

Light Measurement Report

Print date: 1/8/2026

Measurement date and time: 1/2/2026 1:23:03 PM – Measurement no. VFR-260102-0732-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

20.8 W – PF 0.99 – DPF 0.99

121 V – 0.173 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'-H-835-MLB-BLX2835

HP1-P-D-4'-H-835-MLB-BLX2835 –

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

2546 lm – 0.68% / 99.32%

122 lm/W

3096 cd – 56.7°

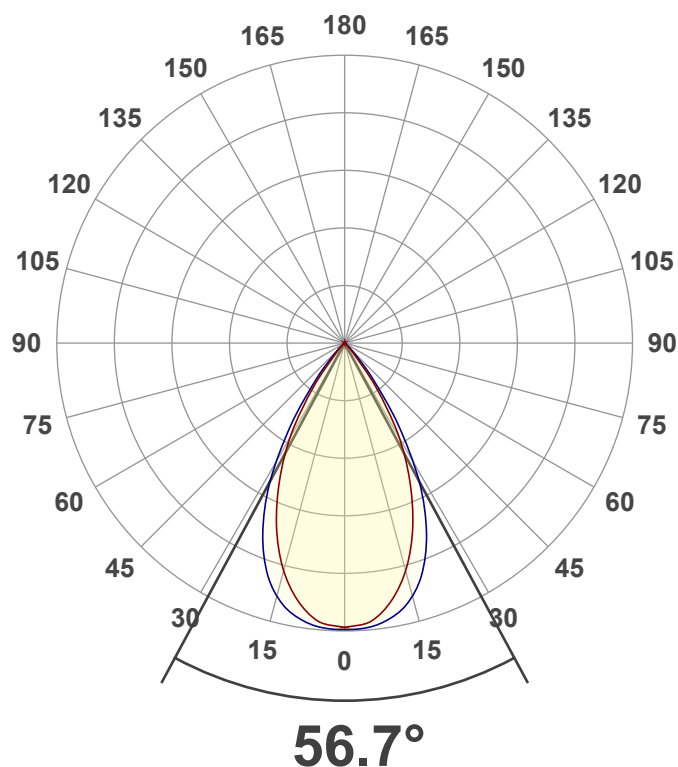
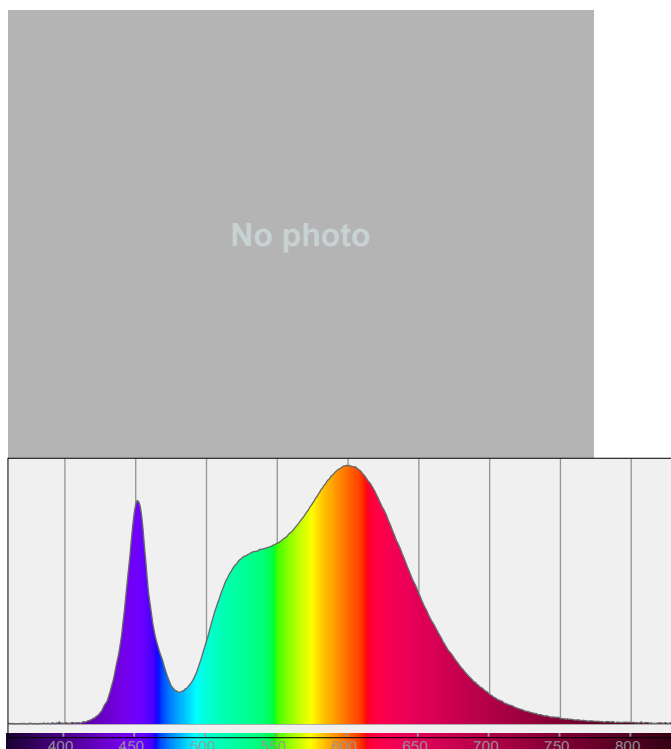
CCT = 3462 K / 3462 K

CRI 81.4

R_f 82.7 – R_g 97.0

Duv 0.0016 – SDCM n/a

SVM n/a – PstLM n/a



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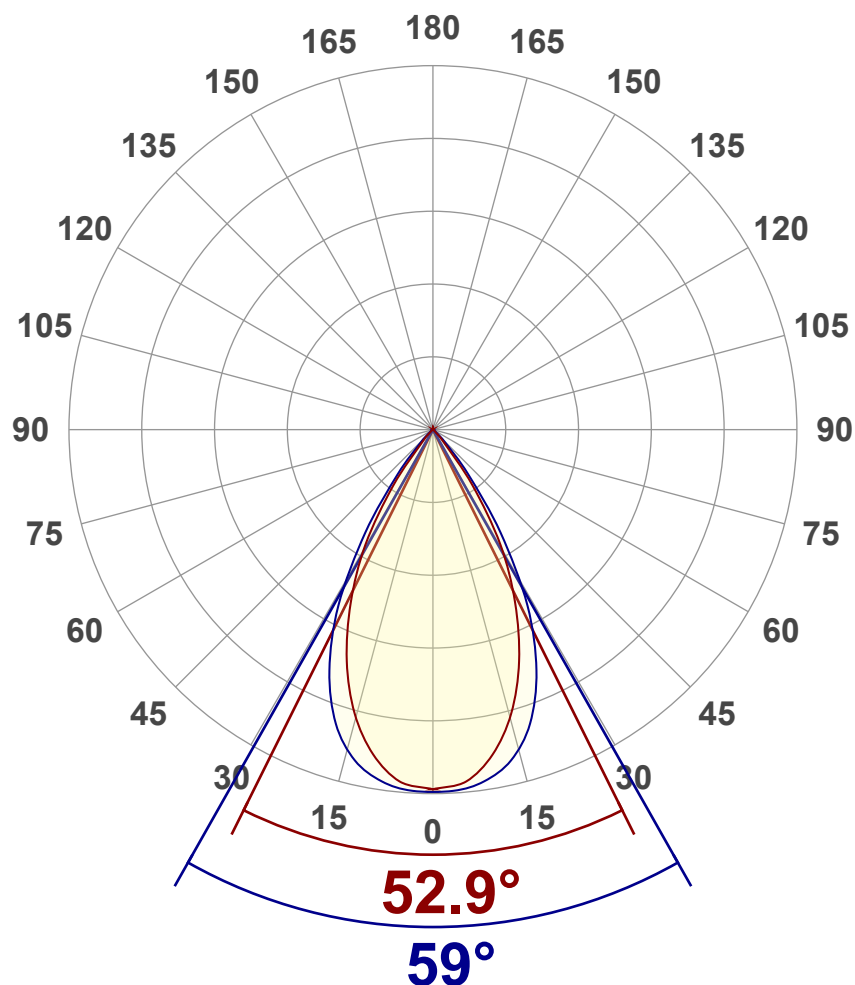
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2546 lm
Lumen Up% / Down%	0.68% / 99.32%
Peak Intensity	3096 cd
Beam Angle (50%)	56.7°
Beam Angle (90%)	59°
Beam Angle (10%)	52.9°

Cut-off Angle

Average 2,5%	93.6°
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Field Angle

Average 10%	82°
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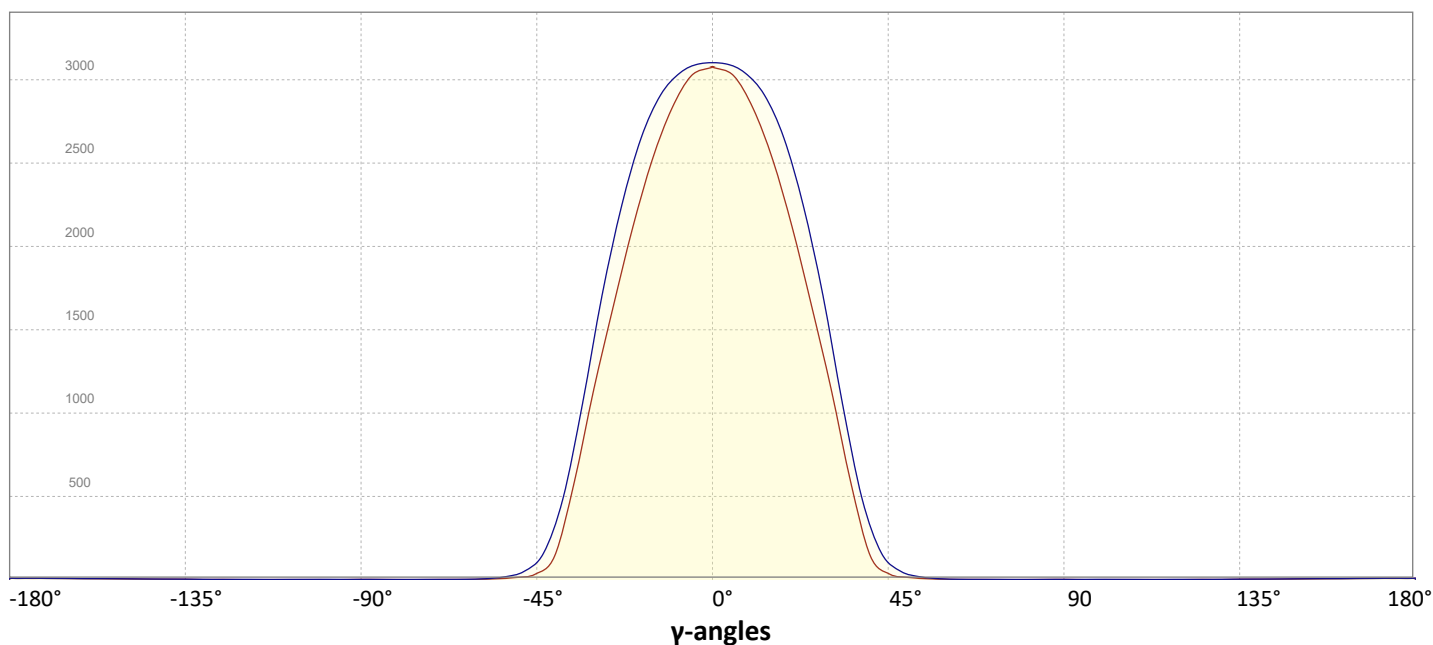
Intensity Ratio

In 120° cone	99.1%
In 90° cone	97.4%

C000-C180

C090-C270

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

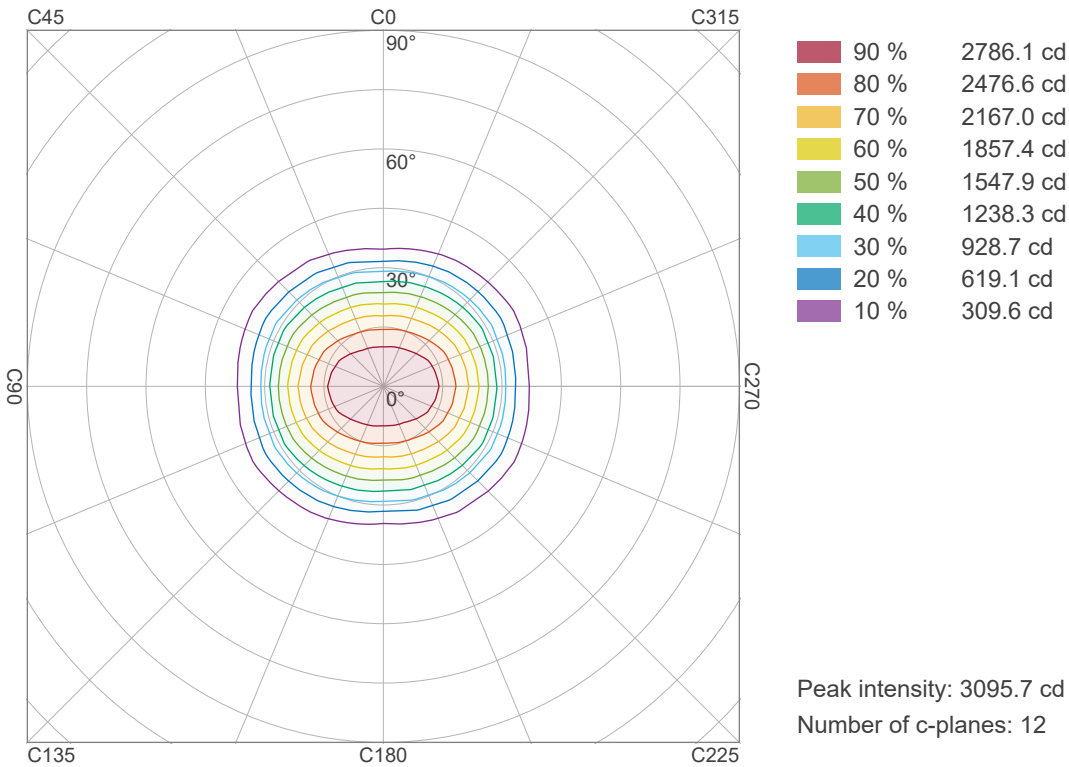


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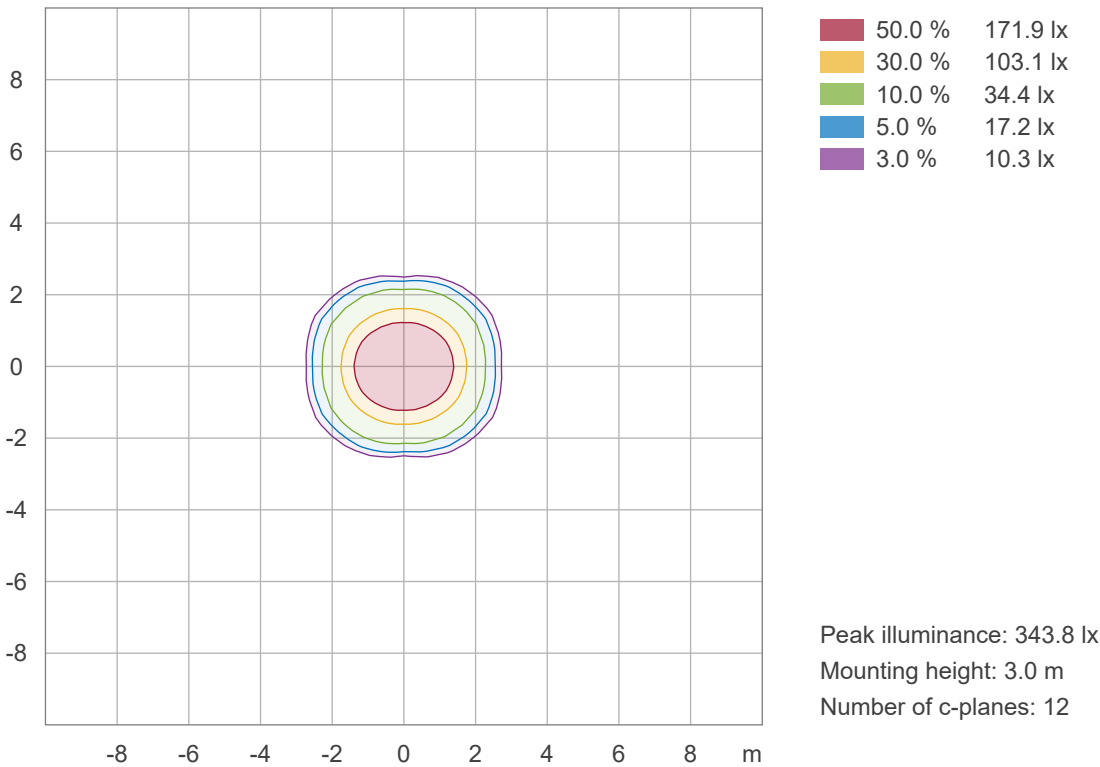
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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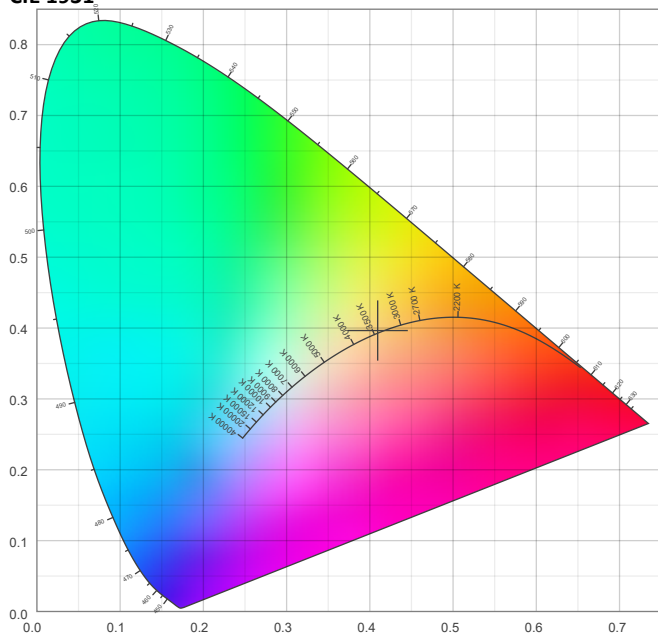


Color details

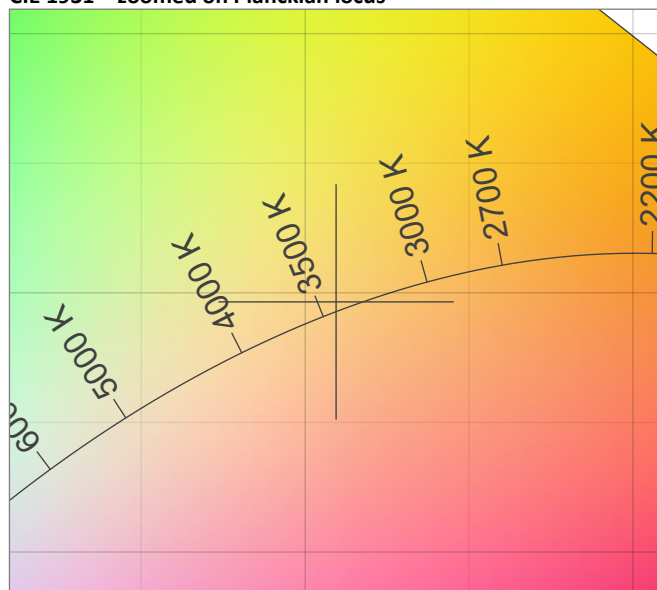
Correlated Color Temperature, Target CCT = 3462 K
Correlated Color Temperature, Measured CCT = 3462 K
Color Rendering Index CRI 81.4
Color Rendering Index, R9 (red component) R9 = 1.5
Color Rendering TM30-18 Rf 82.7 – Rg 97.0
Color Quality Scale CQS = 81.3

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 = 0.0016
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0.236;0.514)

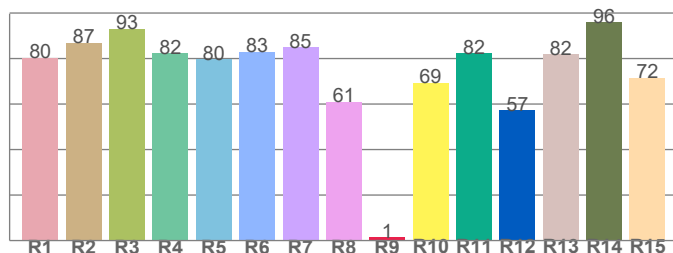
CIE 1931



CIE 1931 – zoomed on Planckian locus



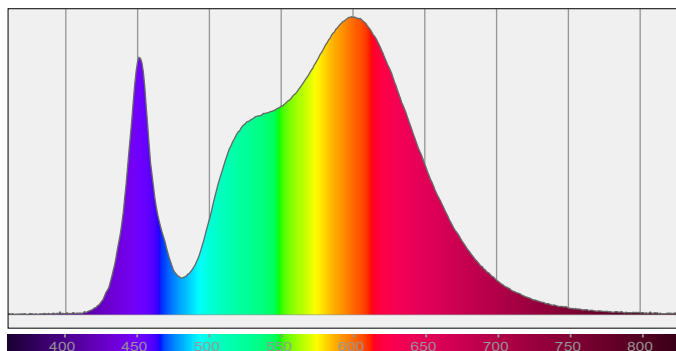
Color Rendering Index per reference color (CIE 1995)



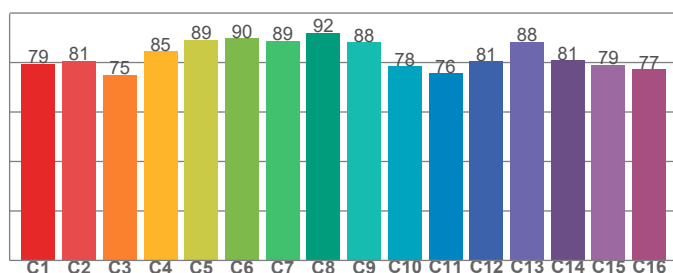
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
80.3	86.9	93.1	82.4	79.6	83.0	85.1	61.1	1.5	69.4	82.4	57.3	81.8	95.9	71.6

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



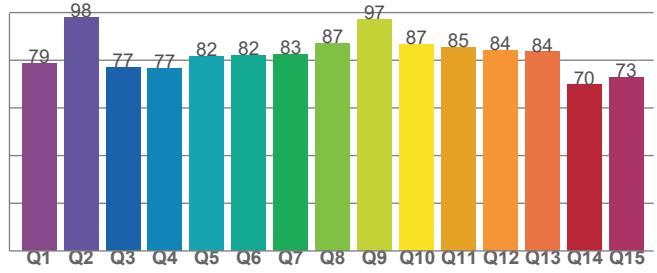
TM30-18 Rf-values per hue bin



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
79.5	80.8	75.1	84.7	89.2	89.9	88.8	92.0	88.2	78.4	75.7	80.5	88.5	81.0	79.0	77.2

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
78.7	98.1	77.0	76.6	81.8	82.1	82.6	87.2	97.2	86.8	85.4	84.2	83.6	69.8	72.9

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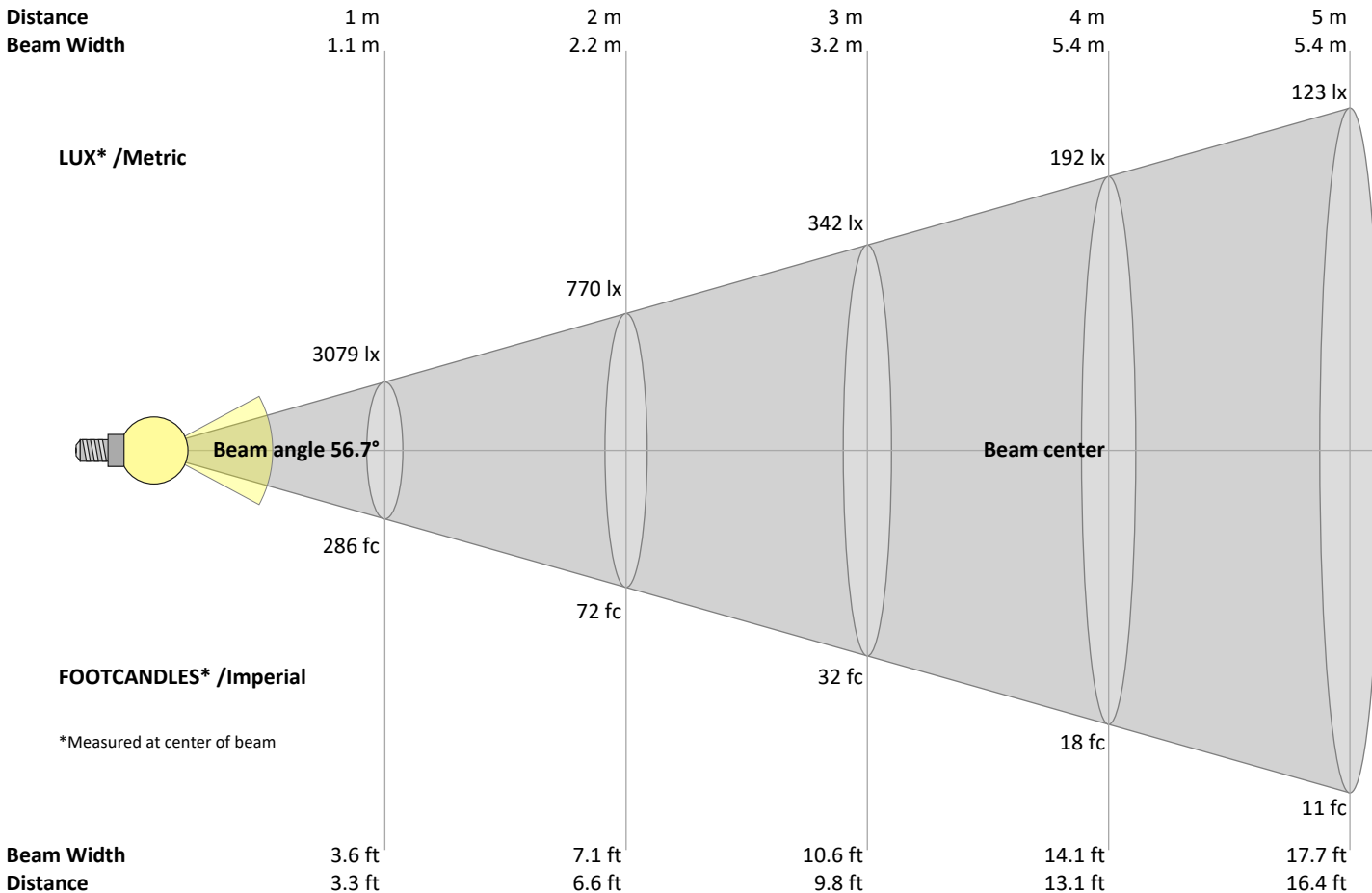
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Beam Details



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
3079	770	342	192	123	86	63	48	38	31	25	21	18	16	14	12	11	10	9	8	lux
286.1	71.5	31.8	17.9	11.4	7.9	5.8	4.5	3.5	2.9	2.4	2	1.7	1.5	1.3	1.1	1	0.9	0.8	0.7	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
3079	3057	3038	3001	2922	2843	2730	2607	2473	2310	2148	1963	1773	1580	1381	1181	963	741	532	355	cd
100%	99%	99%	97%	95%	92%	89%	85%	80%	75%	70%	64%	58%	51%	45%	38%	31%	24%	17%	12%	of 0°va

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
3079	3096	3088	3066	3045	2996	2943	2871	2768	2664	2509	2346	2164	1950	1736	1482	1223	974	747	520	cd
100%	101%	100%	100%	99%	97%	96%	93%	90%	87%	82%	76%	70%	63%	56%	48%	40%	32%	24%	17%	of 0°va

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
3079	3057	3038	3001	2922	2843	2730	2607	2473	2310	2148	1963	1773	1580	1381	1181	963	741	532	355	cd
100%	99%	99%	97%	95%	92%	89%	85%	80%	75%	70%	64%	58%	51%	45%	38%	31%	24%	17%	12%	of 0°va

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
3079	3096	3088	3066	3045	2996	2943	2871	2768	2664	2509	2346	2164	1950	1736	1482	1223	974	747	520	cd
100%	101%	100%	100%	99%	97%	96%	93%	90%	87%	82%	76%	70%	63%	56%	48%	40%	32%	24%	17%	of 0°va

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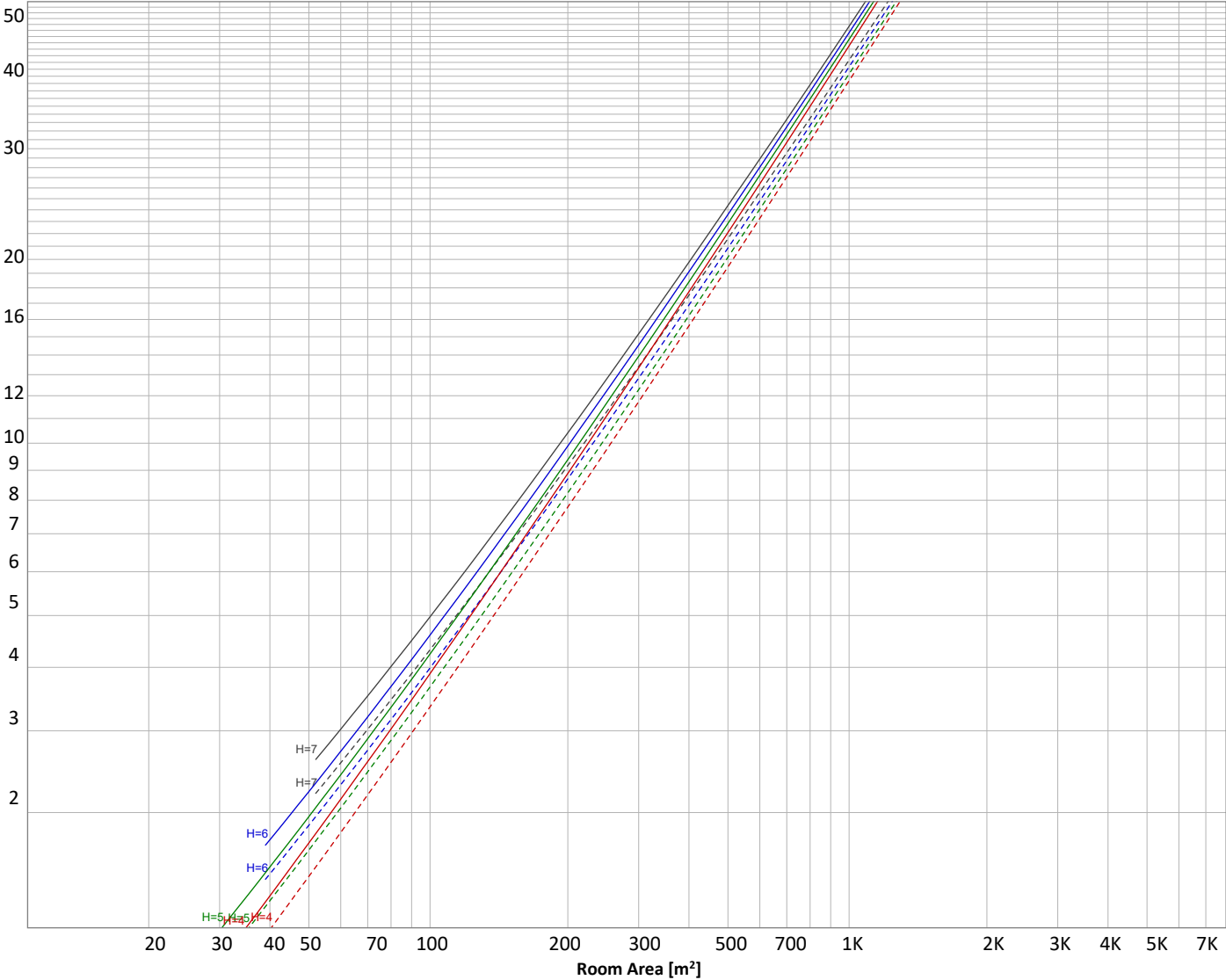
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2546 lm	p(%)		
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
				20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
287 lm	746 lm	854 lm	512 lm	109 lm	13.8 lm	2.71 lm	1.81 lm	1.99 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
1.95 lm	1.82 lm	1.58 lm	1.75 lm	2.21 lm	2.56 lm	2.67 lm	2.06 lm	0.787 lm

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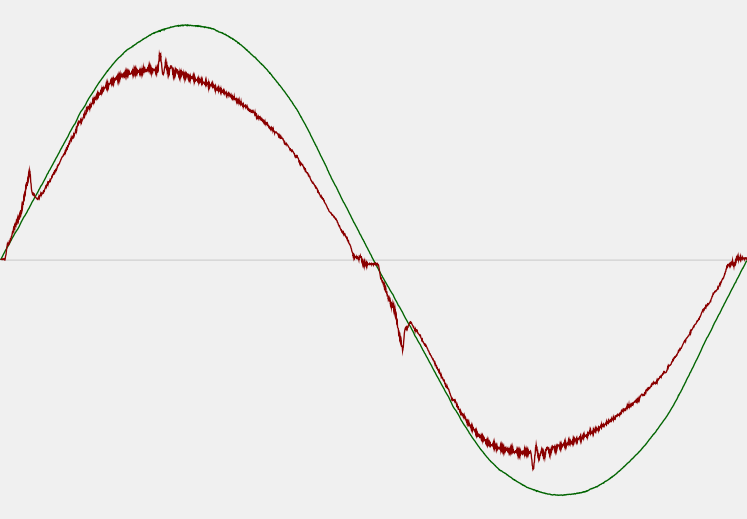


Power Details

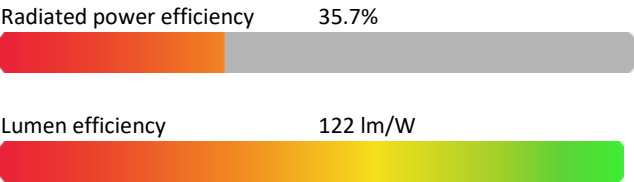
Input Power

Power feed to light source	20.8 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	121 V
RMS Input current feed, I_{RMS}	0.173 A
Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$	20.96 VA
Displacement factor of AC power feed	0.99
Power factor of AC current feed	0.99
Total harmonic distortion of the current	5.92%
Total harmonic distortion of the voltage	1.63%

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	0 K
CCT end	3462 K

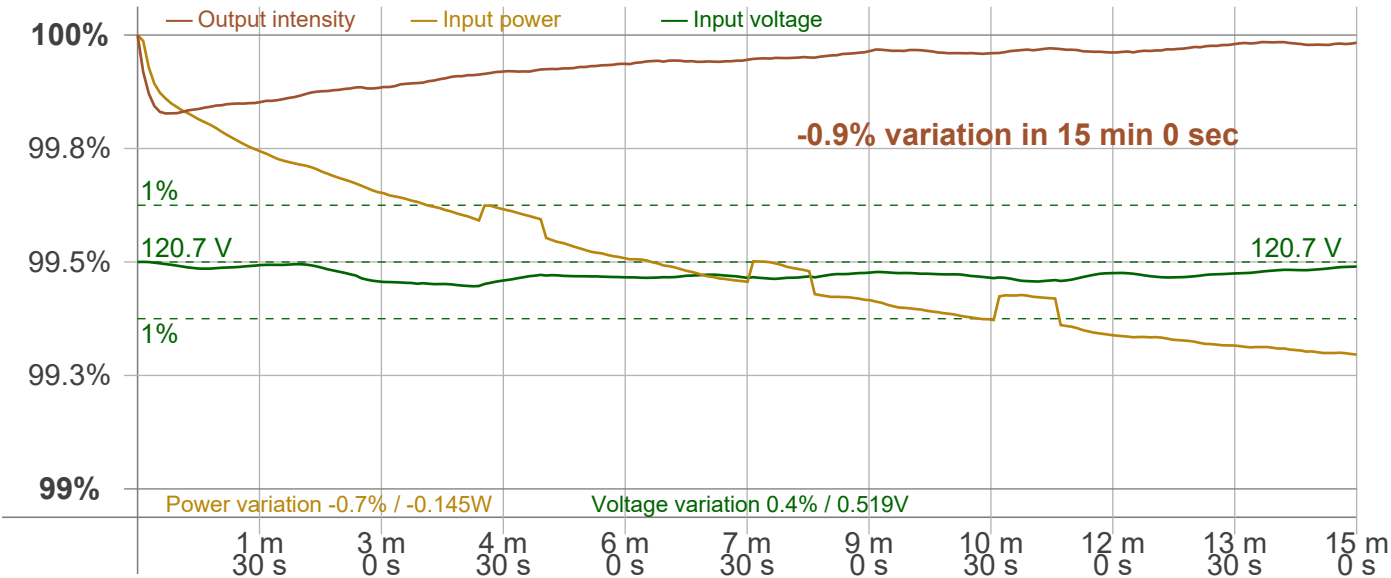
Warmup Result

Total warmup time	Lamp stabilized in 15 min 0 sec
Warmup variation	-0.9%

Output Change

Output start	2552 lm
Output change	-6 lm
Output end	2546 lm

Stabilization Curve



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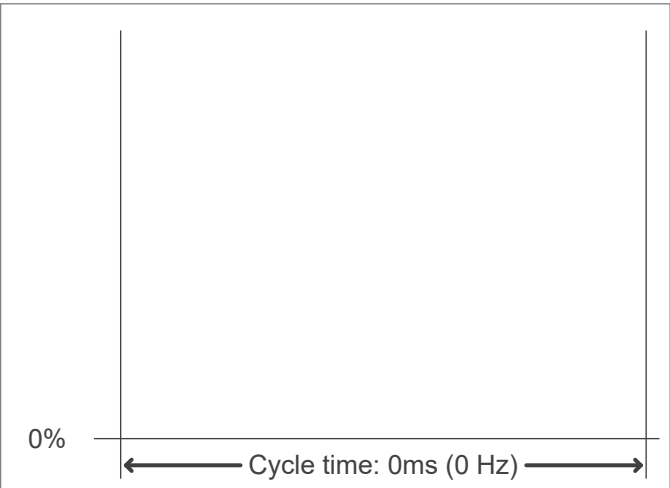
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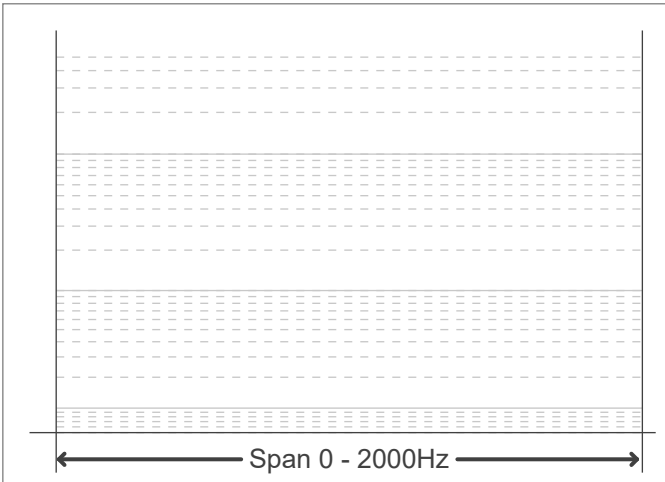
Flicker /TLA details

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 %
		JA8/10 400 Hz	n/a %
		JA8/10 1000 Hz	n/a %
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)		Flicker indices according to Lighting Research Center (2015)	
PstLM value (F < 80 Hz)	n/a	Perception metric, Assist Mp	n/a
SVM value (80 < F < 2000 Hz)	n/a		

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

