

Light Measurement Report

Print date: 25-9-2025

Measurement date and time: 25-9-2025 10:47:56 – Measurement no. VFR-250925-3353-MS

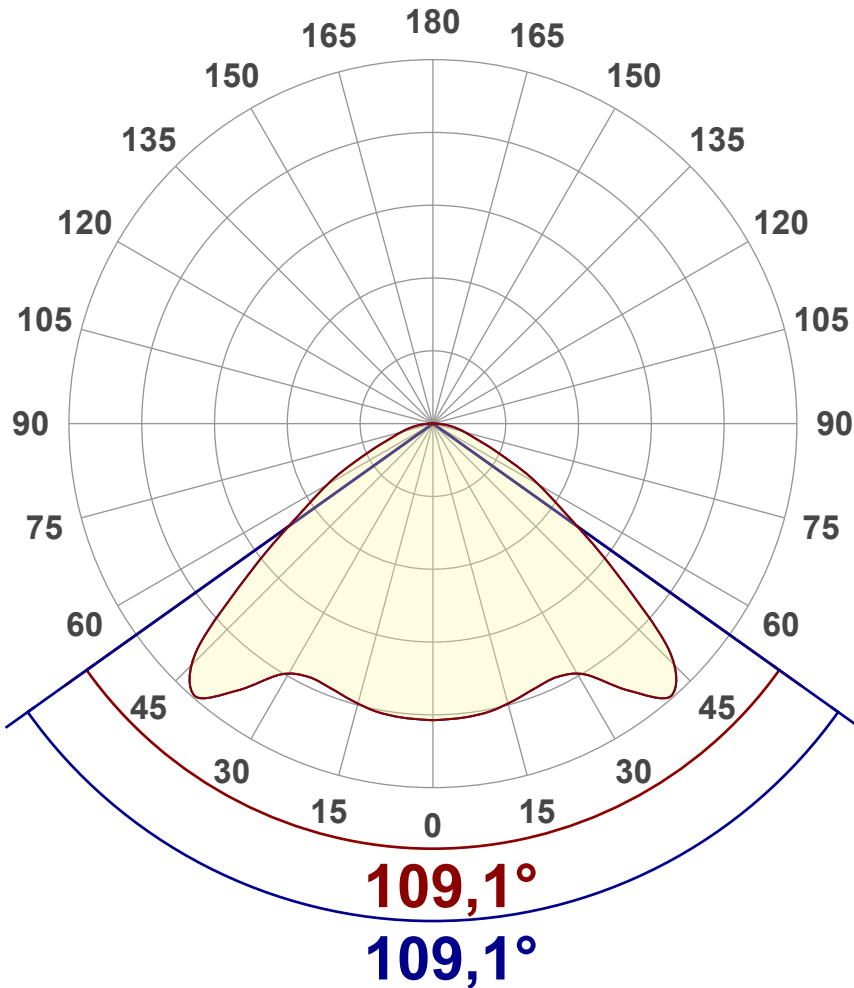
Measurement tracking No. and Link: [VT250925-006192](https://www.viso-systems.com/VT250925-006192)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	23781 lm
Lumen Up% / Down%	0,18% / 99,82%
Peak Intensity	8722 cd
Beam Angle (50%)	109,1°
Beam Angle (90%)	109,1°
Beam Angle (10%)	109,1°

Cut-off Angle

Average 2,5%	172,9°
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Field Angle

Average 10%	147,9°
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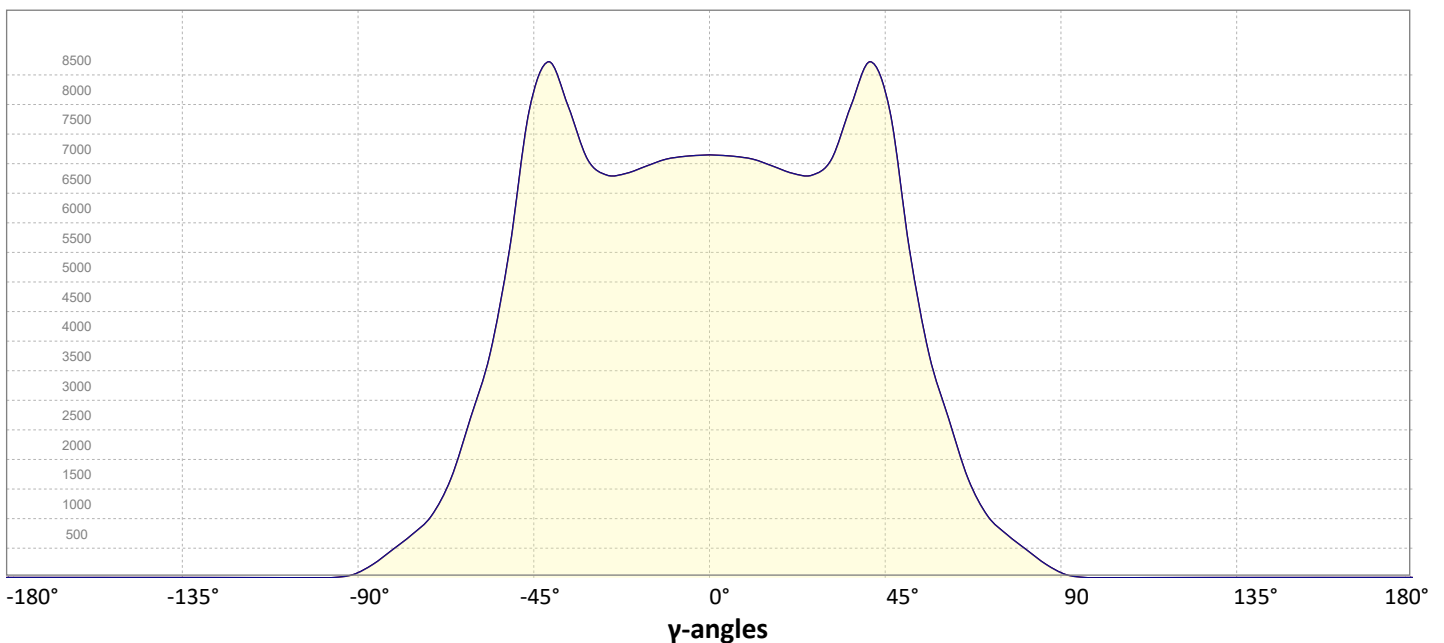
Intensity Ratio

In 120° cone	86,7%
In 90° cone	58,3%

C000-C180

C090-C270

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



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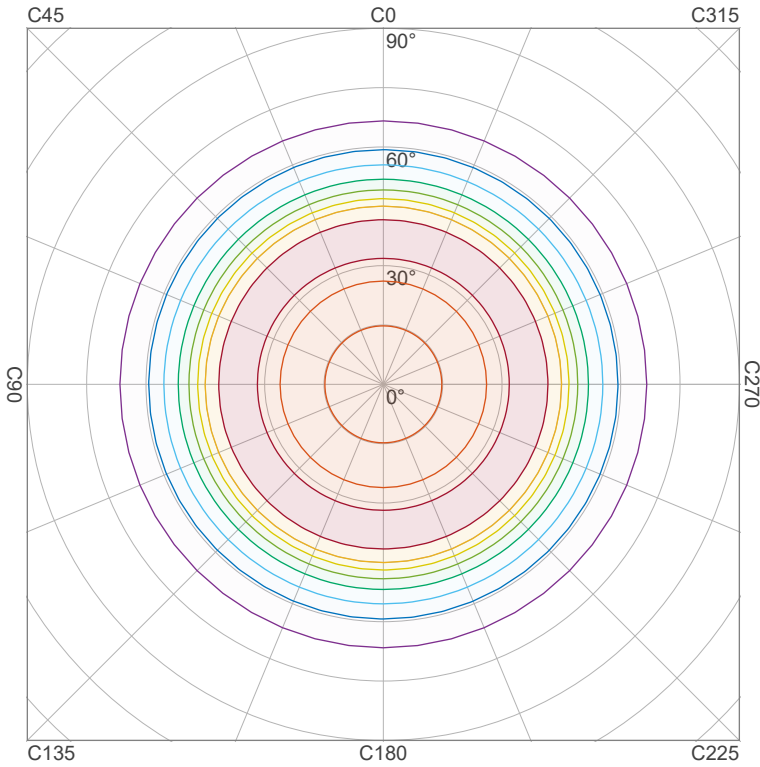
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Iso-intensity Diagram (Iso-candela)

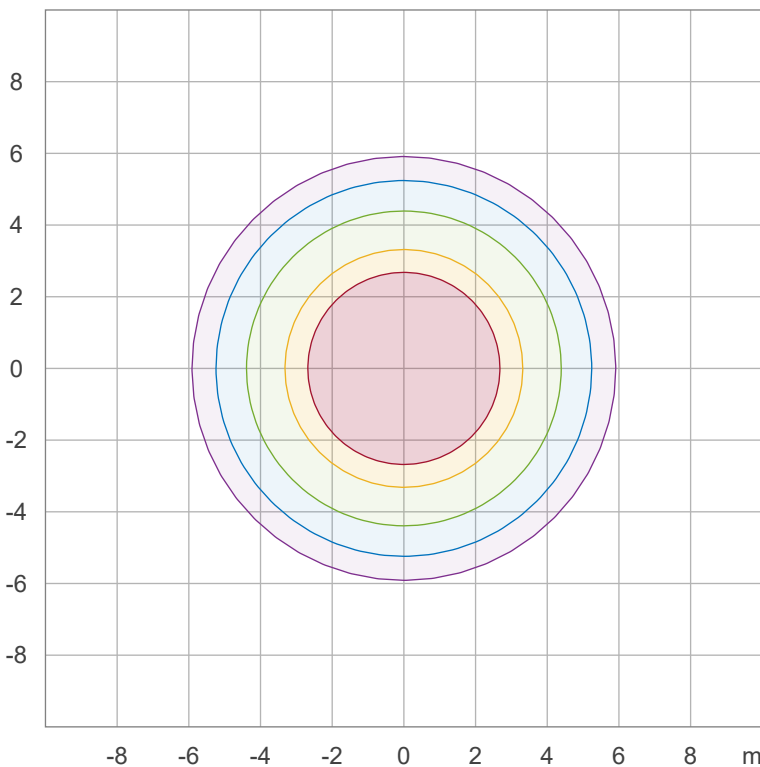


90 %	7821,3 cd
80 %	6952,3 cd
70 %	6083,2 cd
60 %	5214,2 cd
50 %	4345,2 cd
40 %	3476,1 cd
30 %	2607,1 cd
20 %	1738,1 cd
10 %	869,0 cd

Peak intensity: 8690,3 cd

Number of c-planes: 24

Iso-illuminance Diagram (Iso-lux)



50,0 %	396,9 lx
30,0 %	238,1 lx
10,0 %	79,4 lx
5,0 %	39,7 lx
3,0 %	23,8 lx

Peak illuminance: 793,8 lx

Mounting height: 3,0 m

Number of c-planes: 24

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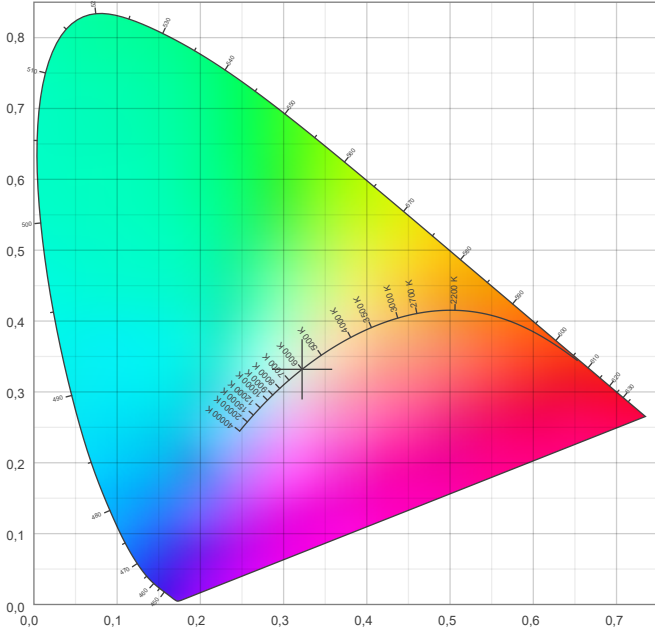


Color details

Correlated Color Temperature, Target CCT = 6000 K
 Correlated Color Temperature, Measured CCT = 5892 K
 Color Rendering Index CRI 74,2
 Color Rendering Index, R9 (red component) R9 = -25,4
 Color Rendering TM30-18 R_f 74,6 – R_g 94,5
 Color Quality Scale CQS = 71,2

MacAdam Steps SDCM = 1,8
 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 = 0,0009
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,203;0,471)

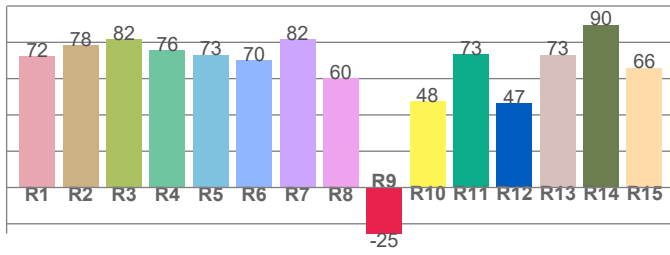
CIE 1931



CIE 1931 – zoomed on Planckian locus



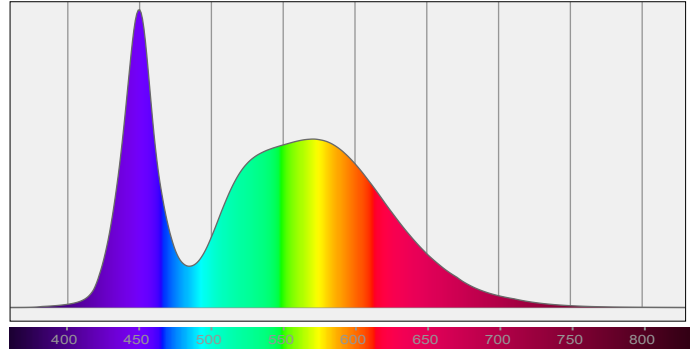
Color Rendering Index per reference color (CIE 1995)



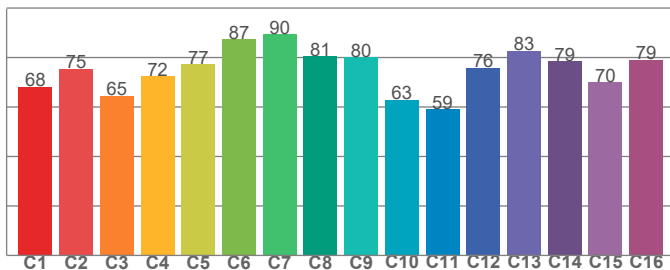
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
72,3	78,5	81,7	75,5	73,3	70,3	81,8	60,2	-25,4	47,7	73,3	46,6	73,2	89,7	66,1

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



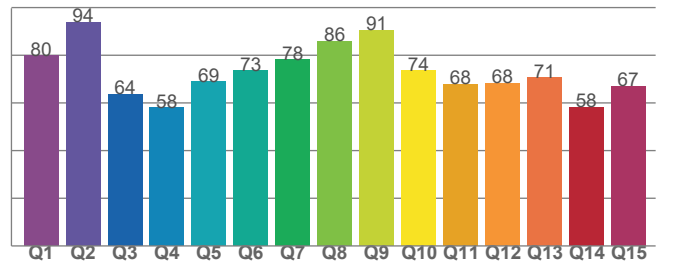
TM30-18 R_f-values per hue bin



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
68,2	75,5	64,6	72,5	77,3	87,5	89,5	80,5	80,0	63,0	59,0	75,9	82,7	78,6	70,1	79,1

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
79,9	93,7	63,6	58,0	68,9	73,5	78,1	85,9	90,6	73,6	67,8	68,2	70,5	58,3	66,9

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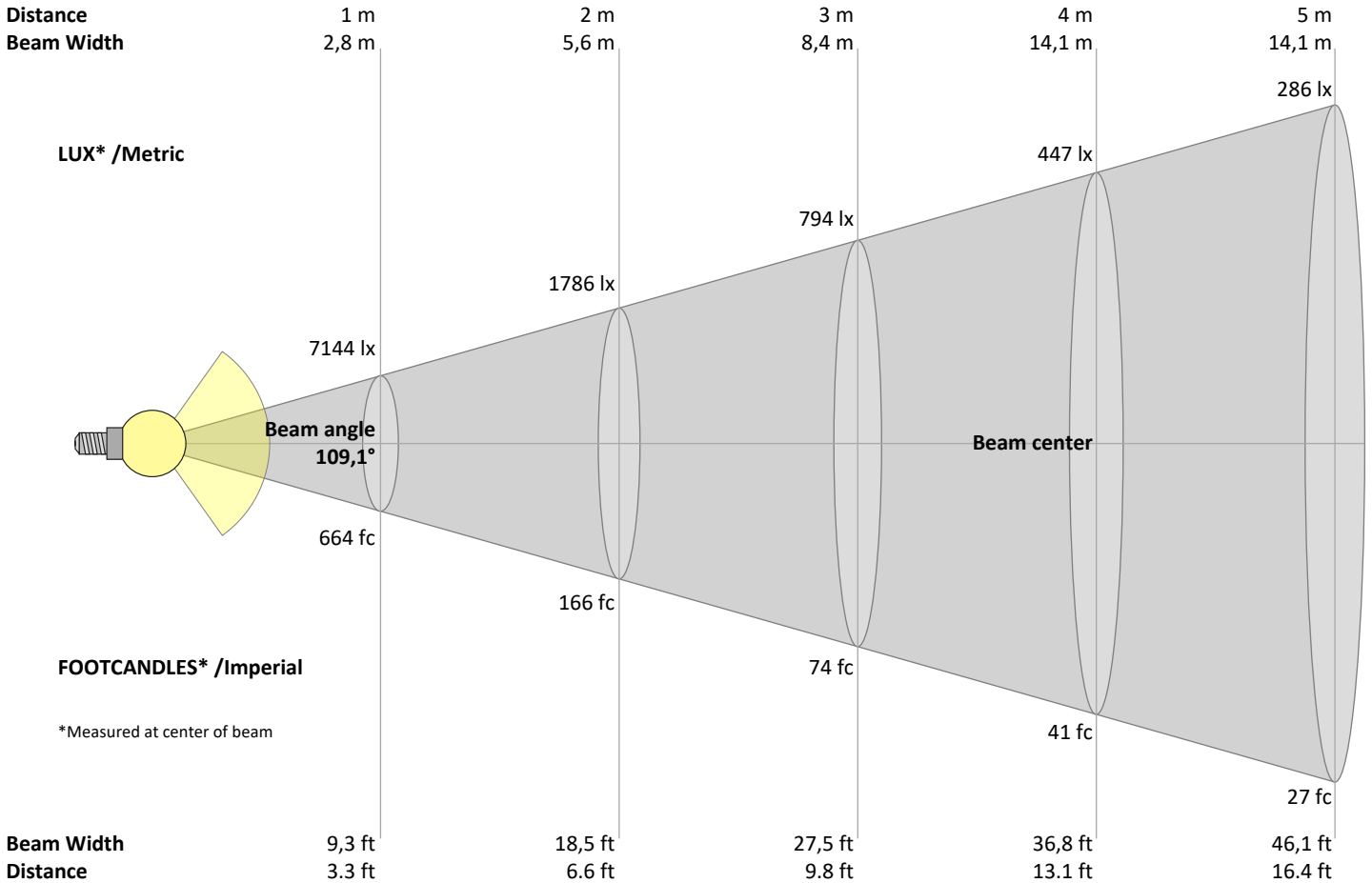
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Operator:



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
7144	1786	794	447	286	198	146	112	88	71	59	50	42	36	32	28	25	22	20	18	lux
663,7	165,9	73,7	41,5	26,5	18,4	13,5	10,4	8,2	6,6	5,5	4,6	3,9	3,4	2,9	2,6	2,3	2	1,8	1,7	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
7144	7129	7086	6985	6866	6812	7005	7754	8541	8084	6110	4206	2958	1922	1198	805	534	285	96	17	cd
100%	100%	99%	98%	96%	95%	98%	109%	120%	113%	86%	59%	41%	27%	17%	11%	7%	4%	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
7144	7129	7086	6985	6866	6812	7005	7754	8541	8084	6110	4206	2958	1922	1198	805	534	285	96	17	cd
100%	100%	99%	98%	96%	95%	98%	109%	120%	113%	86%	59%	41%	27%	17%	11%	7%	4%	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
7144	7129	7086	6985	6866	6812	7005	7754	8541	8084	6110	4206	2958	1922	1198	805	534	285	96	17	cd
100%	100%	99%	98%	96%	95%	98%	109%	120%	113%	86%	59%	41%	27%	17%	11%	7%	4%	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
7144	7129	7086	6985	6866	6812	7005	7754	8541	8084	6110	4206	2958	1922	1198	805	534	285	96	17	cd
100%	100%	99%	98%	96%	95%	98%	109%	120%	113%	86%	59%	41%	27%	17%	11%	7%	4%	1%	0%	of 0°val

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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	33,4	34,5	33,6	34,8	35,1	33,4	34,5	33,6	34,8	35,1
	3H	33,8	35,0	34,2	35,3	35,5	33,8	35,0	34,2	35,3	35,5
	4H	34,0	35,1	34,4	35,4	35,6	34,0	35,1	34,4	35,4	35,6
	6H	34,2	35,2	34,5	35,5	35,8	34,2	35,2	34,5	35,5	35,8
	8H	34,2	35,2	34,6	35,5	35,9	34,2	35,2	34,6	35,5	35,9
	12H	34,3	35,2	34,7	35,6	36,0	34,3	35,2	34,7	35,6	36,0
4H	2H	33,5	34,7	34,0	35,0	35,2	33,5	34,7	34,0	35,0	35,2
	3H	34,2	35,2	34,6	35,5	36,0	34,2	35,2	34,6	35,5	36,0
	4H	34,4	35,3	34,9	35,7	36,3	34,4	35,3	34,9	35,7	36,3
	6H	34,7	35,5	35,2	35,9	36,3	34,7	35,5	35,2	35,9	36,3
	8H	34,8	35,6	35,3	35,9	36,3	34,8	35,6	35,3	35,9	36,3
	12H	34,9	35,5	35,4	36,0	36,4	34,9	35,5	35,4	36,0	36,4
8H	4H	34,5	35,3	35,0	35,6	36,0	34,5	35,3	35,0	35,6	36,0
	6H	34,9	35,5	35,4	35,9	36,5	34,9	35,5	35,4	35,9	36,5
	8H	35,1	35,6	35,6	36,1	36,8	35,1	35,6	35,6	36,1	36,8
	12H	35,3	35,7	35,9	36,2	36,8	35,3	35,7	35,9	36,2	36,8
12H	4H	34,5	35,1	35,0	35,5	36,0	34,5	35,1	35,0	35,5	36,0
	6H	35,0	35,5	35,5	36,0	36,6	35,0	35,5	35,5	36,0	36,6
	8H	35,2	35,6	35,8	36,1	36,7	35,2	35,6	35,8	36,1	36,7

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

S = 1.0H	0,4 / -0,4	0,4 / -0,4
S = 1.5H	0,8 / -1,0	0,8 / -1,0
S = 2.0H	1,8 / -1,8	1,8 / -1,8

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	110	105	101	98	107	103	99	96	99	96	93	95	92	90	91	89	88	85	85
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	64	61	61
4	84	72	64	57	82	71	63	57	69	62	56	66	60	55	64	59	55	53	53
5	77	65	56	49	75	63	55	49	61	54	48	59	53	48	57	52	47	45	45
6	71	58	49	43	69	57	49	43	55	48	42	53	47	42	52	46	41	39	39
7	66	52	44	37	64	51	43	37	50	42	37	48	42	37	47	41	36	34	34
8	61	47	39	33	59	47	39	33	45	38	33	44	37	33	43	37	32	30	30
9	57	43	35	29	55	43	35	29	41	34	29	40	34	29	39	33	29	27	27
10	53	40	32	26	52	39	31	26	38	31	26	37	31	26	36	30	26	24	24

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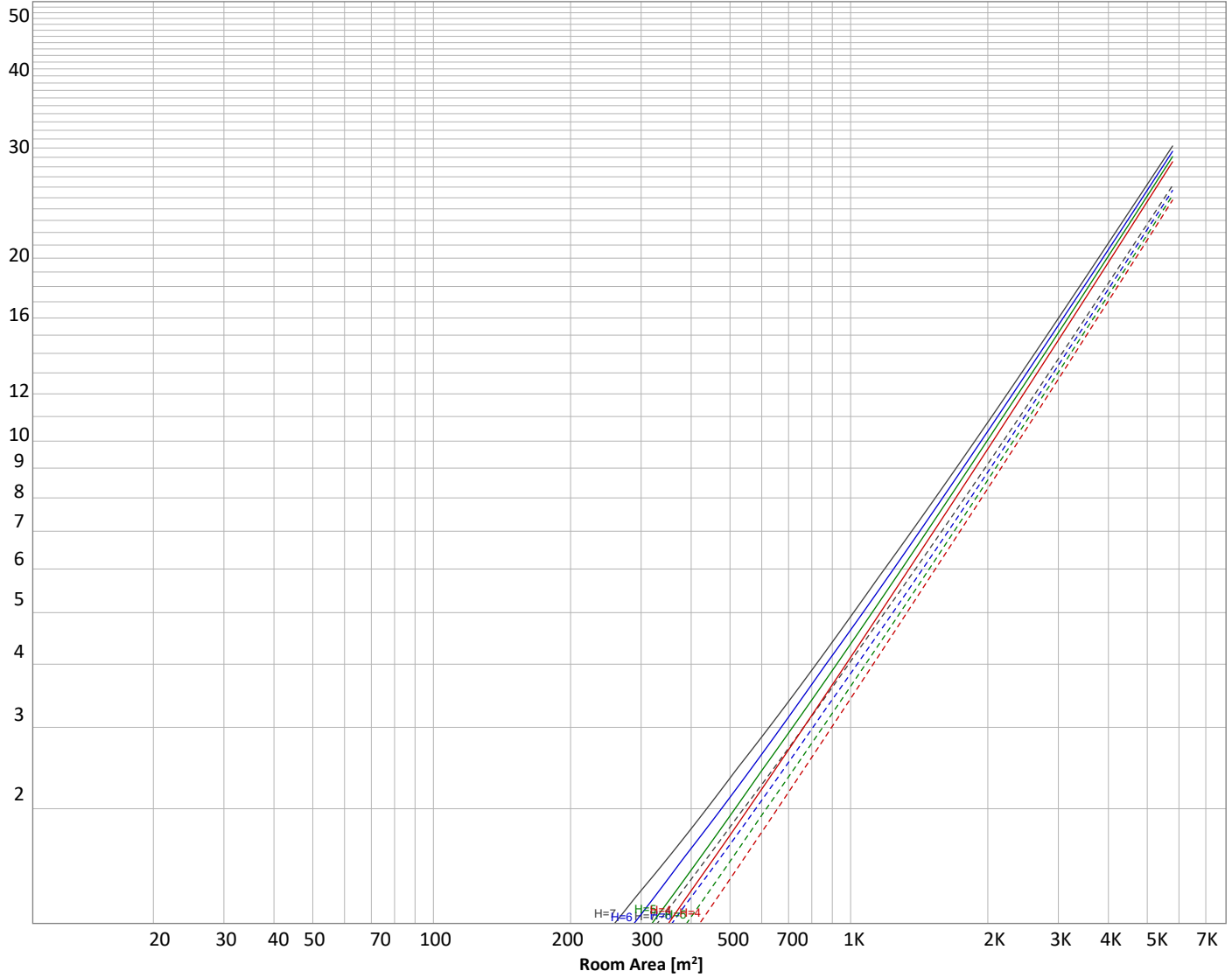
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 23781 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°
679 lm	1976 lm	3173 lm	4882 lm	6081 lm	3823 lm	1946 lm	857 lm	321 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
24,8 lm	1,37 lm	2,65 lm	3,52 lm	3,59 lm	3,08 lm	2,36 lm	1,46 lm	0,506 lm

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Operator:



Outdoor Light Planning

Lumen per Zone

Zone (γ)	Lumen	% Total
0-10°	679 lm	2,9%
10-20°	1976 lm	8,3%
20-30°	3173 lm	13,3%
30-40°	4882 lm	20,5%
40-50°	6081 lm	25,6%
50-60°	3823 lm	16,1%
60-70°	1946 lm	8,2%
70-80°	857 lm	3,6%
80-90°	321 lm	1,3%
90-100°	25 lm	0,1%
100-110°	1 lm	0,0%
110-120°	3 lm	0,0%
120-130°	4 lm	0,0%
130-140°	4 lm	0,0%
140-150°	3 lm	0,0%
150-160°	2 lm	0,0%
160-170°	1 lm	0,0%
170-180°	1 lm	0,0%
Total	23781 lm	100,0%

Intensity peaks

Max intensity	8722 cd
Intensity, 90°	96 cd
Intensity, 0°	7144 cd

Zonal Lumen summary

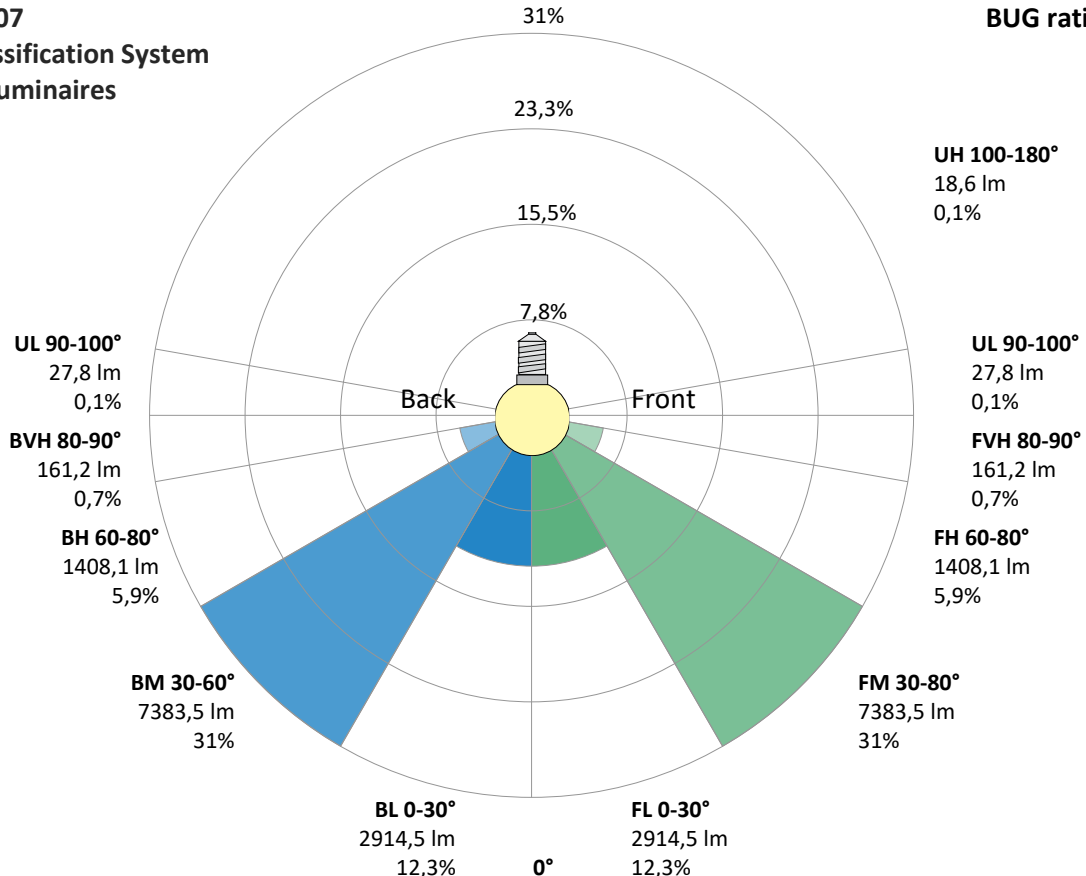
Zone (γ)	Lumen	% Total
0-30°	5828 lm	24,5%
0-40°	10710 lm	45,0%
0-60°	20614 lm	86,7%
60-90°	3124 lm	13,1%
70-100°	1203 lm	5,1%
90-120°	29 lm	0,1%
0-90°	23738 lm	99,8%
90-180°	43 lm	0,2%
0-180°	23781 lm	100,0%

BUG rating

	Lumen	% Total
Forward light		
Low(0-30°)	2915 lm	12,3%
Medium(30-60°)	7384 lm	31,0%
High(60-80°)	1408 lm	5,9%
Very high(80-90°)	161 lm	0,7%
Back light		
Low(0-30°)	2915 lm	12,3%
Medium(30-60°)	7384 lm	31,0%
High(60-80°)	1408 lm	5,9%
Very high(80-90°)	161 lm	0,7%
Uplight		
Low(90-100°)	28 lm	0,1%
High(100-180°)	19 lm	0,1%

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

BUG rating B4 U2 G2



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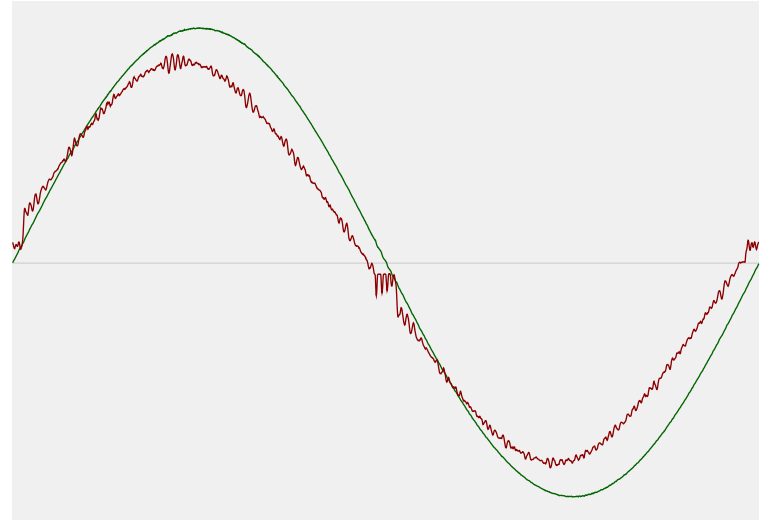


Power Details

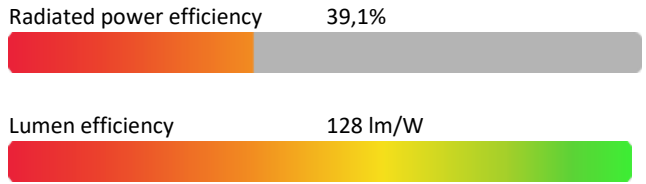
Input Power

Power feed to light source	186,2 W
Frequency of input power	50 Hz
RMS Input voltage feed, V_{RMS}	230 V
RMS Input current feed, I_{RMS}	0,821 A
Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$	188,68 VA
Displacement factor of AC power feed	0,99
Power factor of AC current feed	0,99
Total harmonic distortion of the current	4%
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	5943 K
CCT shift	+57 K
CCT end	6000 K

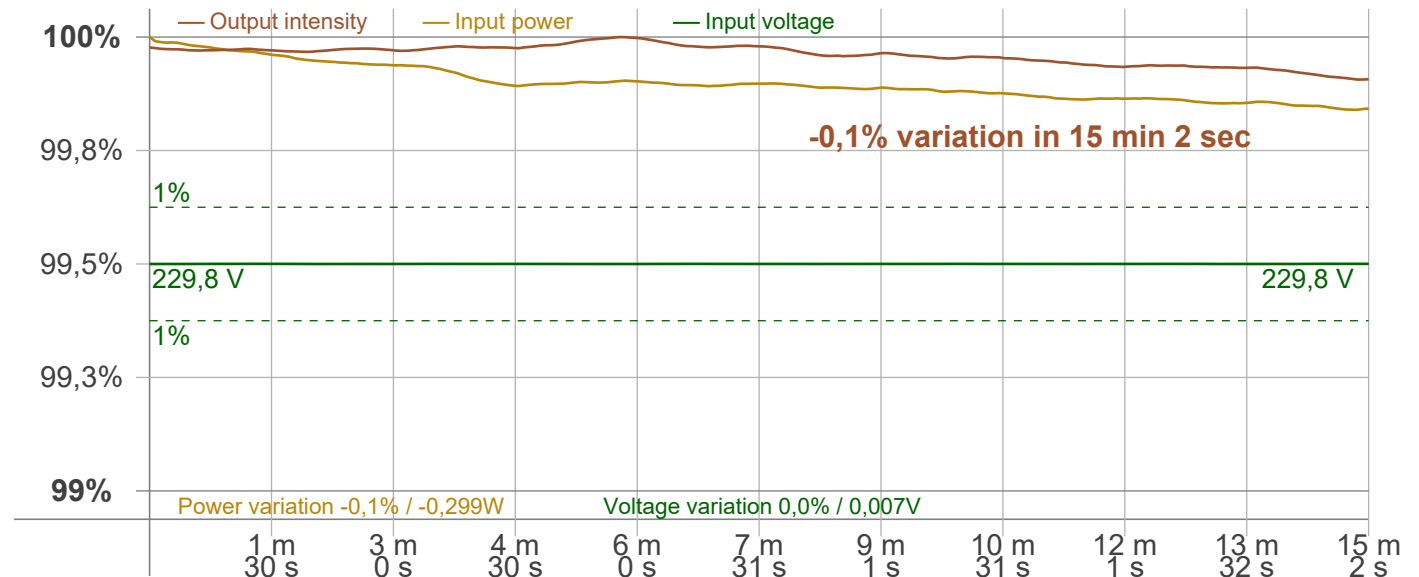
Warmup Result

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

Output Change

Output start	23797 lm
Output change	-16 lm
Output end	23781 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 465,12 Hz
 Percent Flicker 0,33 %
 Flicker index 0

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

JA8/10 40 Hz 0,16 %
 JA8/10 90 Hz 0,17 %
 JA8/10 200 Hz 0,25 %
 JA8/10 400 Hz 0,26 %
 JA8/10 1000 Hz 0,33 %

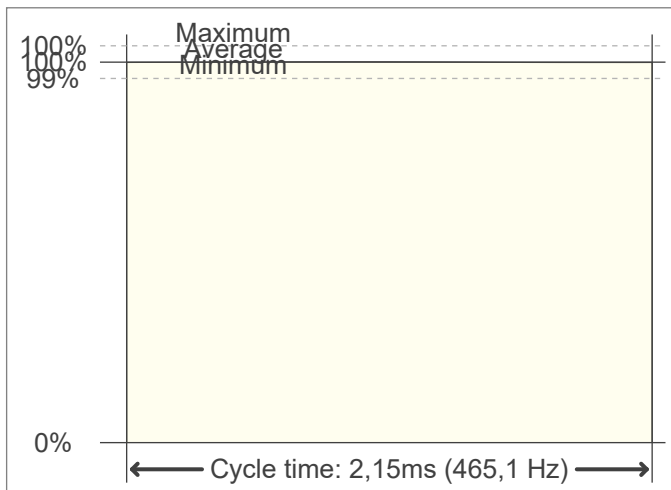
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz) 0,08
 SVM value (80 < F < 2000 Hz) 0

Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp 0,03

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

