

Tested Light Source - 1_PHOT_NINETY-NINE-2125lmChip-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

15.8 W – PF 0.98 – DPF 0.98

242 V – 0.067 A

50 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

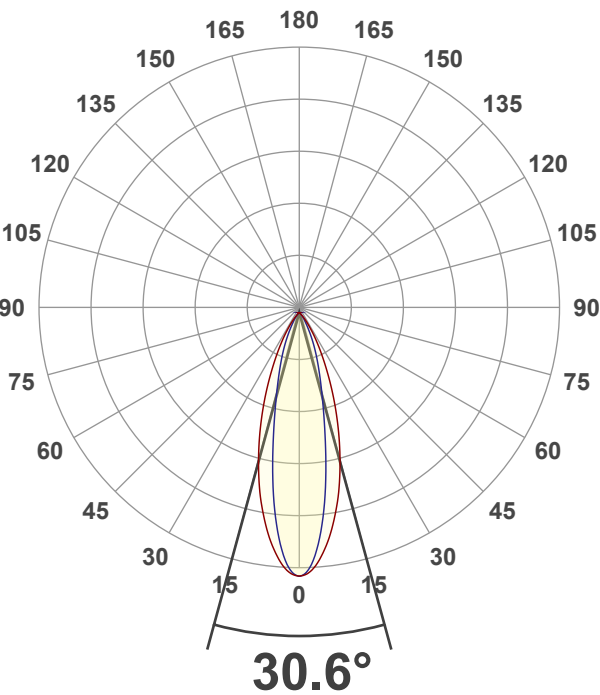
915 lm

58 lm/W

2450 cd – 30.6°

CRI 92.8

Light Intensity Distribution



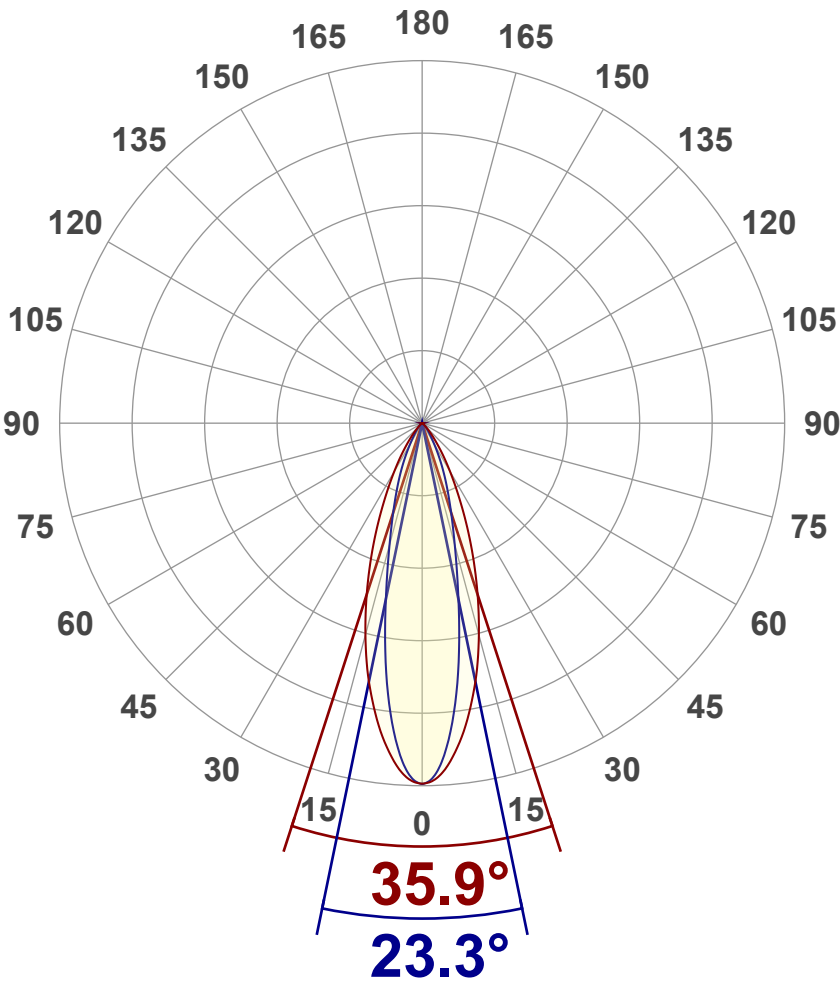
Goniophotometry Report

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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	915 lm
Peak Intensity	2450 cd
Beam Angle (50%)	30.6°
Beam Angle (90%)	23.3°
Beam Angle (10%)	41.8°

Cut-off Angle

Average 2,5%	80.5°
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Field Angle

Average 10%	61°
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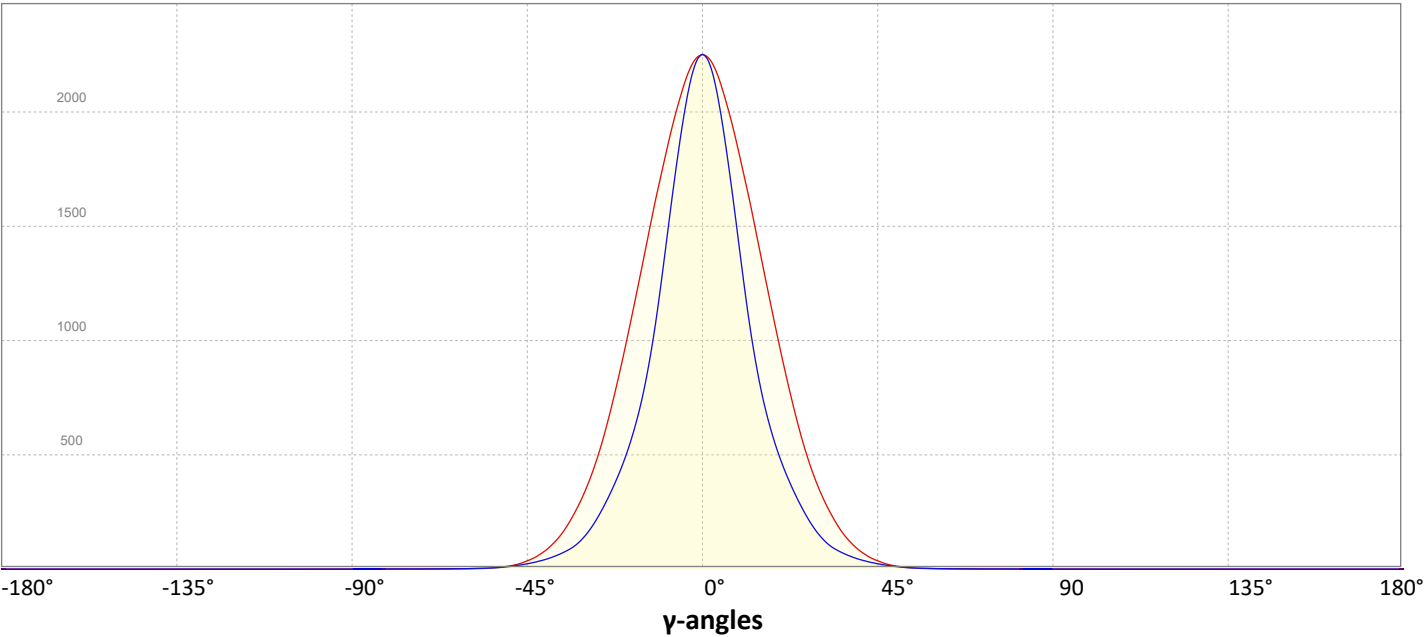
Intensity Ratio

In 120° cone	99.6%
In 90° cone	98.0%

C000-C180

C090-C270

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

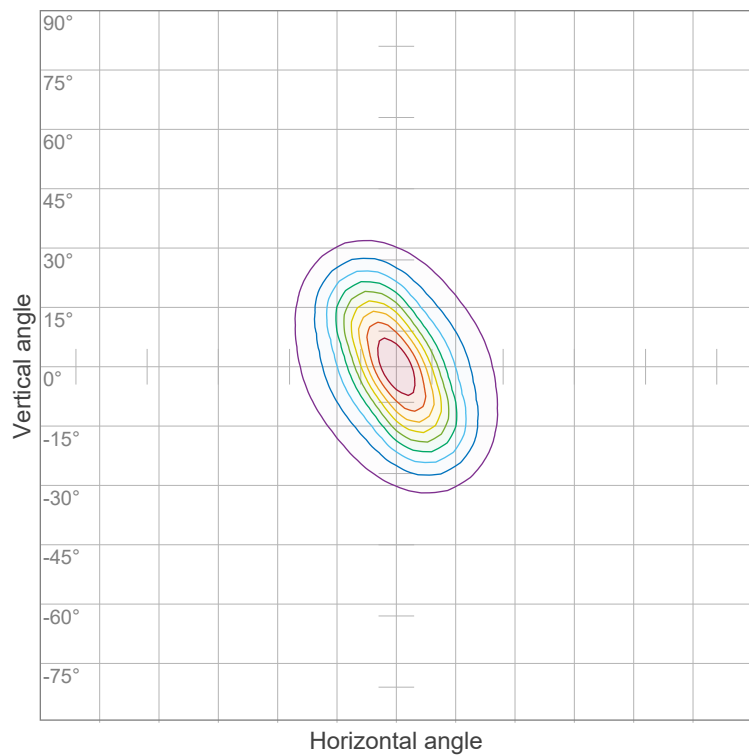


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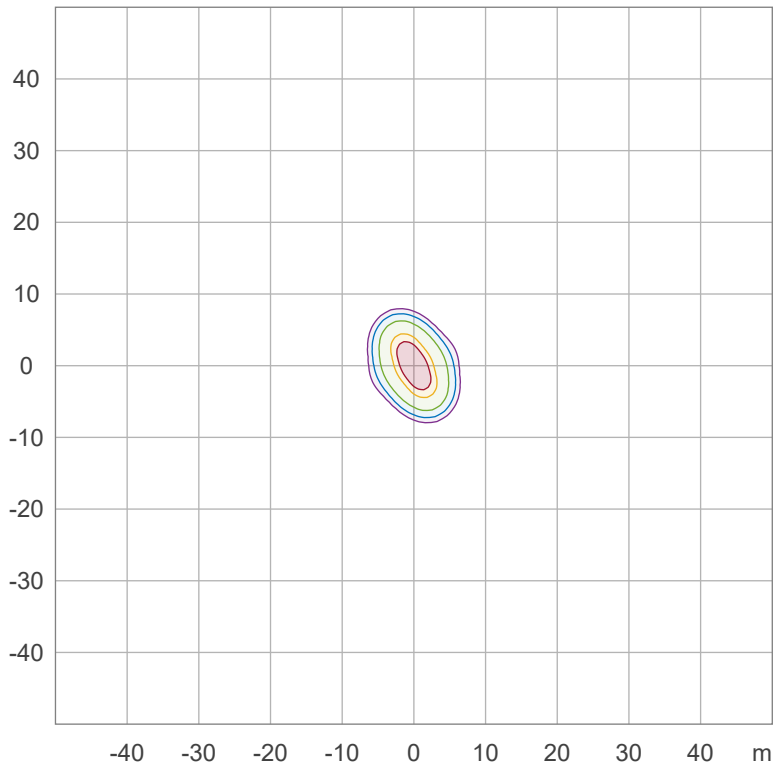
Iso-intensity Diagram (Iso-candela)



90 %	2202.8 cd
80 %	1958.0 cd
70 %	1713.3 cd
60 %	1468.5 cd
50 %	1223.8 cd
40 %	979.0 cd
30 %	734.3 cd
20 %	489.5 cd
10 %	244.8 cd

Peak intensity: 2447.5 cd
Number of c-planes: 32

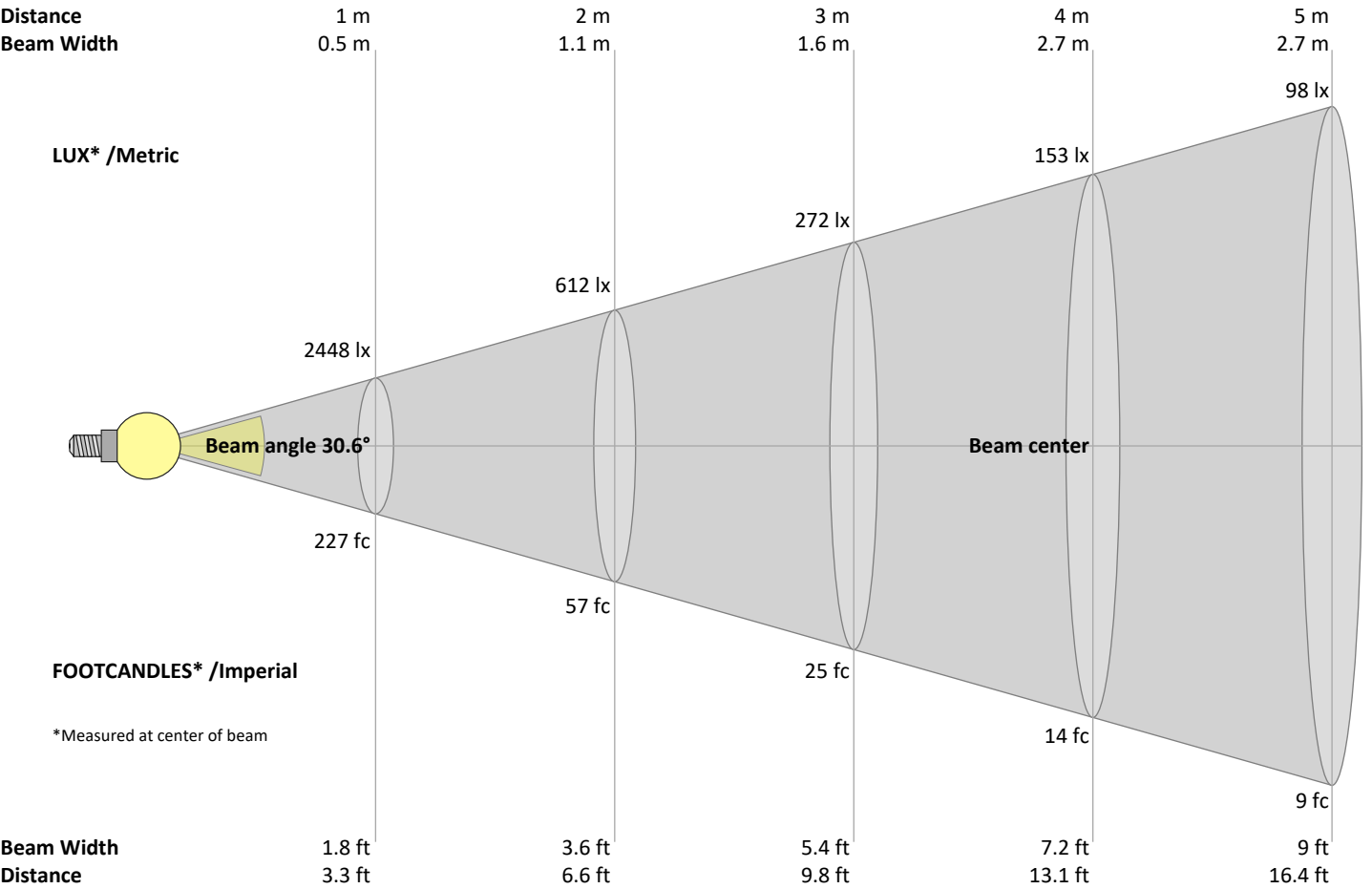
Iso-illuminance Diagram (Iso-lux)



50.0 %	12.2 lx
30.0 %	7.3 lx
10.0 %	2.4 lx
5.0 %	1.2 lx
3.0 %	0.7 lx

Peak illuminance: 24.5 lx
Mounting height: 10.0 m
Number of c-planes: 32

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
2448	612	272	153	98	68	50	38	30	24	20	17	14	12	11	10	8	8	7	6	lux
227.4	56.8	25.3	14.2	9.1	6.3	4.6	3.6	2.8	2.3	1.9	1.6	1.3	1.2	1	0.9	0.8	0.7	0.6	0.6	fc

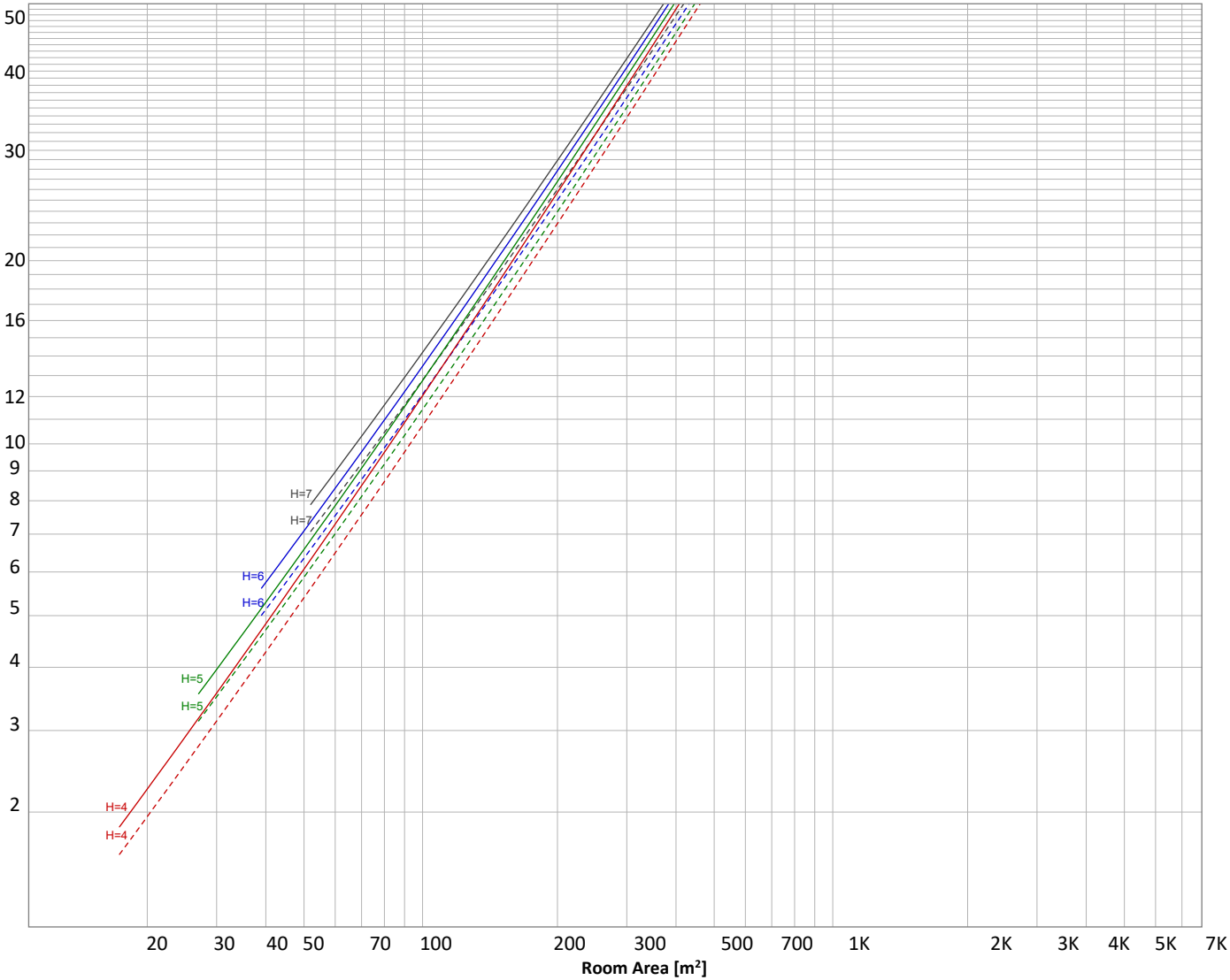
Intensities in 0° c-plane																				
0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2448	2425	2348	2230	2091	1930	1764	1583	1399	1219	1044	879	727	591	476	379	299	230	173	129	cd
100%	99%	96%	91%	85%	79%	72%	65%	57%	50%	43%	36%	30%	24%	19%	16%	12%	9%	7%	5%	of 0°val

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
2448	2396	2241	2012	1742	1452	1178	952	774	636	524	431	349	277	214	163	124	97	77	61	cd
100%	98%	92%	82%	71%	59%	48%	39%	32%	26%	21%	18%	14%	11%	9%	7%	5%	4%	3%	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
2448	2425	2348	2230	2091	1930	1764	1583	1399	1219	1044	879	727	591	476	379	299	230	173	129	cd
100%	99%	96%	91%	85%	79%	72%	65%	57%	50%	43%	36%	30%	24%	19%	16%	12%	9%	7%	5%	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
2448	2396	2241	2012	1742	1452	1178	952	774	636	524	431	349	277	214	163	124	97	77	61	cd
100%	98%	92%	82%	71%	59%	48%	39%	32%	26%	21%	18%	14%	11%	9%	7%	5%	4%	3%	2%	of 0°val

Luminaire budgetary diagram
Uncorrected, comprehensive UGR table according to 117-1995
LAMPS (number of lamps)



Conditions		ρ(%)			
H = Room height	Flux = 915 lm	Line type	Ceiling reflectance	Wall reflectance	Floor reflectance
H _{down} = Lamp distance from ceiling =	0.00 m		70	50	30
H _{work} = Work area height from floor =	0.00 m				
E _{work} = Average lux on work area =	100 lx		50	30	20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
194 lm	334 lm	243 lm	105 lm	29.8 lm	4.92 lm	1.49 lm	0.828 lm	0.668 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0.267 lm	0.256 lm	0.241 lm	0.218 lm	0.086 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°	194 lm	21.2%
10-20°	334 lm	36.5%
20-30°	243 lm	26.6%
30-40°	105 lm	11.5%
40-50°	30 lm	3.3%
50-60°	5 lm	0.5%
60-70°	1 lm	0.2%
70-80°	1 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	915 lm	100.0%

Intensity peaks

Max intensity	2450 cd
Intensity, 90°	0 cd
Intensity, 0°	2448 cd

Zonal Lumen summary

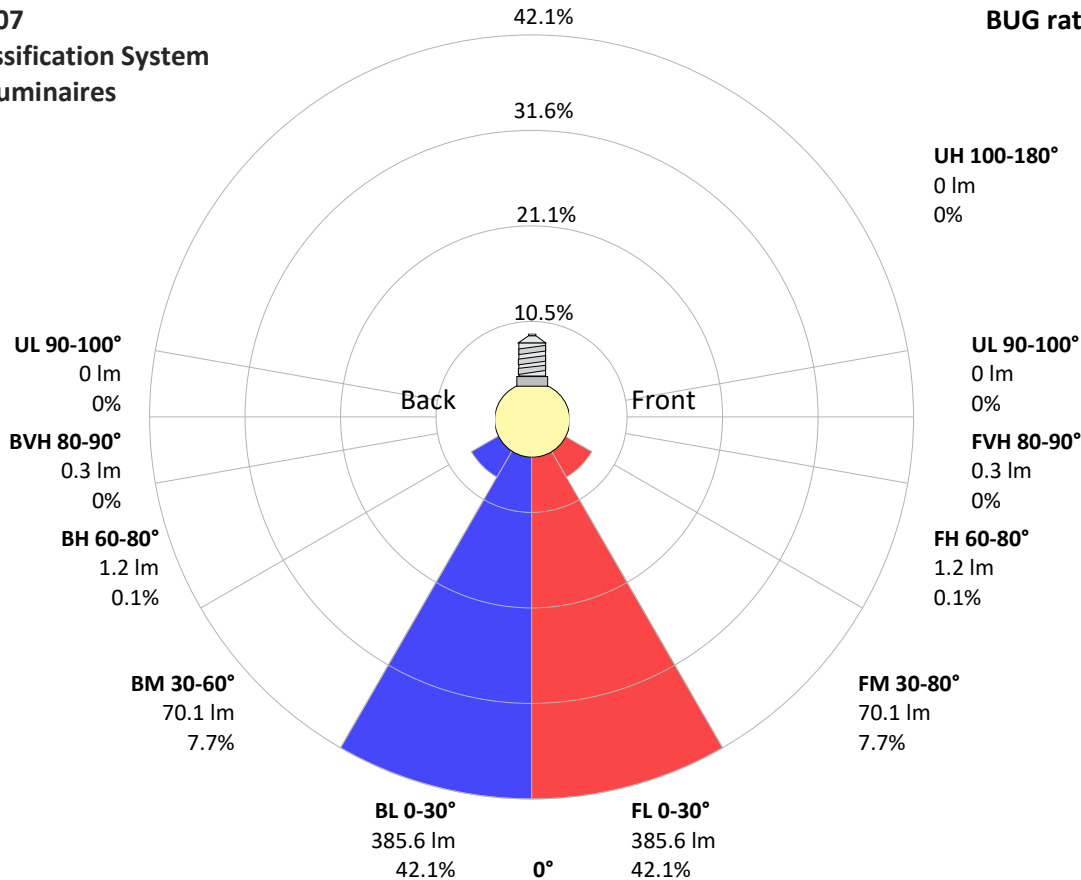
Zone (γ)	Lumen	% Total
0-30°	771 lm	84.3%
0-40°	876 lm	95.8%
0-60°	911 lm	99.6%
60-90°	3 lm	0.3%
70-100°	2 lm	0.2%
90-120°	1 lm	0.1%
0-90°	914 lm	99.9%
90-180°	1 lm	0.1%
0-180°	915 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	386 lm	42.1%
Medium(30-60°)	70 lm	7.7%
High(60-80°)	1 lm	0.1%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	386 lm	42.1%
Medium(30-60°)	70 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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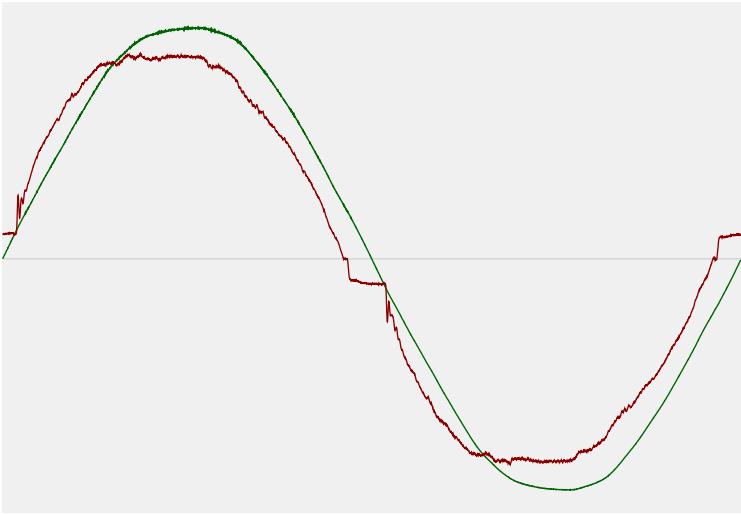


Power Details

Input Power

Power feed to light source	15.8 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	242 V
RMS Input current feed, I_{RMS}	0.067 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	16.12 VA
Displacement factor of AC power feed	0.98
Power factor of AC current feed	0.98
Total harmonic distortion of the current	6.23%
Total harmonic distortion of the voltage	1.42%

Input Power Curve



Efficiency

Radiated power efficiency	21.2%
Lumen efficiency	58 lm/W

Goniophotometry Report

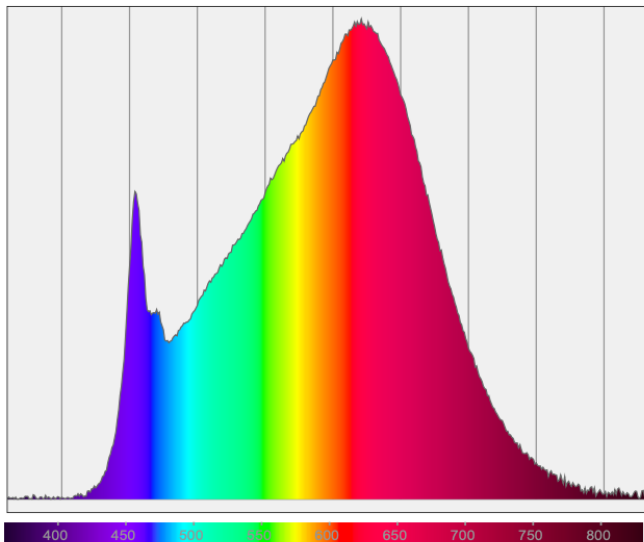
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Color Measurements

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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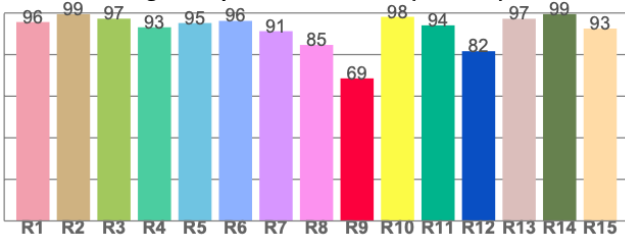
CIE 1931



CIE 1931 – zoomed on Planckian locus



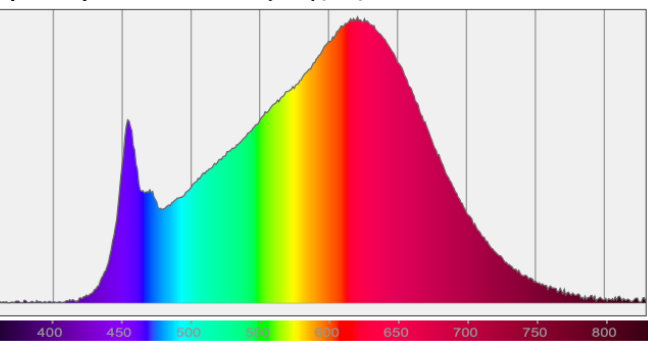
Color Rendering Index per reference color (CIE 1995)



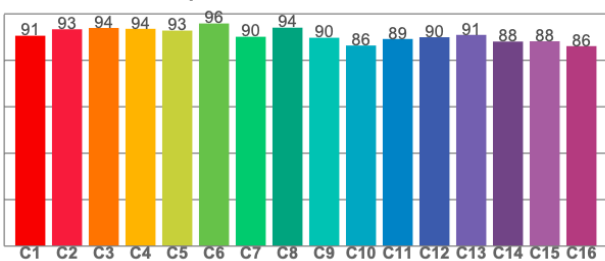
CRI R values, only R1-R8 are used to calculate final CRI value

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%



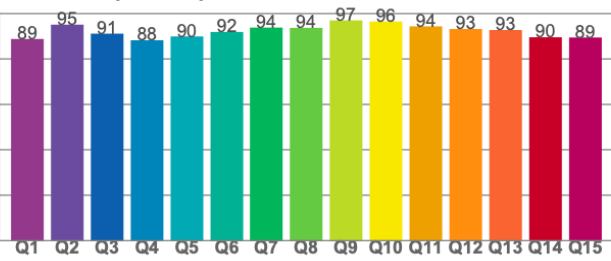
TM30-18 Rf-values per hue bin



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