

Tested Light Source - 1_PHOT_SKIN+BONES-4750lmChip-4000K-WallWash_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

243 V – 0.173 A

49.9 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

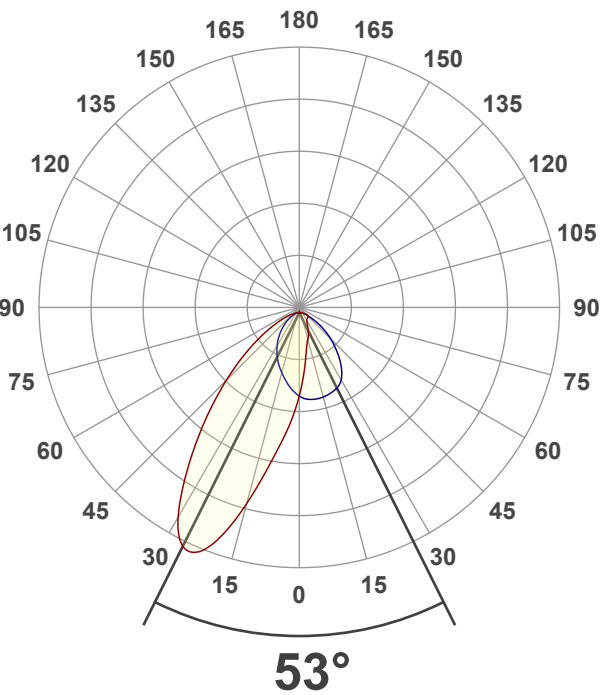
3717 lm

91 lm/W

3621 cd – 53°

CRI 91.3

Light Intensity Distribution



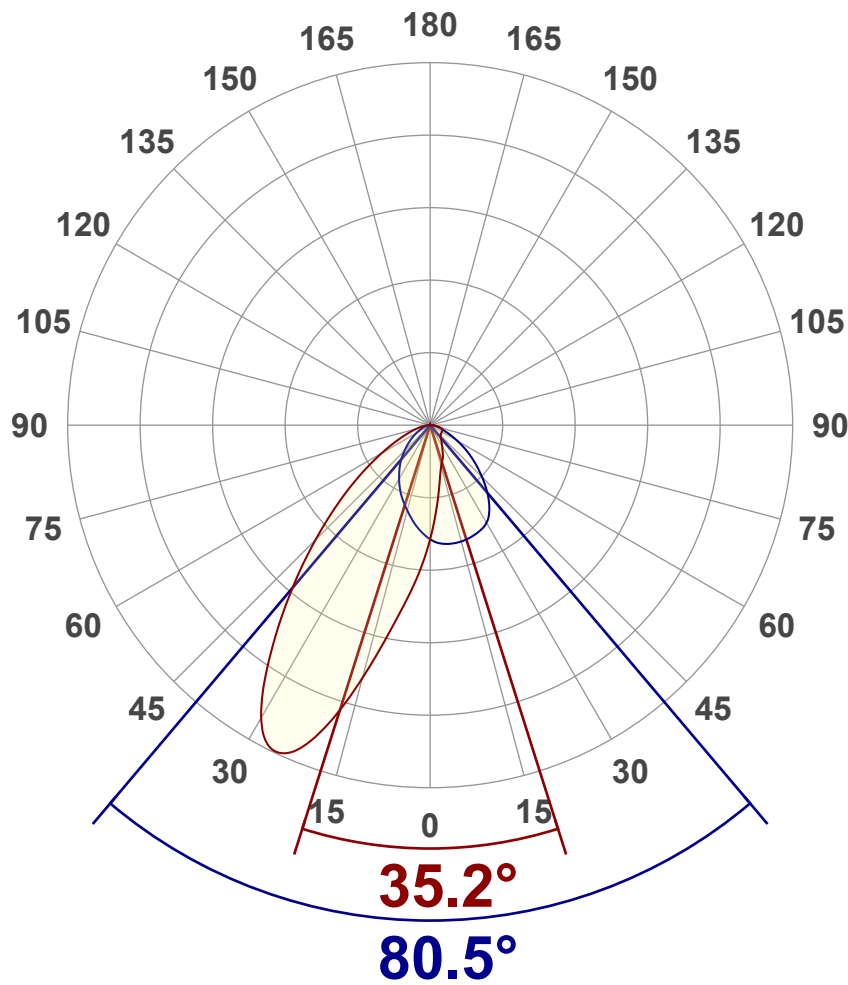
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	3717 lm
Peak Intensity	3621 cd
Beam Angle (50%)	53°
Beam Angle (90%)	80.5°
Beam Angle (10%)	34.9°

Cut-off Angle

Average 2,5%	157.7°
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Field Angle

Average 10%	108.7°
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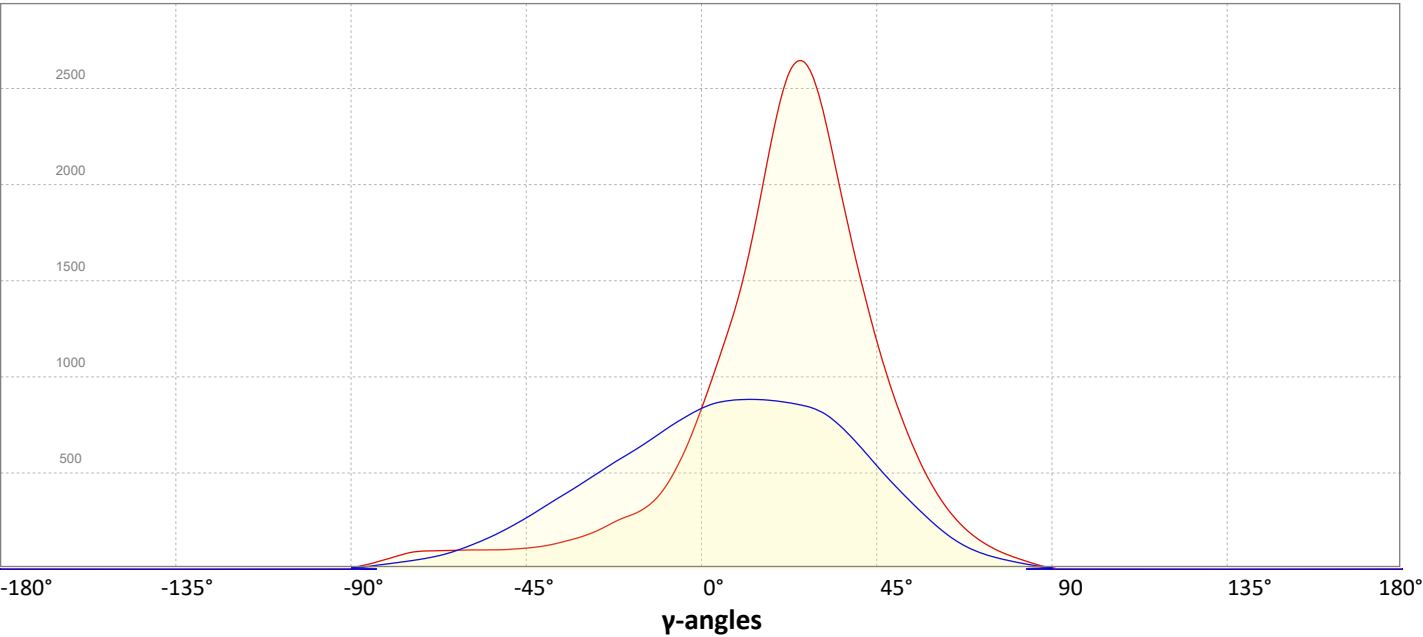
Intensity Ratio

In 120° cone	87.3%
In 90° cone	63.9%

C000-C180

C090-C270

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

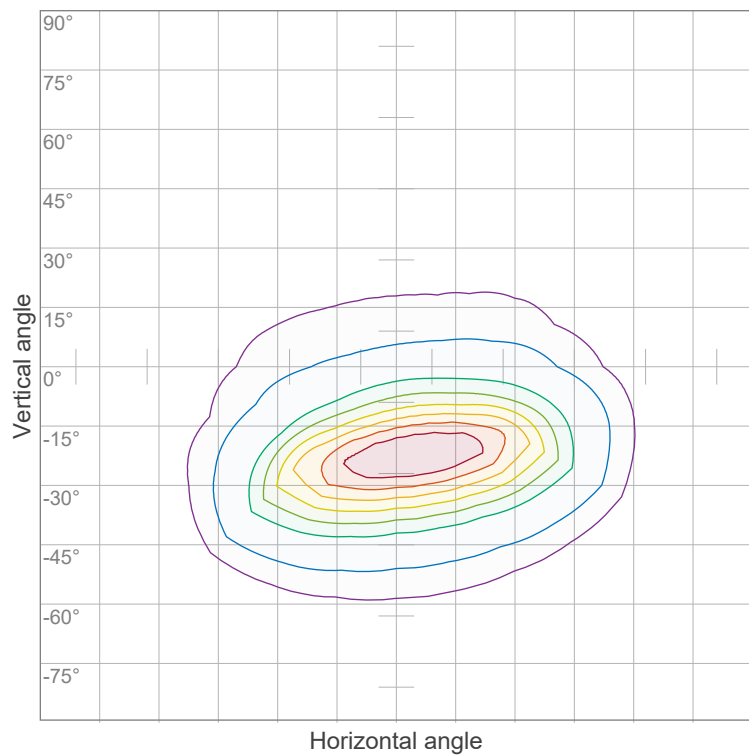


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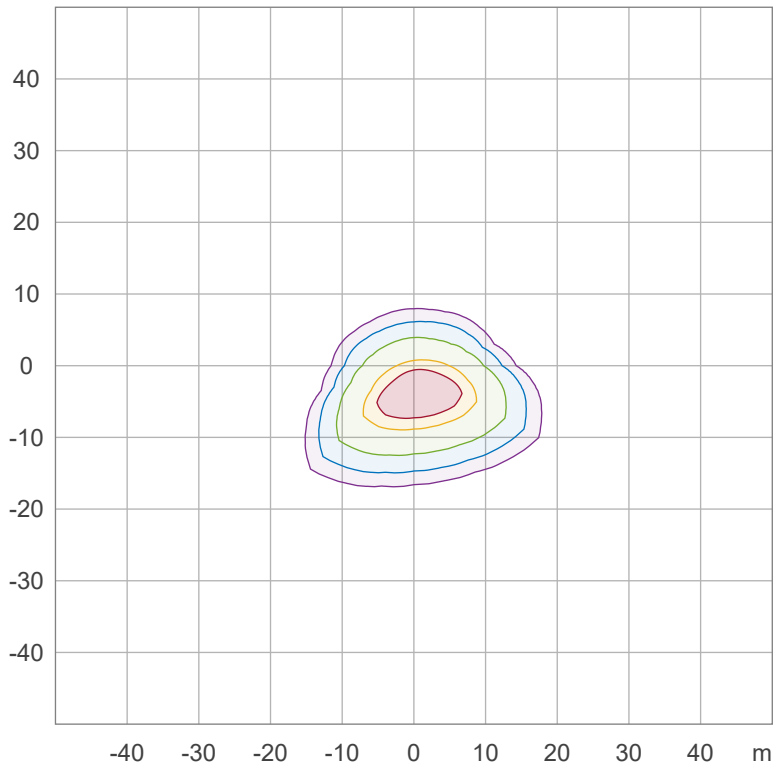
Iso-intensity Diagram (Iso-candela)



90 %	3258.1 cd
80 %	2896.1 cd
70 %	2534.1 cd
60 %	2172.1 cd
50 %	1810.0 cd
40 %	1448.0 cd
30 %	1086.0 cd
20 %	724.0 cd
10 %	362.0 cd

Peak intensity: 3620.1 cd
Number of c-planes: 24

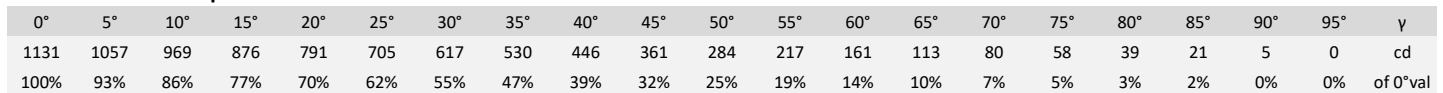
Iso-illuminance Diagram (Iso-lux)



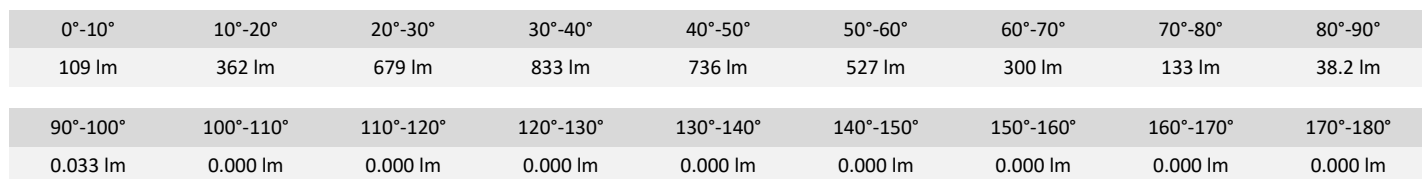
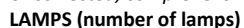
50.0 %	13.9 lx
30.0 %	8.3 lx
10.0 %	2.8 lx
5.0 %	1.4 lx
3.0 %	0.8 lx

Peak illuminance: 27.8 lx
Mounting height: 10.0 m
Number of c-planes: 24

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Outdoor Light Planning

Lumen per Zone

Zone (°)	Lumen	% Total
0-10°	109 lm	2.9%
10-20°	362 lm	9.7%
20-30°	679 lm	18.3%
30-40°	833 lm	22.4%
40-50°	736 lm	19.8%
50-60°	527 lm	14.2%
60-70°	300 lm	8.1%
70-80°	133 lm	3.6%
80-90°	38 lm	1.0%
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	3717 lm	100.0%

Intensity peaks

Max intensity	3621 cd
Intensity, 90°	11 cd
Intensity, 0°	1131 cd

Zonal Lumen summary

Zone (°)	Lumen	% Total
0-30°	1150 lm	30.9%
0-40°	1983 lm	53.3%
0-60°	3246 lm	87.3%
60-90°	471 lm	12.7%
70-100°	171 lm	4.6%
90-120°	0 lm	0.0%
0-90°	3717 lm	100.0%
90-180°	0 lm	0.0%
0-180°	3717 lm	100.0%

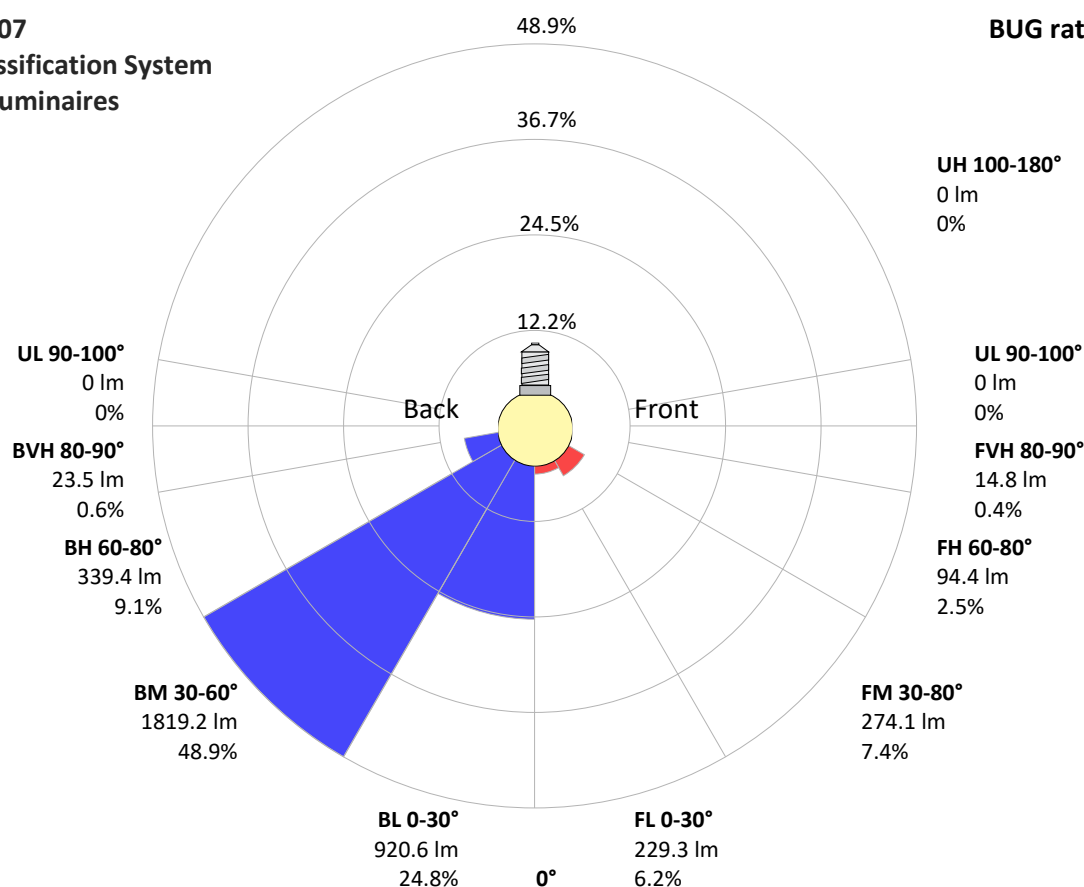
BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	229 lm	6.2%
Medium(30-60°)	274 lm	7.4%
High(60-80°)	94 lm	2.5%
Very high(80-90°)	15 lm	0.4%
Back light		
Low(0-30°)	921 lm	24.8%
Medium(30-60°)	1819 lm	48.9%
High(60-80°)	339 lm	9.1%
Very high(80-90°)	23 lm	0.6%
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 B2 U1 G1



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Power Details

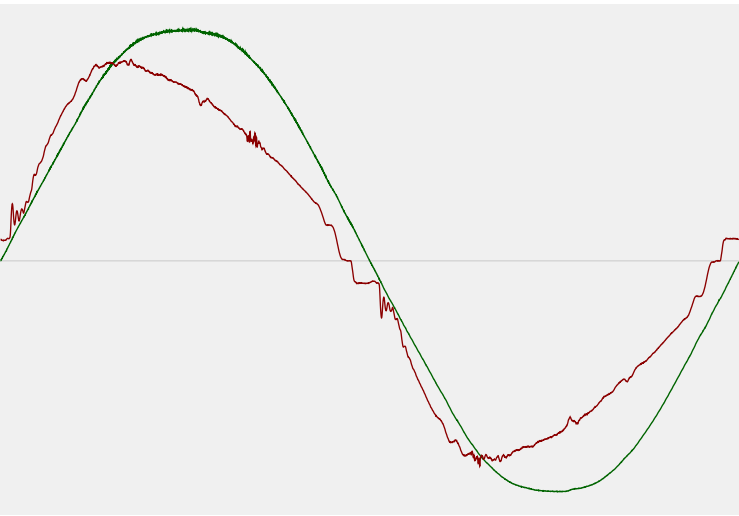
Input Power

Power feed to light source	40.7 W
Frequency of input power	49.9 Hz
RMS Input voltage feed, V_{RMS}	243 V
RMS Input current feed, I_{RMS}	0.173 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	42.1 VA
Displacement factor of AC power feed	0.97
Power factor of AC current feed	0.97
Total harmonic distortion of the current	11.26%
Total harmonic distortion of the voltage	1.64%

Efficiency

Radiated power efficiency	33.1%
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Lumen efficiency	91 lm/W
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Input Power Curve



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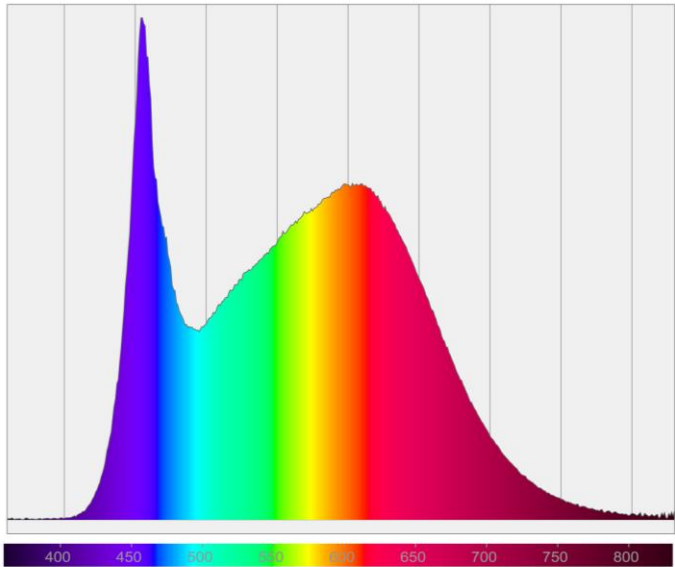
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Color Measurements

Correlated Color Temperature	CCT = 4000 K
Color Rendering TM30-18	R _f 88.9 — R _g 98.5
Color Shift, CIE duv	Duv ±0.0003

Spectral distribution

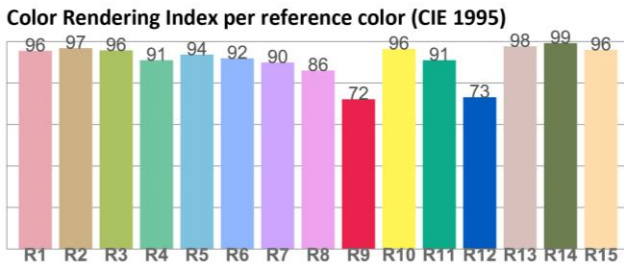
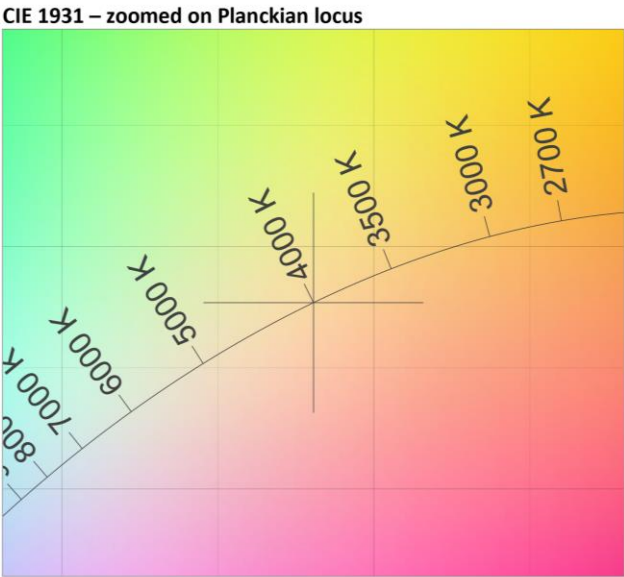
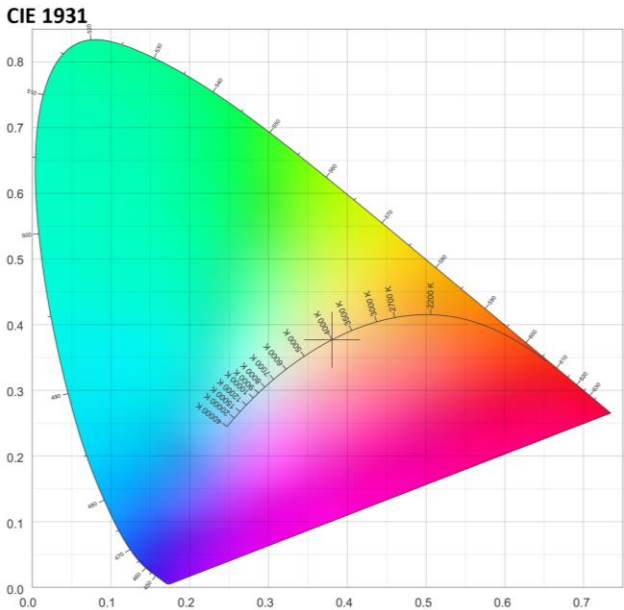


Color details

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 _f 88.9 — R _g 98.5	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.225;0.225)
Color Quality Scale	CQS = 88.9		

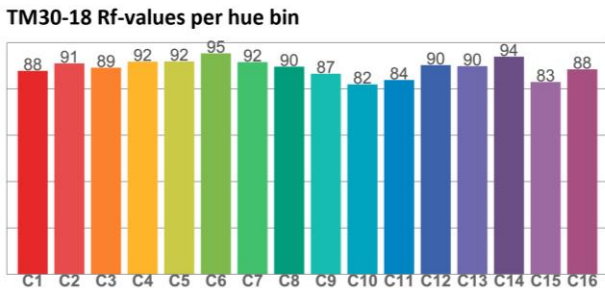
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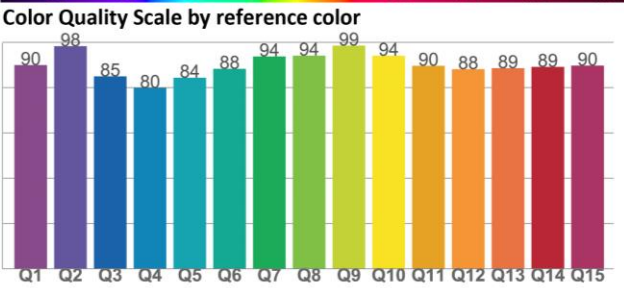
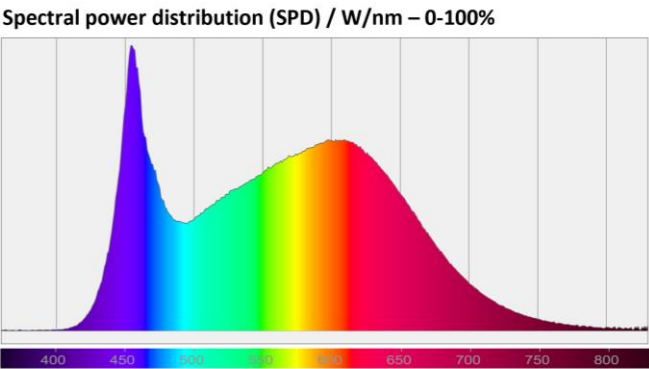
CRI R values, only R1-R8 are used to calculate final CRI value

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