

Light Measurement Report

Print date: 15-5-2025

Measurement date and time: 15-5-2025 10:19:39 – Measurement no. VFR-250515-1265-MS

Measurement tracking No. and Link: [VT250515-004273](#)

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

40 planes – 9°

5°

3,34 m

37,3 W – PF 0,86 – DPF 0,99

230 V – 0,188 A

50 Hz

Lamp stabilized in 16 min 10 sec – 2,0%

Tested Light Source

Product Name

Item No. and Manufacturer

Product Description (line 1)

273252-4000K

273252-4000K – Dutchfulfillment

3-FASE RAILSPOT ERRIAP 40W CRI>95 ZWART

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

3205 lm – 0,12% / 99,88%

86 lm/W

7773 cd – 30,8°

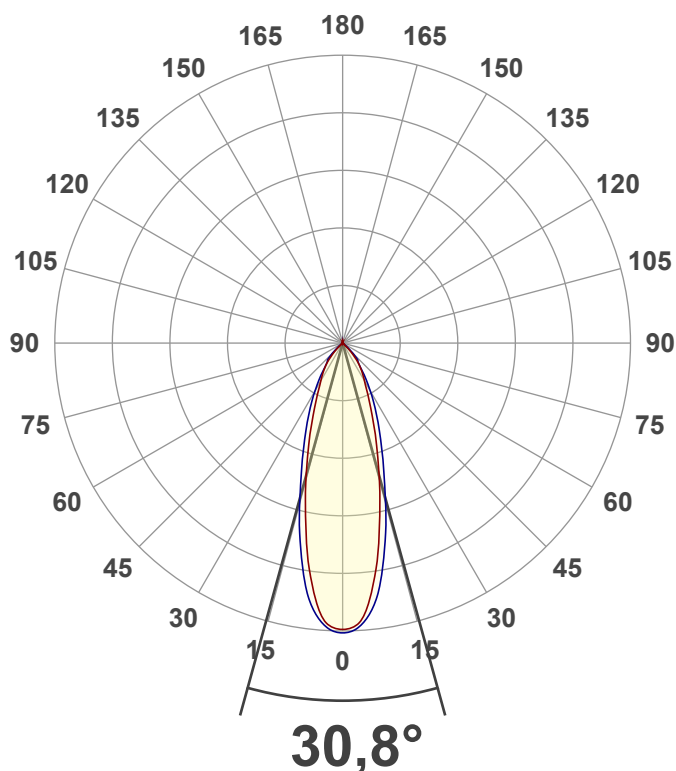
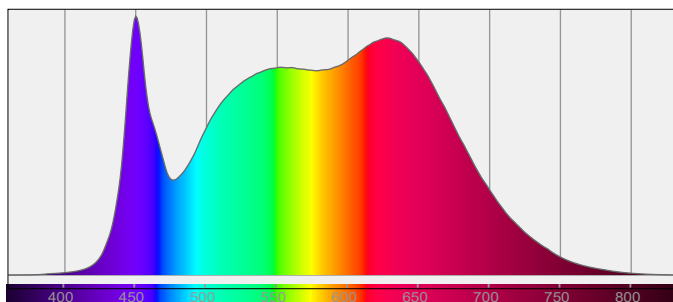
CCT = 4000 K / 4084 K

CRI 95,9

R_f 93,1 – R_g 100,1

Duv 0,0022 – SDCM 2,3

SVM 0,04 – PstLM 0,03



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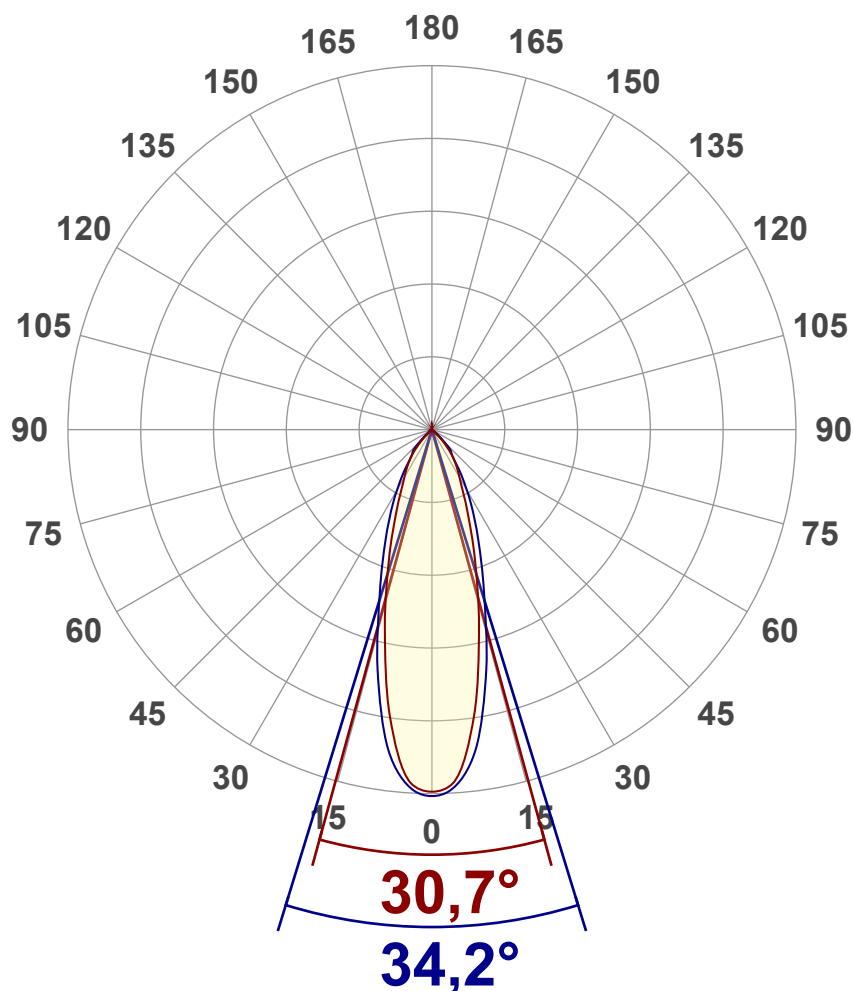
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Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	3205 lm
Lumen Up% / Down%	0,12% / 99,88%
Peak Intensity	7773 cd
Beam Angle (50%)	30,8°
Beam Angle (90%)	34,2°
Beam Angle (10%)	27,6°

Cut-off Angle

Average 2,5%	92,8°
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Field Angle

Average 10%	73,6°
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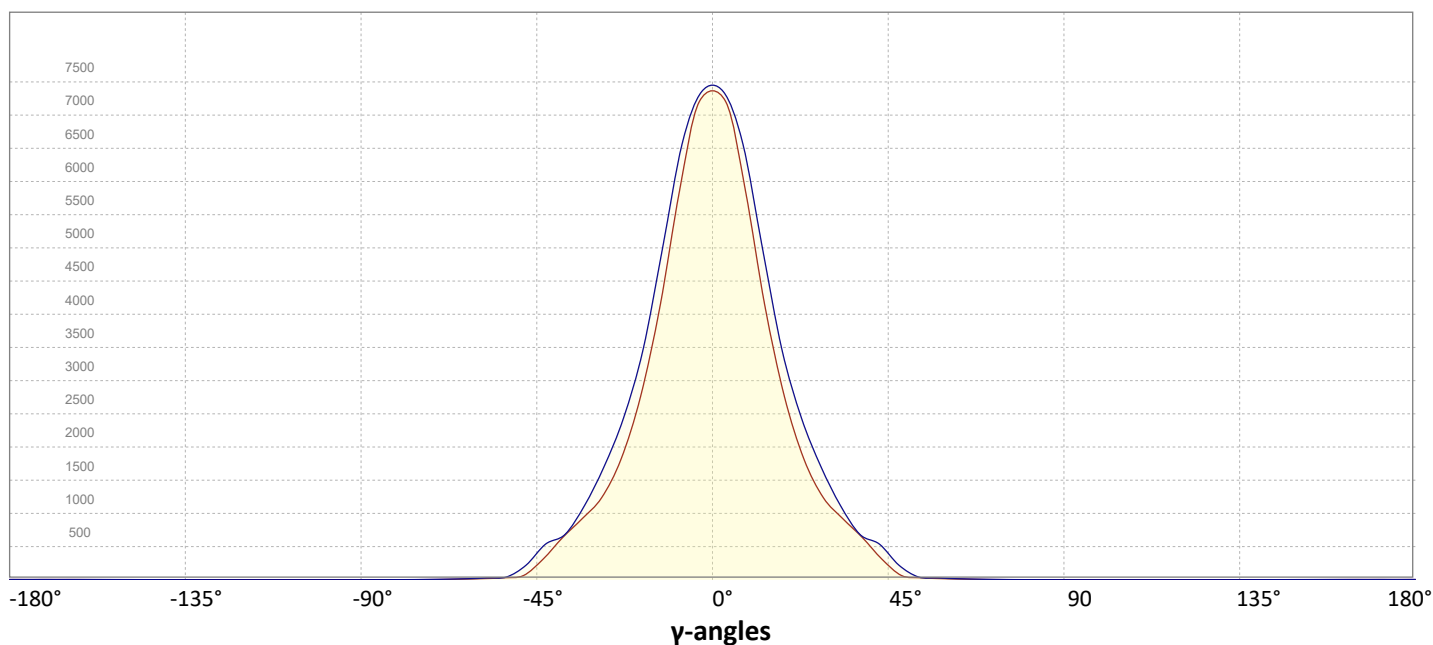
Intensity Ratio

In 120° cone	99,5%
In 90° cone	97,0%

C000-C180

C090-C270

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

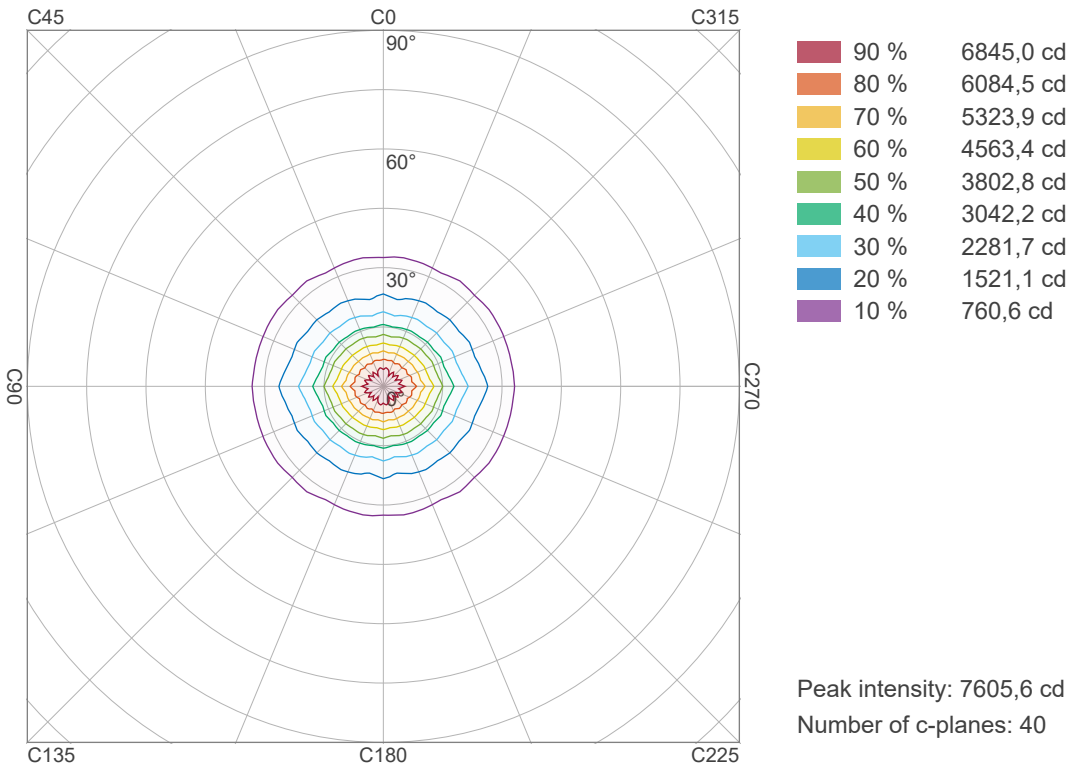


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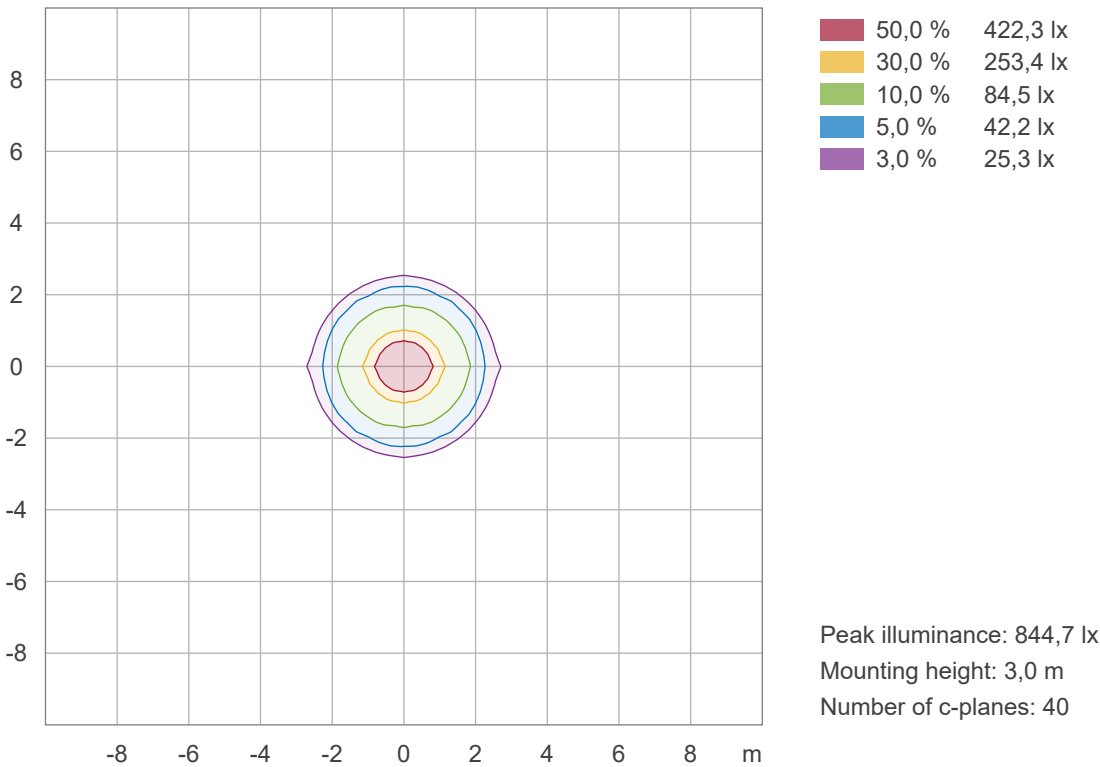
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Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



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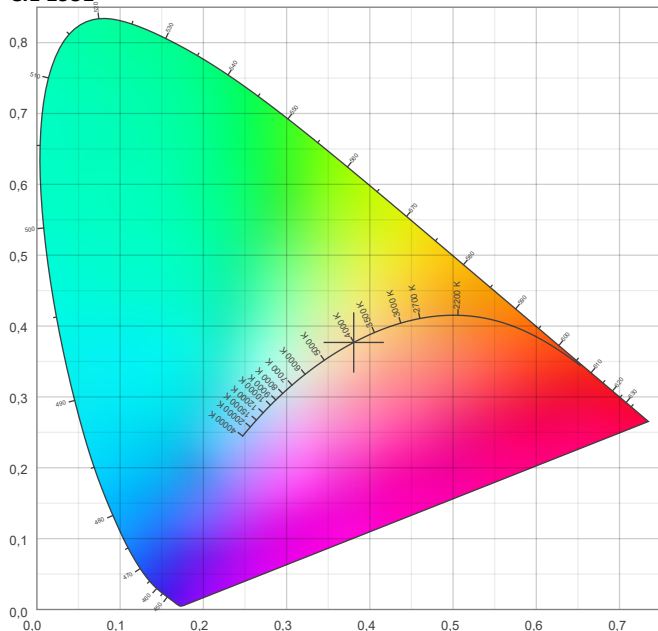


Color details

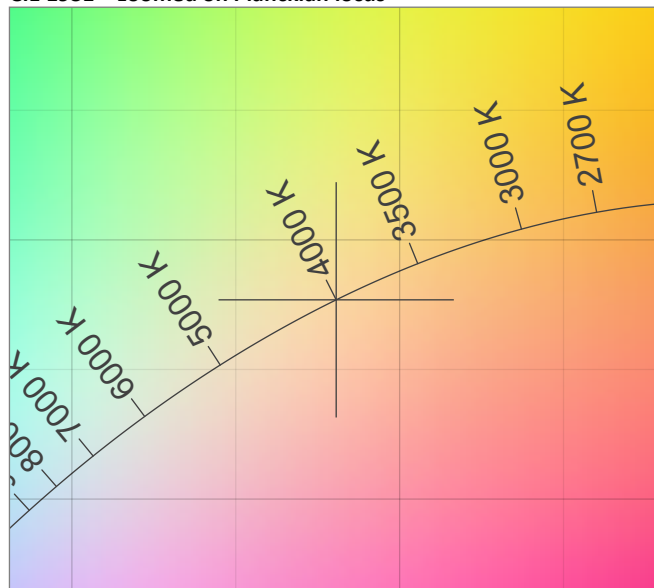
Correlated Color Temperature, Target CCT = 4000 K
Correlated Color Temperature, Measured CCT = 4084 K
Color Rendering Index CRI 95,9
Color Rendering Index, R9 (red component) R9 = 87,0
Color Rendering TM30-18 R_f 93,1 – R_g 100,1
Color Quality Scale CQS = 94,9

MacAdam Steps
Color coordinates CIE 1931 (x;y) = (0,381;0,377)
Color coordinate CIEs 1960 (u;v) = (0,225;0,334)
Color deviation from BBL Duv = 0,0022
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,225;0,502)

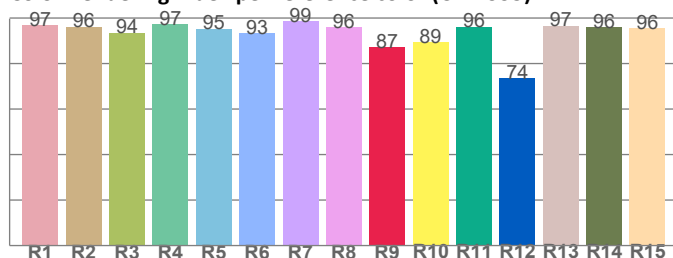
CIE 1931



CIE 1931 – zoomed on Planckian locus



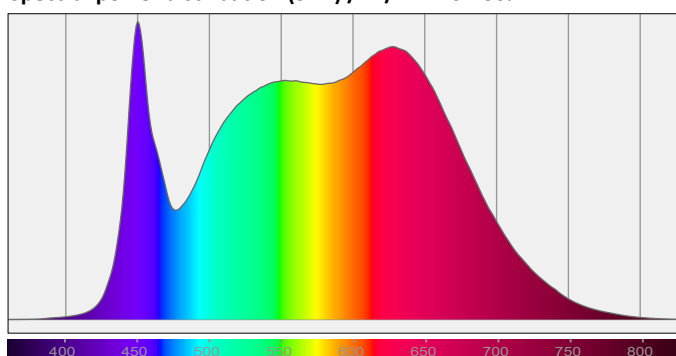
Color Rendering Index per reference color (CIE 1995)



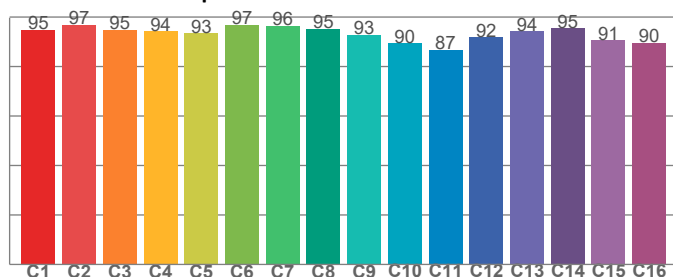
CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
96,9	96,1	93,6	97,2	95,4	93,3	98,7	96,0	87,0	89,4	96,2	73,6	96,6	95,9	95,6

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



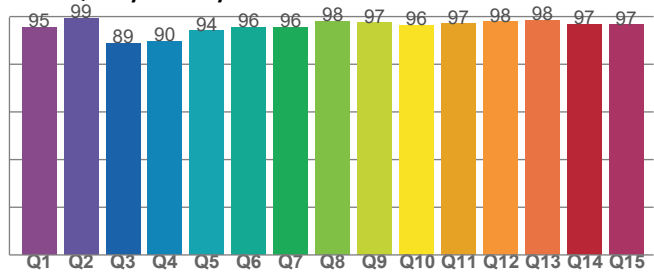
TM30-18 R_f-values per hue bin



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
94,8	97,0	94,9	94,3	93,4	96,8	96,4	95,2	92,9	89,5	86,8	91,8	94,2	95,4	90,5	89,6

Color Quality Scale by reference color



CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
95,4	99,3	88,9	89,6	94,1	95,6	95,6	98,0	97,5	96,4	97,0	97,9	98,4	96,7	96,6

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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		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	19,9	20,5	20,0	20,7	20,9	20,8	21,3	20,9	21,6	21,8
	3H	19,6	20,3	20,0	20,5	20,7	20,5	21,2	20,8	21,4	21,6
	4H	19,5	20,2	19,9	20,5	20,7	20,4	21,1	20,8	21,3	21,5
	6H	19,5	20,1	19,8	20,4	20,8	20,4	21,0	20,7	21,3	21,6
	8H	19,5	20,0	19,8	20,4	20,7	20,3	20,9	20,7	21,2	21,6
	12H	19,4	20,0	19,8	20,3	20,7	20,3	20,8	20,6	21,2	21,6
4H	2H	19,5	20,2	19,9	20,5	20,7	20,4	21,1	20,8	21,3	21,5
	3H	19,4	20,0	19,8	20,3	20,8	20,3	20,8	20,6	21,2	21,6
	4H	19,3	19,8	19,7	20,2	20,7	20,2	20,6	20,6	21,1	21,6
	6H	19,2	19,8	19,7	20,1	20,4	20,1	20,6	20,6	20,9	21,3
	8H	19,2	19,6	19,7	20,0	20,4	20,0	20,5	20,5	20,8	21,2
	12H	19,1	19,5	19,6	19,9	20,3	19,9	20,3	20,5	20,7	21,2
8H	4H	19,2	19,6	19,7	20,0	20,4	20,0	20,5	20,5	20,8	21,2
	6H	19,1	19,4	19,6	19,9	20,4	19,9	20,3	20,5	20,7	21,3
	8H	19,1	19,3	19,6	19,9	20,5	19,9	20,2	20,5	20,7	21,3
	12H	19,0	19,2	19,6	19,7	20,3	19,9	20,1	20,5	20,6	21,2
12H	4H	19,1	19,5	19,6	19,9	20,3	19,9	20,3	20,5	20,7	21,2
	6H	19,1	19,3	19,6	19,9	20,5	19,9	20,2	20,5	20,7	21,3
	8H	19,0	19,2	19,6	19,7	20,3	19,9	20,1	20,5	20,6	21,2
Variations with the observer position for the luminaire spacings, S:											
S = 1.0H		4,2 / -12,6					4,0 / -12,3				
S = 1.5H		6,7 / -15,3					6,5 / -15,2				
S = 2.0H		8,6 / -17,6					8,5 / -17,3				

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	111	111	111	106	106	106	102	102	102	100	
1	114	111	109	107	111	109	107	105	105	103	102	101	100	99	98	97	96	94
2	109	104	101	97	107	103	99	96	99	97	94	96	94	92	94	92	90	89
3	104	98	93	90	102	97	92	89	94	91	88	92	89	86	89	87	85	83
4	99	92	87	83	98	91	87	83	89	85	82	87	84	81	85	82	80	79
5	95	87	82	78	93	86	81	78	85	80	77	83	79	76	81	78	76	74
6	91	83	77	73	89	82	77	73	80	76	73	79	75	72	78	74	72	70
7	87	78	73	69	86	78	73	69	77	72	69	75	71	68	74	71	68	67
8	83	75	69	66	82	74	69	65	73	68	65	72	68	65	71	67	65	63
9	80	71	66	62	79	71	66	62	70	65	62	69	65	62	68	64	62	60
10	77	68	63	59	76	68	63	59	67	62	59	66	62	59	65	62	59	58

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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

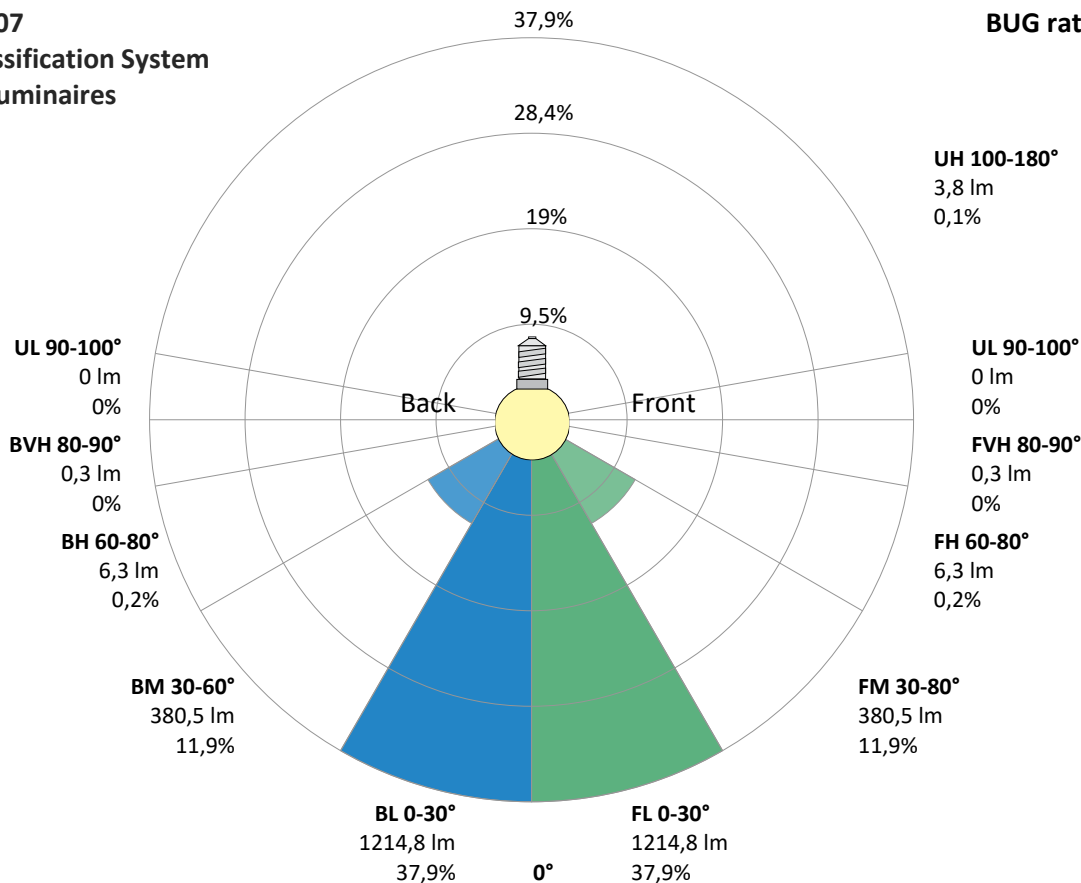
Low(0-30°)	{BUG4} lm	#VALUE!
Medium(30-60°)	{BUG5} lm	#VALUE!
High(60-80°)	{BUG6} lm	#VALUE!
Very high(80-90°)	{BUG7} lm	#VALUE!

Uplight

Low(90-100°)	{BUG8} lm	#VALUE!
High(100-180°)	{BUG9} lm	#VALUE!

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

BUG rating B3 U1 G0



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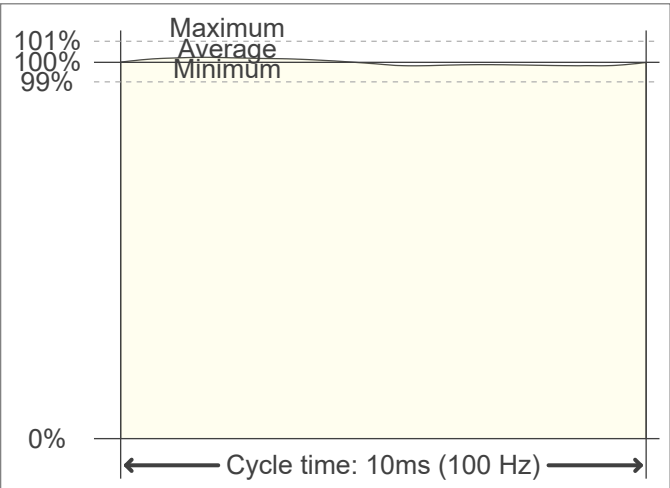
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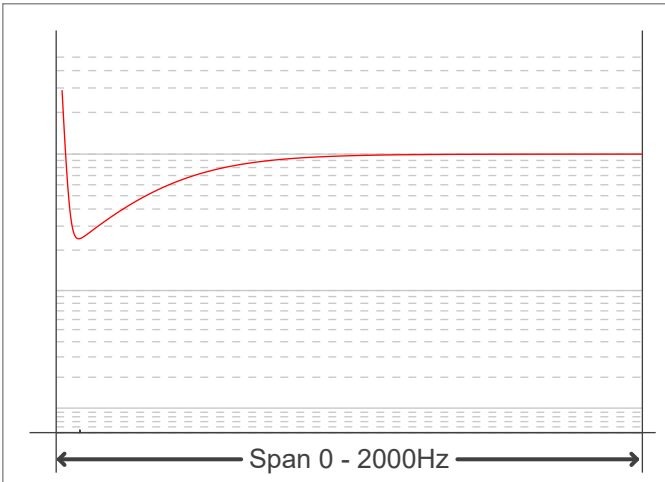
Flicker /TLA details

Flicker Meter Type	Viso Systems LabFlicker	Measurement time	
Frequency of input power	50 Hz	PstLM	180 sec
Flicker/TLA sample rate	20000 samples/s	All other indices	1,2 sec
Flicker indices according to Illuminating Engineering Society (IES)		Flicker indices according to California Energy Commission (CEC) 2016b	
Flicker frequency	100 Hz	JA8/10 40 Hz	0,03 %
Percent Flicker	1,18 %	JA8/10 90 Hz	0,05 %
Flicker index	0	JA8/10 200 Hz	1,14 %
		JA8/10 400 Hz	1,18 %
		JA8/10 1000 Hz	1,18 %
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)		Flicker indices according to Lighting Research Center (2015)	
PstLM value (F < 80 Hz)	0,03	Perception metric, Assist Mp	0,02
SVM value (80 < F < 2000 Hz)	0,04		

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

