

Tested Light Source - 1_PHOT_REFLEKTER-L-4750lmChip-4000K-38Deg-HoneycombLouvre_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

32 planes – 11.25°

1.5°

3.00 m

41.3 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

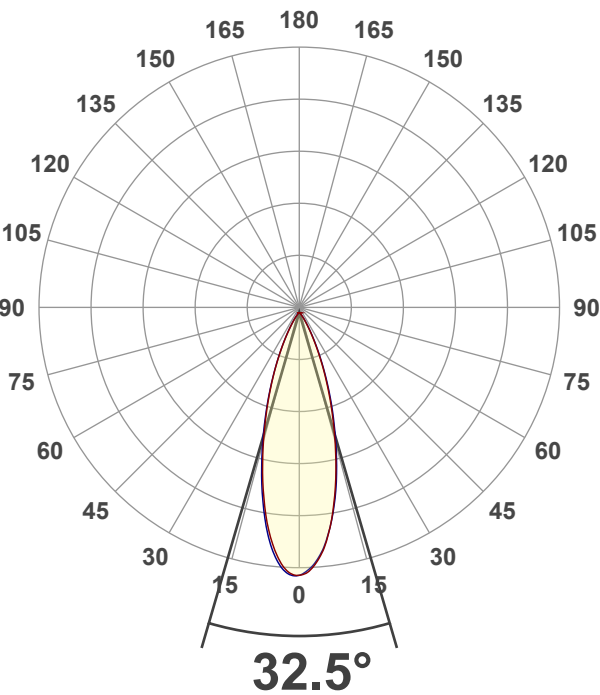
2613 lm

63 lm/W

7082 cd – 32.5°

CRI 92.6

Light Intensity Distribution



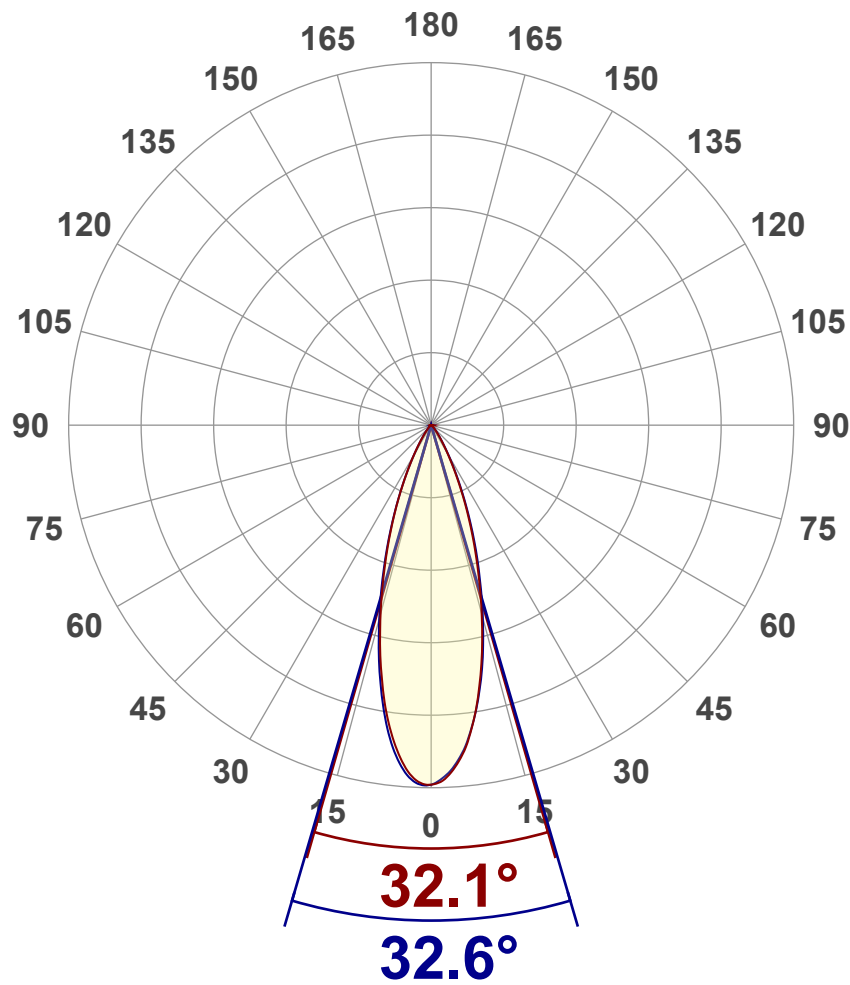
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2613 lm
Peak Intensity	7082 cd
Beam Angle (50%)	32.5°
Beam Angle (90%)	32.6°
Beam Angle (10%)	32.1°

Cut-off Angle

Average 2,5%	77.3°
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Field Angle

Average 10%	59.6°
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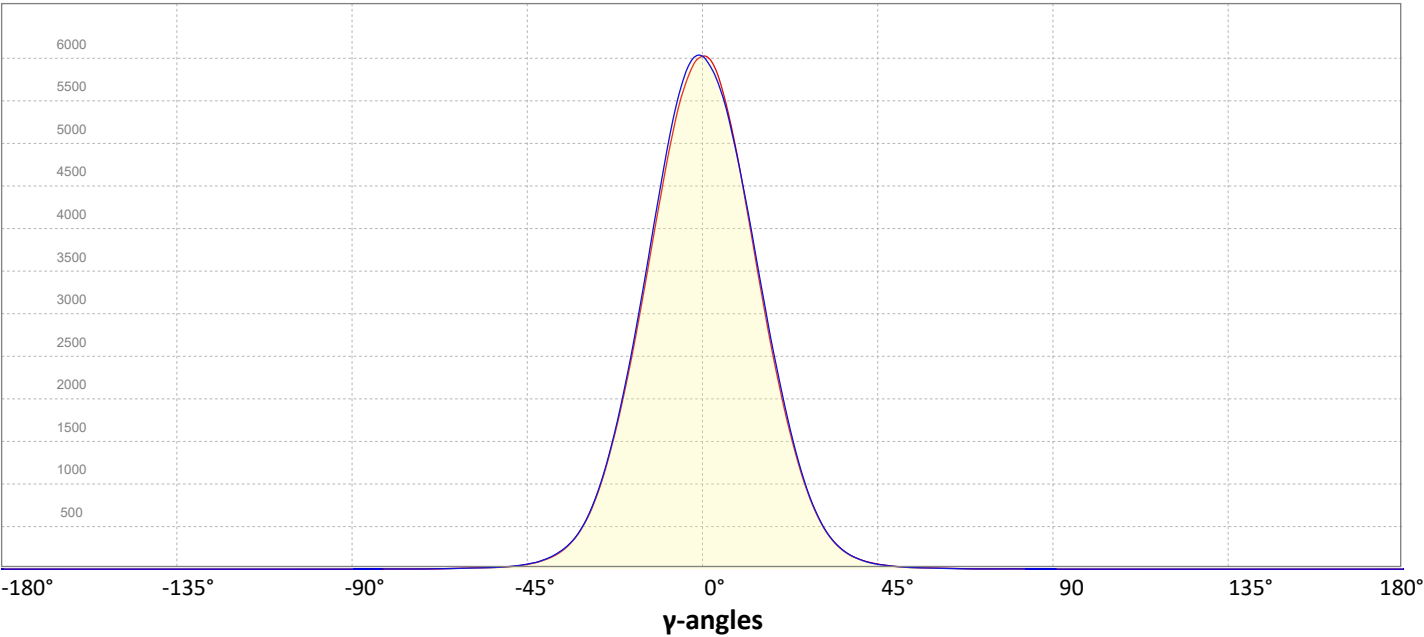
Intensity Ratio

In 120° cone	99.4%
In 90° cone	98.0%

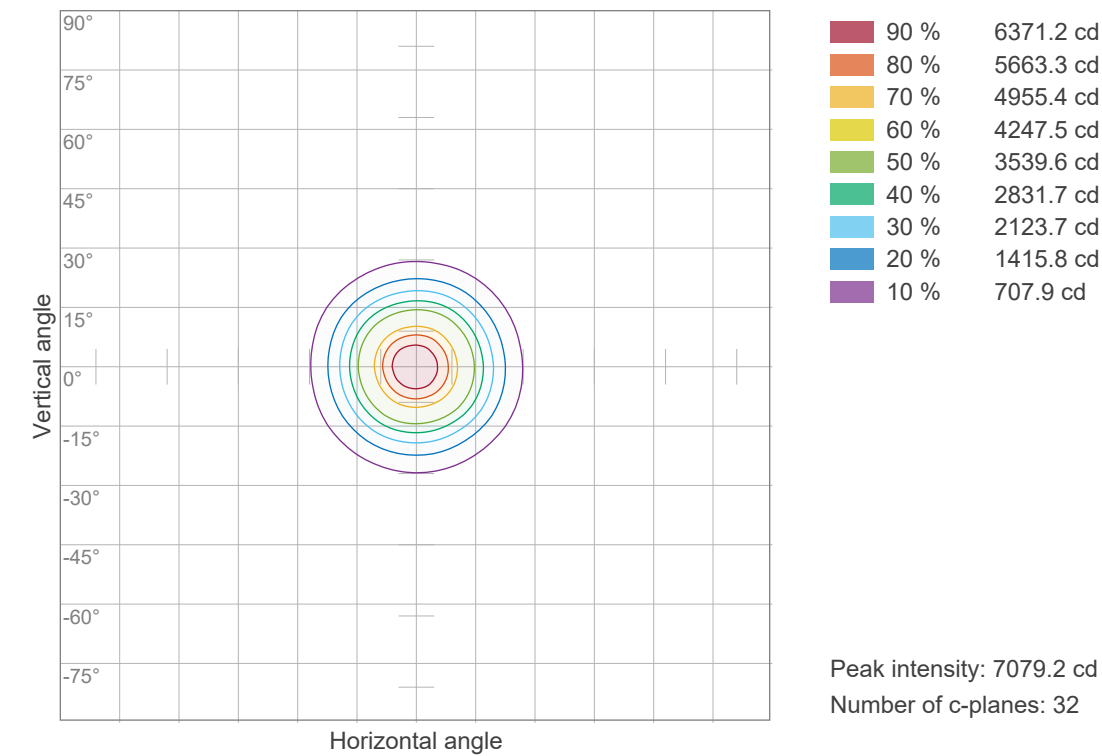
C000-C180

C090-C270

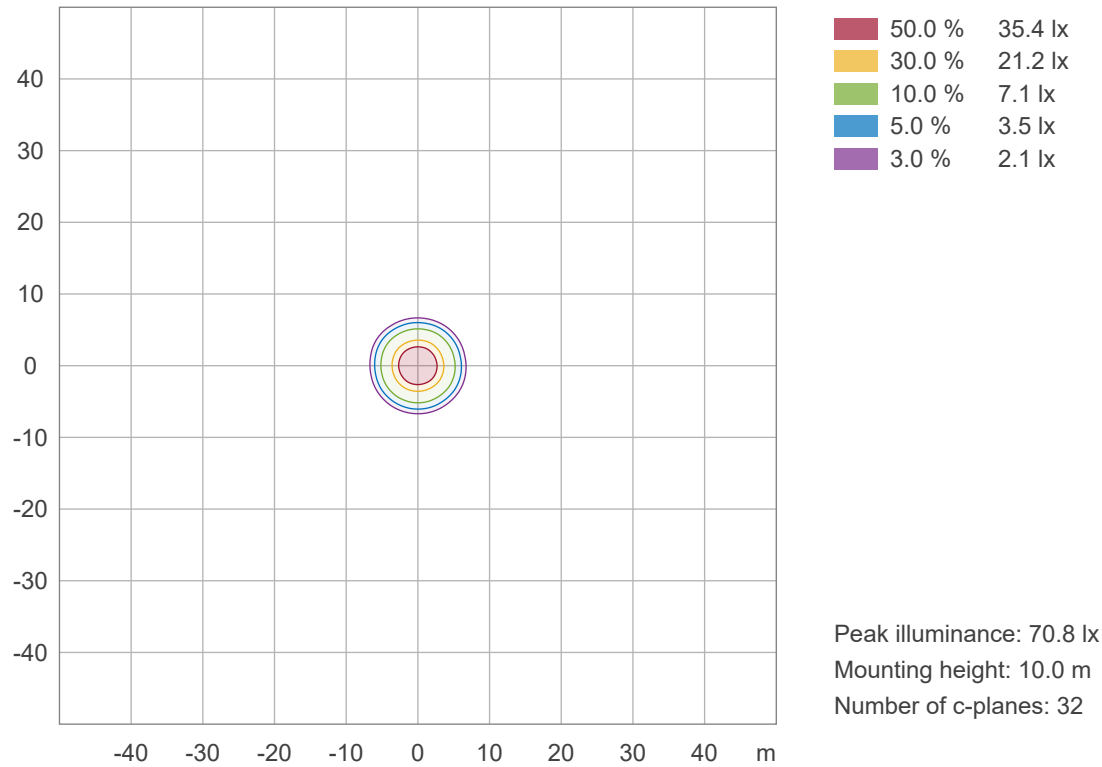
Linear distribution diagram - Intensity (candela) vs γ-angle



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)

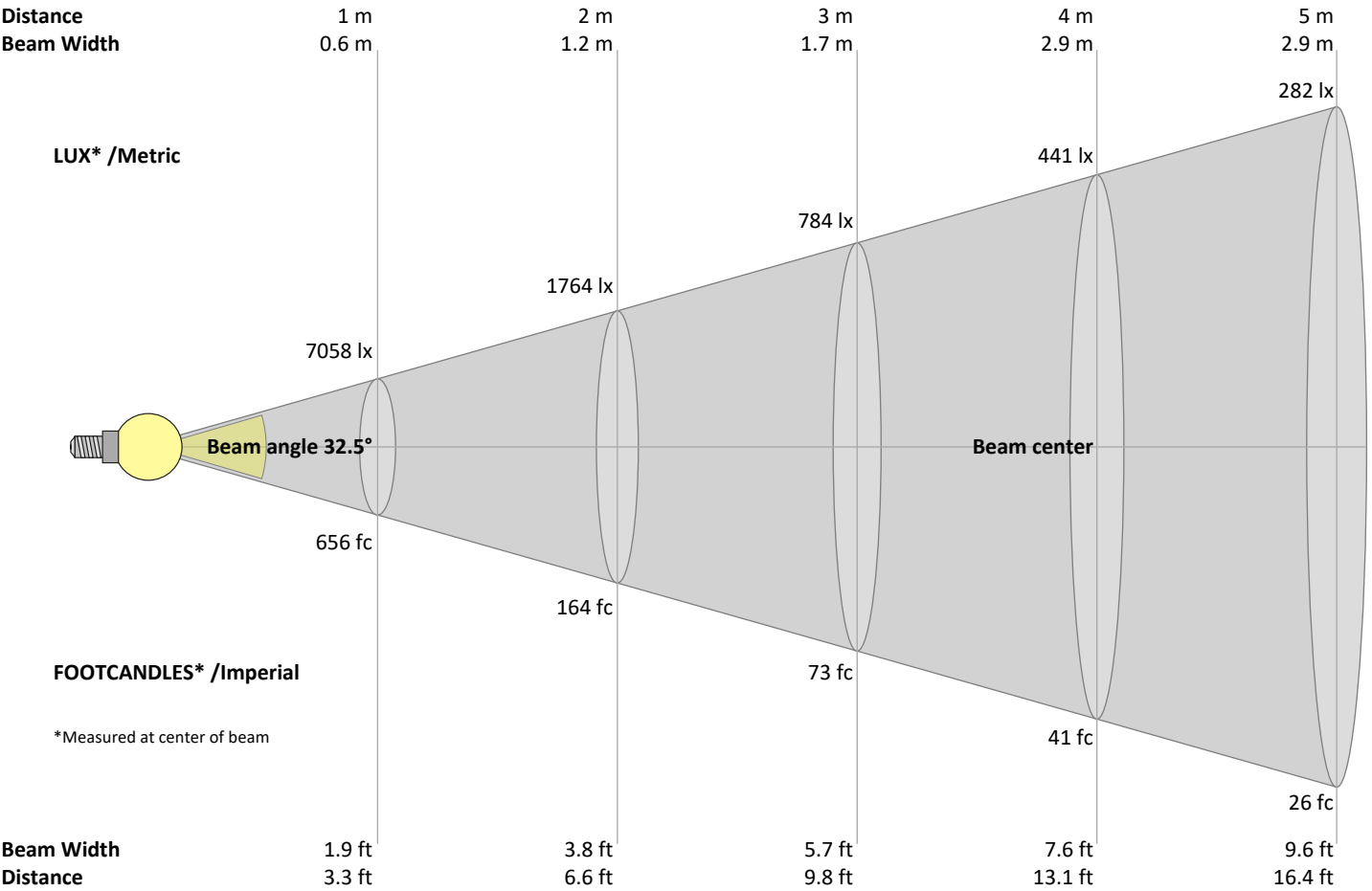


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Beam Details



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
7058	1764	784	441	282	196	144	110	87	71	58	49	42	36	31	28	24	22	20	18	lux
655.7	163.9	72.9	41	26.2	18.2	13.4	10.2	8.1	6.6	5.4	4.6	3.9	3.3	2.9	2.6	2.3	2	1.8	1.6	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
7058	6975	6731	6391	5908	5351	4759	4143	3542	2970	2450	1972	1557	1190	893	661	479	351	254	186	cd
100%	99%	95%	91%	84%	76%	67%	59%	50%	42%	35%	28%	22%	17%	13%	9%	7%	5%	4%	3%	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
7058	6923	6689	6360	5902	5387	4829	4225	3632	3054	2533	2046	1614	1241	935	692	502	367	266	193	cd
100%	98%	95%	90%	84%	76%	68%	60%	51%	43%	36%	29%	23%	18%	13%	10%	7%	5%	4%	3%	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
7058	7007	6792	6413	5941	5380	4771	4145	3542	2968	2453	1985	1572	1216	918	684	499	359	262	190	cd
100%	99%	96%	91%	84%	76%	68%	59%	50%	42%	35%	28%	22%	17%	13%	10%	7%	5%	4%	3%	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
7058	7048	6882	6538	6077	5506	4891	4252	3634	3040	2501	2010	1578	1212	909	668	488	357	266	196	cd
100%	100%	98%	93%	86%	78%	69%	60%	51%	43%	35%	28%	22%	17%	13%	9%	7%	5%	4%	3%	of 0°val

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Uncorrected, comprehensive UGR table according to 117-1995

UGR data could not be calculated due to missing/wrong symmetry. Goto Edit->Photometric->Corrections and select Correct asymmetry.

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	112	110	108	112	110	108	106	106	104	103	102	101	100	99	98	97	95
2	110	106	102	99	108	104	101	98	101	98	96	98	96	94	95	94	92	91
3	106	100	96	93	104	99	95	92	96	93	91	94	91	89	92	90	88	86
4	101	95	91	87	100	94	90	87	92	89	86	90	87	85	88	86	84	82
5	98	91	86	82	96	90	85	82	88	84	81	87	83	81	85	82	80	79
6	94	87	82	78	93	86	81	78	85	81	78	83	80	77	82	79	77	75
7	91	83	78	75	89	82	78	75	81	77	74	80	77	74	79	76	73	72
8	87	80	75	71	86	79	75	71	78	74	71	77	73	71	76	73	70	69
9	84	77	72	68	83	76	72	68	75	71	68	74	71	68	74	70	68	67
10	82	74	69	66	81	73	69	66	73	68	66	72	68	65	71	68	65	64

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LAMPS (number of lamps)

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	593 lm	22.7%
10-20°	1067 lm	40.8%
20-30°	653 lm	25.0%
30-40°	210 lm	8.0%
40-50°	57 lm	2.2%
50-60°	18 lm	0.7%
60-70°	8 lm	0.3%
70-80°	3 lm	0.1%
80-90°	3 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	2613 lm	100.0%

Intensity peaks

Max intensity	7082 cd
Intensity, 90°	0 cd
Intensity, 0°	7058 cd

Zonal Lumen summary

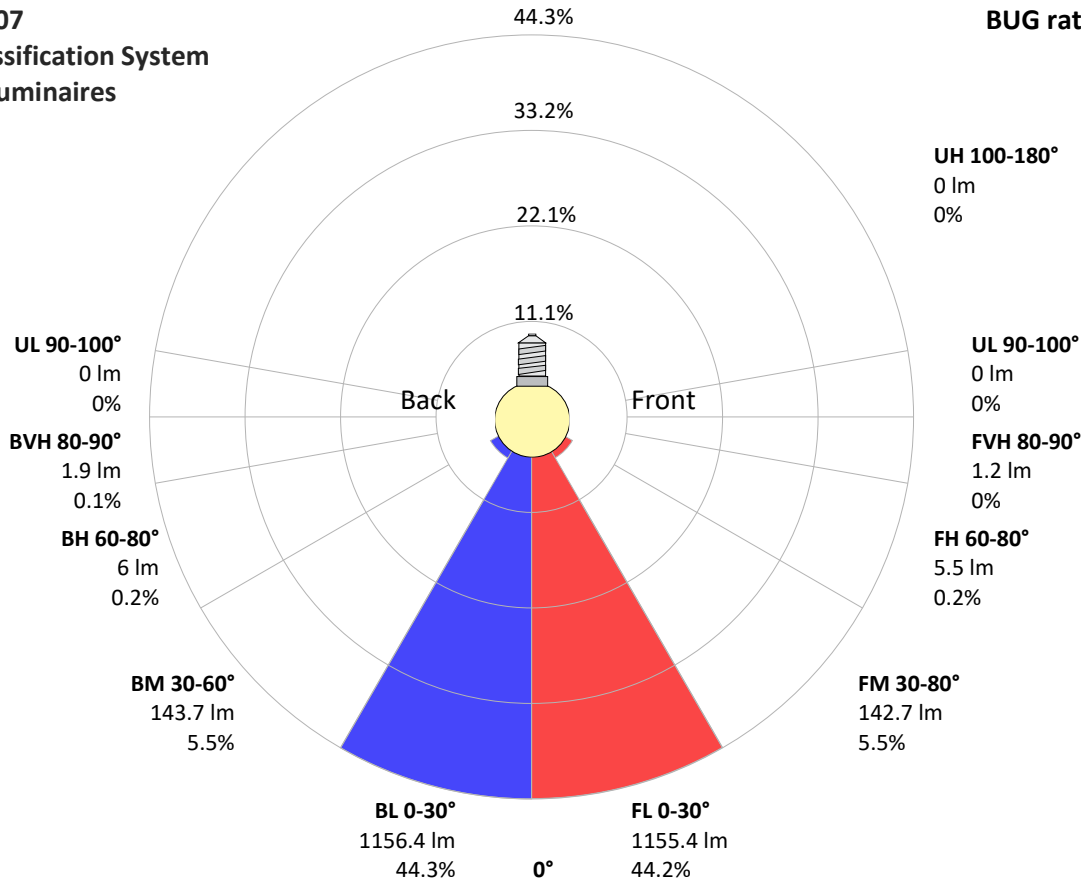
Zone (γ)	Lumen	% Total
0-30°	2313 lm	88.5%
0-40°	2523 lm	96.6%
0-60°	2598 lm	99.4%
60-90°	15 lm	0.6%
70-100°	6 lm	0.2%
90-120°	0 lm	0.0%
0-90°	2613 lm	100.0%
90-180°	0 lm	0.0%
0-180°	2613 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1155 lm	44.2%
Medium(30-60°)	143 lm	5.5%
High(60-80°)	6 lm	0.2%
Very high(80-90°)	1 lm	0.0%
Back light		
Low(0-30°)	1156 lm	44.3%
Medium(30-60°)	144 lm	5.5%
High(60-80°)	6 lm	0.2%
Very high(80-90°)	2 lm	0.1%
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 B3 U1 G0



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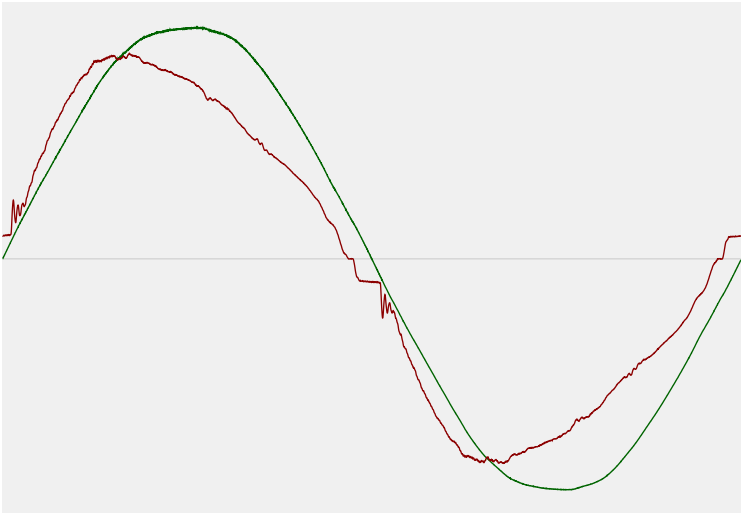


Power Details

Input Power

Power feed to light source	41.3 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 = $V_{RMS} \cdot I_{RMS}$	42.75 VA
Displacement factor of AC power feed	0.97
Power factor of AC current feed	0.97
Total harmonic distortion of the current	11.13%
Total harmonic distortion of the voltage	1.35%

Input Power Curve



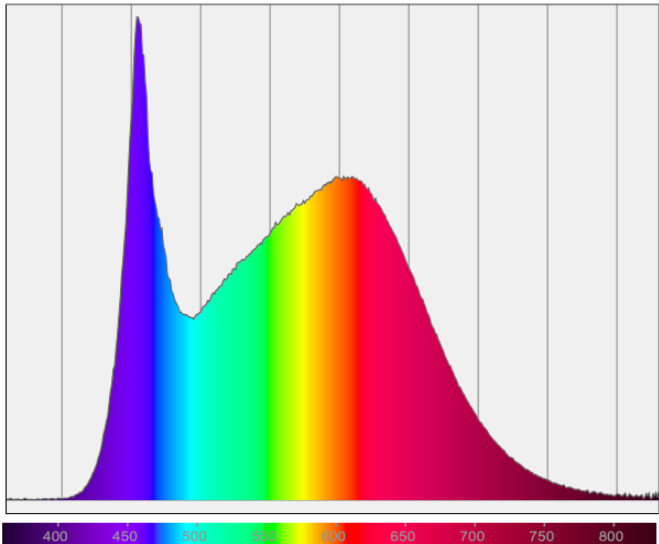
Efficiency

Radiated power efficiency	22.9%
Lumen efficiency	63 lm/W

Color Measurements

Correlated Color Temperature	CCT = 4000 K
Color Rendering TM30-18	R _f 88.9 – R _g 98.5
Color Shift, CIE duv	Duv ±0.0003

Spectral distribution



Color details

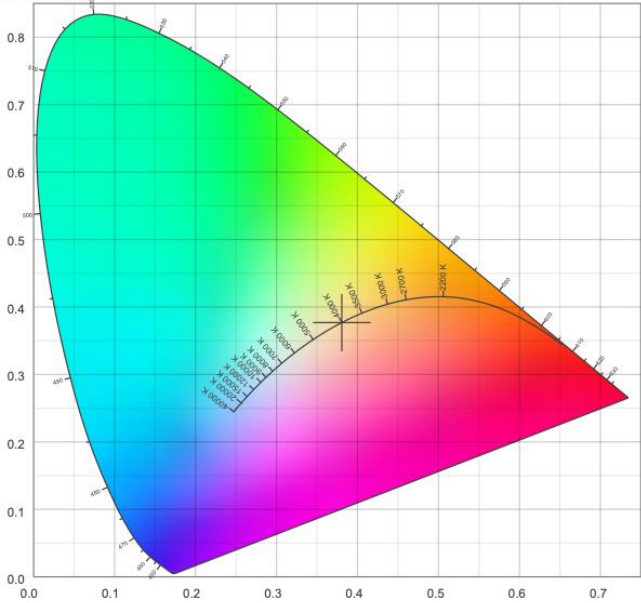
Correlated Color Temperature	CCT = 4000 K	Color coordinates CIE 1931	(x;y) = (0.381;0.377)
Color Rendering Index	CRI 92.6	Color coordinate CIEs 1960	(u;v) = (0.225;0.334)
Color Rendering Index, R9 (red component)	R9 = 72.2	Color deviation from BBL	Duv = ±0.0003
Color Rendering TM30-18	R _f 88.9 – R _g 98.5	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.225;0.225)
Color Quality Scale	CQS = 88.9		

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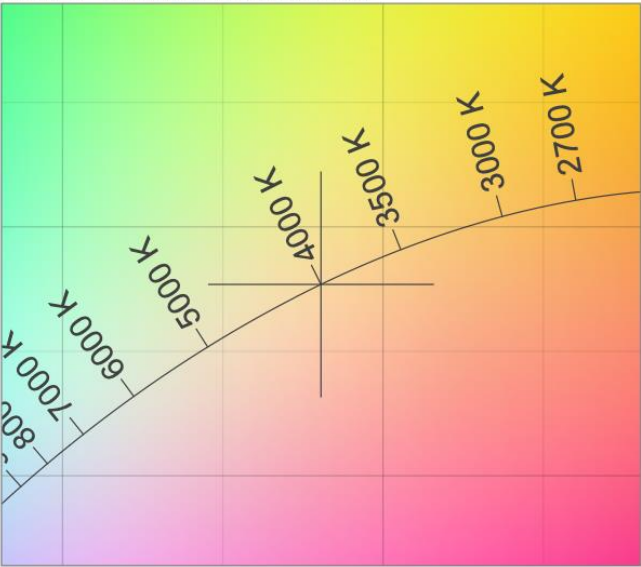
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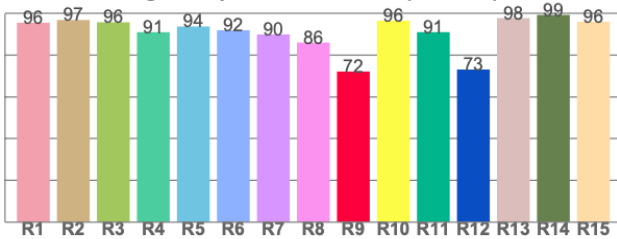
CIE 1931



CIE 1931 – zoomed on Planckian locus



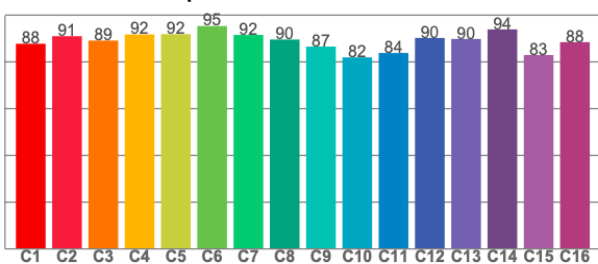
Color Rendering Index per reference color (CIE 1995)



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
95.5	96.8	95.7	91.0	93.7	91.9	89.9	86.0	72.2	96.4	91.0	73.1	97.7	99.2	96.0

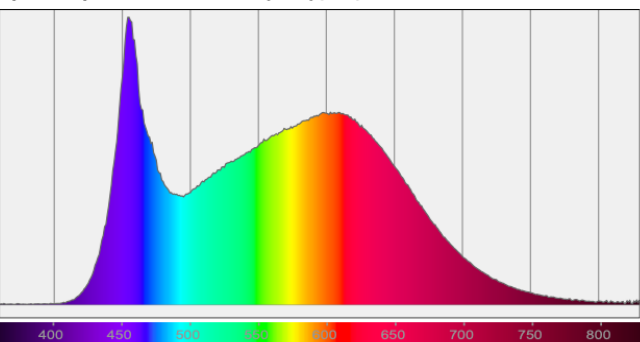
TM30-18 Rf-values per hue bin



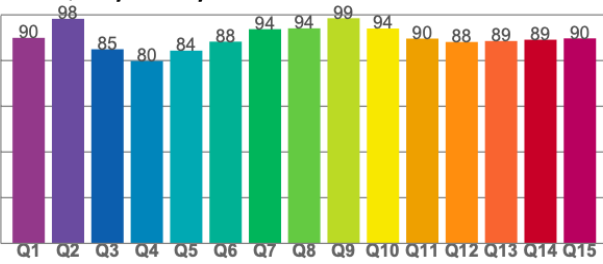
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
87.8	91.0	89.1	91.7	91.9	95.3	91.5	89.6	86.6	81.9	83.8	90.3	89.8	93.9	83.0	88.4

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



Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
89.9	98.3	84.9	79.8	84.3	88.3	93.7	94.1	98.5	94.0	89.6	88.1	88.6	89.1	89.7