

Tested Light Source - 1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-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°

2°

3.00 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

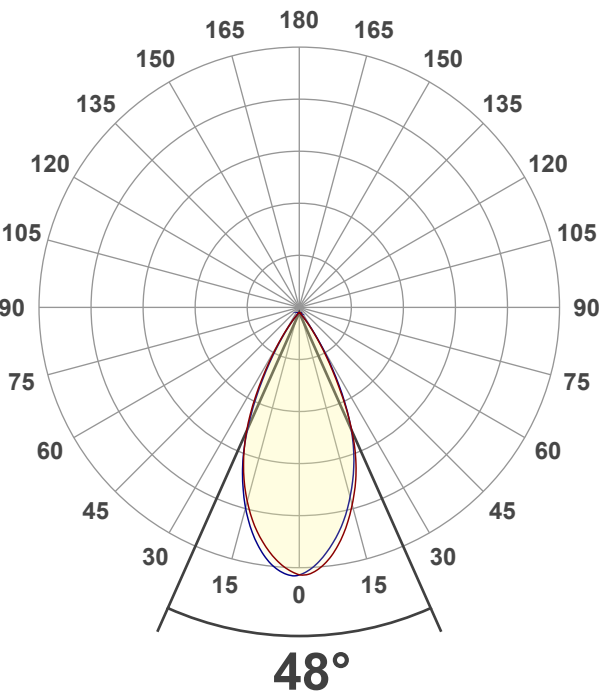
2195 lm

53 lm/W

3604 cd – 48°

CRI 92.6

Light Intensity Distribution



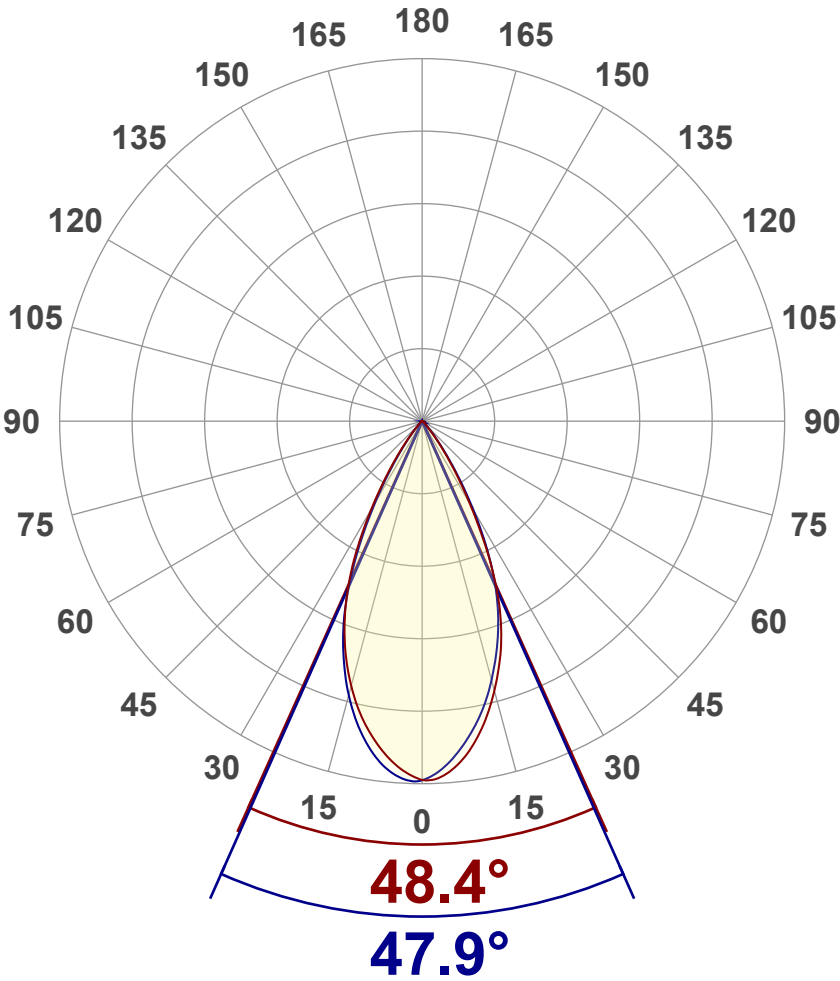
Goniophotometry Report

1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-HoneycombLouvre_2303
www.factorylux.com



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2195 lm
Peak Intensity	3604 cd
Beam Angle (50%)	48°
Beam Angle (90%)	47.9°
Beam Angle (10%)	48.4°

Cut-off Angle

Average 2,5%	84.7°
--------------	-------

Field Angle

Average 10%	72.3°
-------------	-------

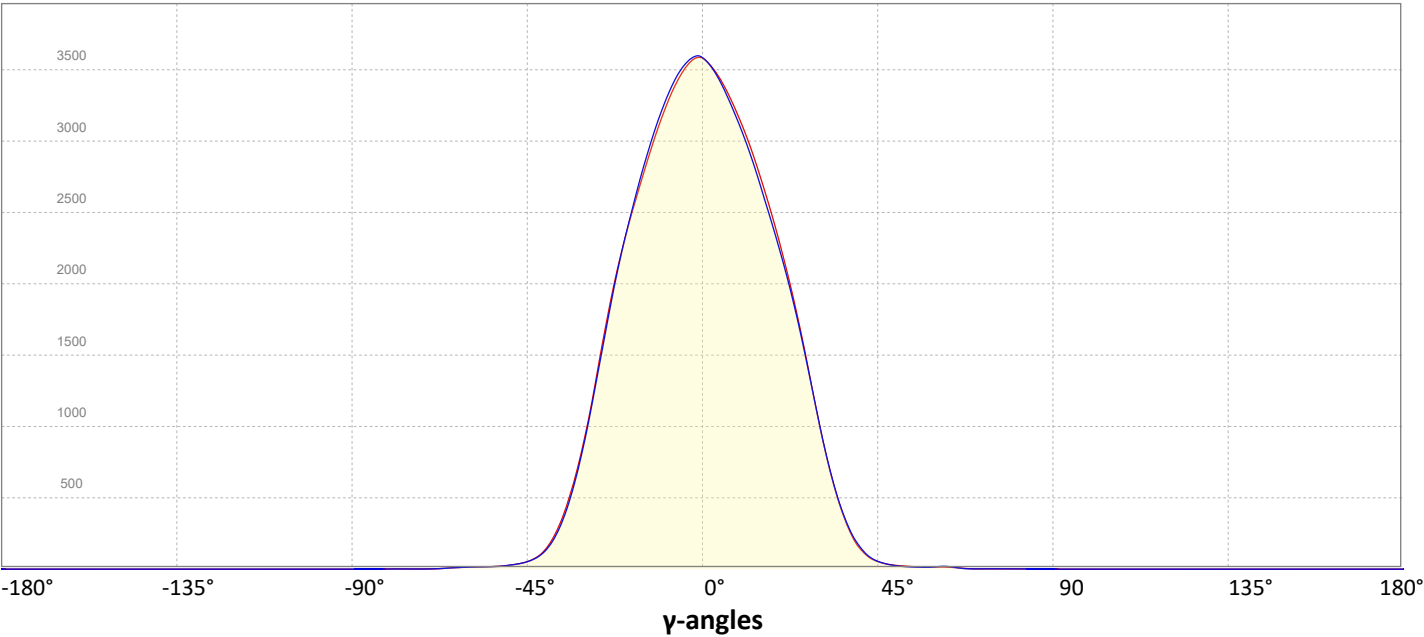
Intensity Ratio

In 120° cone	99.5%
In 90° cone	98.1%

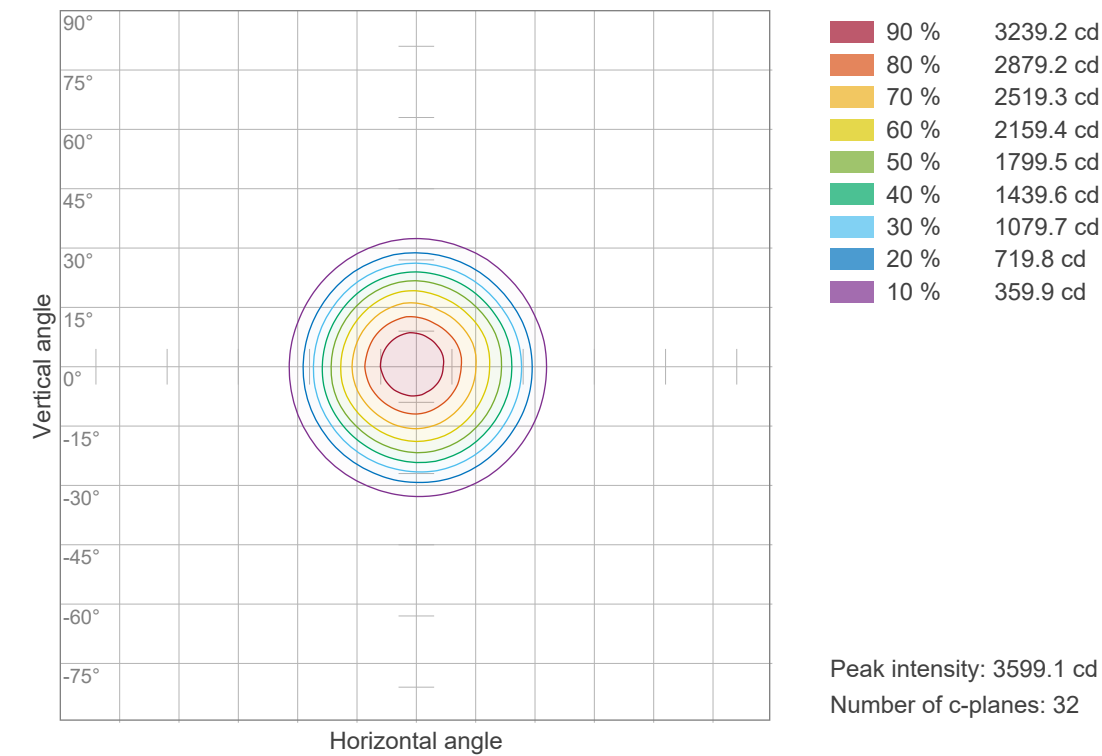
C000-C180

C090-C270

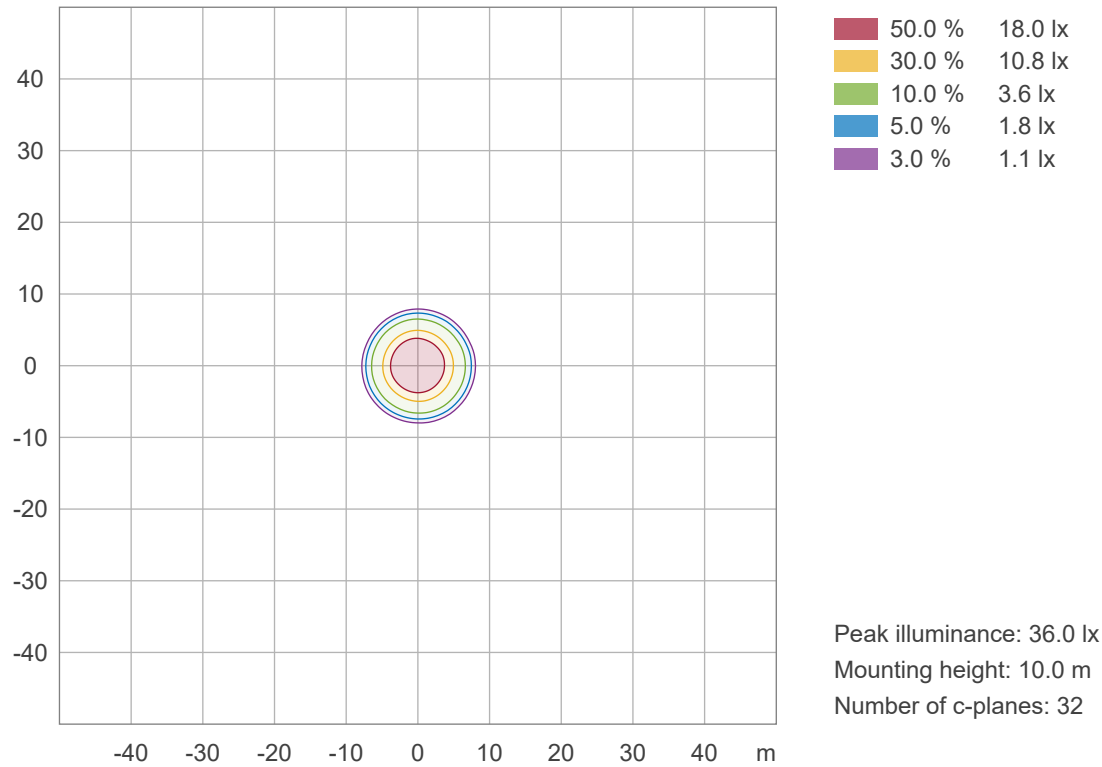
Linear distribution diagram - Intensity (candela) vs γ-angle



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



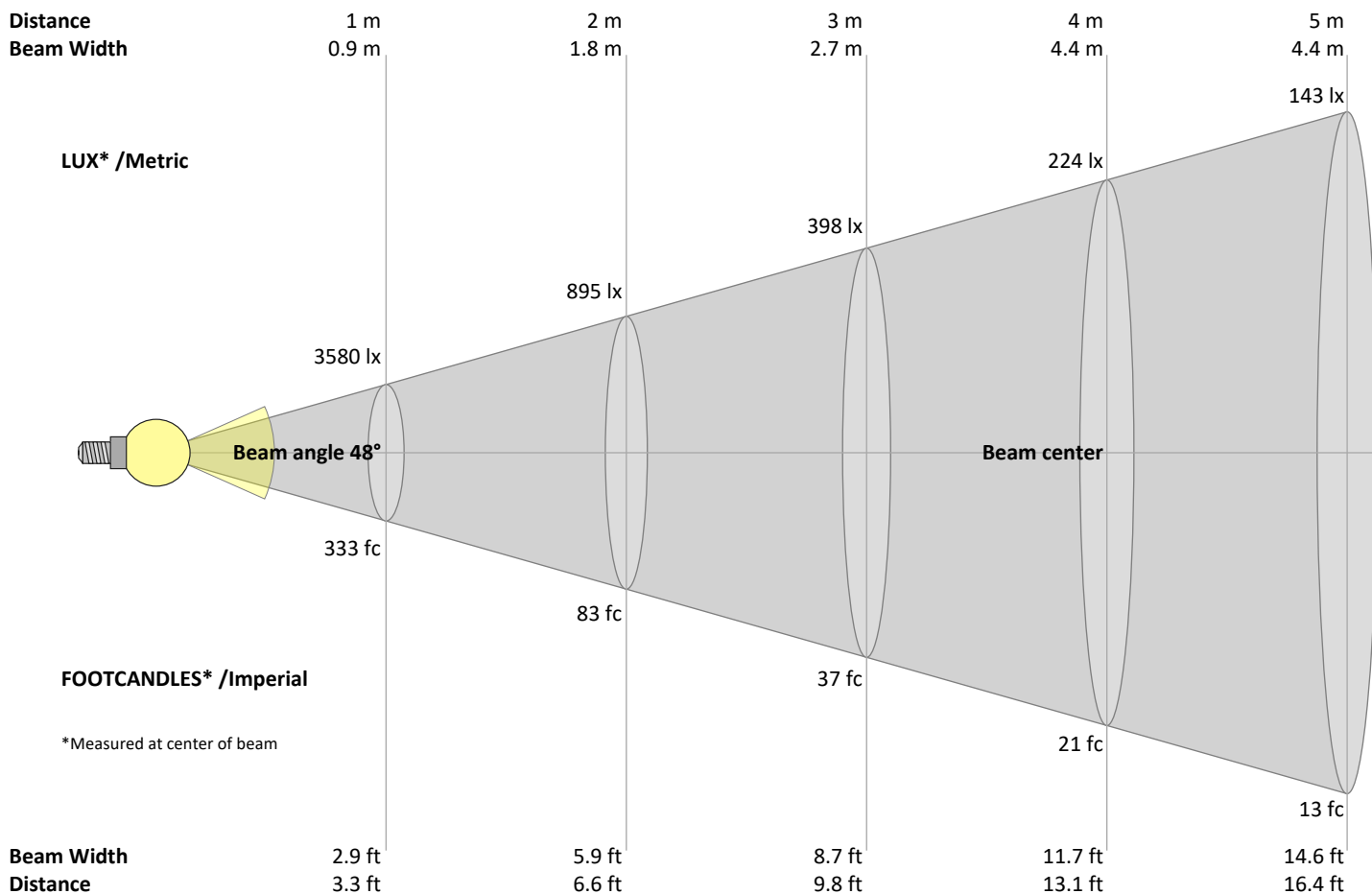
Goniophotometry Report

1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-HoneycombLouvre_2303

www.factorylux.com



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
3580	895	398	224	143	99	73	56	44	36	30	25	21	18	16	14	12	11	10	9	lux
332.6	83.1	37	20.8	13.3	9.2	6.8	5.2	4.1	3.3	2.7	2.3	2	1.7	1.5	1.3	1.2	1	0.9	0.8	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
3580	3578	3527	3443	3332	3197	3044	2874	2694	2508	2306	2080	1821	1535	1232	957	719	522	360	239	cd
100%	100%	99%	96%	93%	89%	85%	80%	75%	70%	64%	58%	51%	43%	34%	27%	20%	15%	10%	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
3580	3526	3441	3333	3210	3075	2927	2764	2585	2406	2217	2015	1792	1547	1285	1022	780	571	401	269	cd
100%	98%	96%	93%	90%	86%	82%	77%	72%	67%	62%	56%	50%	43%	36%	29%	22%	16%	11%	8%	of 0°val

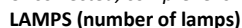
Intensities in 180° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
3580	3531	3457	3361	3248	3120	2979	2820	2647	2463	2264	2051	1818	1564	1288	1017	773	565	393	258	cd
100%	99%	97%	94%	91%	87%	83%	79%	74%	69%	63%	57%	51%	44%	36%	28%	22%	16%	11%	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
3580	3588	3550	3478	3376	3246	3096	2923	2736	2526	2307	2064	1790	1500	1211	937	698	497	339	222	cd
100%	100%	99%	97%	94%	91%	86%	82%	76%	71%	64%	58%	50%	42%	34%	26%	19%	14%	9%	6%	of 0°val

1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-HoneycombLouvre_2303
www.factorylux.com



Zonal Lumen Summary

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	320 lm	14.6%
10-20°	762 lm	34.7%
20-30°	743 lm	33.8%
30-40°	295 lm	13.4%
40-50°	49 lm	2.2%
50-60°	15 lm	0.7%
60-70°	8 lm	0.4%
70-80°	2 lm	0.1%
80-90°	1 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	2195 lm	100.0%

Intensity peaks

Max intensity	3604 cd
Intensity, 90°	0 cd
Intensity, 0°	3580 cd

Zonal Lumen summary

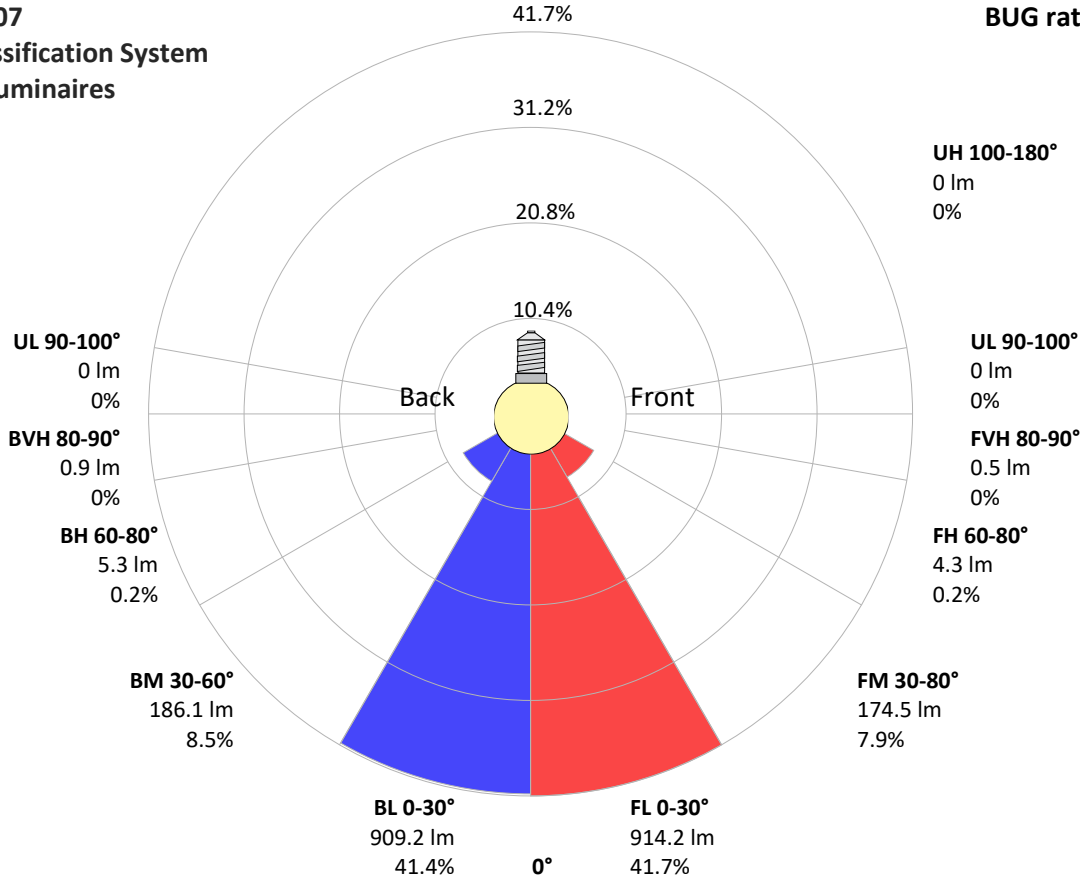
Zone (γ)	Lumen	% Total
0-30°	1825 lm	83.1%
0-40°	2120 lm	96.6%
0-60°	2184 lm	99.5%
60-90°	11 lm	0.5%
70-100°	3 lm	0.1%
90-120°	0 lm	0.0%
0-90°	2195 lm	100.0%
90-180°	0 lm	0.0%
0-180°	2195 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	914 lm	41.7%
Medium(30-60°)	174 lm	7.9%
High(60-80°)	4 lm	0.2%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	909 lm	41.4%
Medium(30-60°)	186 lm	8.5%
High(60-80°)	5 lm	0.2%
Very high(80-90°)	1 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 B2 U1 G0



Goniophotometry Report

1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-HoneycombLouvre_2303
www.factorylux.com

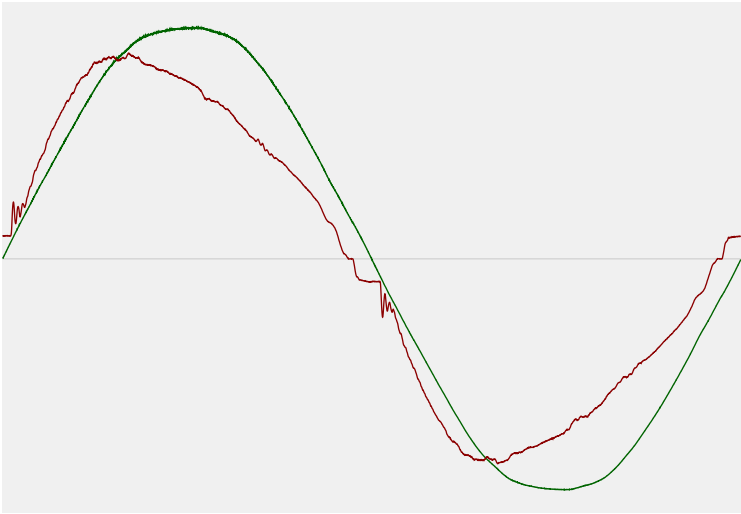


Power Details

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 = $V_{RMS} \cdot I_{RMS}$	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	11.2%
Total harmonic distortion of the voltage	1.53%

Input Power Curve



Efficiency

Radiated power efficiency	19.2%
<div><div></div></div>	
Lumen efficiency	53 lm/W
<div><div></div></div>	

Goniophotometry Report

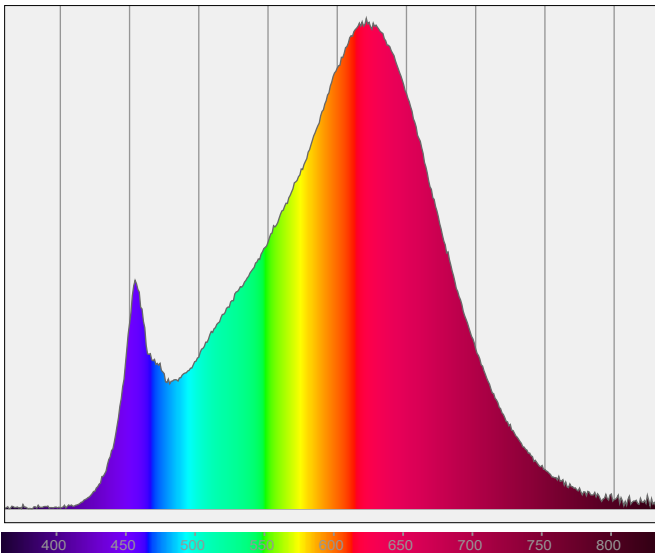
1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-HoneycombLouvre_2303
www.factorylux.com



Color Measurements

Correlated Color Temperature	CCT = 2700 K
Color Rendering TM30-18	R _f 91.5 — R _g 99.7
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 = 62.2	Color deviation from BBL	Duv = ±0.0003
Color Rendering TM30-18	R _f 91.5 — R _g 99.7	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.263;0.263)
Color Quality Scale	CQS = 89.9		

Goniophotometry Report

1_PHOT_REFLEKTER-L-4050lmChip-2700K-58Deg-HoneycombLouvre_2303
www.factorylux.com



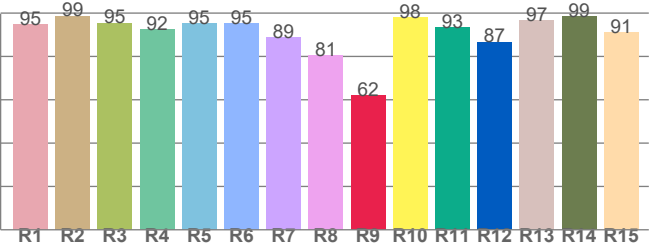
CIE 1931



CIE 1931 – zoomed on Planckian locus



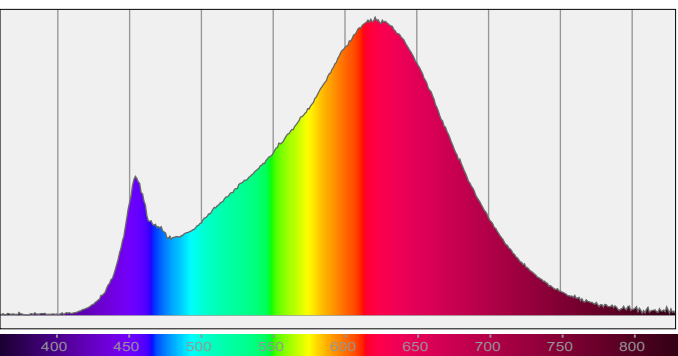
Color Rendering Index per reference color (CIE 1995)



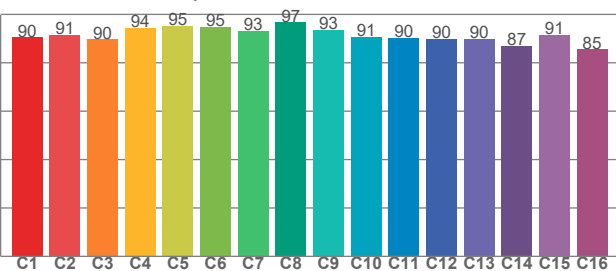
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
94.9	98.7	95.5	92.3	95.4	95.1	88.6	80.6	62.2	98.2	93.3	86.7	96.7	98.7	91.3

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



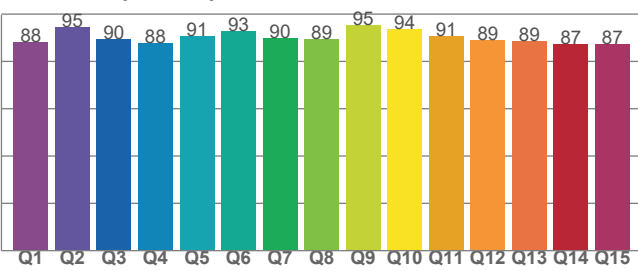
TM30-18 Rf-values per hue bin



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
90.5	91.5	89.6	94.4	95.2	94.9	93.2	96.7	93.5	90.5	90.4	89.7	89.8	87.0	91.4	85.5

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
88.2	94.6	89.6	87.7	90.8	93.0	90.0	89.2	95.3	93.6	90.9	88.9	88.5	87.1	87.2