

Tested Light Source - 1\_PHOT\_SKIN+BONES-4750lmChip-4000K-WallWash-HoneycombLouvre\_2309

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

24 planes – 15°

2°

1.50 m

40.7 W – PF 0.97 – DPF 0.97

241 V – 0.175 A

49.9 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

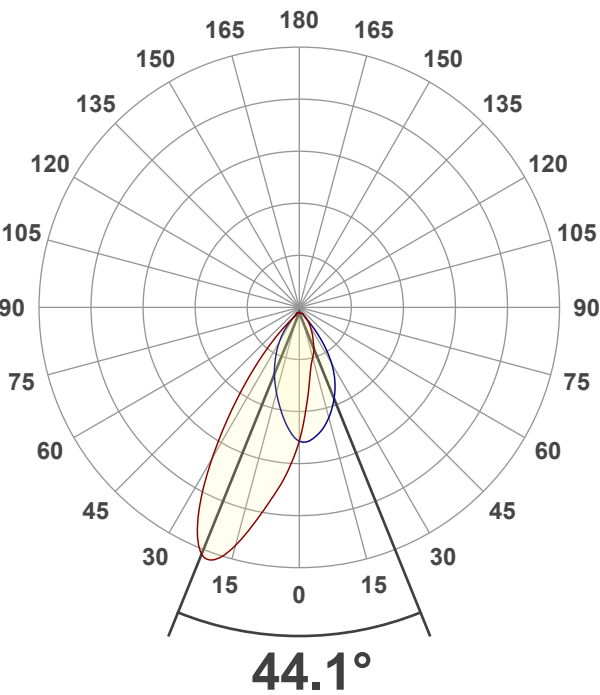
1310 lm

32 lm/W

2092 cd – 44.1°

CRI 91.4

Light Intensity Distribution



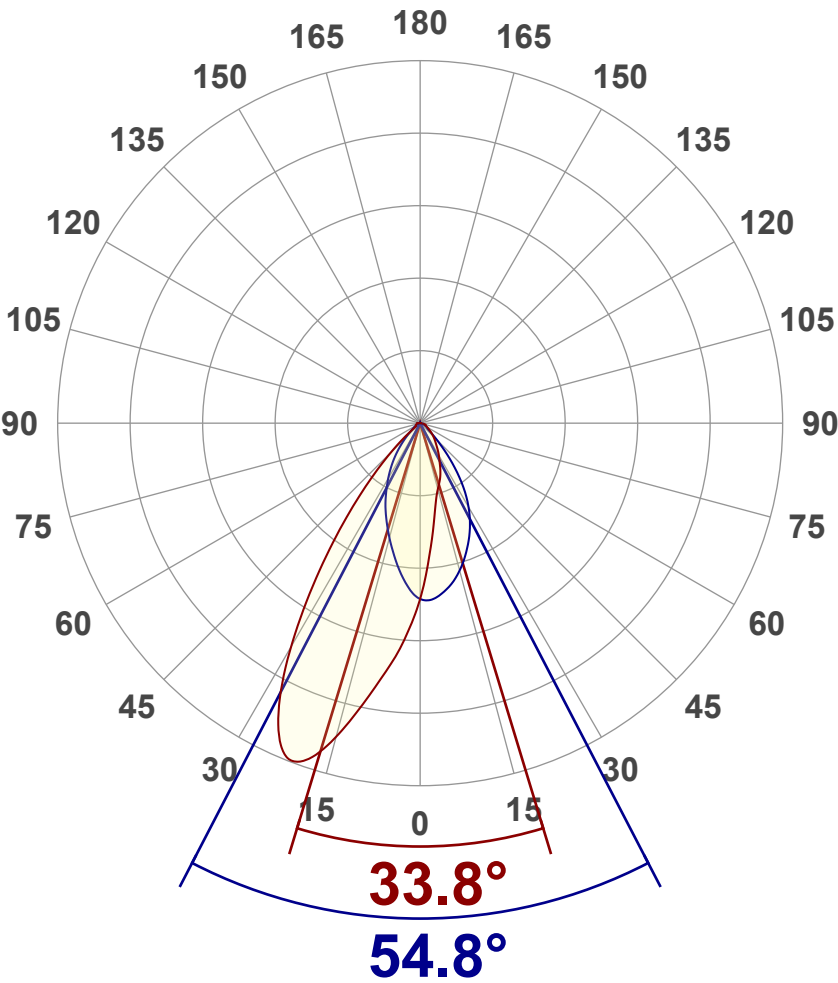
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	1310 lm
Peak Intensity	2092 cd
Beam Angle (50%)	44.1°
Beam Angle (90%)	54.8°
Beam Angle (10%)	33.2°

Cut-off Angle

Average 2,5%	114.7°
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Field Angle

Average 10%	85.5°
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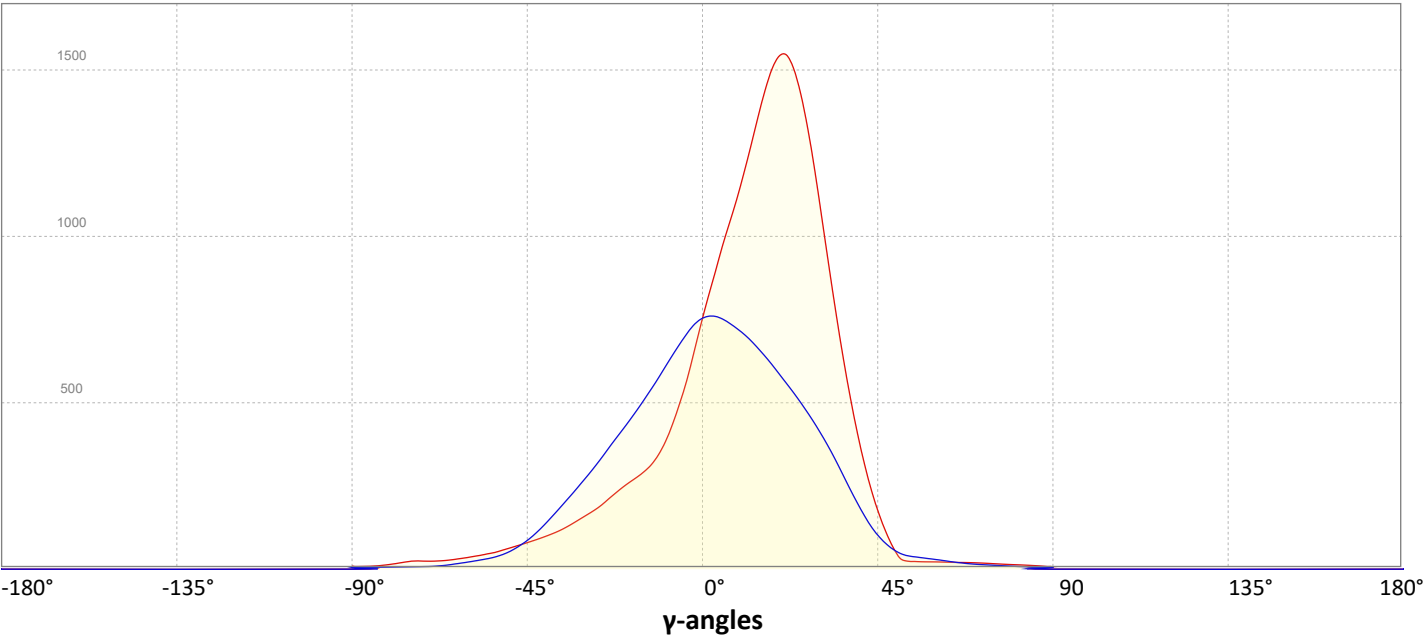
Intensity Ratio

In 120° cone	95.9%
In 90° cone	89.4%

C000-C180

C090-C270

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

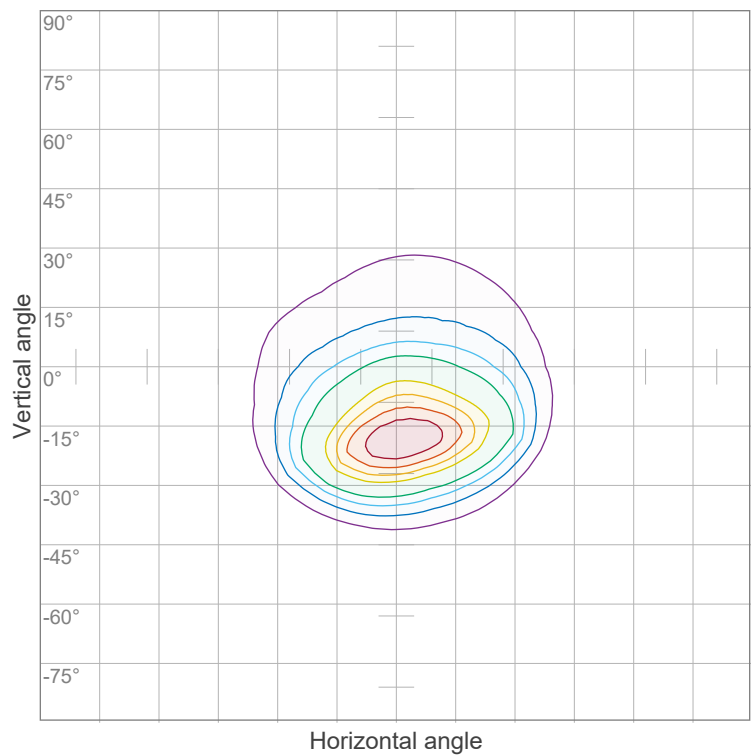


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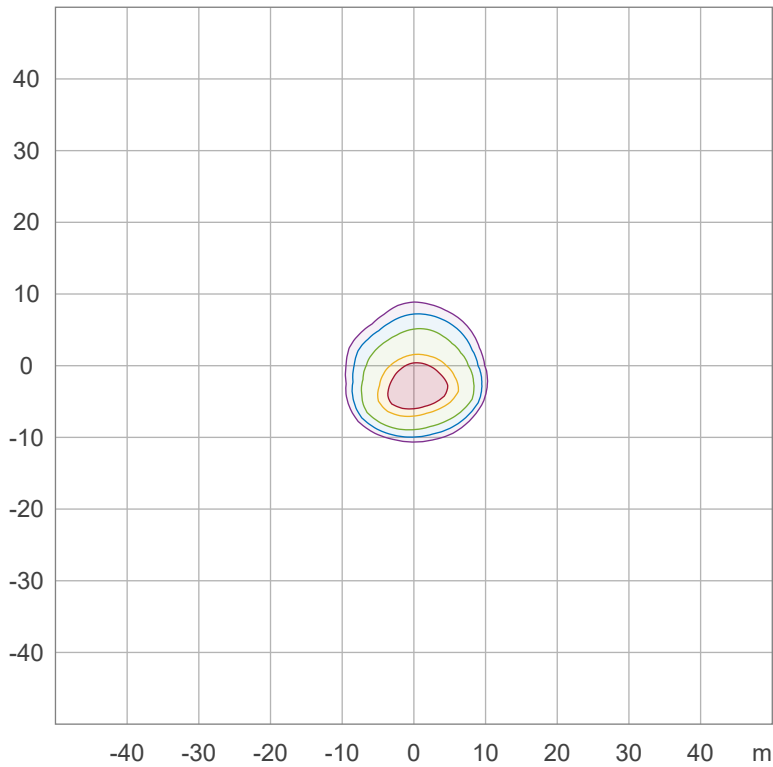
## Iso-intensity Diagram (Iso-candela)



90 %	1882.1 cd
80 %	1672.9 cd
70 %	1463.8 cd
60 %	1254.7 cd
50 %	1045.6 cd
40 %	836.5 cd
30 %	627.4 cd
20 %	418.2 cd
10 %	209.1 cd

Peak intensity: 2091.2 cd  
Number of c-planes: 24

## Iso-illuminance Diagram (Iso-lux)



50.0 %	8.8 lx
30.0 %	5.3 lx
10.0 %	1.8 lx
5.0 %	0.9 lx
3.0 %	0.5 lx

Peak illuminance: 17.5 lx  
Mounting height: 10.0 m  
Number of c-planes: 24

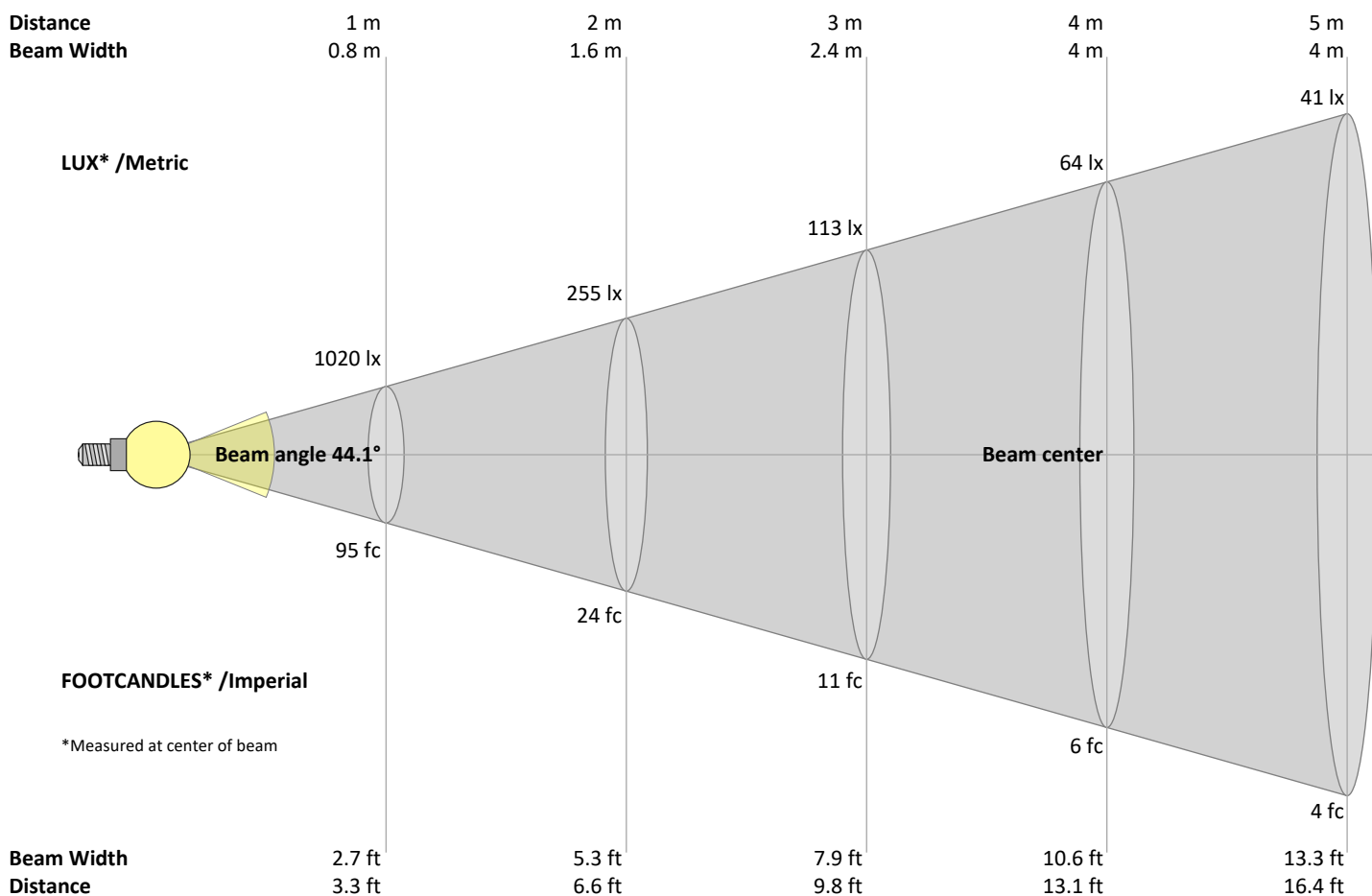
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## Beam Details



### 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
1020	255	113	64	41	28	21	16	13	10	8	7	6	5	5	4	4	3	3	3	lux
94.7	23.7	10.5	5.9	3.8	2.6	1.9	1.5	1.2	0.9	0.8	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	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
1020	894	770	668	578	504	450	412	384	361	339	314	287	260	237	218	199	180	162	148	cd
100%	88%	75%	65%	57%	49%	44%	40%	38%	35%	33%	31%	28%	25%	23%	21%	19%	18%	16%	15%	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
1020	1029	1024	1010	989	964	936	903	867	829	788	747	704	660	612	562	508	449	386	323	cd
100%	101%	100%	99%	97%	95%	92%	89%	85%	81%	77%	73%	69%	65%	60%	55%	50%	44%	38%	32%	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
1020	1137	1250	1360	1464	1575	1696	1823	1944	2040	2089	2079	2003	1873	1701	1498	1283	1071	873	695	cd
100%	112%	123%	133%	144%	154%	166%	179%	191%	200%	205%	204%	196%	184%	167%	147%	126%	105%	86%	68%	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
1020	996	958	912	863	812	761	713	666	621	578	537	494	451	410	371	334	297	261	225	cd
100%	98%	94%	89%	85%	80%	75%	70%	65%	61%	57%	53%	48%	44%	40%	36%	33%	29%	26%	22%	of 0°val

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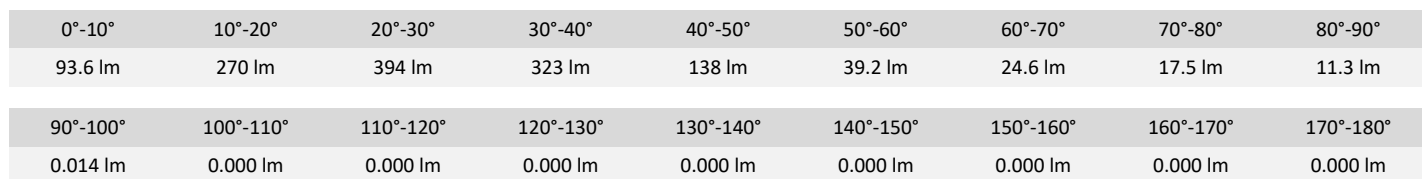
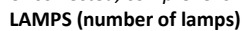
*Uncorrected, comprehensive UGR table according to 117-1995*

[illegible]

### 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	112	109	106	103	110	107	104	102	103	101	99	99	97	96	96	94	93	91
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	85	83
3	99	92	86	82	97	91	85	81	88	83	80	85	82	78	83	80	77	75
4	94	85	79	74	92	84	78	73	82	76	72	79	75	72	78	74	71	69
5	88	79	72	67	86	78	71	67	76	70	66	74	69	66	72	68	65	63
6	83	73	66	61	81	72	66	61	71	65	61	69	64	60	68	63	60	58
7	78	68	61	56	77	67	61	56	66	60	56	65	59	56	63	59	55	54
8	74	63	57	52	73	63	56	52	62	56	52	61	55	51	59	55	51	50
9	70	59	53	48	69	59	52	48	58	52	48	57	52	48	56	51	48	46
10	66	56	49	45	65	55	49	45	54	49	45	53	48	45	53	48	44	43

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	94 lm	7.1%
10-20°	270 lm	20.6%
20-30°	394 lm	30.1%
30-40°	323 lm	24.6%
40-50°	138 lm	10.5%
50-60°	39 lm	3.0%
60-70°	25 lm	1.9%
70-80°	18 lm	1.3%
80-90°	11 lm	0.9%
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	1310 lm	100.0%

Intensity peaks

Max intensity	2092 cd
Intensity, 90°	8 cd
Intensity, 0°	1020 cd

Zonal Lumen summary

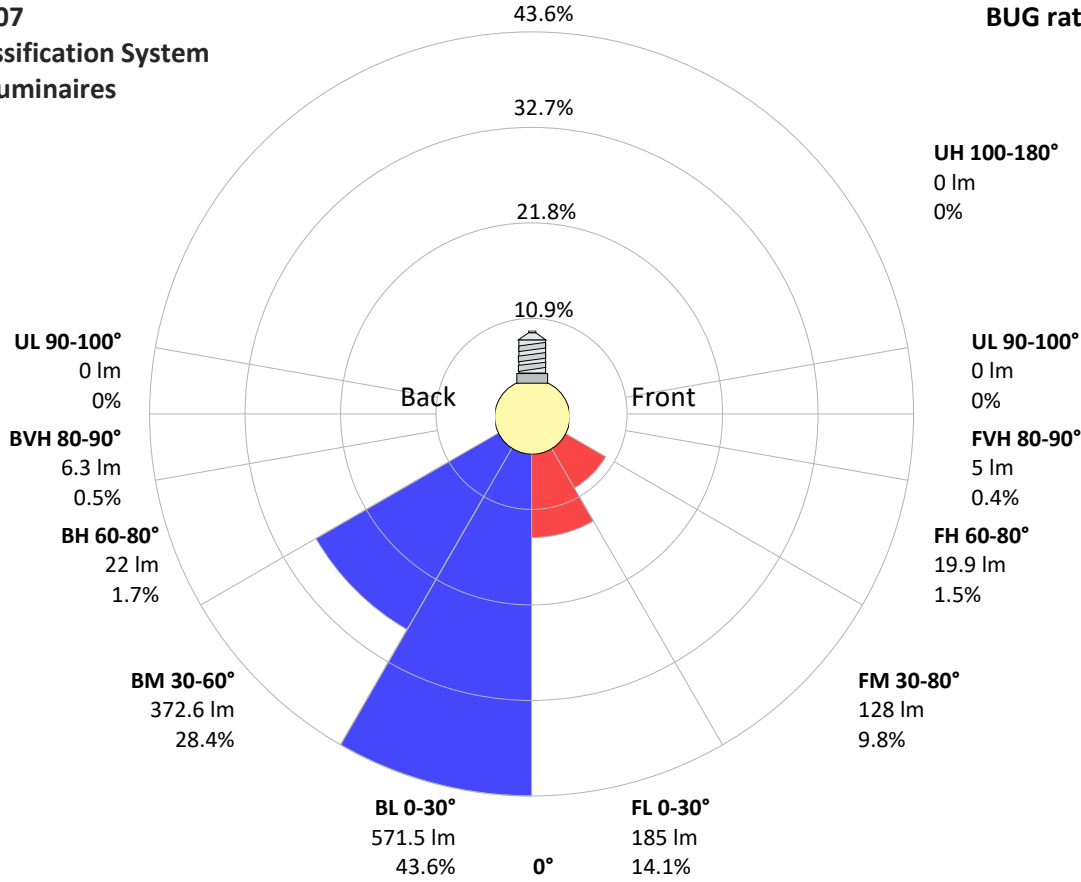
Zone (γ)	Lumen	% Total
0-30°	757 lm	57.8%
0-40°	1080 lm	82.4%
0-60°	1257 lm	95.9%
60-90°	53 lm	4.1%
70-100°	29 lm	2.2%
90-120°	0 lm	0.0%
0-90°	1310 lm	100.0%
90-180°	0 lm	0.0%
0-180°	1310 lm	100.0%

BUG rating

	Lumen	% Total
<b>Forward light</b>		
Low(0-30°)	185 lm	14.1%
Medium(30-60°)	128 lm	9.8%
High(60-80°)	20 lm	1.5%
Very high(80-90°)	5 lm	0.4%
<b>Back light</b>		
Low(0-30°)	572 lm	43.6%
Medium(30-60°)	373 lm	28.4%
High(60-80°)	22 lm	1.7%
Very high(80-90°)	6 lm	0.5%
<b>Uplight</b>		
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

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## Power Details

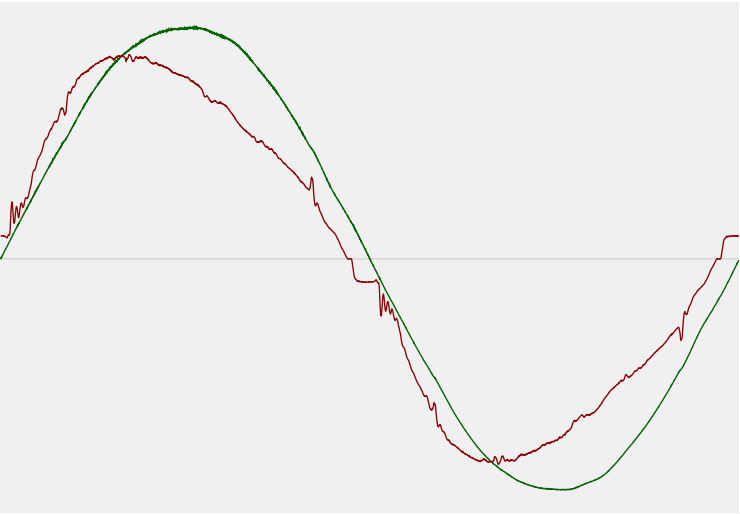
### Input Power

Power feed to light source	40.7 W
Frequency of input power	49.9 Hz
RMS Input voltage feed, $V_{RMS}$	241 V
RMS Input current feed, $I_{RMS}$	0.175 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	42.03 VA
Displacement factor of AC power feed	0.97
Power factor of AC current feed	0.97
Total harmonic distortion of the current	10.79%
Total harmonic distortion of the voltage	1.1%

### Efficiency

Radiated power efficiency	11.7%
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Lumen efficiency	32 lm/W
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### Input Power Curve



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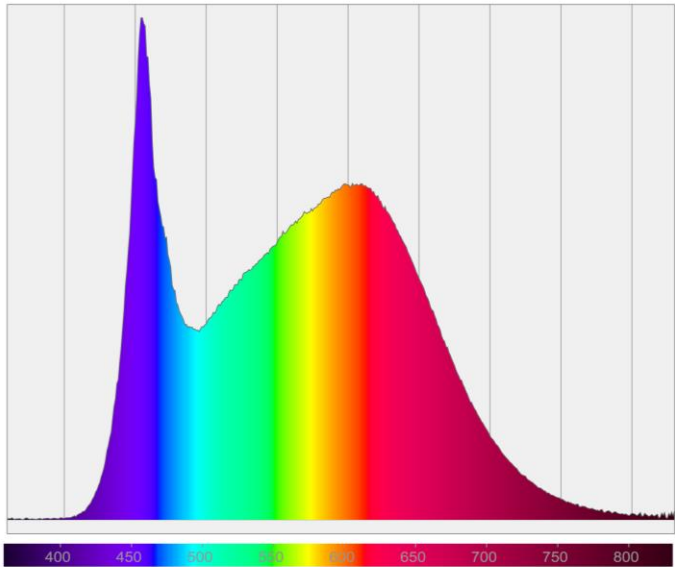
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## Color Measurements

Correlated Color Temperature	CCT = 4000 K
Color Rendering TM30-18	R <sub>f</sub> 88.9 — R <sub>g</sub> 98.5
Color Shift, CIE duv	Duv ±0.0003

## Spectral distribution

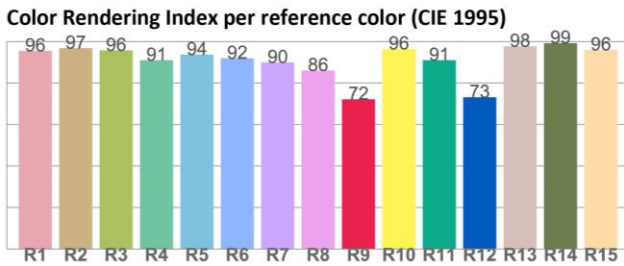
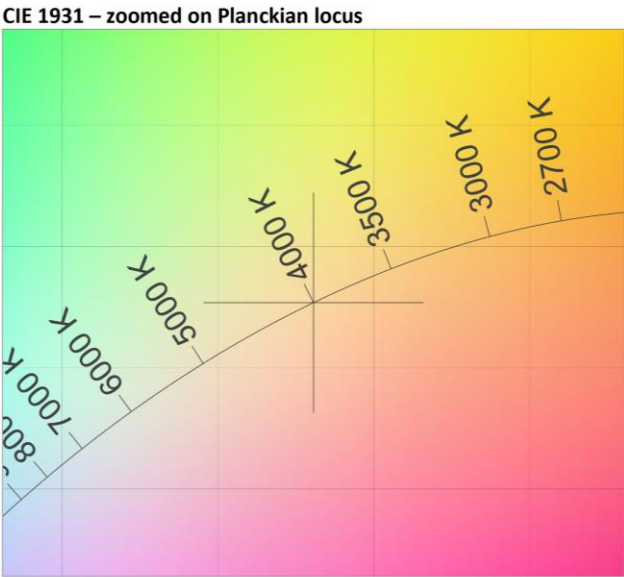
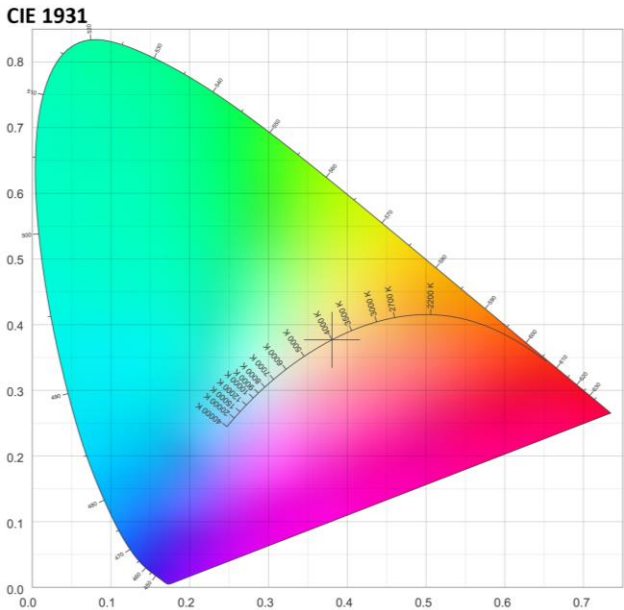


## Color details

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 <sub>f</sub> 88.9 — R <sub>g</sub> 98.5	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.225;0.225)
Color Quality Scale	CQS = 88.9		

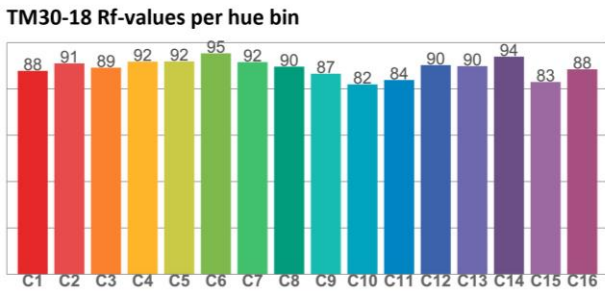
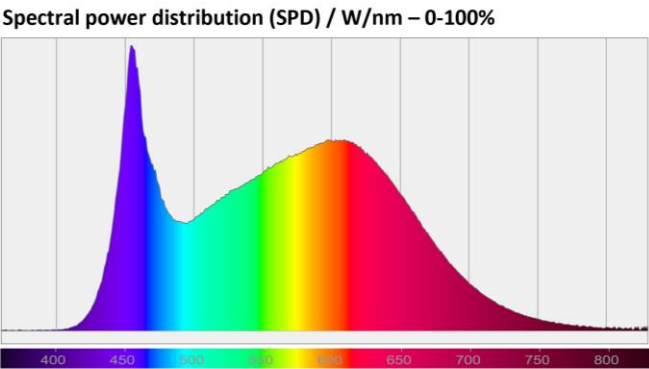
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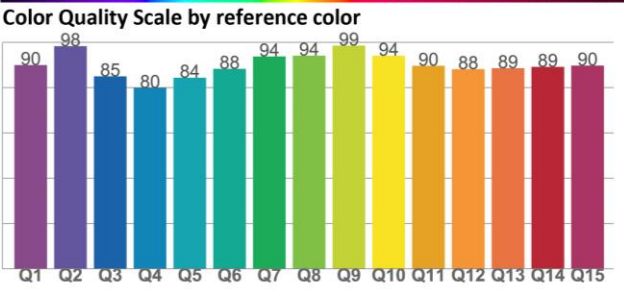
CRI R values, only R1-R8 are used to calculate final CRI value

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 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



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