

Tested Light Source - 1_PHOT_NINETY-NINE-1750lmChip-3000K-Spreader-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°

1.50 m

14.6 W – PF 0.47 – DPF 0.78

243 V – 0.127 A

50 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

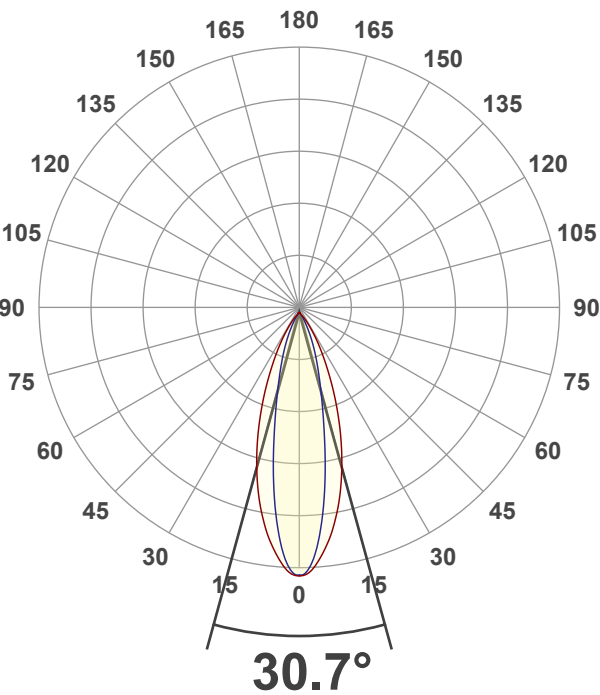
780 lm

53 lm/W

2092 cd – 30.7°

CRI 93.0

Light Intensity Distribution



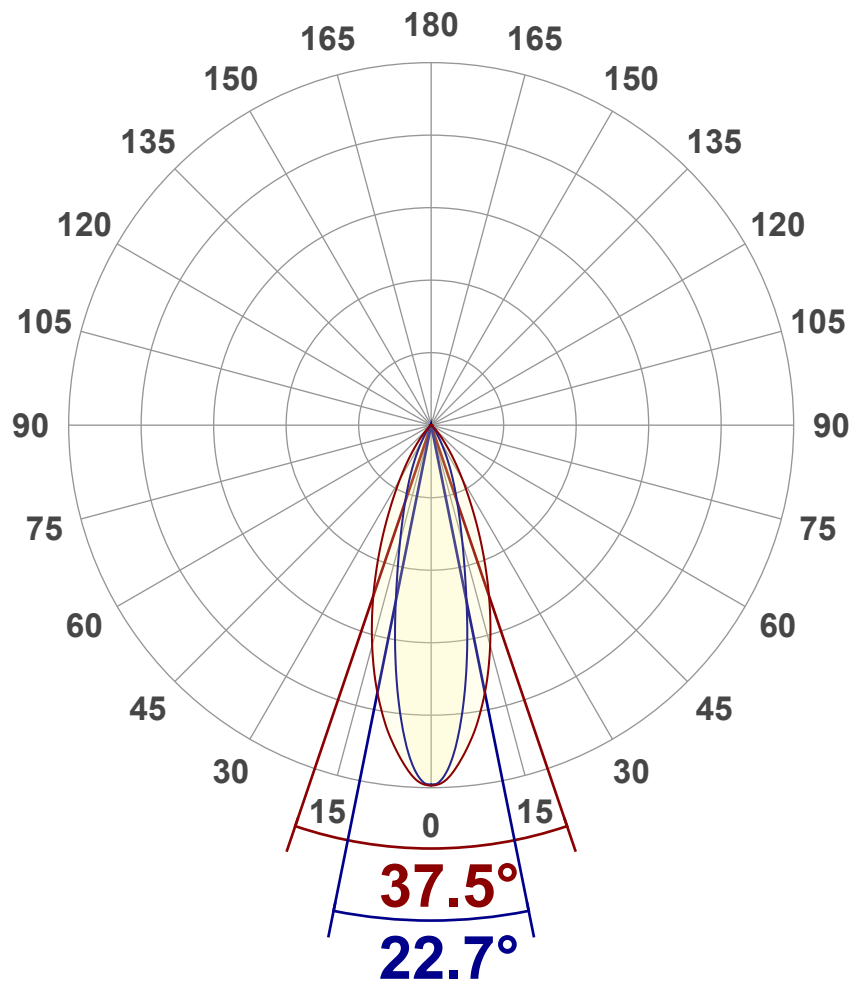
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	780 lm
Peak Intensity	2092 cd
Beam Angle (50%)	30.7°
Beam Angle (90%)	22.7°
Beam Angle (10%)	44.2°

Cut-off Angle

Average 2,5%	79.3°
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Field Angle

Average 10%	60.7°
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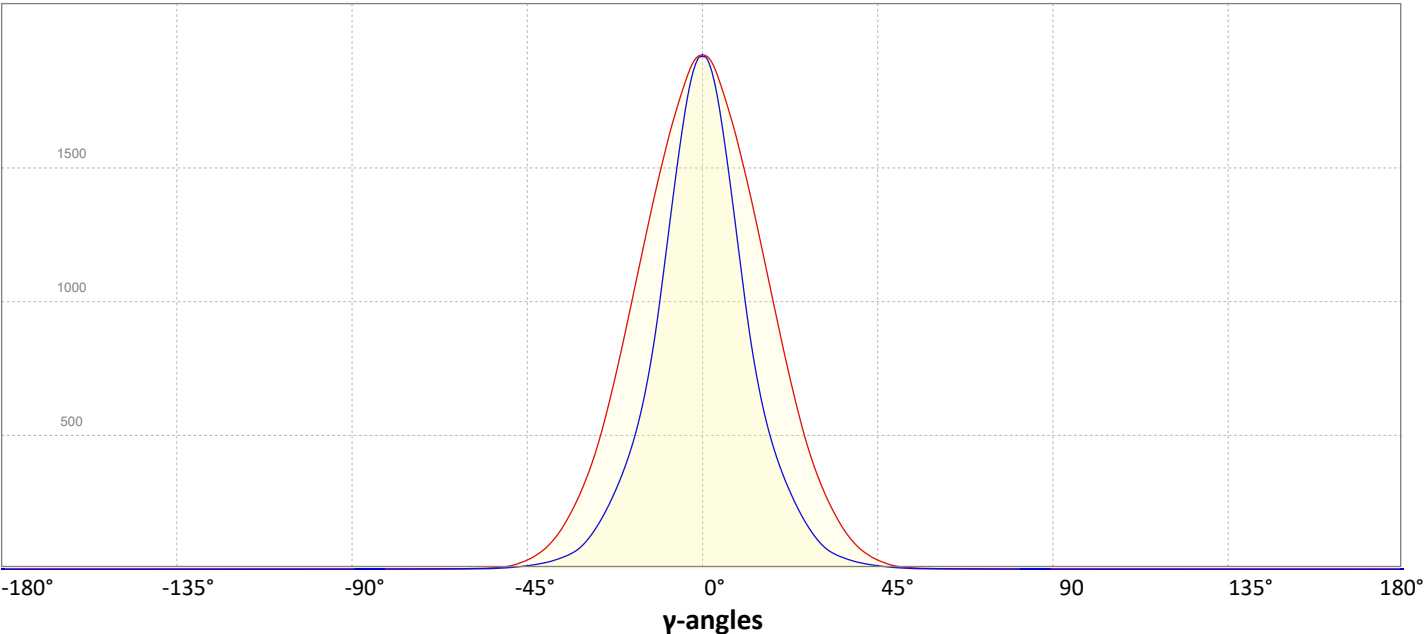
Intensity Ratio

In 120° cone	99.6%
In 90° cone	98.1%

C000-C180

C090-C270

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

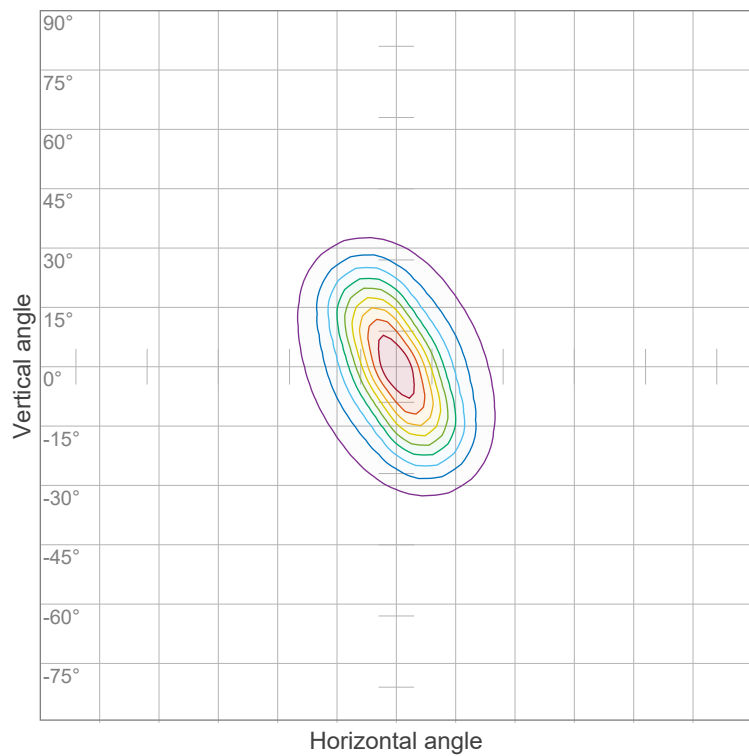


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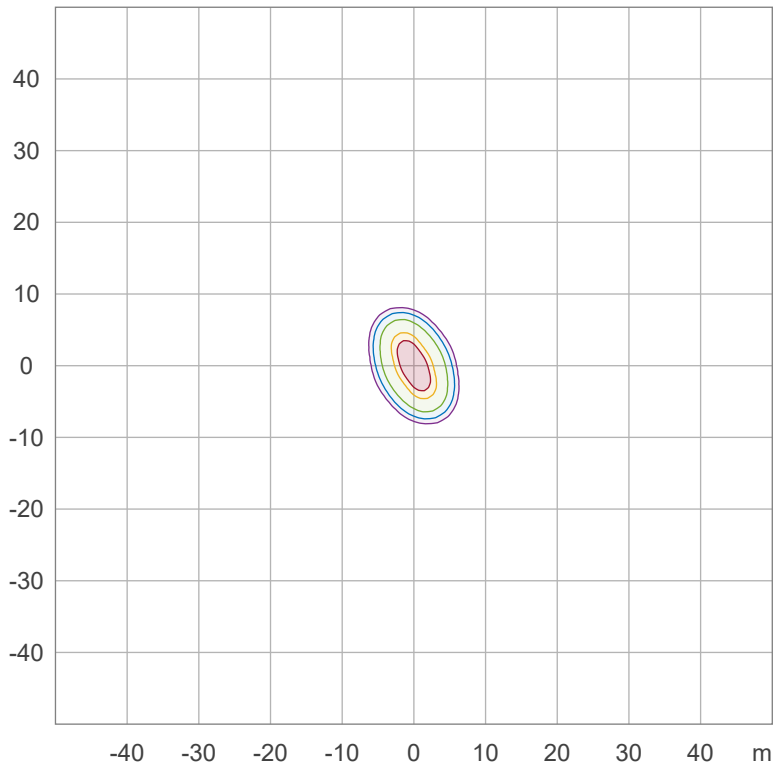
Iso-intensity Diagram (Iso-candela)



90 %	1881.2 cd
80 %	1672.2 cd
70 %	1463.1 cd
60 %	1254.1 cd
50 %	1045.1 cd
40 %	836.1 cd
30 %	627.1 cd
20 %	418.0 cd
10 %	209.0 cd

Peak intensity: 2090.2 cd
Number of c-planes: 32

Iso-illuminance Diagram (Iso-lux)



50.0 %	10.5 lx
30.0 %	6.3 lx
10.0 %	2.1 lx
5.0 %	1.0 lx
3.0 %	0.6 lx

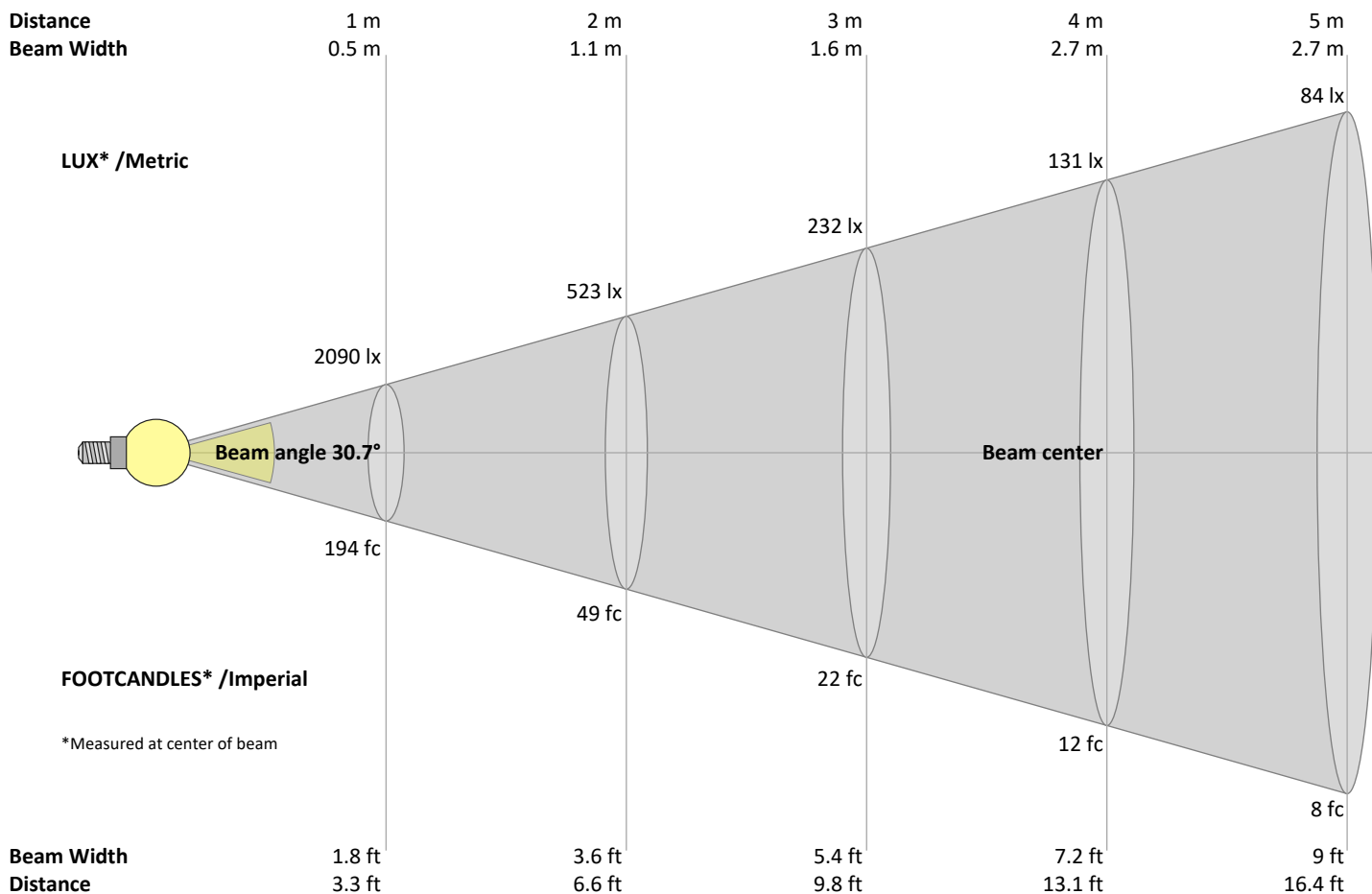
Peak illuminance: 20.9 lx
Mounting height: 10.0 m
Number of c-planes: 32

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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
2090	523	232	131	84	58	43	33	26	21	17	15	12	11	9	8	7	6	6	5	lux
194.2	48.5	21.6	12.1	7.8	5.4	4	3	2.4	1.9	1.6	1.3	1.1	1	0.9	0.8	0.7	0.6	0.5	0.5	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
2090	2071	2001	1905	1798	1673	1541	1397	1249	1100	952	809	676	554	450	362	287	223	168	124	cd
100%	99%	96%	91%	86%	80%	74%	67%	60%	53%	46%	39%	32%	27%	22%	17%	14%	11%	8%	6%	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
2090	2044	1905	1698	1459	1208	972	779	627	508	412	332	263	203	152	111	81	61	47	37	cd
100%	98%	91%	81%	70%	58%	46%	37%	30%	24%	20%	16%	13%	10%	7%	5%	4%	3%	2%	2%	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
2090	2071	2001	1905	1798	1673	1541	1397	1249	1100	952	809	676	554	450	362	287	223	168	124	cd
100%	99%	96%	91%	86%	80%	74%	67%	60%	53%	46%	39%	32%	27%	22%	17%	14%	11%	8%	6%	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
2090	2044	1905	1698	1459	1208	972	779	627	508	412	332	263	203	152	111	81	61	47	37	cd
100%	98%	91%	81%	70%	58%	46%	37%	30%	24%	20%	16%	13%	10%	7%	5%	4%	3%	2%	2%	of 0°val

Goniophotometry Report

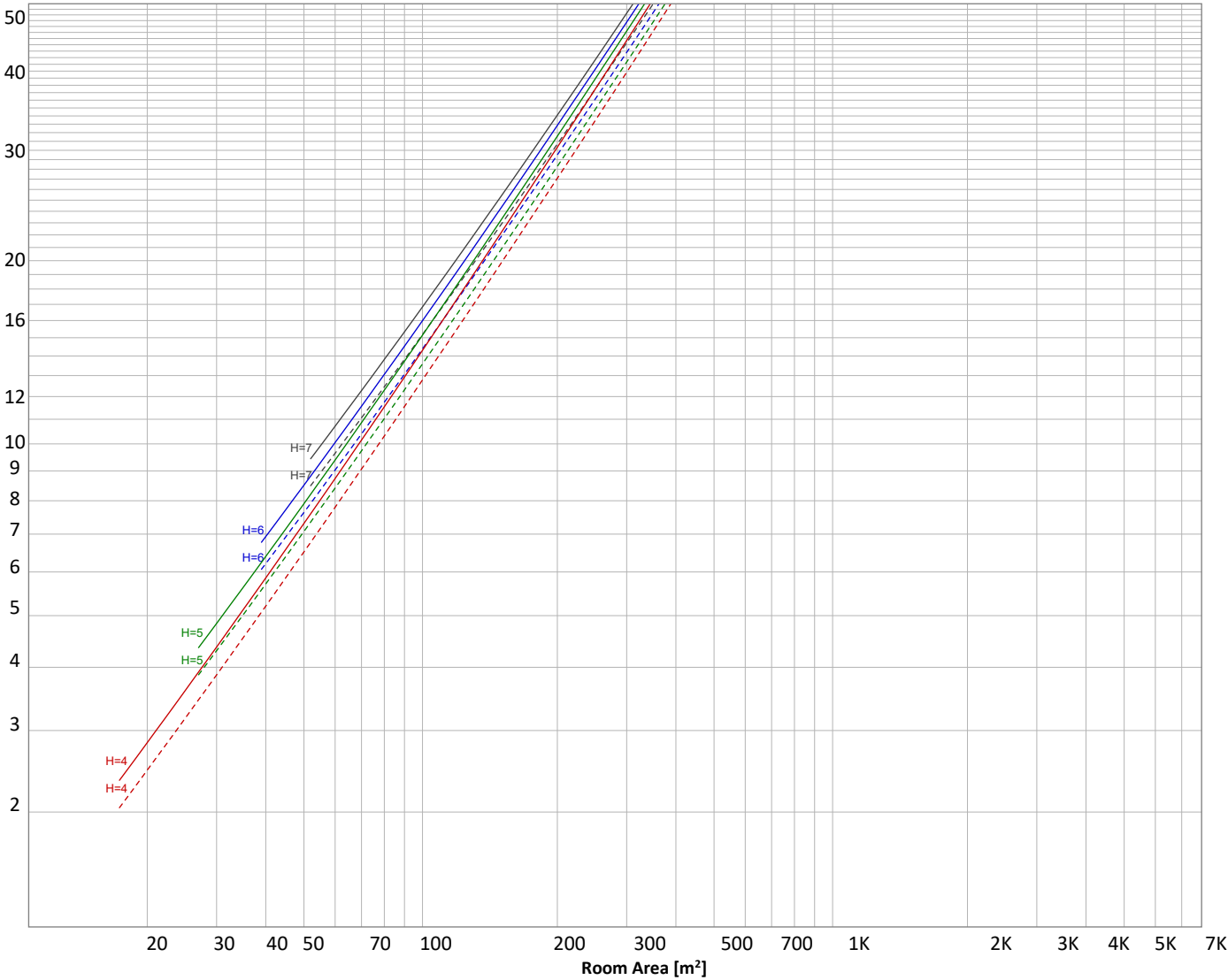
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 780 lm	ρ(%)		
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	Wall reflectance
H _{work} = Work area height from floor =	0.00 m	-----	70	50
E _{work} = Average lux on work area =	100 lx	—————	50	30
				Floor reflectance
				30
				20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
165 lm	284 lm	208 lm	90.8 lm	25.0 lm	4.24 lm	1.26 lm	0.671 lm	0.485 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0.138 lm	0.119 lm	0.112 lm	0.101 lm	0.039 lm	0.000 lm	0.000 lm	0.000 lm	0.000 lm

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	165 lm	21.2%
10-20°	284 lm	36.4%
20-30°	208 lm	26.7%
30-40°	91 lm	11.6%
40-50°	25 lm	3.2%
50-60°	4 lm	0.5%
60-70°	1 lm	0.2%
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	780 lm	100.0%

Intensity peaks

Max intensity	2092 cd
Intensity, 90°	0 cd
Intensity, 0°	2090 cd

Zonal Lumen summary

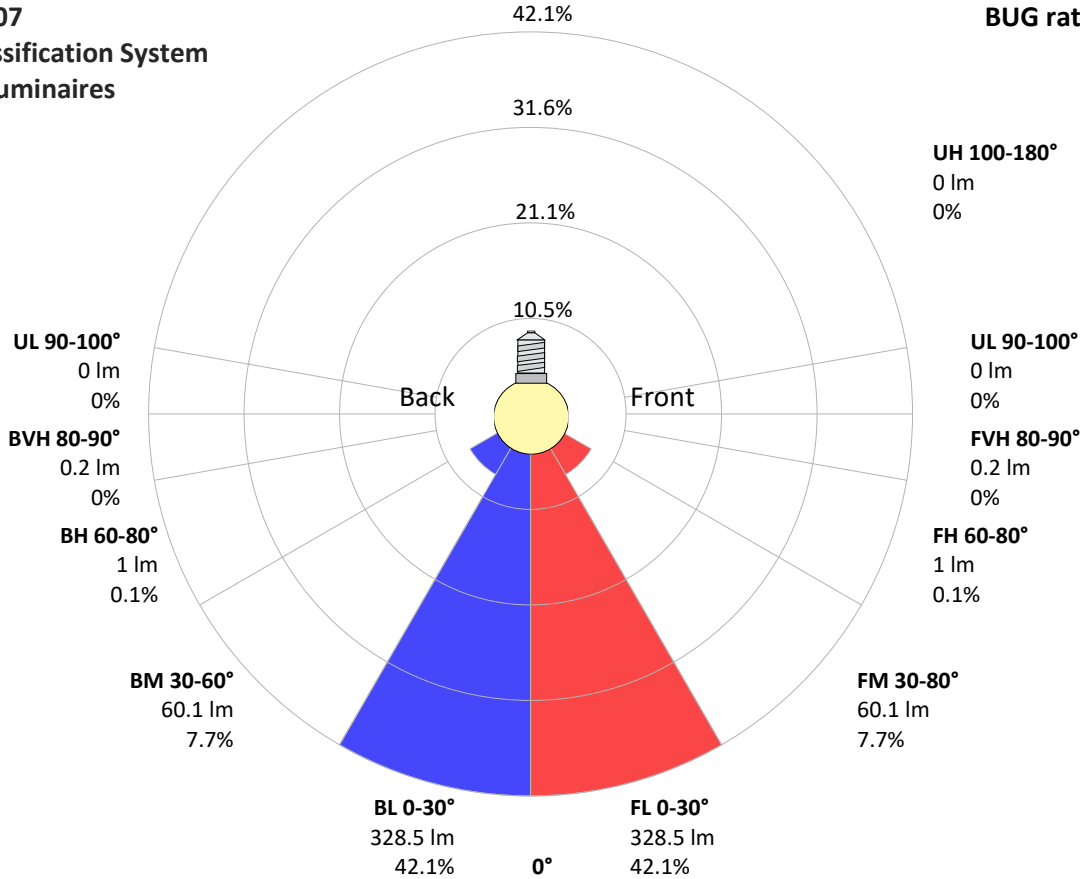
Zone (γ)	Lumen	% Total
0-30°	657 lm	84.2%
0-40°	748 lm	95.9%
0-60°	777 lm	99.6%
60-90°	2 lm	0.3%
70-100°	1 lm	0.2%
90-120°	0 lm	0.0%
0-90°	779 lm	99.9%
90-180°	1 lm	0.1%
0-180°	780 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	329 lm	42.1%
Medium(30-60°)	60 lm	7.7%
High(60-80°)	1 lm	0.1%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	329 lm	42.1%
Medium(30-60°)	60 lm	7.7%
High(60-80°)	1 lm	0.1%
Very high(80-90°)	0 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 B1 U1 G0



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Power Details

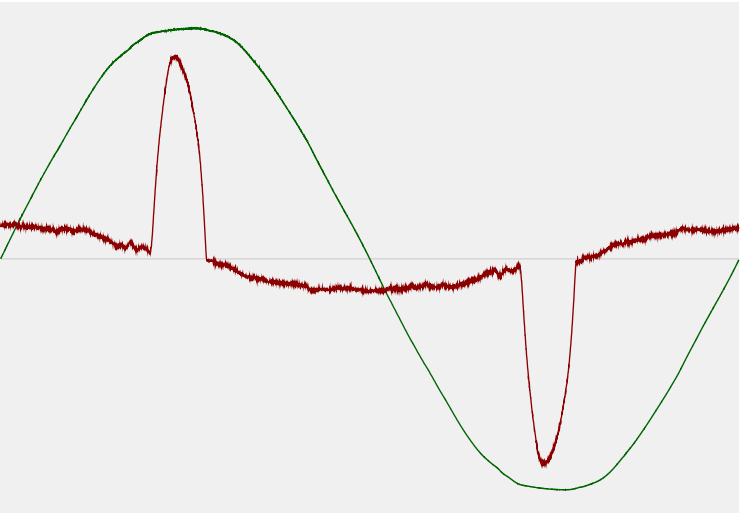
Input Power

Power feed to light source	14.6 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	243 V
RMS Input current feed, I_{RMS}	0.127 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	30.84 VA
Displacement factor of AC power feed	0.78
Power factor of AC current feed	0.47
Total harmonic distortion of the current	130.1%
Total harmonic distortion of the voltage	1.33%

Efficiency

Radiated power efficiency	19.6%
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Lumen efficiency	53 lm/W
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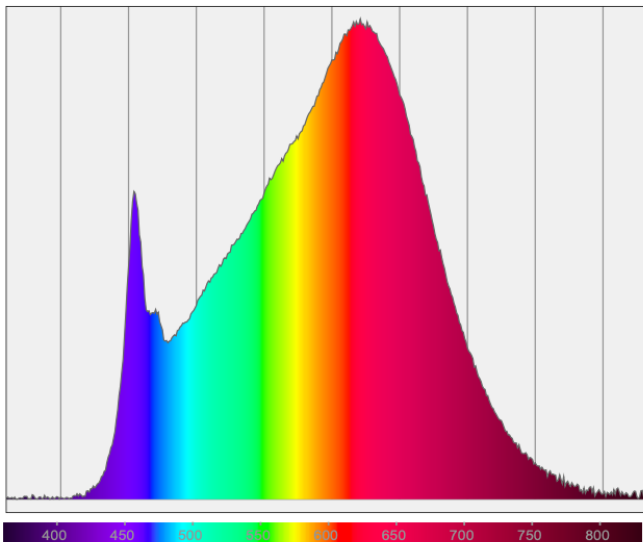
Input Power Curve



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		

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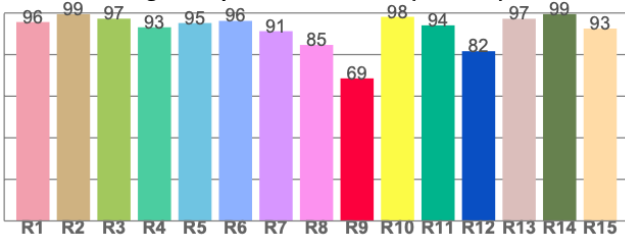
CIE 1931



CIE 1931 – zoomed on Planckian locus



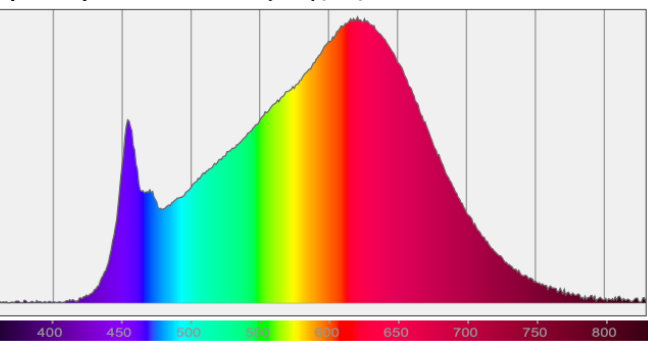
Color Rendering Index per reference color (CIE 1995)



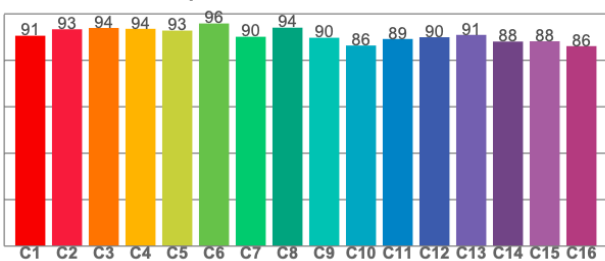
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
95.7	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%



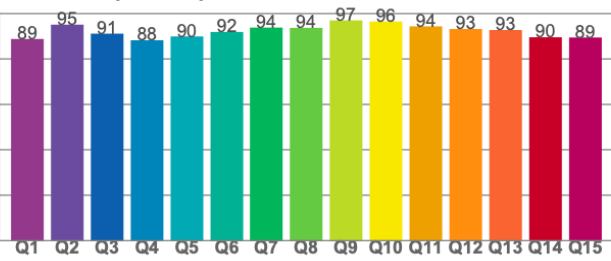
TM30-18 Rf-values per hue bin



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