

Test report

Laboratory and Equipment

Test lab
Spectrometer Manufacturer and Model
Measurement date

Viso LabSpion - serial: 3331725735 sensor serial: 3532797498 - T
LabSpion - Type C, horizontal
01/09/2026

Measurement Conditions

Tested c-planes
Tested gamma resolution
Input Power

72 planes - 5,00°
1,00°
10,33 W

Tested Light Source

Luminaire
Basic Luminous Shape
Item No.
Manufacturer
Description
Dimensions, luminous surface
Dimensions, light source housing

BETALED 10 3000K 24D WHITE
SPOT
01401000302403
ELECTRUM
LED Bridgelux\line Driver Eaglerise \line 250mA\line
H/D = 0, W = 0, L = 3,3, Shape = SPOT
H/D = 7,3, W = 0, L = 9,4

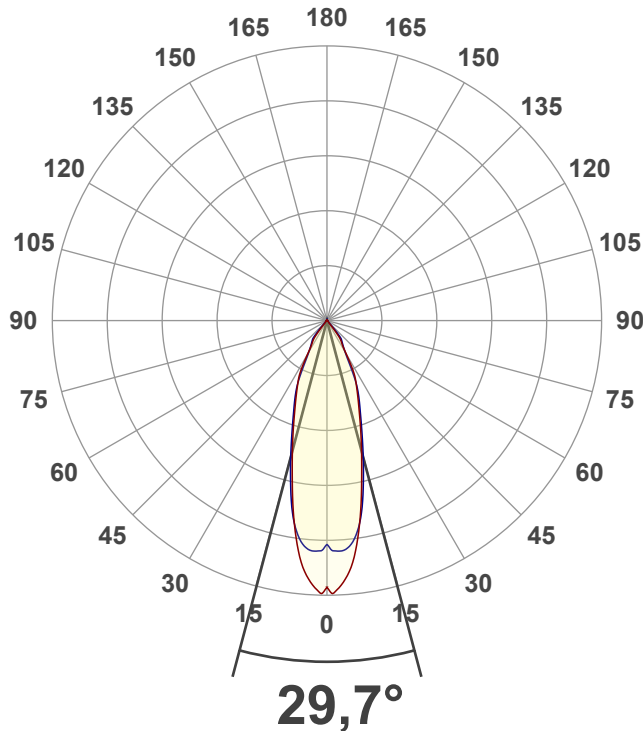
Main Light Measurement Results

Output - Total Lumen (Up% / Down%)
Efficiency
Peak Intensity
Correlated Color Temperature, CCT
Color Rendering Index

1034 lm - 0,2416% / 99,76%
100,1 lm/W
2636 cd
3000 K
CRI 92,7 TM30Rf 89,3 TM30 Rg 104,5

Polar light distribution diagram

Unit: 0-100% of peak intensity



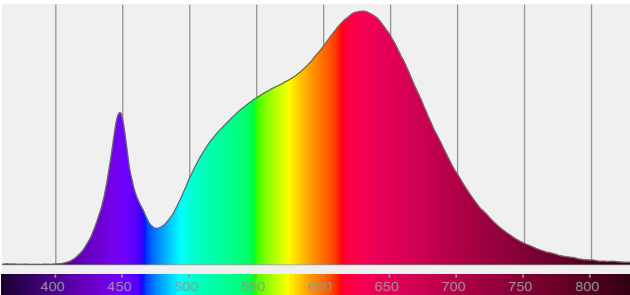
— C0 - C180
— C90 - C270

$\eta = 100\%$

Product photo

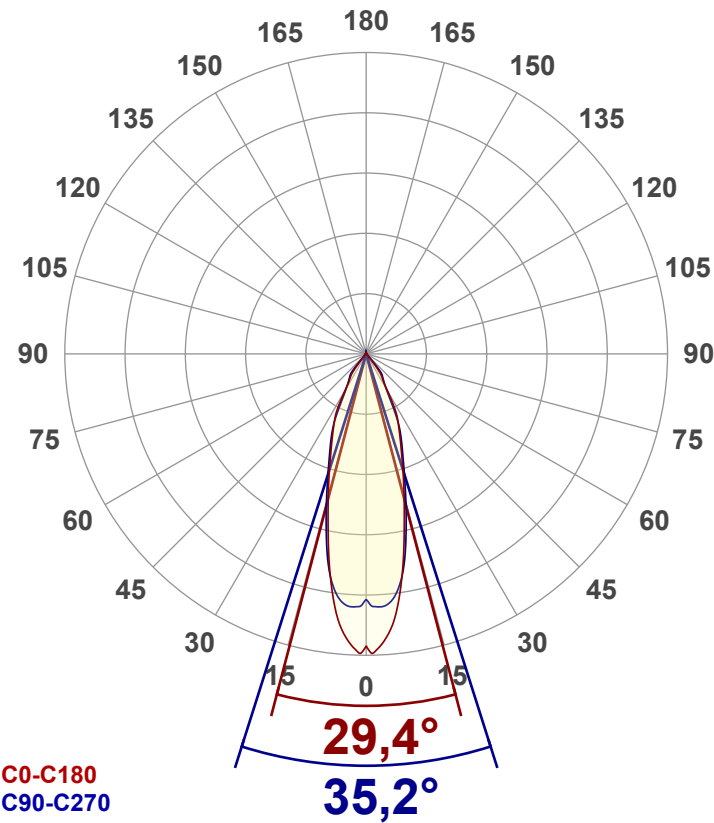


Spectral power distribution



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	1034 lm
Lumen Up% / Down%	0,2416% / 99,76%
Peak Intensity	2636 cd
Beam Angle (50%-FWHM)	29,7°

EU Ecodesign parameters

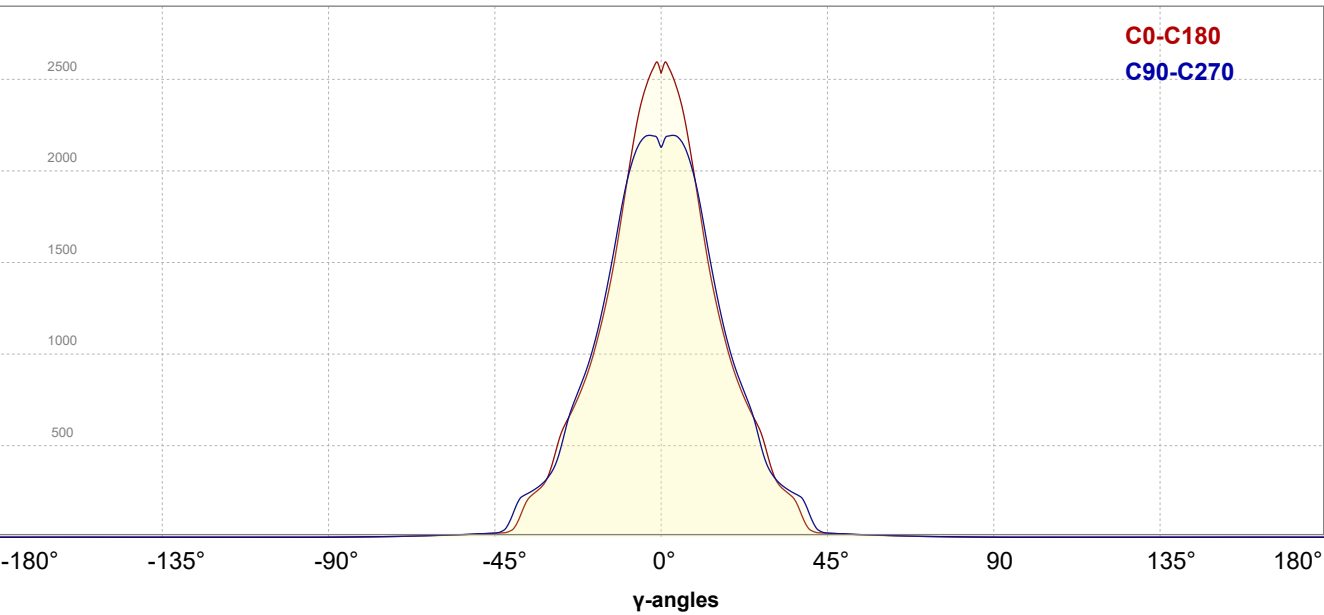
Directionality (DLS or NDLS)	DLS
Ecodesign Useful Luminous Flux	998,7 lm
Ecodesign Energy Class	E

Intensity Ratio

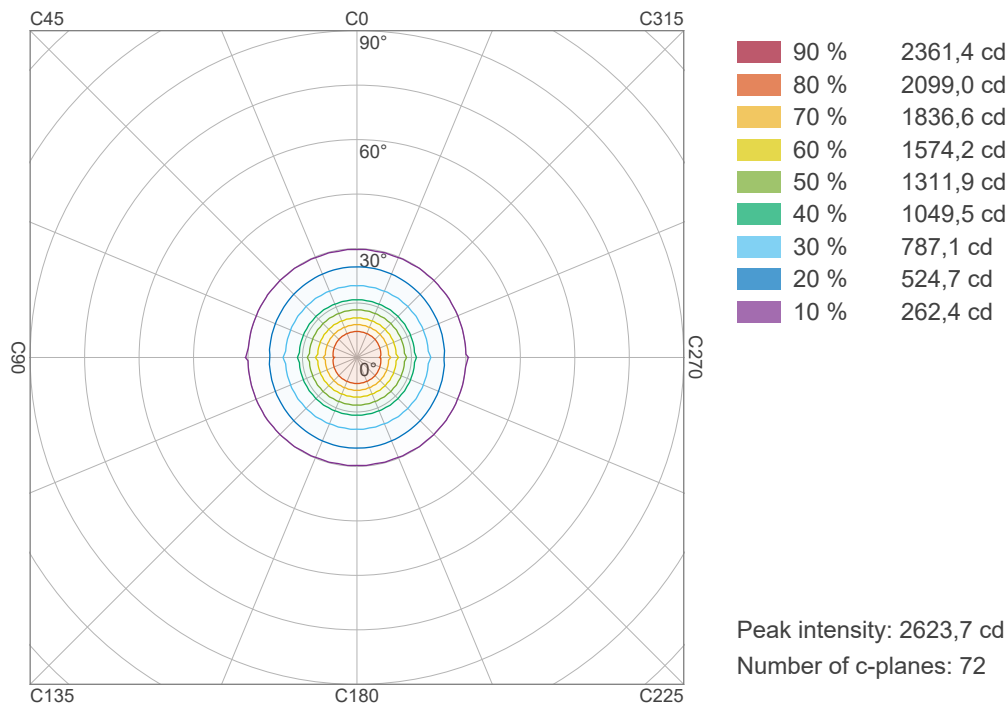
In 120° cone	98,58%
In 90° cone	96,62%

Linear distribution diagram

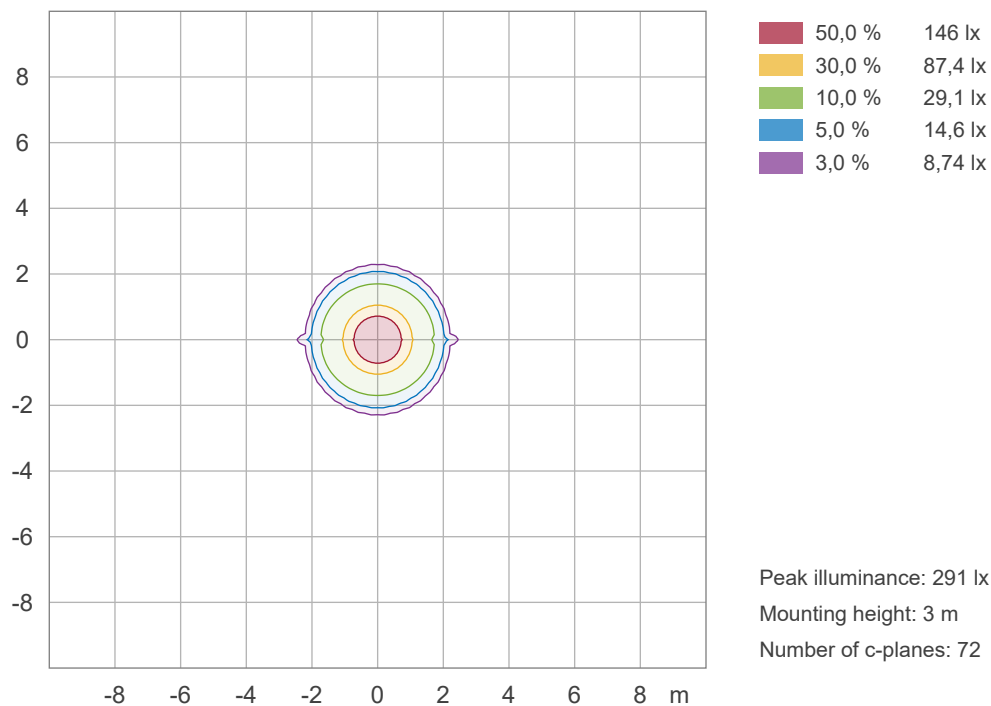
Intensity [cd]



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



Test report

Color details

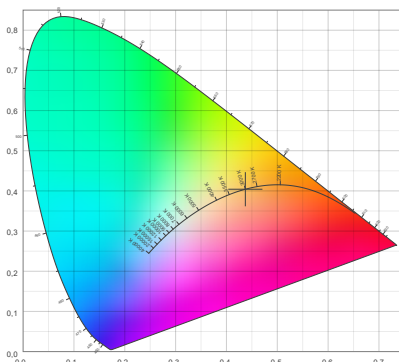
Correlated Color Temperature, Target
Correlated Color Temperature, Measured
Color Rendering Index
Color Rendering Index, R9 (red)
Color Rendering TM30-18

CCT = 3000 K
CCT = 3028 K
CRI 92,7
R9 = 74,9
Rf 89,3
Rg 104,5

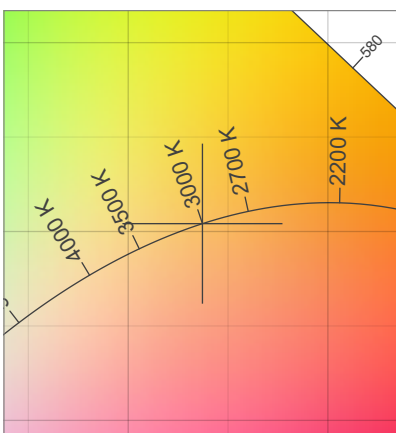
MacAdam Steps
Color deviation from BBL
Color coordinates CIE 1931
Color coordinate CIEs 1960
Color coordinate CIEs 1976
Color Quality Scale

SDCM = 2,4
Duv = -0,0020
(x;y) = (0,4372;0,4042)
(u;v) = (0,2507;0,3476)
(u';v') = (0,2507;0,5215)
CQS = 89,2

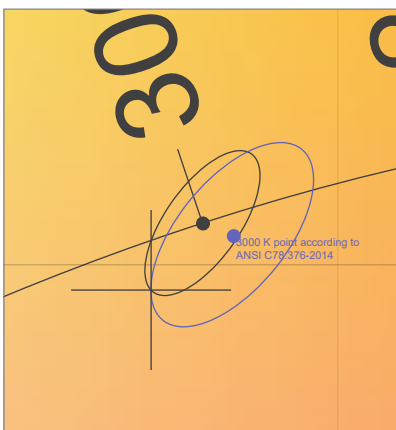
CIE 1931 Chromaticity diagram



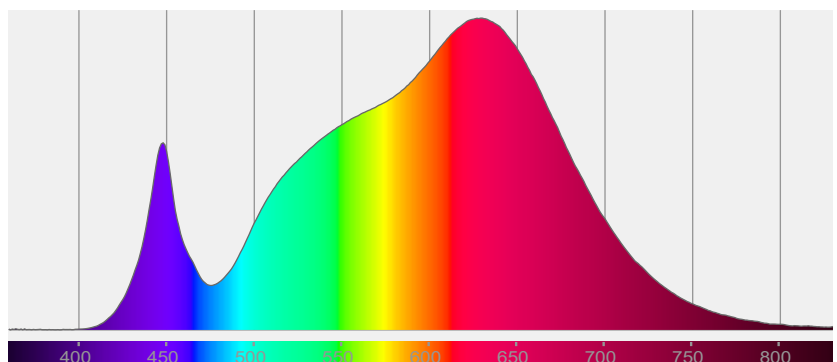
CIE 1931 Chromaticity - zoomed



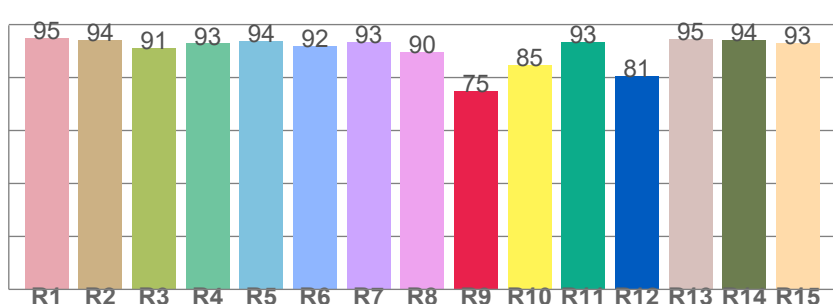
CIE 1931 Chromaticity - SDCM



Spectral power distribution



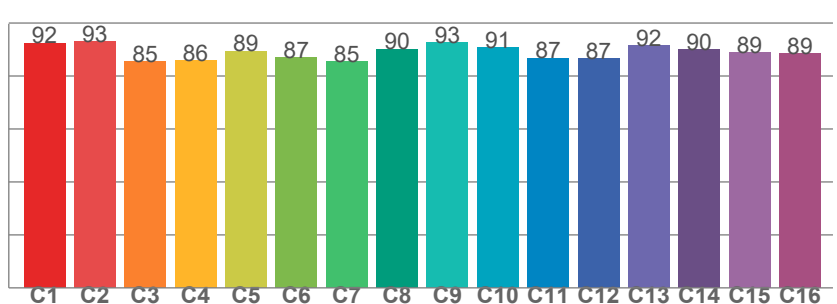
Color Rendering Index per reference color (CIE 1995)



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
95,1	94,1	91,0	92,8	93,6	91,8	93,2	89,7	74,9	84,8	93,3	80,6	94,6	94,0	93,1

TM30-18 Rf-values per hue bin

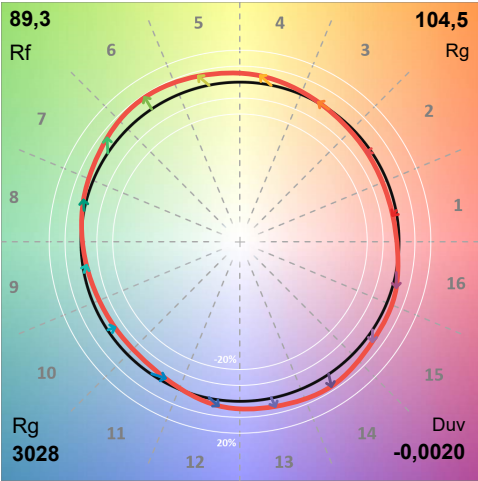


TM30-18 Rf-values per hue bin

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
92,5	93,1	85,4	85,9	89,4	87,1	85,4	90,2	92,7	90,8	86,8	86,8	91,6	90,0	88,8	88,6

Color details - ANSI/IES TM-30-18 Color Rendition Report

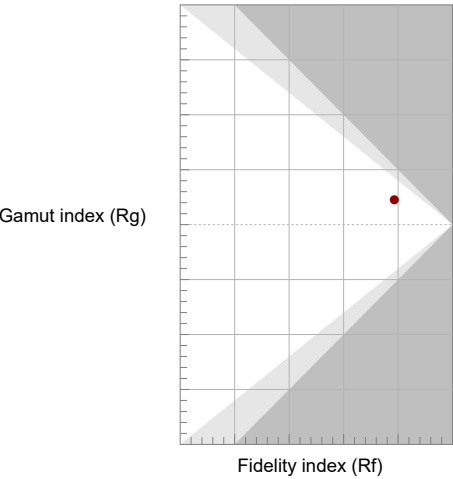
Color Vector Graphic



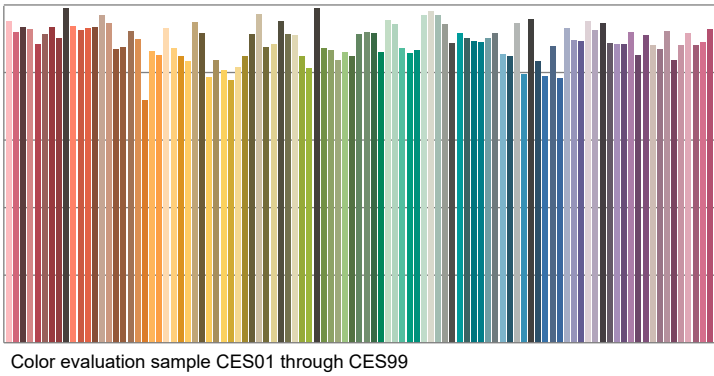
Color Distortion Graphic



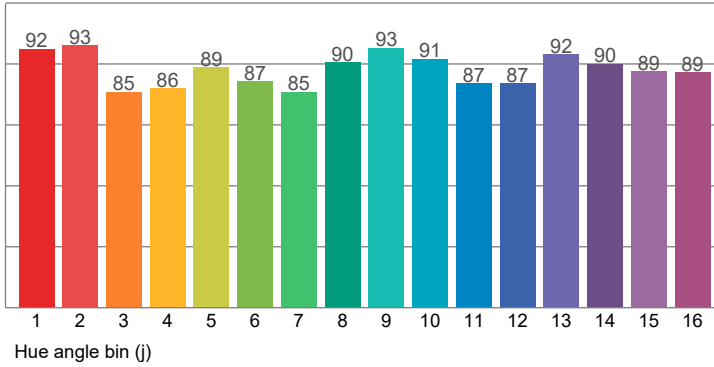
Gamut Index vs. Fidelity Index



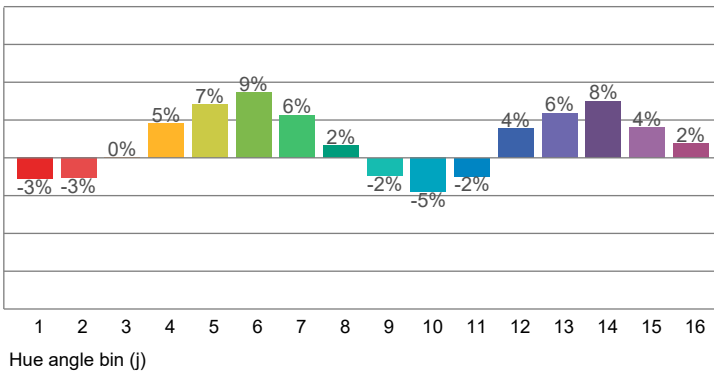
Color Rendition by Color Evaluation Sample (CES)



Local Color Fidelity (per hue bin)



Local Chroma Shift (per hue bin)



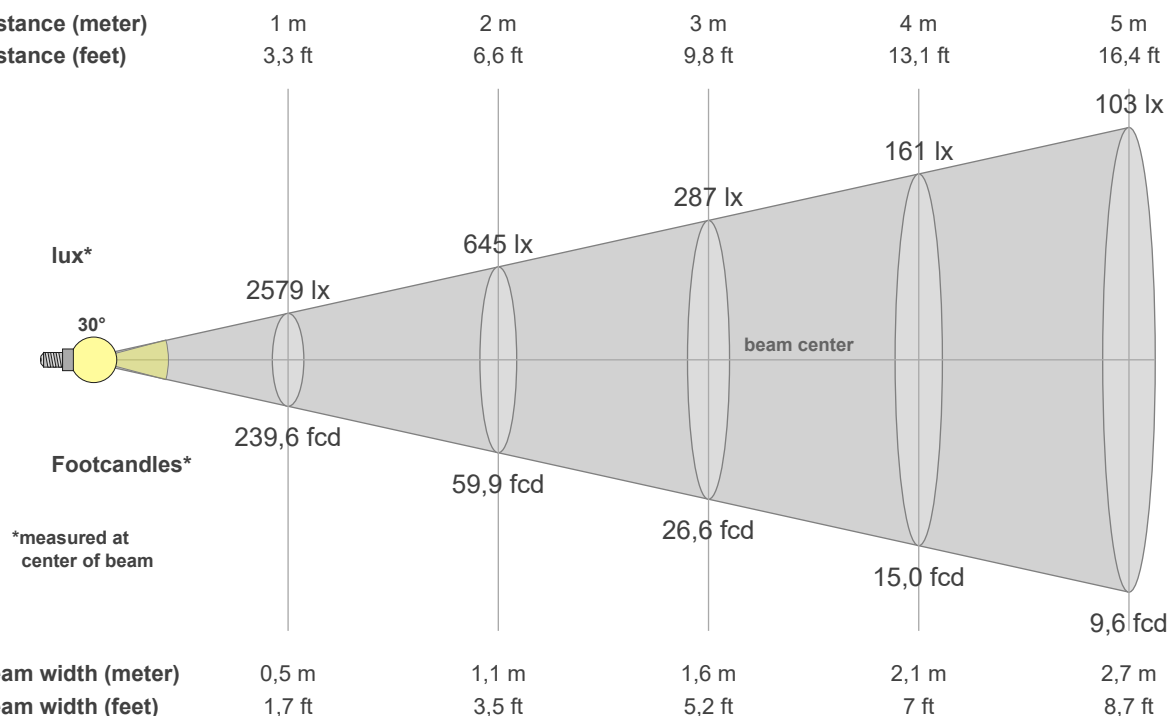
CIE x 0,4372
CIE y 0,4372
CIE u' 0,2507
CIE v' 0,5215

CIE 13.3-1995

Ra 92,7
R9 74,9

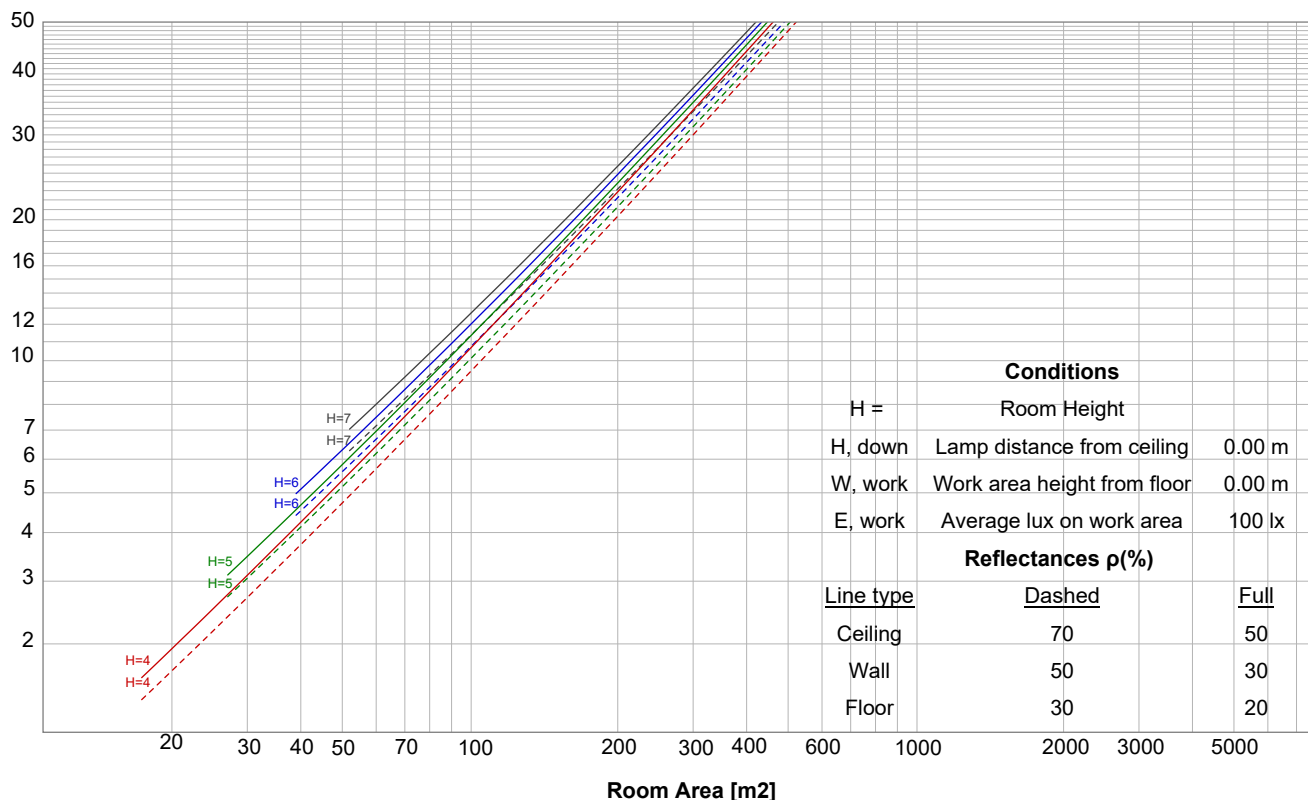
Test report

Beam details



Luminaire budgetary diagram

LAMPS (number of lamps)



Test report

Intensity 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
2579	645	287	161	103	72	53	40	32	26	21	18	15	13	11	10	9	8	7	6	lux
239,6	59,9	26,6	15	9,6	6,7	4,9	3,7	3	2,4	2	1,7	1,4	1,2	1,1	0,9	0,8	0,7	0,7	0,6	fc

Intensities in 0° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2579	2565	2466	2317	2095	1842	1584	1364	1180	1022	890	784	694	616	506	366	284	246	209	122	cd
100%	99%	96%	90%	81%	71%	61%	53%	46%	40%	35%	30%	27%	24%	20%	14%	11%	10%	8%	5%	of 0°val

Intensities in 90° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2579	2189	2190	2143	2037	1872	1653	1432	1234	1064	928	819	714	578	431	345	296	264	240	215	cd
100%	85%	85%	83%	79%	73%	64%	56%	48%	41%	36%	32%	28%	22%	17%	13%	11%	10%	9%	8%	of 0°val

Intensities in 180° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2579	2565	2466	2317	2095	1842	1584	1364	1180	1022	890	784	694	616	506	366	284	246	209	122	cd
100%	99%	96%	90%	81%	71%	61%	53%	46%	40%	35%	30%	27%	24%	20%	14%	11%	10%	8%	5%	of 0°val

Intensities in 270° c-plane

0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°	γ
2579	2189	2190	2143	2037	1872	1653	1432	1234	1064	928	819	714	578	431	345	296	264	240	215	cd
100%	85%	85%	83%	79%	73%	64%	56%	48%	41%	36%	32%	28%	22%	17%	13%	11%	10%	9%	8%	of 0°val

Test report

UGR Table

Corrected, comprehensive UGR table according to 117-1995, S/H ratio=0.25

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		21,3	21,8	21,4	22,1	22,3	21,6	22,2	21,7	22,4	22,6
	3H		21,2	21,9	21,6	22,1	22,3	21,5	22,2	21,9	22,4	22,6
	4H		21,2	21,9	21,6	22,1	22,4	21,5	22,2	21,9	22,4	22,7
	6H		21,3	21,9	21,6	22,2	22,5	21,6	22,1	21,9	22,4	22,8
	8H		21,3	21,8	21,6	22,2	22,5	21,6	22,1	21,9	22,4	22,8
	12H		21,3	21,8	21,6	22,2	22,6	21,6	22,1	21,9	22,4	22,9
4H	2H		21,0	21,7	21,4	21,9	22,2	21,4	22,0	21,8	22,3	22,5
	3H		21,2	21,7	21,6	22,1	22,5	21,5	22,0	21,9	22,4	22,8
	4H		21,2	21,7	21,6	22,1	22,6	21,5	22,0	21,9	22,4	22,9
	6H		21,3	21,8	21,8	22,1	22,5	21,5	22,1	22,0	22,4	22,8
	8H		21,3	21,8	21,8	22,1	22,5	21,6	22,0	22,1	22,4	22,7
	12H		21,3	21,7	21,8	22,1	22,5	21,5	21,9	22,0	22,3	22,8
8H	4H		21,2	21,6	21,7	22,0	22,4	21,4	21,9	22,0	22,3	22,6
	6H		21,3	21,6	21,8	22,1	22,6	21,6	21,9	22,1	22,3	22,9
	8H		21,4	21,7	21,9	22,2	22,8	21,6	21,9	22,2	22,4	23,0
	12H		21,5	21,7	22,0	22,2	22,8	21,7	21,9	22,3	22,4	23,0
12H	4H		21,1	21,5	21,6	21,9	22,4	21,4	21,8	21,9	22,2	22,6
	6H		21,3	21,6	21,8	22,1	22,7	21,6	21,8	22,1	22,3	23,0
	8H		21,4	21,6	22,0	22,1	22,7	21,6	21,8	22,2	22,3	22,9
Variations with the observer position for the luminaire spacings, S:												
S = 1.0H			4,4 / -3,3					4,8 / -3,6				
S = 1.5H			7,0 / -3,7					7,4 / -4,1				
S = 2.0H			8,9 / -4,1					9,3 / -4,6				

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	20
RCR		(Room Cavity Ratio)				Room values are expressed as percentage of Lumen delivered to the task surface												
0	119,0	119,0	119,0	119,0	116,2	116,2	116,2	116,2	111,0	111,0	111,0	106,2	106,2	106,2	101,8	101,8	101,8	99,8
1	114,0	111,4	109,1	107,1	111,5	109,2	107,2	105,3	105,2	103,5	102,1	101,4	100,2	99,0	98,0	97,0	96,1	94,3
2	109,1	104,6	101,0	97,9	106,9	102,9	99,6	96,8	99,7	97,0	94,7	96,7	94,5	92,6	94,0	92,2	90,7	89,1
3	104,4	98,6	94,2	90,6	102,4	97,3	93,2	89,9	94,7	91,2	88,4	92,3	89,4	87,0	90,0	87,7	85,7	84,2
4	100,0	93,3	88,4	84,6	98,2	92,1	87,6	84,1	90,0	86,2	83,1	88,1	84,8	82,1	86,2	83,5	81,2	79,8
5	95,8	88,4	83,3	79,5	94,3	87,5	82,7	79,1	85,8	81,6	78,4	84,2	80,6	77,7	82,6	79,5	77,1	75,7
6	91,9	84,1	78,8	75,1	90,5	83,3	78,4	74,8	81,9	77,5	74,3	80,5	76,7	73,8	79,2	75,9	73,3	72,0
7	88,2	80,1	74,8	71,2	87,0	79,5	74,5	71,0	78,2	73,8	70,6	77,1	73,1	70,2	76,0	72,5	69,8	68,6
8	84,8	76,5	71,3	67,7	83,7	75,9	71,0	67,5	74,9	70,4	67,2	73,9	69,9	66,9	73,0	69,4	66,7	65,5
9	81,6	73,2	68,0	64,5	80,5	72,7	67,8	64,4	71,8	67,3	64,2	70,9	66,9	64,0	70,1	66,5	63,8	62,6
10	78,5	70,1	65,0	61,7	77,6	69,7	64,9	61,6	68,9	64,5	61,4	68,2	64,1	61,3	67,5	63,8	61,1	60,0

Test report

Light measurement results

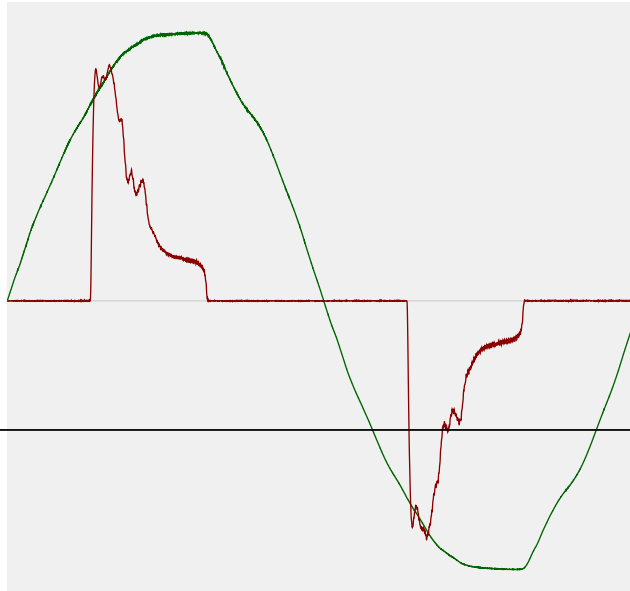
Print date 01-09-2026

Power details

Input power

Frequency of input power	50,0 Hz
Power feed to light source	10,33 W
RMS Input voltage feed V,RMS	242,2 V
RMS Input current feed I,RMS	0,07 A
Volt-Amp or apparent power = V,RMS*I,RMS	16,8 VA
Displacement factor of AC power feed	0,93
Power factor of AC current feed	0,62
Total harmonic distortion of the current	105,5%
Total harmonic distortion of the voltage	3,181%

Input power curve



Efficiency

Radiated power efficiency 35,81

Lumen efficiency 100,1 lm/W

Stabilization details

Warmup Conditions

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

Color Temperature Change

CCT start	3009 K
CCT shift	-9 K
CCT end	3000 K

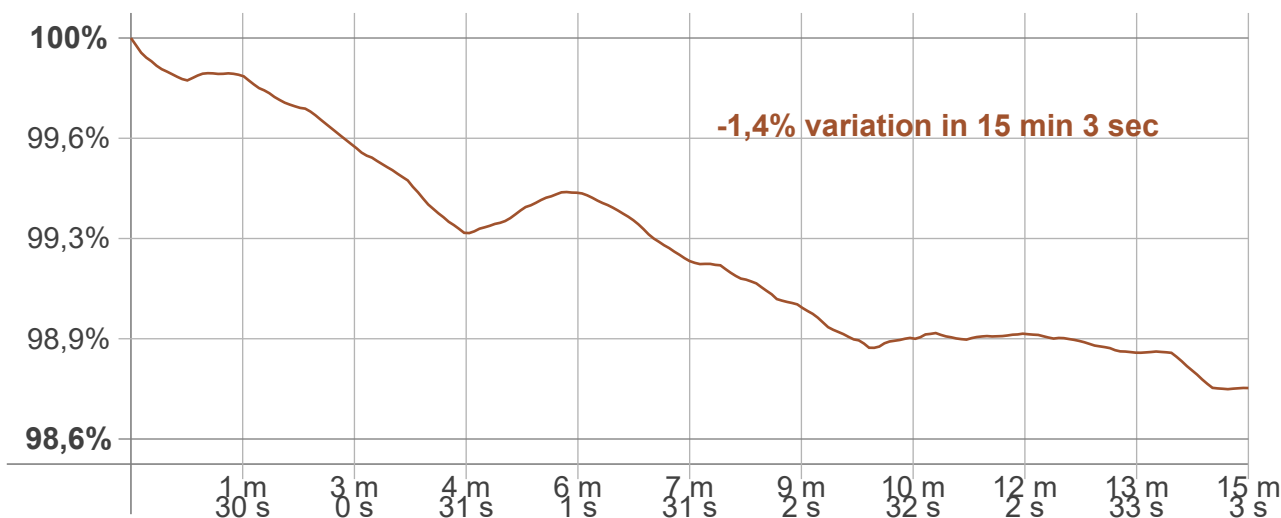
Warmup Result

Total warmup time	Lamp stabilized in
Warmup variation	-1,4115%

Output Change

Output start	1048 lm
Output change	-13,995 lm
Output end	1034 lm

Stabilization Curve



Flicker TLA details

Flicker Meter Type	Viso Systems LabFlicker
Frequency of input power	50,0 Hz
Flicker/TLA sample rate	20,0 samples/s

Measurement time	
PstLM	180 sec.
All other indices	1,5 sec,

Flicker indices according to Illuminating Engineering Society (IES)

Flicker frequency	100,0 Hz
Percent Flicker	0,8756 %
Flicker index	0,0

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

JA8/10 40 Hz	0,1077 %
JA8/10 90 Hz	0,3239 %
JA8/10 200 Hz	0,9336 %
JA8/10 400 Hz	0,8568 %
JA8/10 1000 Hz	0,8689 %

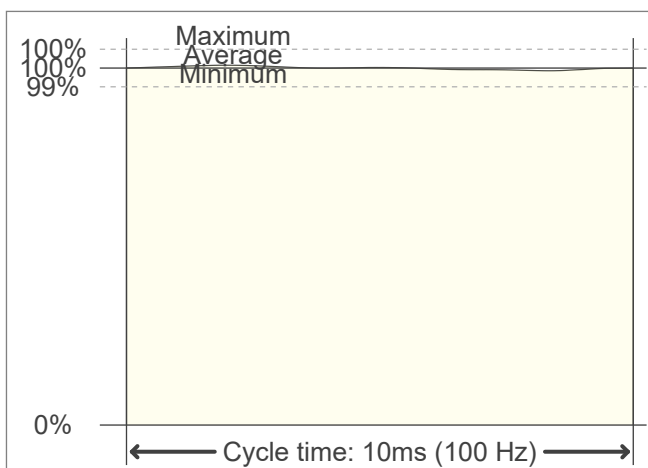
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value ($F < 80$ Hz)	0,06
SVM value ($80 < F < 2000$ Hz)	0,02

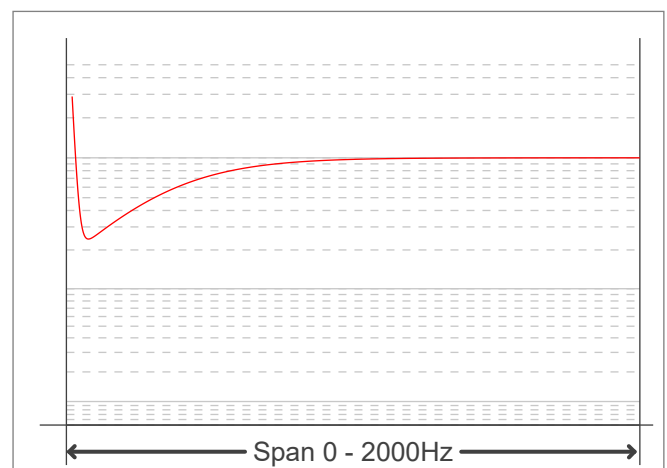
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp	0,03
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Flicker frame (frame of one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

