HBUD2-50K300LSD

Light efficiency:

178 Lumens/Watt

Light quality:

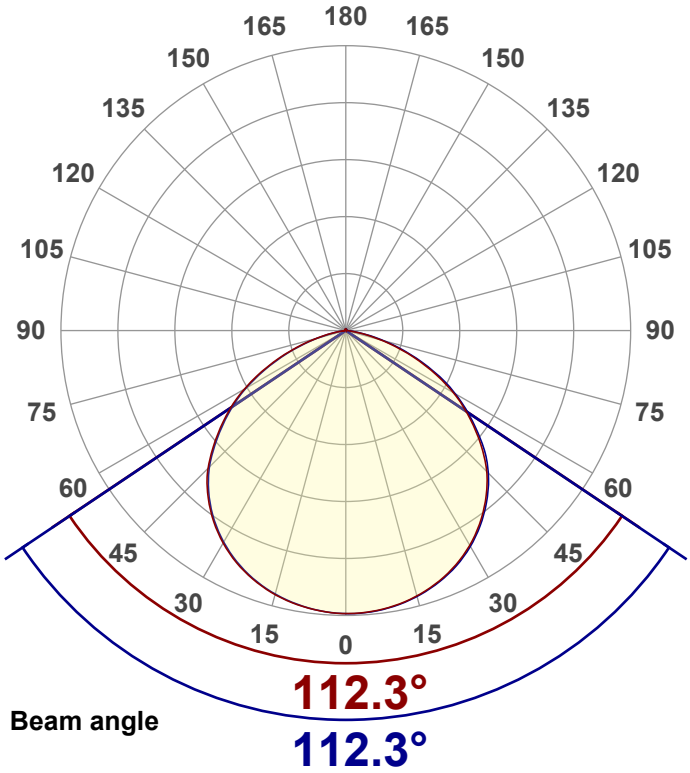
CRI: 73.4

Color temperature:

5511 K

Output: 52851 lm
Peak: 18921 cd

Power: 296.1 W
PF: 1.0



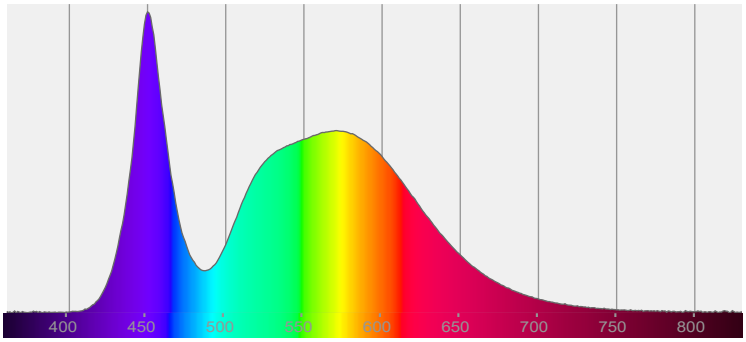
Beam angle

Product name:
HBUD2-50K300LSD

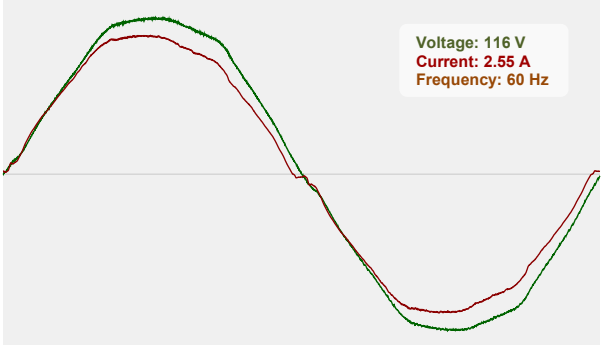
Date and time:
8/29/2025 6:43:51 AM

CIE 1931
x: 0.332
y: 0.347

Spectra



Power



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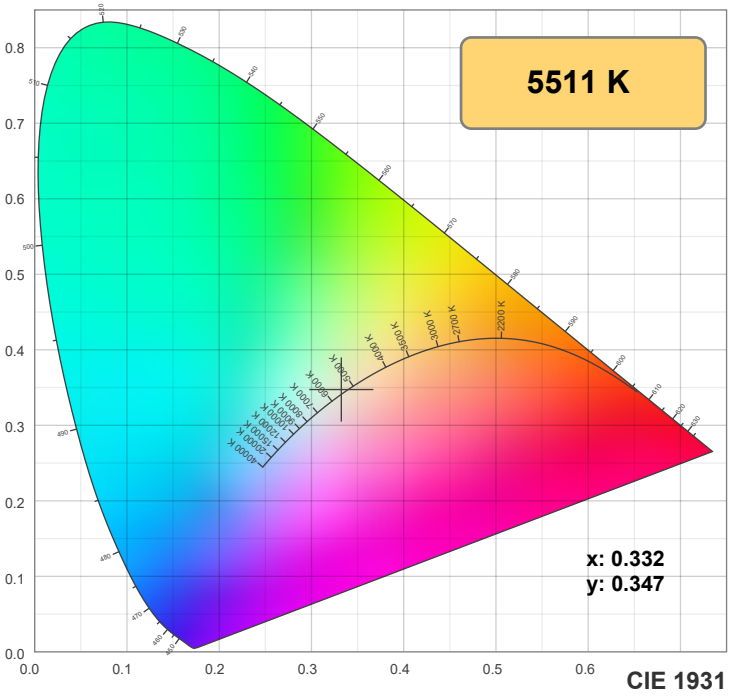
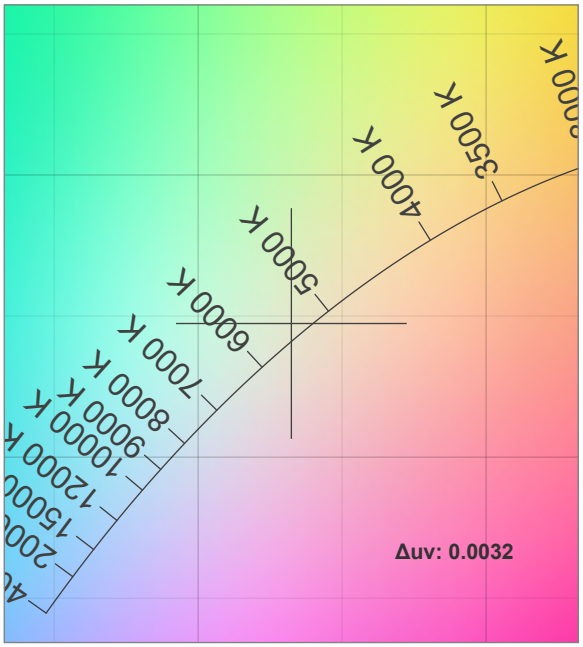
Color Specifications

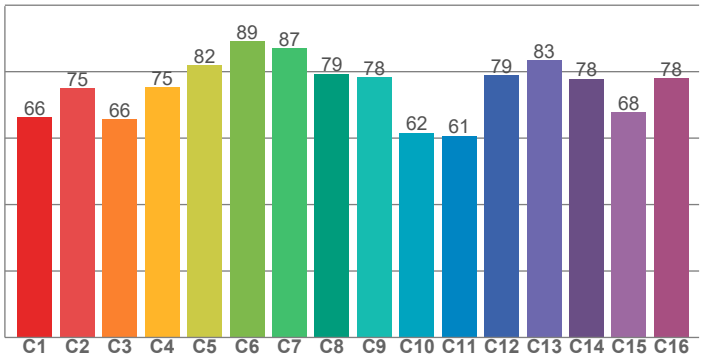


CIE 1931

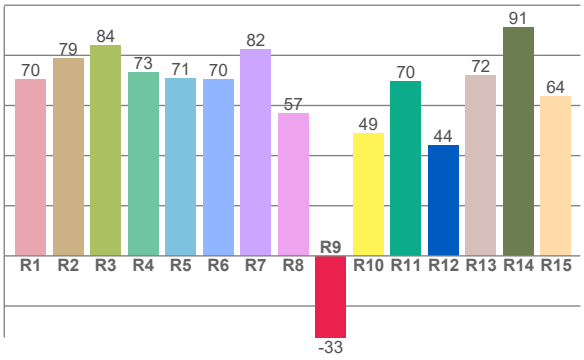


CIE 1931 ZOOM

TM30: 74.9



CRI: 73.4 (R1-R8)



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
70.3	78.9	84.1	73.2	71.0	70.5	82.2	56.7	-32.6	48.9	69.6	44.0	72.1	91.1	63.5

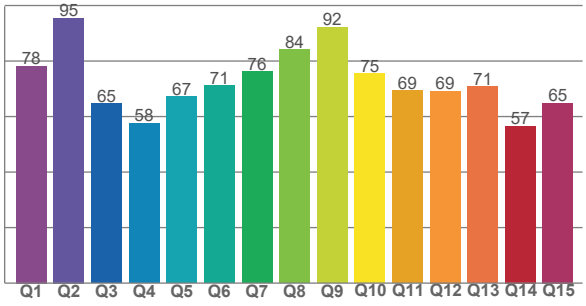
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
66.2	75.0	65.7	75.3	81.9	89.2	87.1	79.3	78.3	61.6	60.7	79.0	83.4	77.9	67.8	78.0

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
78.2	95.5	64.6	57.6	67.1	71.1	76.1	84.0	92.2	75.5	69.3	69.2	70.7	56.6	64.9

CQS: 70.8



Color parameters

Color temperature	Color rendering index	Red component	Color fidelity	Color gamut	Color quality scale	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate	Color deviation from black body
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
5511 K	73.4	-32.6	74.9	92.7	70.8	0.332	0.347	0.204	0.320	0.0032

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TM30 Report

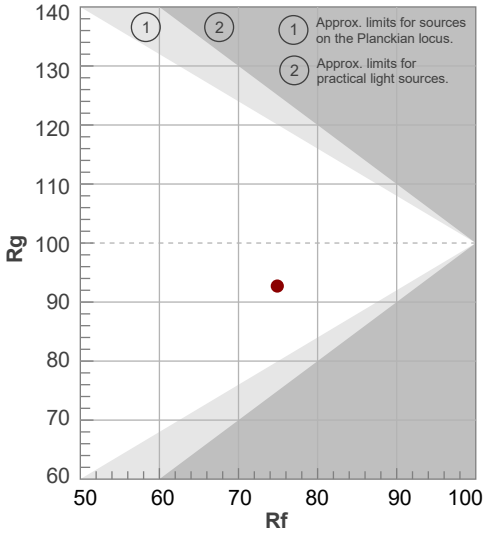
Rf 74.9

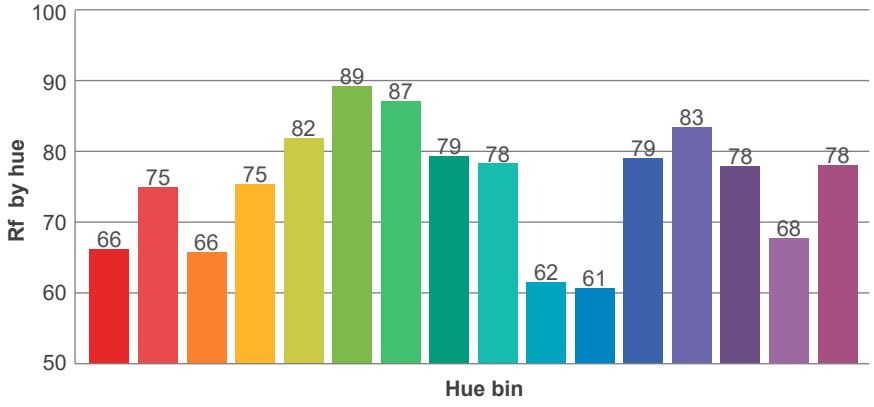
Fidelity index Rf

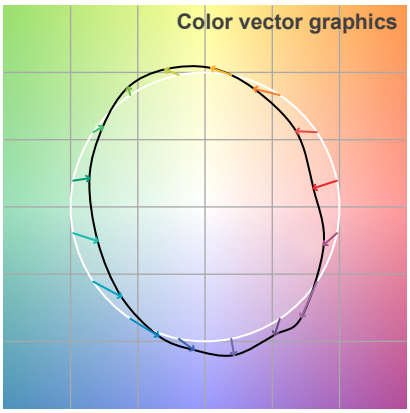
Rg 92.7

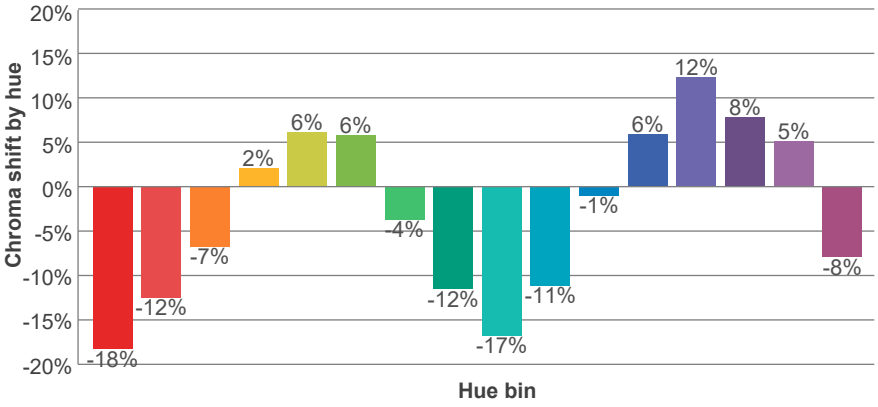
Gamut index Rg

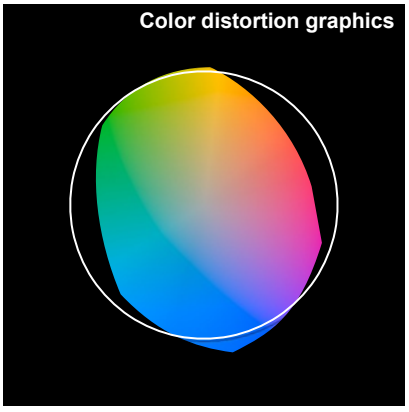
		Graphic shifts (%)	
Hue Bin	R_f	Chroma	Hue
1	66	-18%	-2%
2	75	-12%	9%
3	66	-7%	19%
4	75	2%	16%
5	82	6%	9%
6	89	6%	-2%
7	87	-4%	-7%
8	79	-12%	-4%
9	78	-17%	9%
10	62	-11%	21%
11	61	-1%	24%
12	79	6%	13%
13	83	12%	0%
14	78	8%	-10%
15	68	5%	-28%
16	78	-8%	-10%

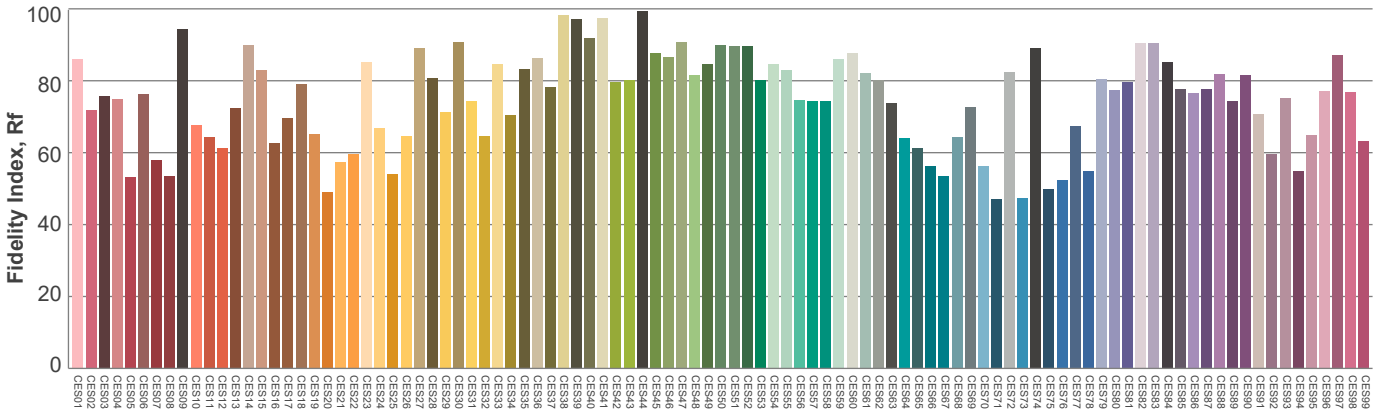












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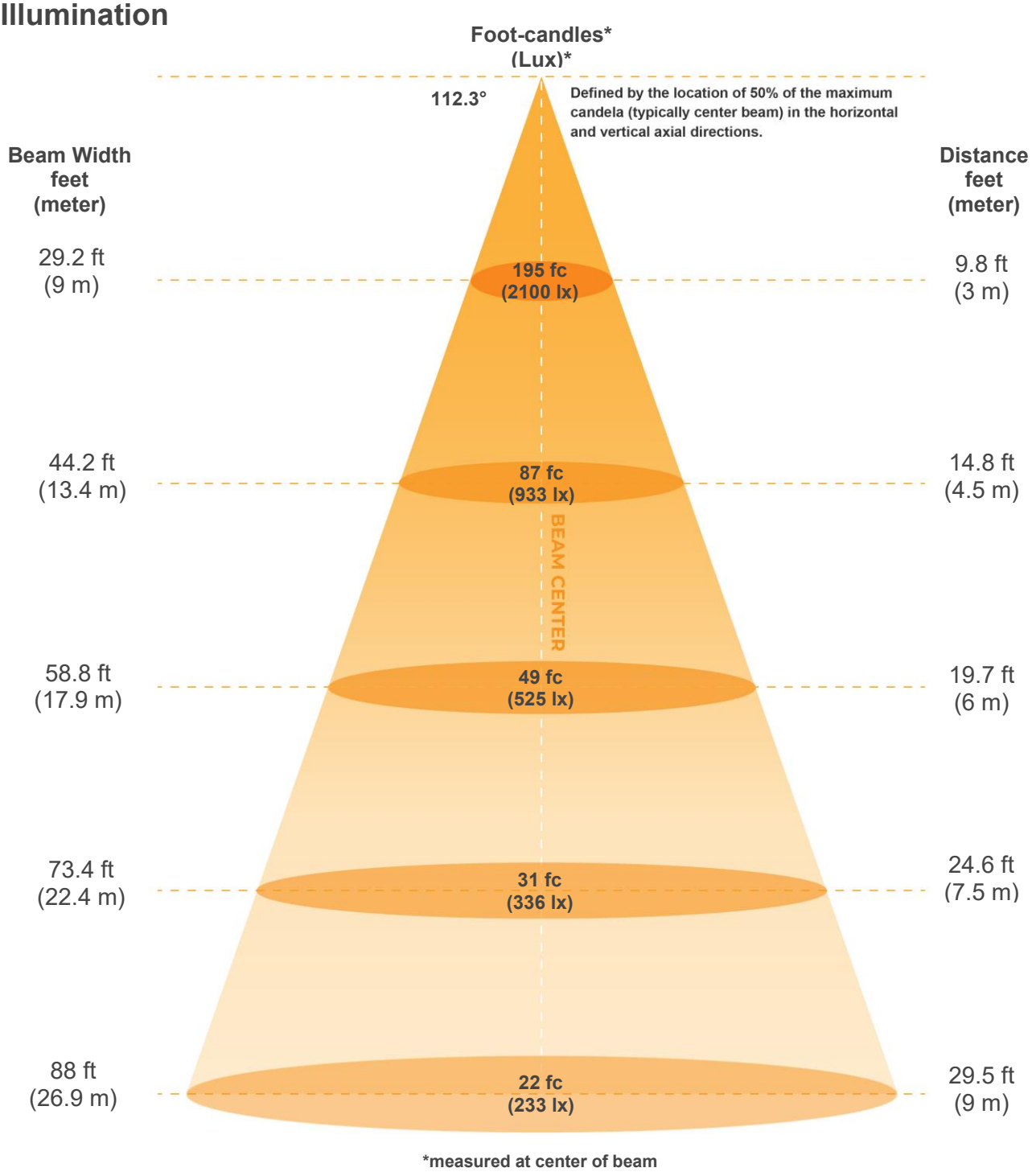
Illumination



Beam intensities from 1-20m

m	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ft	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
lux	18897	4724	2100	1181	756	525	386	295	233	189	156	131	112	96	84	74	65	58	52	47
fc	1755.6	438.9	195.1	109.7	70.2	48.8	35.8	27.4	21.7	17.6	14.5	12.2	10.4	9	7.8	6.9	6.1	5.4	4.9	4.4

Beam angle H	Beam Angle V	Field angle H 10%	Field Angle V 10%	Cutoff Angle 2.5%	Intensity Ratio in 120°	Intensity Ratio in 90°
112.3°	112.3°	152.7°	152.6°	165°	82.4%	56.3%

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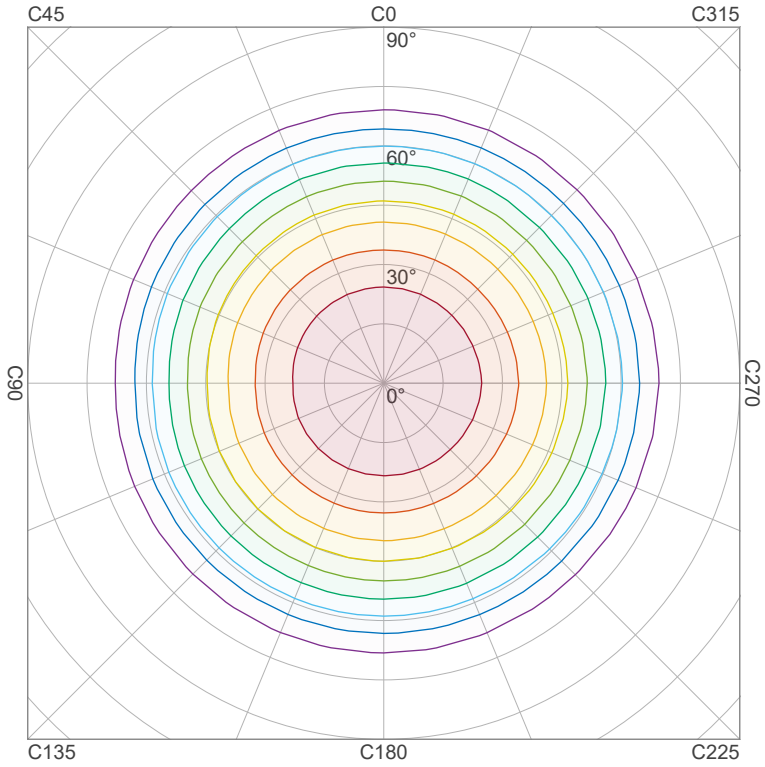
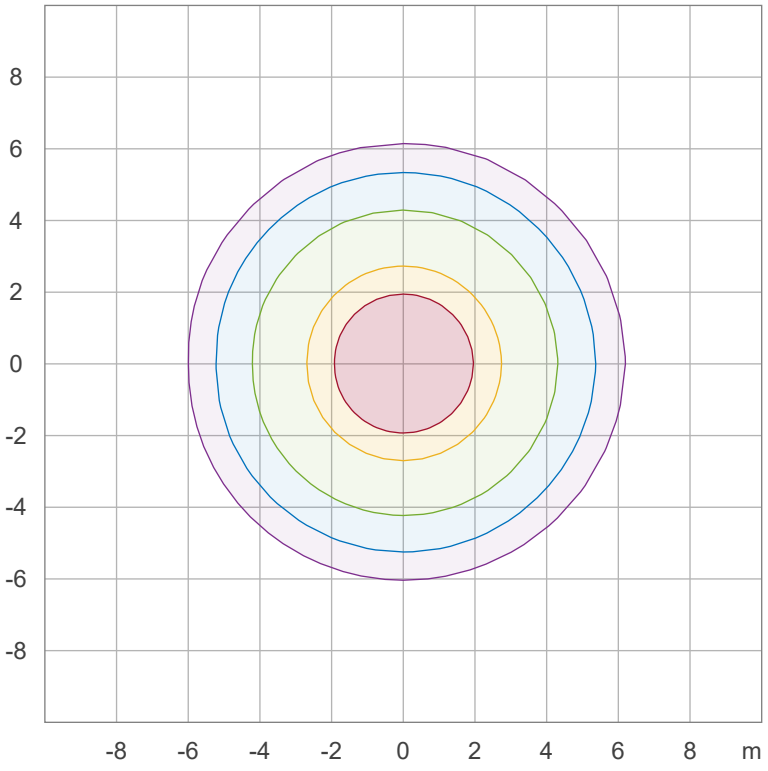
Iso-intensity Diagram (Iso-candela)



90 %	17024.2 cd
80 %	15132.6 cd
70 %	13241.1 cd
60 %	11349.5 cd
50 %	9457.9 cd
40 %	7566.3 cd
30 %	5674.7 cd
20 %	3783.2 cd
10 %	1891.6 cd

Peak intensity: 18915.8 cd
Number of c-planes: 16

Iso-illuminance Diagram (Iso-lux)



50.0 %	1050.3 lx
30.0 %	630.2 lx
10.0 %	210.1 lx
5.0 %	105.0 lx
3.0 %	63.0 lx

Peak illuminance: 2100.5 lx
Mounting height: 3.0 m
Number of c-planes: 16

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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	**Viewed Crosswise** (Viewing direction orthogonal to lamp length axis)					**Viewed Endwise** (Viewing direction parallel to lamp length axis)				
X **Y**										
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/wrong symmetry. Go to Edit -> Photometric -> Corrections and select Correct asymmetry (UGR not defined for asymmetrical distributions)..

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	109	105	101	98	107	103	99	96	98	95	93	94	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	83	79	75	80	77	74	71
3	91	81	73	67	89	79	72	66	76	70	65	74	68	64	71	66	63	61
4	84	72	63	57	81	71	63	56	68	61	56	66	60	55	63	58	54	52
5	77	64	56	49	75	63	55	49	61	54	48	59	53	48	57	51	47	45
6	71	58	49	43	69	57	49	43	55	48	42	53	47	42	52	46	41	39
7	66	52	44	38	64	52	43	38	50	43	37	48	42	37	47	41	37	35
8	61	48	39	34	60	47	39	34	46	38	33	44	38	33	43	37	33	31
9	57	44	36	30	56	43	35	30	42	35	30	41	34	30	40	34	30	28
10	54	40	33	27	52	40	32	27	39	32	27	38	31	27	37	31	27	25

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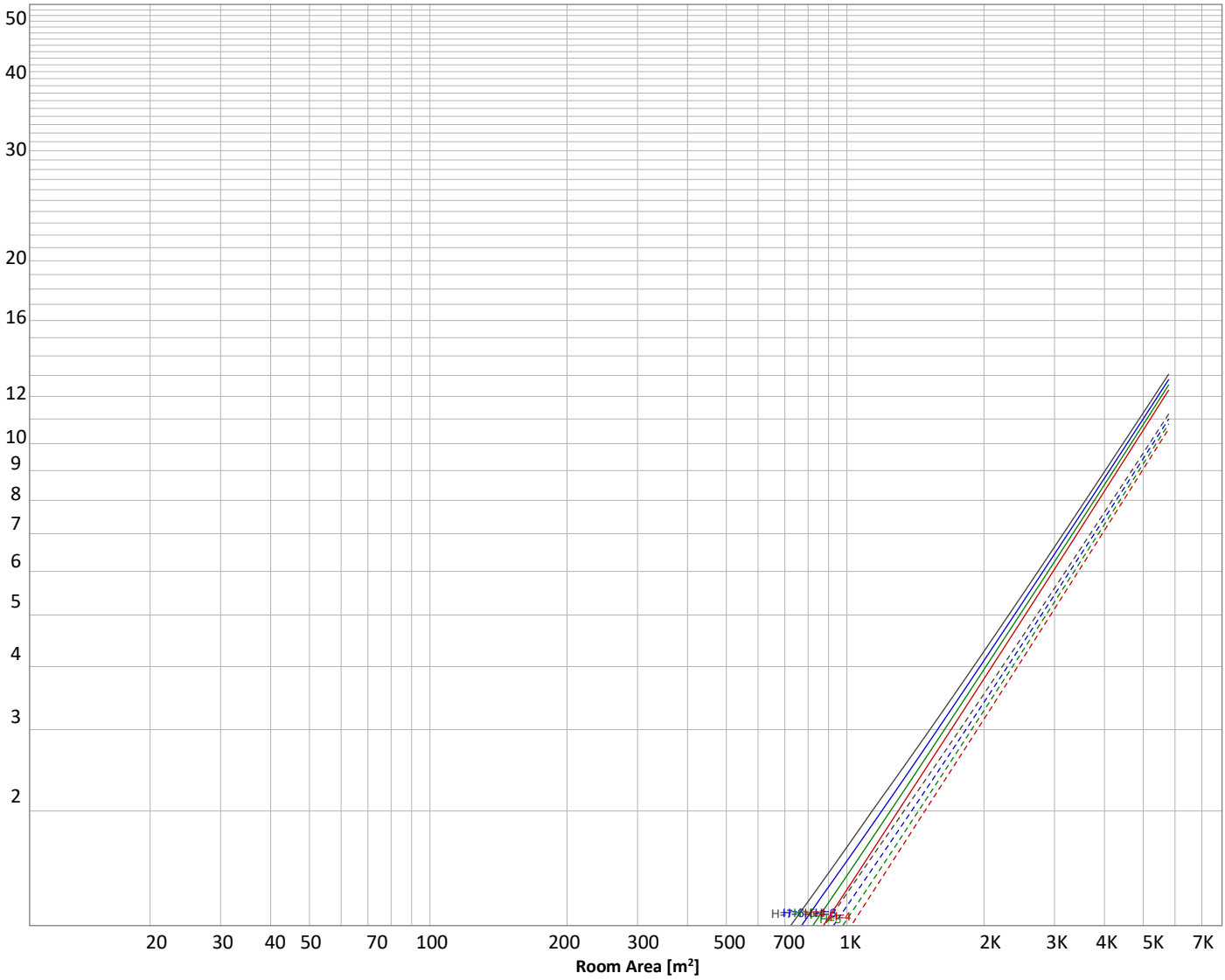
Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 52851 lm
H_{down} = Lamp distance from ceiling =	0.00 m
H_{work} = Work area height from floor =	0.00 m
E_{work} = Average lux on work area =	100 lx

	ρ(%)		
Line type	Ceiling reflectance	Wall reflectance	Floor reflectance
----------	70	50	30
————	50	30	20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
1792 lm	5169 lm	7944 lm	9719 lm	10123 lm	8826 lm	6044 lm	2490 lm	300 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
52.8 lm	58.2 lm	63.8 lm	65.8 lm	62.9 lm	56.5 lm	44.7 lm	29.0 lm	10.1 lm

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Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	1792 lm	3.4%
10-20°	5169 lm	9.8%
20-30°	7944 lm	15.0%
30-40°	9719 lm	18.4%
40-50°	10123 lm	19.2%
50-60°	8826 lm	16.7%
60-70°	6044 lm	11.4%
70-80°	2490 lm	4.7%
80-90°	300 lm	0.6%
90-100°	53 lm	0.1%
100-110°	58 lm	0.1%
110-120°	64 lm	0.1%
120-130°	66 lm	0.1%
130-140°	63 lm	0.1%
140-150°	56 lm	0.1%
150-160°	45 lm	0.1%
160-170°	29 lm	0.1%
170-180°	10 lm	0.0%
Total	52851 lm	100.0%

Intensity peaks

Max intensity	18921 cd
Intensity, 90°	48 cd
Intensity, 0°	18897 cd

Zonal Lumen summary

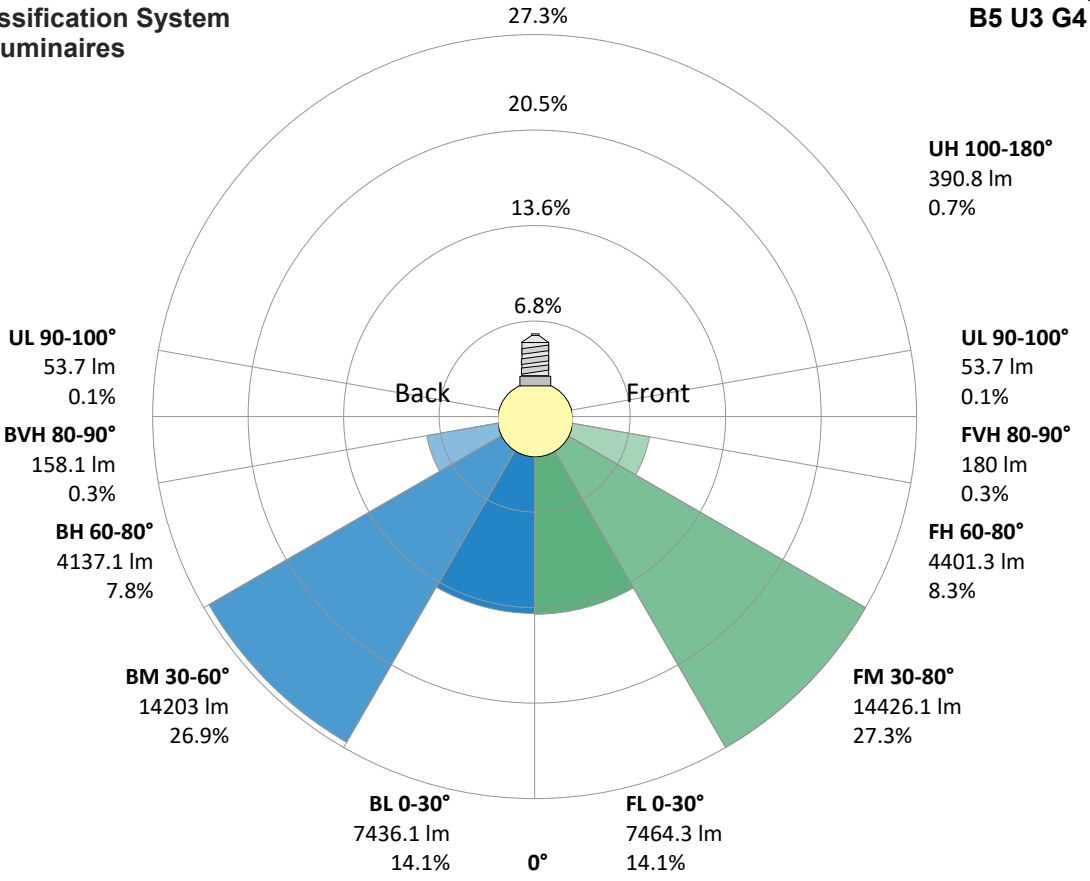
Zone (γ)	Lumen	% Total
0-30°	14905 lm	28.2%
0-40°	24624 lm	46.6%
0-60°	43573 lm	82.4%
60-90°	8834 lm	16.7%
70-100°	2843 lm	5.4%
90-120°	175 lm	0.3%
0-90°	52407 lm	99.2%
90-180°	444 lm	0.8%
0-180°	52851 lm	100.0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	7464 lm	14.1%
Medium(30-60°)	14426 lm	27.3%
High(60-80°)	4401 lm	8.3%
Very high(80-90°)	180 lm	0.3%
Back light		
Low(0-30°)	7436 lm	14.1%
Medium(30-60°)	14203 lm	26.9%
High(60-80°)	4137 lm	7.8%
Very high(80-90°)	158 lm	0.3%
Uplight		
Low(90-100°)	54 lm	0.1%
High(100-180°)	391 lm	0.7%

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

BUG rating
B5 U3 G4



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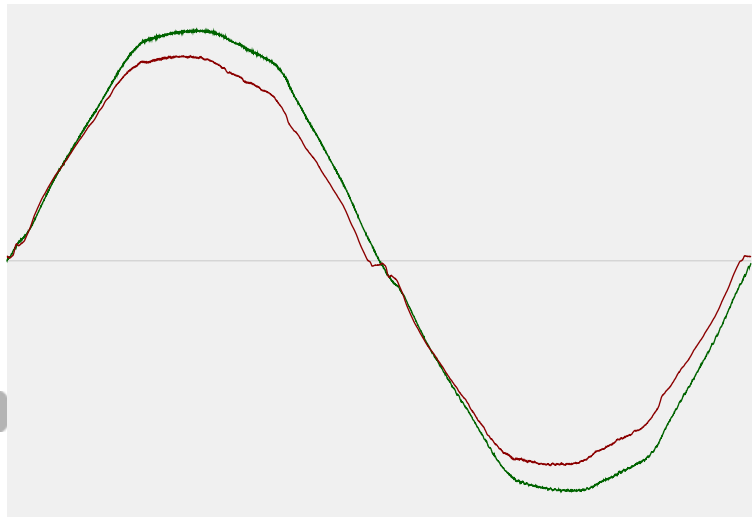
Power Details

Input Power

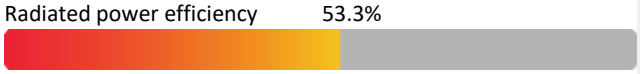
Power feed to light source	296.1 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	116 V
RMS Input current feed, I_{RMS}	2.55 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	296.86 VA
Displacement factor of AC power feed	1.0
Power factor of AC current feed	1.0
Total harmonic distortion of the current	3.87%
Total harmonic distortion of the voltage	2.91%

Input Power Curve



Efficiency

Radiated power efficiency 53.3%



Lumen efficiency 178 lm/W

Stabilization Details

Warmup Conditions

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

Color Temperature Change

CCT start	5427 K
CCT shift	+84 K
CCT end	5511 K

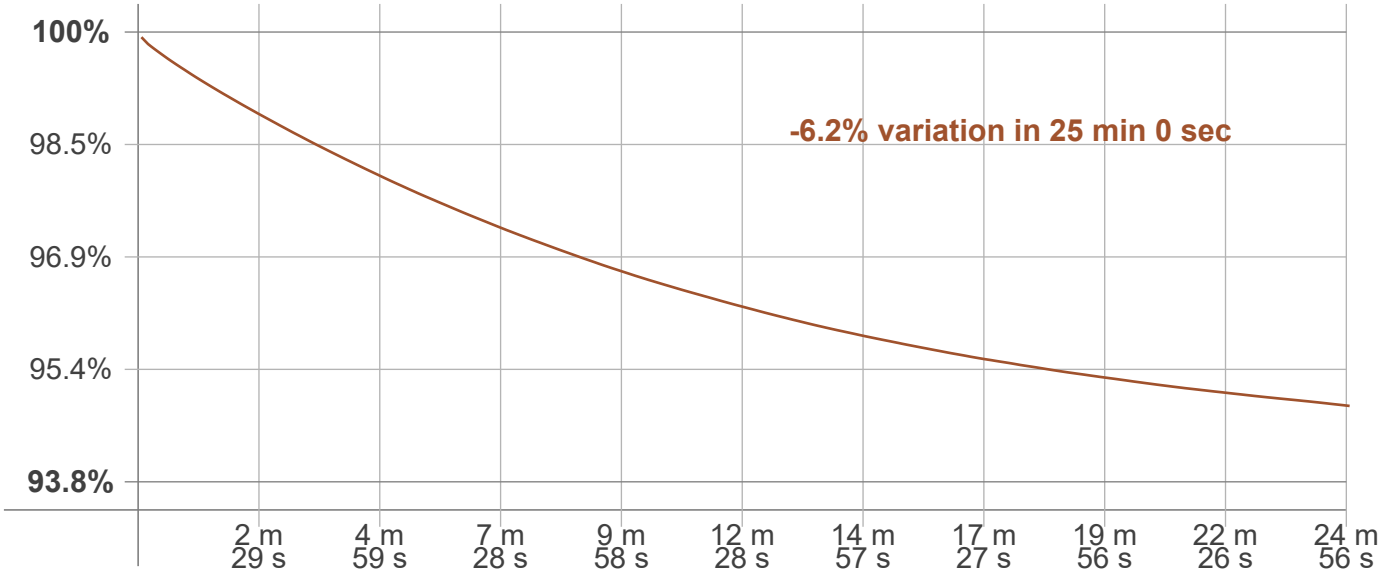
Warmup Result

Total warmup time	Lamp stabilized in 25 min 0 sec
Warmup variation	-6.2%

Output Change

Output start	55900 lm
Output change	-3049 lm
Output end	52851 lm

Stabilization Curve



Flicker /TLA details

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Flicker Meter Type	Viso Systems LabFlicker
Frequency of input power	60 Hz
Flicker/TLA sample rate	20000 samples/s

Measurement time

PstLM	180 sec
All other indices	1.2 sec

Flicker indices according to Illuminating Engineering Society (IES)

Flicker frequency	119.76 Hz
Percent Flicker	0.74 %
Flicker index	0

Flicker indices per California Energy Commission (CEC) 2016b

JA8/10 40 Hz	0.02 %
JA8/10 90 Hz	0.05 %
JA8/10 200 Hz	0.49 %
JA8/10 400 Hz	0.7 %
JA8/10 1000 Hz	0.73 %

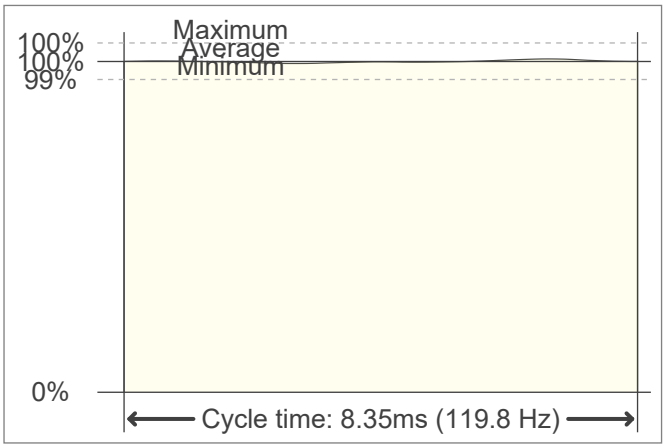
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz)	0.01
SVM value (80 < F < 2000 Hz)	0.02

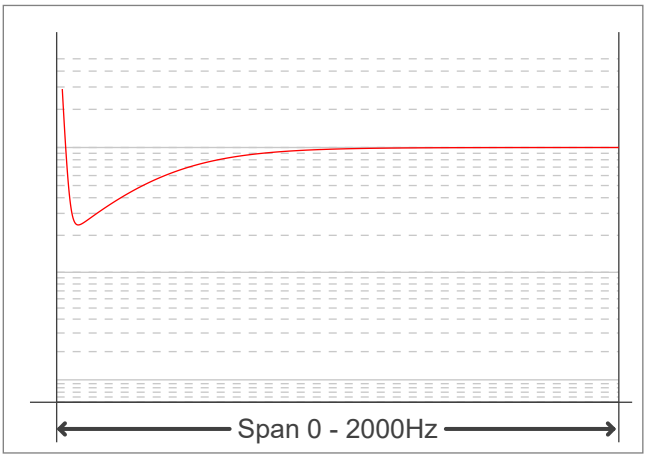
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp	0

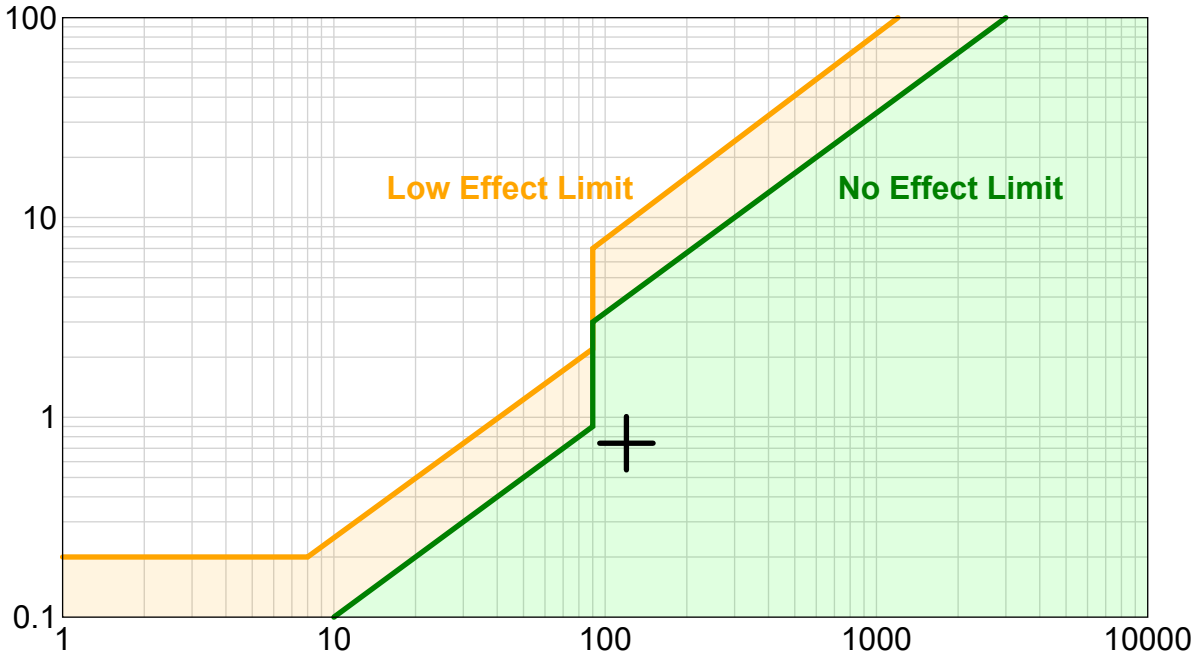
Flicker frame (frame of one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot



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