

Tested Light Source - 1_PHOT_REFLEKTER-L-4300lmChip-3000K-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

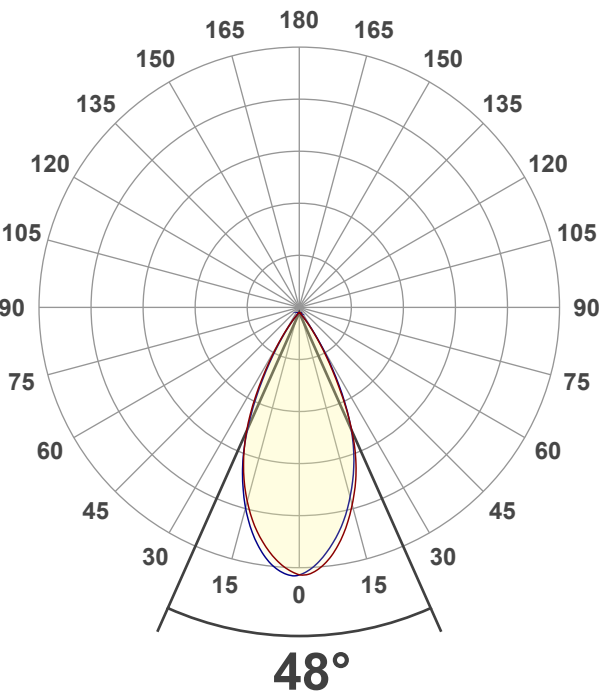
2327 lm

56 lm/W

3821 cd – 48°

CRI 92.6

Light Intensity Distribution



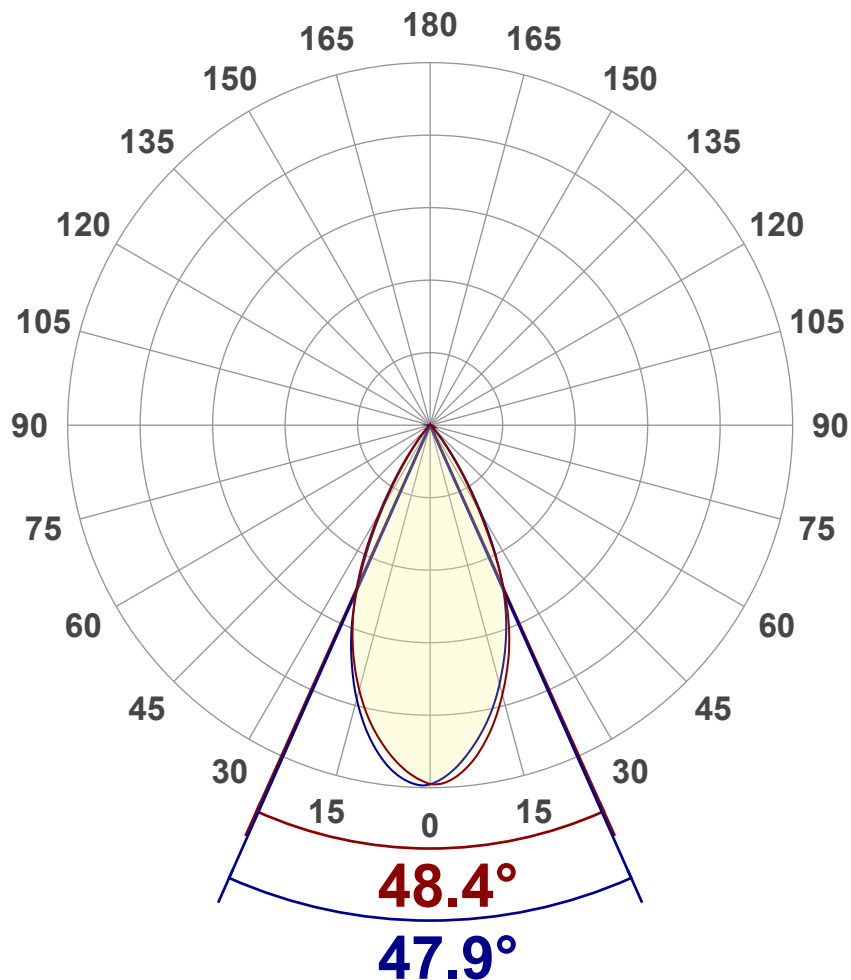
Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2327 lm
Peak Intensity	3821 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°
-------------	-------

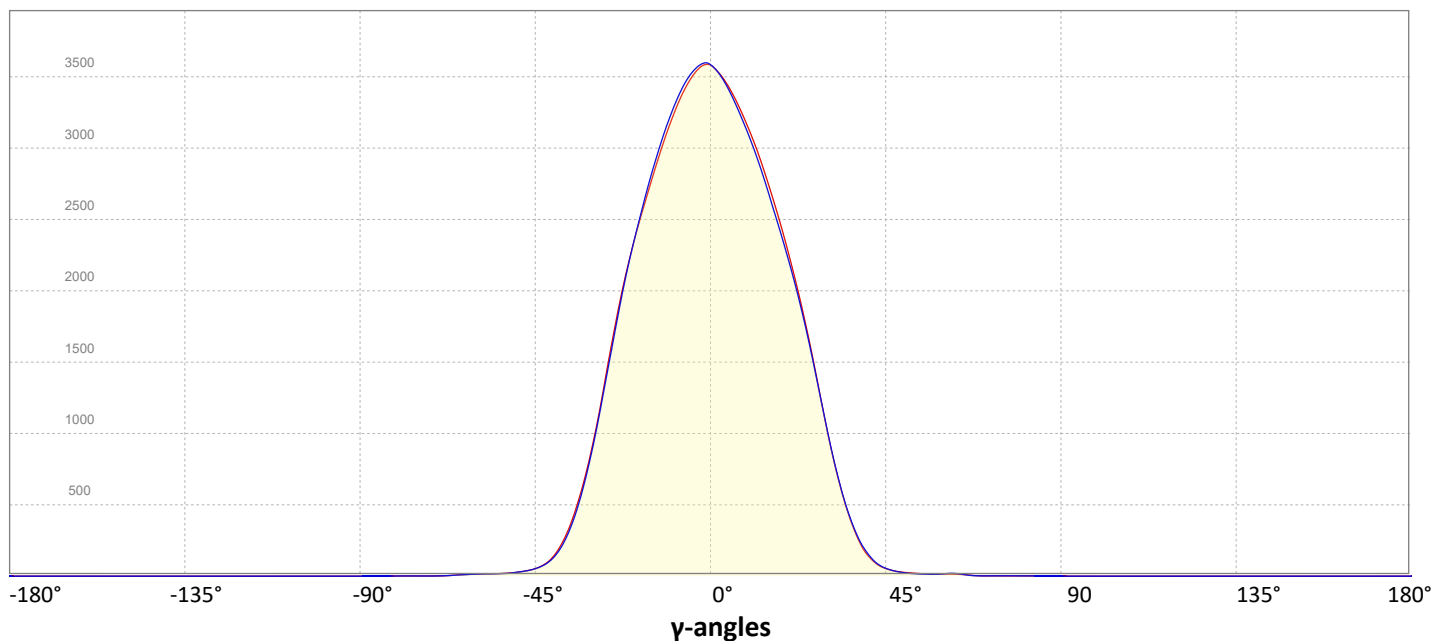
Intensity Ratio

In 120° cone	99.5%
In 90° cone	98.1%

C000-C180

C090-C270

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

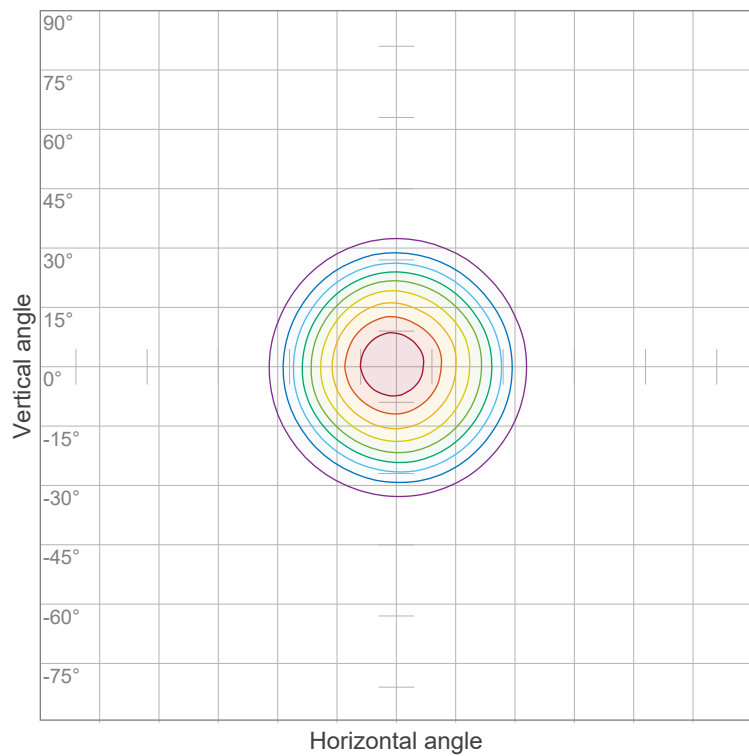


Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com



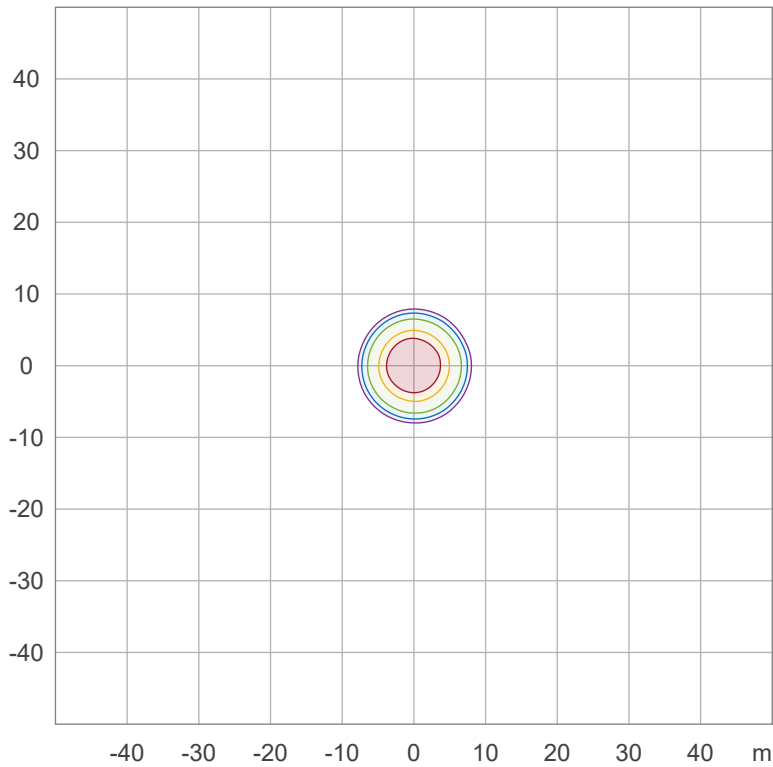
Iso-intensity Diagram (Iso-candela)



90 %	3434.2 cd
80 %	3052.7 cd
70 %	2671.1 cd
60 %	2289.5 cd
50 %	1907.9 cd
40 %	1526.3 cd
30 %	1144.7 cd
20 %	763.2 cd
10 %	381.6 cd

Peak intensity: 3815.8 cd
Number of c-planes: 32

Iso-illuminance Diagram (Iso-lux)



50.0 %	19.1 lx
30.0 %	11.4 lx
10.0 %	3.8 lx
5.0 %	1.9 lx
3.0 %	1.1 lx

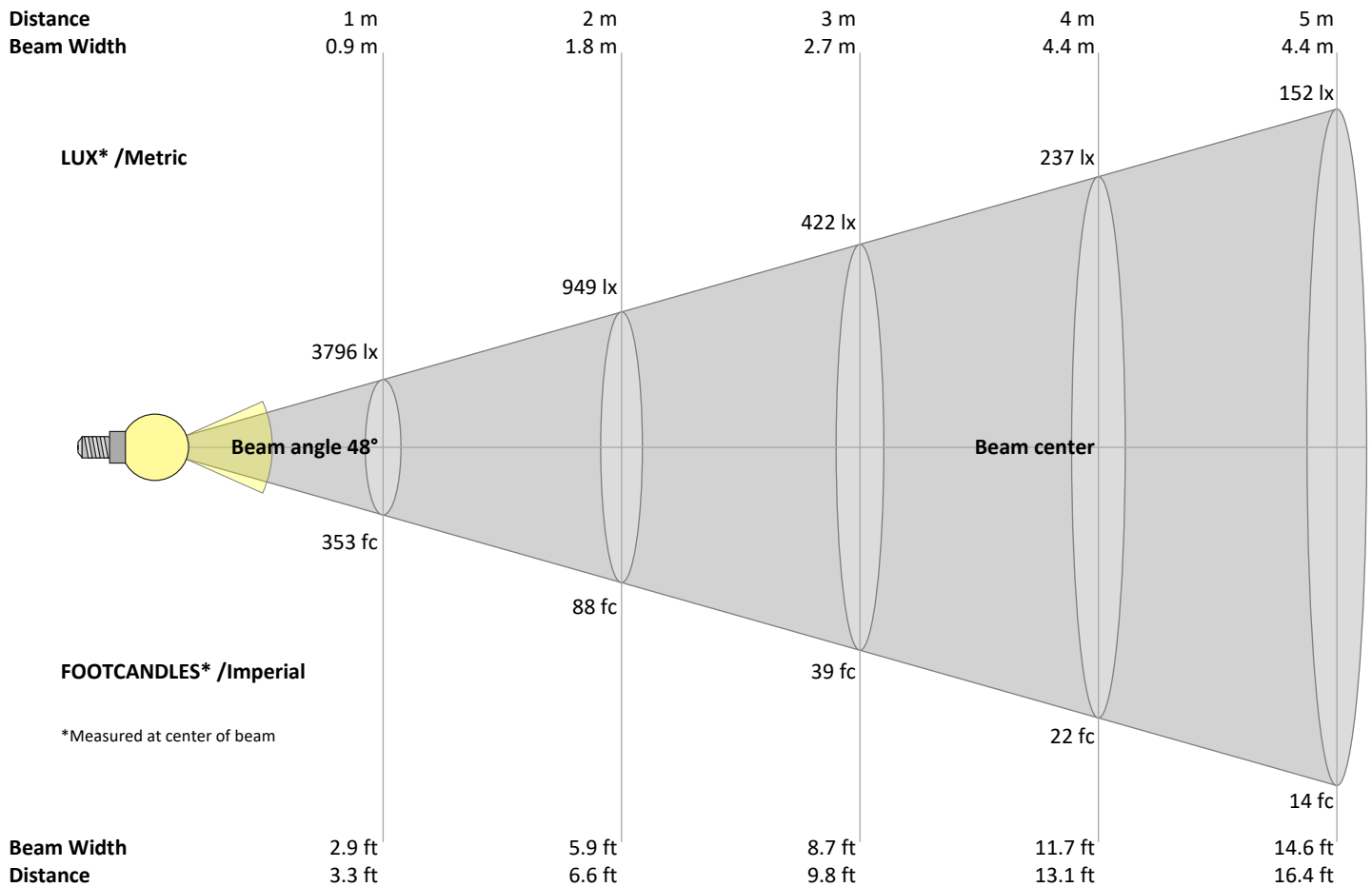
Peak illuminance: 38.1 lx
Mounting height: 10.0 m
Number of c-planes: 32

Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-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
3796	949	422	237	152	105	77	59	47	38	31	26	22	19	17	15	13	12	11	9	lux
352.6	88.2	39.2	22	14.1	9.8	7.2	5.5	4.4	3.5	2.9	2.4	2.1	1.8	1.6	1.4	1.2	1.1	1	0.9	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
3796	3794	3739	3650	3533	3389	3227	3047	2856	2659	2445	2206	1931	1627	1306	1015	762	553	382	253	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
3796	3738	3649	3534	3403	3261	3104	2930	2741	2551	2350	2136	1900	1640	1362	1084	827	606	426	285	cd
100%	98%	96%	93%	90%	86%	82%	77%	72%	67%	62%	56%	50%	43%	36%	29%	22%	16%	11%	8%	of 0°val

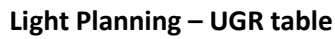
Intensities in 180° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
3796	3743	3665	3564	3443	3308	3158	2989	2807	2612	2401	2174	1927	1658	1366	1078	819	599	416	274	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
3796	3804	3763	3688	3579	3442	3282	3099	2901	2678	2446	2189	1898	1591	1284	993	740	527	360	236	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-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com

[illegible]

n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a

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	111	109	107	112	109	107	105	105	104	102	102	100	99	98	97	96	94
2	109	104	101	98	107	103	99	97	100	97	94	97	94	92	94	92	91	89
3	104	98	94	90	102	97	93	89	94	91	88	92	89	87	90	87	85	84
4	100	93	88	84	98	92	87	83	89	85	82	87	84	81	86	83	80	79
5	95	88	82	78	94	87	82	78	85	81	77	83	80	77	82	79	76	75
6	91	83	78	74	90	82	77	73	81	76	73	79	75	72	78	75	72	71
7	87	79	73	69	86	78	73	69	77	72	69	76	72	69	75	71	68	67
8	83	75	69	66	82	74	69	66	73	69	65	72	68	65	71	68	65	63
9	80	71	66	62	79	71	66	62	70	65	62	69	65	62	68	64	62	60
10	77	68	63	59	76	68	62	59	67	62	59	66	62	59	65	61	59	57

1_PHOT_REFLEKTER-L-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com

LAMPS (number of lamps)

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	339 lm	14.6%
10-20°	808 lm	34.7%
20-30°	788 lm	33.8%
30-40°	312 lm	13.4%
40-50°	51 lm	2.2%
50-60°	16 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	2327 lm	100.0%

Intensity peaks

Max intensity	3821 cd
Intensity, 90°	0 cd
Intensity, 0°	3796 cd

Zonal Lumen summary

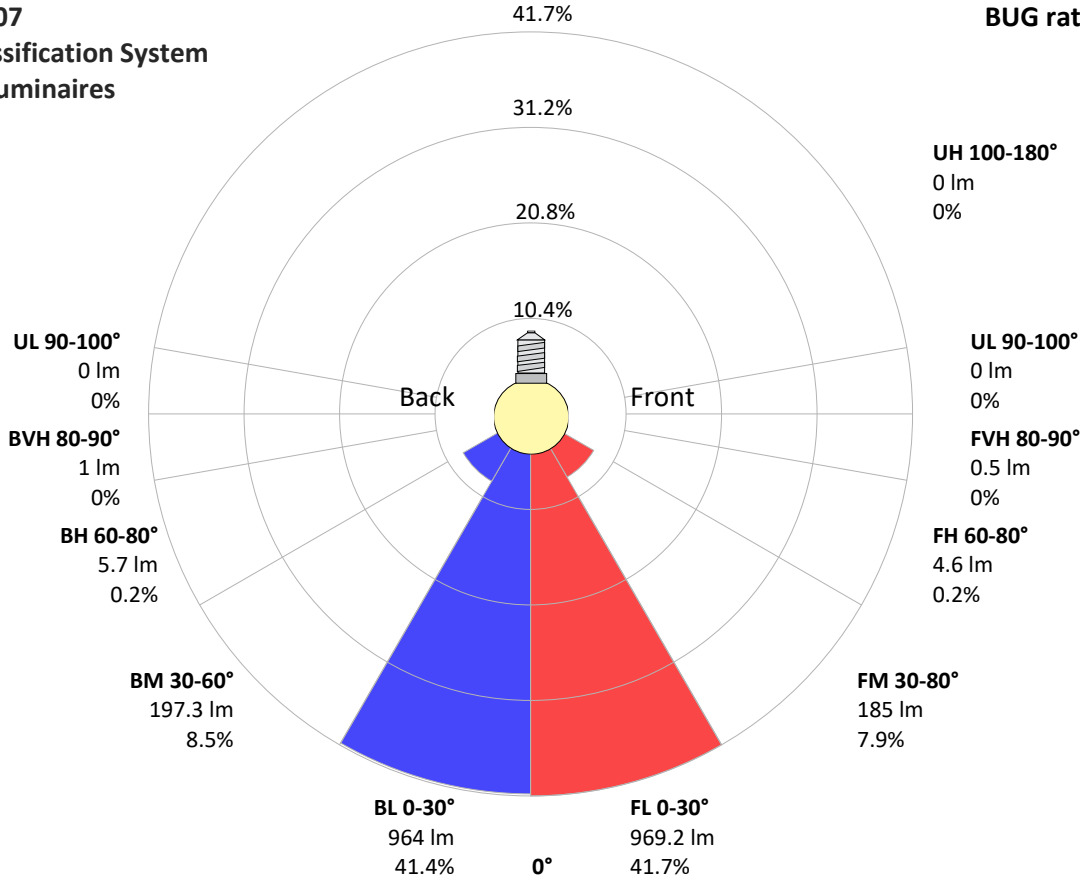
Zone (γ)	Lumen	% Total
0-30°	1935 lm	83.1%
0-40°	2247 lm	96.6%
0-60°	2315 lm	99.5%
60-90°	12 lm	0.5%
70-100°	3 lm	0.1%
90-120°	0 lm	0.0%
0-90°	2327 lm	100.0%
90-180°	0 lm	0.0%
0-180°	2327 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	969 lm	41.7%
Medium(30-60°)	185 lm	7.9%
High(60-80°)	5 lm	0.2%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	964 lm	41.4%
Medium(30-60°)	197 lm	8.5%
High(60-80°)	6 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-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com

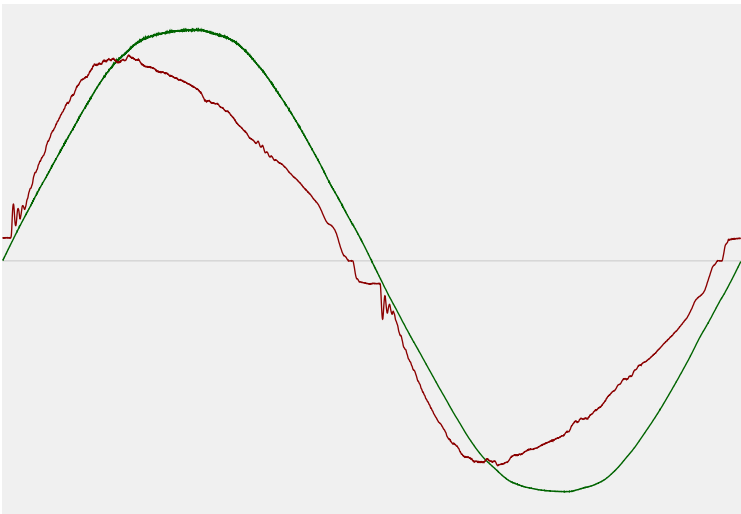


Power Details

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	20.4%
<div><div></div></div>	
Lumen efficiency	56 lm/W
<div><div></div></div>	

Goniophotometry Report

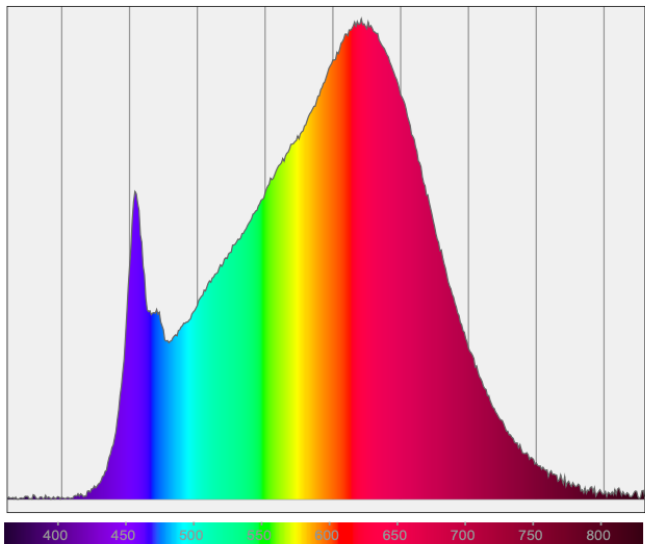
1_PHOT_REFLEKTER-L-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com



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		

Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-58Deg-HoneycombLouvre_2303
www.factorylux.com



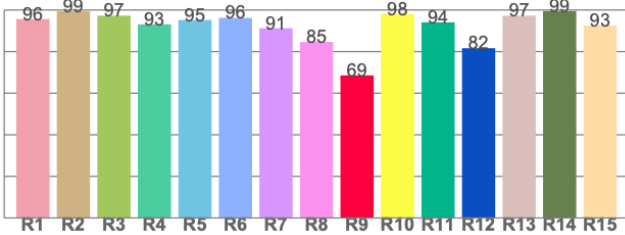
CIE 1931



CIE 1931 – zoomed on Planckian locus



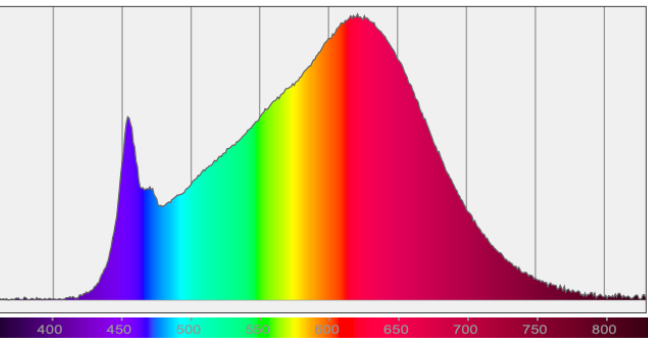
Color Rendering Index per reference color (CIE 1995)



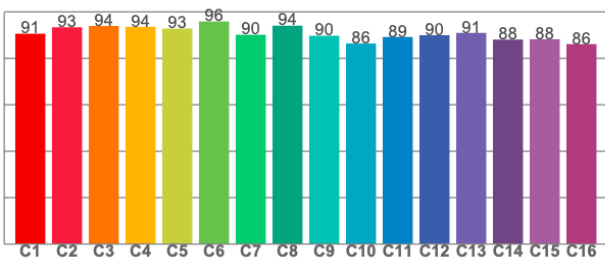
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
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%



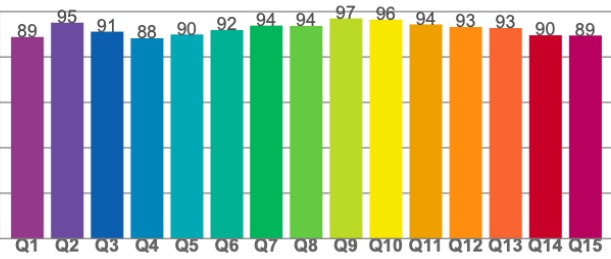
TM30-18 Rf-values per hue bin



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