

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
08/10/2026

Measurement Conditions

Tested c-planes
Tested gamma resolution
Input Power

72 planes - 5,00°
1,00°
27,97 W

Tested Light Source

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

MARLI 30 3000K 36D WHITE
SPOT
06110000303603
ELECTRUM
700mA\line LED CITIZEN 1208 GEN9\line
H/D = 0, W = 0, L = 6,4, Shape = SPOT
H/D = 17,5, W = 0, L = 7,5

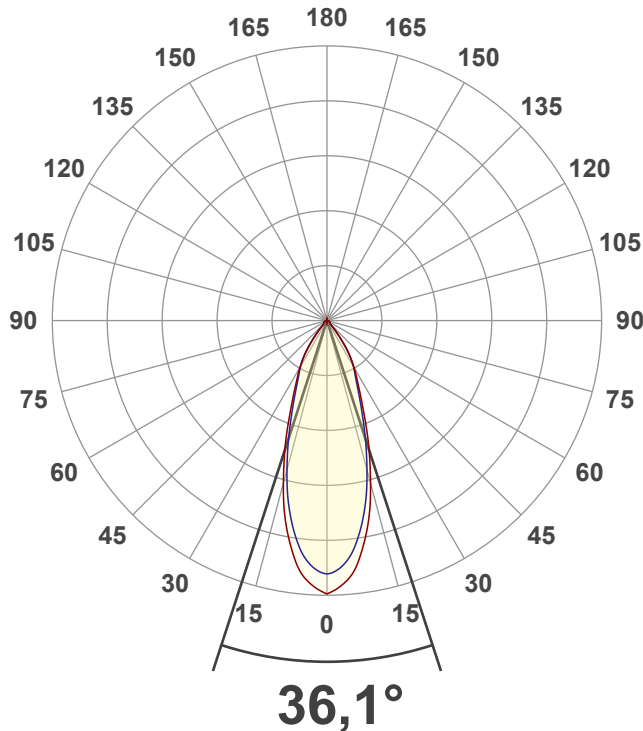
Main Light Measurement Results

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

3112 lm - 0,7024% / 99,3%
111,2 lm/W
6172 cd
3000 K
CRI 92,4 TM30Rf 91,9 TM30 Rg 99,5

Polar light distribution diagram

Unit: 0-100% of peak intensity



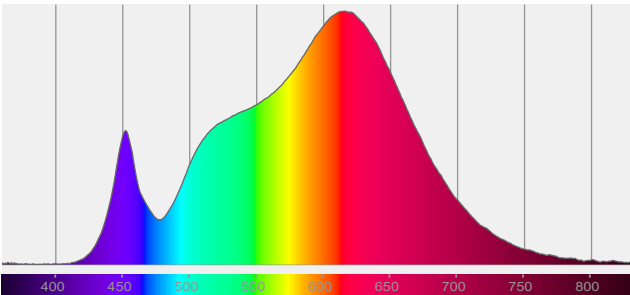
— C0 - C180
— C90 - C270

$\eta = 100\%$

Product photo

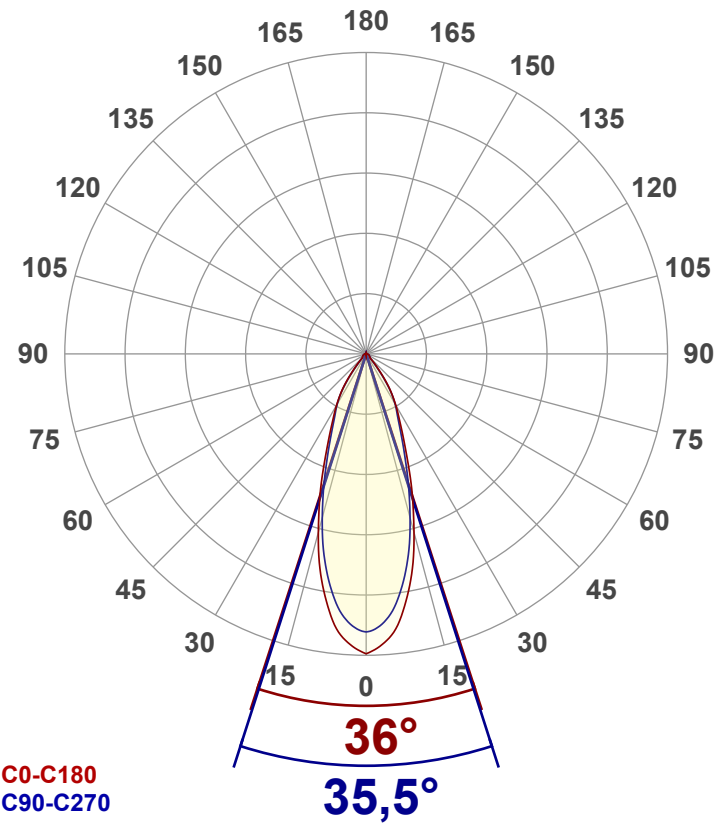


Spectral power distribution



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	3112 lm
Lumen Up% / Down%	0,7024% / 99,3%
Peak Intensity	6172 cd
Beam Angle (50%-FWHM)	36,1°

EU Ecodesign parameters

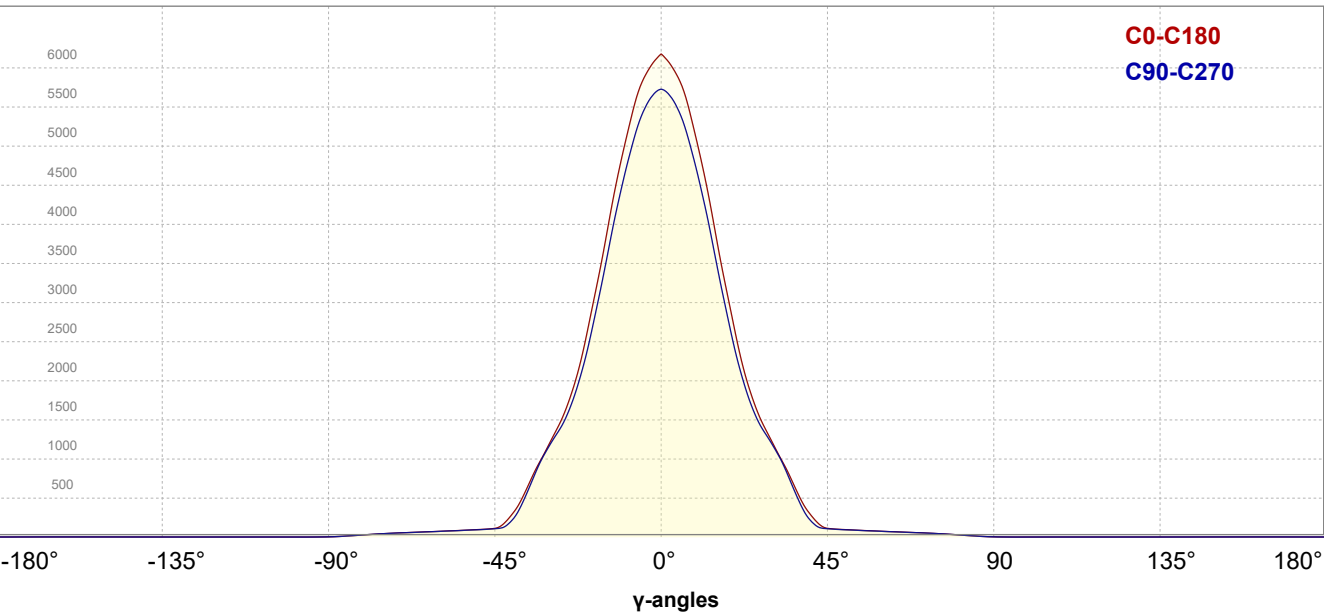
Directionality (DLS or NDLS)	DLS
Ecodesign Useful Luminous Flux	2841 lm
Ecodesign Energy Class	E

Intensity Ratio

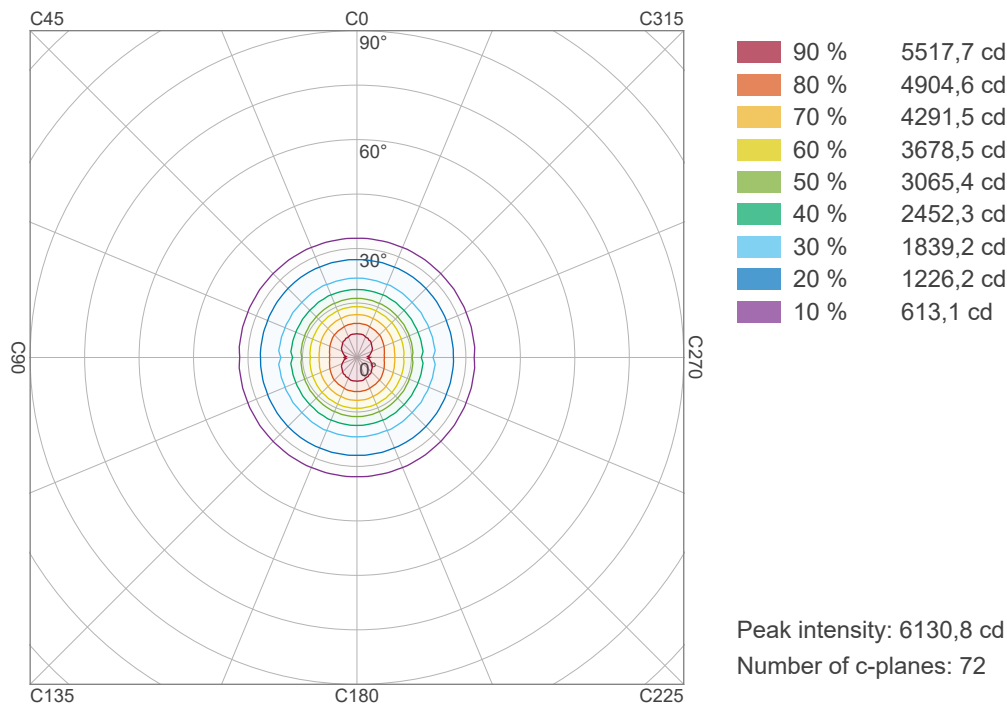
In 120° cone	95,06%
In 90° cone	91,29%

Linear distribution diagram

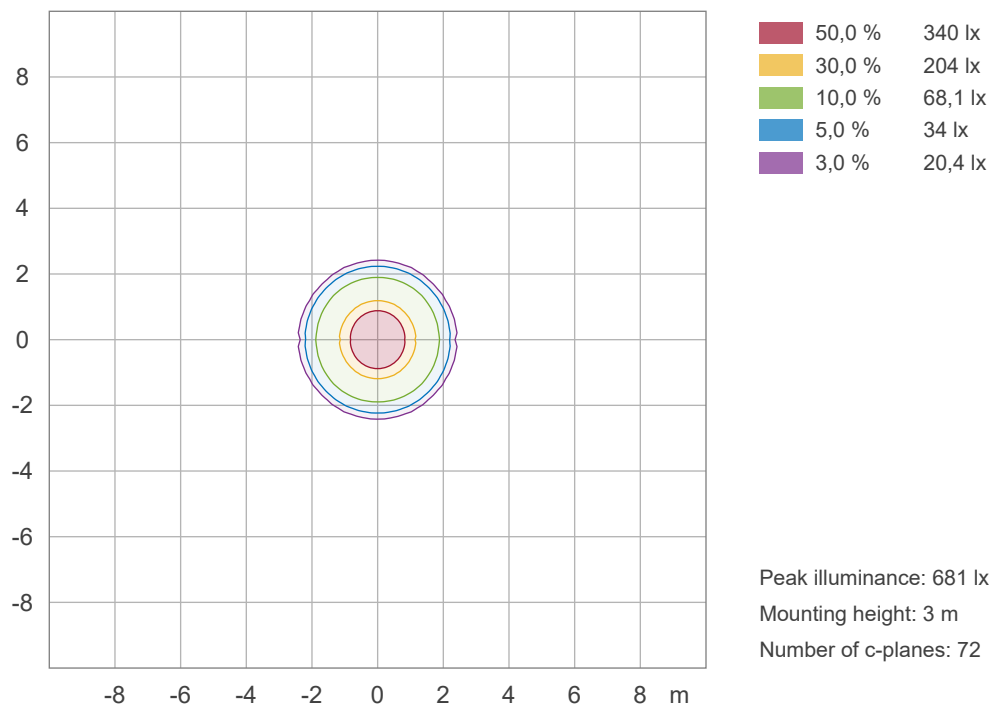
Intensity [cd]



Iso-intensity Diagram (Iso-candela)



Iso-illuminance Diagram (Iso-lux)



Test report

Color details

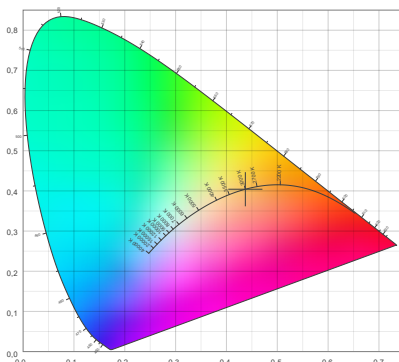
Correlated Color Temperature, Target
Correlated Color Temperature, Measured
Color Rendering Index
Color Rendering Index, R9 (red)
Color Rendering TM30-18

CCT = 3000 K
CCT = 3064 K
CRI 92,4
R9 = 51,6
Rf 91,9
Rg 99,5

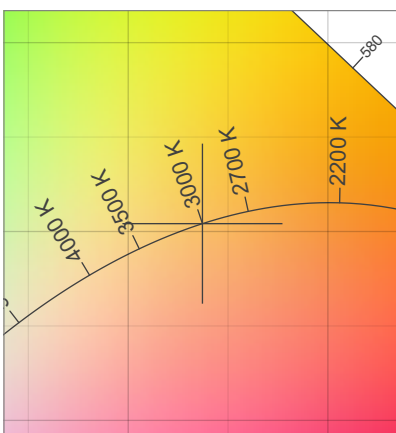
MacAdam Steps
Color deviation from BBL
Color coordinates CIE 1931
Color coordinate CIEs 1960
Color coordinate CIEs 1976
Color Quality Scale

SDCM = 2,4
Duv = 0,0014
(x;y) = (0,4372;0,4042)
(u;v) = (0,2507;0,3476)
(u';v') = (0,2507;0,5215)
CQS = 90,9

CIE 1931 Chromaticity diagram



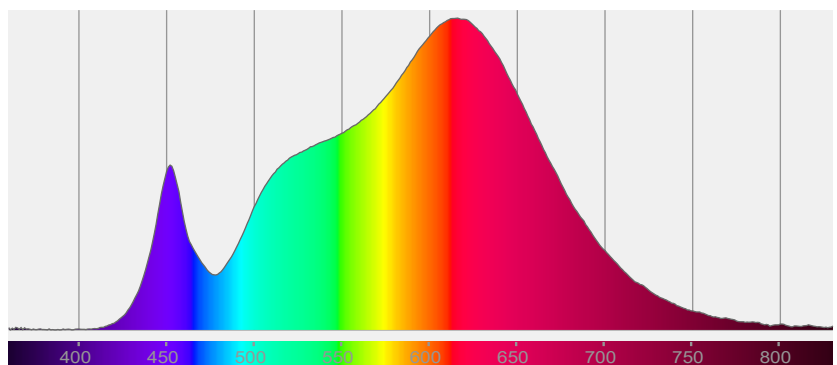
CIE 1931 Chromaticity - zoomed



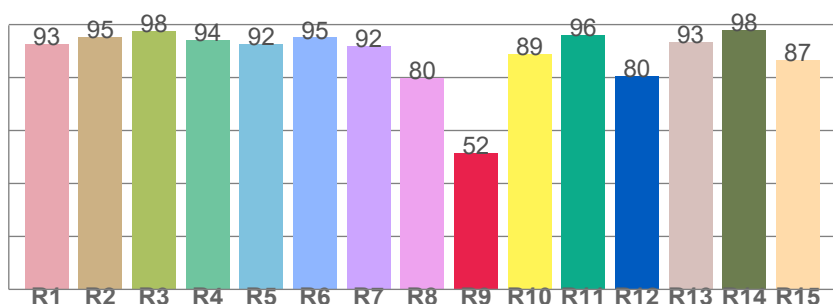
CIE 1931 Chromaticity - SDCM



Spectral power distribution



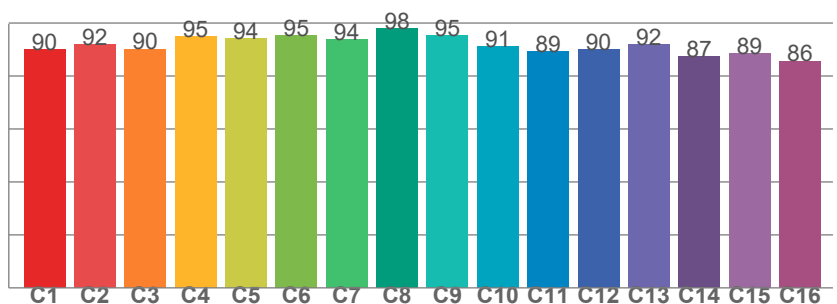
Color Rendering Index per reference color (CIE 1995)



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
92,7	95,2	97,6	94,3	92,5	95,1	92,0	79,7	51,6	88,7	96,2	80,4	93,4	98,0	86,5

TM30-18 Rf-values per hue bin

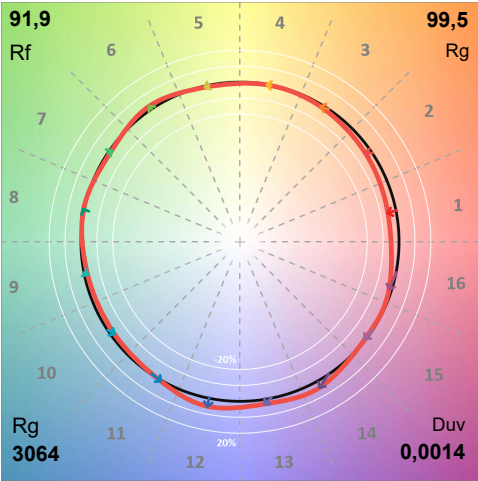


TM30-18 Rf-values per hue bin

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90,1	92,0	90,2	95,0	94,1	95,4	93,7	98,0	95,4	91,3	89,1	90,2	91,9	87,4	88,6	85,6

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

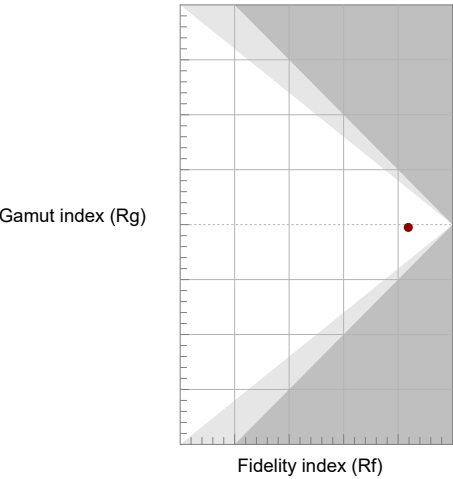
Color Vector Graphic



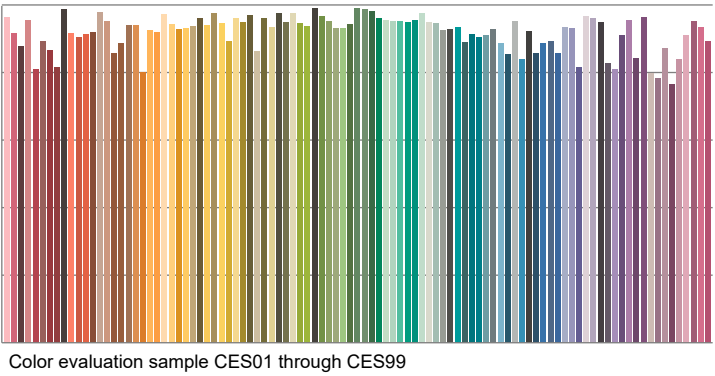
Color Distortion Graphic



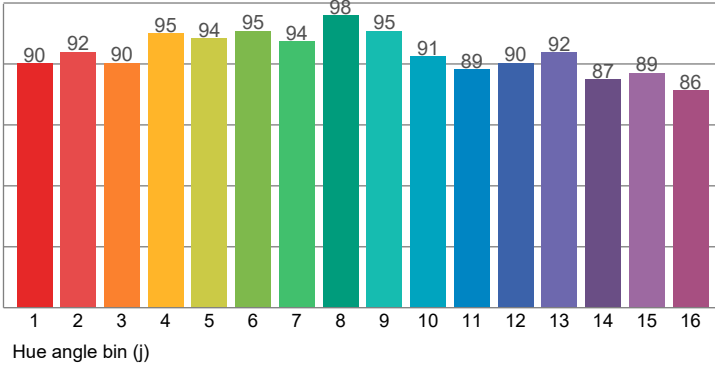
Gamut Index vs. Fidelity Index



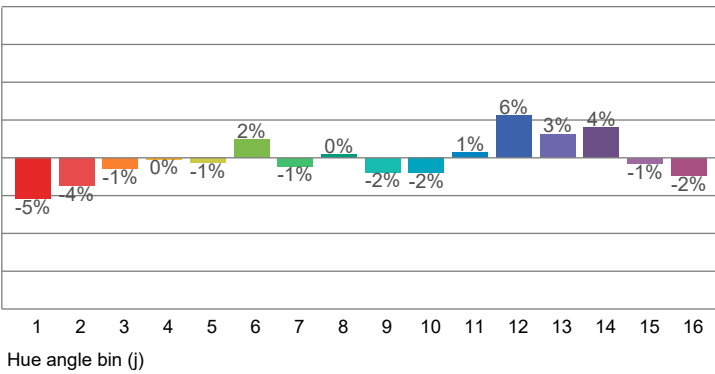
Color Rendition by Color Evaluation Sample (CES)



Local Color Fidelity (per hue bin)



Local Chroma Shift (per hue bin)

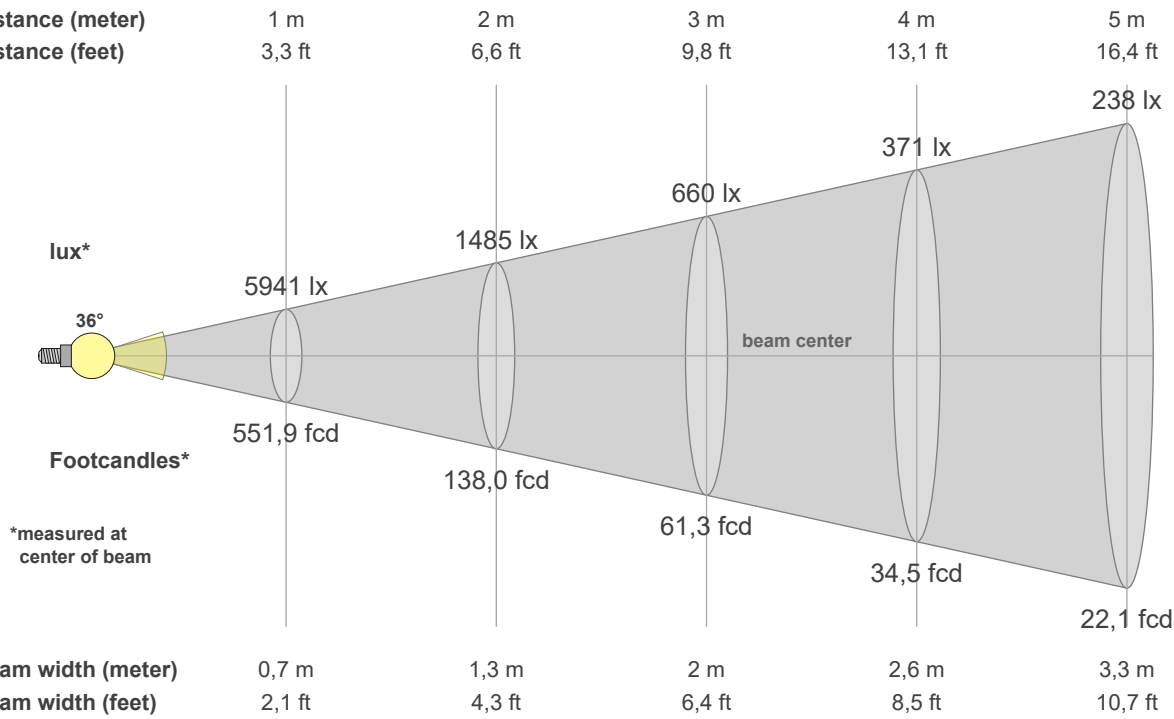


CIE x 0,4372
CIE y 0,4372
CIE u' 0,2507
CIE v' 0,5215

CIE	13.3-1995
Ra	92,4
R9	51,6

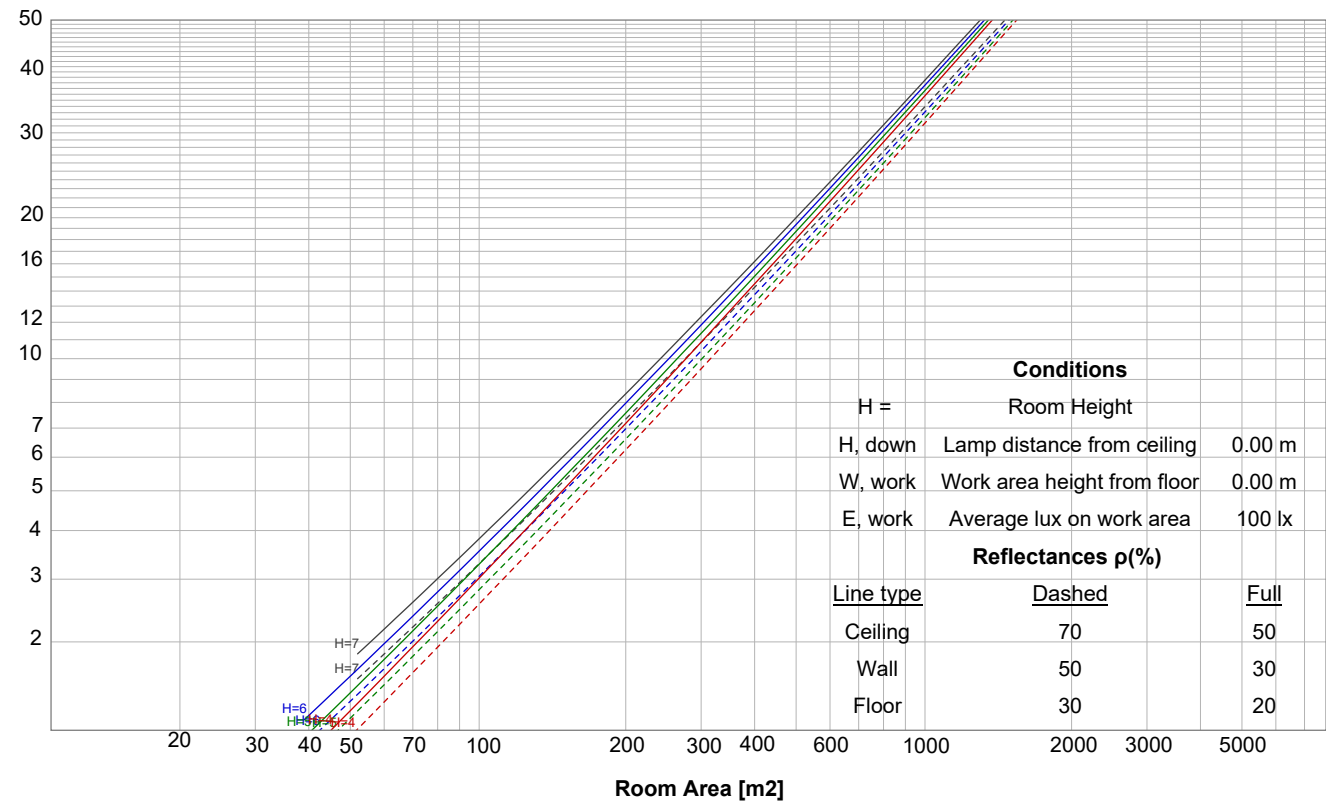
Test report

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
5941	1485	660	371	238	165	121	93	73	59	49	41	35	30	26	23	21	18	16	15	lux
551,9	138	61,3	34,5	22,1	15,3	11,3	8,6	6,8	5,5	4,6	3,8	3,3	2,8	2,5	2,2	1,9	1,7	1,5	1,4	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
5941	6076	5928	5716	5382	4988	4558	4068	3554	3084	2625	2208	1878	1611	1403	1220	1037	861	659	464	cd
100%	102%	100%	96%	91%	84%	77%	68%	60%	52%	44%	37%	32%	27%	24%	21%	17%	14%	11%	8%	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
5941	5663	5520	5299	4981	4610	4197	3735	3260	2811	2388	2033	1739	1508	1339	1189	1024	823	601	393	cd
100%	95%	93%	89%	84%	78%	71%	63%	55%	47%	40%	34%	29%	25%	23%	20%	17%	14%	10%	7%	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
5941	6076	5928	5716	5382	4988	4558	4068	3554	3084	2625	2208	1878	1611	1403	1220	1037	861	659	464	cd
100%	102%	100%	96%	91%	84%	77%	68%	60%	52%	44%	37%	32%	27%	24%	21%	17%	14%	11%	8%	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
5941	5663	5520	5299	4981	4610	4197	3735	3260	2811	2388	2033	1739	1508	1339	1189	1024	823	601	393	cd
100%	95%	93%	89%	84%	78%	71%	63%	55%	47%	40%	34%	29%	25%	23%	20%	17%	14%	10%	7%	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		23,0	23,7	23,2	23,9	24,1	22,8	23,5	23,0	23,7	23,9
	3H		23,8	24,6	24,2	24,8	25,0	23,6	24,4	24,0	24,6	24,8
	4H		24,4	25,1	24,8	25,3	25,6	24,2	24,9	24,6	25,2	25,4
	6H		25,0	25,6	25,3	25,9	26,3	24,8	25,5	25,1	25,8	26,1
	8H		25,2	25,8	25,5	26,1	26,5	25,1	25,7	25,4	26,0	26,4
	12H		25,3	25,9	25,7	26,3	26,7	25,2	25,8	25,6	26,2	26,6
4H	2H		23,1	23,8	23,5	24,1	24,3	22,9	23,7	23,3	23,9	24,2
	3H		24,4	25,0	24,7	25,3	25,7	24,2	24,8	24,6	25,2	25,6
	4H		25,1	25,6	25,5	26,0	26,6	24,9	25,5	25,4	25,9	26,4
	6H		25,8	26,4	26,3	26,7	27,1	25,7	26,3	26,2	26,6	27,0
	8H		26,1	26,6	26,6	27,0	27,3	26,0	26,5	26,5	26,9	27,2
	12H		26,3	26,7	26,8	27,1	27,6	26,2	26,6	26,7	27,0	27,5
8H	4H		25,4	25,9	25,9	26,2	26,6	25,2	25,8	25,8	26,1	26,5
	6H		26,3	26,6	26,8	27,1	27,7	26,2	26,5	26,7	27,0	27,6
	8H		26,7	27,0	27,2	27,5	28,2	26,6	26,9	27,1	27,4	28,1
	12H		27,0	27,3	27,6	27,8	28,4	27,0	27,2	27,6	27,7	28,3
12H	4H		25,4	25,8	25,9	26,2	26,7	25,3	25,7	25,8	26,1	26,6
	6H		26,4	26,7	26,9	27,2	27,9	26,3	26,6	26,8	27,1	27,8
	8H		26,8	27,1	27,4	27,6	28,2	26,7	27,0	27,3	27,5	28,1
Variations with the observer position for the luminaire spacings, S:												
S = 1.0H			1,5 / -0,6					1,4 / -0,5				
S = 1.5H			3,0 / -0,6					2,9 / -0,6				
S = 2.0H			4,4 / -0,8					4,2 / -0,7				

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	118,9	118,9	118,9	118,9	116,0	116,0	116,0	116,0	110,7	110,7	110,7	105,9	105,9	105,9	101,4	101,4	101,4	99,3
1	113,0	110,1	107,5	105,1	110,4	107,8	105,5	103,4	103,7	101,8	100,1	99,8	98,3	96,9	96,3	95,1	94,0	92,2
2	107,4	102,4	98,3	94,8	105,1	100,6	96,8	93,7	97,3	94,2	91,5	94,2	91,6	89,4	91,3	89,3	87,5	85,8
3	102,2	95,7	90,7	86,7	100,1	94,3	89,7	86,0	91,5	87,7	84,5	89,0	85,8	83,1	86,7	84,0	81,8	80,1
4	97,3	89,9	84,4	80,2	95,5	88,7	83,6	79,7	86,4	82,1	78,7	84,4	80,7	77,7	82,4	79,3	76,7	75,2
5	92,8	84,7	79,0	74,8	91,2	83,7	78,4	74,4	81,9	77,2	73,7	80,1	76,1	73,0	78,5	75,1	72,3	70,8
6	88,7	80,1	74,3	70,1	87,2	79,2	73,8	69,9	77,7	72,9	69,3	76,2	72,0	68,8	74,9	71,2	68,3	66,9
7	84,8	75,9	70,1	66,1	83,4	75,2	69,7	65,9	73,9	69,0	65,5	72,6	68,3	65,1	71,5	67,6	64,7	63,3
8	81,2	72,1	66,4	62,5	80,0	71,5	66,1	62,3	70,4	65,5	62,0	69,3	65,0	61,7	68,3	64,4	61,5	60,1
9	77,8	68,7	63,1	59,3	76,7	68,2	62,8	59,2	67,2	62,4	59,0	66,3	61,9	58,7	65,4	61,4	58,5	57,2
10	74,7	65,6	60,1	56,4	73,7	65,1	59,9	56,4	64,3	59,5	56,2	63,5	59,1	56,0	62,7	58,7	55,8	54,6

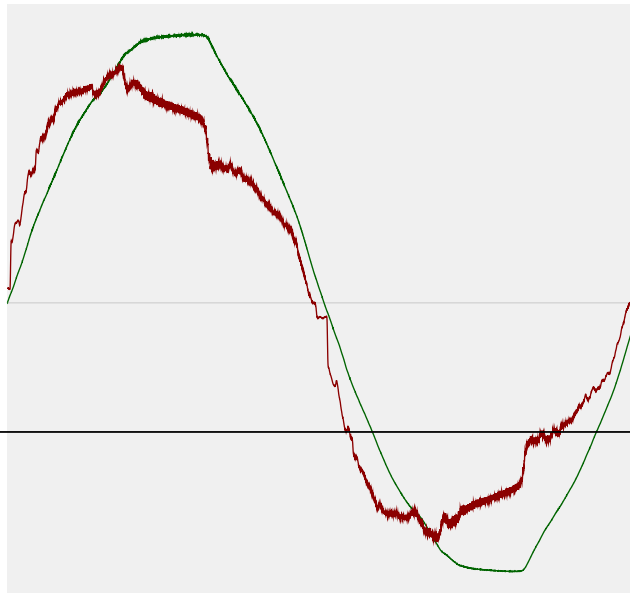
Test report

Power details

Input power

Frequency of input power	50,1 Hz
Power feed to light source	27,97 W
RMS Input voltage feed V,RMS	234,7 V
RMS Input current feed I,RMS	0,12 A
Volt-Amp or apparent power = V,RMS*I,RMS	29,3 VA
Displacement factor of AC power feed	0,97
Power factor of AC current feed	0,96
Total harmonic distortion of the current	16,09%
Total harmonic distortion of the voltage	3,294%

Input power curve



Efficiency

Radiated power efficiency 36,82

Lumen efficiency 111,2 lm/W

Stabilization details

Warmup Conditions

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

Color Temperature Change

CCT start	3000 K
CCT shift	0 K
CCT end	3000 K

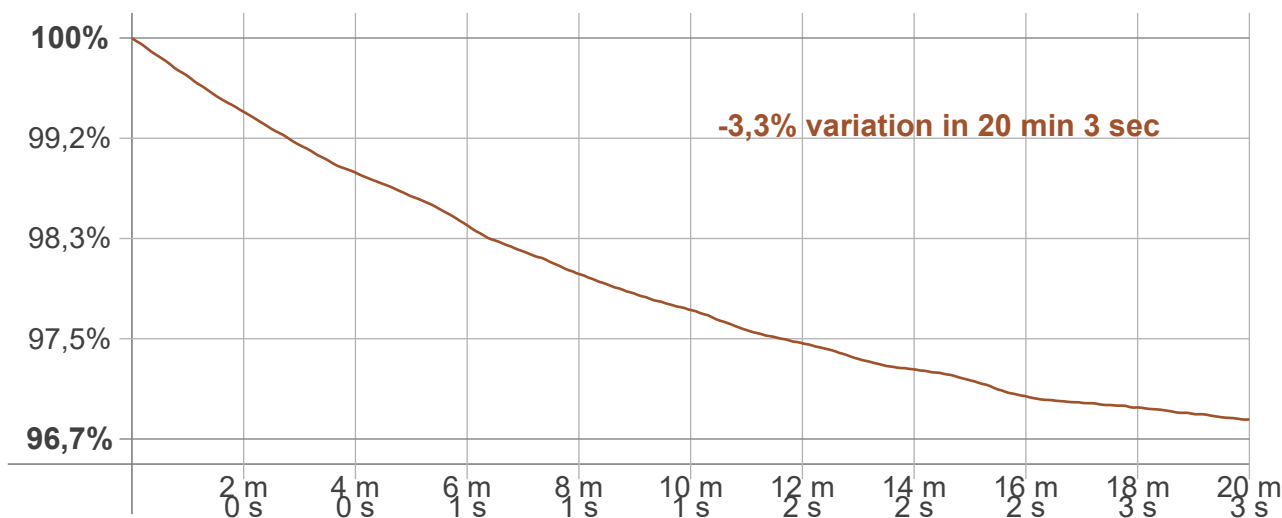
Warmup Result

Total warmup time	Lamp stabilized in :
Warmup variation	-3,338%

Output Change

Output start	3217 lm
Output change	-104,79 lm
Output end	3112 lm

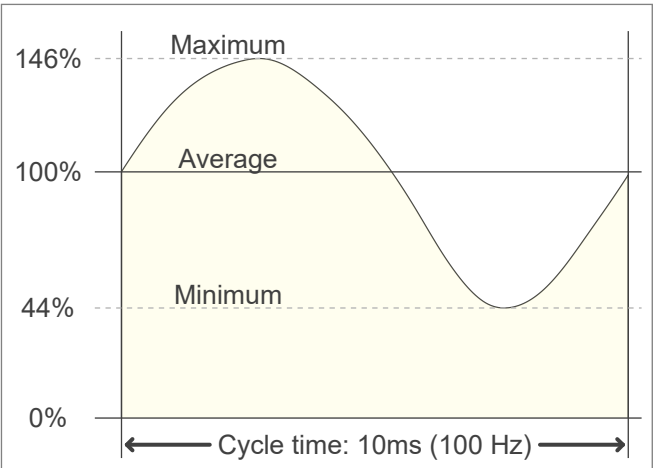
Stabilization Curve



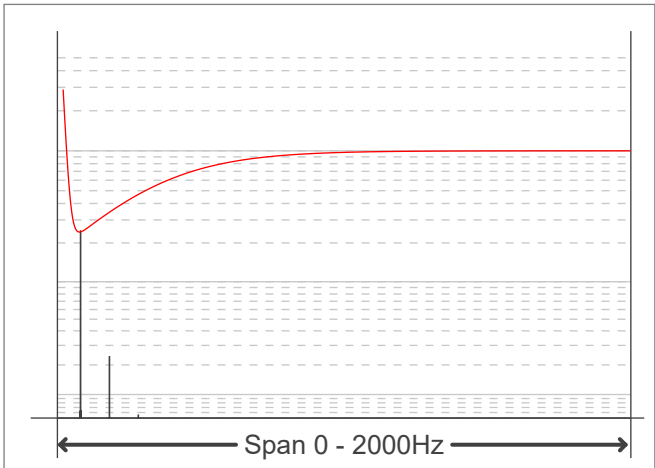
Flicker TLA details

Flicker Meter Type	Viso Systems LabFlicker	Measurement time	
Frequency of input power	50,1 Hz	PstLM	180 sec.
Flicker/TLA sample rate	20,0 samples/s	All other indices	1,5 sec,
Flicker indices according to Illuminating Engineering Society (IES)		Flicker indices according to California Energy Commission (CEC) 2016b	
Flicker frequency	100,0 Hz	JA8/10 40 Hz	2,247 %
Percent Flicker	53,53 %	JA8/10 90 Hz	20,48 %
Flicker index	0,2	JA8/10 200 Hz	58,2 %
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)		JA8/10 400 Hz	57,62 %
PstLM value (F < 80 Hz)	0,42	JA8/10 1000 Hz	60,4 %
SVM value (80 < F < 2000 Hz)	1,94	Flicker indices according to Lighting Research Center (2015)	
		Perception metric, Assist Mp	0,31

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

