

Light Measurement Report

Print date: 15-7-2025

Measurement date and time: 15-7-2025 11:48:26 – Measurement no. VFR-250715-2118-MS

Measurement tracking No. and Link: [VT250715-002616](#)

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

56 planes – 6,43°
5°
12,12 m
64,4 W – PF 0,97 – DPF 0,98
230 V – 0,288 A
50 Hz
Lamp stabilized in 15 min 1 sec – 2,0%

Tested Light Source

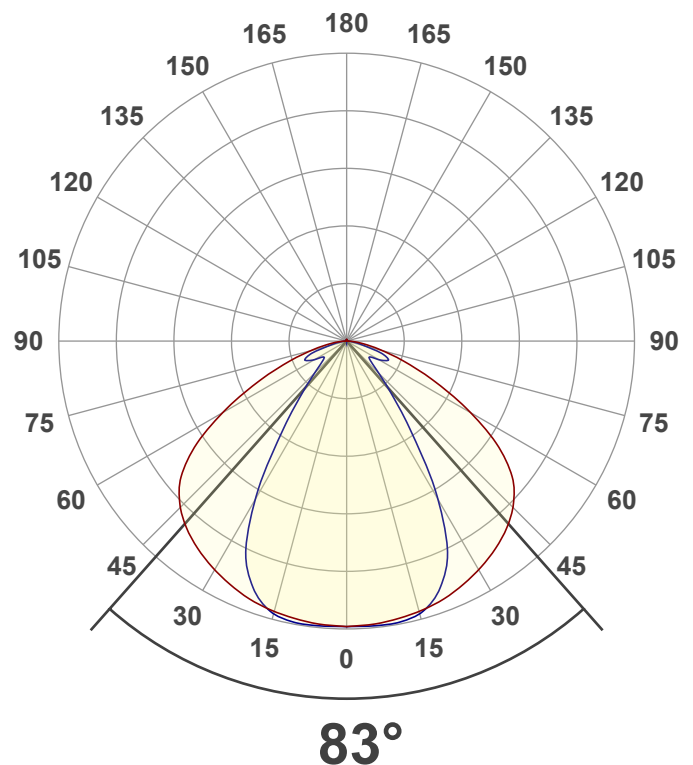
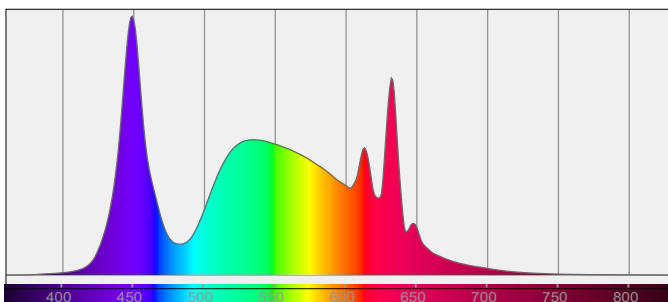
Product Name
Item No. and Manufacturer
Product Description (line 1)

276260-5700K
276260-5700K – Dutchfulfillment
LICHTLIJN JUPITER | LED MODULE | 33W/42W/58W/66W | 60°

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

10102 lm – 0,86% / 99,14%
157 lm/W
5167 cd – 83°
CCT = 5700 K / 5715 K
CRI 82,8
R_f 82,2 – R_g 101,2
Duv 0,0045 – SDCM 6,2
SVM 0 – PstLM 0,01



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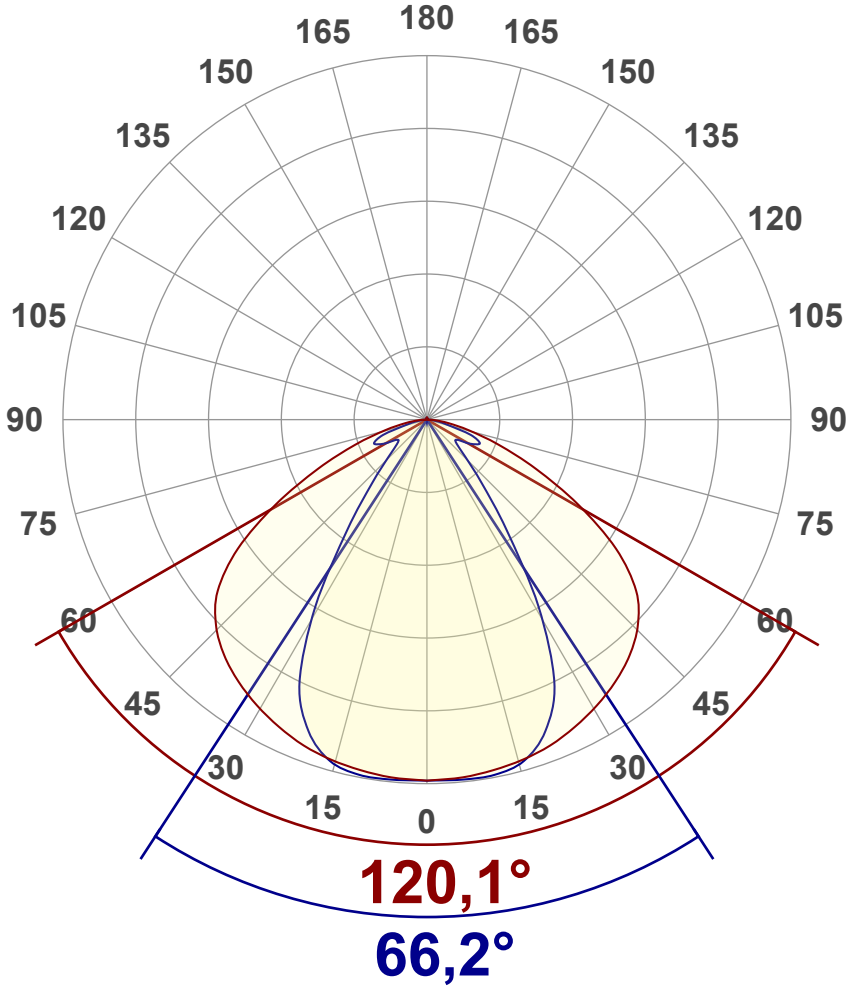
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Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	10102 lm
Lumen Up% / Down%	0,86% / 99,14%
Peak Intensity	5167 cd
Beam Angle (50%)	83°
Beam Angle (90%)	66,2°
Beam Angle (10%)	105,9°

Cut-off Angle

Average 2,5%	167,3°
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Field Angle

Average 10%	142,9°
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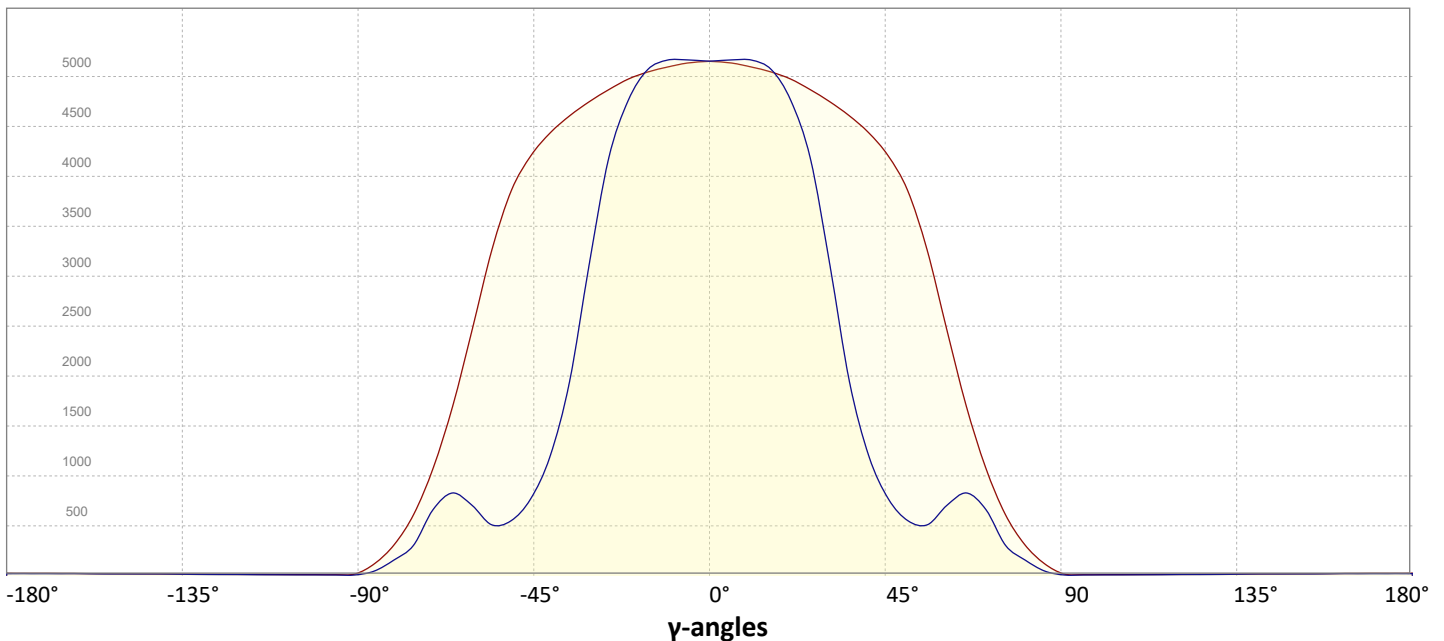
Intensity Ratio

In 120° cone	86,2%
In 90° cone	69,5%

C000-C180

C090-C270

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



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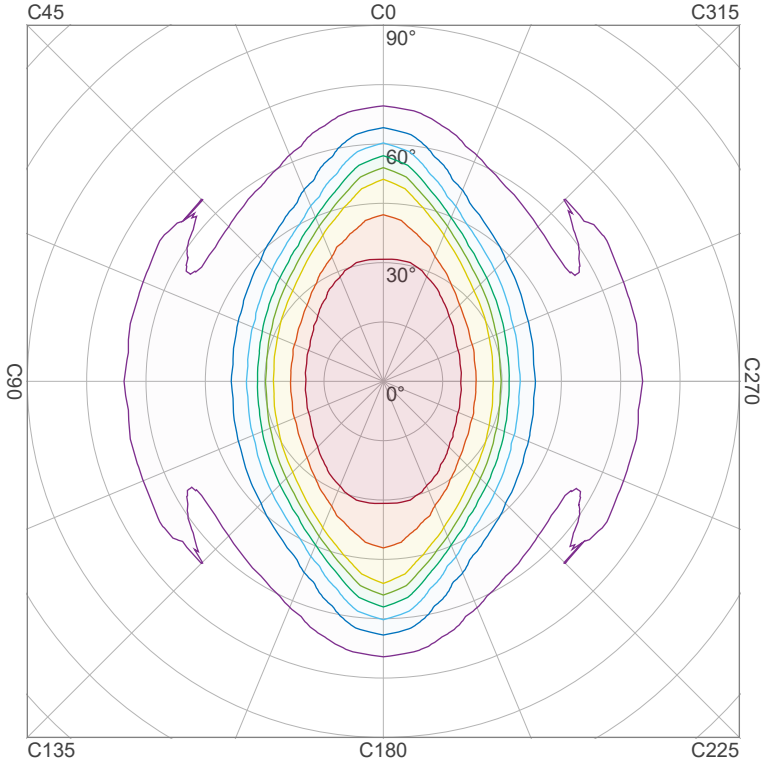
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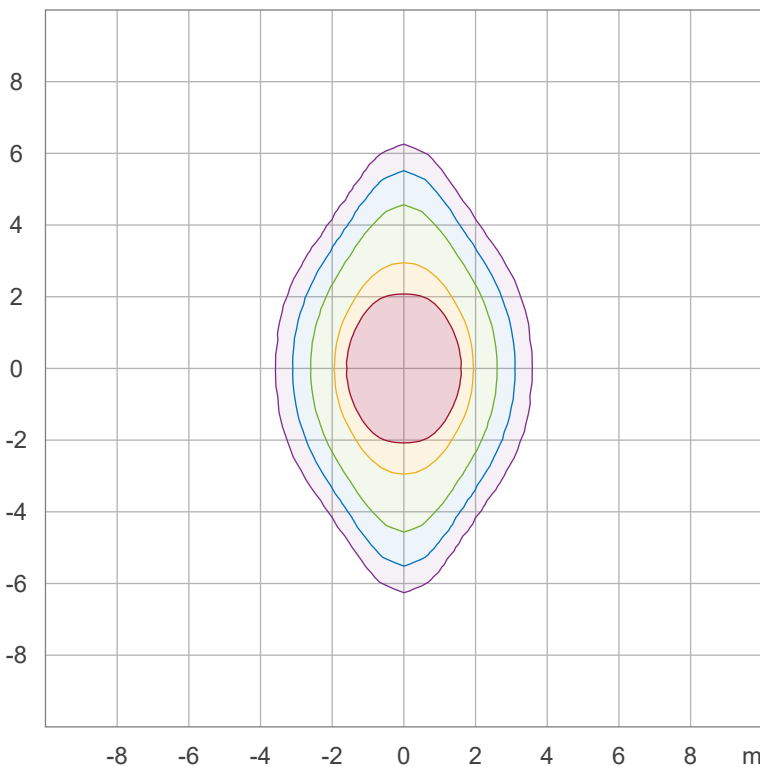
Iso-intensity Diagram (Iso-candela)



90 %	4649,4 cd
80 %	4132,8 cd
70 %	3616,2 cd
60 %	3099,6 cd
50 %	2583,0 cd
40 %	2066,4 cd
30 %	1549,8 cd
20 %	1033,2 cd
10 %	516,6 cd

Peak intensity: 5166,0 cd
Number of c-planes: 56

Iso-illuminance Diagram (Iso-lux)



50,0 %	286,3 lx
30,0 %	171,8 lx
10,0 %	57,3 lx
5,0 %	28,6 lx
3,0 %	17,2 lx

Peak illuminance: 572,6 lx
Mounting height: 3,0 m
Number of c-planes: 56

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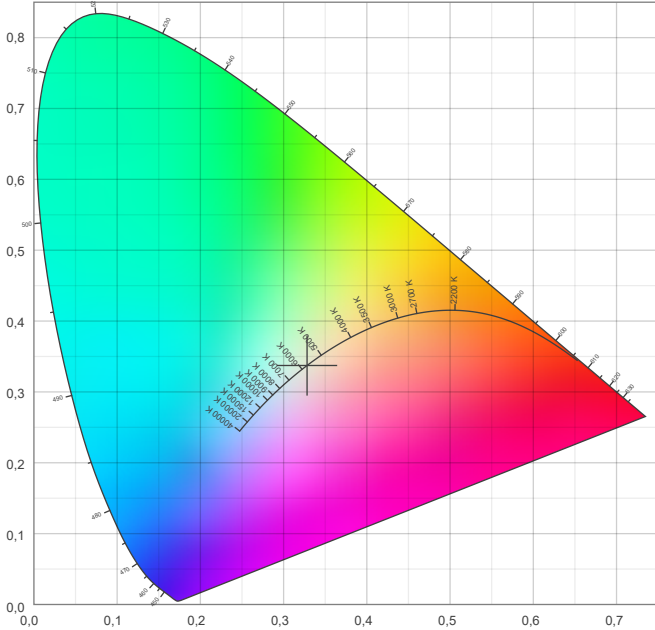


Color details

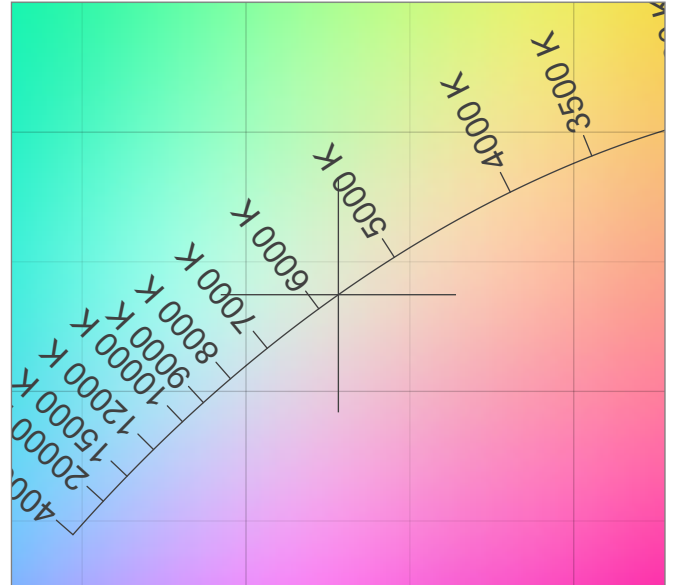
Correlated Color Temperature, Target CCT = 5700 K
 Correlated Color Temperature, Measured CCT = 5715 K
 Color Rendering Index CRI 82,8
 Color Rendering Index, R9 (red component) R9 = 50,4
 Color Rendering TM30-18 R_f 82,2 – R_g 101,2
 Color Quality Scale CQS = 82,9

MacAdam Steps SDCM = 6,2
 Color coordinates CIE 1931 (x;y) = (0,328;0,337)
 Color coordinate CIEs 1960 (u;v) = (0,205;0,317)
 Color deviation from BBL Duv = 0,0045
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,205;0,475)

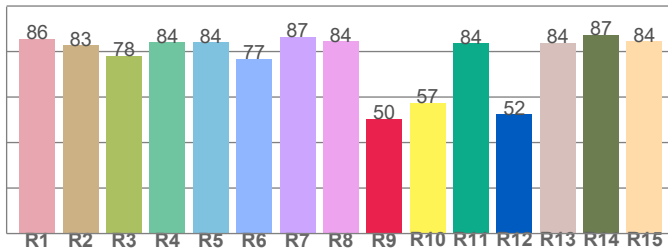
CIE 1931



CIE 1931 – zoomed on Planckian locus



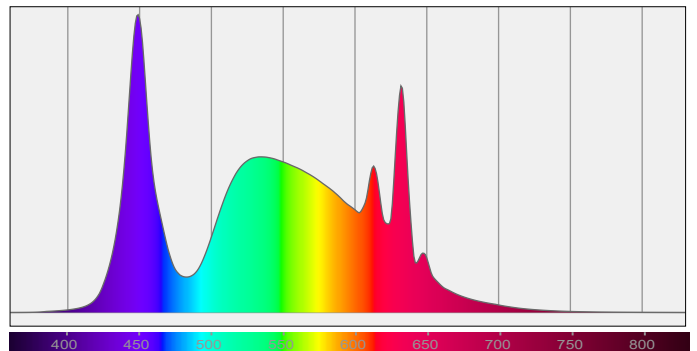
Color Rendering Index per reference color (CIE 1995)



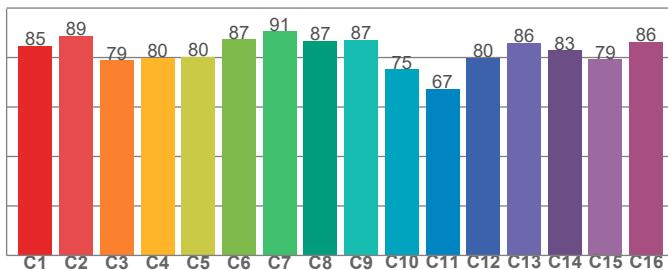
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
85,6	82,9	78,2	84,2	84,1	76,8	86,5	84,4	50,4	57,5	83,6	52,4	83,8	87,3	84,5

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



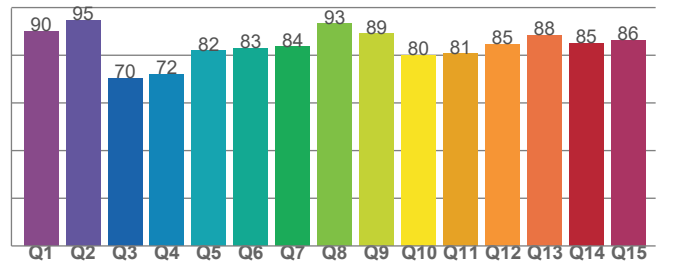
TM30-18 Rf-values per hue bin



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
84,8	88,9	78,8	79,9	80,3	87,3	90,6	86,8	87,2	75,2	67,4	79,9	86,0	83,0	79,2	86,4

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
90,2	94,7	70,3	72,0	81,8	83,0	83,6	93,2	89,0	80,1	80,7	84,7	88,3	84,9	86,4

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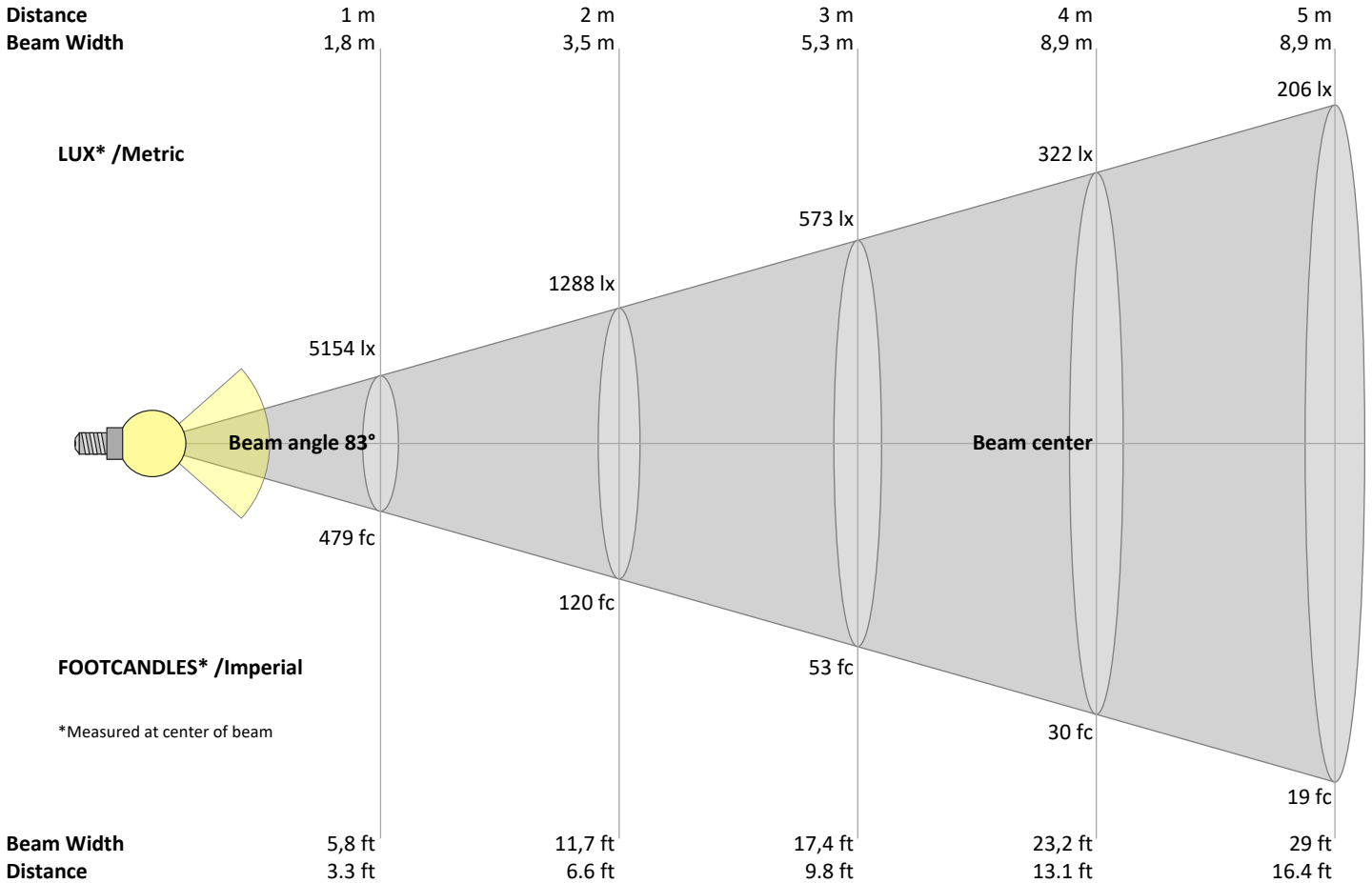
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Beam Details



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
5154	1288	573	322	206	143	105	81	64	52	43	36	30	26	23	20	18	16	14	13	lux
478,8	119,7	53,2	29,9	19,2	13,3	9,8	7,5	5,9	4,8	4	3,3	2,8	2,4	2,1	1,9	1,7	1,5	1,3	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
5154	5137	5100	5053	4985	4885	4766	4629	4463	4241	3910	3350	2586	1814	1172	683	356	150	33	12	cd
100%	100%	99%	98%	97%	95%	92%	90%	87%	82%	76%	65%	50%	35%	23%	13%	7%	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
5154	5164	5164	5084	4810	4273	3288	2138	1319	839	586	518	674	808	688	362	181	65	14	7	cd
100%	100%	100%	99%	93%	83%	64%	41%	26%	16%	11%	10%	13%	16%	13%	7%	4%	1%	0%	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
5154	5137	5100	5053	4985	4885	4766	4629	4463	4241	3910	3350	2586	1814	1172	683	356	150	33	12	cd
100%	100%	99%	98%	97%	95%	92%	90%	87%	82%	76%	65%	50%	35%	23%	13%	7%	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
5154	5164	5164	5084	4810	4273	3288	2138	1319	839	586	518	674	808	688	362	181	65	14	7	cd
100%	100%	100%	99%	93%	83%	64%	41%	26%	16%	11%	10%	13%	16%	13%	7%	4%	1%	0%	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	27,2	28,2	27,4	28,5	28,7	21,3	22,4	21,6	22,7	22,9
	3H	28,0	29,0	28,4	29,3	29,5	24,3	25,4	24,7	25,6	25,8
	4H	28,3	29,3	28,7	29,6	29,8	25,0	26,1	25,4	26,3	26,6
	6H	28,5	29,4	28,8	29,7	30,1	25,4	26,3	25,8	26,6	27,0
	8H	28,5	29,4	28,9	29,7	30,1	25,5	26,4	25,9	26,7	27,1
	12H	28,5	29,3	28,9	29,7	30,1	25,5	26,4	25,9	26,7	27,2
4H	2H	27,0	28,0	27,4	28,3	28,5	21,7	22,7	22,1	23,0	23,3
	3H	28,0	28,8	28,3	29,2	29,6	25,0	25,9	25,4	26,2	26,7
	4H	28,2	29,0	28,7	29,5	30,0	25,8	26,6	26,2	27,0	27,6
	6H	28,5	29,3	29,0	29,6	30,0	26,2	27,0	26,7	27,3	27,7
	8H	28,6	29,2	29,1	29,6	30,0	26,3	27,0	26,8	27,4	27,8
	12H	28,6	29,1	29,1	29,6	30,1	26,4	26,9	26,9	27,4	27,9
8H	4H	28,3	29,0	28,8	29,4	29,7	26,0	26,7	26,5	27,0	27,4
	6H	28,6	29,1	29,1	29,6	30,1	26,5	27,0	27,0	27,5	28,1
	8H	28,7	29,2	29,3	29,7	30,4	26,7	27,1	27,2	27,7	28,3
	12H	28,8	29,2	29,4	29,7	30,3	26,8	27,1	27,4	27,6	28,3
12H	4H	28,3	28,8	28,8	29,3	29,7	26,0	26,5	26,5	27,0	27,5
	6H	28,6	29,1	29,2	29,6	30,2	26,6	27,0	27,1	27,5	28,2
	8H	28,7	29,1	29,3	29,6	30,2	26,7	27,1	27,3	27,6	28,2

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

S = 1.0H	0,7 / -1,0	0,3 / -0,2
S = 1.5H	2,0 / -2,5	0,9 / -0,6
S = 2.0H	3,4 / -3,4	1,7 / -1,3

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	110	106	102	99	107	104	101	98	99	97	94	96	93	91	92	90	88	86
2	102	95	89	84	99	93	87	83	89	85	81	86	82	79	83	80	77	75
3	94	85	78	72	92	83	77	72	80	75	70	78	73	69	75	71	68	66
4	87	77	69	63	85	75	68	63	73	67	62	71	65	61	68	64	60	58
5	81	70	62	56	79	69	61	56	67	60	55	65	59	54	63	58	54	52
6	76	64	56	50	74	63	55	50	61	54	49	59	53	49	58	53	48	47
7	71	59	51	45	69	58	50	45	56	49	45	55	49	44	53	48	44	42
8	66	54	46	41	65	53	46	41	52	45	41	51	45	40	50	44	40	38
9	62	50	43	37	61	49	42	37	48	42	37	47	41	37	46	41	37	35
10	59	47	39	34	57	46	39	34	45	39	34	44	38	34	43	38	34	32

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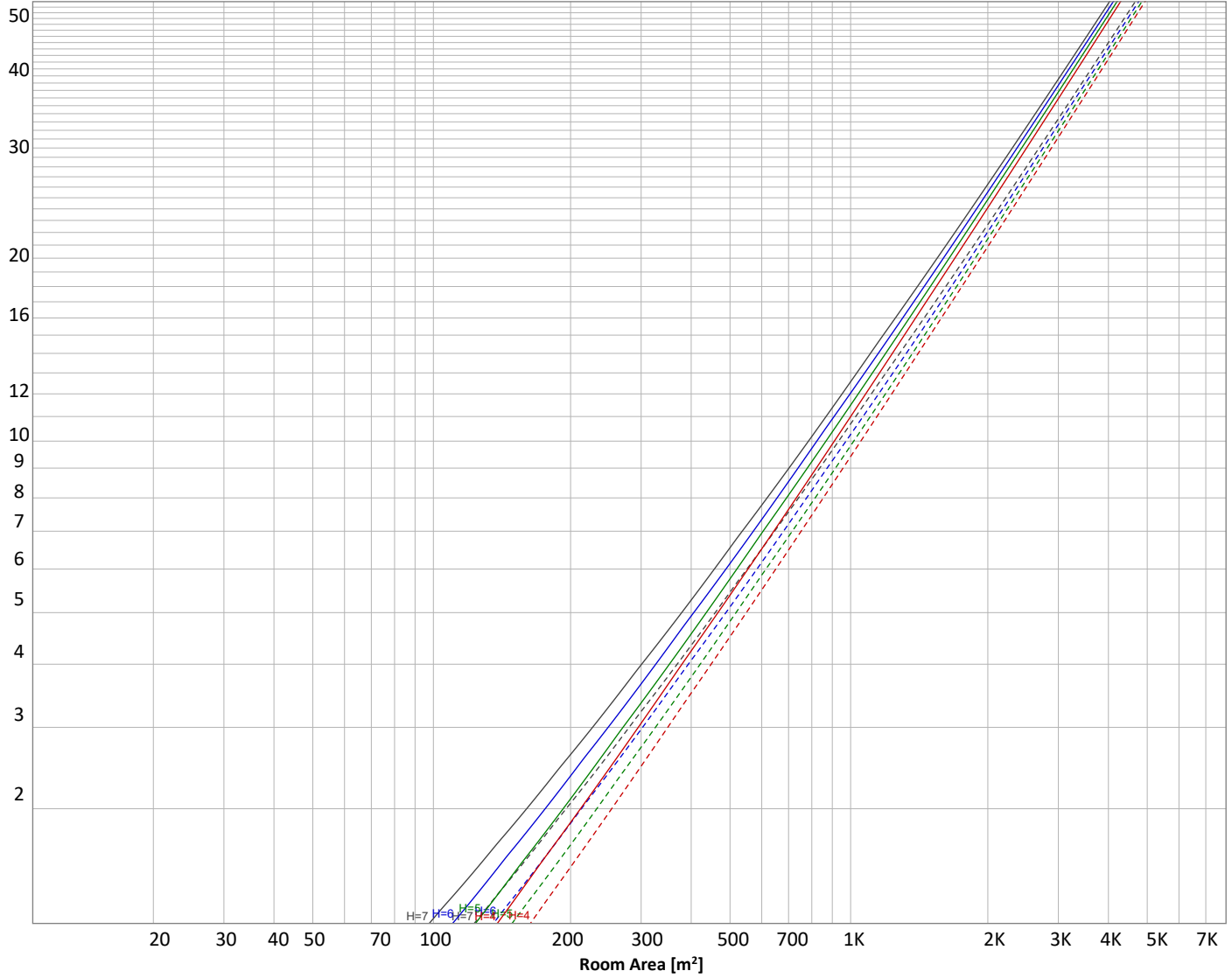
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 10102 lm				
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	ρ(%) Wall reflectance	Floor reflectance
H _{work} = Work area height from floor =	0.00 m	-----	70	50	30
E _{work} = Average lux on work area =	100 lx	—————	50	30	20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
491 lm	1437 lm	2136 lm	2113 lm	1528 lm	1005 lm	739 lm	451 lm	114 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
10,7 lm	10,7 lm	11,8 lm	12,4 lm	12,5 lm	11,6 lm	9,30 lm	6,13 lm	2,16 lm

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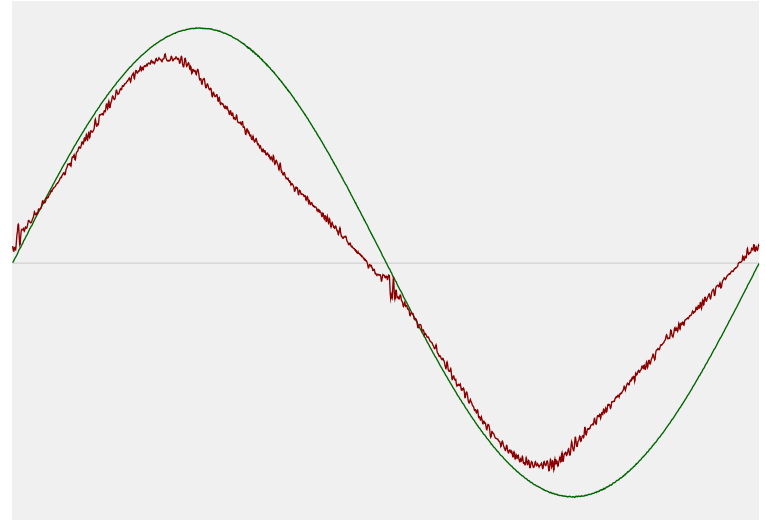


Power Details

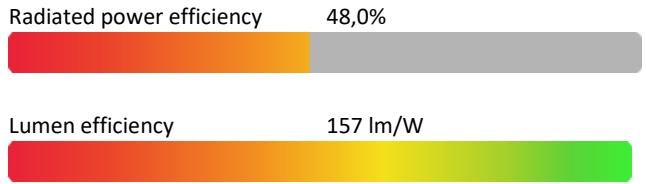
Input Power

Power feed to light source	64,4 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,288 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	66,22 VA
Displacement factor of AC power feed	0,98
Power factor of AC current feed	0,97
Total harmonic distortion of the current	12,54%
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	5700 K
CCT shift	+0 K
CCT end	5700 K

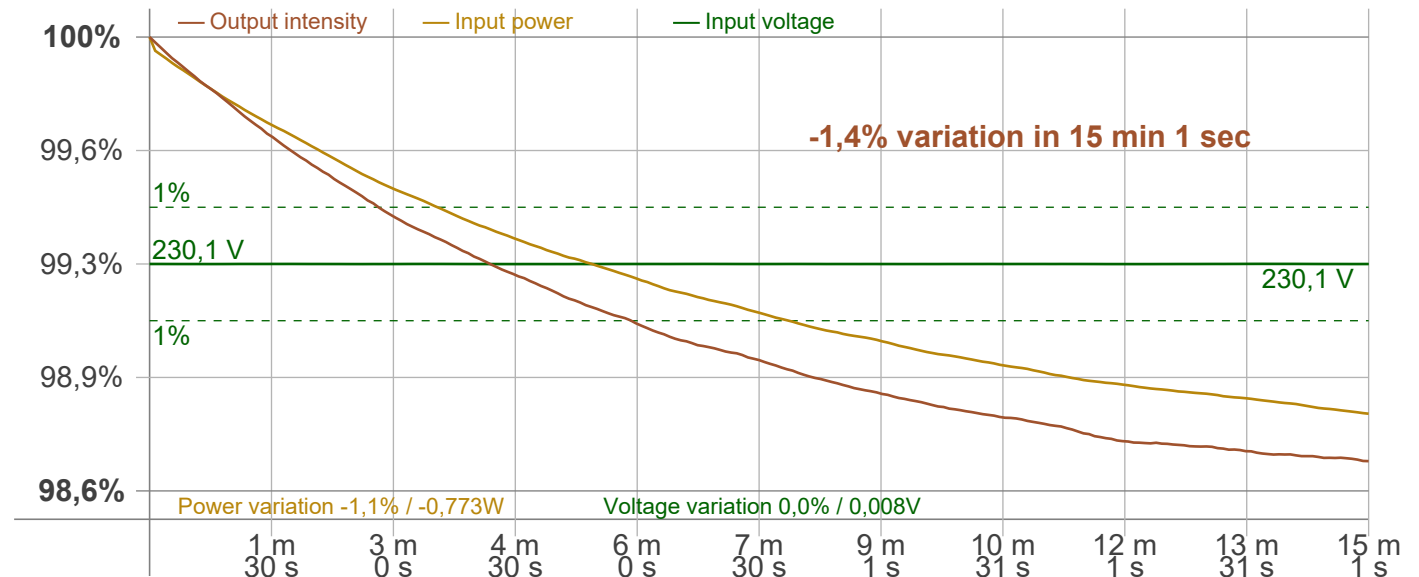
Warmup Result

Total warmup time	Lamp stabilized in 15 min 1 sec
Warmup variation	-1,4%

Output Change

Output start	10243 lm
Output change	-141 lm
Output end	10102 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 98,52 Hz
 Percent Flicker 0,08 %
 Flicker index 0

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

JA8/10 40 Hz 0,02 %
 JA8/10 90 Hz 0,02 %
 JA8/10 200 Hz 0,05 %
 JA8/10 400 Hz 0,05 %
 JA8/10 1000 Hz 0,06 %

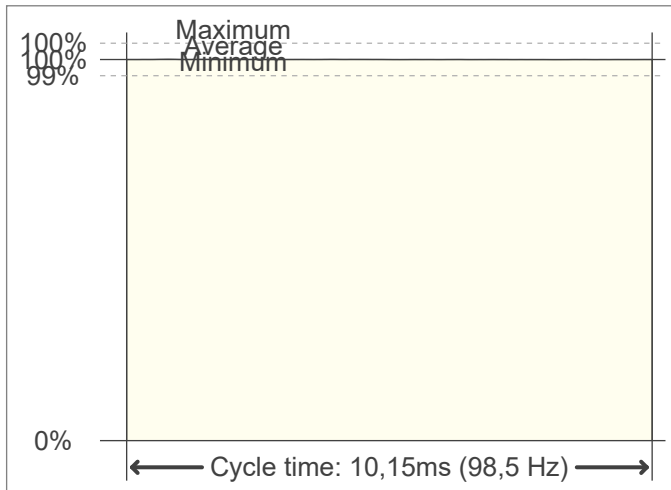
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz) 0,01
 SVM value (80 < F < 2000 Hz) 0

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

