

Light Measurement Report

Print date: 1/7/2026
Measurement date and time: 1/2/2026 11:43:39 AM – Measurement no. VFR-260102-0725-MS
Measurement tracking No. and Link: [n/a](#)
Operator:



Laboratory and Equipment

Laboratory Owner and Location	Viso Systems, Copenhagen V, Denmark
Goniospectrometer System and Type	LabSpion – Type C, horizontal
Sensor Name, Calibr. Date and Serial No.	LabSensor Model2 – 4/8/2025 – 1516006613
Spectrometer Manufacturer and Model	Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

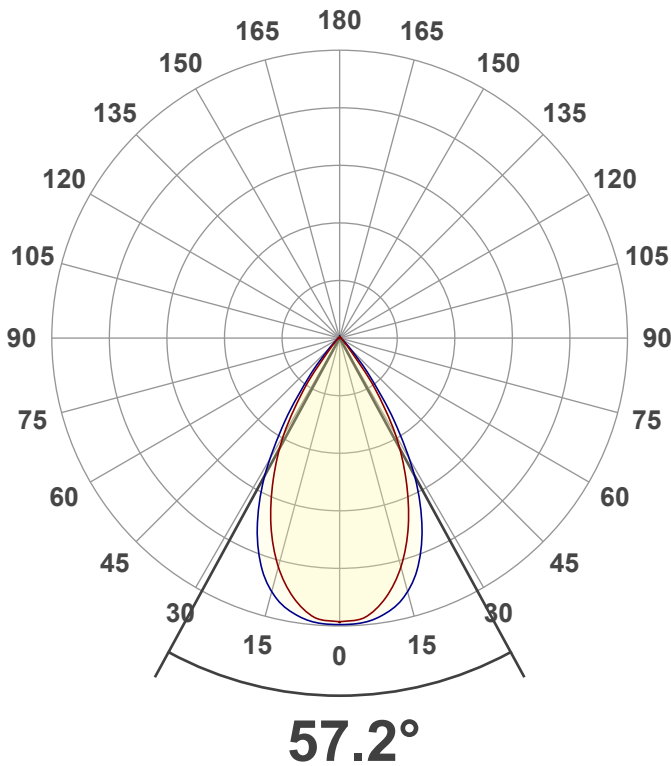
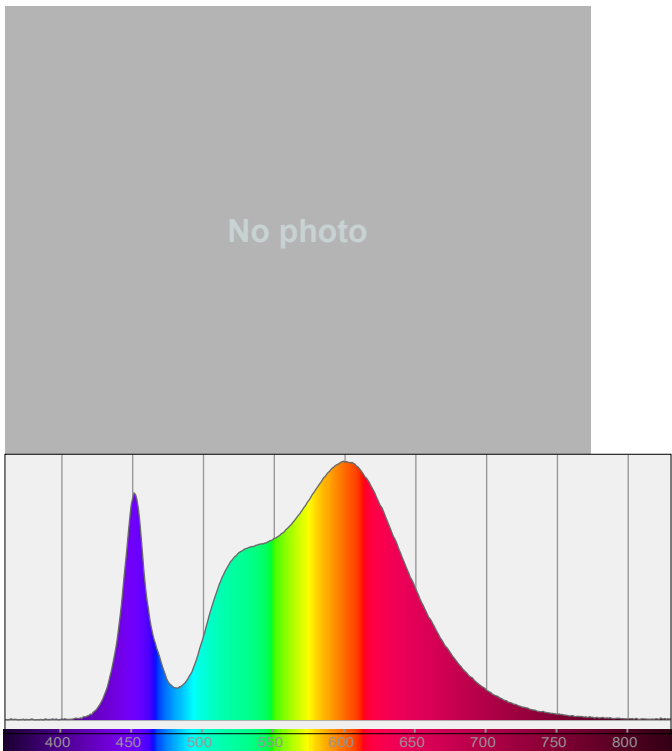
Number of C-planes and Resolution	12 planes – 30°
γ (gamma)-Resolution	5°
Test Distance	10.57 m
Input Power, Power and Displ. Factors	20.8 W – PF 0.99 – DPF 0.99
Input RMS Voltage and Current	121 V – 0.173 A
Frequency of Input Power	60 Hz
Warm-up Time and Variation	Lamp stabilized in 15 min 1 sec – 2.0%

Tested Light Source

Product Name	HP1-P-D-4'-H-835-MLW-BLX2835
Item No. and Manufacturer	HP1-P-D-4'-H-835-MLW-BLX2835 – Finelite Inc.
Product Description (line 1)	

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)	2798 lm – 0.8% / 99.2%
Efficiency	134 lm/W
Peak Intensity and Beam Angle	3202 cd – 57.2°
Correlated Color Temperature, Target/Measured	CCT = 3475 K / 3475 K
Color Rendering Index	CRI 81.5
Color Rendering TM30-18	R _f 82.8 – R _g 97.0
Color Shift, CIE duv and MacAdam Steps	Duv 0.0016 – SDCM n/a
Flicker	SVM n/a – PstLM n/a



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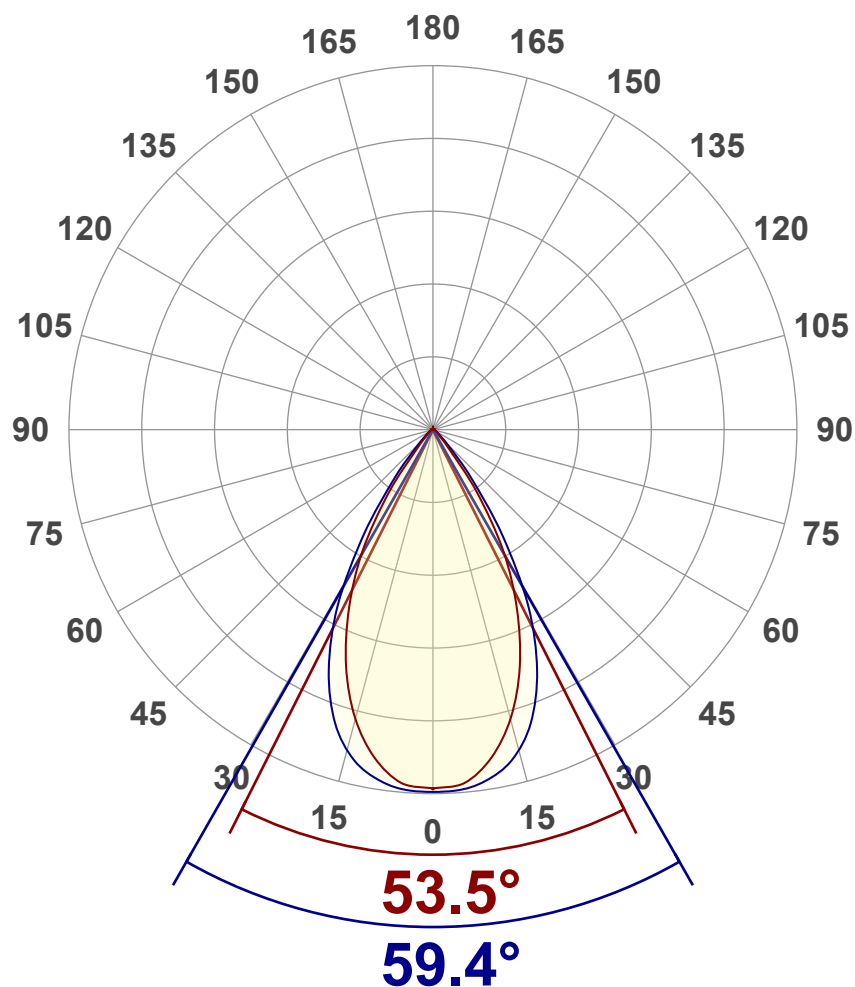
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2798 lm
Lumen Up% / Down%	0.8% / 99.2%
Peak Intensity	3202 cd
Beam Angle (50%)	57.2°
Beam Angle (90%)	59.4°
Beam Angle (10%)	53.5°

Cut-off Angle

Average 2,5%	101.5°
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Field Angle

Average 10%	83.5°
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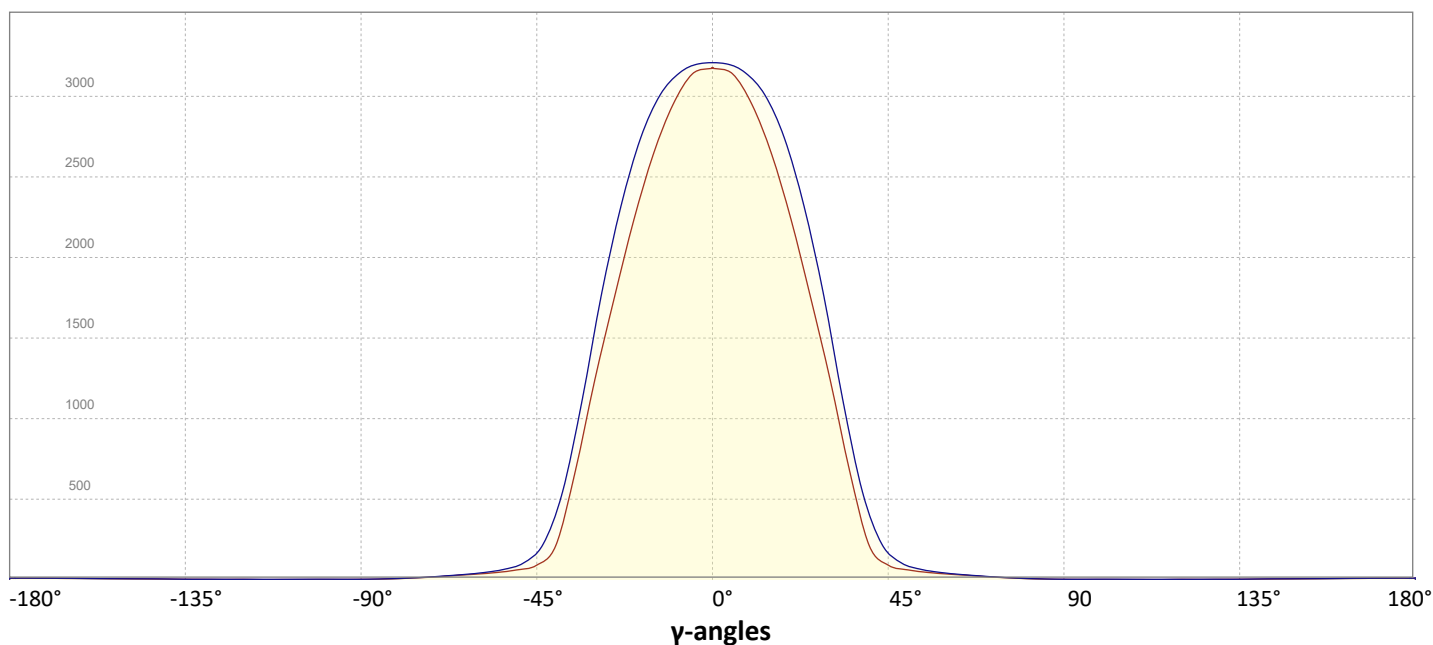
Intensity Ratio

In 120° cone	97.4%
In 90° cone	93.8%

C000-C180

C090-C270

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

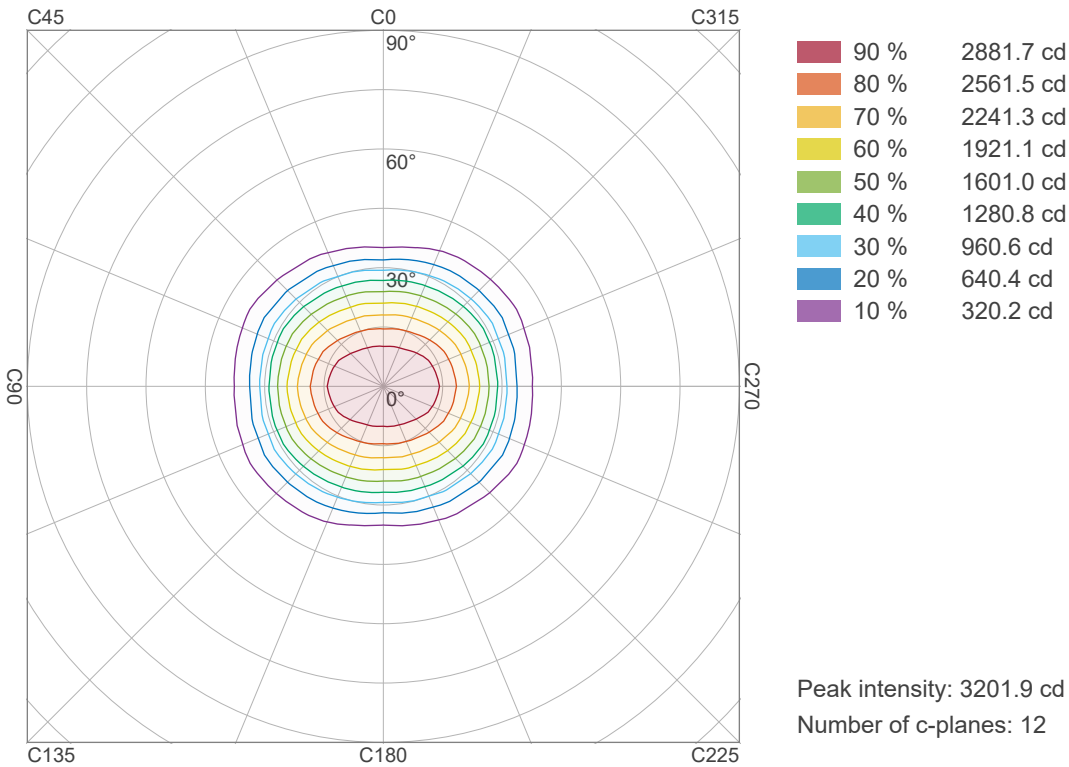


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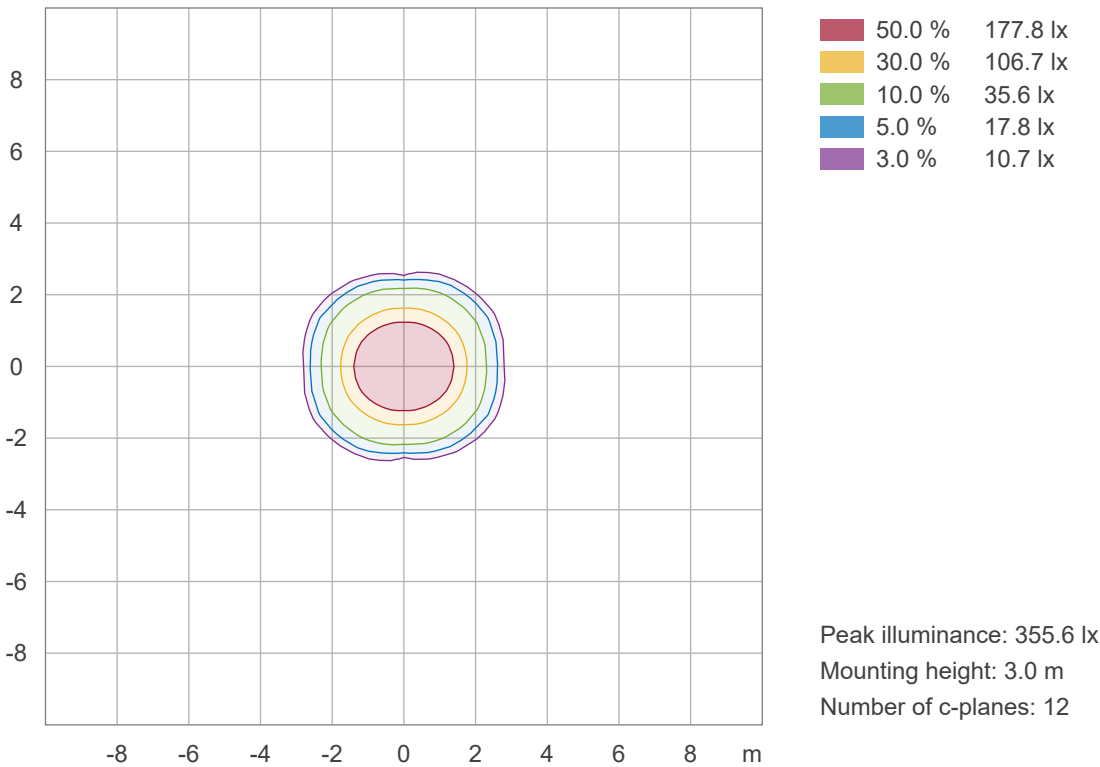
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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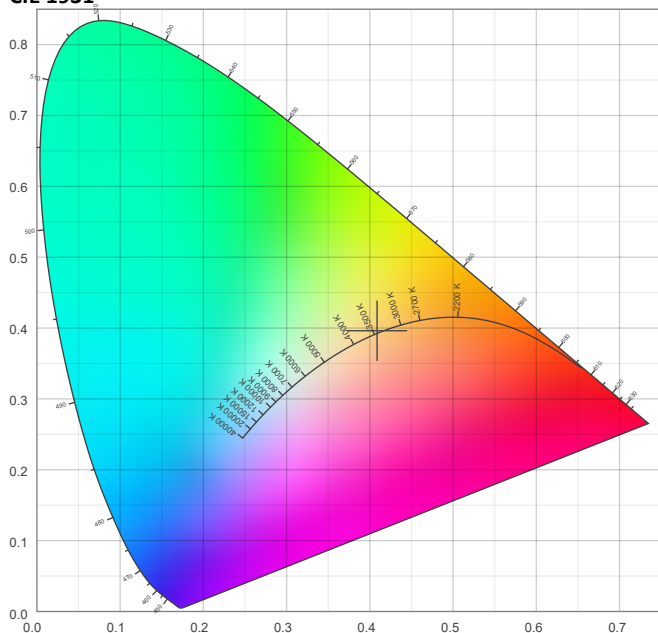


Color details

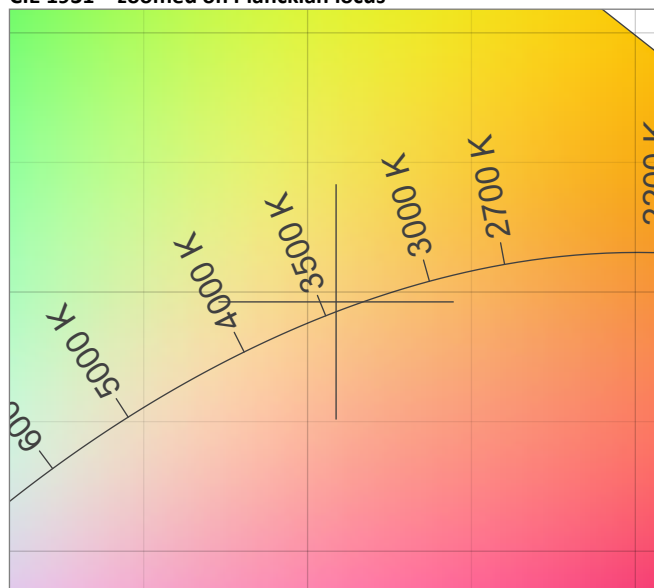
Correlated Color Temperature, Target CCT = 3475 K
Correlated Color Temperature, Measured CCT = 3475 K
Color Rendering Index CRI 81.5
Color Rendering Index, R9 (red component) R9 = 2.0
Color Rendering TM30-18 R_f 82.8 – R_g 97.0
Color Quality Scale CQS = 81.5

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0.409;0.396)
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)

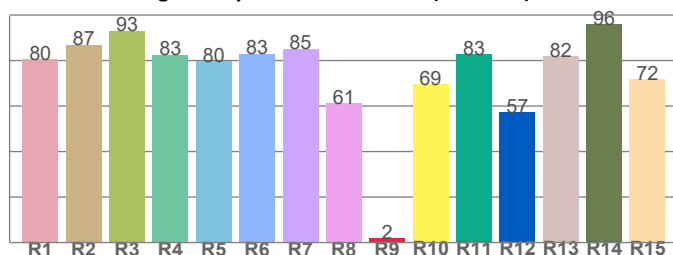
CIE 1931



CIE 1931 – zoomed on Planckian locus



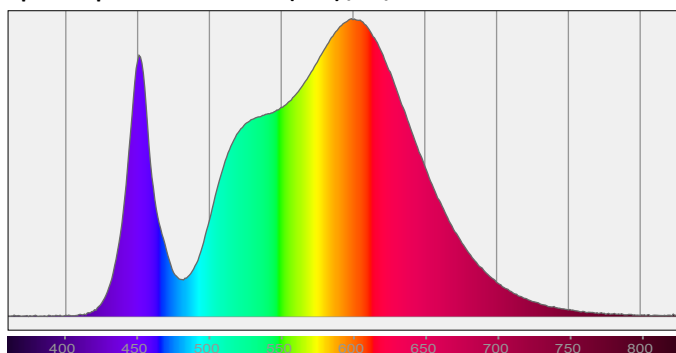
Color Rendering Index per reference color (CIE 1995)



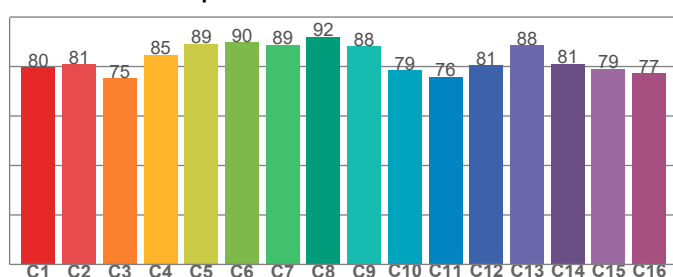
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
80.4	87.0	93.0	82.6	79.8	83.0	85.2	61.4	2.0	69.5	82.6	57.4	81.9	95.9	71.7

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



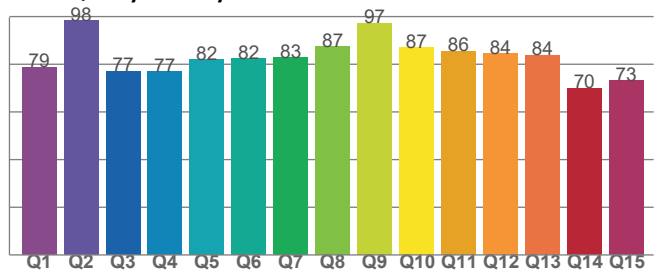
TM30-18 R_f-values per hue bin



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
79.6	80.9	75.2	84.7	89.2	89.8	88.9	92.1	88.3	78.6	75.8	80.5	88.5	81.1	79.1	77.3

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
78.8	98.2	77.1	76.8	82.0	82.3	82.8	87.4	97.2	87.0	85.6	84.4	83.8	70.0	73.1

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Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances											
ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size											
H = mounting height above eye level											
X	Y	Viewed Crosswise (Viewing direction orthogonal to lamp length axis)					Viewed Endwise (Viewing direction parallel to lamp length axis)				
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Variations with the observer position for the luminaire spacings, S:											
	n/a			n/a					n/a		
	n/a			n/a					n/a		
	n/a			n/a					n/a		

UGR data could not be calculated due to missing light source dimensions. Go to Edit -> Photometric -> Dimensions and set the source dimensions.

Coefficients of Utilization

Ceiling reflectance	80			70			50			30			10			0		
Wall reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Floor reflectance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0
RCR		(RCR: Room Cavity Ratio)			Room Values are expressed as percentage of Lumen delivered to the task surface													
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	101	101	101	99
1	113	110	108	105	111	108	106	104	104	102	100	100	98	97	96	95	94	92
2	107	102	98	95	105	101	97	94	97	94	91	94	91	89	91	89	87	86
3	102	95	90	86	100	94	89	85	91	87	84	88	85	82	86	83	81	79
4	97	89	83	79	95	88	82	78	85	81	77	83	79	76	81	78	75	74
5	92	83	77	73	90	82	77	72	80	75	72	78	74	71	77	73	70	69
6	87	78	72	68	85	77	71	67	76	71	67	74	70	66	73	69	66	64
7	83	73	67	63	81	73	67	63	71	66	62	70	65	62	69	65	62	60
8	79	69	63	59	77	68	63	59	67	62	58	66	62	58	65	61	58	56
9	75	65	59	55	74	65	59	55	64	59	55	63	58	55	62	58	54	53
10	71	62	56	52	70	61	56	52	60	55	52	60	55	52	59	54	51	50

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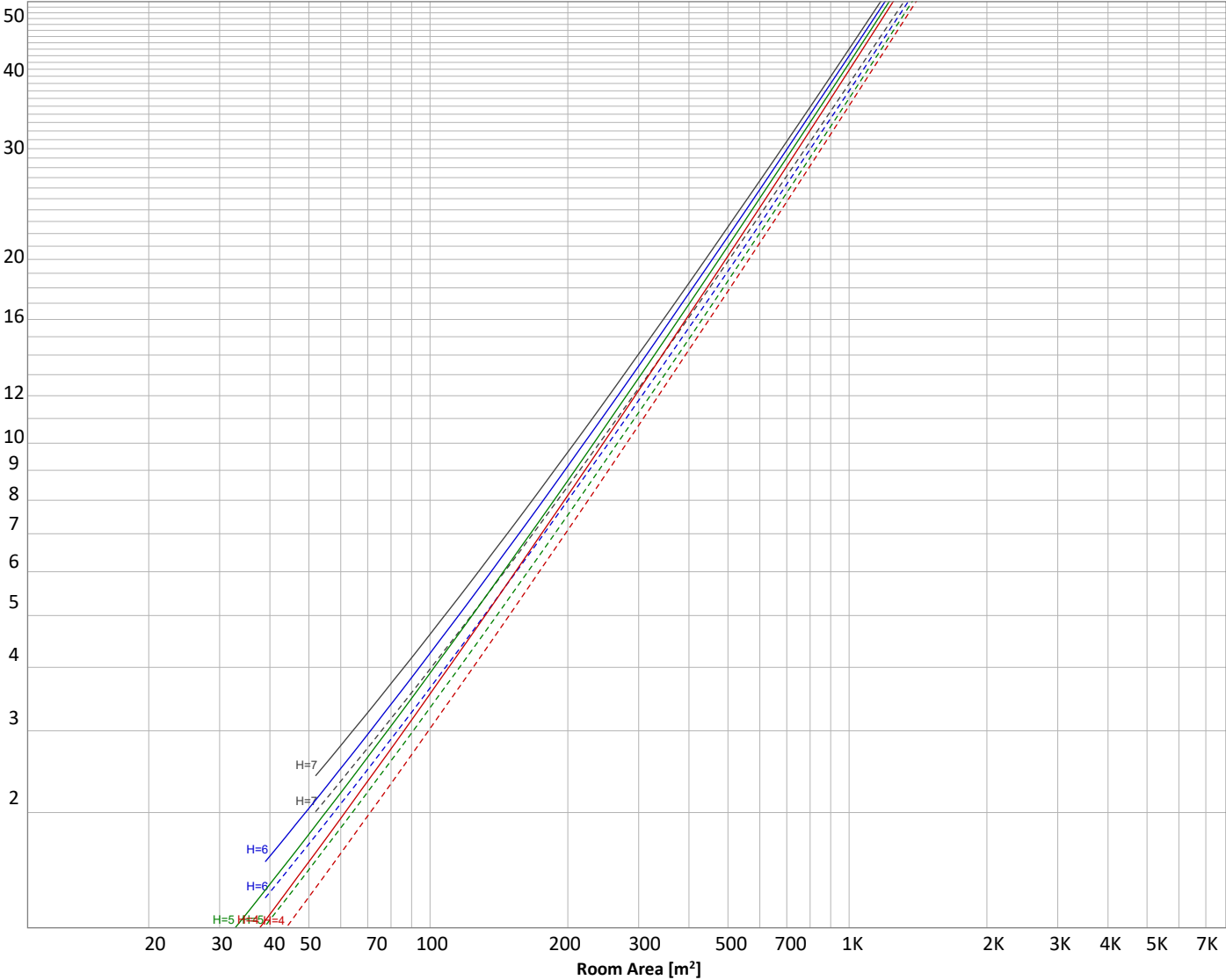
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2798 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°
297 lm	775 lm	893 lm	554 lm	154 lm	52.4 lm	30.0 lm	14.8 lm	5.36 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
2.92 lm	2.63 lm	2.32 lm	2.35 lm	2.68 lm	3.09 lm	3.04 lm	2.37 lm	0.890 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	297 lm	10.6%
10-20°	775 lm	27.7%
20-30°	893 lm	31.9%
30-40°	554 lm	19.8%
40-50°	154 lm	5.5%
50-60°	52 lm	1.9%
60-70°	30 lm	1.1%
70-80°	15 lm	0.5%
80-90°	5 lm	0.2%
90-100°	3 lm	0.1%
100-110°	3 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°	3 lm	0.1%
160-170°	2 lm	0.1%
170-180°	1 lm	0.0%
Total	2798 lm	100.0%

Intensity peaks

Max intensity	3202 cd
Intensity, 90°	3 cd
Intensity, 0°	3185 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	1965 lm	70.2%
0-40°	2519 lm	90.0%
0-60°	2725 lm	97.4%
60-90°	50 lm	1.8%
70-100°	23 lm	0.8%
90-120°	8 lm	0.3%
0-90°	2775 lm	99.2%
90-180°	22 lm	0.8%
0-180°	2798 lm	100.0%

BUG rating

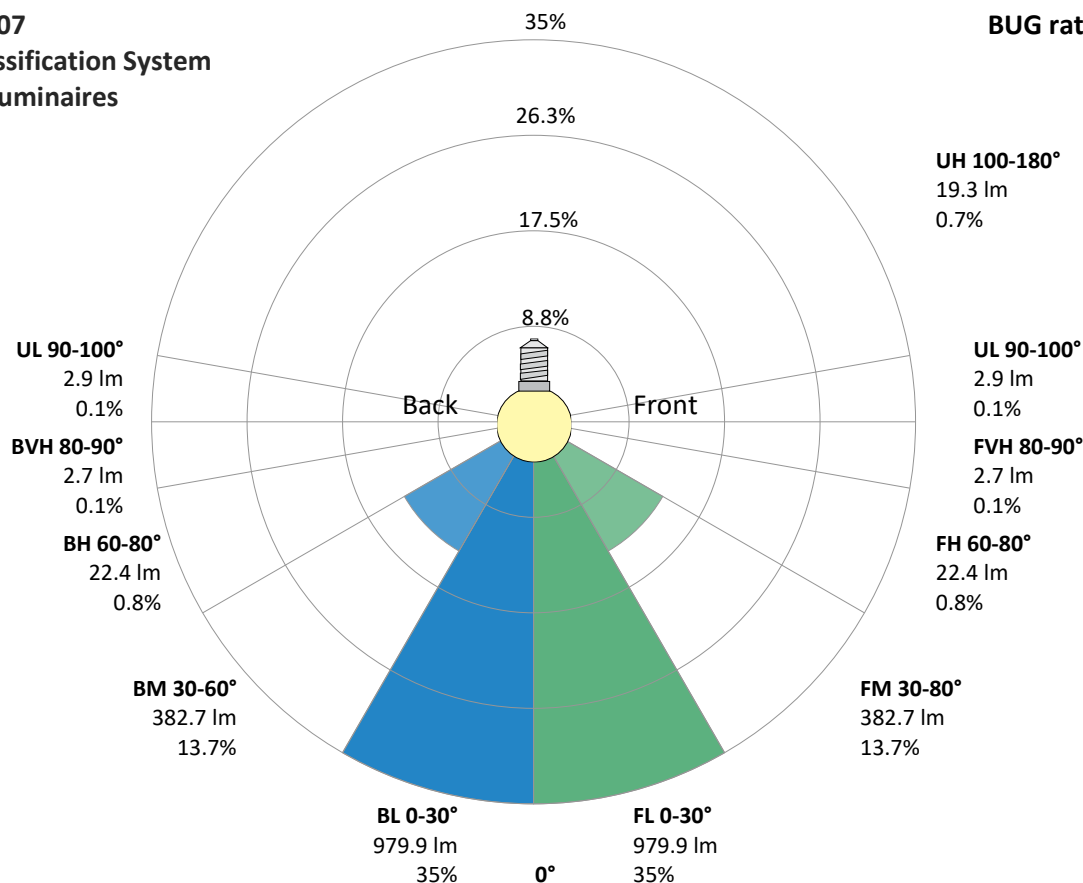
	Lumen	% Total
Forward light		
Low(0-30°)	980 lm	35.0%
Medium(30-60°)	383 lm	13.7%
High(60-80°)	22 lm	0.8%
Very high(80-90°)	3 lm	0.1%
Back light		
Low(0-30°)	980 lm	35.0%
Medium(30-60°)	383 lm	13.7%
High(60-80°)	22 lm	0.8%
Very high(80-90°)	3 lm	0.1%

Uplight

Low(90-100°)	3 lm	0.1%
High(100-180°)	19 lm	0.7%

IESNA TM-15-07 Luminaire Classification System For Outdoor Luminaires

BUG rating B2 U2 G0



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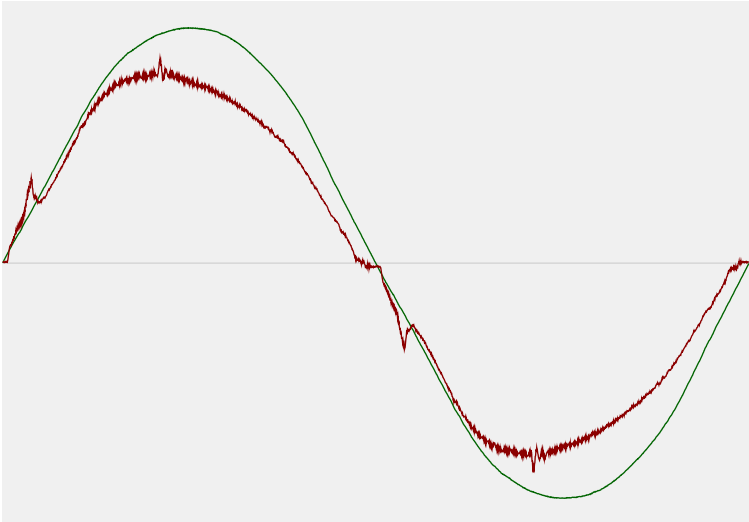


Power Details

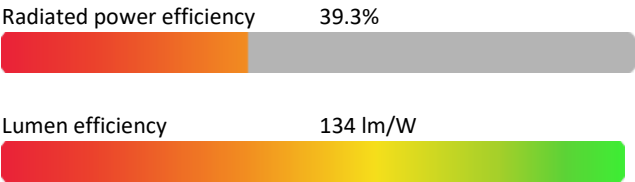
Input Power

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	5.94%
Total harmonic distortion of the voltage	1.72%

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	3474 K
CCT shift	+1 K
CCT end	3475 K

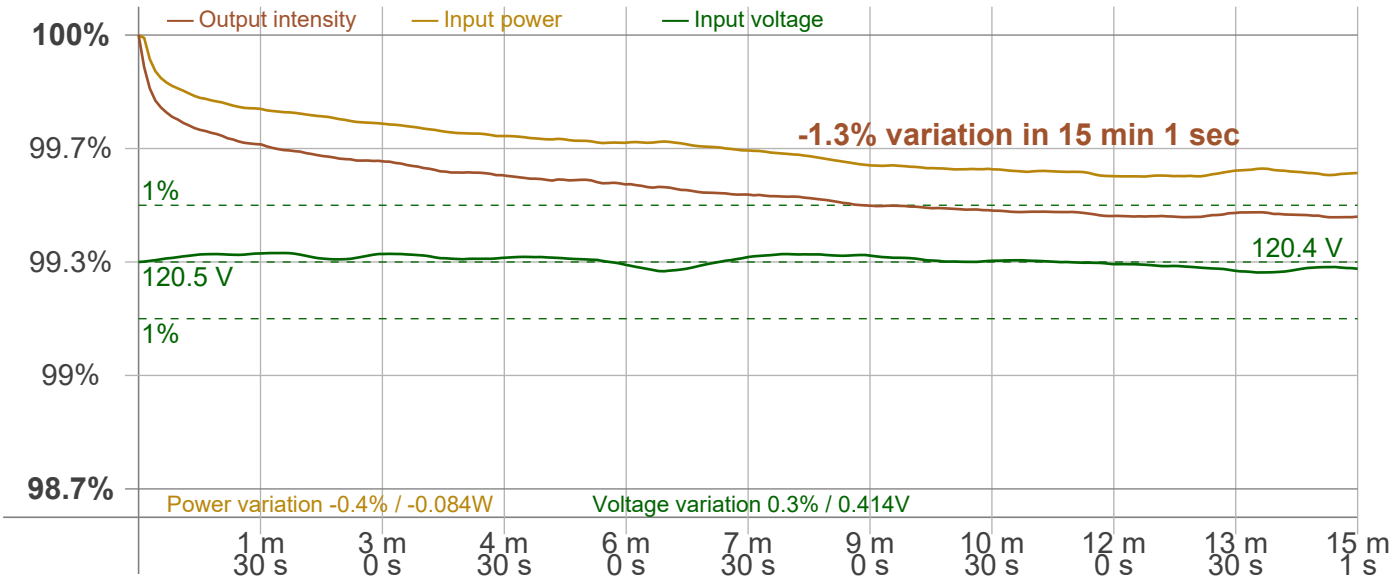
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	-1.3%

Output Change

Output start	2819 lm
Output change	-21 lm
Output end	2798 lm

Stabilization Curve



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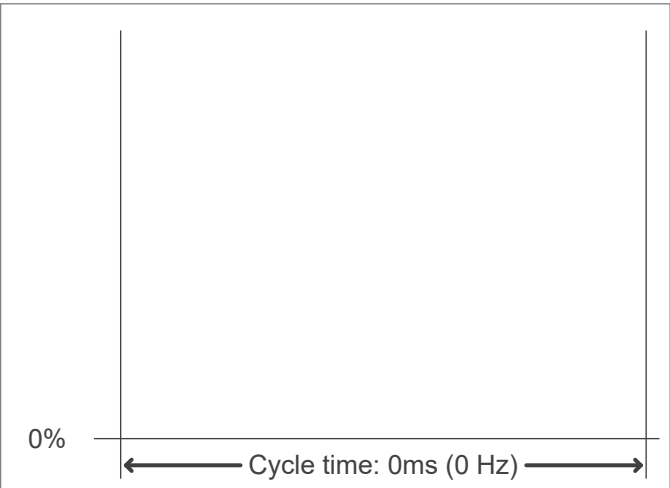
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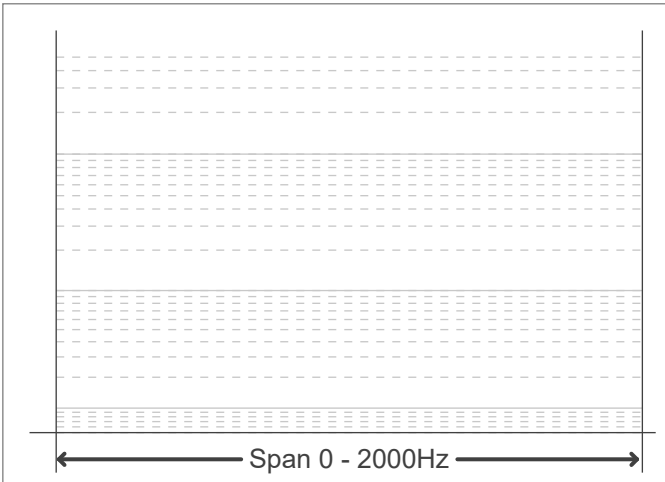
Flicker /TLA details

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

