

Tested Light Source - 1\_PHOT\_NINETY-NINE-1925lmChip-4000K-WallWash-HoneycombLouvre\_2309

Laboratory and Equipment

Laboratory Owner and Location	Factorylux, Greenhill Mills, Hebden Bridge, HX7 5QF, UK
Goniospectrometer System and Type	BaseSpion – Type C, horizontal
Spectrometer Manufacturer and Model	Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

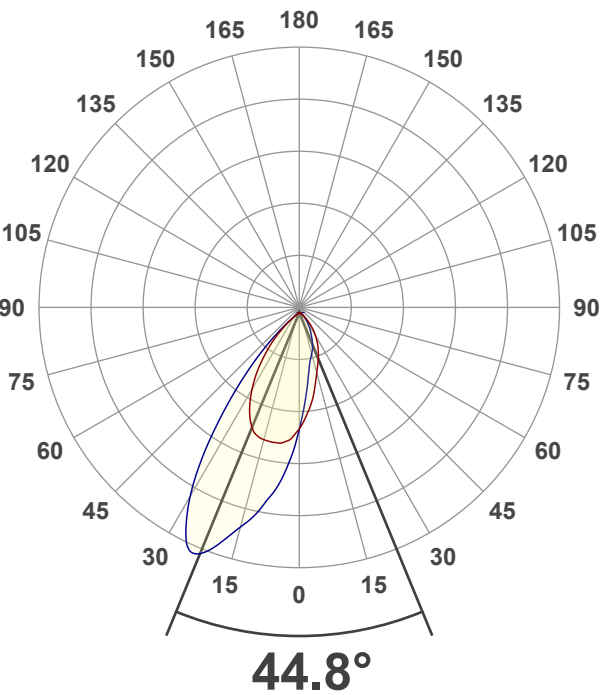
Measurement Conditions

Number of C-planes and Resolution	24 planes – 15°
γ (gamma)-Resolution	1.5°
Test Distance	1.50 m
Input Power, Power and Displ. Factors	13.4 W – PF 0.98 – DPF 0.99
Input RMS Voltage and Current	240 V – 0.057 A
Frequency of Input Power	50.1 Hz

Main Light Measurement Results

Output	511 lm
Efficiency	38 lm/W
Peak Intensity and Beam Angle	829 cd – 44.8°
Color Rendering Index	CRI 92.4

Light Intensity Distribution



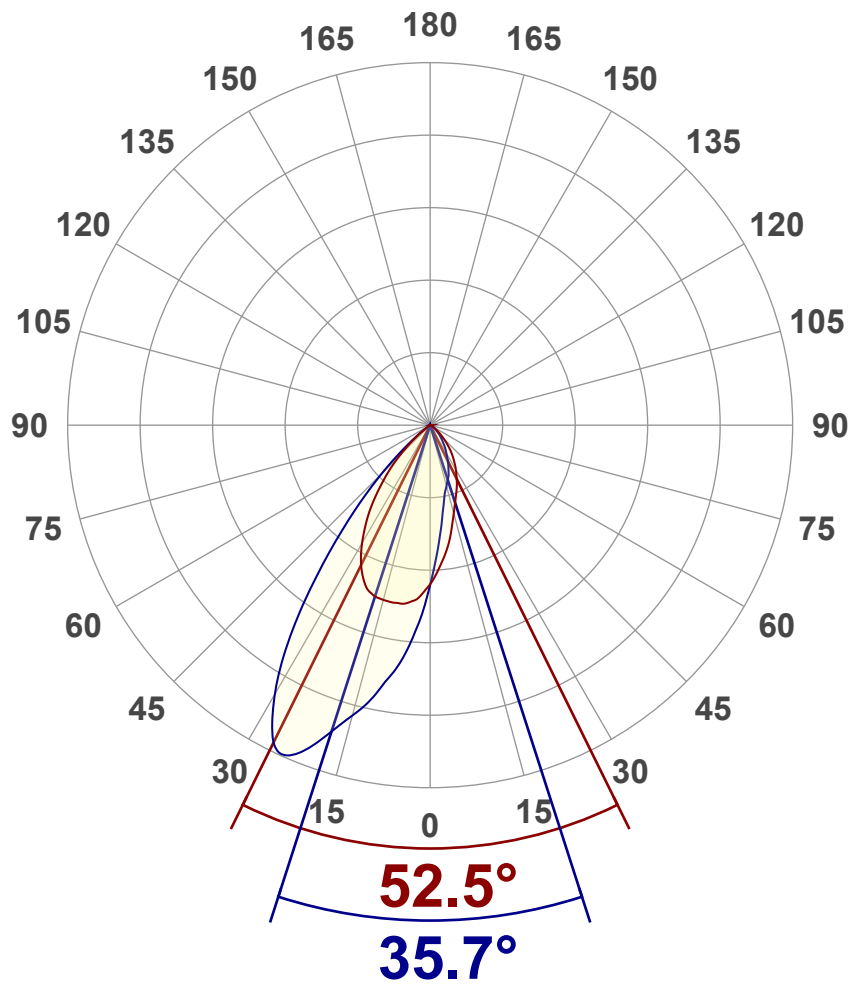
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	511 lm
Peak Intensity	829 cd
Beam Angle (50%)	44.8°
Beam Angle (90%)	35.7°
Beam Angle (10%)	57.8°

Cut-off Angle

Average 2,5%	107.1°
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Field Angle

Average 10%	86.7°
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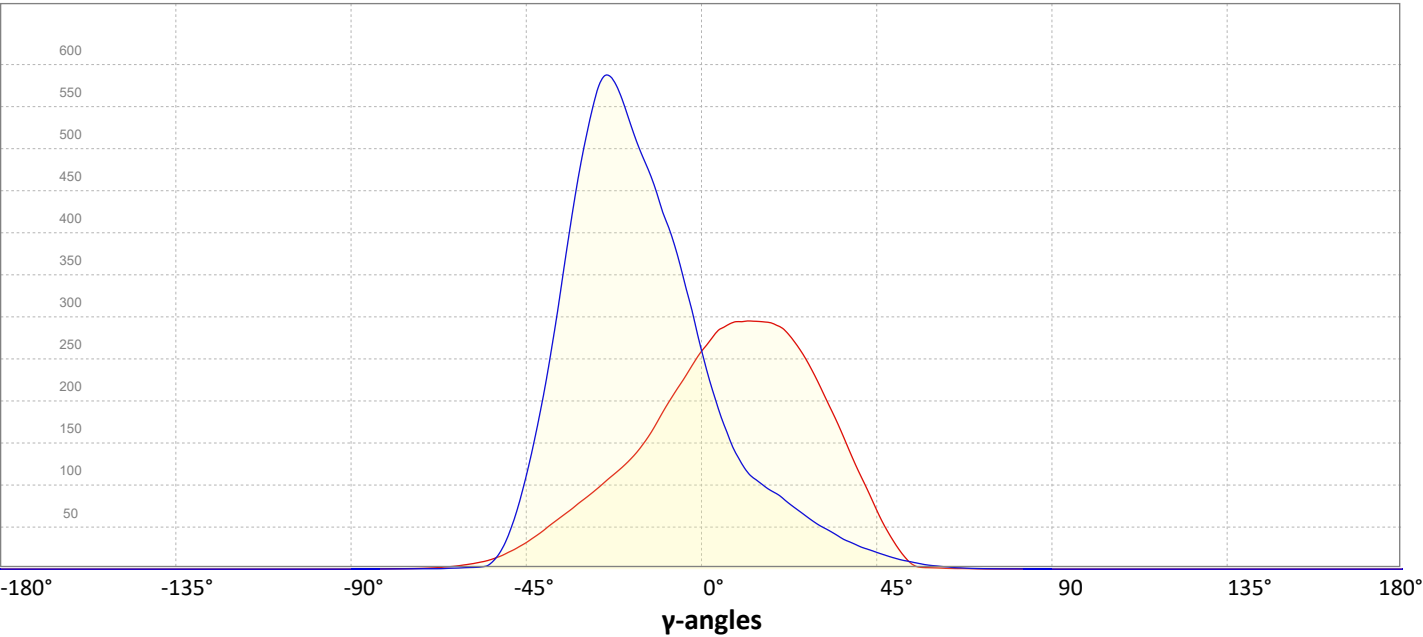
Intensity Ratio

In 120° cone	99.3%
In 90° cone	92.8%

C000-C180

C090-C270

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

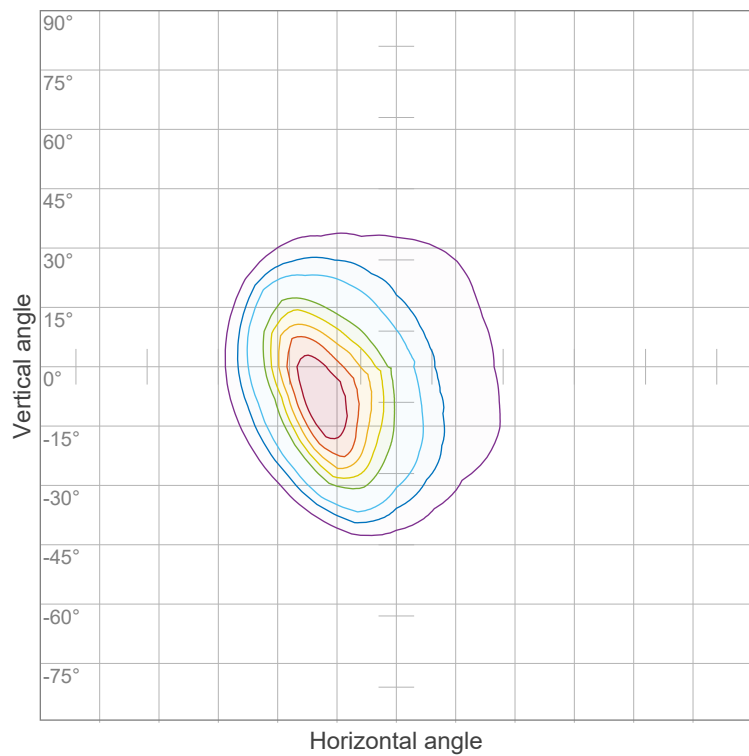


Goniophotometry Report

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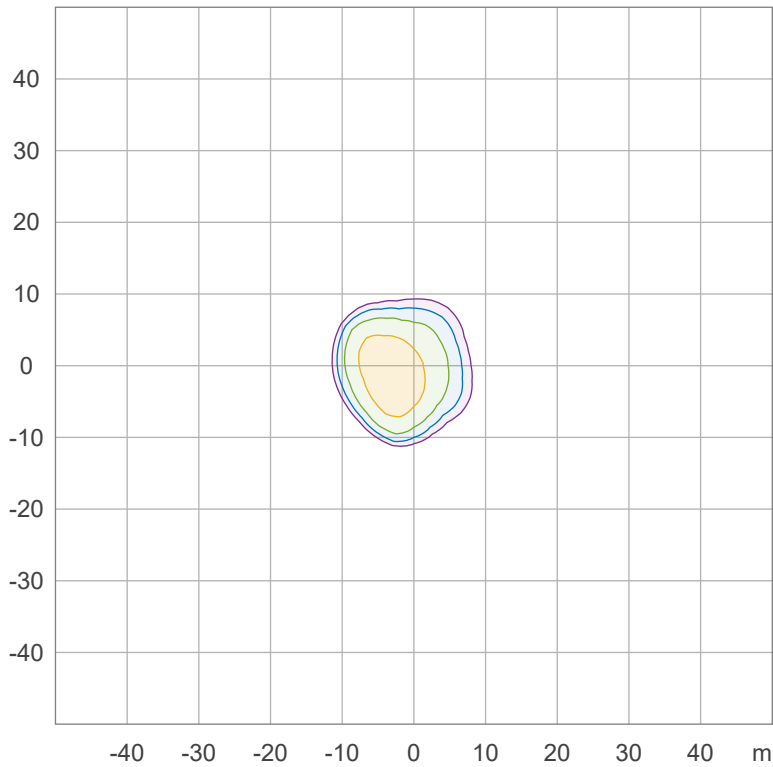
Iso-intensity Diagram (Iso-candela)



90 %	744.8 cd
80 %	662.1 cd
70 %	579.3 cd
60 %	496.5 cd
50 %	413.8 cd
40 %	331.0 cd
30 %	248.3 cd
20 %	165.5 cd
10 %	82.8 cd

Peak intensity: 827.6 cd  
Number of c-planes: 24

Iso-illuminance Diagram (Iso-lux)



50.0 %	3.4 lx
30.0 %	2.0 lx
10.0 %	0.7 lx
5.0 %	0.3 lx
3.0 %	0.2 lx

Peak illuminance: 6.8 lx  
Mounting height: 10.0 m  
Number of c-planes: 24

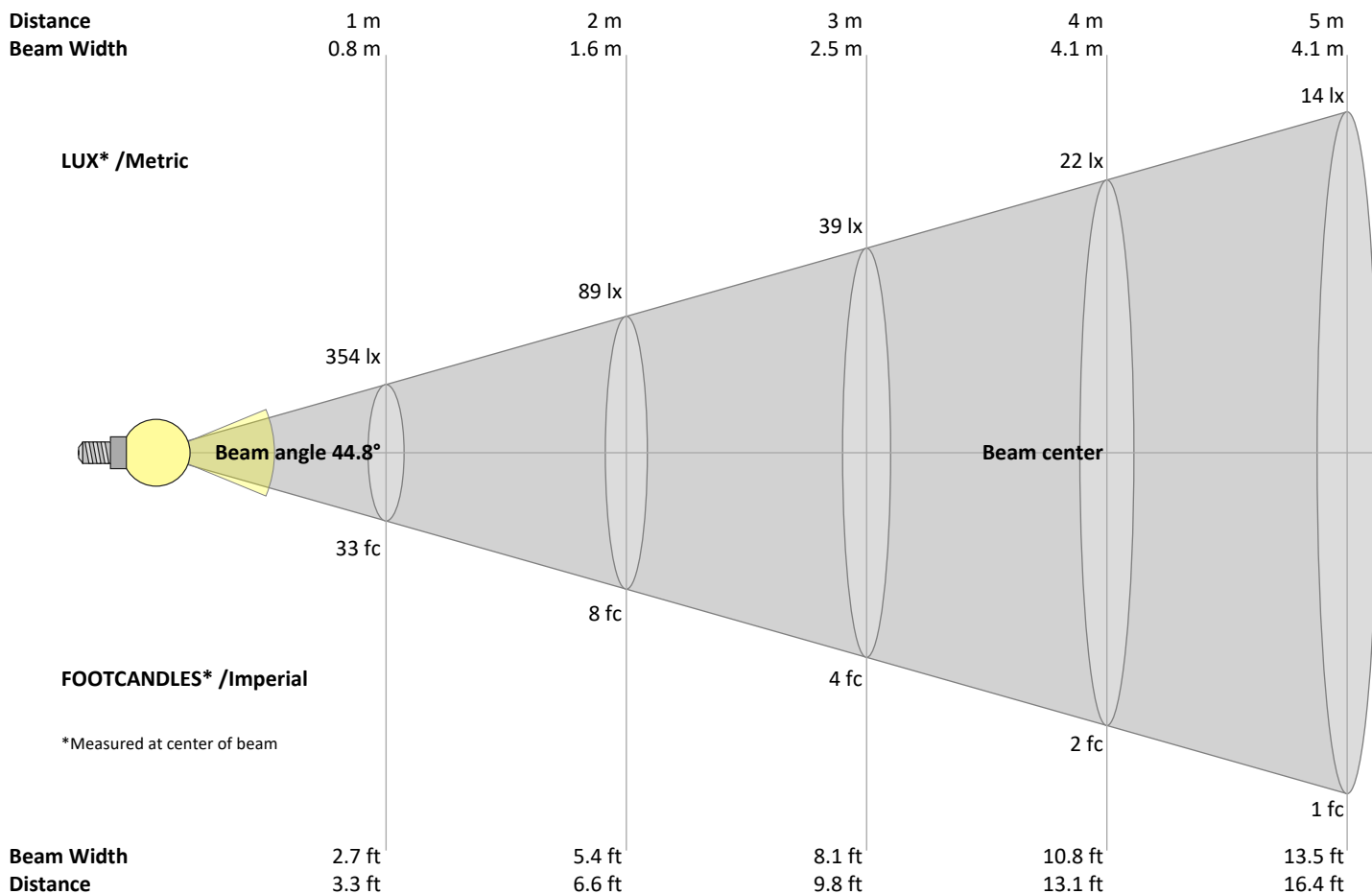
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## Beam Details



### 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
354	89	39	22	14	10	7	6	4	4	3	2	2	2	2	1	1	1	1	1	lux
32.9	8.2	3.7	2.1	1.3	0.9	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	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
354	333	312	293	273	252	230	210	193	179	166	155	145	134	123	114	104	94	84	75	cd
100%	94%	88%	83%	77%	71%	65%	59%	55%	50%	47%	44%	41%	38%	35%	32%	29%	26%	24%	21%	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
354	306	265	230	197	174	155	144	135	126	119	108	99	90	80	72	65	58	50	44	cd
100%	86%	75%	65%	56%	49%	44%	41%	38%	36%	34%	31%	28%	25%	23%	20%	18%	16%	14%	12%	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
354	367	383	391	397	399	400	400	399	397	391	381	365	347	325	301	274	248	220	191	cd
100%	104%	108%	110%	112%	113%	113%	113%	112%	112%	110%	107%	103%	98%	92%	85%	77%	70%	62%	54%	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
354	405	454	502	543	576	616	649	679	714	751	781	795	783	743	685	618	540	457	375	cd
100%	114%	128%	142%	153%	163%	174%	183%	191%	201%	212%	220%	224%	221%	209%	193%	174%	152%	129%	106%	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	113	110	107	105	110	108	105	103	104	102	100	100	98	97	96	95	94	92
2	107	101	97	93	104	99	95	92	96	93	90	93	90	88	90	88	86	84
3	100	93	88	83	98	92	87	83	89	85	81	87	83	80	84	81	79	77
4	94	86	80	75	93	85	79	75	83	78	74	81	76	73	79	75	72	71
5	89	80	73	68	87	79	73	68	77	71	67	75	70	67	73	69	66	65
6	84	74	67	62	82	73	67	62	71	66	62	70	65	61	69	64	61	59
7	79	69	62	57	77	68	62	57	66	61	57	65	60	56	64	60	56	54
8	74	64	57	53	73	63	57	52	62	56	52	61	56	52	60	55	52	50
9	70	60	53	49	69	59	53	48	58	52	48	57	52	48	56	51	48	46
10	66	56	49	45	65	55	49	45	54	49	45	54	48	45	53	48	45	43

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## Zonal Lumen Summary

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	34 lm	6.6%
10-20°	101 lm	19.7%
20-30°	156 lm	30.6%
30-40°	141 lm	27.6%
40-50°	65 lm	12.7%
50-60°	11 lm	2.1%
60-70°	2 lm	0.5%
70-80°	1 lm	0.1%
80-90°	0 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	511 lm	100.0%

Intensity peaks

Max intensity	829 cd
Intensity, 90°	0 cd
Intensity, 0°	354 cd

Zonal Lumen summary

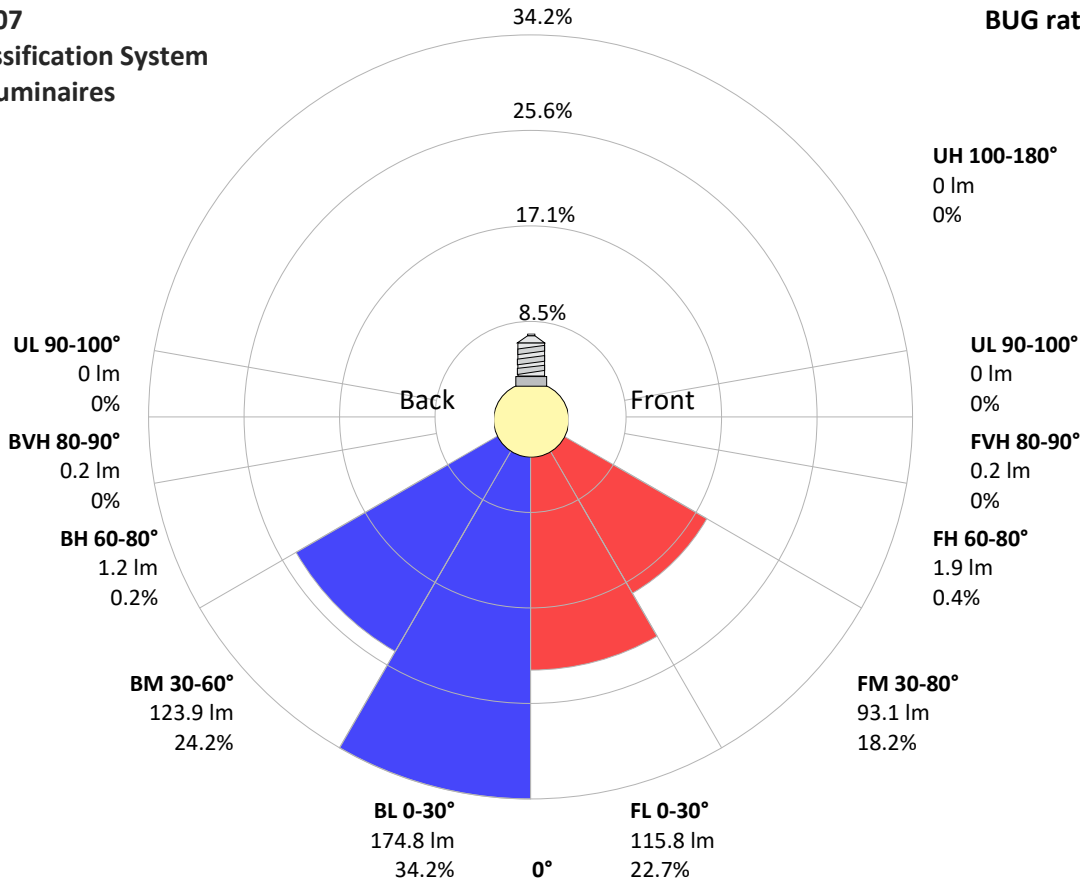
Zone (γ)	Lumen	% Total
0-30°	291 lm	56.9%
0-40°	432 lm	84.5%
0-60°	507 lm	99.3%
60-90°	4 lm	0.7%
70-100°	1 lm	0.2%
90-120°	0 lm	0.0%
0-90°	511 lm	100.0%
90-180°	0 lm	0.0%
0-180°	511 lm	100.0%

BUG rating

	Lumen	% Total
<b>Forward light</b>		
Low(0-30°)	116 lm	22.7%
Medium(30-60°)	93 lm	18.2%
High(60-80°)	2 lm	0.4%
Very high(80-90°)	0 lm	0.0%
<b>Back light</b>		
Low(0-30°)	175 lm	34.2%
Medium(30-60°)	124 lm	24.2%
High(60-80°)	1 lm	0.2%
Very high(80-90°)	0 lm	0.0%
<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 B1 U1 G0



# Goniophotometry Report

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## Power Details

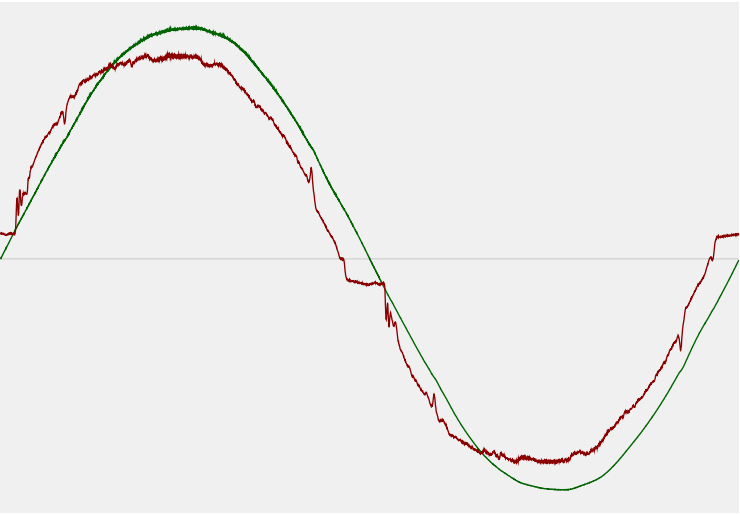
### Input Power

Power feed to light source	13.4 W
Frequency of input power	50.1 Hz
RMS Input voltage feed, $V_{RMS}$	240 V
RMS Input current feed, $I_{RMS}$	0.057 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	13.64 VA
Displacement factor of AC power feed	0.99
Power factor of AC current feed	0.98
Total harmonic distortion of the current	6.63%
Total harmonic distortion of the voltage	1.12%

### Efficiency

Radiated power efficiency	14.0%
<div><div></div></div>	
Lumen efficiency	38 lm/W
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### Input Power Curve





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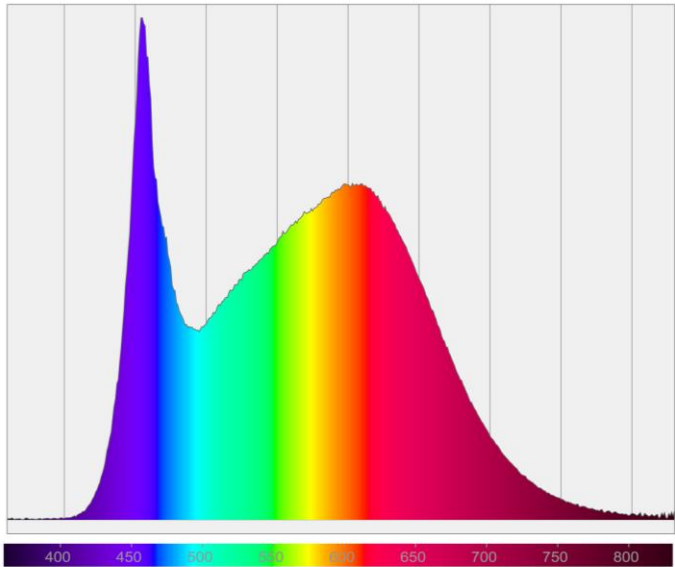
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## Color Measurements

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

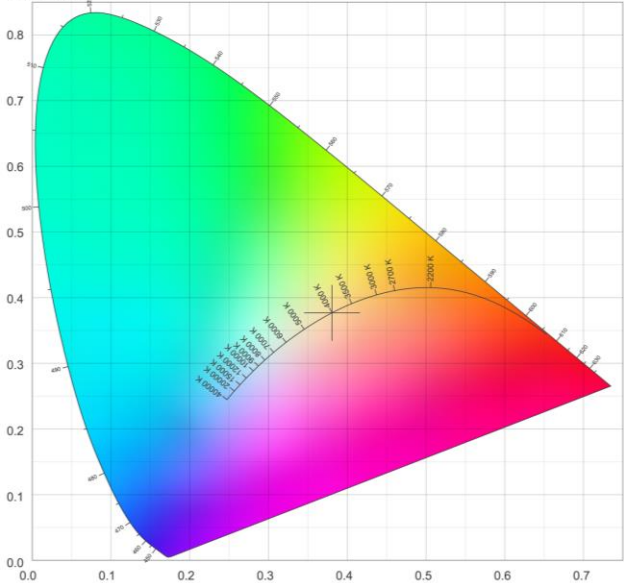
Correlated Color Temperature	CCT = 4000 K	Color coordinates CIE 1931	(x;y) = (0.381;0.377)
Color Rendering Index	CRI 92.6	Color coordinate CIEs 1960	(u;v) = (0.225;0.334)
Color Rendering Index, R9 (red component)	R9 = 72.2	Color deviation from BBL	Duv = ±0.0003
Color Rendering TM30-18	R <sub>f</sub> 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		

Goniophotometry Report

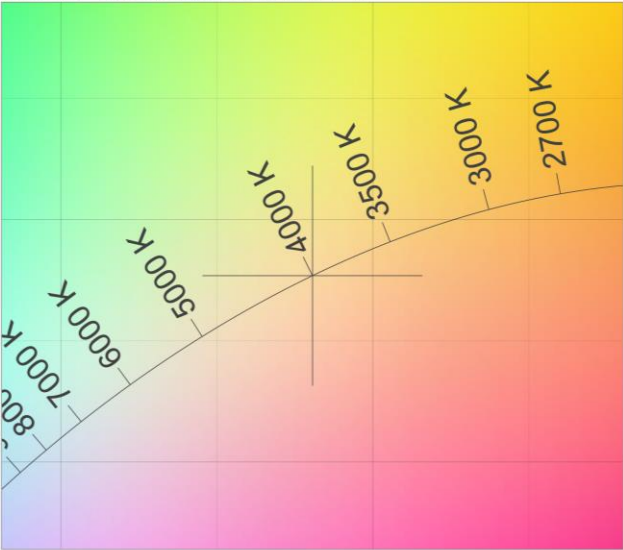
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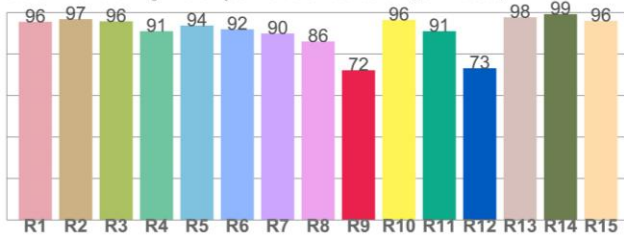
CIE 1931



CIE 1931 – zoomed on Planckian locus



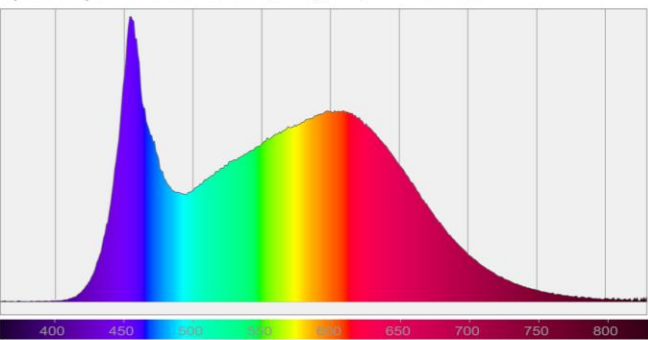
Color Rendering Index per reference color (CIE 1995)



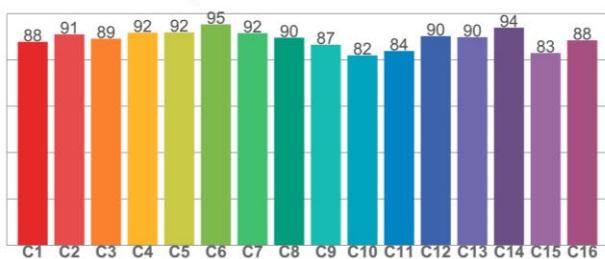
CRI R values, only R1-R8 are used to calculate final CRI value

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

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



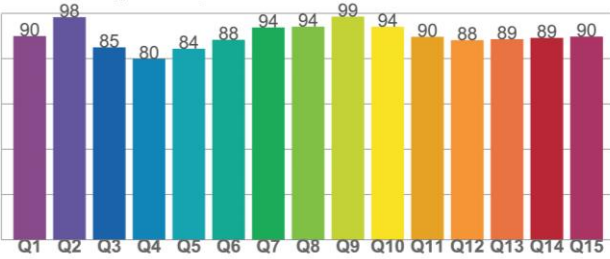
TM30-18 Rf-values per hue bin



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
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

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