

Light Measurement Report

Print date: 1/7/2026

Measurement date and time: 1/2/2026 12:49:35 PM – Measurement no. VFR-260102-0730-MS

Measurement tracking No. and Link: [n/a](#)

Operator:



Laboratory and Equipment

Laboratory Owner and Location

Goniospectrometer System and Type

Sensor Name, Calibr. Date and Serial No.

Spectrometer Manufacturer and Model

Viso Systems, Copenhagen V, Denmark

LabSpion – Type C, horizontal

LabSensor Model2 – 4/8/2025 – 1516006613

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

Warm-up Time and Variation

12 planes – 30°

5°

10.57 m

27.6 W – PF 0.96 – DPF 0.98

121 V – 0.238 A

60 Hz

Lamp stabilized in 15 min 0 sec – 2.0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

HP1-P-D-4'-V-835-MLB-BLX2835

HP1-P-D-4'-V-835-MLB-BLX2835 – Finelite Inc.

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)

Efficiency

Peak Intensity and Beam Angle

Correlated Color Temperature, Target/Measured

Color Rendering Index

Color Rendering TM30-18

Color Shift, CIE duv and MacAdam Steps

Flicker

3296 lm – 0.71% / 99.29%

119 lm/W

4007 cd – 56.6°

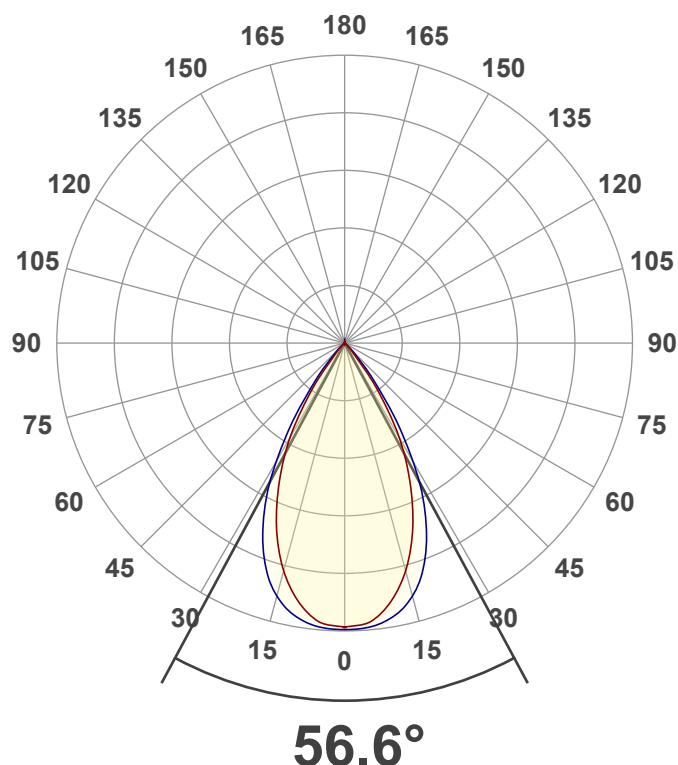
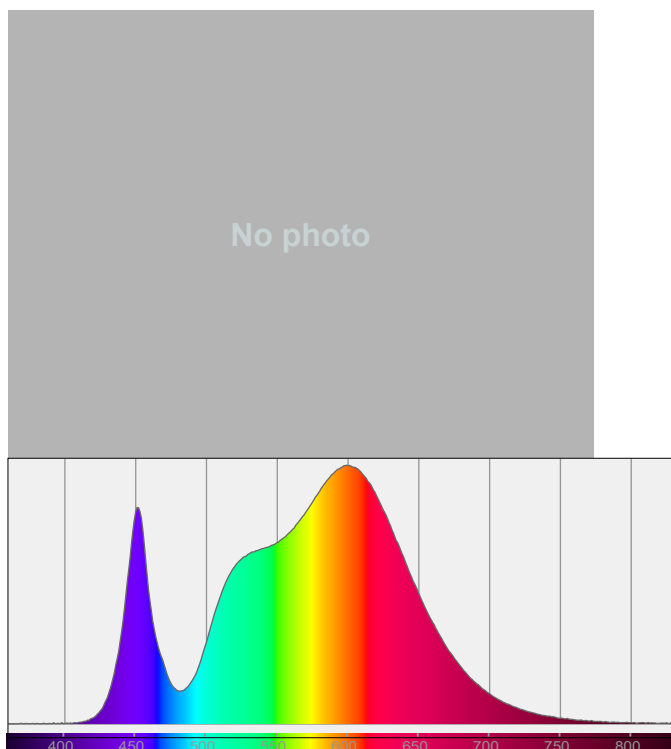
CCT = 3464 K / 3464 K

CRI 81.1

R_f 82.5 – R_g 96.8

Duv 0.0017 – SDCM n/a

SVM n/a – PstLM n/a



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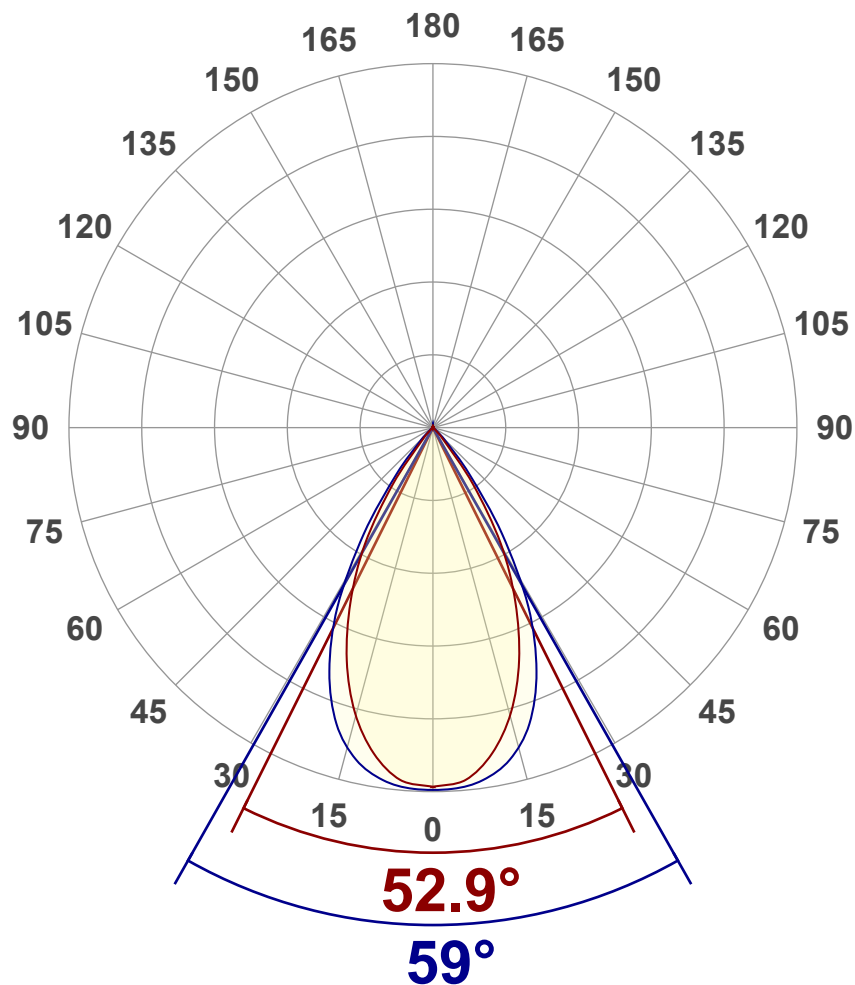
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	3296 lm
Lumen Up% / Down%	0.71% / 99.29%
Peak Intensity	4007 cd
Beam Angle (50%)	56.6°
Beam Angle (90%)	59°
Beam Angle (10%)	52.9°

Cut-off Angle

Average 2,5%	93.3°
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Field Angle

Average 10%	81.9°
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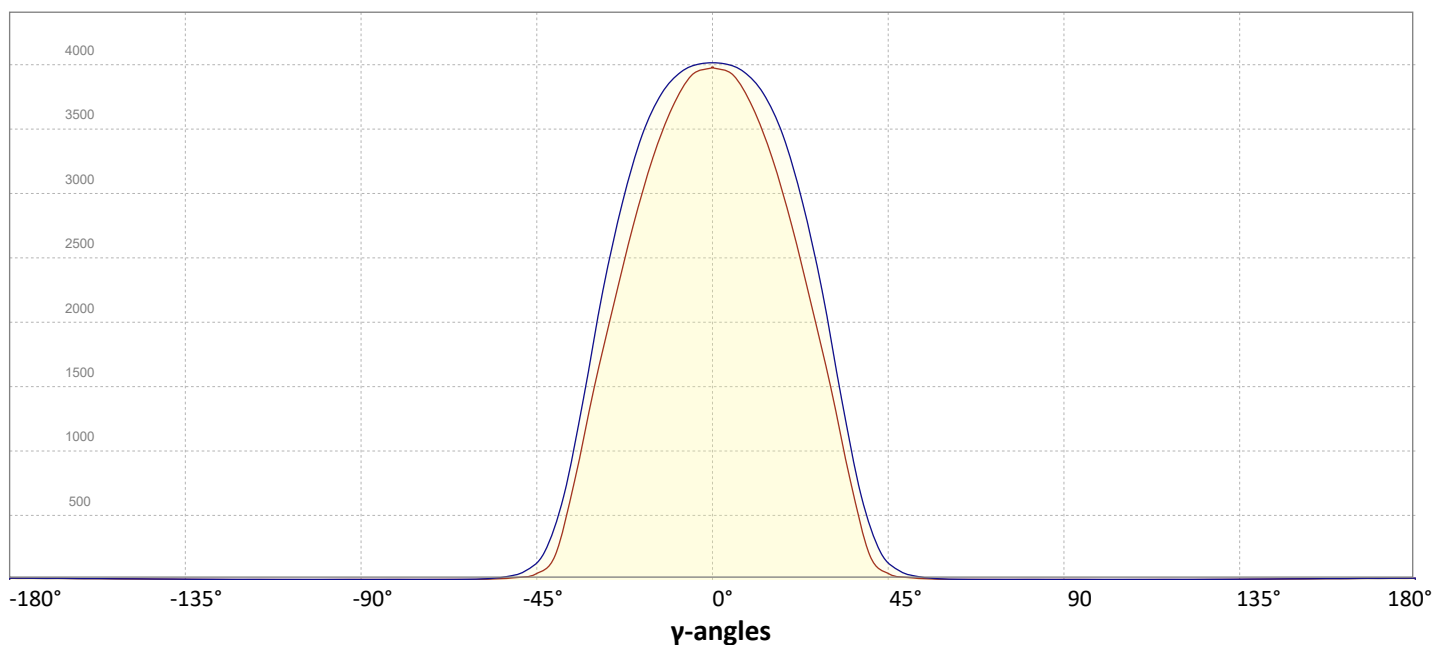
Intensity Ratio

In 120° cone	99.0%
In 90° cone	97.5%

C000-C180

C090-C270

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

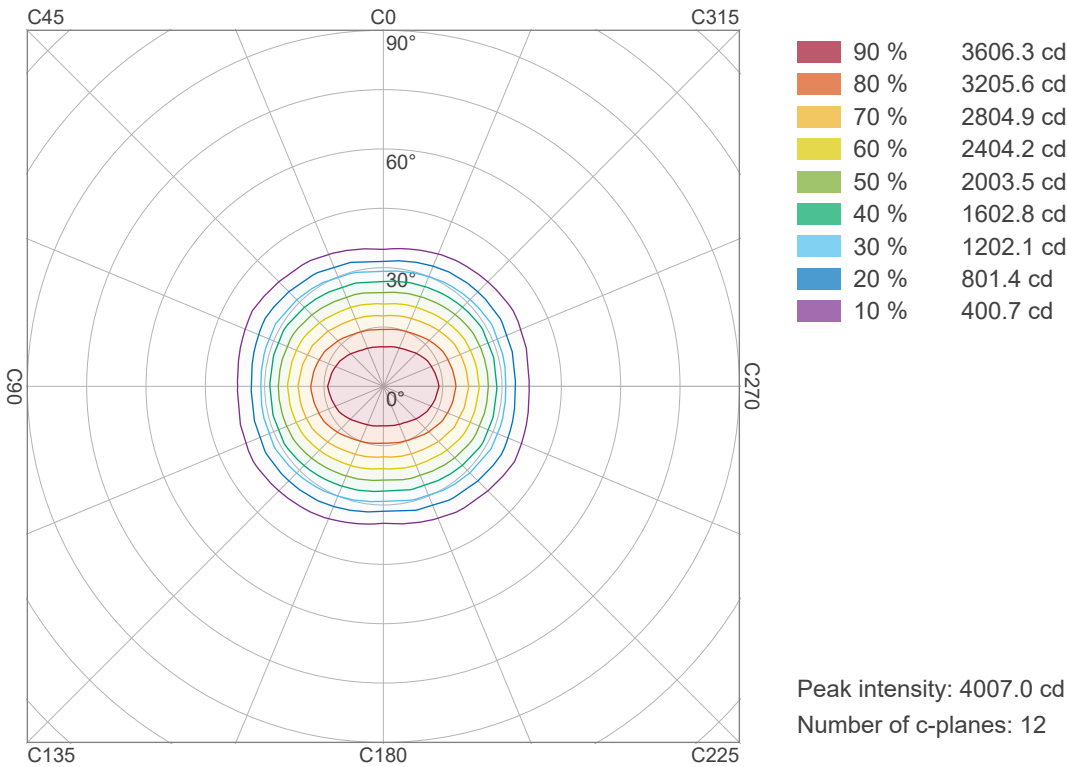


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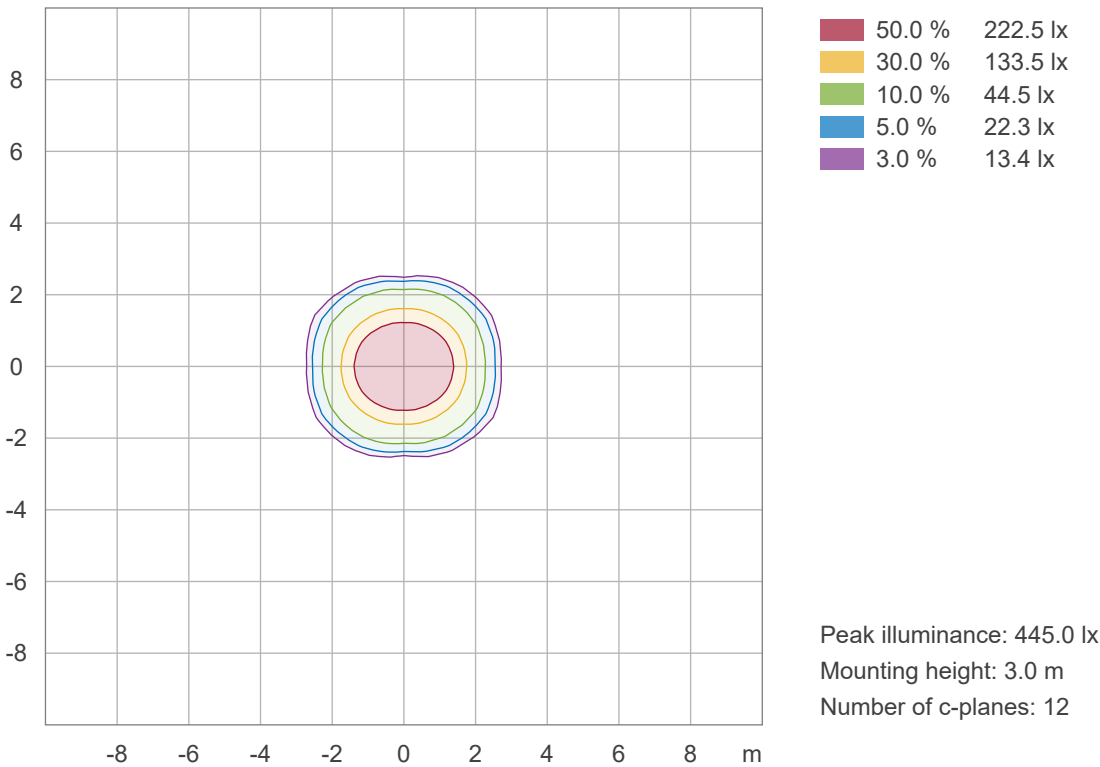
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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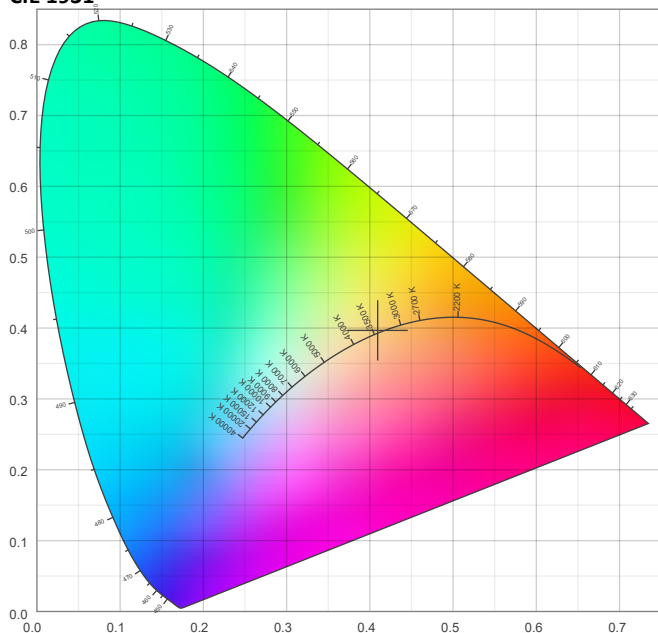


Color details

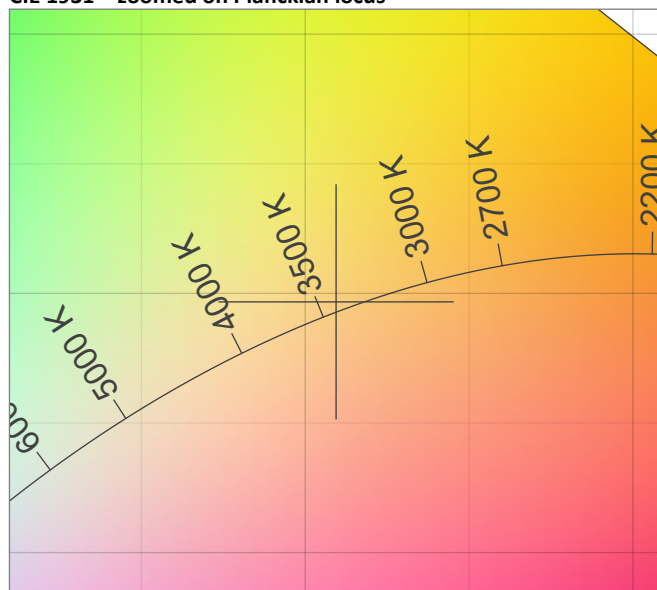
Correlated Color Temperature, Target CCT = 3464 K
Correlated Color Temperature, Measured CCT = 3464 K
Color Rendering Index CRI 81.1
Color Rendering Index, R9 (red component) R9 = 0.5
Color Rendering TM30-18 R_f 82.5 – R_g 96.8
Color Quality Scale CQS = 81.1

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0.409;0.397)
Color coordinate CIEs 1960 (u;v) = (0.236;0.343)
Color deviation from BBL Duv = 0.0017
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0.236;0.514)

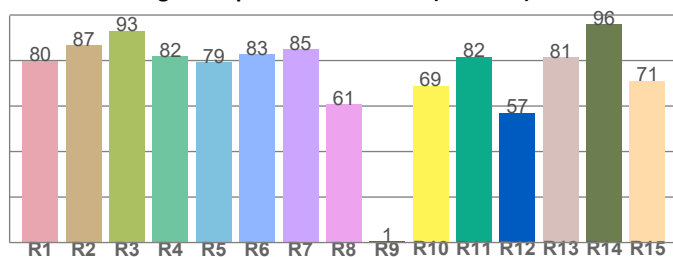
CIE 1931



CIE 1931 – zoomed on Planckian locus



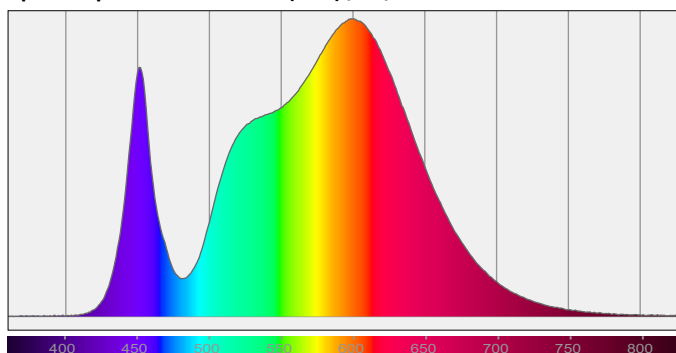
Color Rendering Index per reference color (CIE 1995)



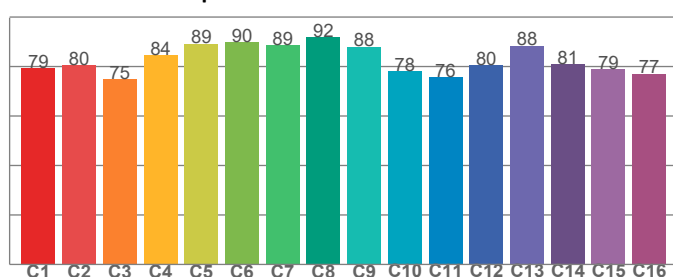
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
79.9	86.7	93.0	82.0	79.2	82.6	85.0	60.7	0.5	68.9	81.7	57.1	81.4	95.9	71.2

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



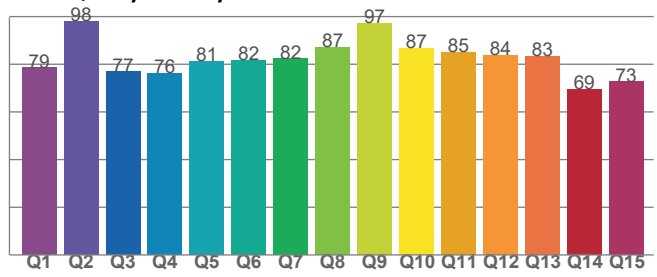
TM30-18 R_f-values per hue bin



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
79.2	80.5	74.8	84.5	89.2	89.9	88.6	91.8	87.9	78.1	75.6	80.5	88.5	81.0	78.9	77.1

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
78.5	98.1	77.0	76.2	81.4	81.8	82.4	87.1	97.1	86.7	85.1	83.9	83.3	69.5	72.6

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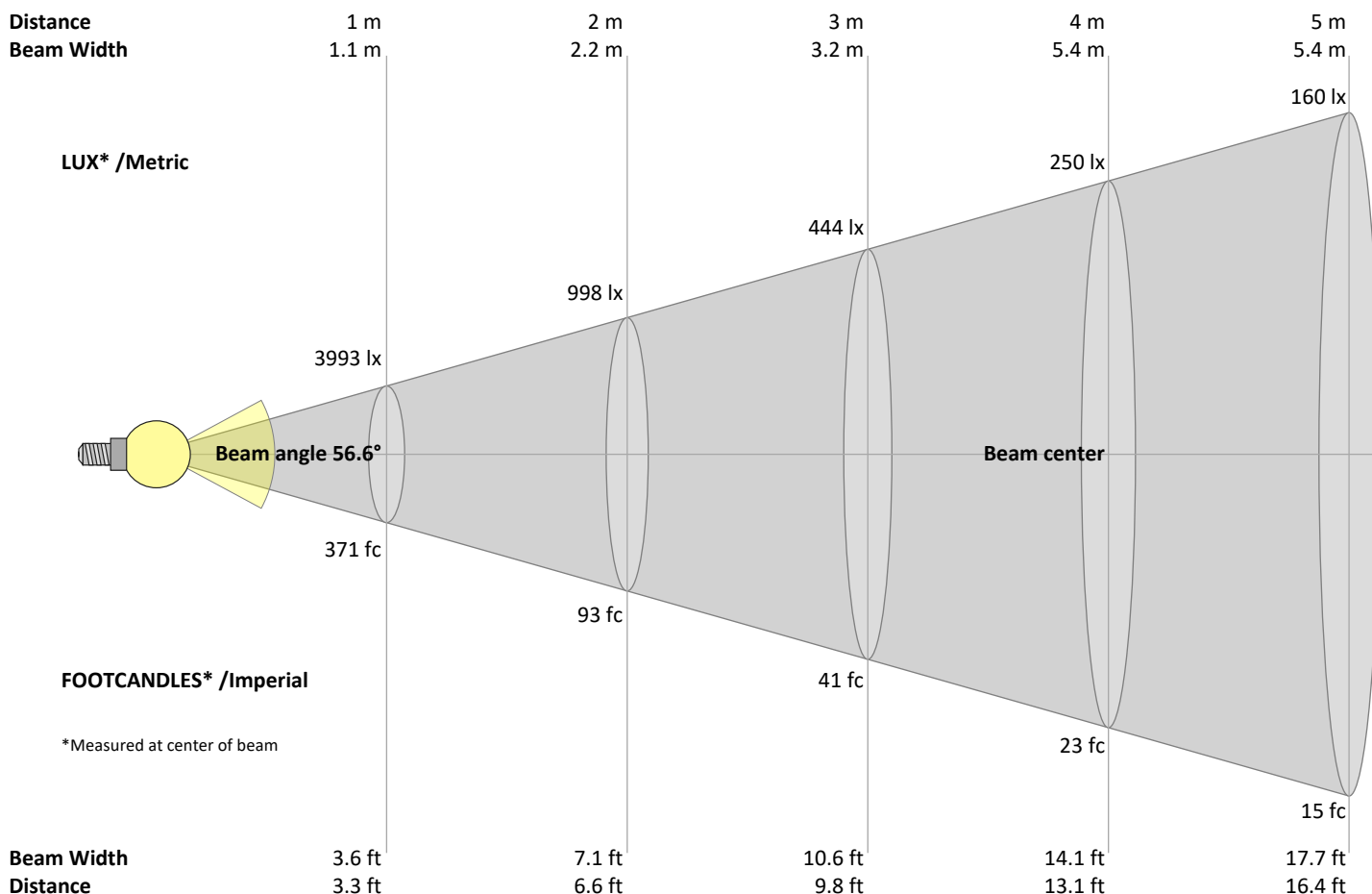
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Beam Details



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
3993	998	444	250	160	111	81	62	49	40	33	28	24	20	18	16	14	12	11	10	lux
370.9	92.7	41.2	23.2	14.8	10.3	7.6	5.8	4.6	3.7	3.1	2.6	2.2	1.9	1.6	1.4	1.3	1.1	1	0.9	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
3993	3955	3933	3884	3783	3682	3533	3376	3200	2991	2782	2542	2296	2046	1788	1530	1246	957	688	455	cd
100%	99%	99%	97%	95%	92%	88%	85%	80%	75%	70%	64%	58%	51%	45%	38%	31%	24%	17%	11%	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
3993	4007	3995	3970	3944	3878	3810	3713	3583	3453	3247	3039	2800	2527	2255	1919	1582	1262	962	662	cd
100%	100%	100%	99%	99%	97%	95%	93%	90%	86%	81%	76%	70%	63%	56%	48%	40%	32%	24%	17%	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
3993	3955	3933	3884	3783	3682	3533	3376	3200	2991	2782	2542	2296	2046	1788	1530	1246	957	688	455	cd
100%	99%	99%	97%	95%	92%	88%	85%	80%	75%	70%	64%	58%	51%	45%	38%	31%	24%	17%	11%	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
3993	4007	3995	3970	3944	3878	3810	3713	3583	3453	3247	3039	2800	2527	2255	1919	1582	1262	962	662	cd
100%	100%	100%	99%	99%	97%	95%	93%	90%	86%	81%	76%	70%	63%	56%	48%	40%	32%	24%	17%	of 0°val

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	372 lm	11.3%
10-20°	967 lm	29.3%
20-30°	1107 lm	33.6%
30-40°	663 lm	20.1%
40-50°	137 lm	4.2%
50-60°	17 lm	0.5%
60-70°	3 lm	0.1%
70-80°	3 lm	0.1%
80-90°	3 lm	0.1%
90-100°	3 lm	0.1%
100-110°	2 lm	0.1%
110-120°	2 lm	0.1%
120-130°	2 lm	0.1%
130-140°	3 lm	0.1%
140-150°	3 lm	0.1%
150-160°	4 lm	0.1%
160-170°	3 lm	0.1%
170-180°	1 lm	0.0%
Total	3296 lm	100.0%

Intensity peaks

Max intensity	4007 cd
Intensity, 90°	3 cd
Intensity, 0°	3993 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	2446 lm	74.2%
0-40°	3109 lm	94.3%
0-60°	3263 lm	99.0%
60-90°	9 lm	0.3%
70-100°	8 lm	0.2%
90-120°	7 lm	0.2%
0-90°	3272 lm	99.3%
90-180°	23 lm	0.7%
0-180°	3296 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	1217 lm	36.9%
Medium(30-60°)	414 lm	12.6%
High(60-80°)	3 lm	0.1%
Very high(80-90°)	1 lm	0.0%
Back light		
Low(0-30°)	1217 lm	36.9%
Medium(30-60°)	414 lm	12.6%
High(60-80°)	3 lm	0.1%
Very high(80-90°)	1 lm	0.0%

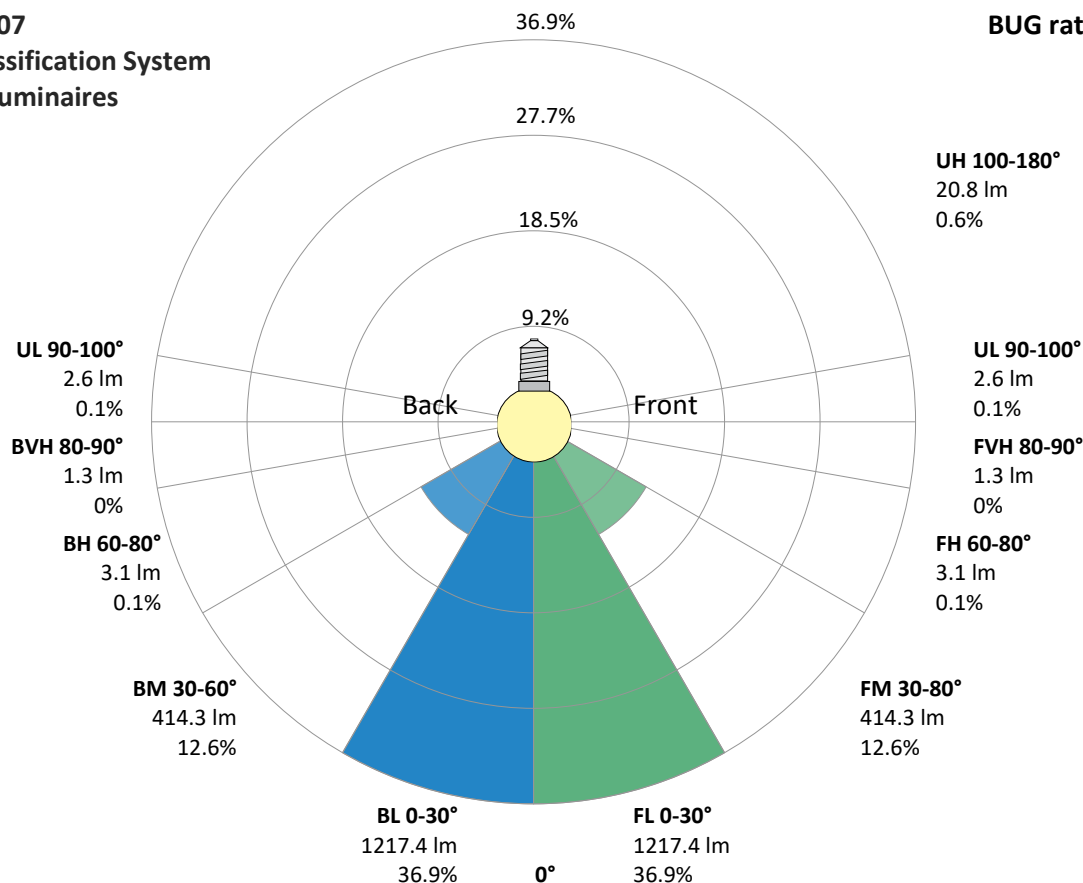
Uplight

Low(90-100°)	3 lm	0.1%
High(100-180°)	21 lm	0.6%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B3 U2 G0



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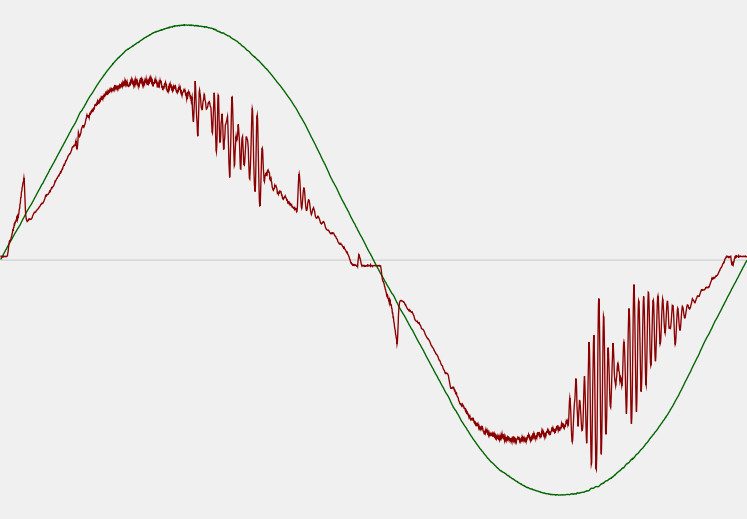


Power Details

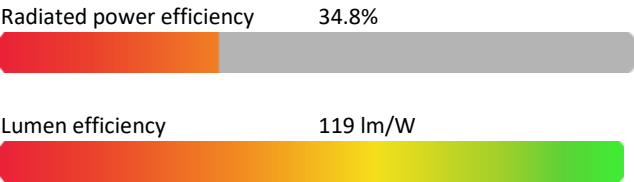
Input Power

Power feed to light source	27.6 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	121 V
RMS Input current feed, I_{RMS}	0.238 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	28.83 VA
Displacement factor of AC power feed	0.98
Power factor of AC current feed	0.96
Total harmonic distortion of the current	14.01%
Total harmonic distortion of the voltage	1.68%

Input Power Curve



Efficiency



Stabilization Details

Warmup Conditions

Stable period	15 min
Stable change max	2.0%
Minimum time	15 min

Color Temperature Change

CCT start	3462 K
CCT shift	+2 K
CCT end	3464 K

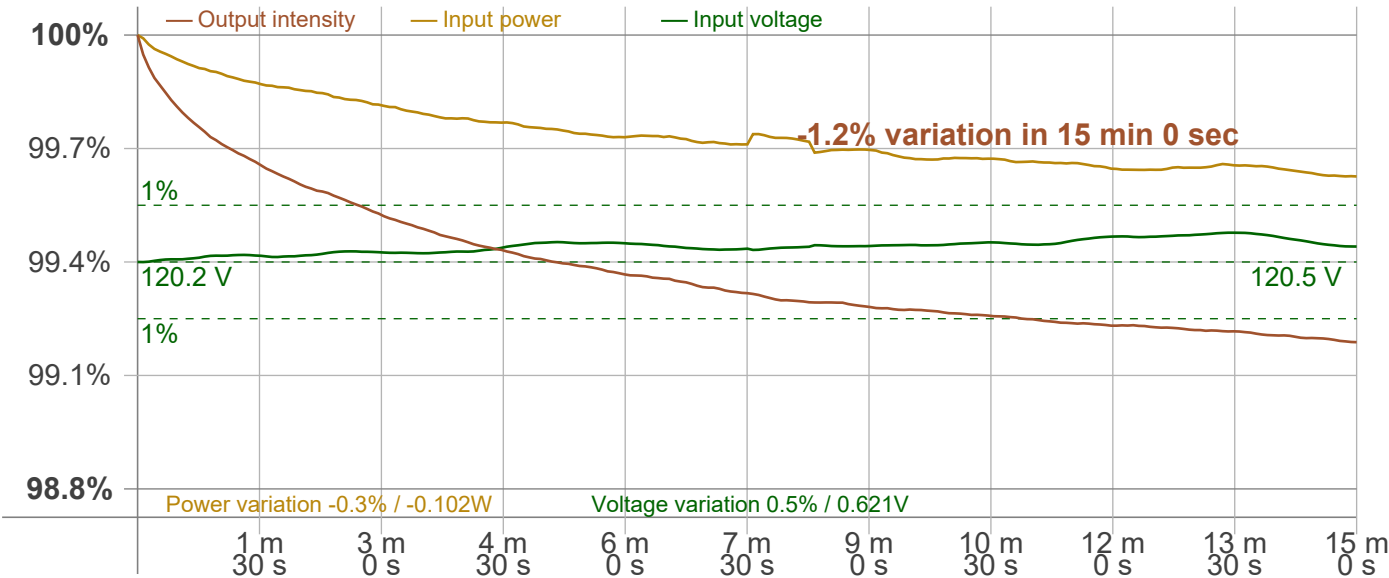
Warmup Result

Total warmup time	Lamp stabilized in 15 min 0 sec
Warmup variation	-1.2%

Output Change

Output start	3327 lm
Output change	-31 lm
Output end	3296 lm

Stabilization Curve



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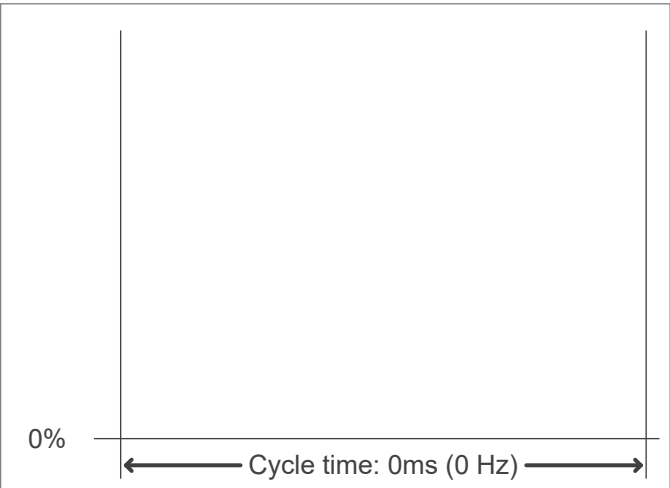
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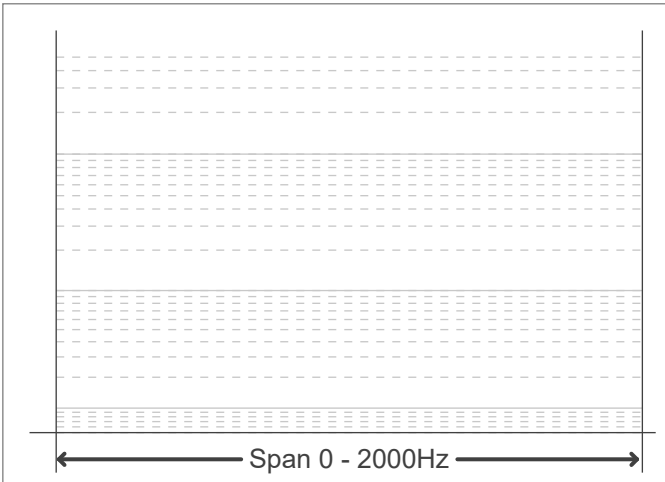
Flicker /TLA details

Flicker Meter Type	Viso Systems LabFlicker	Measurement time	
Frequency of input power	60 Hz	PstLM	180 sec
Flicker/TLA sample rate	n/a samples/s	All other indices	1,2 sec
Flicker indices according to Illuminating Engineering Society (IES)		Flicker indices according to California Energy Commission (CEC) 2016b	
Flicker frequency	n/a Hz	JA8/10 40 Hz	n/a %
Percent Flicker	n/a %	JA8/10 90 Hz	n/a %
Flicker index	n/a	JA8/10 200 Hz	n/a %
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)		JA8/10 400 Hz	n/a %
PstLM value (F < 80 Hz)	n/a	JA8/10 1000 Hz	n/a %
SVM value (80 < F < 2000 Hz)	n/a	Flicker indices according to Lighting Research Center (2015)	
		Perception metric, Assist Mp	n/a

Flicker frame (frame of one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

