

Light Measurement Report

Print date: 1/7/2026

Measurement date and time: 1/2/2026 11:16:49 AM – Measurement no. VFR-260102-0723-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

14.4 W – PF 0.99 – DPF 0.99

121 V – 0.120 A

60 Hz

Lamp stabilized in 15 min 1 sec – 2.0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

HP1-P-D-4'-B-835-MLW-BLX2835

HP1-P-D-4'-B-835-MLW-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

2020 lm – 0.94% / 99.06%

140 lm/W

2307 cd – 57.1°

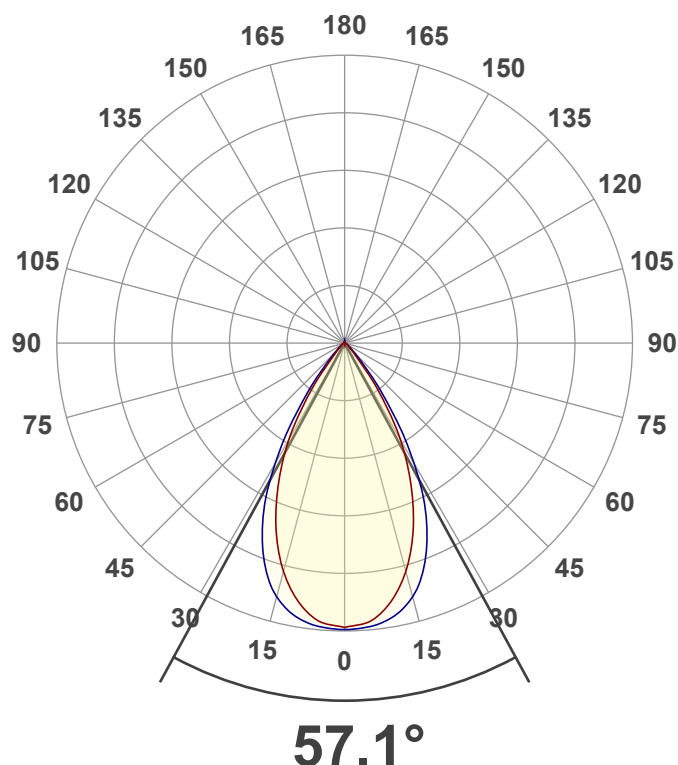
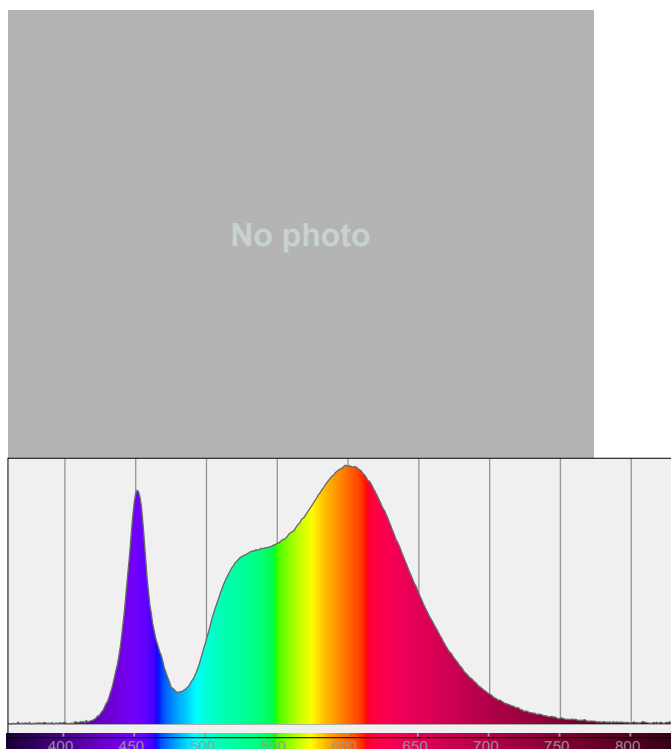
CCT = 3478 K / 3478 K

CRI 81.8

R_f 82.9 – R_g 97.1

Duv 0.0016 – SDCM n/a

SVM n/a – PstLM n/a



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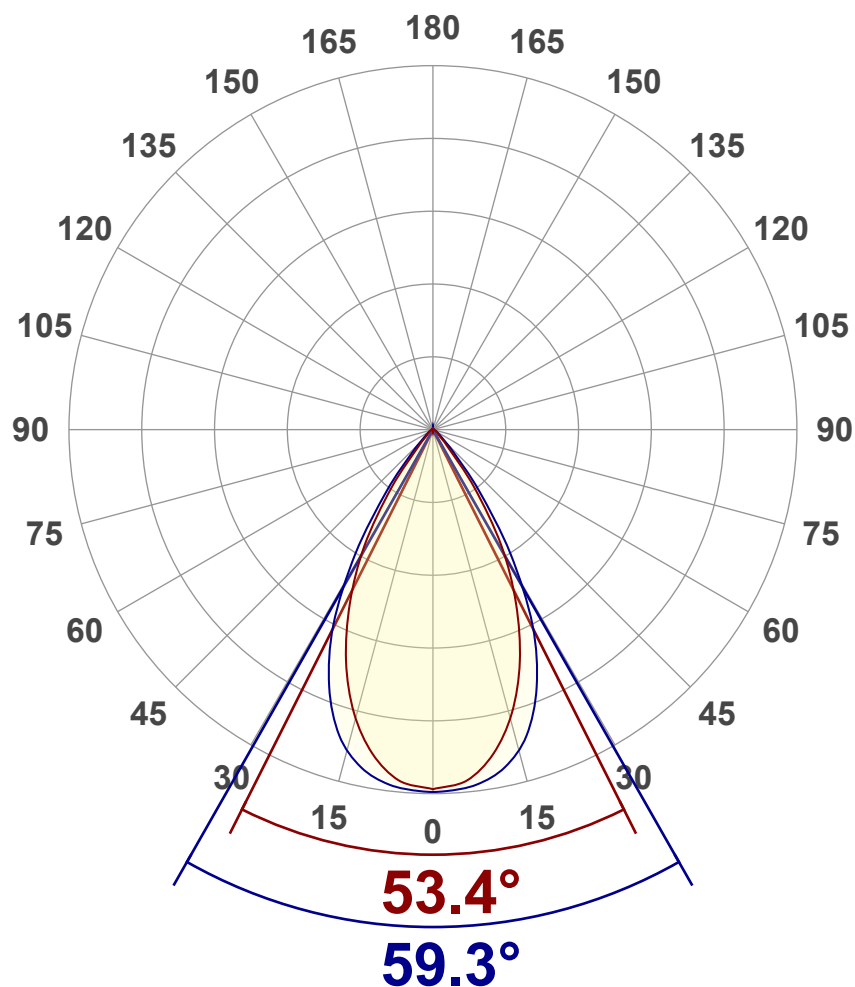
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2020 lm
Lumen Up% / Down%	0.94% / 99.06%
Peak Intensity	2307 cd
Beam Angle (50%)	57.1°
Beam Angle (90%)	59.3°
Beam Angle (10%)	53.4°

Cut-off Angle

Average 2,5%	101.5°
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Field Angle

Average 10%	83.7°
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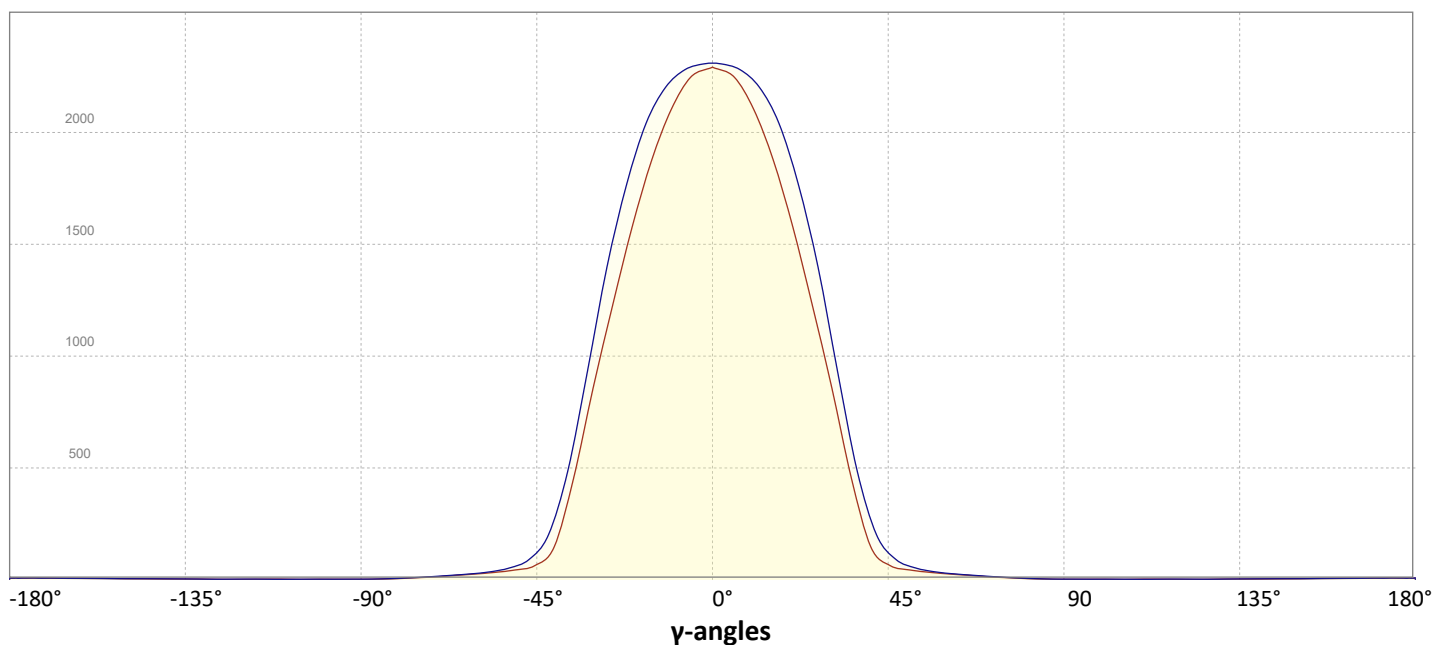
Intensity Ratio

In 120° cone	97.2%
In 90° cone	93.5%

C000-C180

C090-C270

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

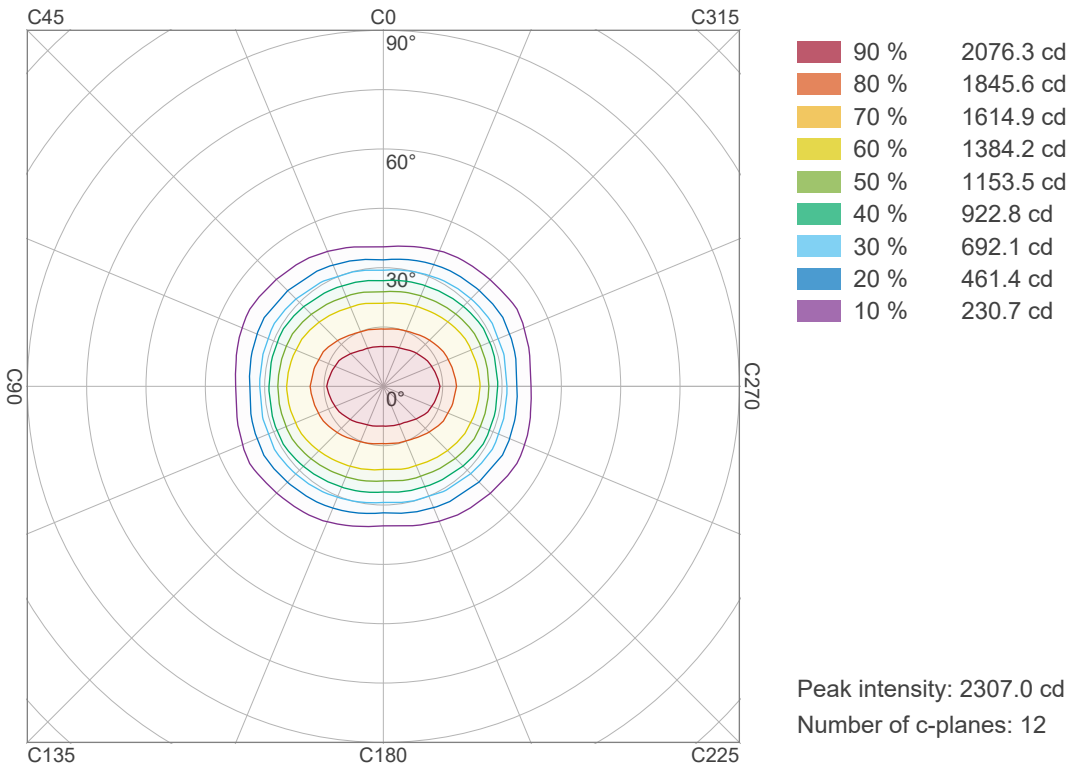


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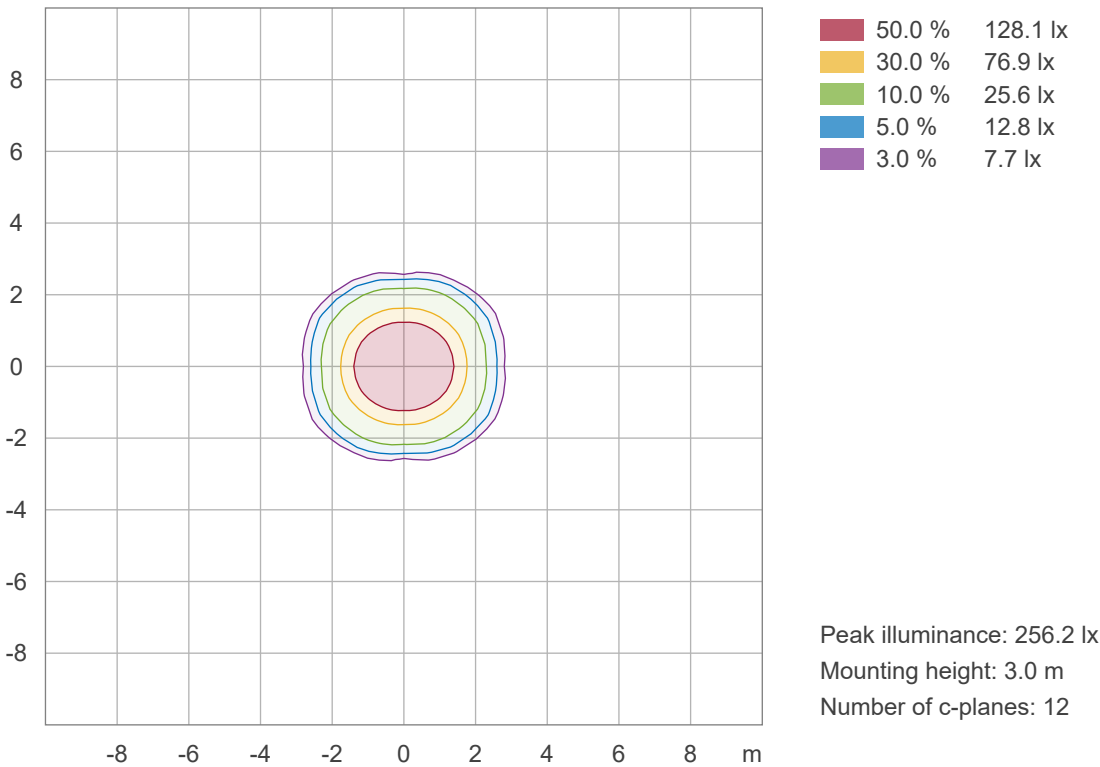
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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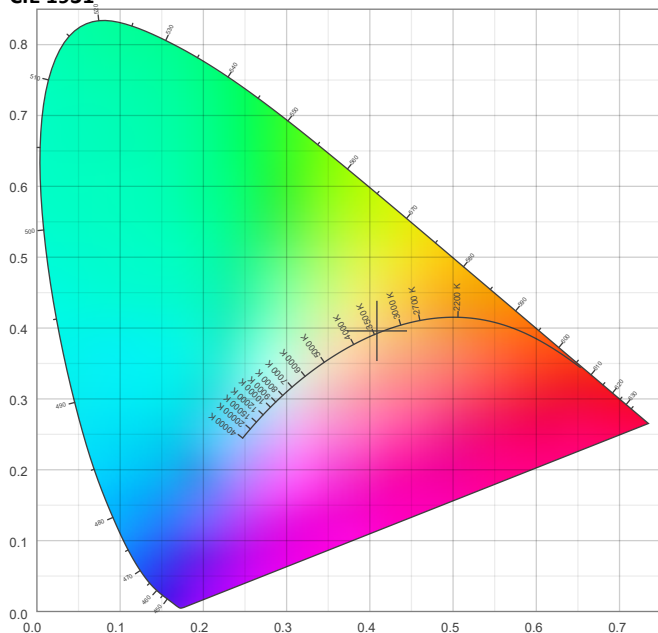


Color details

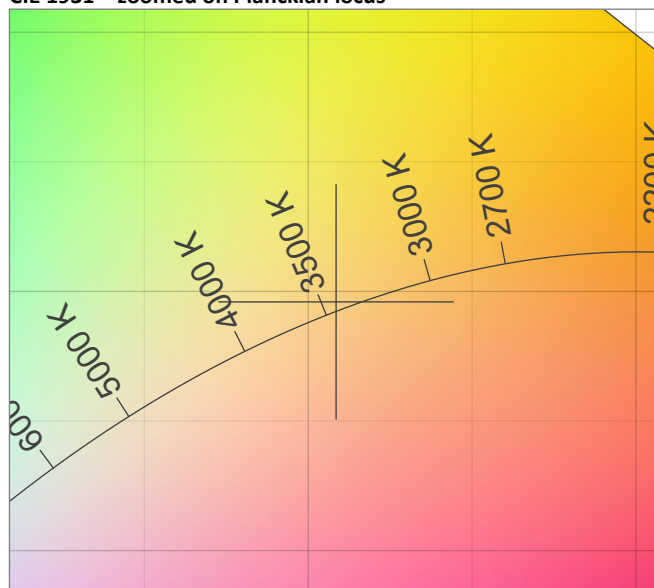
Correlated Color Temperature, Target CCT = 3478 K
Correlated Color Temperature, Measured CCT = 3478 K
Color Rendering Index CRI 81.8
Color Rendering Index, R9 (red component) R9 = 3.0
Color Rendering TM30-18 R_f 82.9 – R_g 97.1
Color Quality Scale CQS = 81.8

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0.408;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)

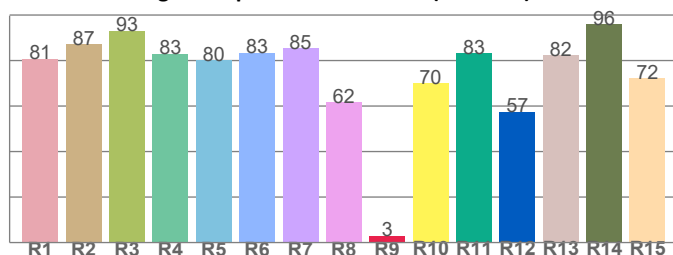
CIE 1931



CIE 1931 – zoomed on Planckian locus



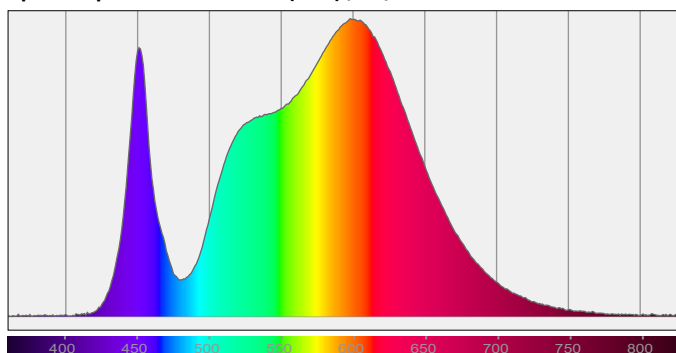
Color Rendering Index per reference color (CIE 1995)



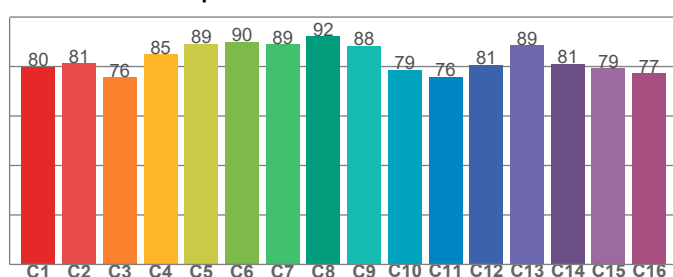
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
80.8	87.2	93.1	83.0	80.2	83.4	85.3	61.7	3.0	70.0	83.2	57.5	82.3	95.9	72.1

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



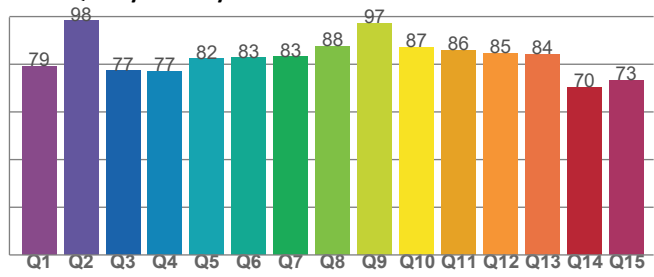
TM30-18 R_f-values per hue bin



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	75.6	85.1	89.2	90.0	89.1	92.3	88.4	78.8	75.9	80.7	88.5	81.1	79.3	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
79.1	98.3	77.3	77.1	82.3	82.7	83.1	87.6	97.3	87.2	85.9	84.7	84.1	70.4	73.4

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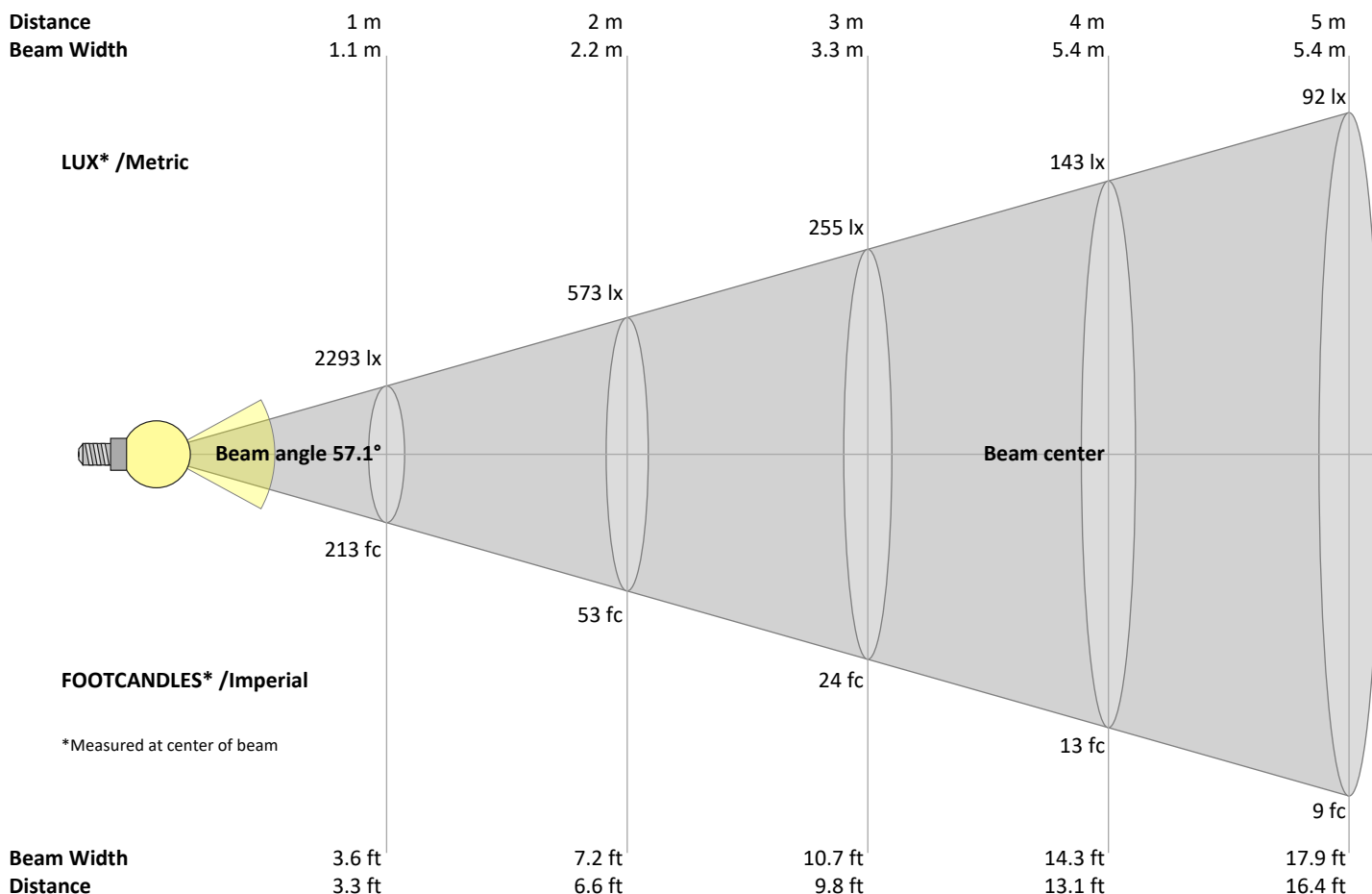
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Operator:



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
2293	573	255	143	92	64	47	36	28	23	19	16	14	12	10	9	8	7	6	6	lux
213	53.3	23.7	13.3	8.5	5.9	4.3	3.3	2.6	2.1	1.8	1.5	1.3	1.1	0.9	0.8	0.7	0.7	0.6	0.5	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
2293	2276	2260	2235	2177	2119	2038	1947	1850	1731	1611	1477	1337	1195	1047	899	741	580	427	304	cd
100%	99%	99%	97%	95%	92%	89%	85%	81%	75%	70%	64%	58%	52%	46%	39%	32%	25%	19%	13%	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
2293	2307	2297	2286	2265	2234	2202	2138	2073	1986	1876	1766	1620	1473	1307	1120	933	756	579	432	cd
100%	101%	100%	100%	99%	97%	96%	93%	90%	87%	82%	77%	71%	64%	57%	49%	41%	33%	25%	19%	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
2293	2276	2260	2235	2177	2119	2038	1947	1850	1731	1611	1477	1337	1195	1047	899	741	580	427	304	cd
100%	99%	99%	97%	95%	92%	89%	85%	81%	75%	70%	64%	58%	52%	46%	39%	32%	25%	19%	13%	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
2293	2307	2297	2286	2265	2234	2202	2138	2073	1986	1876	1766	1620	1473	1307	1120	933	756	579	432	cd
100%	101%	100%	100%	99%	97%	96%	93%	90%	87%	82%	77%	71%	64%	57%	49%	41%	33%	25%	19%	of 0°val

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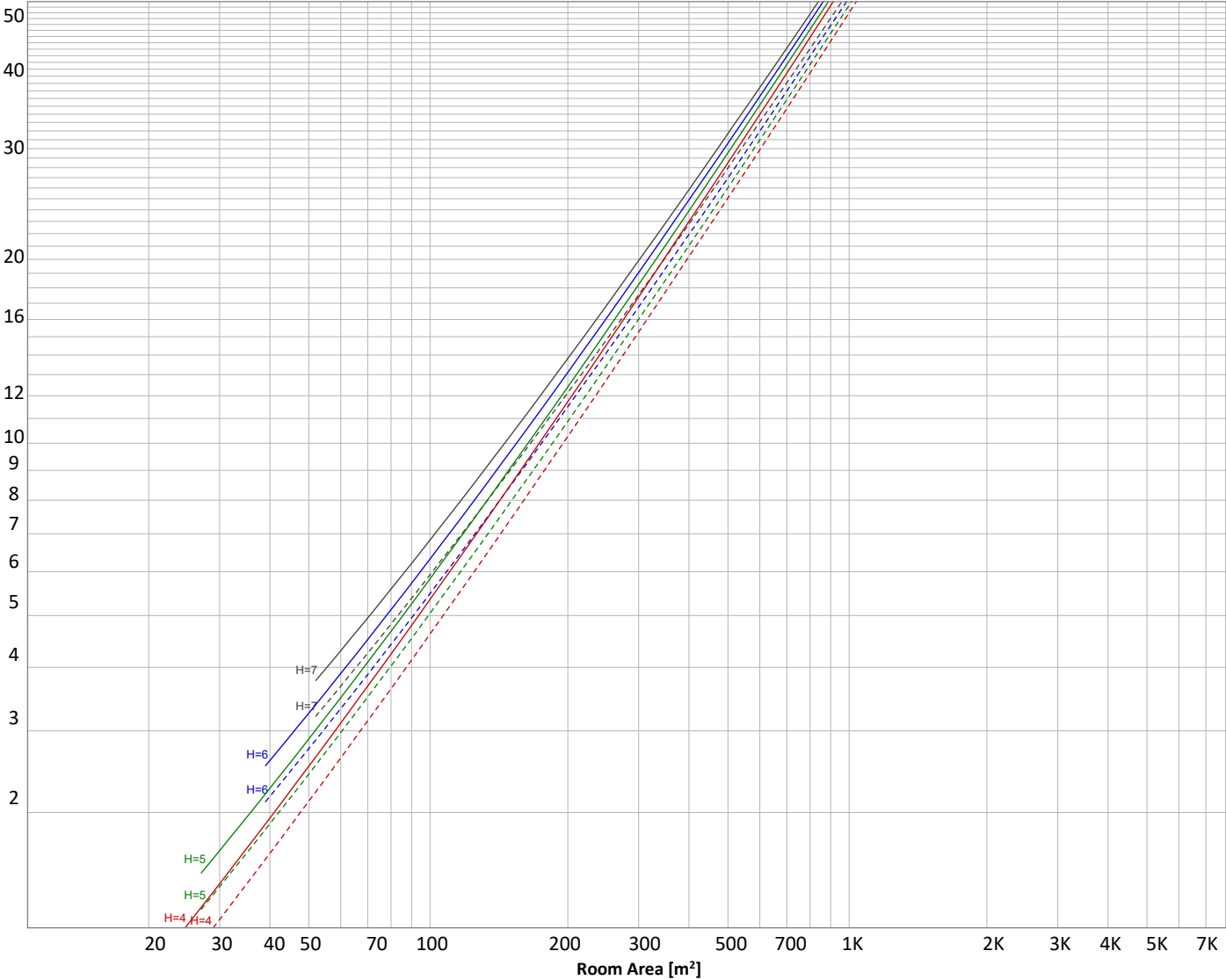
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Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 2020 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°
214 lm	558 lm	644 lm	400 lm	110 lm	38.0 lm	22.0 lm	11.3 lm	4.34 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
2.53 lm	2.38 lm	2.29 lm	2.09 lm	2.38 lm	2.48 lm	2.39 lm	1.79 lm	0.680 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	214 lm	10.6%
10-20°	558 lm	27.6%
20-30°	644 lm	31.9%
30-40°	400 lm	19.8%
40-50°	110 lm	5.5%
50-60°	38 lm	1.9%
60-70°	22 lm	1.1%
70-80°	11 lm	0.6%
80-90°	4 lm	0.2%
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°	2 lm	0.1%
140-150°	2 lm	0.1%
150-160°	2 lm	0.1%
160-170°	2 lm	0.1%
170-180°	1 lm	0.0%
Total	2020 lm	100.0%

Intensity peaks

Max intensity	2307 cd
Intensity, 90°	2 cd
Intensity, 0°	2293 cd

Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	1415 lm	70.1%
0-40°	1815 lm	89.9%
0-60°	1963 lm	97.2%
60-90°	38 lm	1.9%
70-100°	18 lm	0.9%
90-120°	7 lm	0.4%
0-90°	2001 lm	99.1%
90-180°	19 lm	0.9%
0-180°	2020 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	705 lm	34.9%
Medium(30-60°)	277 lm	13.7%
High(60-80°)	17 lm	0.8%
Very high(80-90°)	2 lm	0.1%
Back light		
Low(0-30°)	705 lm	34.9%
Medium(30-60°)	277 lm	13.7%
High(60-80°)	17 lm	0.8%
Very high(80-90°)	2 lm	0.1%

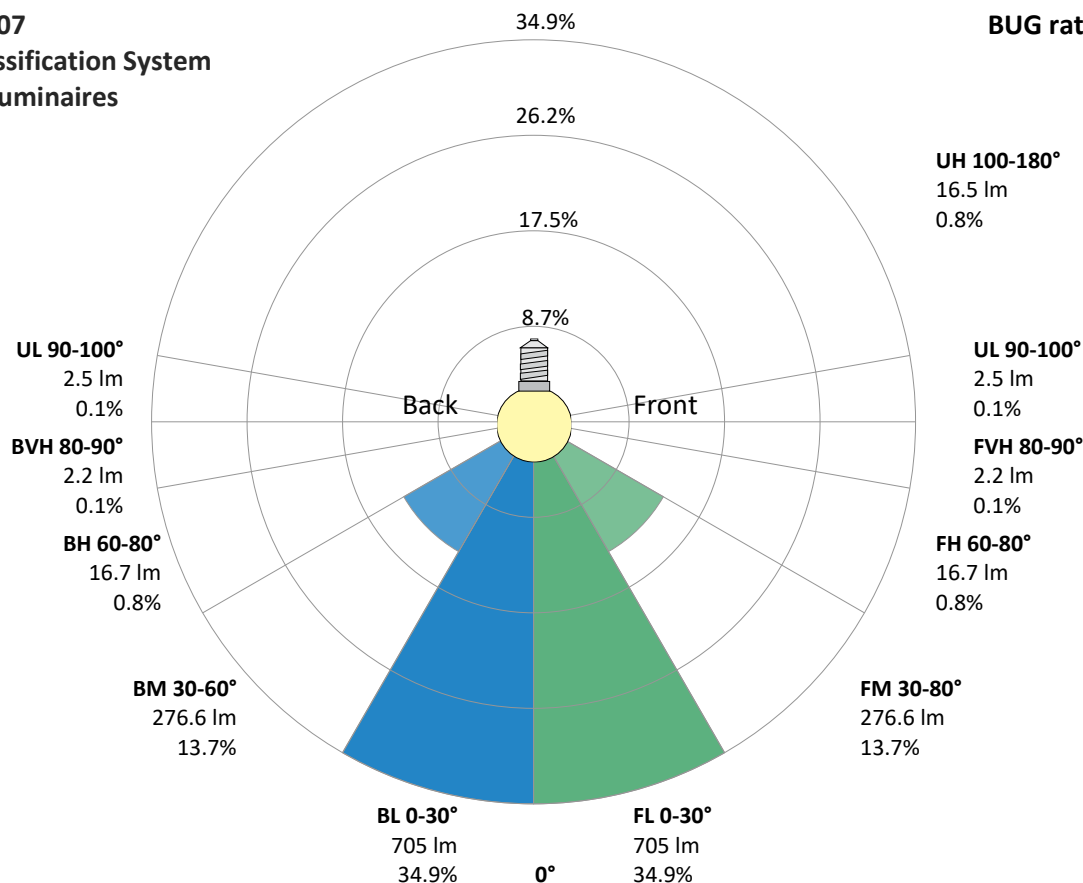
Uplight

Low(90-100°)	3 lm	0.1%
High(100-180°)	16 lm	0.8%

IESNA TM-15-07

Luminaire Classification System For Outdoor Luminaires

BUG rating B2 U2 G0



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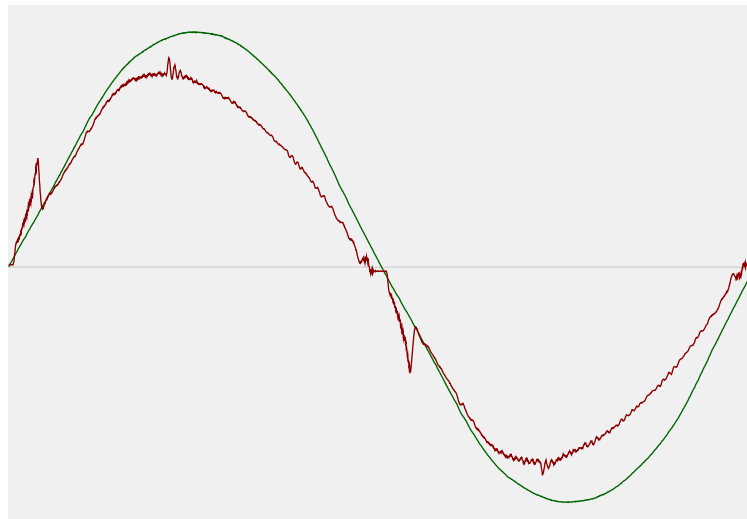


Power Details

Input Power

Power feed to light source	14.4 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	121 V
RMS Input current feed, I_{RMS}	0.120 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	14.55 VA
Displacement factor of AC power feed	0.99
Power factor of AC current feed	0.99
Total harmonic distortion of the current	6.4%
Total harmonic distortion of the voltage	1.78%

Input Power Curve



Efficiency

Radiated power efficiency 41.0%



Lumen efficiency 140 lm/W



Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	3477 K
CCT shift	+1 K
CCT end	3478 K

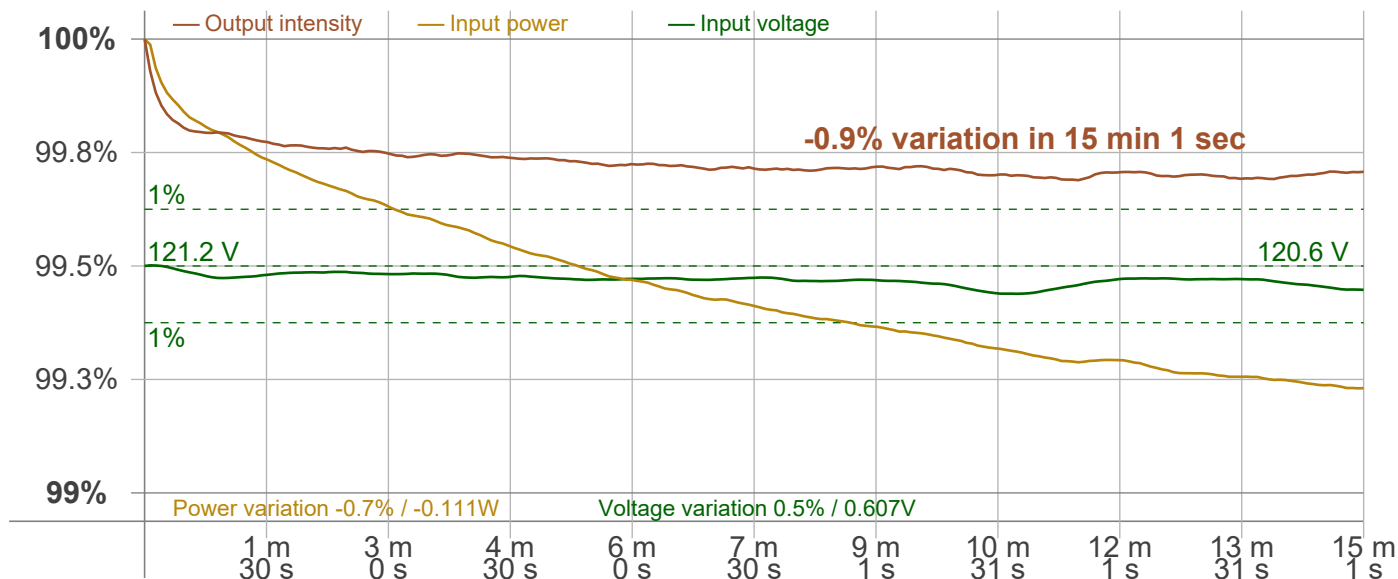
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	-0.9%

Output Change

Output start	2030 lm
Output change	-10 lm
Output end	2020 lm

Stabilization Curve



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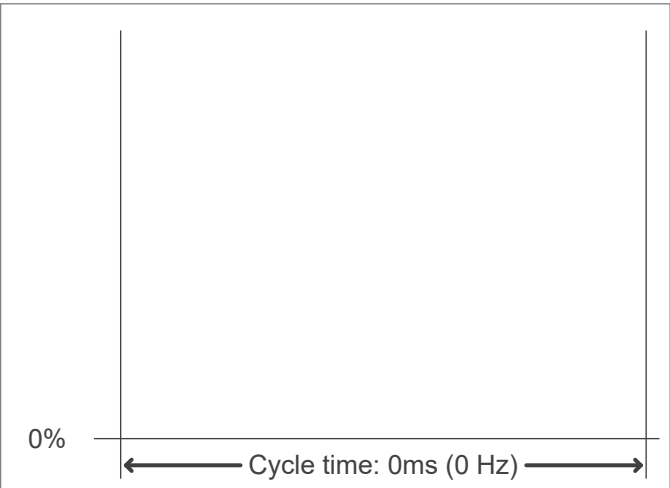
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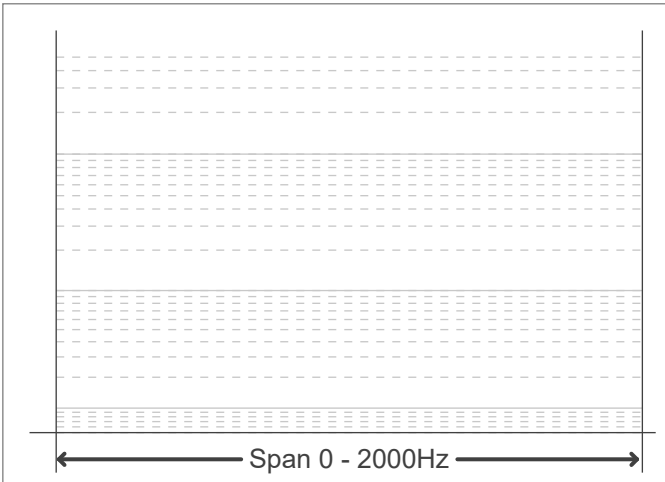
Flicker /TLA details

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

