

Tested Light Source - 1_PHOT_NINETY-NINE-2350lmChip-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°

1.5°

1.50 m

16.0 W – PF 0.99 – DPF 0.99

240 V – 0.068 A

50 Hz

Main Light Measurement Results

Output

Efficiency

Peak Intensity and Beam Angle

Color Rendering Index

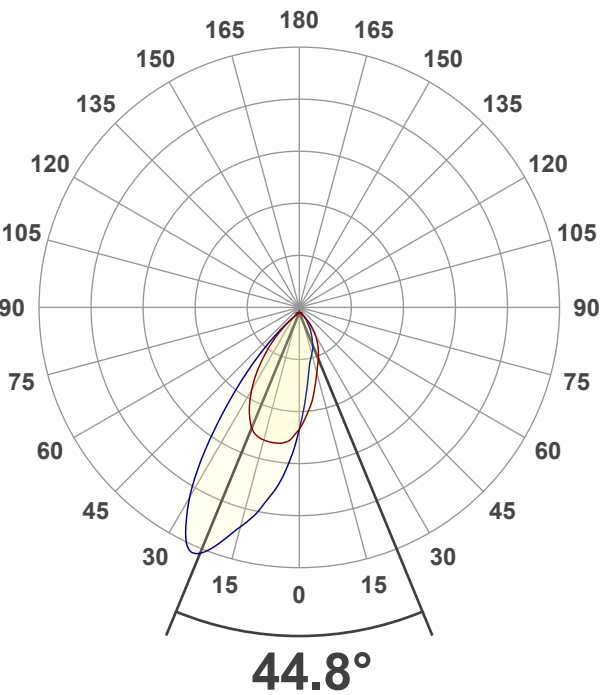
592 lm

37 lm/W

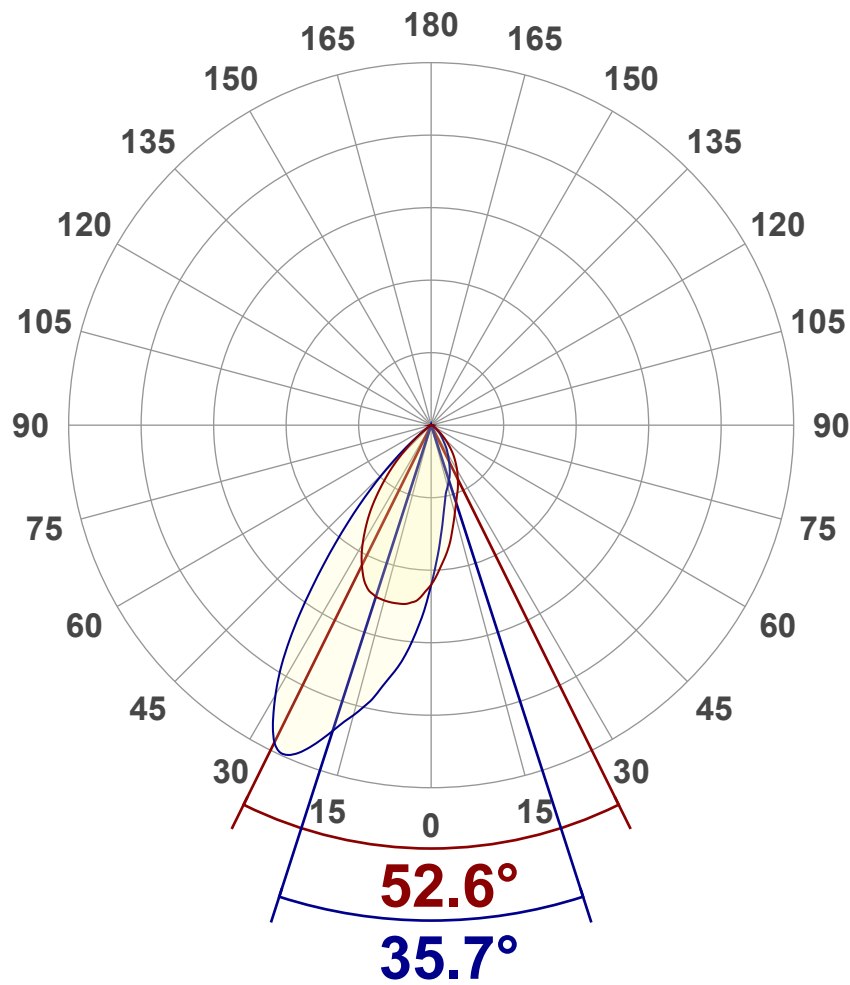
960 cd – 44.8°

CRI 91.8

Light Intensity Distribution



Luminous Intensity diagramUnit: 0-100% of peak intensity



Main Values	
Output (total Lumen)	592 lm
Peak Intensity	960 cd
Beam Angle (50%)	44.8°
Beam Angle (90%)	35.7°
Beam Angle (10%)	57.8°

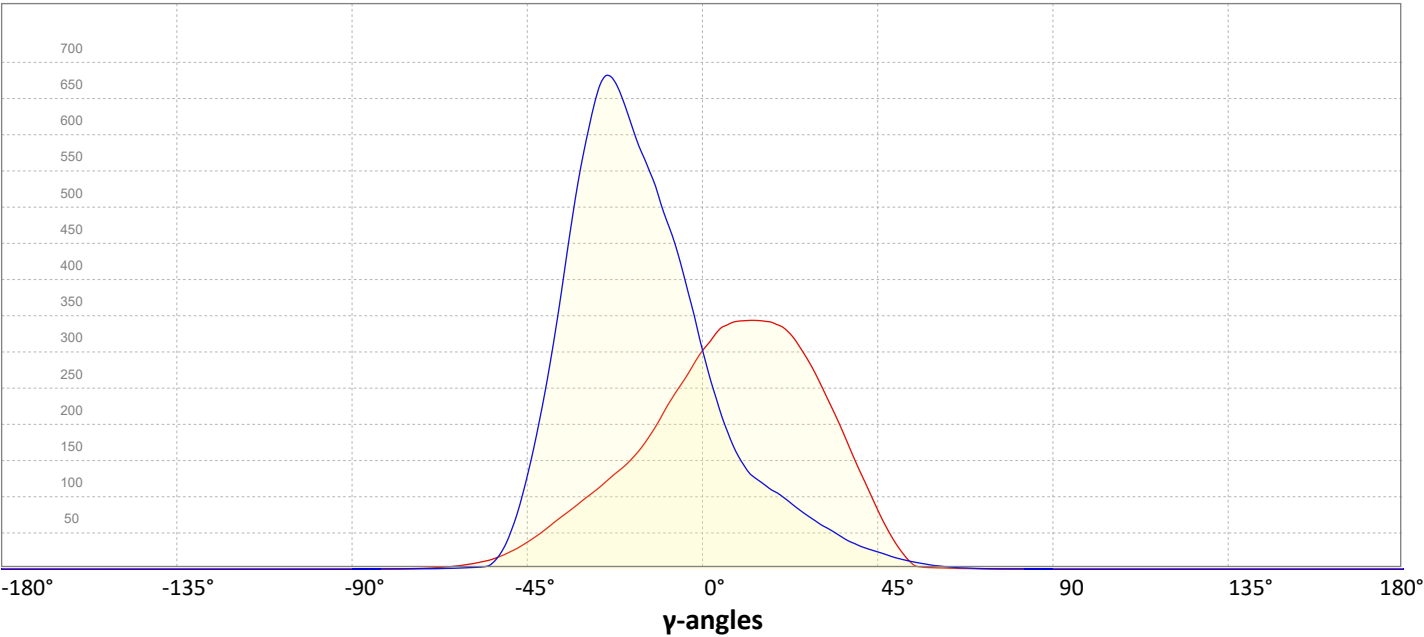
Cut-off Angle	
Average 2,5%	107.3°

Field Angle	
Average 10%	86.9°

Intensity Ratio	
In 120° cone	99.3%
In 90° cone	92.8%

C000-C180
C090-C270

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

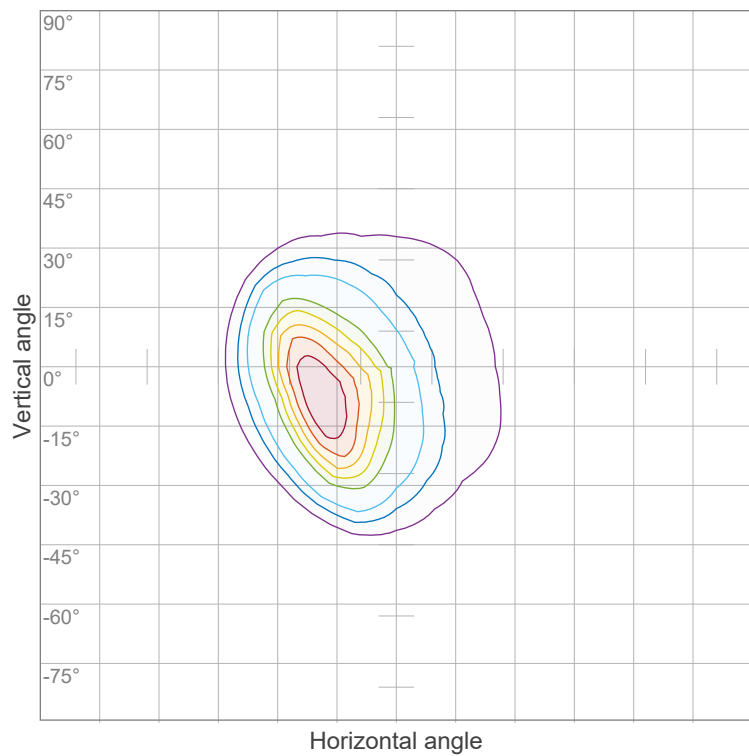


Goniophotometry Report

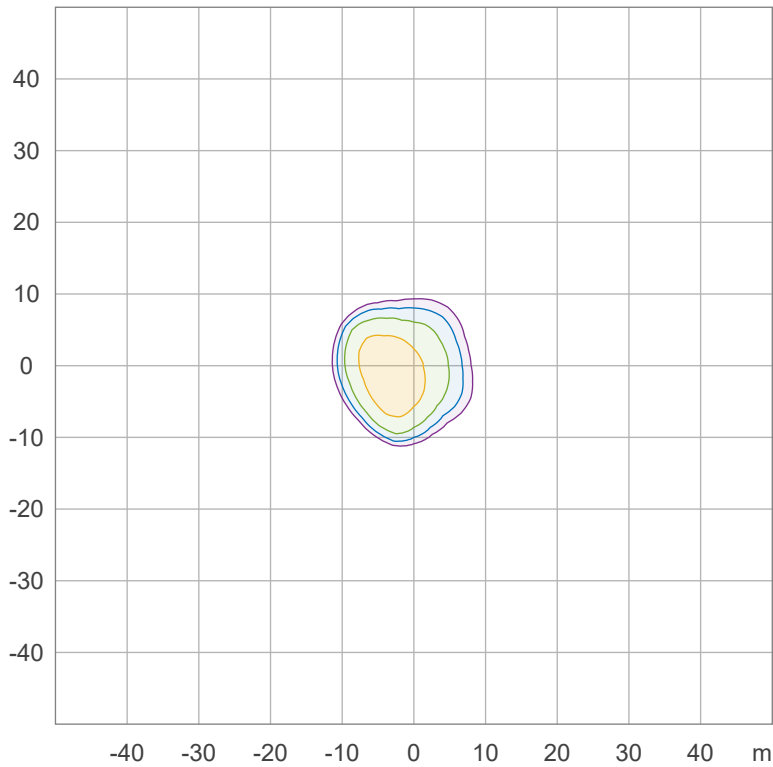
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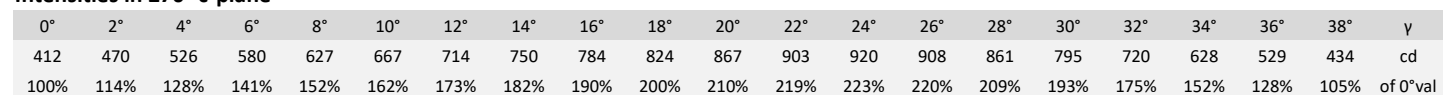
Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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LAMPS (number of lamps)

[illegible]

Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	39 lm	6.6%
10-20°	116 lm	19.7%
20-30°	181 lm	30.6%
30-40°	163 lm	27.6%
40-50°	75 lm	12.6%
50-60°	13 lm	2.2%
60-70°	3 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	592 lm	100.0%

Intensity peaks

Max intensity	960 cd
Intensity, 90°	0 cd
Intensity, 0°	412 cd

Zonal Lumen summary

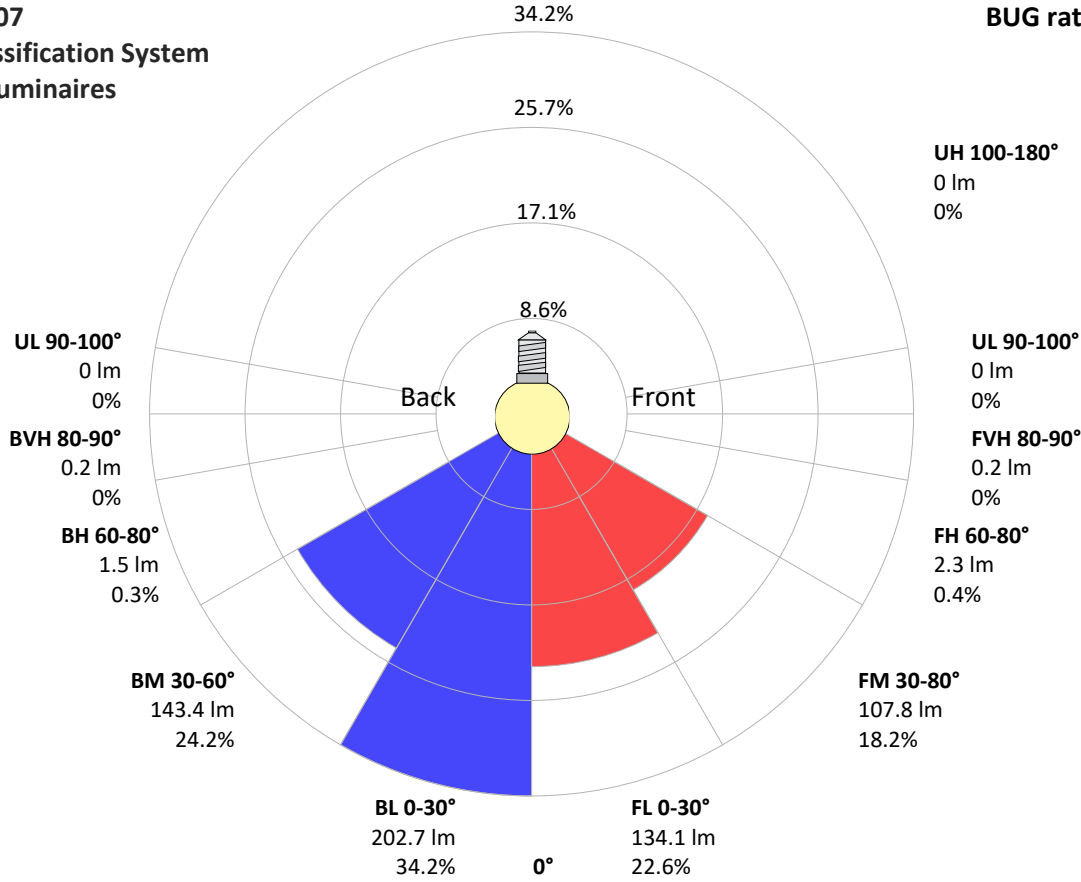
Zone (γ)	Lumen	% Total
0-30°	337 lm	56.9%
0-40°	500 lm	84.5%
0-60°	588 lm	99.3%
60-90°	4 lm	0.7%
70-100°	1 lm	0.2%
90-120°	0 lm	0.0%
0-90°	592 lm	100.0%
90-180°	0 lm	0.0%
0-180°	592 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	134 lm	22.6%
Medium(30-60°)	108 lm	18.2%
High(60-80°)	2 lm	0.4%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	203 lm	34.2%
Medium(30-60°)	143 lm	24.2%
High(60-80°)	2 lm	0.3%
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



Goniophotometry Report

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Power Details

Input Power

Power feed to light source	16.0 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	240 V
RMS Input current feed, I_{RMS}	0.068 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	16.24 VA
Displacement factor of AC power feed	0.99
Power factor of AC current feed	0.99
Total harmonic distortion of the current	6.55%
Total harmonic distortion of the voltage	1.09%

Efficiency

Radiated power efficiency	13.5%
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Lumen efficiency	37 lm/W
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Input Power Curve



Goniophotometry Report

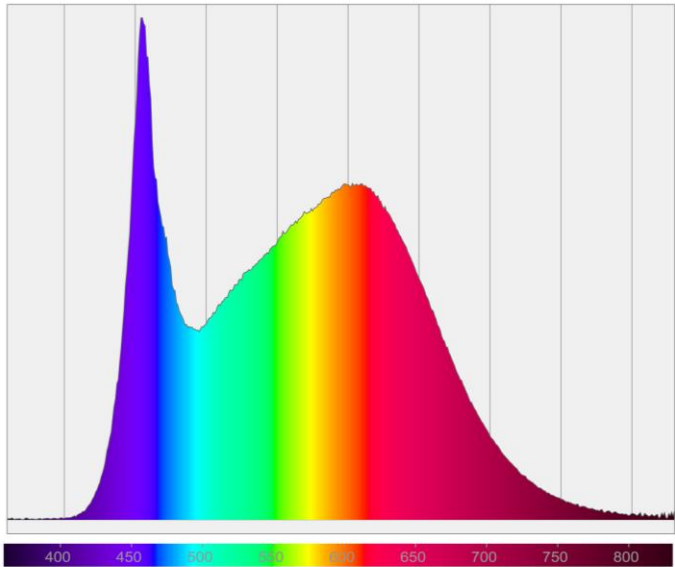
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Color Measurements

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

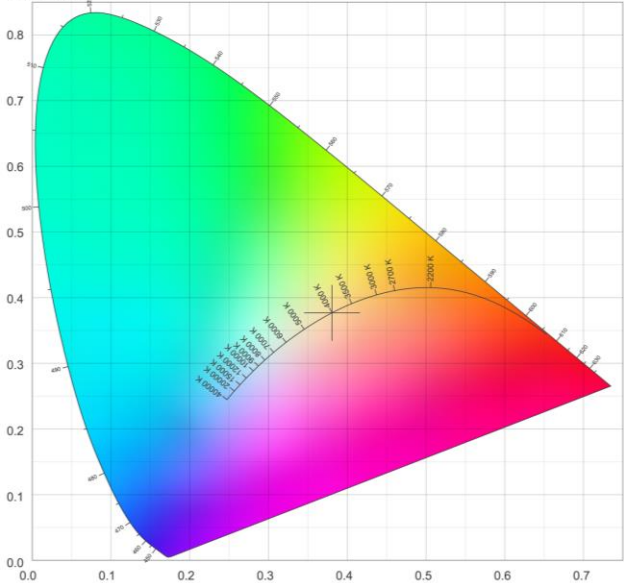
Correlated Color Temperature	CCT = 4000 K	Color coordinates CIE 1931	(x;y) = (0.381;0.377)
Color Rendering Index	CRI 92.6	Color coordinate CIEs 1960	(u;v) = (0.225;0.334)
Color Rendering Index, R9 (red component)	R9 = 72.2	Color deviation from BBL	Duv = ±0.0003
Color Rendering TM30-18	R _f 88.9 — R _g 98.5	Color coordinate CIEs 1976 (CIELUV)	(u';v') = (0.225;0.225)
Color Quality Scale	CQS = 88.9		

Goniophotometry Report

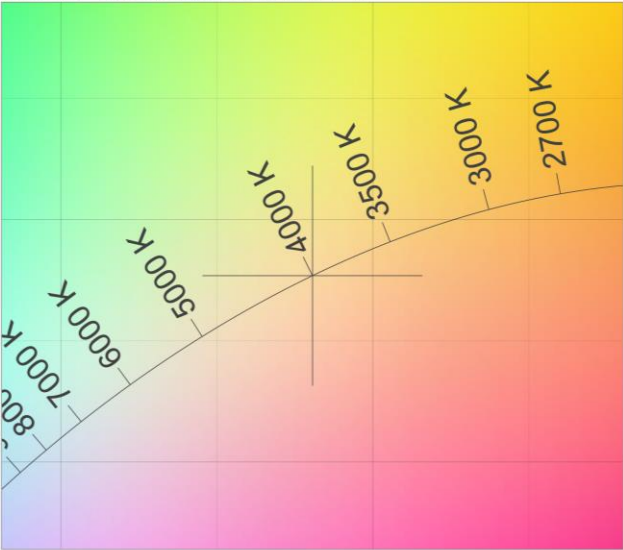
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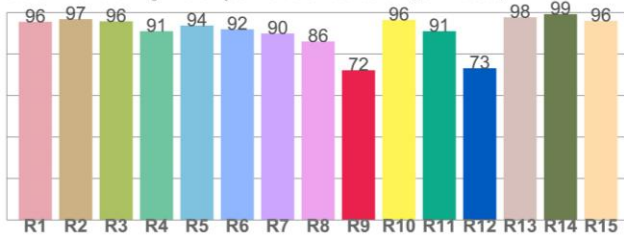
CIE 1931



CIE 1931 – zoomed on Planckian locus



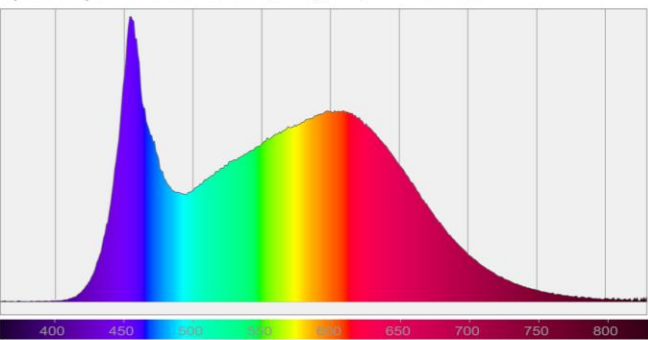
Color Rendering Index per reference color (CIE 1995)



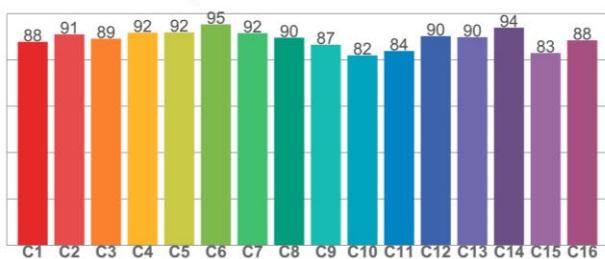
CRI R values, only R1-R8 are used to calculate final CRI value

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%



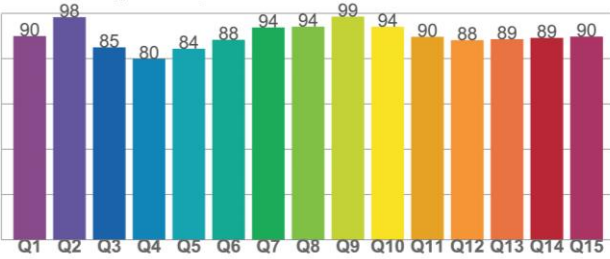
TM30-18 Rf-values per hue bin



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