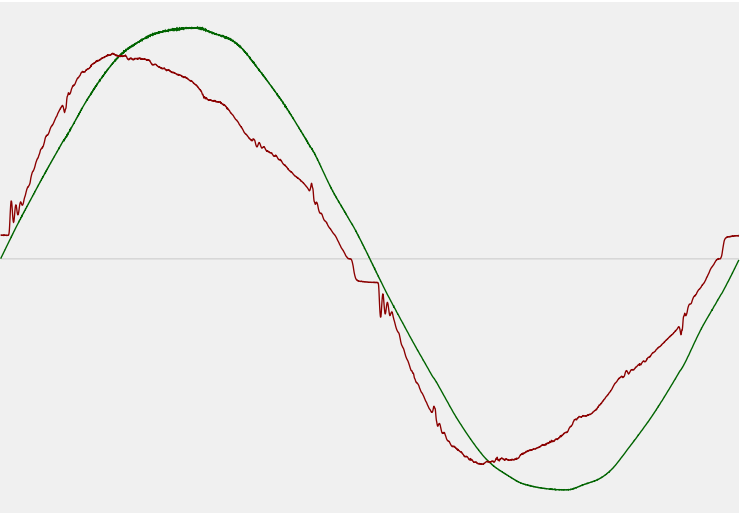
Input Power

Power feed to light source	41.4 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	242 V
RMS Input current feed, I_{RMS}	0.177 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	42.82 VA
Displacement factor of AC power feed	0.97
Power factor of AC current feed	0.97
Total harmonic distortion of the current	11.06%
Total harmonic distortion of the voltage	1.26%

Efficiency

Radiated power efficiency	18.0%
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Lumen efficiency	50 lm/W
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Input Power Curve



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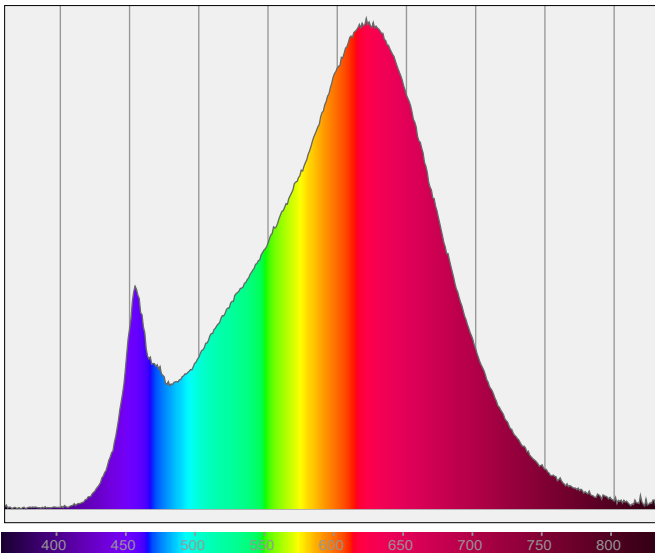
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Color Measurements

Correlated Color Temperature	CCT = 2700 K
Color Rendering TM30-18	R _f 91.5 — R _g 99.6
Color Shift, CIE duv	Duv ±0.0003

Spectral distribution



Color details

Correlated Color Temperature	CCT = 2700 K	Color coordinates CIE 1931	(x;y) = (0.460;0.411)
Color Rendering Index	CRI 92.6	Color coordinate CIEs 1960	(u;v) = (0.263;0.352)
Color Rendering Index, R9 (red component)	R9 = 61.6	Color deviation from BBL	Duv = ±0.0003
Color Rendering TM30-18	R _f 91.5 — R _g 99.6	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.263;0.263)
Color Quality Scale	CQS = 89.9		

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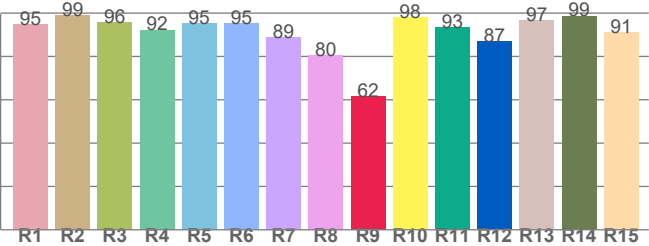
CIE 1931



CIE 1931 – zoomed on Planckian locus



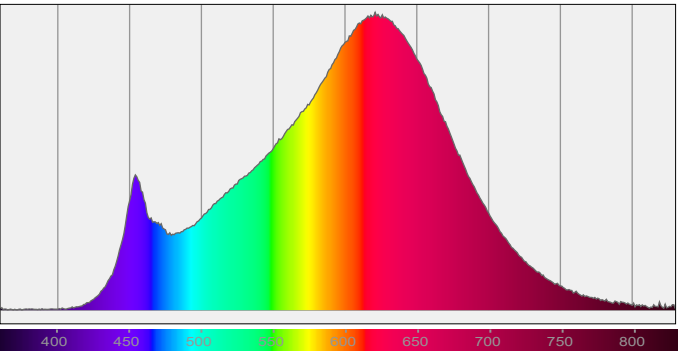
Color Rendering Index per reference color (CIE 1995)



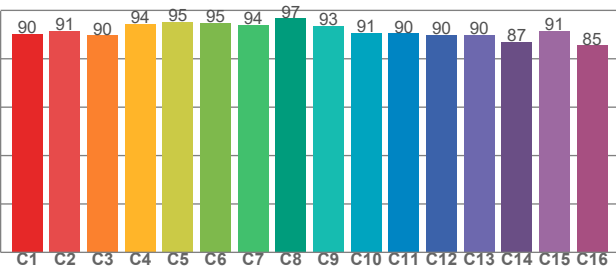
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
94.7	98.8	95.6	92.2	95.2	95.3	88.7	80.4	61.6	98.0	93.2	86.9	96.5	98.7	91.0

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



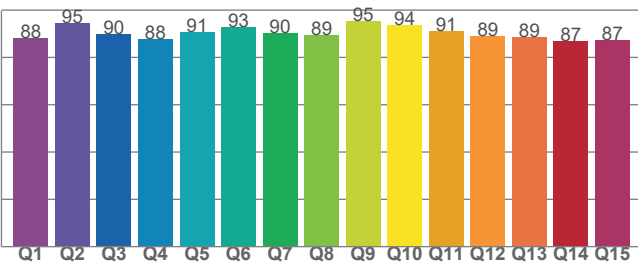
TM30-18 Rf-values per hue bin



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
90.4	91.5	89.7	94.4	95.3	94.9	93.8	96.7	93.5	90.5	90.4	89.7	89.7	87.0	91.4	85.4

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
88.0	94.5	89.7	87.8	90.8	92.9	90.1	89.3	95.3	93.7	91.0	89.0	88.7	87.0	87.1