

Light Measurement Report

Print date: 26-5-2025

Measurement date and time: 26-5-2025 15:20:04 – Measurement no. VFR-250526-1452-MS

Measurement tracking No. and Link: [VT250526-000733](#)

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 – 11-1-2024 – 3130191315
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°
11,99 m
74,9 W – PF 0,97 – DPF 0,97
230 V – 0,337 A
50 Hz
Lamp stabilized in 15 min 1 sec – 2,0%

Tested Light Source

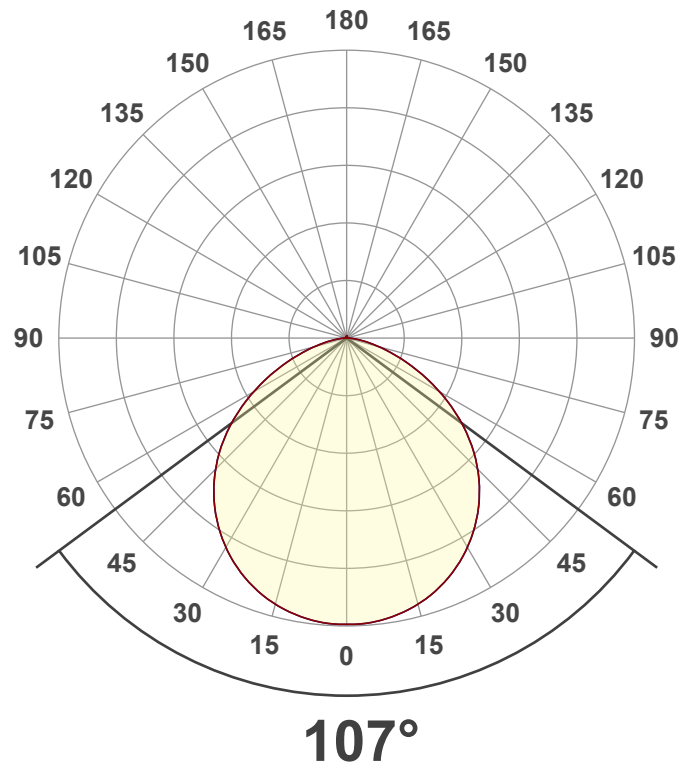
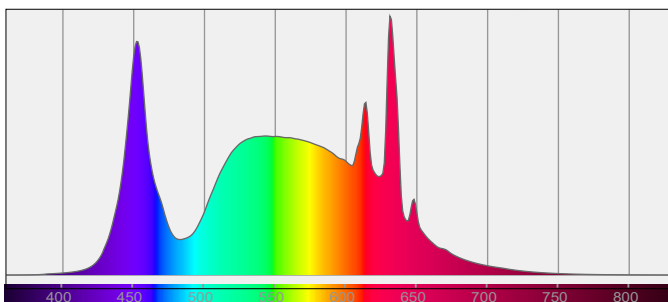
Product Name
Item No. and Manufacturer
Product Description (line 1)

810344-5000K BATCH 2502
810344-5000K BATCH 2502 – Dutchfulfillment
LICHTLIJN MODULE | JUPITER | 29-75W | 90° | CCT-SWITCH

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

14007 lm – 0,95% / 99,05%
187 lm/W
5289 cd – 107°
CCT = 5000 K / 4686 K
CRI 85,8
 R_f 84,4 – R_g 99,7
Duv 0,0031 – SDCM 6,2
SVM 0,03 – PstLM 0,02



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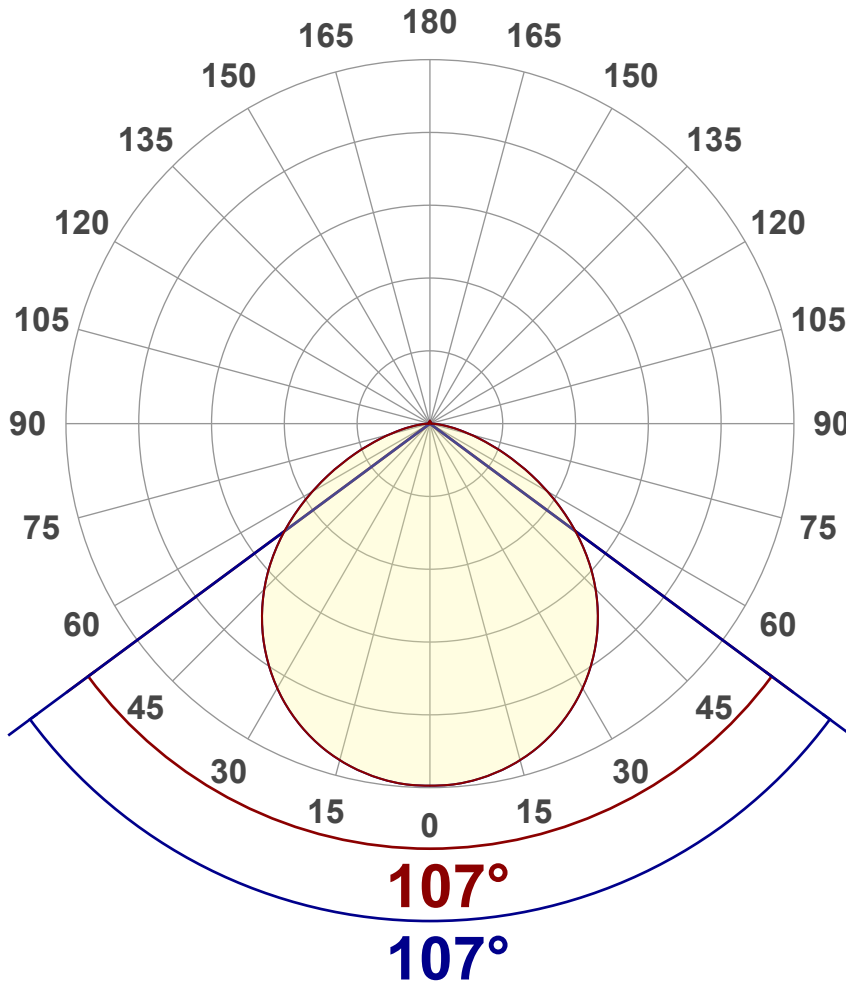
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	14007 lm
Lumen Up% / Down%	0,95% / 99,05%
Peak Intensity	5289 cd
Beam Angle (50%)	107°
Beam Angle (90%)	107°
Beam Angle (10%)	107°

Cut-off Angle

Average 2,5%	170,5°
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Field Angle

Average 10%	153°
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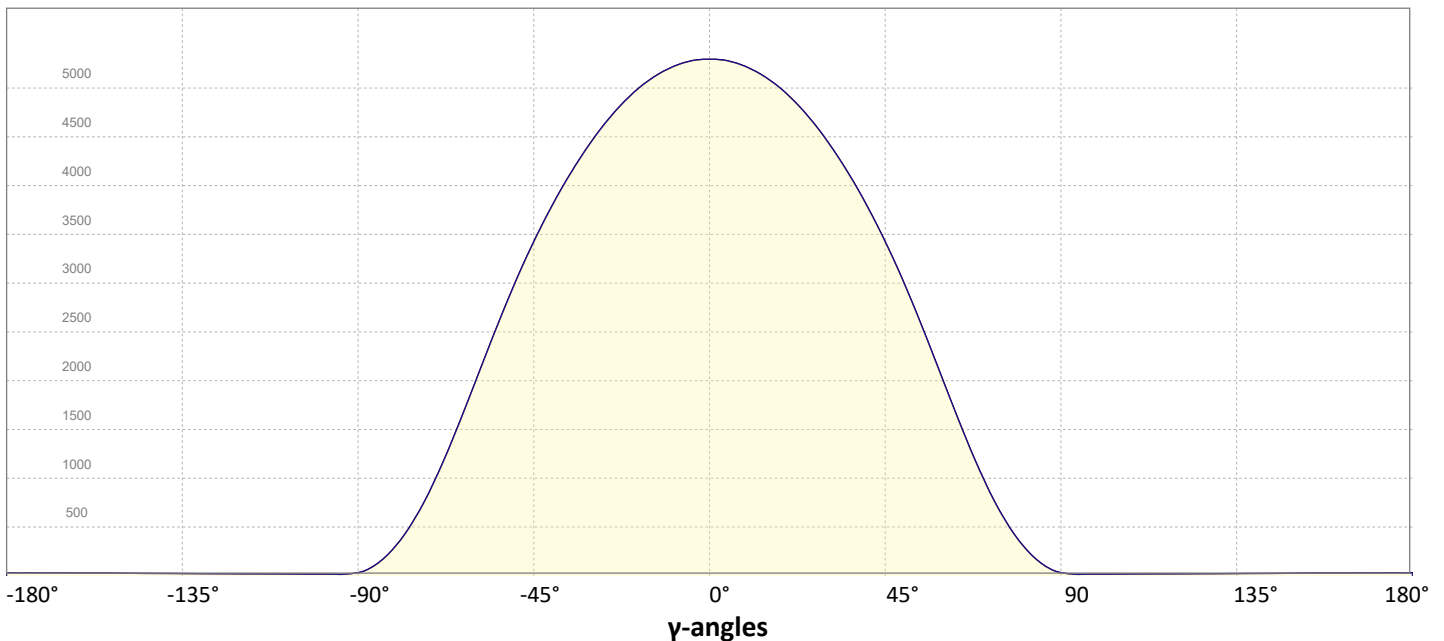
Intensity Ratio

In 120° cone	82,7%
In 90° cone	57,5%

C000-C180

C090-C270

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



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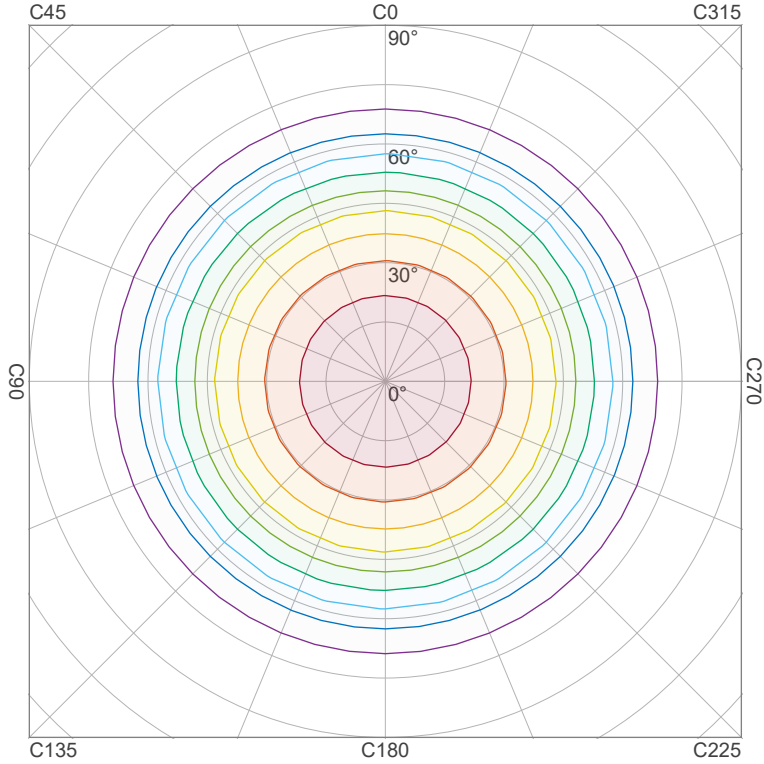
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Iso-intensity Diagram (Iso-candela)

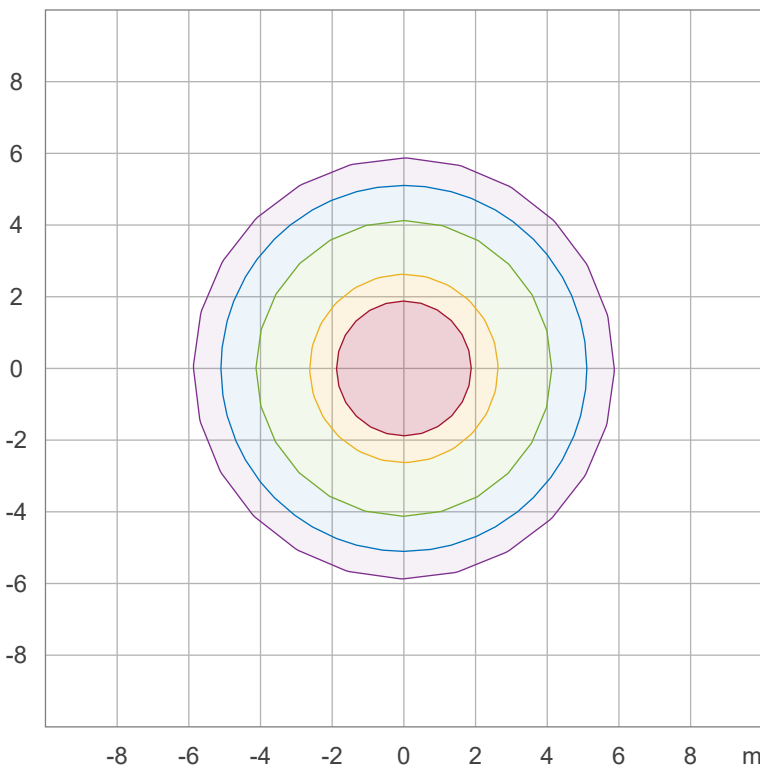


90 %	4760,4 cd
80 %	4231,5 cd
70 %	3702,5 cd
60 %	3173,6 cd
50 %	2644,7 cd
40 %	2115,7 cd
30 %	1586,8 cd
20 %	1057,9 cd
10 %	528,9 cd

Peak intensity: 5289,3 cd

Number of c-planes: 12

Iso-illuminance Diagram (Iso-lux)



50,0 %	293,9 lx
30,0 %	176,3 lx
10,0 %	58,8 lx
5,0 %	29,4 lx
3,0 %	17,6 lx

Peak illuminance: 587,7 lx

Mounting height: 3,0 m

Number of c-planes: 12

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Operator:



Color details

Correlated Color Temperature, Target CCT = 5000 K
 Correlated Color Temperature, Measured CCT = 4686 K
 Color Rendering Index CRI 85,8
 Color Rendering Index, R9 (red component) R9 = 49,1
 Color Rendering TM30-18 R_f 84,4 – R_g 99,7
 Color Quality Scale CQS = 84,9

MacAdam Steps SDCM = 6,2
 Color coordinates CIE 1931 (x;y) = (0,345;0,352)
 Color coordinate CIEs 1960 (u;v) = (0,211;0,323)
 Color deviation from BBL Duv = 0,0031
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,211;0,485)

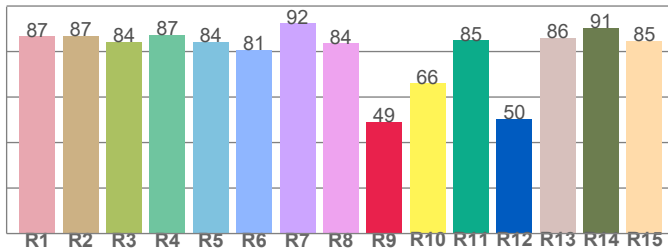
CIE 1931



CIE 1931 – zoomed on Planckian locus



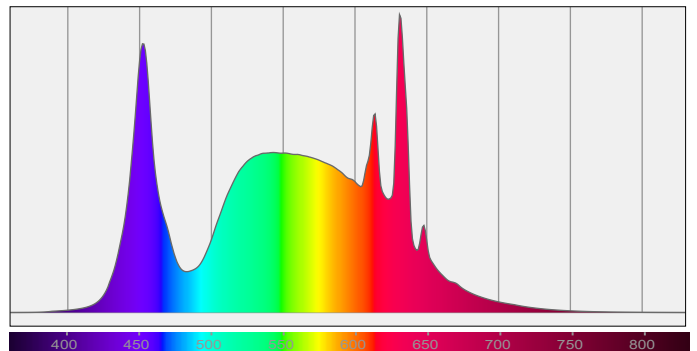
Color Rendering Index per reference color (CIE 1995)



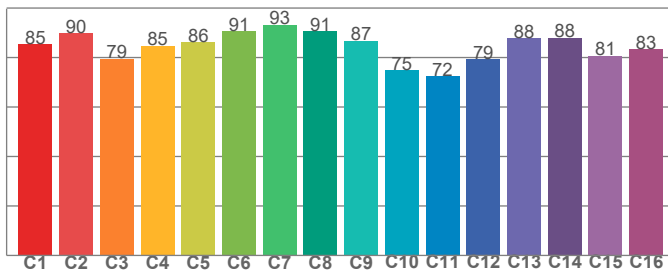
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
86,7	86,9	84,3	87,3	84,3	80,8	92,4	83,7	49,1	66,0	84,9	50,5	86,1	90,5	84,8

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



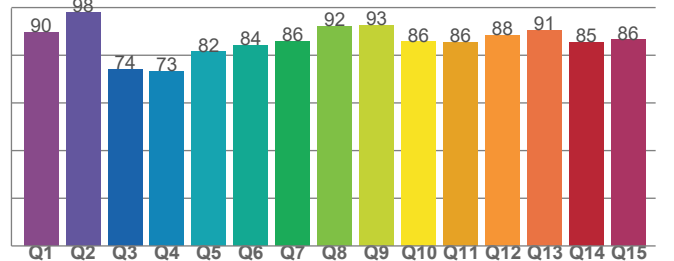
TM30-18 R_f-values per hue bin



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
85,3	89,7	79,5	84,8	86,3	90,7	93,2	90,7	86,8	75,0	72,5	79,4	87,7	88,0	80,8	83,4

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
89,8	98,0	74,2	73,3	81,6	84,2	85,8	92,2	92,6	85,7	85,5	88,3	90,6	85,4	86,5

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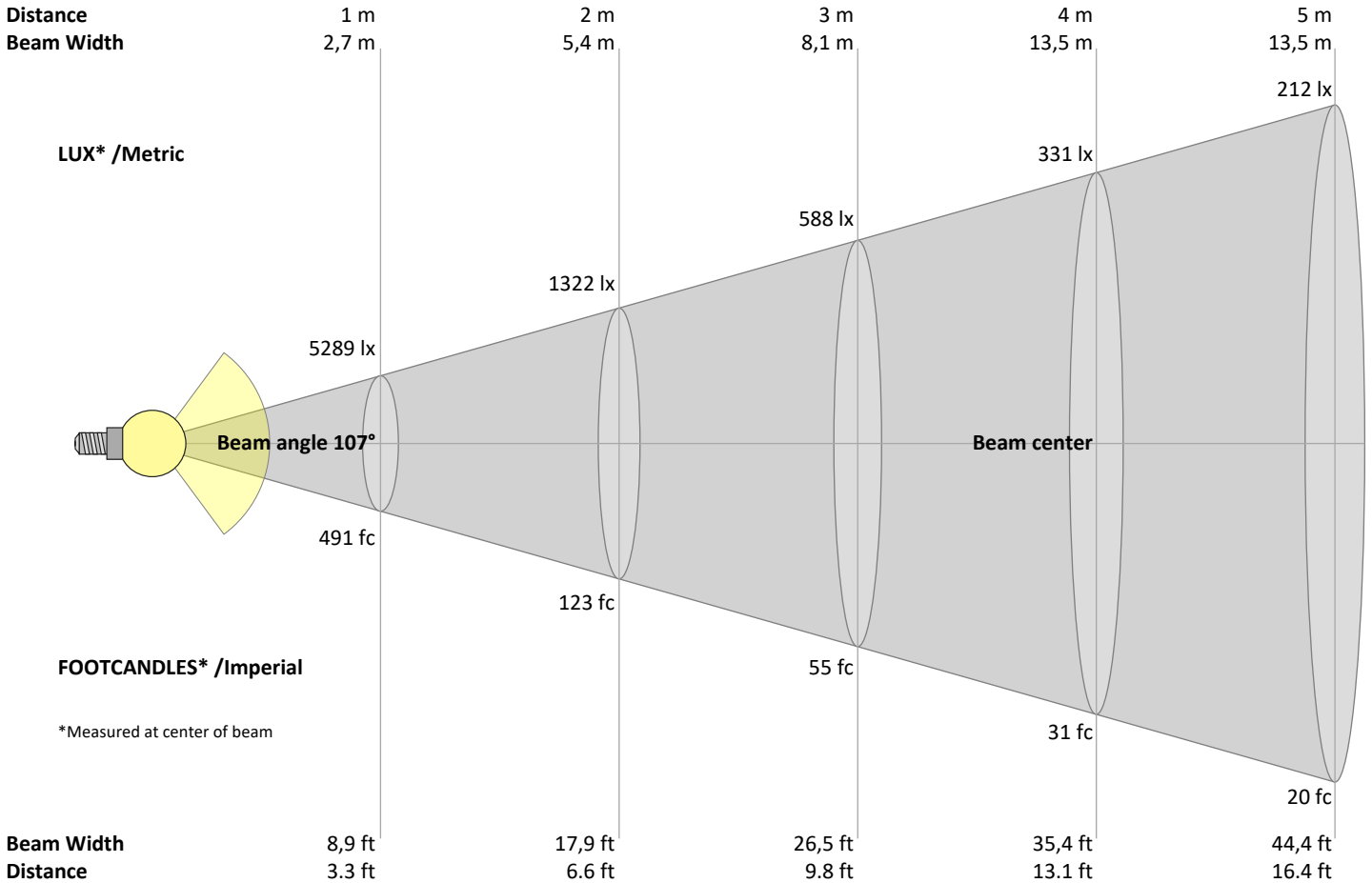
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Operator:



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
5289	1322	588	331	212	147	108	83	65	53	44	37	31	27	24	21	18	16	15	13	lux
491,4	122,8	54,6	30,7	19,7	13,6	10	7,7	6,1	4,9	4,1	3,4	2,9	2,5	2,2	1,9	1,7	1,5	1,4	1,2	fc

Intensities in 0° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
5289	5270	5202	5088	4927	4717	4460	4158	3812	3420	2980	2495	1985	1481	1017	628	334	138	41	17	cd
100%	100%	98%	96%	93%	89%	84%	79%	72%	65%	56%	47%	38%	28%	19%	12%	6%	3%	1%	0%	of 0°val

Intensities in 90° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
5289	5270	5202	5088	4927	4717	4460	4158	3812	3420	2980	2495	1985	1481	1017	628	334	138	41	17	cd
100%	100%	98%	96%	93%	89%	84%	79%	72%	65%	56%	47%	38%	28%	19%	12%	6%	3%	1%	0%	of 0°val

Intensities in 180° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
5289	5270	5202	5088	4927	4717	4460	4158	3812	3420	2980	2495	1985	1481	1017	628	334	138	41	17	cd
100%	100%	98%	96%	93%	89%	84%	79%	72%	65%	56%	47%	38%	28%	19%	12%	6%	3%	1%	0%	of 0°val

Intensities in 270° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°	γ
5289	5270	5202	5088	4927	4717	4460	4158	3812	3420	2980	2495	1985	1481	1017	628	334	138	41	17	cd
100%	100%	98%	96%	93%	89%	84%	79%	72%	65%	56%	47%	38%	28%	19%	12%	6%	3%	1%	0%	of 0°val

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Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances		70	70	50	50	30	70	70	50	50	30
	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		Viewed Crosswise					Viewed Endwise				
H = mounting height above eye level		(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
X	Y										
2H	2H	27,1	28,3	27,3	28,6	28,8	27,5	28,6	27,7	28,9	29,2
	3H	28,0	29,2	28,4	29,5	29,7	28,5	29,7	28,9	29,9	30,2
	4H	28,3	29,4	28,7	29,7	30,0	28,8	30,0	29,2	30,2	30,5
	6H	28,5	29,5	28,8	29,8	30,2	29,1	30,1	29,4	30,4	30,8
	8H	28,5	29,4	28,8	29,8	30,2	29,1	30,1	29,5	30,4	30,9
	12H	28,5	29,4	28,8	29,8	30,2	29,1	30,1	29,5	30,4	30,9
4H	2H	27,5	28,7	28,0	29,0	29,2	27,8	29,0	28,3	29,3	29,5
	3H	28,7	29,6	29,1	30,0	30,5	29,1	30,0	29,5	30,4	30,9
	4H	29,0	29,9	29,5	30,3	30,8	29,5	30,3	29,9	30,8	31,3
	6H	29,2	30,0	29,7	30,4	30,8	29,8	30,6	30,3	31,0	31,3
	8H	29,3	30,0	29,8	30,4	30,8	29,8	30,6	30,4	31,0	31,4
	12H	29,3	29,9	29,8	30,3	30,8	29,9	30,5	30,4	30,9	31,4
8H	4H	29,1	29,9	29,7	30,3	30,7	29,6	30,3	30,1	30,7	31,1
	6H	29,4	30,0	30,0	30,5	31,0	30,0	30,5	30,5	31,0	31,6
	8H	29,5	30,0	30,1	30,6	31,2	30,1	30,6	30,6	31,1	31,8
	12H	29,6	30,0	30,2	30,5	31,1	30,2	30,6	30,8	31,1	31,8
12H	4H	29,1	29,7	29,6	30,2	30,7	29,6	30,2	30,1	30,6	31,1
	6H	29,5	30,0	30,0	30,5	31,1	30,0	30,5	30,5	31,0	31,7
	8H	29,6	30,0	30,2	30,5	31,1	30,1	30,5	30,7	31,1	31,7

Variations with the observer position for the luminaire spacings, S:

S = 1.0H	0,1 / -0,2	0,1 / -0,2
S = 1.5H	0,4 / -0,6	0,3 / -0,5
S = 2.0H	0,9 / -1,2	0,8 / -1,1

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	106	106	106	101	101	101	99	
1	109	105	101	97	107	103	99	96	98	95	93	94	92	90	90	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	74	67	89	80	73	67	77	71	65	74	69	64	71	67	63	61
4	84	72	64	57	82	71	63	57	68	62	56	66	60	55	64	59	54	52
5	77	65	56	50	75	64	55	49	61	54	49	59	53	48	57	52	48	45
6	71	58	50	44	69	57	49	43	56	48	43	54	47	42	52	46	42	40
7	66	53	44	39	64	52	44	38	51	43	38	49	43	38	48	42	37	35
8	62	48	40	34	60	48	40	34	46	39	34	45	39	34	44	38	33	32
9	58	44	36	31	56	44	36	31	43	36	31	42	35	30	40	35	30	28
10	54	41	33	28	53	41	33	28	39	33	28	38	32	28	38	32	28	26

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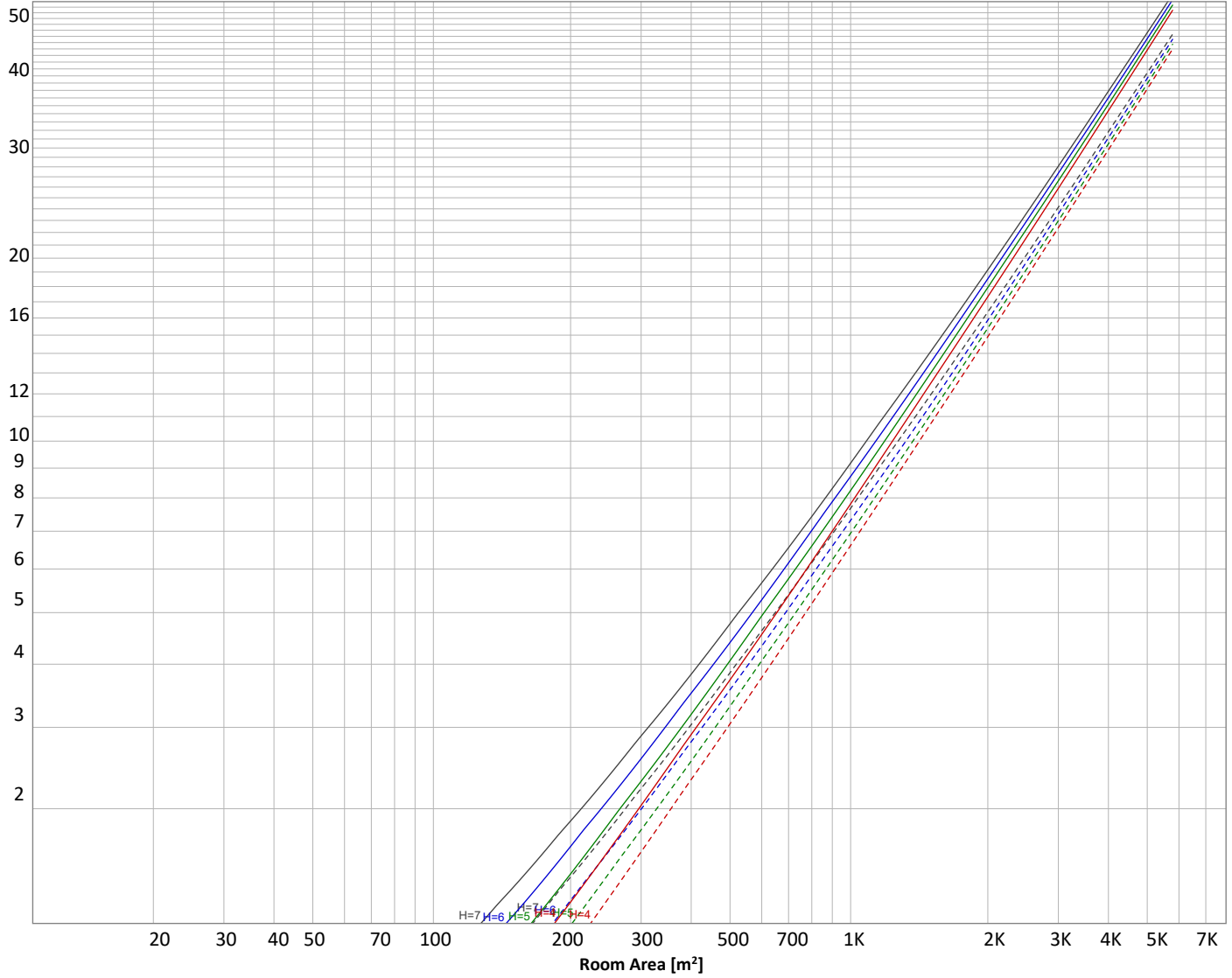
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 14007 lm			
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	ρ(%) 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°
502 lm	1438 lm	2176 lm	2603 lm	2638 lm	2228 lm	1465 lm	668 lm	156 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
20,8 lm	18,2 lm	18,9 lm	18,5 lm	17,5 lm	15,4 lm	12,5 lm	7,95 lm	2,79 lm

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Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	502 lm	3,6%
10-20°	1438 lm	10,3%
20-30°	2176 lm	15,5%
30-40°	2603 lm	18,6%
40-50°	2638 lm	18,8%
50-60°	2228 lm	15,9%
60-70°	1465 lm	10,5%
70-80°	668 lm	4,8%
80-90°	156 lm	1,1%
90-100°	21 lm	0,1%
100-110°	18 lm	0,1%
110-120°	19 lm	0,1%
120-130°	19 lm	0,1%
130-140°	18 lm	0,1%
140-150°	15 lm	0,1%
150-160°	13 lm	0,1%
160-170°	8 lm	0,1%
170-180°	3 lm	0,0%
Total	14007 lm	100,0%

Intensity peaks

Max intensity	5289 cd
Intensity, 90°	41 cd
Intensity, 0°	5289 cd

Zonal Lumen summary

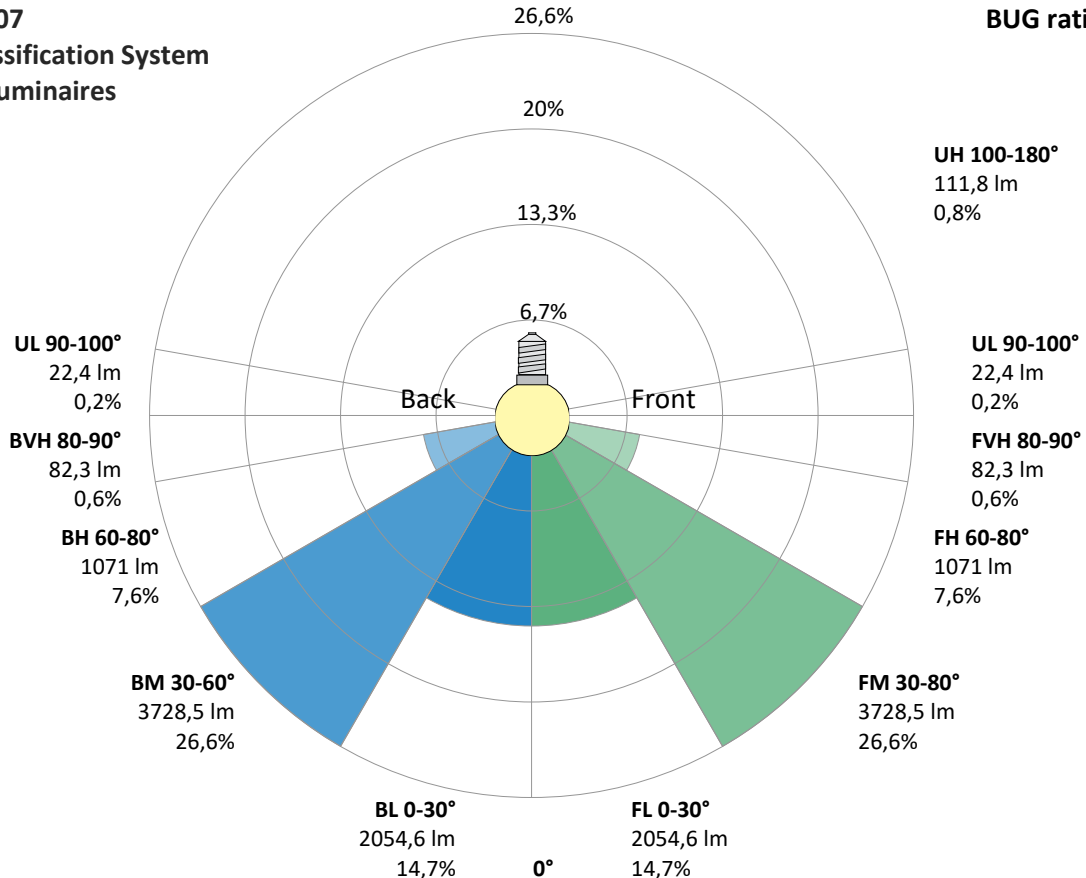
Zone (γ)	Lumen	% Total
0-30°	4116 lm	29,4%
0-40°	6719 lm	48,0%
0-60°	11586 lm	82,7%
60-90°	2289 lm	16,3%
70-100°	845 lm	6,0%
90-120°	58 lm	0,4%
0-90°	13874 lm	99,1%
90-180°	133 lm	0,9%
0-180°	14007 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	2055 lm	14,7%
Medium(30-60°)	3728 lm	26,6%
High(60-80°)	1071 lm	7,6%
Very high(80-90°)	82 lm	0,6%
Back light		
Low(0-30°)	2055 lm	14,7%
Medium(30-60°)	3728 lm	26,6%
High(60-80°)	1071 lm	7,6%
Very high(80-90°)	82 lm	0,6%
Uplight		
Low(90-100°)	22 lm	0,2%
High(100-180°)	112 lm	0,8%

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

BUG rating B3 U3 G1



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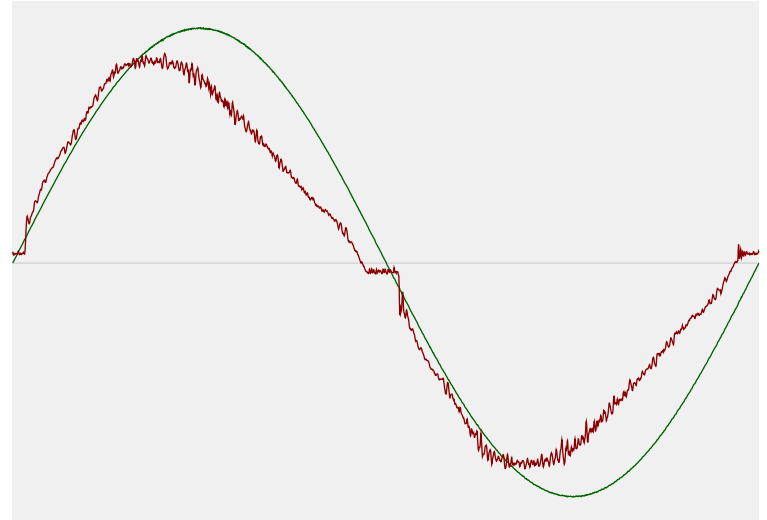


Power Details

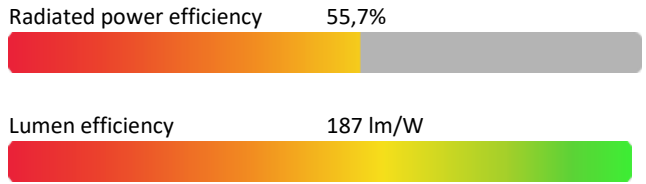
Input Power

Power feed to light source	74,9 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,337 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	77,53 VA
Displacement factor of AC power feed	0,97
Power factor of AC current feed	0,97
Total harmonic distortion of the current	11,61%
Total harmonic distortion of the voltage	0,07%

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	4999 K
CCT shift	+1 K
CCT end	5000 K

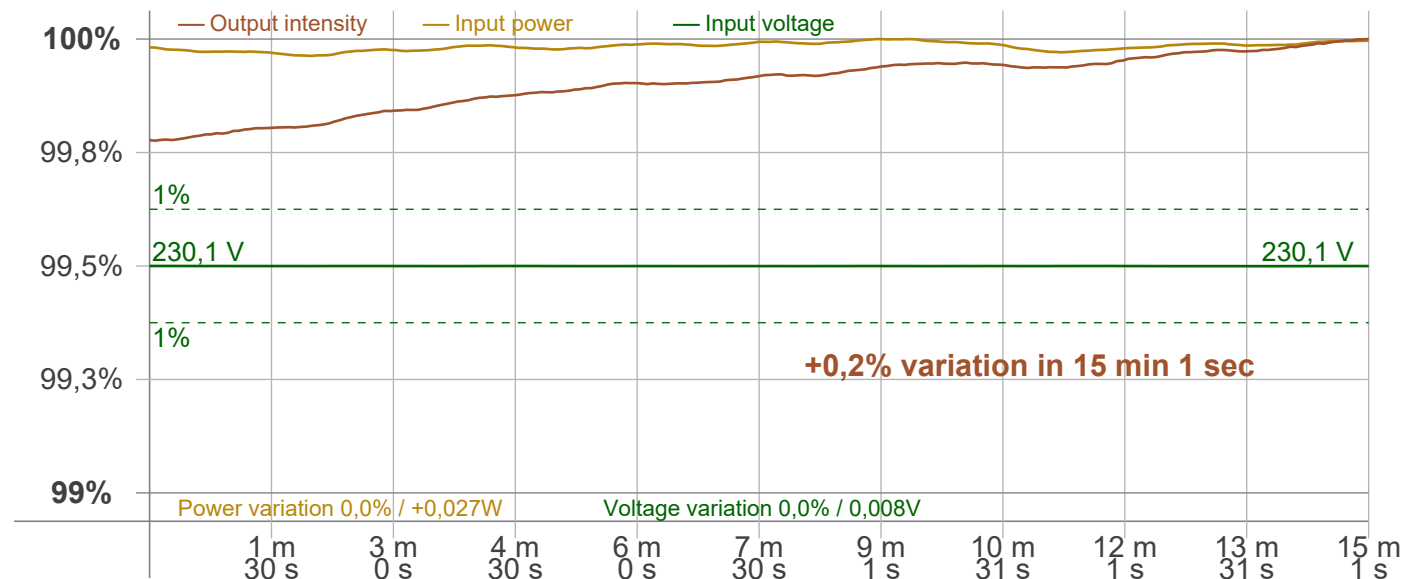
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	+0,2%

Output Change

Output start	13978 lm
Output change	+29 lm
Output end	14007 lm

Stabilization Curve



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Flicker /TLA details

Flicker Meter Type: Viso Systems LabFlicker
 Frequency of input power: 50 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: 100 Hz
 Percent Flicker: 0,87 %
 Flicker index: 0

Flicker indices according to California Energy Commission (CEC) 2016b

JA8/10 40 Hz: 0,02 %
 JA8/10 90 Hz: 0,03 %
 JA8/10 200 Hz: 0,84 %
 JA8/10 400 Hz: 0,85 %
 JA8/10 1000 Hz: 0,86 %

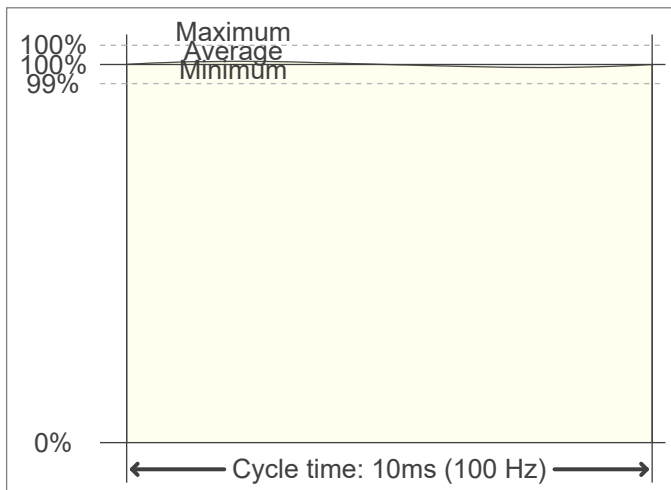
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz): 0,02
 SVM value (80 < F < 2000 Hz): 0,03

Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp: 0,01

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

