

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

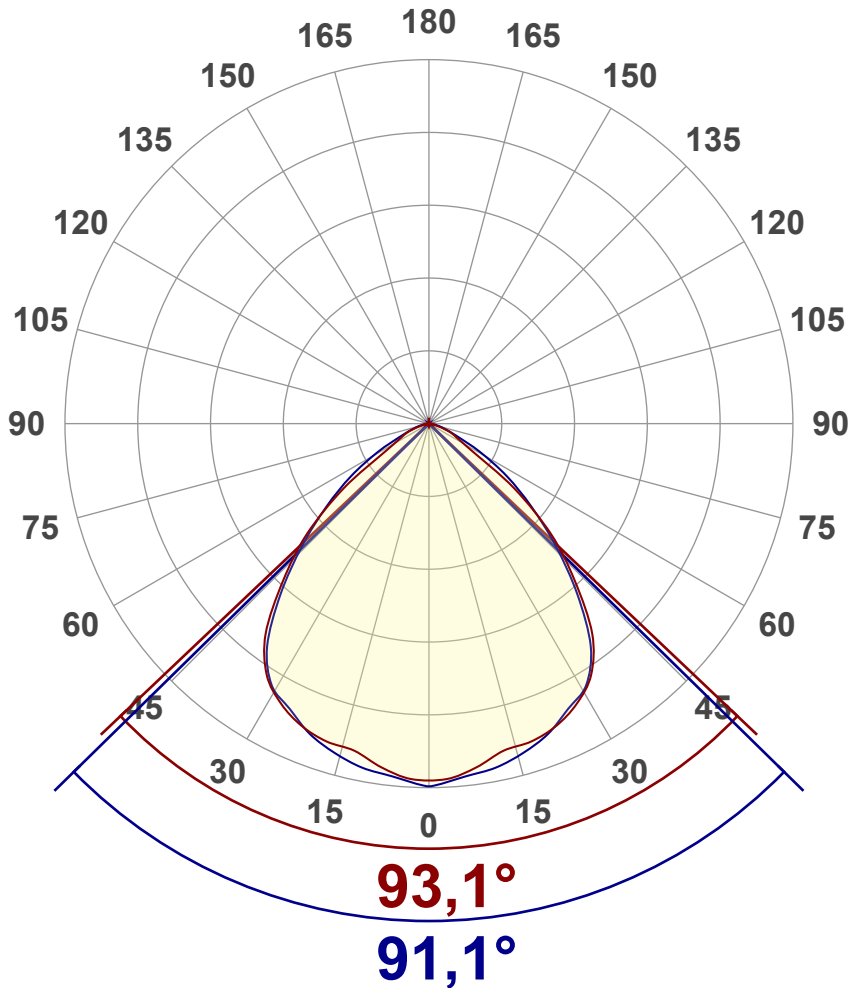
Measurement tracking No. and Link: [VT250506-003733](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	185 lm
Lumen Up% / Down%	0,15% / 99,85%
Peak Intensity	92,1 cd
Beam Angle (50%)	92,1°
Beam Angle (90%)	91,1°
Beam Angle (10%)	92,1°

Cut-off Angle

Average 2,5%	153,5°
--------------	--------

Field Angle

Average 10%	125,9°
-------------	--------

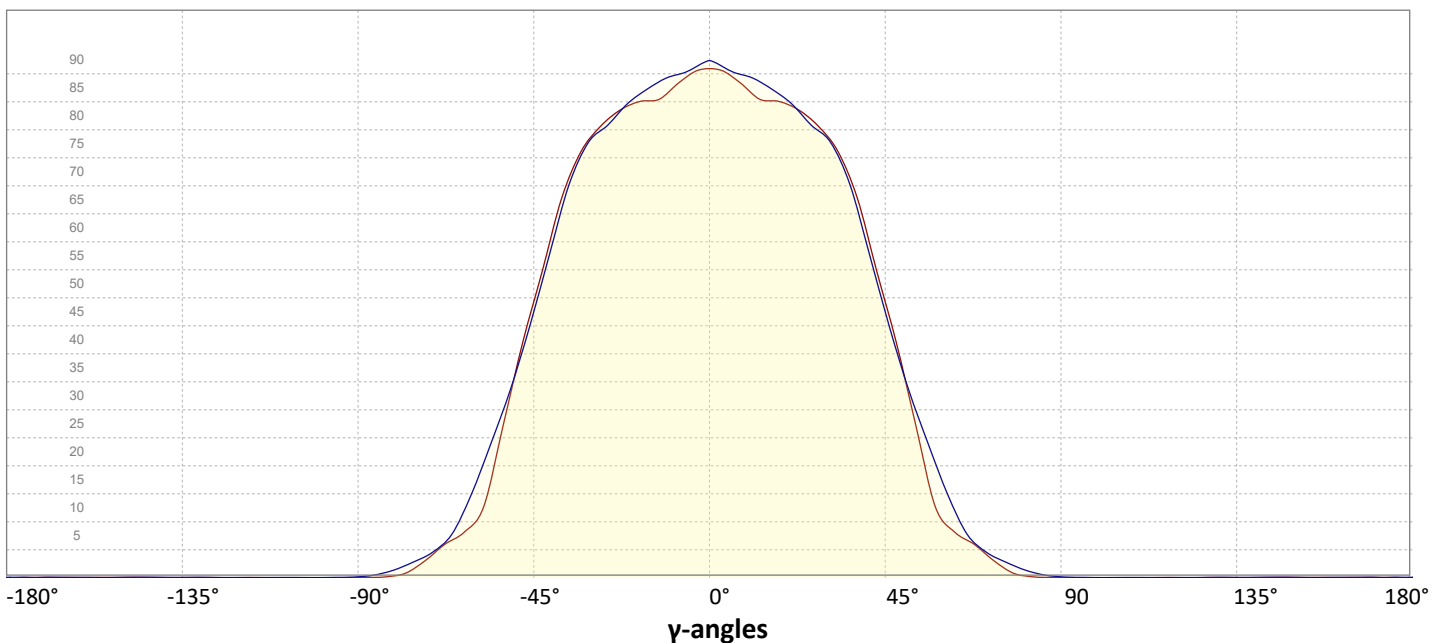
Intensity Ratio

In 120° cone	93,7%
In 90° cone	73,4%

C000-C180

C090-C270

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



Light Measurement Report

Print date: 6-5-2025

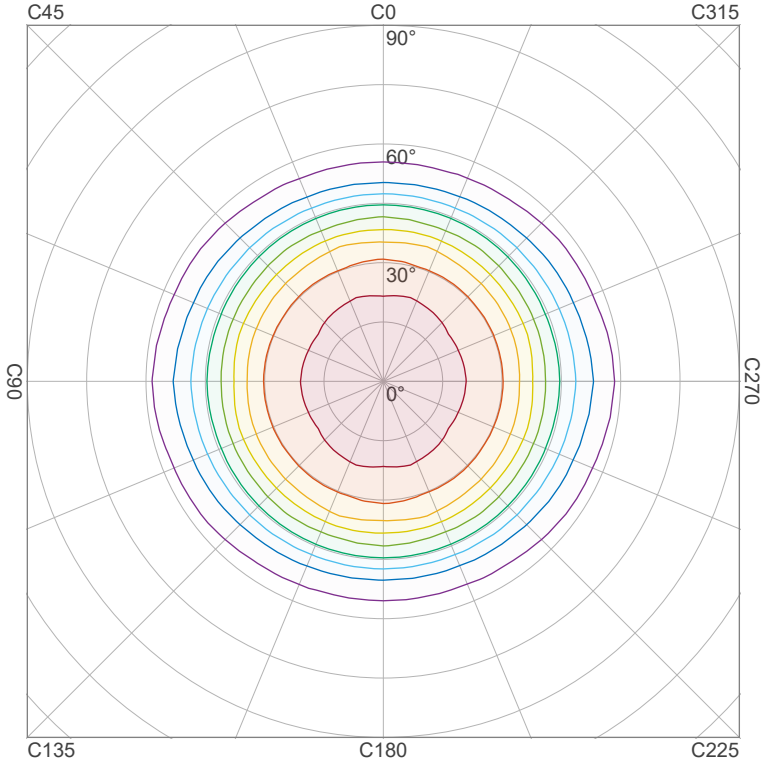
Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

Operator:



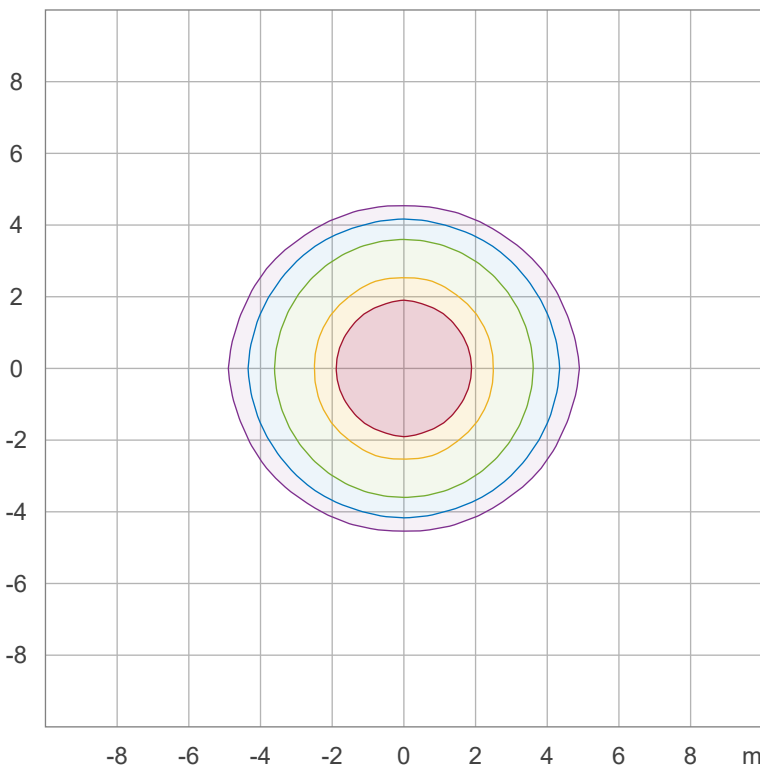
Iso-intensity Diagram (Iso-candela)



90 %	82,9 cd
80 %	73,7 cd
70 %	64,5 cd
60 %	55,3 cd
50 %	46,1 cd
40 %	36,9 cd
30 %	27,6 cd
20 %	18,4 cd
10 %	9,2 cd

Peak intensity: 92,1 cd
Number of c-planes: 20

Iso-illuminance Diagram (Iso-lux)



50,0 %	5,1 lx
30,0 %	3,1 lx
10,0 %	1,0 lx
5,0 %	0,5 lx
3,0 %	0,3 lx

Peak illuminance: 10,2 lx
Mounting height: 3,0 m
Number of c-planes: 20

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

Operator:

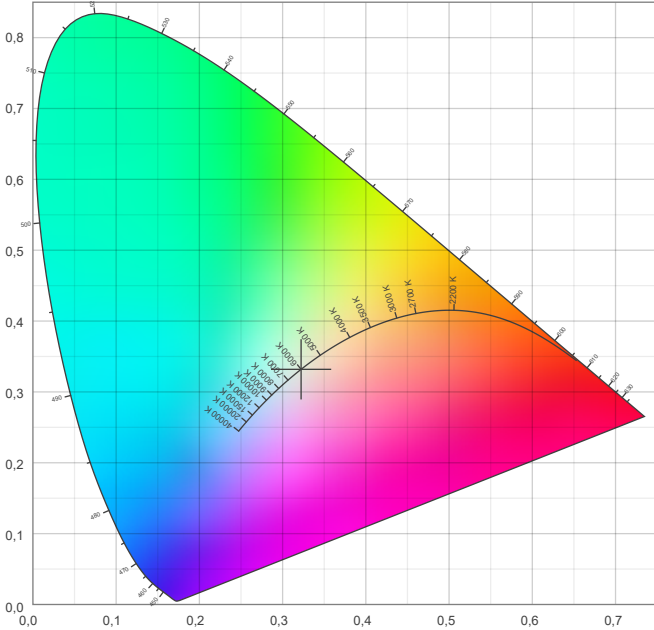


Color details

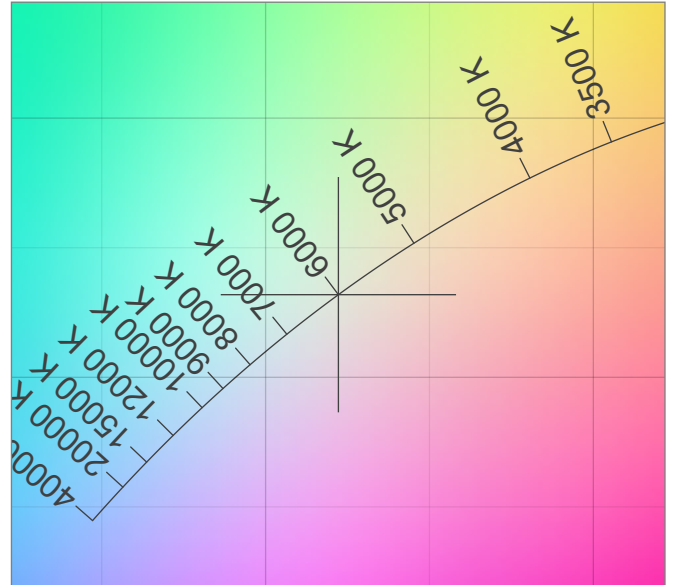
Correlated Color Temperature, Target CCT = 6000 K
 Correlated Color Temperature, Measured CCT = 5744 K
 Color Rendering Index CRI 96,0
 Color Rendering Index, R9 (red component) R9 = 92,9
 Color Rendering TM30-18 R_f 91,0 – R_g 100,6
 Color Quality Scale CQS = 91,6

MacAdam Steps SDCM = 4,4
 Color coordinates CIE 1931 (x;y) = (0,322;0,332)
 Color coordinate CIEs 1960 (u;v) = (0,203;0,314)
 Color deviation from BBL Duv = -0,0016
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,203;0,471)

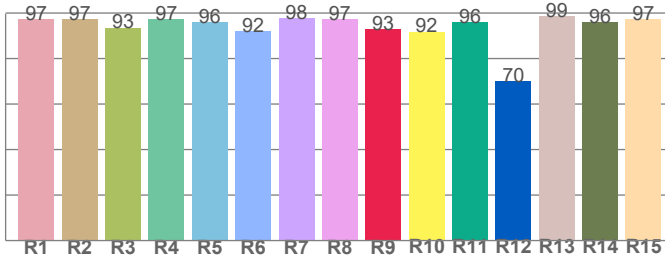
CIE 1931



CIE 1931 – zoomed on Planckian locus



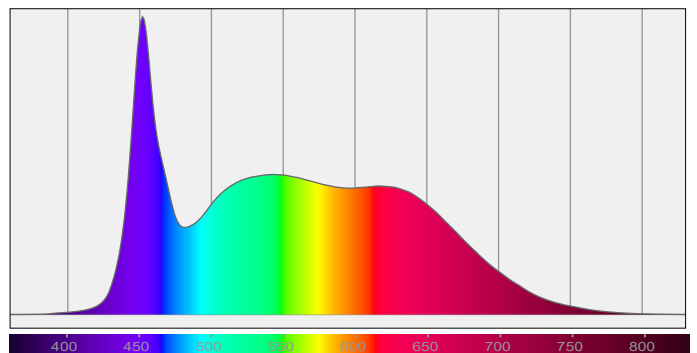
Color Rendering Index per reference color (CIE 1995)



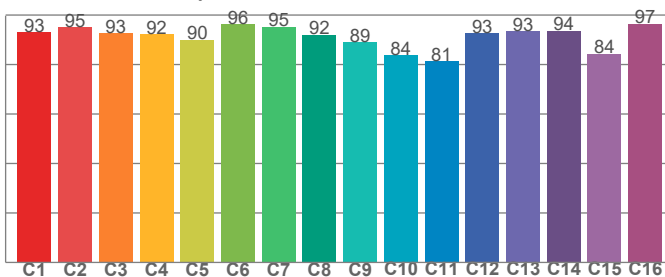
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
97,2	97,3	93,4	97,3	95,8	92,0	97,7	97,3	92,9	91,8	95,9	70,0	98,5	96,1	97,1

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



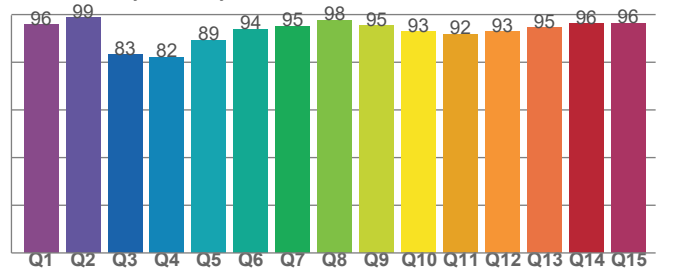
TM30-18 R_f-values per hue bin



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
92,9	95,2	92,6	92,1	90,0	96,3	95,3	92,1	89,1	83,8	81,4	92,7	93,4	93,6	84,3	96,5

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
95,8	98,7	83,1	82,0	89,2	93,9	95,2	97,6	95,3	92,8	91,7	92,9	94,6	96,2	96,5

Light Measurement Report

Print date: 6-5-2025

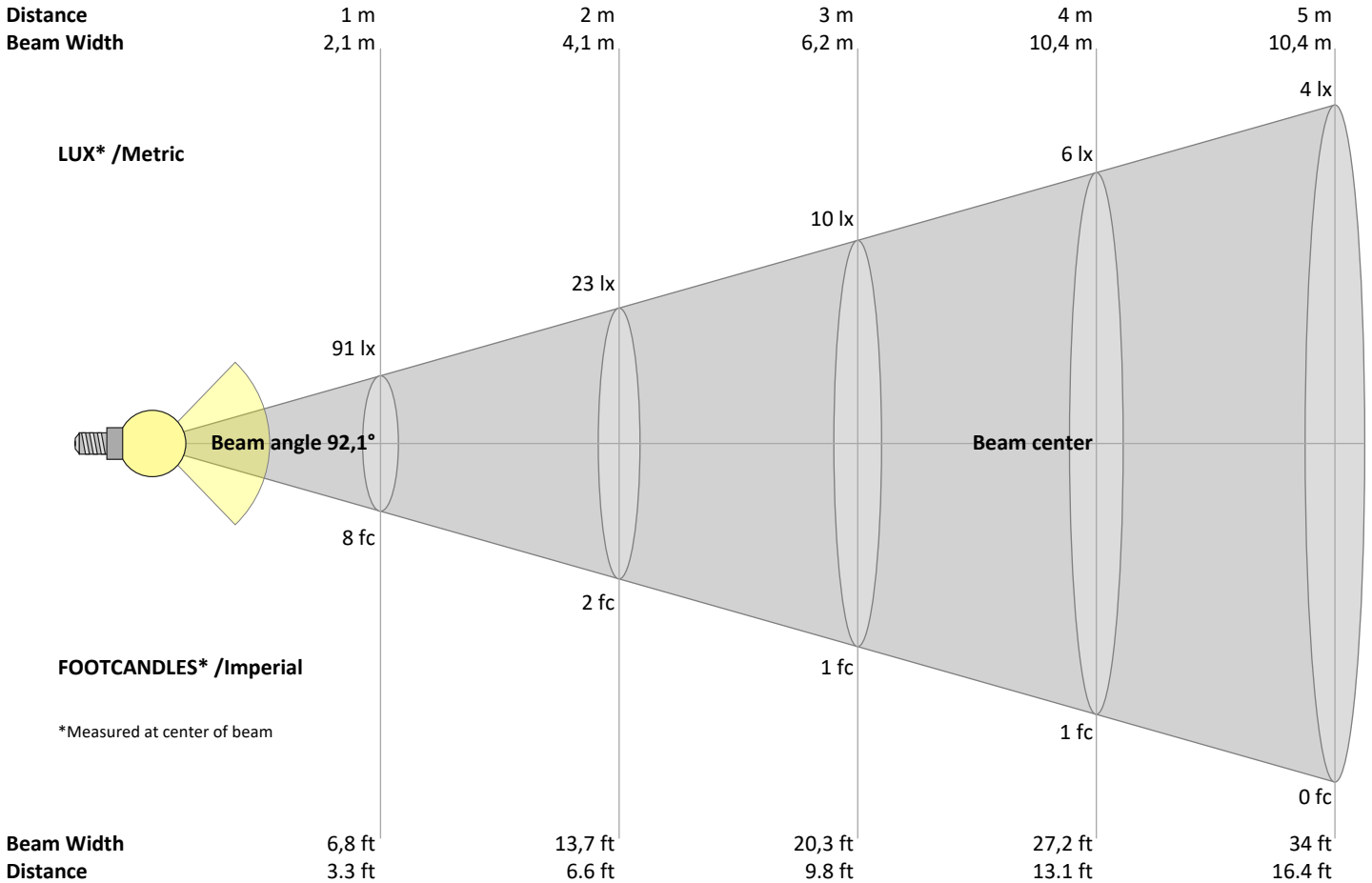
Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

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	
91	23	10	6	4	3	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	lux
8,5	2,1	0,9	0,5	0,3	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0	0	0	0	0	0	0	0	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	
91,0	89,7	87,1	85,3	84,4	82,3	78,7	72,6	62,2	49,2	35,6	20,9	10,7	7,2	4,7	2,1	0,5	0,1	0,0	0,0	0,0	cd
100%	99%	96%	94%	93%	90%	87%	80%	68%	54%	39%	23%	12%	8%	5%	2%	1%	0%	0%	0%	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	
91,0	90,7	89,5	87,6	85,2	81,6	78,4	71,7	60,1	47,5	35,8	25,8	16,7	9,2	5,2	3,1	1,6	0,6	0,2	0,1	0,1	cd
100%	100%	98%	96%	94%	90%	86%	79%	66%	52%	39%	28%	18%	10%	6%	3%	2%	1%	0%	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	
91,0	89,7	87,1	85,3	84,4	82,3	78,7	72,6	62,2	49,2	35,6	20,9	10,7	7,2	4,7	2,1	0,5	0,1	0,0	0,0	0,0	cd
100%	99%	96%	94%	93%	90%	87%	80%	68%	54%	39%	23%	12%	8%	5%	2%	1%	0%	0%	0%	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	
91,0	90,7	89,5	87,6	85,2	81,6	78,4	71,7	60,1	47,5	35,8	25,8	16,7	9,2	5,2	3,1	1,6	0,6	0,2	0,1	0,1	cd
100%	100%	98%	96%	94%	90%	86%	79%	66%	52%	39%	28%	18%	10%	6%	3%	2%	1%	0%	0%	0%	of 0°val

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](https://www.viso-systems.com/VT250506-003733)

Operator:



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	23,9	24,8	24,0	25,1	25,3	24,3	25,2	24,4	25,5	25,7
	3H	23,9	24,9	24,3	25,2	25,4	24,3	25,3	24,7	25,6	25,8
	4H	23,9	24,9	24,3	25,1	25,4	24,3	25,3	24,7	25,6	25,8
	6H	23,9	24,7	24,2	25,0	25,4	24,4	25,2	24,7	25,5	25,9
	8H	23,8	24,7	24,2	25,0	25,4	24,3	25,2	24,7	25,5	25,9
	12H	23,8	24,6	24,1	24,9	25,4	24,3	25,1	24,7	25,4	25,9
4H	2H	23,8	24,8	24,2	25,1	25,3	24,2	25,2	24,6	25,4	25,7
	3H	24,1	24,9	24,4	25,2	25,6	24,5	25,2	24,8	25,6	26,0
	4H	24,0	24,8	24,5	25,2	25,7	24,4	25,2	24,9	25,6	26,1
	6H	24,0	24,7	24,5	25,1	25,4	24,5	25,2	25,0	25,5	25,9
	8H	24,0	24,6	24,5	25,0	25,4	24,4	25,1	24,9	25,4	25,8
	12H	23,9	24,4	24,4	24,9	25,3	24,4	24,9	24,9	25,3	25,8
8H	4H	24,0	24,7	24,5	25,0	25,4	24,4	25,0	24,9	25,4	25,8
	6H	24,0	24,5	24,5	24,9	25,5	24,4	24,9	24,9	25,4	25,9
	8H	24,0	24,4	24,5	24,9	25,6	24,5	24,9	25,0	25,4	26,0
	12H	24,0	24,3	24,5	24,8	25,4	24,4	24,8	25,0	25,3	25,9
12H	4H	24,0	24,5	24,5	24,9	25,4	24,3	24,9	24,8	25,3	25,8
	6H	24,0	24,4	24,5	24,9	25,6	24,4	24,8	25,0	25,4	26,0
	8H	24,0	24,3	24,6	24,8	25,4	24,4	24,8	25,0	25,3	25,9

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

S = 1.0H	0,7 / -1,5	0,6 / -1,0
S = 1.5H	2,3 / -3,9	1,7 / -3,2
S = 2.0H	3,8 / -4,9	3,2 / -4,8

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	102	102	102	100	100	
1	111	108	104	101	109	105	102	100	101	99	97	97	95	94	94	92	91	89	89
2	103	97	91	87	101	95	90	86	92	87	84	88	85	82	85	83	80	78	78
3	96	87	80	75	94	86	79	74	83	78	73	80	76	72	78	74	71	69	69
4	89	79	71	66	87	77	71	65	75	69	64	73	68	64	71	66	63	61	61
5	82	71	64	58	81	70	63	58	68	62	57	66	61	56	65	60	56	54	54
6	77	65	57	52	75	64	57	51	62	56	51	61	55	51	59	54	50	48	48
7	72	59	52	46	70	59	51	46	57	51	46	56	50	45	55	49	45	43	43
8	67	55	47	42	65	54	47	42	53	46	41	52	46	41	50	45	41	39	39
9	63	50	43	38	61	50	43	38	49	42	38	48	42	37	47	41	37	36	36
10	59	47	39	35	58	46	39	35	45	39	34	44	38	34	44	38	34	33	33

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

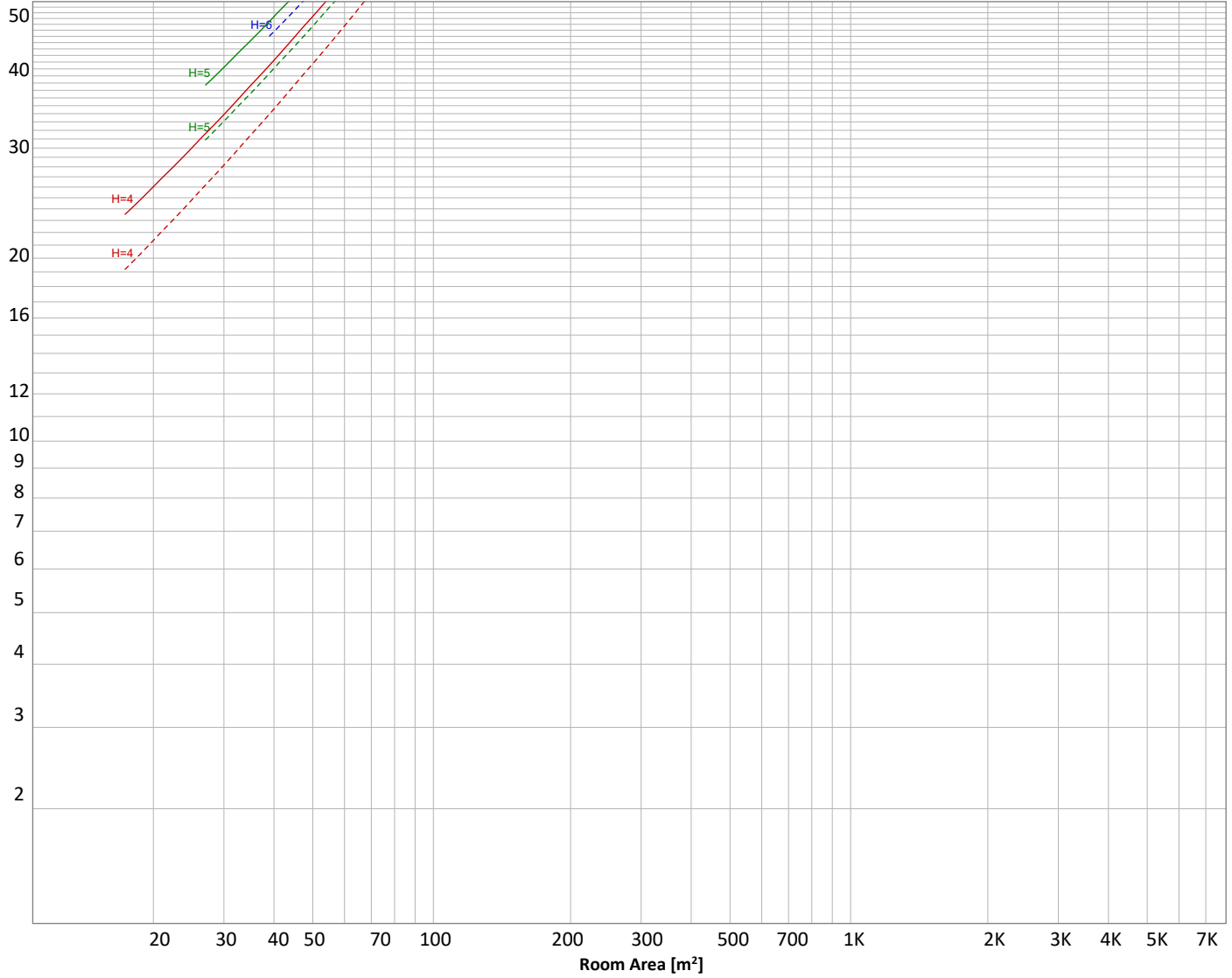
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 185 lm	$\rho(\%)$			
H _{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	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°
8,53 lm	24,4 lm	37,7 lm	44,7 lm	37,3 lm	20,6 lm	7,82 lm	3,08 lm	0,494 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,037 lm	0,030 lm	0,032 lm	0,039 lm	0,043 lm	0,037 lm	0,029 lm	0,018 lm	0,006 lm

Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	{LUM00-10} lm	#VALUE!
10-20°	{LUM10-20} lm	#VALUE!
20-30°	{LUM20-30} lm	#VALUE!
30-40°	{LUM30-40} lm	#VALUE!
40-50°	{LUM40-50} lm	#VALUE!
50-60°	{LUM50-60} lm	#VALUE!
60-70°	{LUM60-70} lm	#VALUE!
70-80°	{LUM70-80} lm	#VALUE!
80-90°	{LUM80-90} lm	#VALUE!
90-100°	{LUM90-100} lm	#VALUE!
100-110°	{LUM100-110} lm	#VALUE!
110-120°	{LUM110-120} lm	#VALUE!
120-130°	{LUM120-130} lm	#VALUE!
130-140°	{LUM130-140} lm	#VALUE!
140-150°	{LUM140-150} lm	#VALUE!
150-160°	{LUM150-160} lm	#VALUE!
160-170°	{LUM160-170} lm	#VALUE!
170-180°	{LUM170-180} lm	#VALUE!
Total	0 lm	#VALUE!

Intensity peaks

Max intensity	{PEAK} cd
Intensity, 90°	{INT90} cd
Intensity, 0°	{INT0} cd

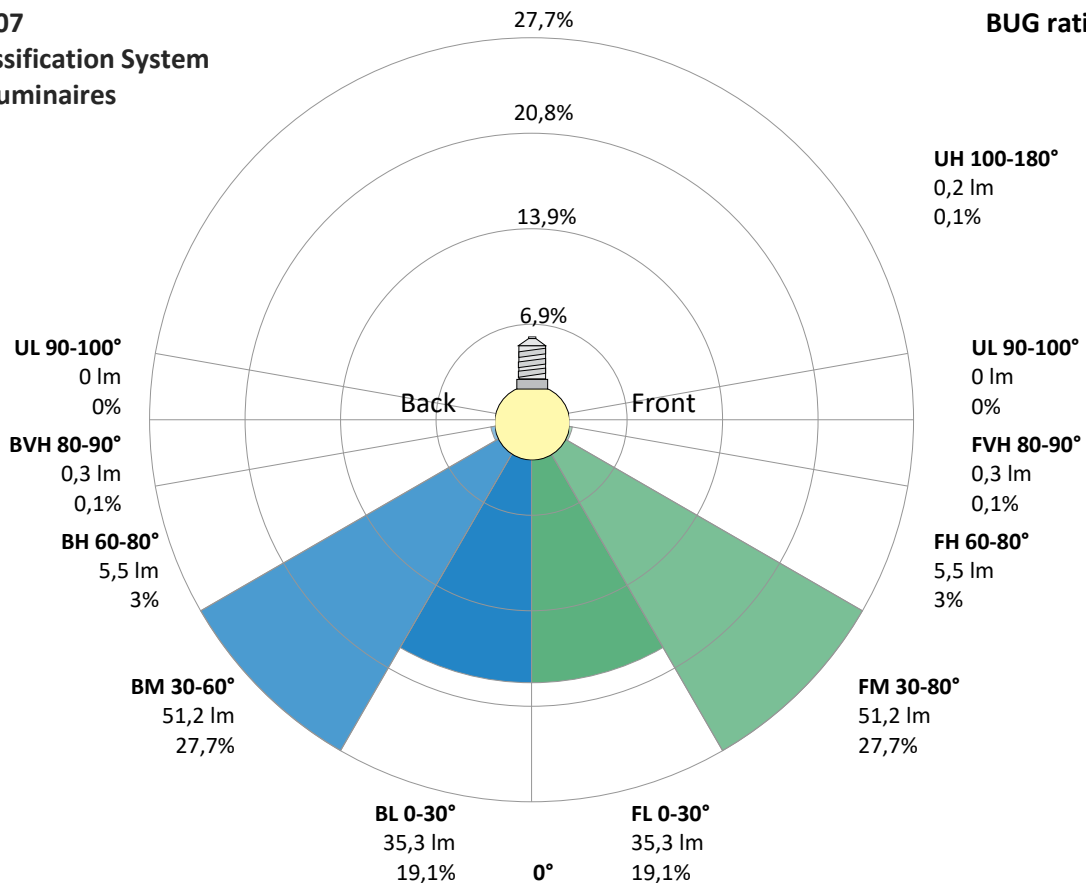
Zonal Lumen summary

Zone (γ)	Lumen	% Total
0-30°	{LUM00-30} lm	#VALUE!
0-40°	{LUM00-40} lm	#VALUE!
0-60°	{LUM00-60} lm	#VALUE!
60-90°	{LUM60-90} lm	#VALUE!
70-100°	{LUM70-100} lm	#VALUE!
90-120°	{LUM90-120} lm	#VALUE!
0-90°	{LUM00-90} lm	#VALUE!
90-180°	{LUM90-180} lm	#VALUE!
0-180°	{LUM00-180} lm	#VALUE!

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	{BUG0} lm	#VALUE!
Medium(30-60°)	{BUG1} lm	#VALUE!
High(60-80°)	{BUG2} lm	#VALUE!
Very high(80-90°)	{BUG3} lm	#VALUE!
Back light		
Low(0-30°)	{BUG4} lm	#VALUE!
Medium(30-60°)	{BUG5} lm	#VALUE!
High(60-80°)	{BUG6} lm	#VALUE!
Very high(80-90°)	{BUG7} lm	#VALUE!
Uplight		
Low(90-100°)	{BUG8} lm	#VALUE!
High(100-180°)	{BUG9} lm	#VALUE!

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



Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

Operator:

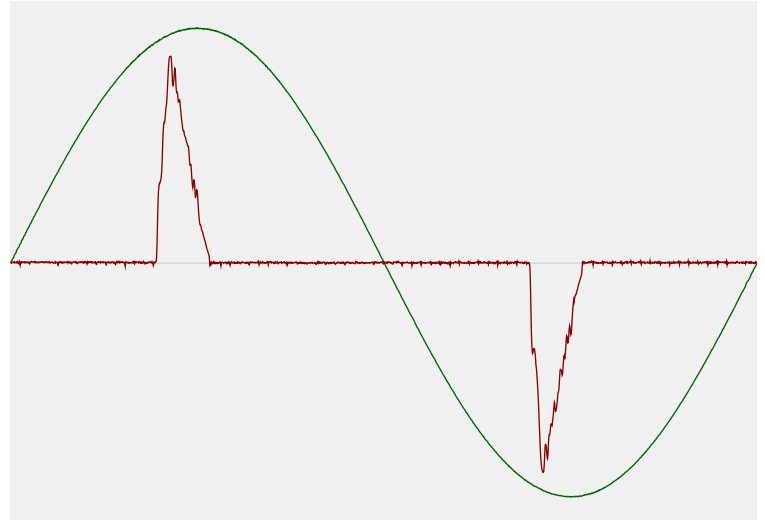


Power Details

Input Power

Power feed to light source	4,9 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,047 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	10,74 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,46
Total harmonic distortion of the current	189,37%
Total harmonic distortion of the voltage	0,09%

Input Power Curve



Efficiency

Radiated power efficiency 13,7%



Lumen efficiency 38 lm/W



Stabilization Details

Warmup Conditions

Stable period	15 min
Stable change max	2,0%
Minimum time	15 min

Color Temperature Change

CCT start	6000 K
CCT shift	+0 K
CCT end	6000 K

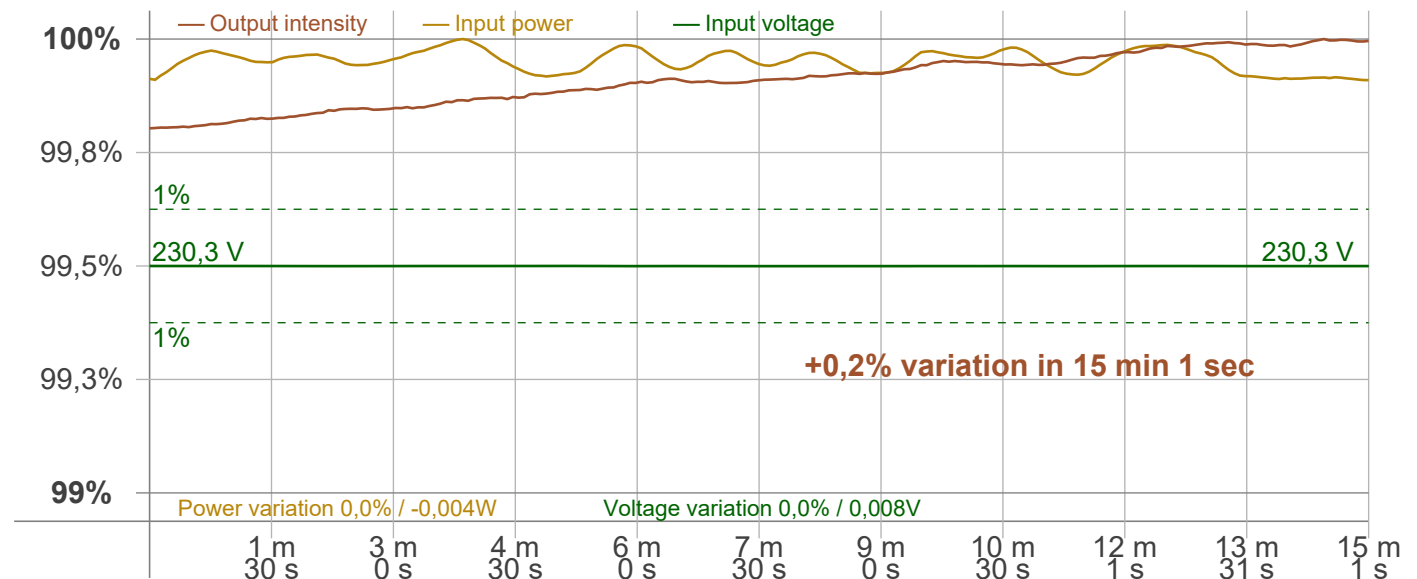
Warmup Result

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

Output Change

Output start	185 lm
Output change	+ lm
Output end	185 lm

Stabilization Curve



Light Measurement Report

Print date: 6-5-2025

Measurement date and time: 6-5-2025 11:43:55 – Measurement no. VFR-250506-1098-MS

Measurement tracking No. and Link: [VT250506-003733](#)

Operator:



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: 1000 Hz
 Percent Flicker: 15,52 %
 Flicker index: 0,04

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

JA8/10 40 Hz: 0,42 %
 JA8/10 90 Hz: 0,84 %
 JA8/10 200 Hz: 1,54 %
 JA8/10 400 Hz: 2,53 %
 JA8/10 1000 Hz: 9,76 %

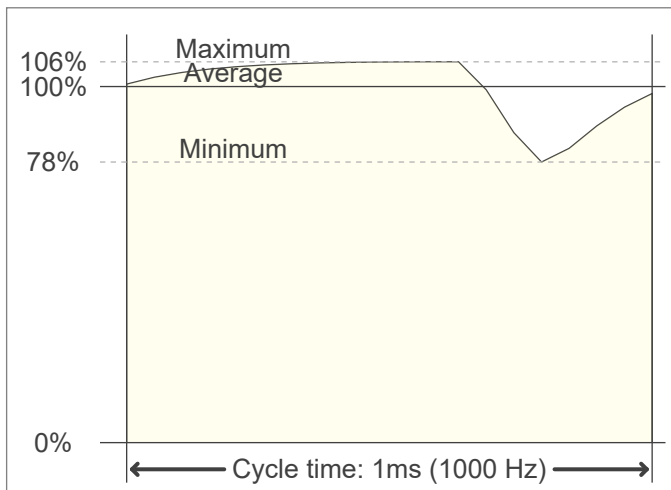
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz): 0,11
 SVM value (80 < F < 2000 Hz): 0,1

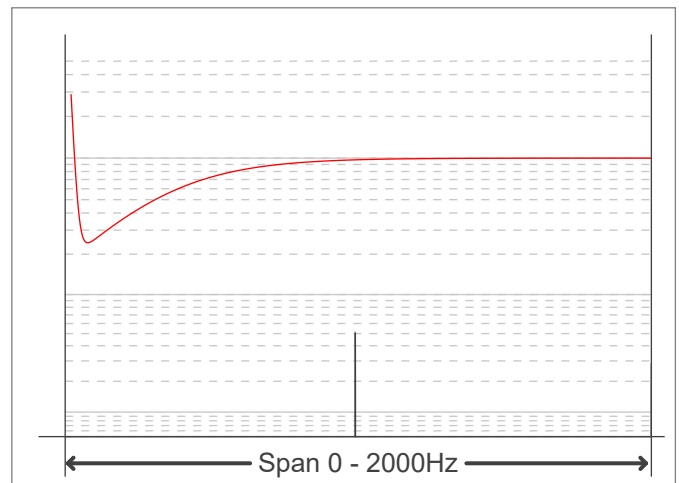
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp: 0,07

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

