

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

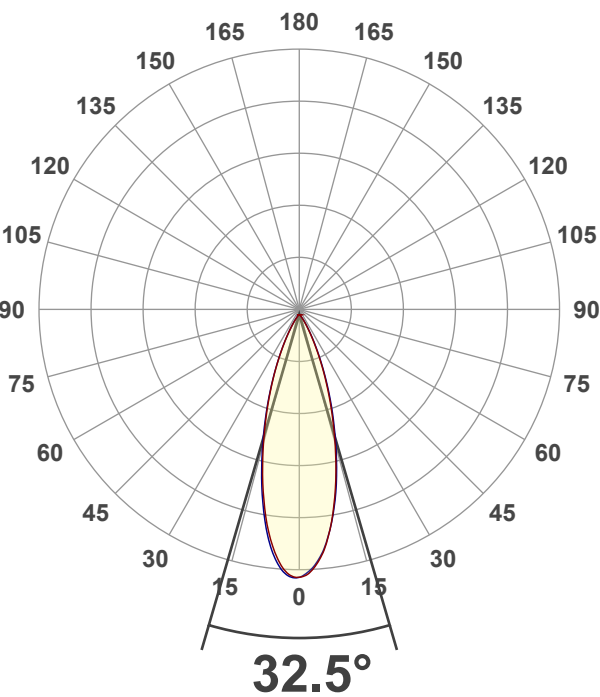
2362 lm

57 lm/W

6402 cd – 32.5°

CRI 92.6

Light Intensity Distribution



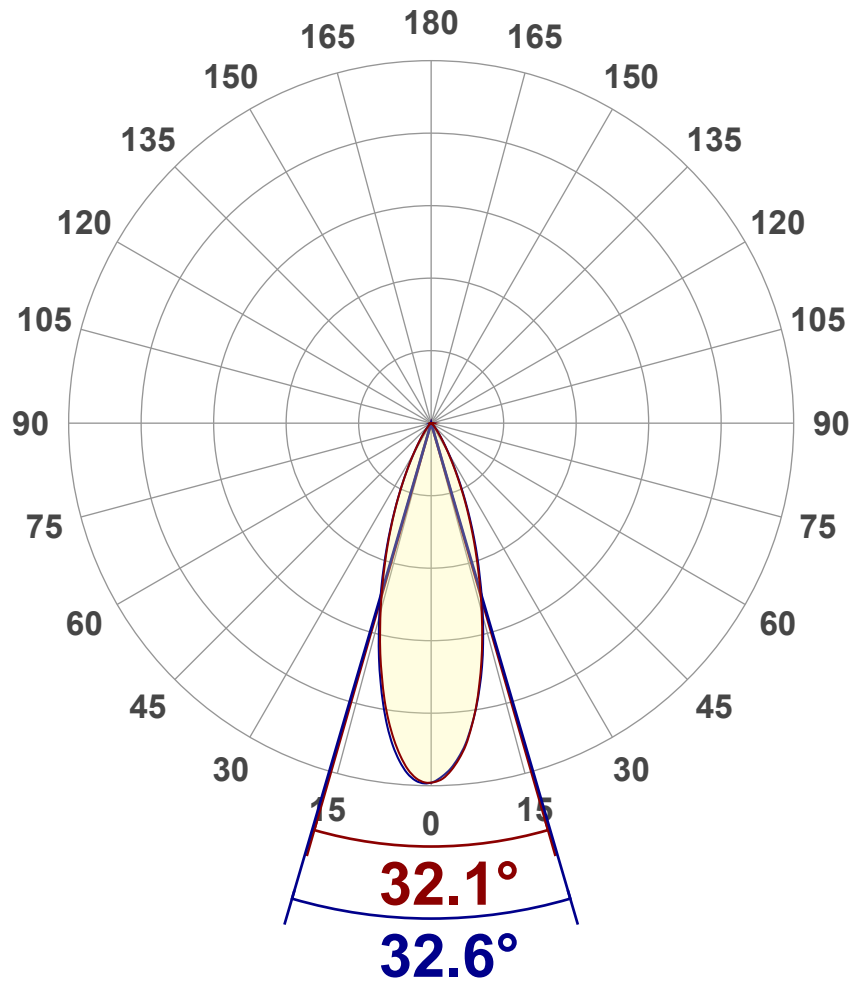
Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-HoneycombLouvre_2303
www.factorylux.com



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2362 lm
Peak Intensity	6402 cd
Beam Angle (50%)	32.5°
Beam Angle (90%)	32.6°
Beam Angle (10%)	32.1°

Cut-off Angle

Average 2,5%	77.3°
--------------	-------

Field Angle

Average 10%	59.6°
-------------	-------

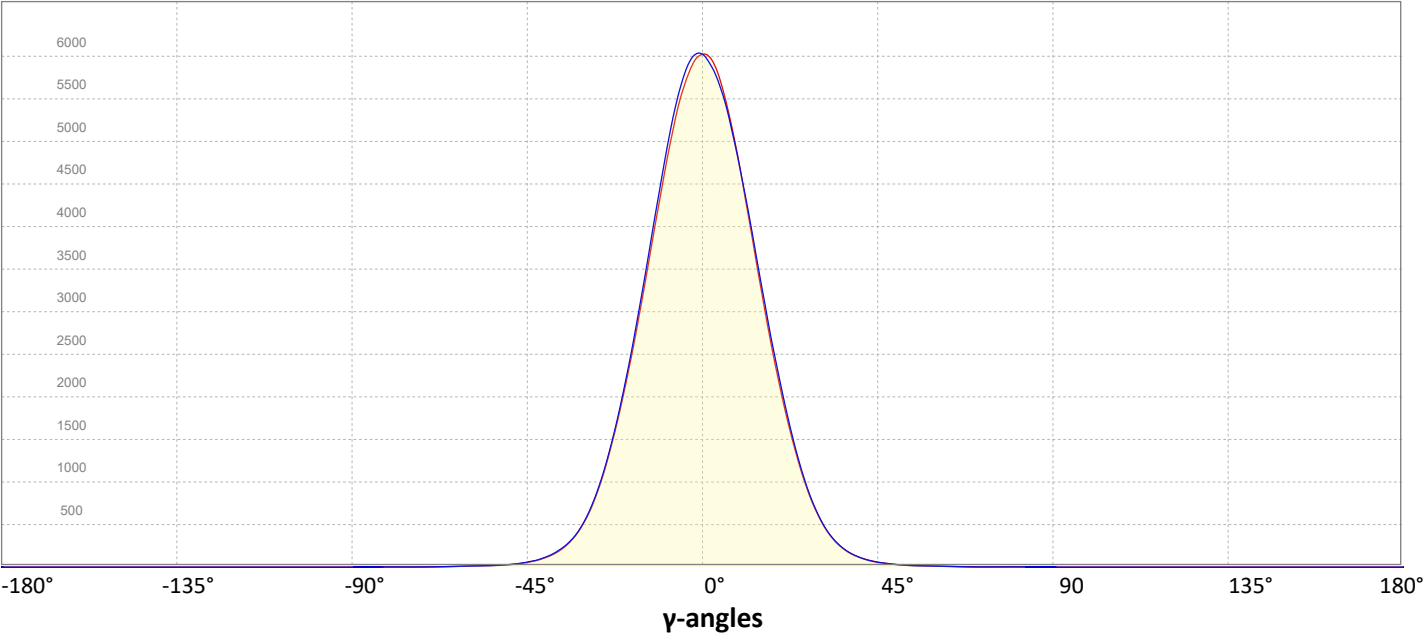
Intensity Ratio

In 120° cone	99.4%
In 90° cone	98.0%

C000-C180

C090-C270

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

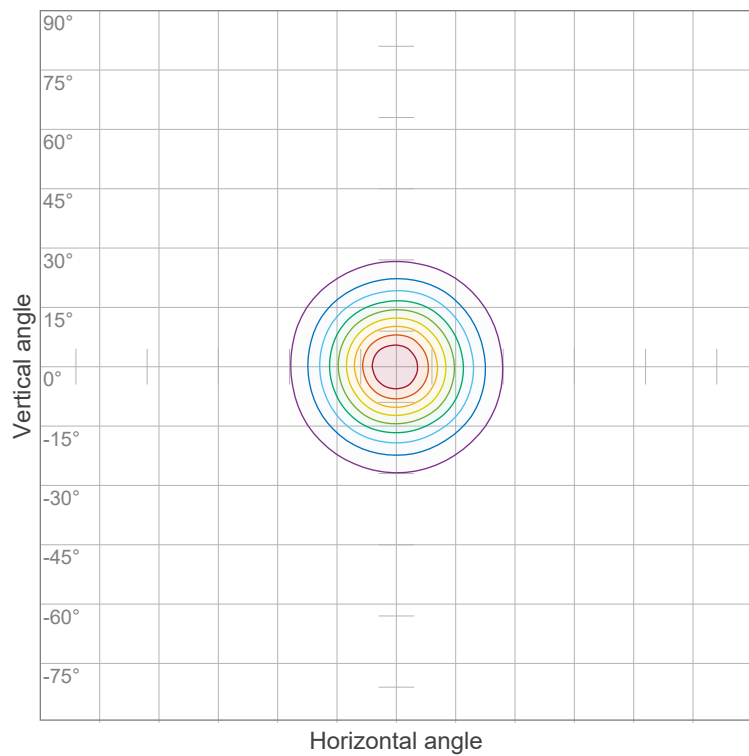


Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-HoneycombLouvre_2303
www.factorylux.com



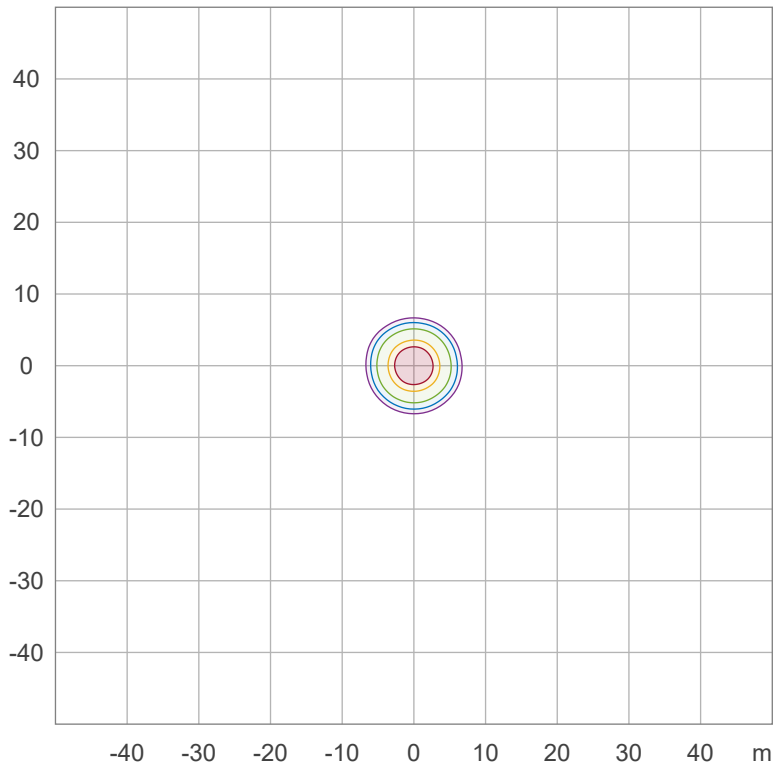
Iso-intensity Diagram (Iso-candela)



90 %	5759.2 cd
80 %	5119.3 cd
70 %	4479.4 cd
60 %	3839.5 cd
50 %	3199.6 cd
40 %	2559.7 cd
30 %	1919.7 cd
20 %	1279.8 cd
10 %	639.9 cd

Peak intensity: 6399.2 cd
Number of c-planes: 32

Iso-illuminance Diagram (Iso-lux)



50.0 %	32.0 lx
30.0 %	19.2 lx
10.0 %	6.4 lx
5.0 %	3.2 lx
3.0 %	1.9 lx

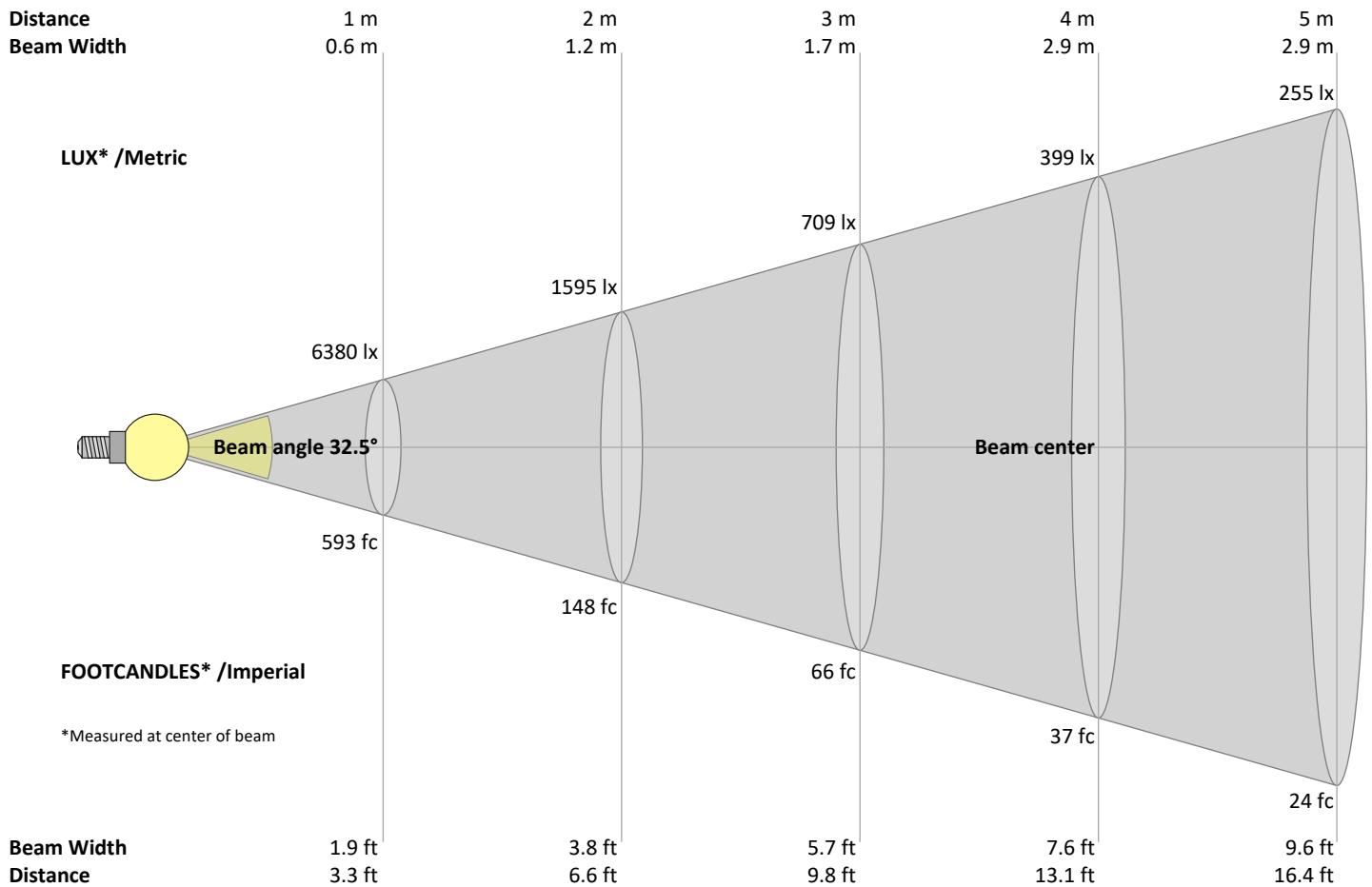
Peak illuminance: 64.0 lx
Mounting height: 10.0 m
Number of c-planes: 32

Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-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
6380	1595	709	399	255	177	130	100	79	64	53	44	38	33	28	25	22	20	18	16	lux
592.7	148.2	65.9	37	23.7	16.5	12.1	9.3	7.3	5.9	4.9	4.1	3.5	3	2.6	2.3	2.1	1.8	1.6	1.5	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
6380	6305	6084	5777	5341	4837	4302	3745	3201	2685	2215	1783	1408	1076	807	597	433	318	230	168	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
6380	6258	6046	5749	5335	4869	4365	3819	3283	2761	2290	1849	1459	1122	845	626	453	332	240	175	cd
100%	98%	95%	90%	84%	76%	68%	60%	51%	43%	36%	29%	23%	18%	13%	10%	7%	5%	4%	3%	of 0°val

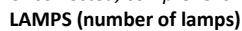
Intensities in 180° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
6380	6334	6140	5797	5370	4863	4313	3747	3201	2683	2218	1795	1421	1099	830	618	451	325	236	171	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
6380	6371	6221	5910	5493	4977	4421	3843	3285	2748	2261	1817	1426	1096	822	604	441	322	240	177	cd
100%	100%	98%	93%	86%	78%	69%	60%	51%	43%	35%	28%	22%	17%	13%	9%	7%	5%	4%	3%	of 0°val

1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-HoneycombLouvre_2303
www.factorylux.com



Zonal Lumen Summary

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	536 lm	22.7%
10-20°	964 lm	40.8%
20-30°	591 lm	25.0%
30-40°	190 lm	8.0%
40-50°	51 lm	2.2%
50-60°	17 lm	0.7%
60-70°	7 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	2362 lm	100.0%

Intensity peaks

Max intensity	6402 cd
Intensity, 90°	0 cd
Intensity, 0°	6380 cd

Zonal Lumen summary

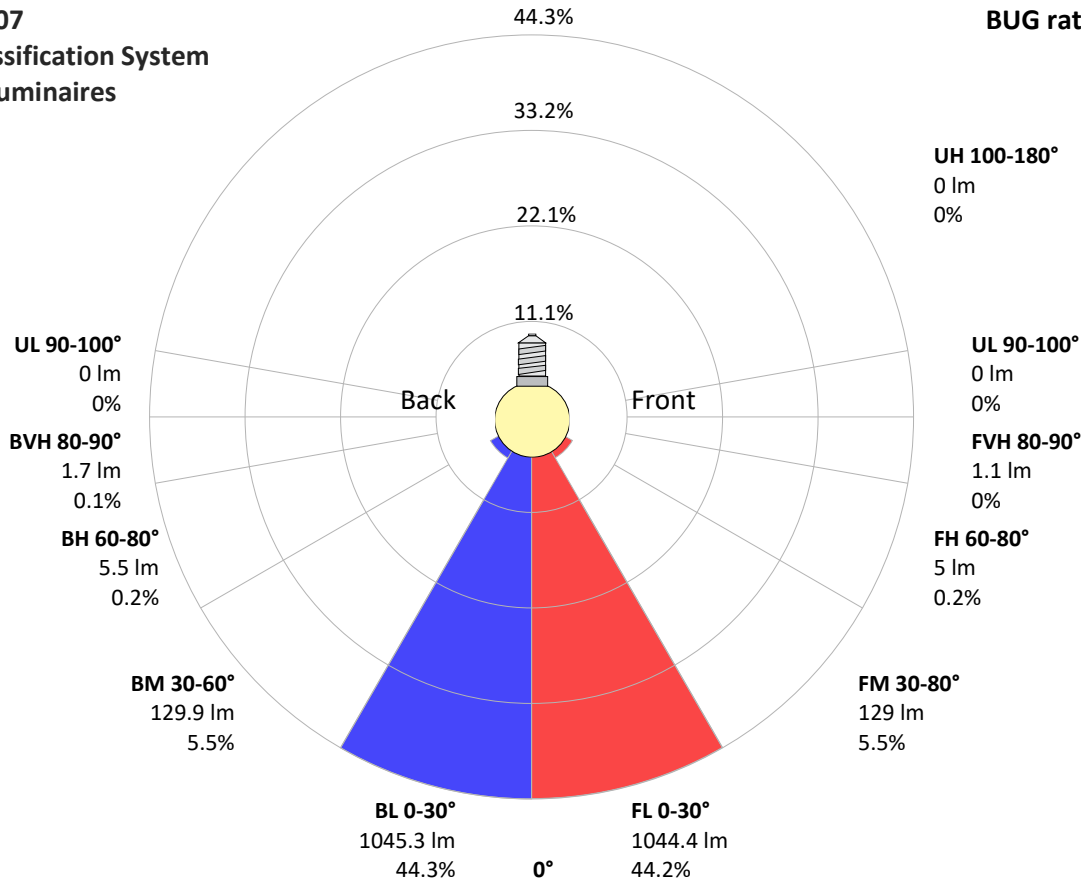
Zone (γ)	Lumen	% Total
0-30°	2091 lm	88.5%
0-40°	2281 lm	96.6%
0-60°	2349 lm	99.4%
60-90°	13 lm	0.6%
70-100°	6 lm	0.2%
90-120°	0 lm	0.0%
0-90°	2362 lm	100.0%
90-180°	0 lm	0.0%
0-180°	2362 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1044 lm	44.2%
Medium(30-60°)	129 lm	5.5%
High(60-80°)	5 lm	0.2%
Very high(80-90°)	1 lm	0.0%
Back light		
Low(0-30°)	1045 lm	44.3%
Medium(30-60°)	130 lm	5.5%
High(60-80°)	5 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



Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-HoneycombLouvre_2303
www.factorylux.com

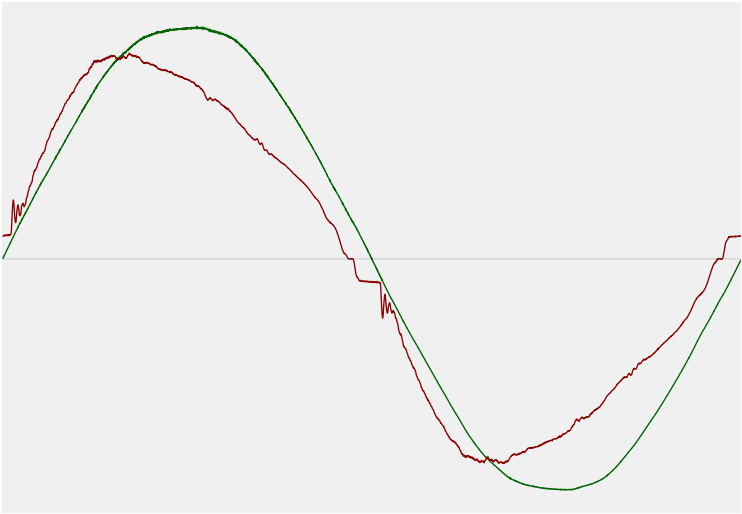


Power Details

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	20.7%
Lumen efficiency	57 lm/W

Goniophotometry Report

1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-HoneycombLouvre_2303
www.factorylux.com



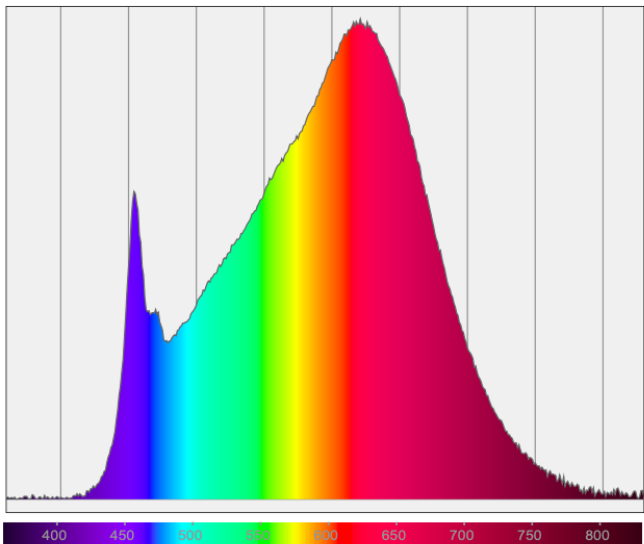
Color Measurements

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

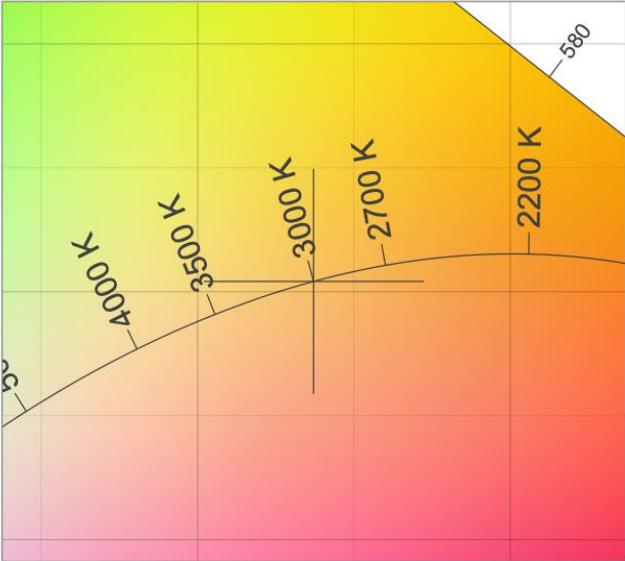
1_PHOT_REFLEKTER-L-4300lmChip-3000K-38Deg-HoneycombLouvre_2303
www.factorylux.com



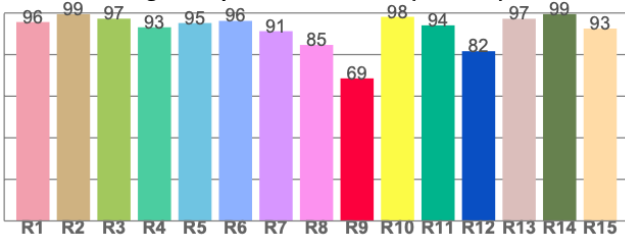
CIE 1931



CIE 1931 – zoomed on Planckian locus



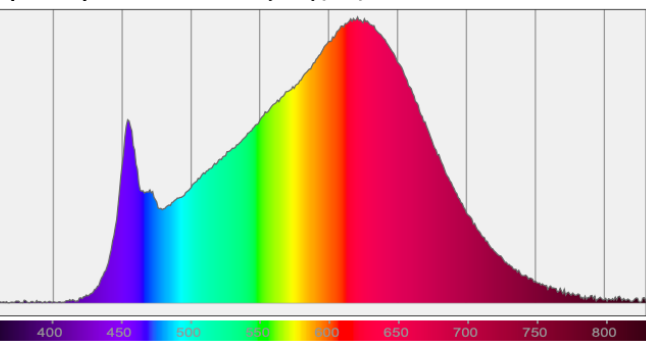
Color Rendering Index per reference color (CIE 1995)



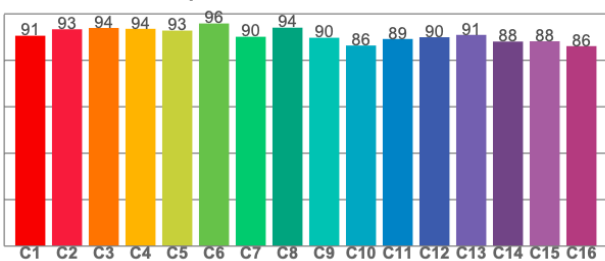
CRI R values, only R1-R8 are used to calculate final CRI value

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%



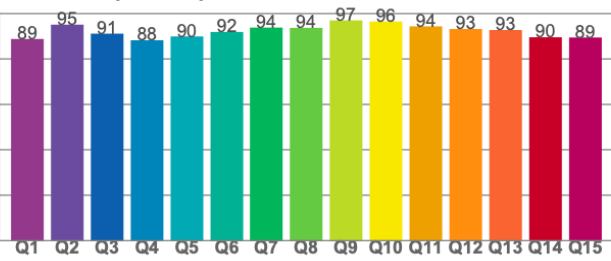
TM30-18 Rf-values per hue bin



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