

Light Measurement Report

Print date: 1/7/2026

Measurement date and time: 12/18/2025 5:21:02 PM – Measurement no. VFR-251218-0694-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

8.5 W – PF 0.98 – DPF 0.99

122 V – 0.072 A

60 Hz

Not completed – 2.0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

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

HP1-P-D-4'-S-835-MLB-BLX2835 – Fineline 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

1082 lm – 0.43% / 99.57%

127 lm/W

1325 cd – 56.4°

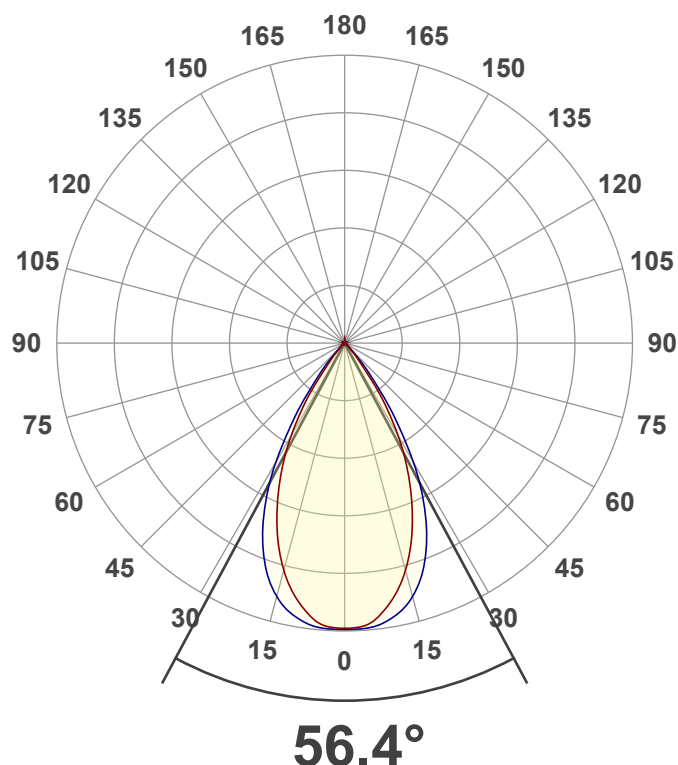
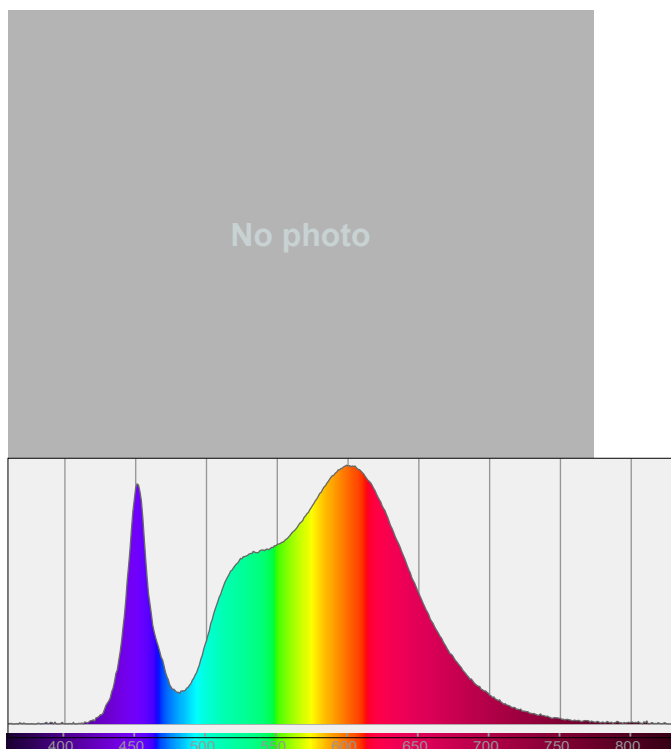
CCT = 3457 K / 3457 K

CRI 81.9

R_f 82.9 – R_g 97.2

Duv 0.0012 – SDCM n/a

SVM n/a – PstLM n/a



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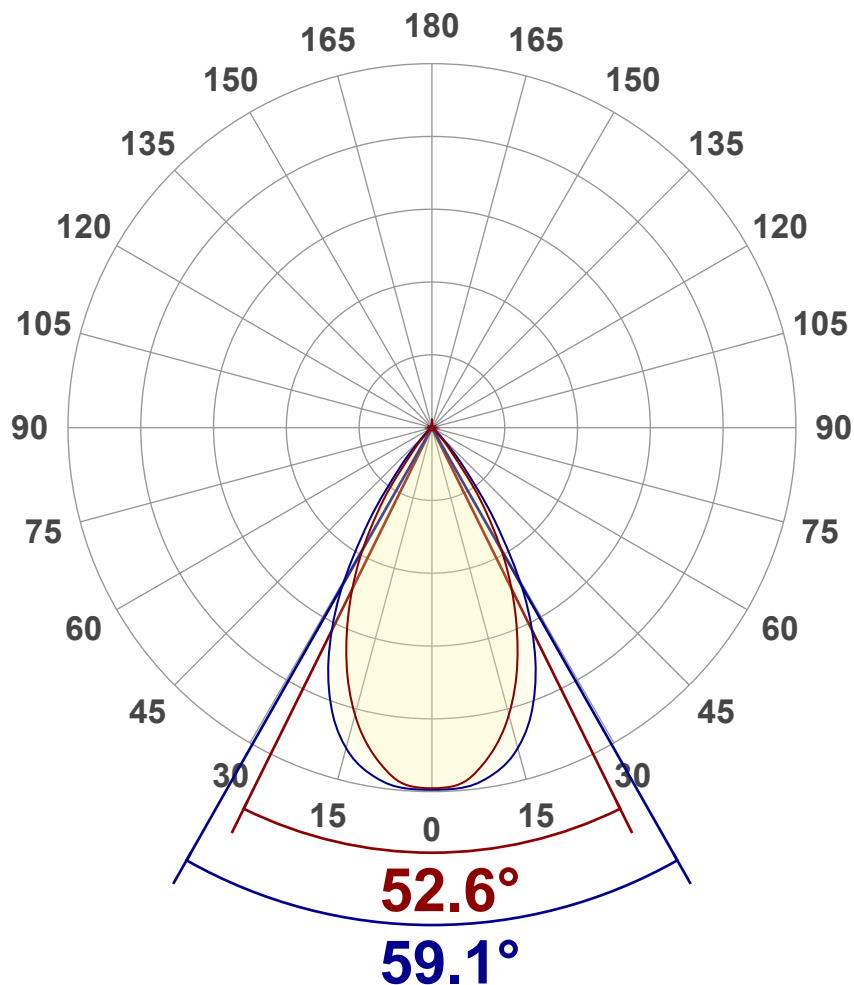
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	1082 lm
Lumen Up% / Down%	0.43% / 99.57%
Peak Intensity	1325 cd
Beam Angle (50%)	56.4°
Beam Angle (90%)	59.1°
Beam Angle (10%)	52.6°

Cut-off Angle

Average 2,5%	93.8°
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Field Angle

Average 10%	81.9°
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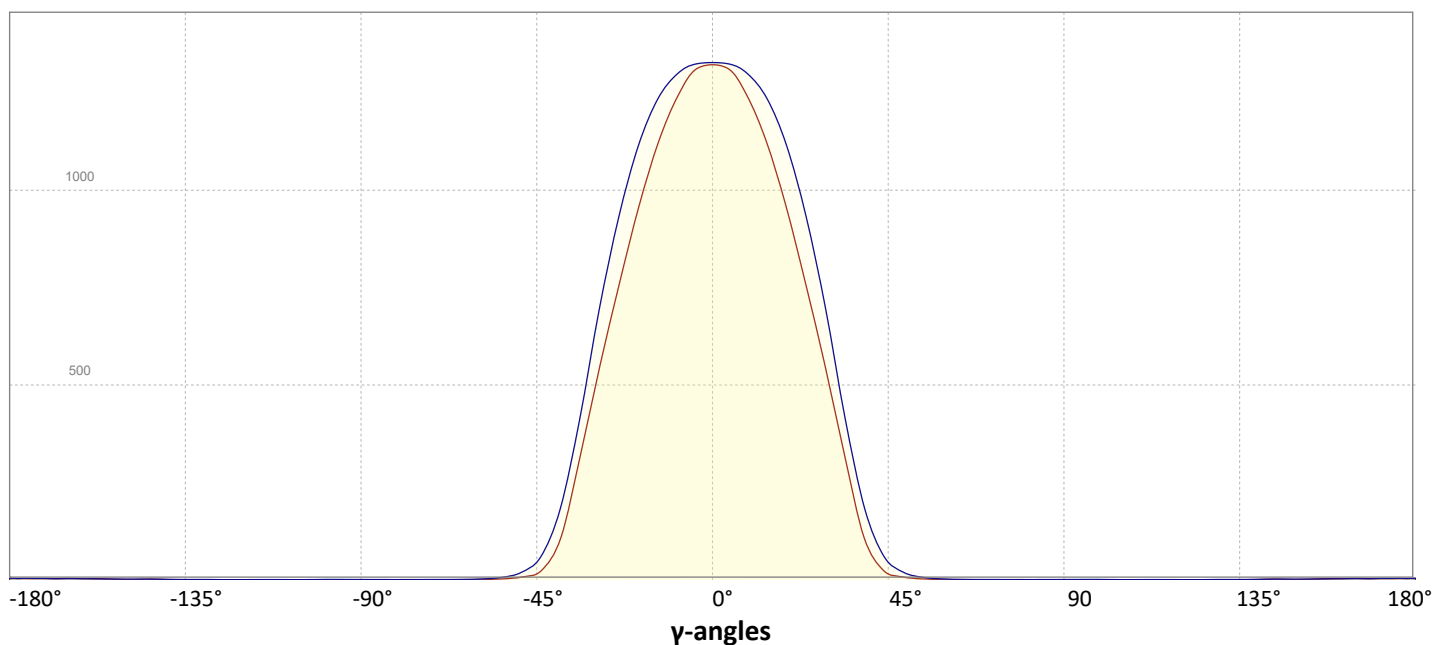
Intensity Ratio

In 120° cone	99.4%
In 90° cone	97.8%

C000-C180

C090-C270

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

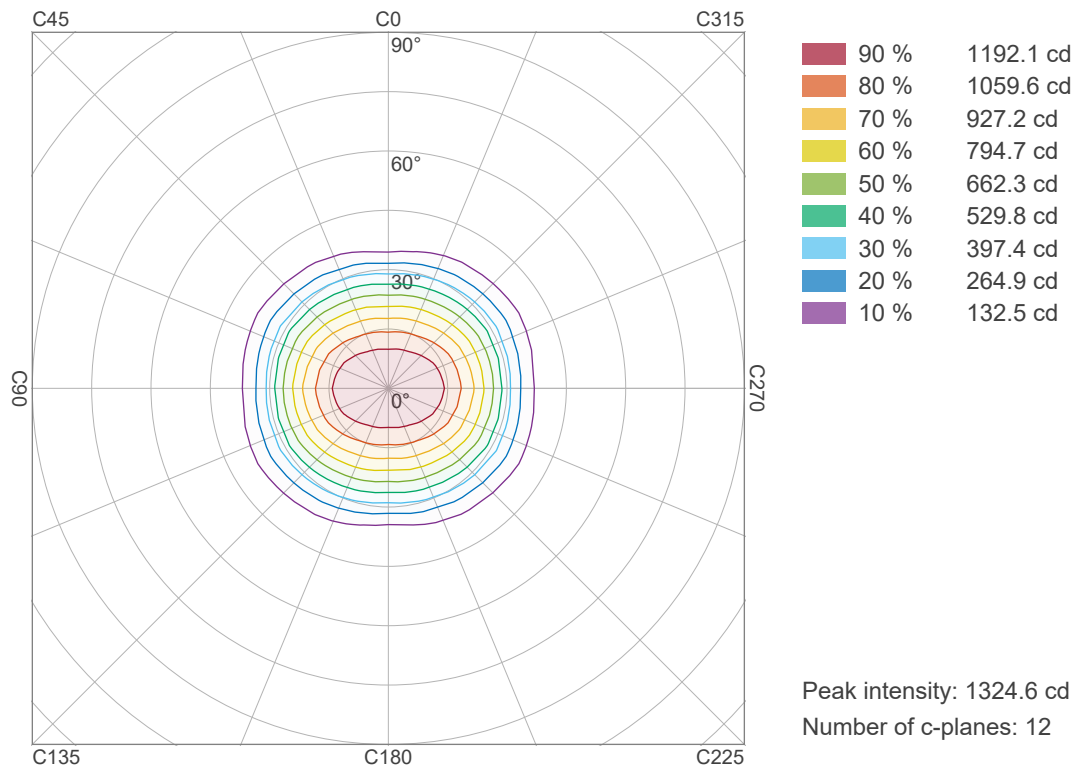


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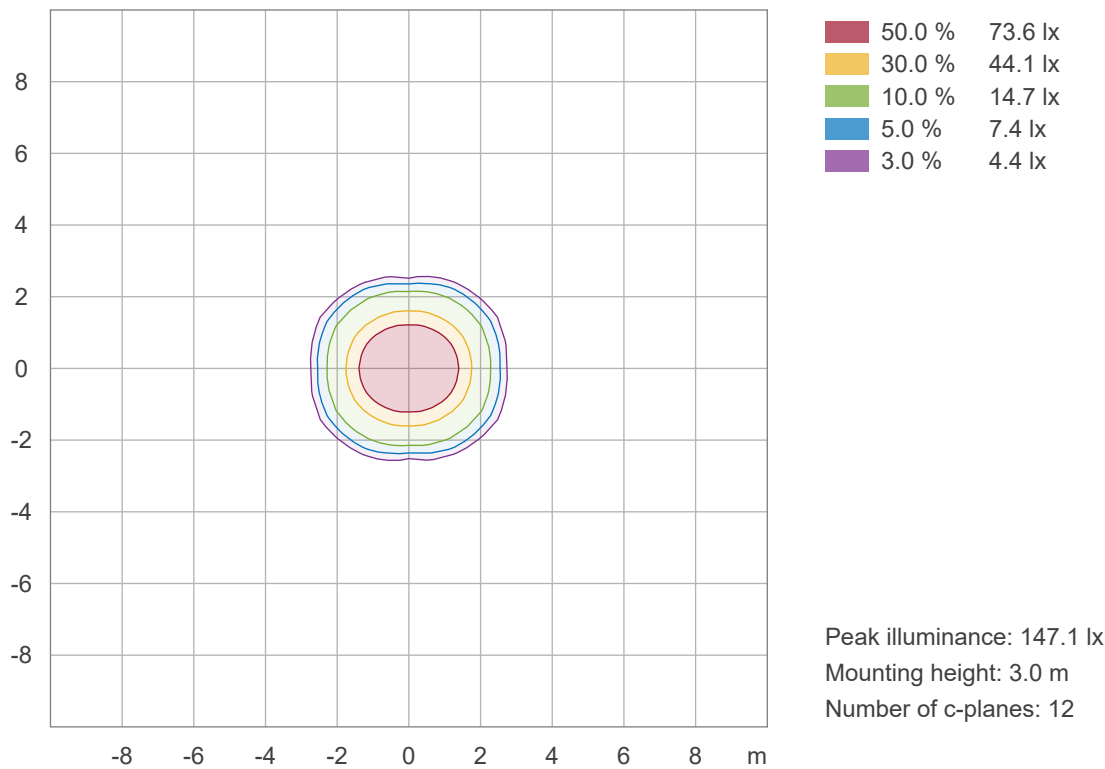
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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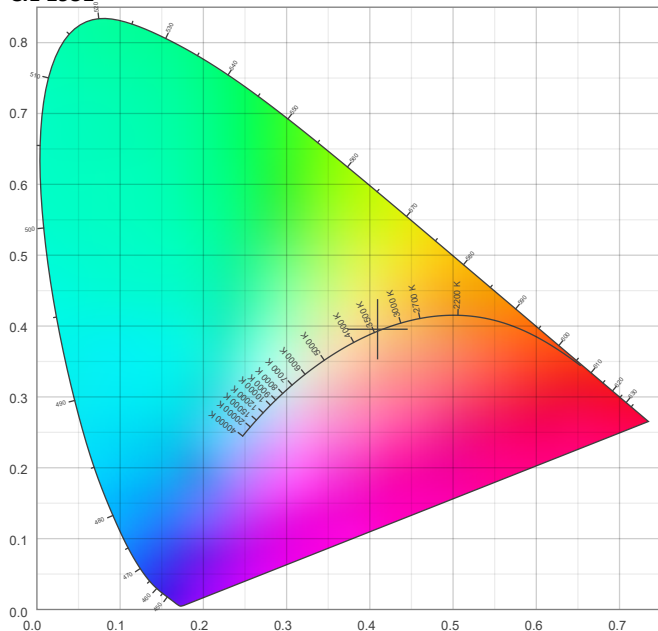


Color details

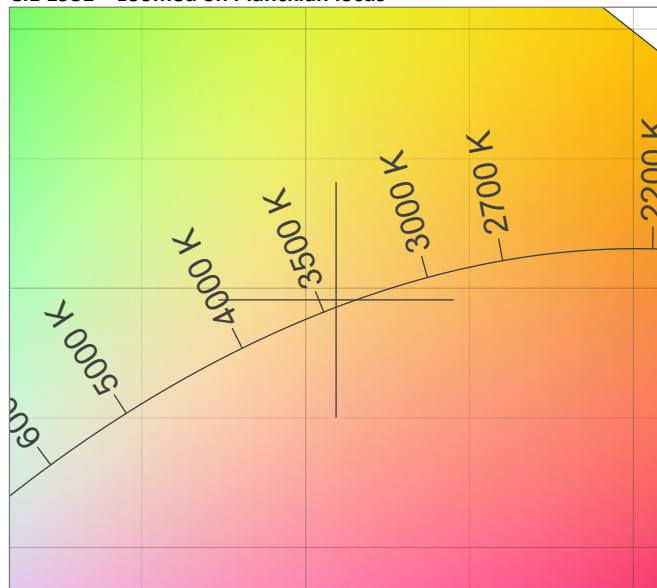
Correlated Color Temperature, Target CCT = 3457 K
Correlated Color Temperature, Measured CCT = 3457 K
Color Rendering Index CRI 81.9
Color Rendering Index, R9 (red component) R9 = 3.3
Color Rendering TM30-18 R_f 82.9 – R_g 97.2
Color Quality Scale CQS = 81.6

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 = 0.0012
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0.236;0.514)

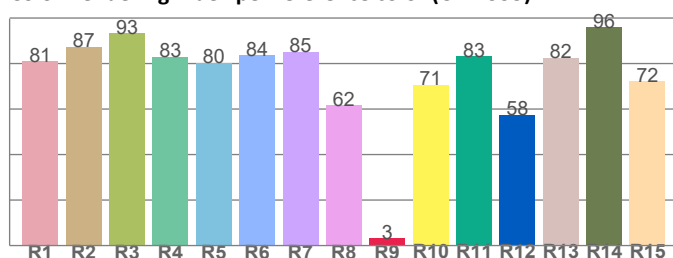
CIE 1931



CIE 1931 – zoomed on Planckian locus



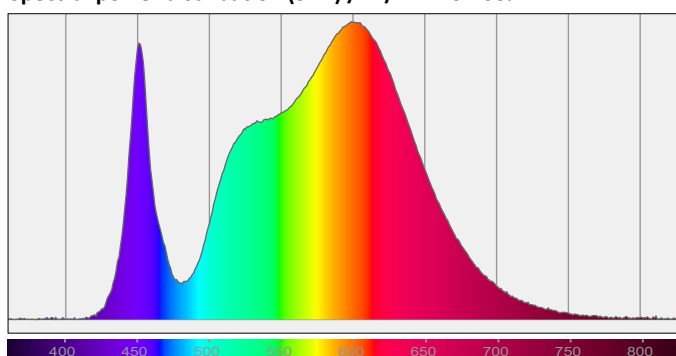
Color Rendering Index per reference color (CIE 1995)



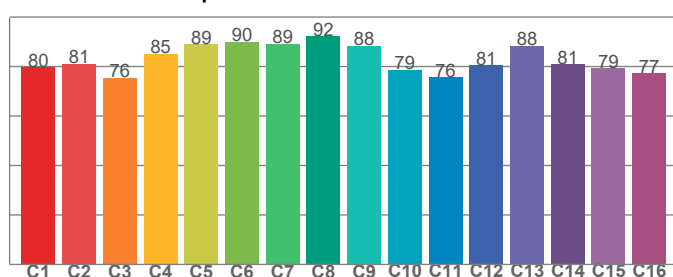
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
81.0	87.4	93.4	83.0	80.3	83.7	85.2	61.6	3.3	70.6	83.2	57.6	82.5	96.1	72.3

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



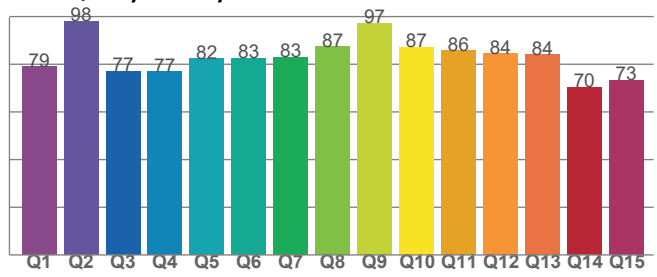
TM30-18 R_f-values per hue bin



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
79.8	81.2	75.5	85.1	89.1	90.0	89.2	92.3	88.4	78.6	75.8	80.6	88.5	80.9	79.2	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
79.0	98.1	77.0	76.8	82.2	82.6	82.9	87.3	97.2	87.1	85.7	84.5	83.9	70.4	73.4

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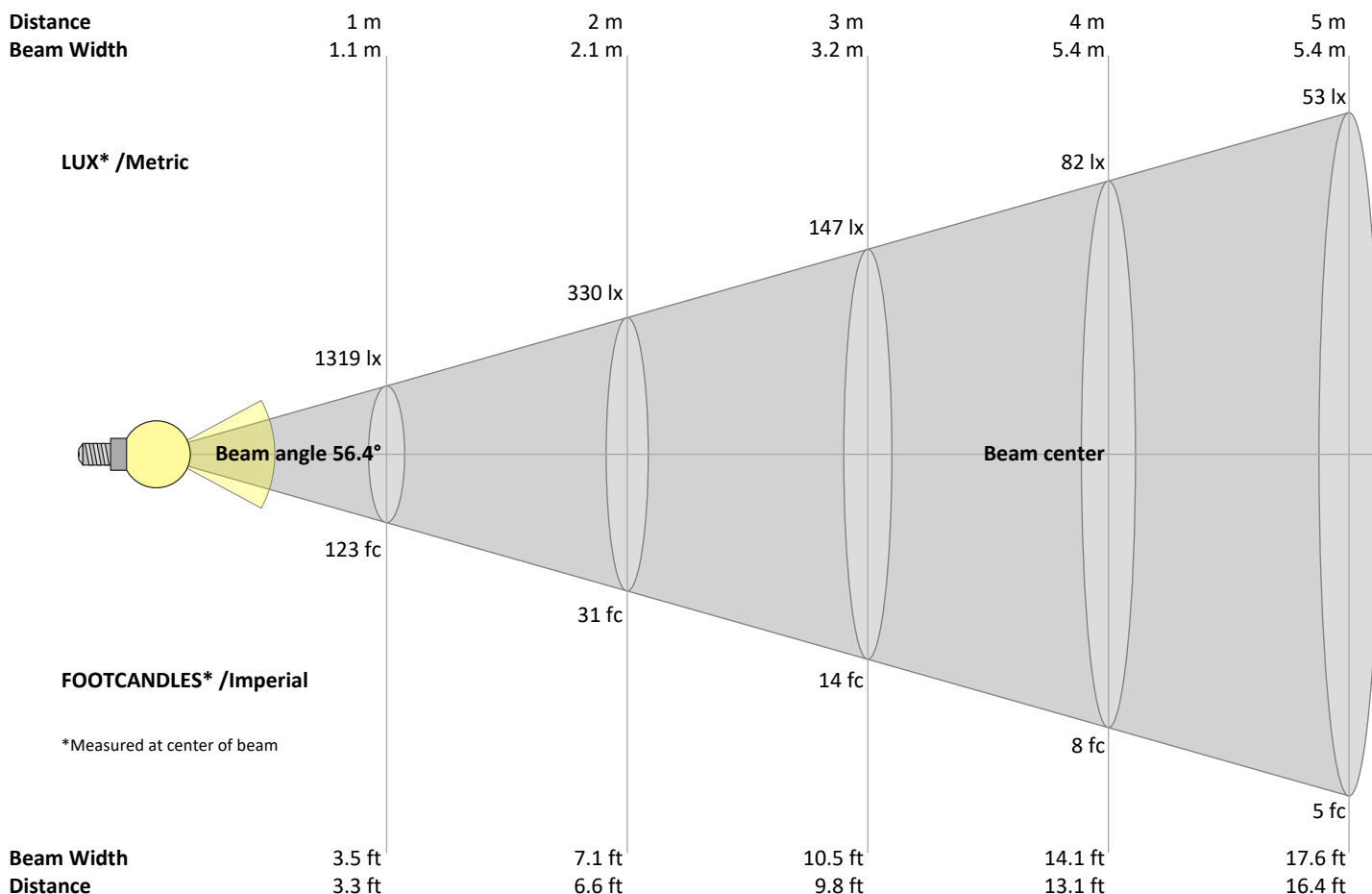
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Beam Details



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
1319	330	147	82	53	37	27	21	16	13	11	9	8	7	6	5	5	4	4	3	lux
122.6	30.6	13.6	7.7	4.9	3.4	2.5	1.9	1.5	1.2	1	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	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
1319	1313	1310	1282	1255	1215	1167	1118	1052	986	912	833	753	669	584	495	403	312	227	142	cd
100%	100%	99%	97%	95%	92%	88%	85%	80%	75%	69%	63%	57%	51%	44%	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
1319	1325	1325	1314	1304	1286	1260	1234	1186	1138	1077	1004	931	836	741	637	525	412	320	227	cd
100%	100%	100%	100%	99%	97%	96%	94%	90%	86%	82%	76%	71%	63%	56%	48%	40%	31%	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
1319	1313	1310	1282	1255	1215	1167	1118	1052	986	912	833	753	669	584	495	403	312	227	142	cd
100%	100%	99%	97%	95%	92%	88%	85%	80%	75%	69%	63%	57%	51%	44%	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
1319	1325	1325	1314	1304	1286	1260	1234	1186	1138	1077	1004	931	836	741	637	525	412	320	227	cd
100%	100%	100%	100%	99%	97%	96%	94%	90%	86%	82%	76%	71%	63%	56%	48%	40%	31%	24%	17%	of 0°val

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Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

[illegible]

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	102	102	102	100
1	114	111	108	106	111	109	107	105	105	103	101	101	99	98	97	96	95	93
2	108	103	100	96	106	102	98	95	98	96	93	95	93	91	93	91	89	87
3	103	97	92	88	101	95	91	87	93	89	86	90	87	85	88	85	83	82
4	98	91	85	81	96	90	85	81	87	83	80	85	82	79	83	80	78	76
5	93	85	79	75	92	84	79	75	82	78	74	81	77	74	79	76	73	71
6	89	80	74	70	87	79	74	70	78	73	69	76	72	69	75	71	68	67
7	84	75	70	66	83	75	69	65	73	69	65	72	68	65	71	67	64	63
8	80	71	65	61	79	71	65	61	70	65	61	69	64	61	68	64	60	59
9	77	67	62	58	76	67	61	58	66	61	57	65	61	57	64	60	57	56
10	73	64	58	54	72	63	58	54	63	58	54	62	57	54	61	57	54	53

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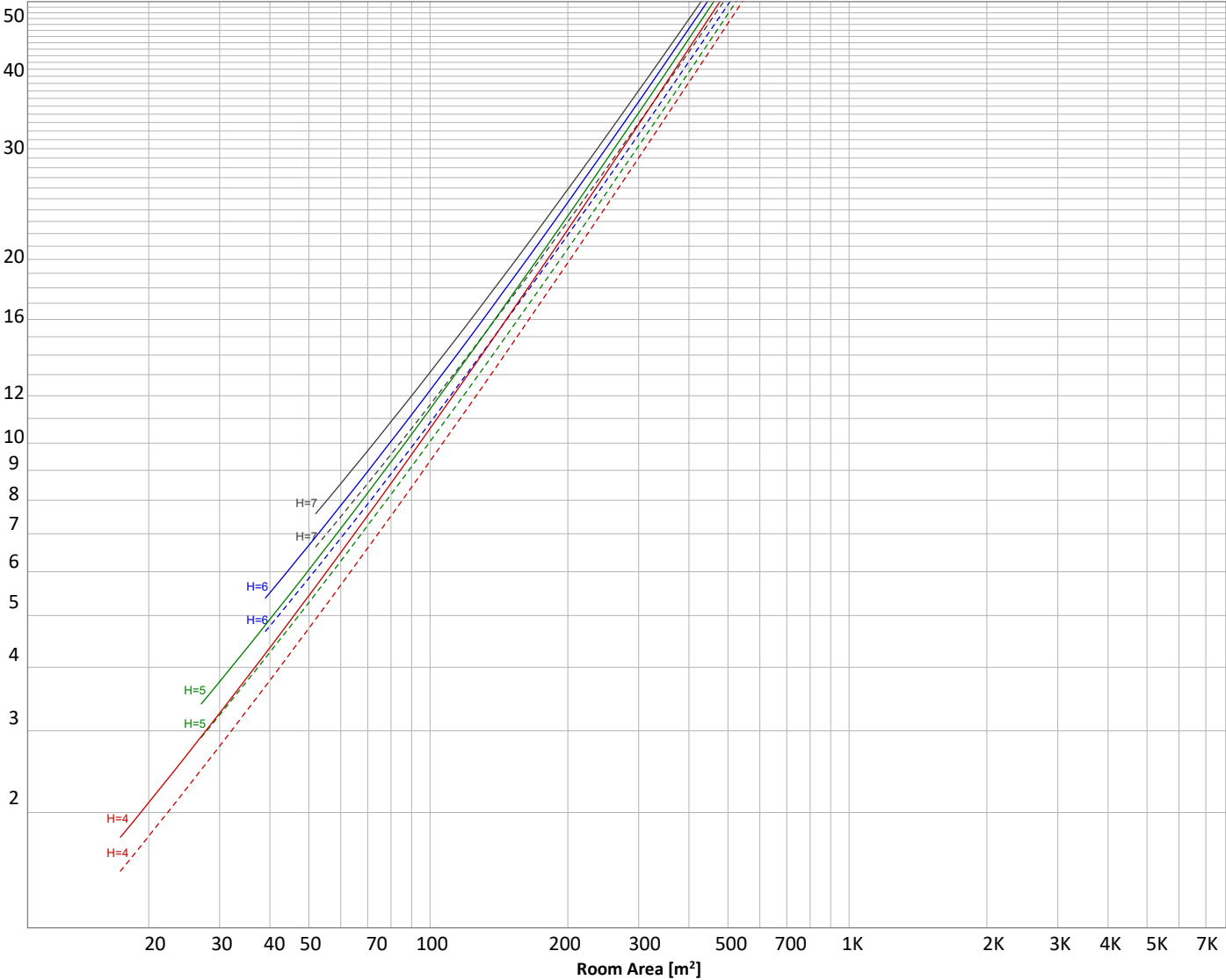
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 1082 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°
123 lm	319 lm	364 lm	217 lm	47.4 lm	5.50 lm	0.743 lm	0.276 lm	0.392 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0.445 lm	0.324 lm	0.259 lm	0.372 lm	0.551 lm	0.816 lm	0.897 lm	0.741 lm	0.299 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	123 lm	11.4%
10-20°	319 lm	29.5%
20-30°	364 lm	33.6%
30-40°	217 lm	20.1%
40-50°	47 lm	4.4%
50-60°	5 lm	0.5%
60-70°	1 lm	0.1%
70-80°	0 lm	0.0%
80-90°	0 lm	0.0%
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°	1 lm	0.1%
140-150°	1 lm	0.1%
150-160°	1 lm	0.1%
160-170°	1 lm	0.1%
170-180°	0 lm	0.0%
Total	1082 lm	100.0%

Intensity peaks

Max intensity	1325 cd
Intensity, 90°	0 cd
Intensity, 0°	1319 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	806 lm	74.5%
0-40°	1023 lm	94.5%
0-60°	1076 lm	99.4%
60-90°	1 lm	0.1%
70-100°	1 lm	0.1%
90-120°	1 lm	0.1%
0-90°	1077 lm	99.6%
90-180°	5 lm	0.4%
0-180°	1082 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	402 lm	37.1%
Medium(30-60°)	136 lm	12.6%
High(60-80°)	1 lm	0.0%
Very high(80-90°)	0 lm	0.0%
Back light		
Low(0-30°)	402 lm	37.1%
Medium(30-60°)	136 lm	12.6%
High(60-80°)	1 lm	0.0%
Very high(80-90°)	0 lm	0.0%

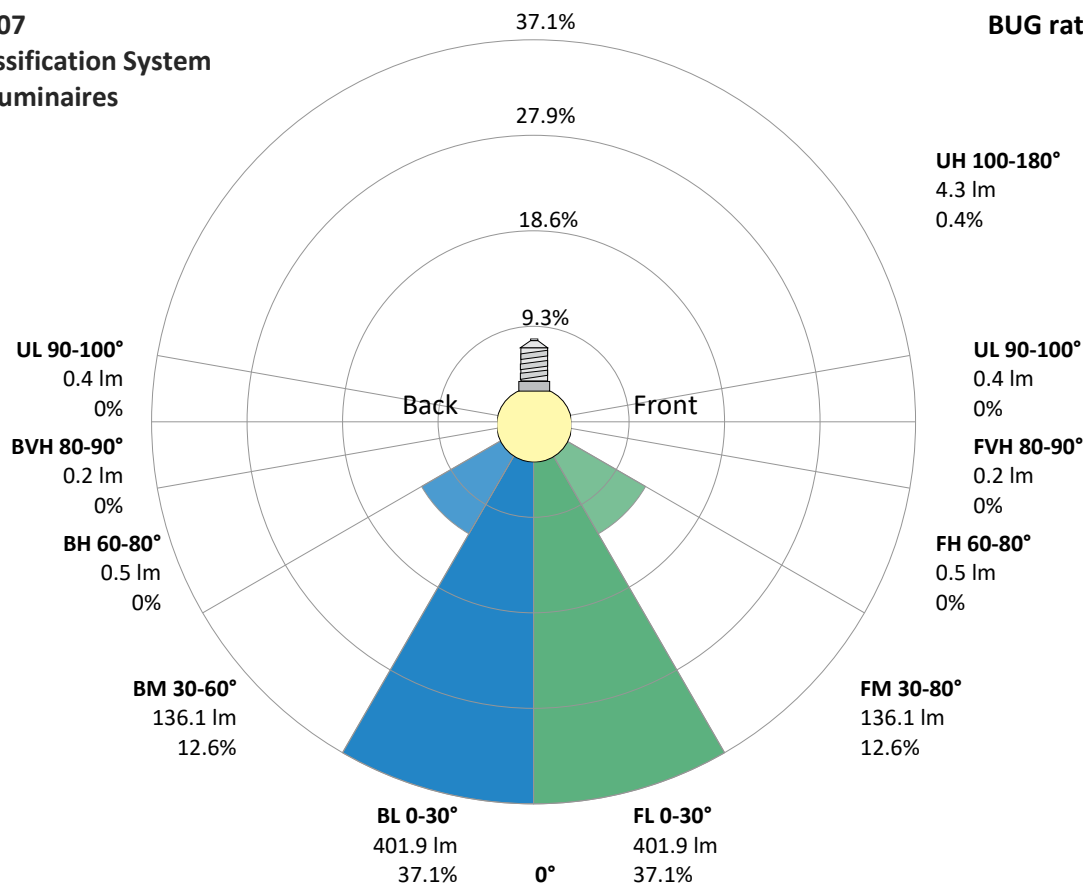
Uplight

Low(90-100°)	0 lm	0.0%
High(100-180°)	4 lm	0.4%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B1 U1 G0



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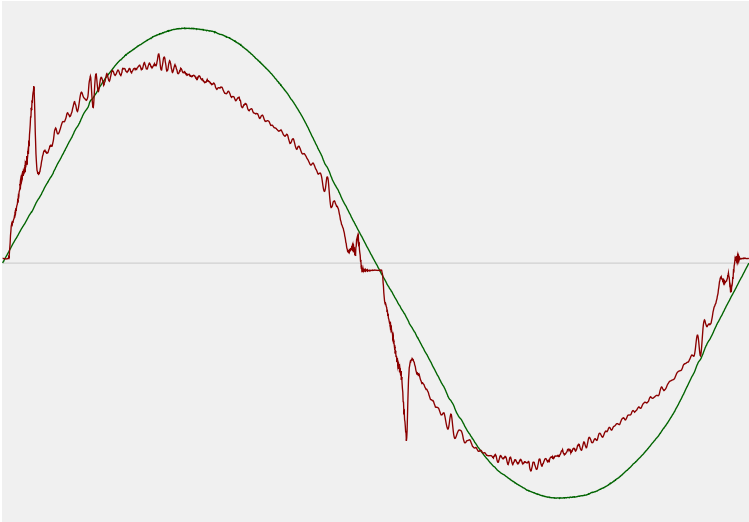


Power Details

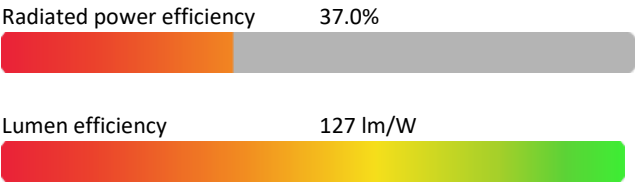
Input Power

Power feed to light source	8.5 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	122 V
RMS Input current feed, I_{RMS}	0.072 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	8.72 VA
Displacement factor of AC power feed	0.99
Power factor of AC current feed	0.98
Total harmonic distortion of the current	11.05%
Total harmonic distortion of the voltage	2.08%

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	3457 K
CCT shift	+0 K
CCT end	3457 K

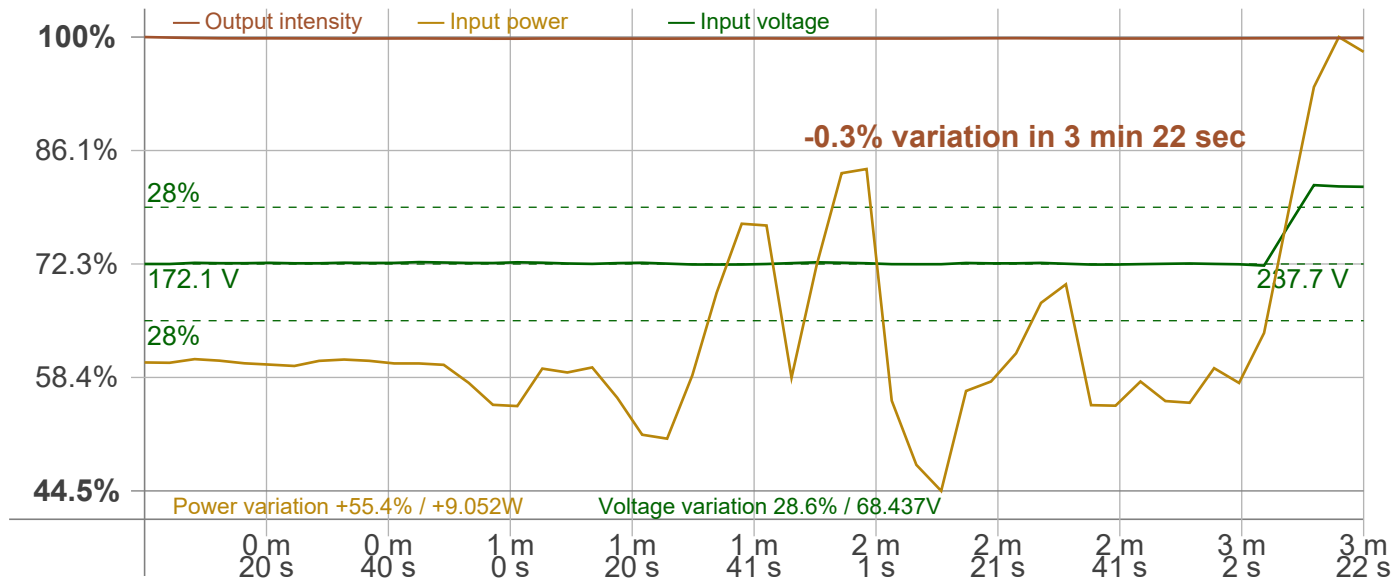
Warmup Result

Total warmup time	Not completed
Warmup variation	-0.3%

Output Change

Output start	1083 lm
Output change	-1 lm
Output end	1082 lm

Stabilization Curve



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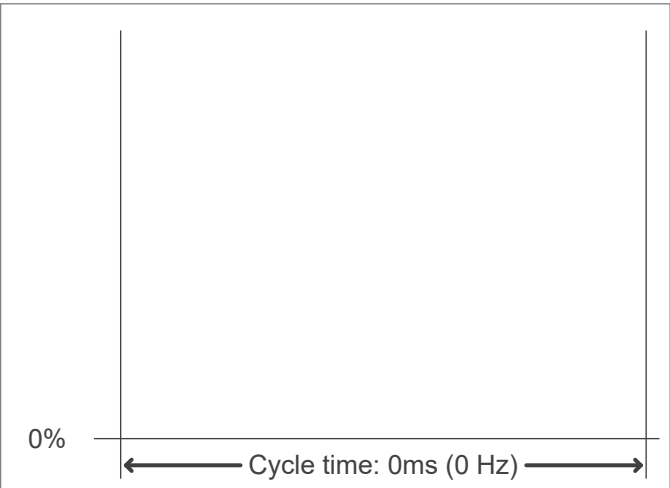
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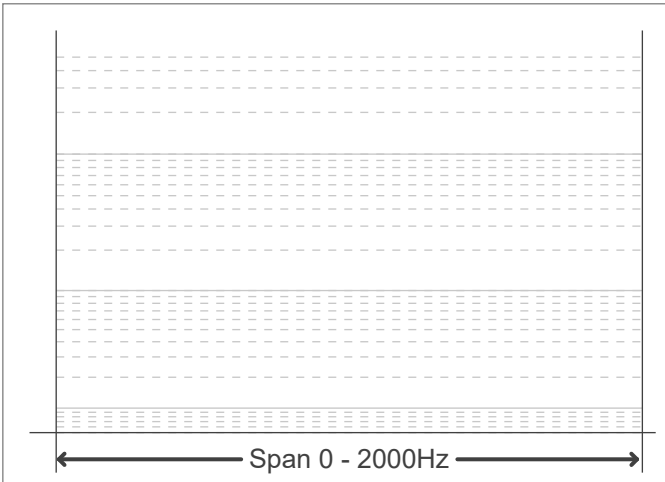
Flicker /TLA details

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

