

Laboratory and Equipment

Test lab
Spectrometer Manufacturer and Model
Measurement date

Viso LightSpion - Seriennummer: 1435906163
LightSpion – Type C, horizontal
08.04.2026

Measurement Conditions

Tested c-planes
Tested gamma resolution
Input Power
Input RMS Voltage and Current

4 planes – 90°
7.5°
19.8 W
24.0 V – 0.826 A

Tested Light Source

Luminaire
Item No.
Manufacturer
Measured length
Dimension (Lamp w x h) | (Light w x h)
Description

FLEX STRIP HEP-COB 288 MONO WW 1m 260327
AS2COB28806
awLed by audiowerk GmbH
1000mm
10mm x 1000mm | 6mm x 3mm
Charge: 260327

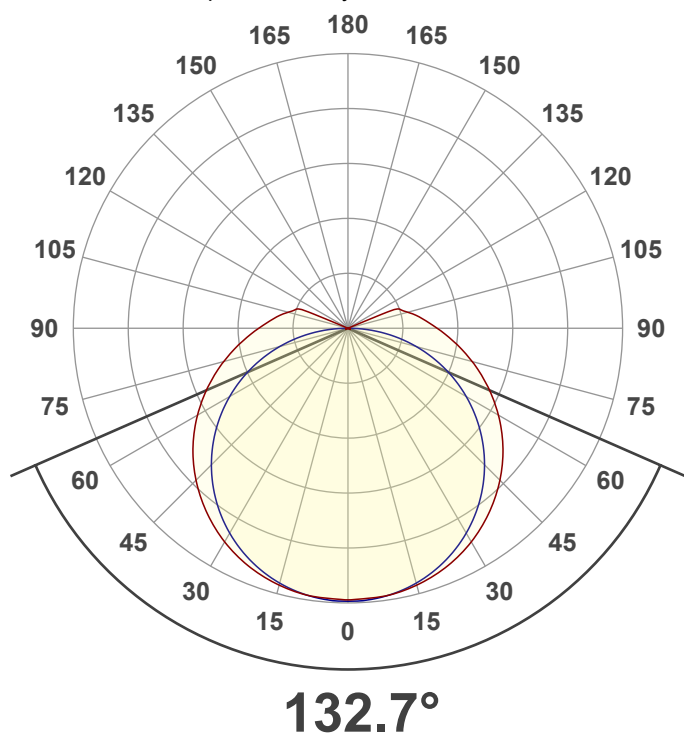
Main Light Measurement Results

Output – Total Lumen (Up% / Down%)
Efficiency
Peak Intensity
Correlated Color Temperature, CCT
Color Rendering Index
Ecodesign Energy Class

2874 lm – 8% / 92%
145 lm/W
737 cd
3000 K
CRI 92.9
E

Polar light distribution diagram

Unit: 0-100% of peak intensity



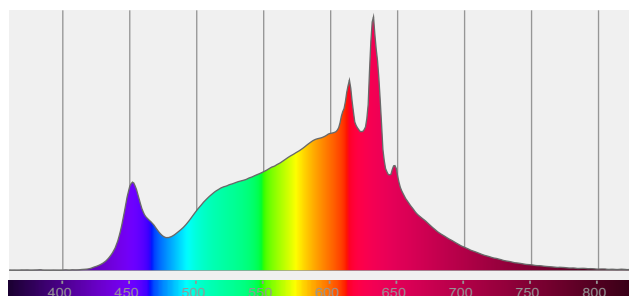
— C0 - C180
— C90 - C270

$\eta = 100.0\%$

Product photo

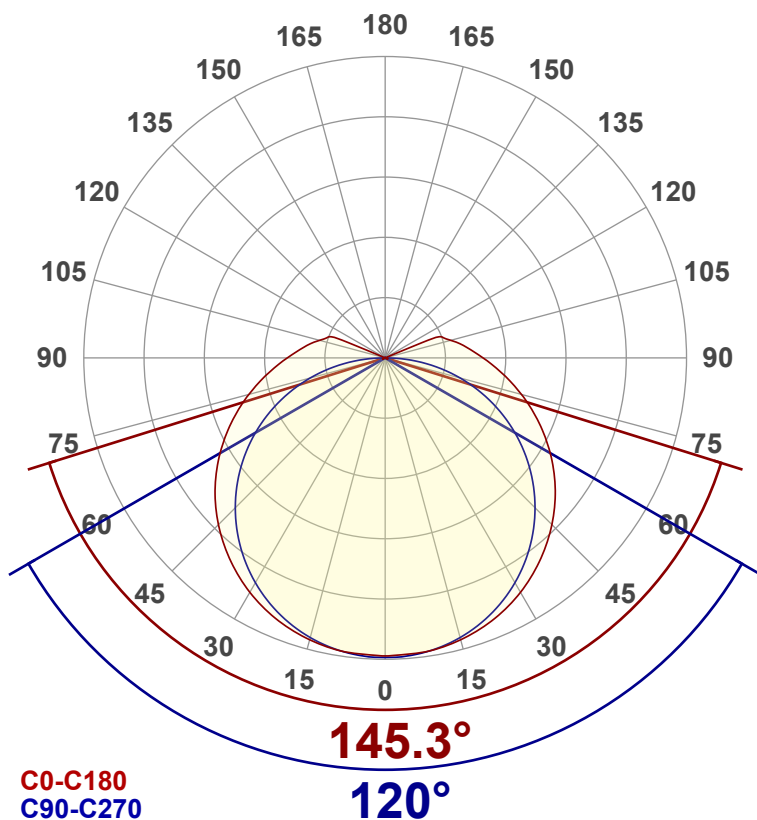


Spectral power distribution



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

Output (total Lumen)	2874 lm
Lumen Up% / Down%	7.72% / 92.28%
Peak Intensity	737 cd
Beam Angle (50%-FWHM)	132.66°

EU Ecodesign parameters

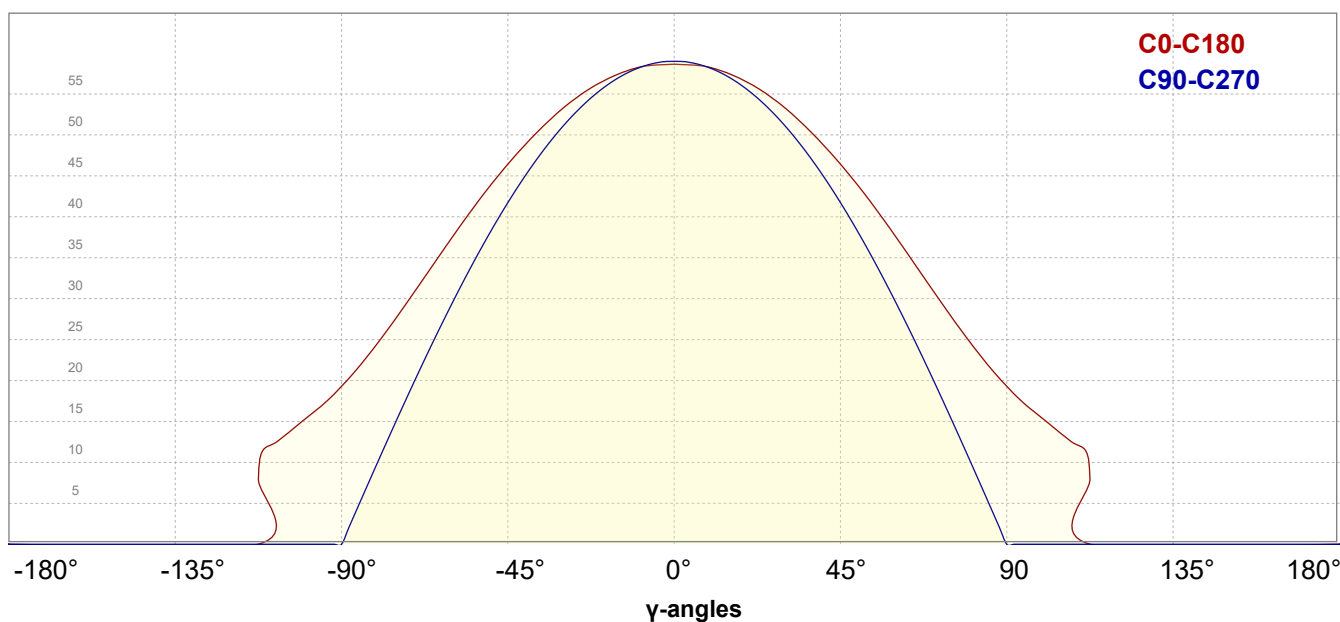
Directionality (DLS or NDLS)	NDLS
Ecodesign Useful Luminous	2874 lm
Ecodesign Energy Class	E

Intensity Ratio

In 120° cone	63.2%
In 90° cone	41.2%

Linear distribution diagram

Intensity [cd]



Color details

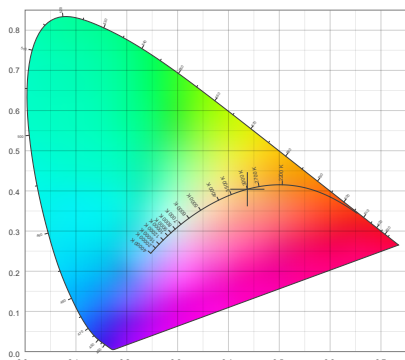
Correlated Color Temperature, Target
 Correlated Color Temperature, Measured
 Color Rendering Index
 Color Rendering Index, R9 (red)
 Color Rendering TM30-18

CCT = 3000 K
 CCT = 3036 K
 CRI 92.9
 R9 = 53.5
 Rf 91.0
 Rg 98.3

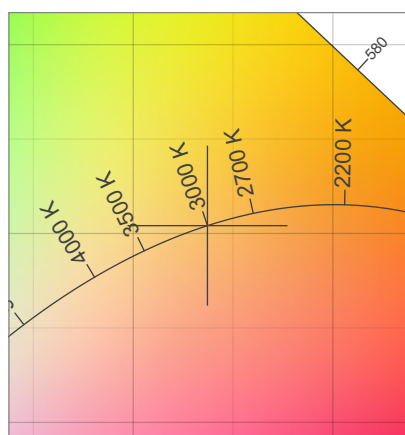
MacAdam Steps
 Color deviation from BBL
 Color coordinates CIE 1931
 Color coordinate CIEs 1960
 Color coordinate CIEs 1976
 Color Quality Scale

SDCM = 1.4
 Duv = 0.0009
 (x;y) = (0.437;0.404)
 (u;v) = (0.251;0.348)
 (u';v') = (0.251;0.521)
 CQS = 90.9

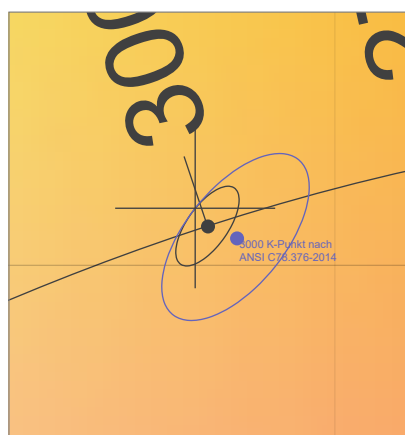
CIE 1931 Chromaticity diagram



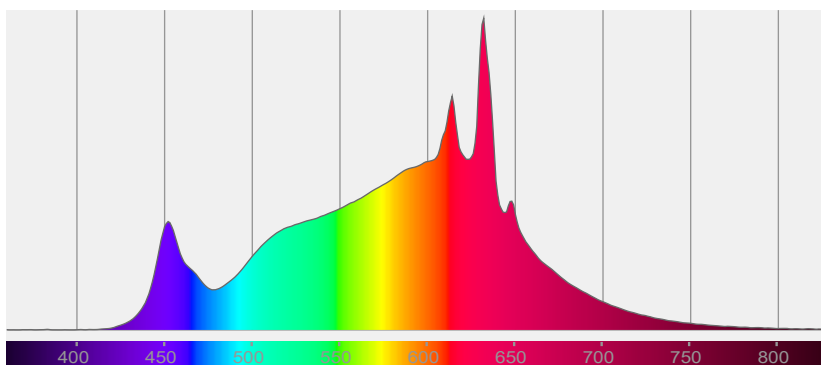
CIE 1931 Chromaticity - zoomed



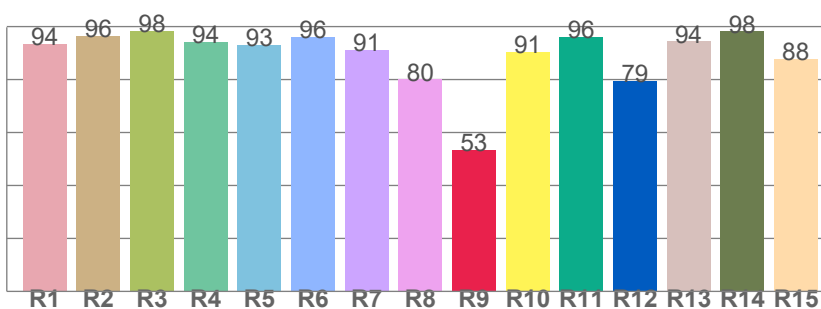
CIE 1931 Chromaticity - SDCM



Spectral power distribution



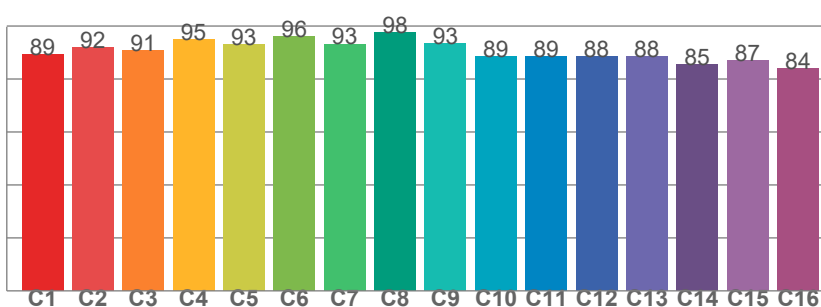
Color Rendering Index per reference color (CIE 1995)



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
93.6	96.4	98.4	94.1	93.1	96.2	91.2	80.1	53.5	90.5	96.0	79.4	94.3	98.2	87.8

TM30-18 Rf-values per hue bin

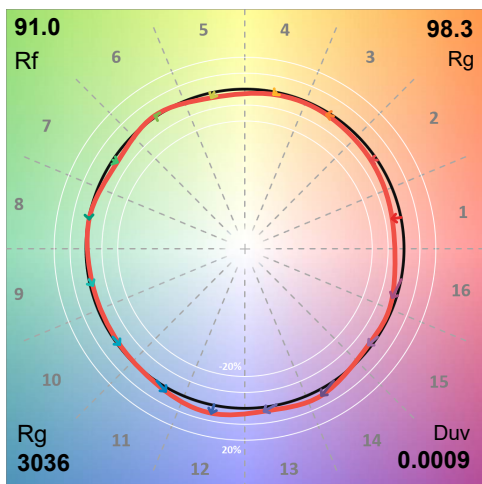


TM30-18 Rf-values per hue bin

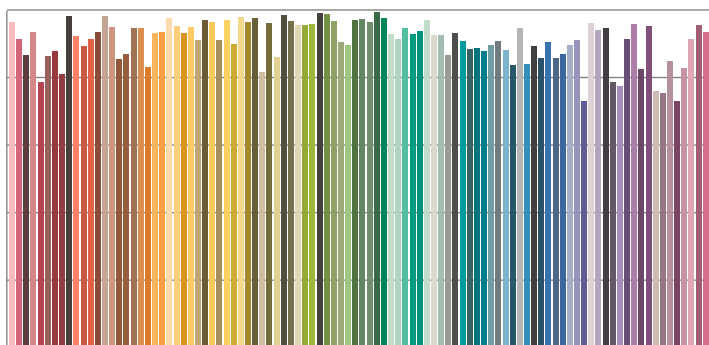
C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
89.3	92.1	90.9	95.1	93.1	96.0	93.3	97.6	93.5	88.7	88.5	88.4	88.5	85.5	87.2	83.9

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

Color Vector Graphic



Color Rendition by Color Evaluation Sample (CES)

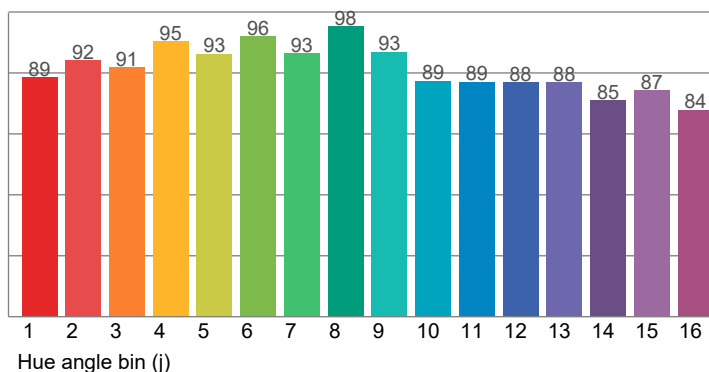


Color evaluation sample CES01 through CES99

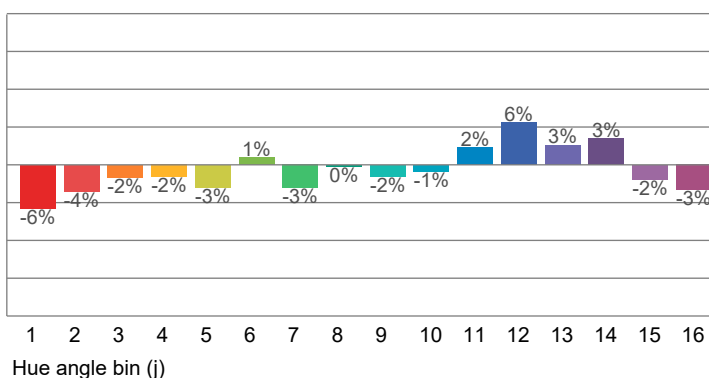
Color Distortion Graphic



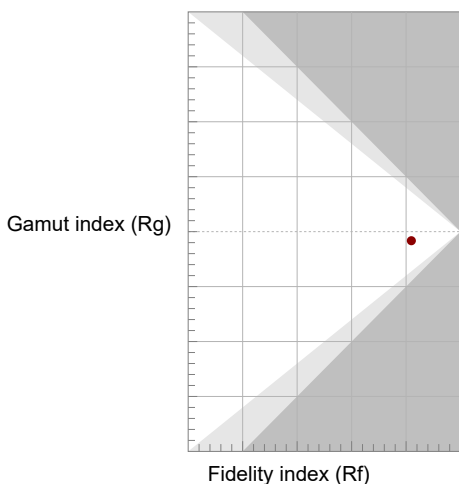
Local Color Fidelity (per hue bin)



Local Chroma Shift (per hue bin)



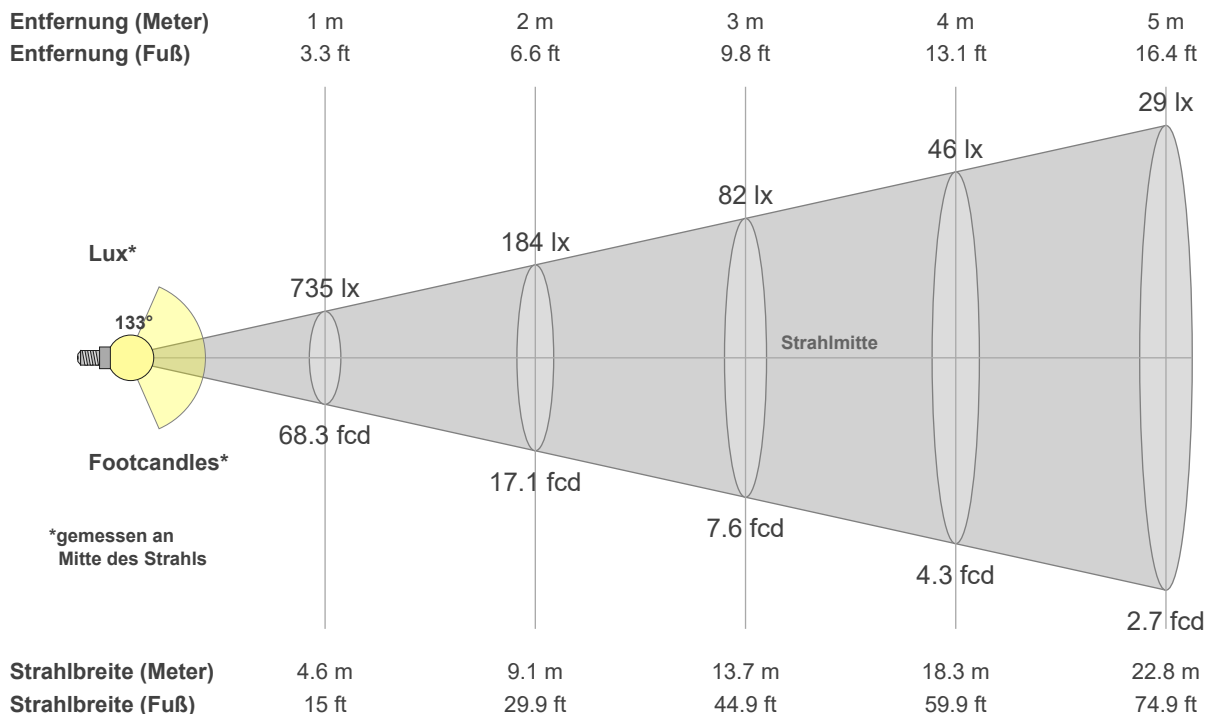
Gamut Index vs. Fidelity Index



CIE x 0.437
CIE y 0.404
CIE u' 0.251
CIE v' 0.521

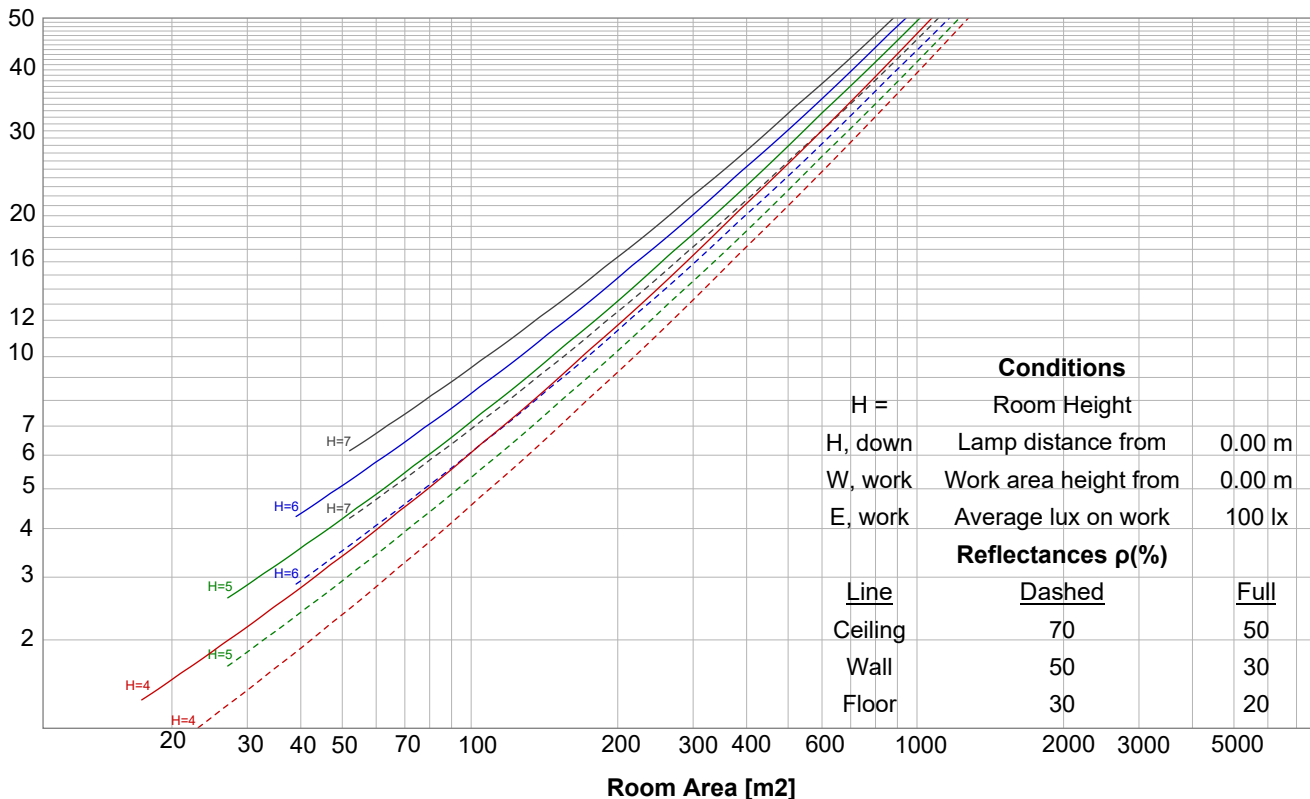
CIE	13.3-1995
Ra	92.9
R9	53.5

Beam details



Luminaire budgetary diagram

LAMPS (number of lamps)



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
735	184	82	46	29	20	15	11	9	7	6	5	4	4	3	3	3	2	2	2	lux
68.3	17.1	7.6	4.3	2.7	1.9	1.4	1.1	0.8	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	fc

Intensities in 0° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ	
735	729	710	678	635	580	516	445	371	302	242	195	155	0	0	0	0	0	0	0	0	cd
100%	99%	97%	92%	86%	79%	70%	61%	51%	41%	33%	27%	21%	0%	0%	0%	0%	0%	0%	0%	0%	of 0°val

Intensities in 90° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ	
735	728	701	657	597	521	434	335	228	115	0	0	0	0	0	0	0	0	0	0	0	cd
100%	99%	95%	89%	81%	71%	59%	46%	31%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	of 0°val

Intensities in 180° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ	
735	729	710	678	635	580	516	445	371	302	242	195	155	0	0	0	0	0	0	0	0	cd
100%	99%	97%	92%	86%	79%	70%	61%	51%	41%	33%	27%	21%	0%	0%	0%	0%	0%	0%	0%	0%	of 0°val

Intensities in 270° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°	γ	
735	728	701	657	597	521	434	335	228	115	0	0	0	0	0	0	0	0	0	0	0	cd
100%	99%	95%	89%	81%	71%	59%	46%	31%	16%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	of 0°val

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	27.7	29.0	28.1	29.4	29.8	28.0	29.2	28.4	29.7	30.1				
	3H	29.6	30.9	30.1	31.3	31.7	29.8	31.0	30.3	31.5	31.8				
	4H	30.6	31.8	31.1	32.2	32.7	30.6	31.8	31.1	32.2	32.7				
	6H	31.6	32.7	32.1	33.1	33.6	31.4	32.4	31.8	32.8	33.4				
	8H	32.1	33.1	32.5	33.6	34.1	31.6	32.7	32.1	33.1	33.7				
	12H	32.5	33.6	33.0	34.0	34.6	31.8	32.9	32.3	33.3	33.9				
4H	2H	28.4	29.6	28.9	30.0	30.4	28.6	29.8	29.1	30.2	30.7				
	3H	30.6	31.6	31.1	32.1	32.7	30.7	31.7	31.2	32.2	32.7				
	4H	31.6	32.7	32.2	33.1	33.8	31.6	32.6	32.1	33.0	33.7				
	6H	32.7	33.6	33.3	34.1	34.6	32.4	33.3	33.0	33.8	34.3				
	8H	33.3	34.1	33.9	34.6	35.1	32.7	33.5	33.3	34.0	34.6				
	12H	33.8	34.5	34.4	35.1	35.7	33.0	33.7	33.6	34.2	34.8				
8H	4H	32.0	32.8	32.6	33.3	33.8	31.9	32.7	32.5	33.2	33.8				
	6H	33.3	33.9	33.9	34.5	35.2	32.9	33.6	33.6	34.2	34.9				
	8H	34.0	34.6	34.6	35.2	36.0	33.4	34.0	34.0	34.6	35.4				
	12H	34.7	35.2	35.4	35.8	36.5	33.8	34.3	34.5	34.9	35.6				
12H	4H	32.0	32.7	32.6	33.3	33.9	32.0	32.7	32.6	33.2	33.8				
	6H	33.4	34.0	34.0	34.6	35.4	33.1	33.7	33.7	34.3	35.1				
	8H	34.1	34.6	34.8	35.3	36.0	33.6	34.1	34.3	34.7	35.4				
Variations with the observer position for the luminaire spacings, S:															
S = 1.0H		0.1 / 0.0					0.0 / 0.0								
S = 1.5H		0.1 / -0.1					0.1 / -0.1								
S = 2.0H		0.2 / -0.2					0.3 / -0.3								

Coefficients of utilization

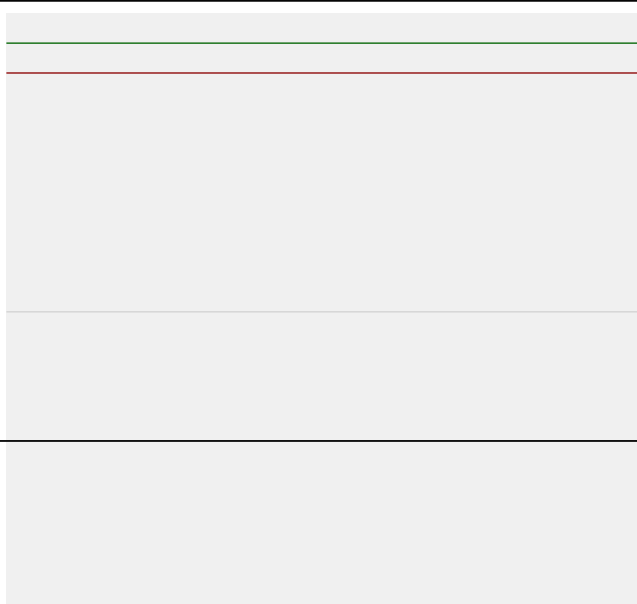
Ceiling reflectance	80				70				50			30			10			0
Wall reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Floor reflectance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
RCR	(Room Cavity Ratio) Room values are expressed as percentage of Lumen delivered to the task surface																	
0	117.2	117.2	117.2	117.2	113.6	113.6	113.6	113.6	106.8	106.8	106.8	100.6	100.6	100.6	95.0	95.0	95.0	92.3
1	104.4	98.5	93.3	88.5	100.7	95.4	90.7	86.3	89.7	85.7	82.2	84.4	81.2	78.2	79.5	76.9	74.6	71.8
2	93.9	84.4	76.6	70.0	90.4	81.8	74.6	68.5	76.9	70.9	65.7	72.3	67.4	63.0	68.2	64.1	60.5	57.7
3	84.9	73.3	64.2	57.0	81.7	71.0	62.7	56.0	66.9	59.8	54.0	63.0	57.0	52.0	59.4	54.4	50.1	47.5
4	77.4	64.4	54.8	47.6	74.4	62.5	53.6	46.8	58.9	51.3	45.3	55.6	49.1	43.8	52.5	47.0	42.4	39.8
5	70.9	57.2	47.5	40.5	68.2	55.5	46.6	39.9	52.5	44.7	38.7	49.6	42.9	37.5	47.0	41.1	36.4	34.0
6	65.3	51.2	41.7	35.0	62.8	49.8	40.9	34.5	47.2	39.4	33.5	44.7	37.9	32.6	42.4	36.4	31.7	29.4
7	60.4	46.2	37.1	30.6	58.2	45.0	36.4	30.2	42.8	35.1	29.5	40.6	33.8	28.7	38.6	32.6	28.0	25.8
8	56.1	42.1	33.2	27.1	54.1	41.0	32.6	26.8	39.0	31.5	26.1	37.1	30.4	25.5	35.4	29.4	24.9	22.8
9	52.4	38.5	30.0	24.2	50.5	37.6	29.5	24.0	35.8	28.5	23.4	34.2	27.6	22.9	32.6	26.7	22.4	20.4
10	49.0	35.4	27.3	21.8	47.4	34.6	26.8	21.6	33.1	26.0	21.1	31.6	25.2	20.7	30.3	24.4	20.2	18.4

Power details

Input power

Frequency of input power	0 Hz
Power feed to light source	19.8 W
RMS Input voltage feed V,RMS	24.0 V
RMS Input current feed I,RMS	0.826 A
Volt-Amp or apparent power = V,RMS*I,RMS	19.83 VA
Displacement factor of AC power feed	0.0
Power factor of AC current feed	1.0
Total harmonic distortion of the current	0%
Total harmonic distortion of the voltage	0%

Input power curve



Efficiency

Radiated power efficiency	44.8%
Lumen efficiency	145 lm/W

Stabilization details

Warmup Conditions

Stable period	3 Min
Stable change max	3.0%
Minimum time	3 Min

Color Temperature Change

CCT start	3011 K
CCT shift	-11 K
CCT end	3000 K

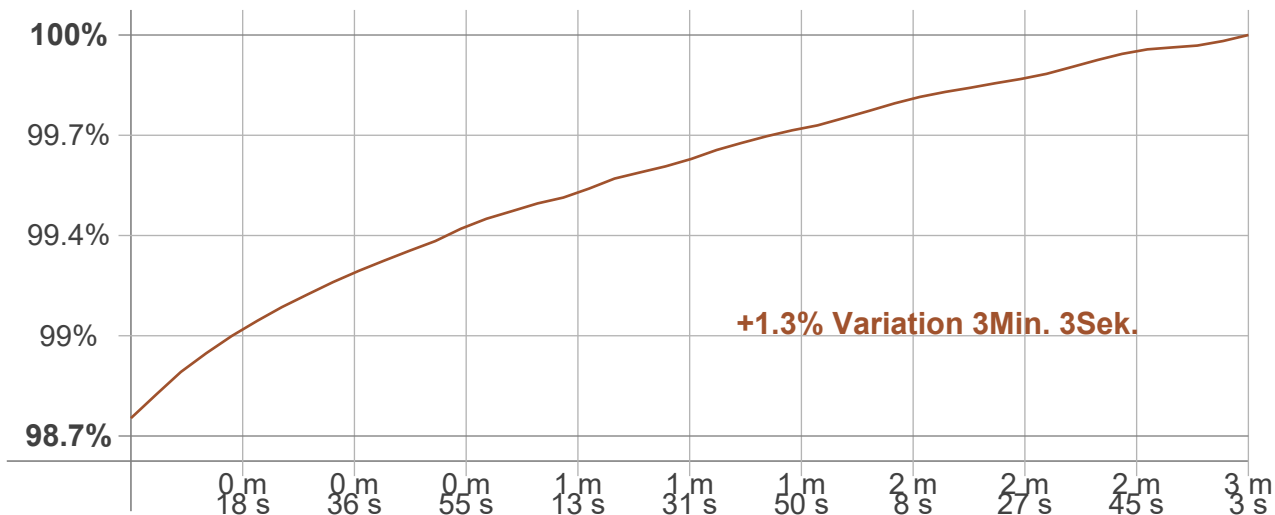
Warmup Result

Total warmup time	Lampe
Warmup variation	+1.3%

Output Change

Output start	2843 lm
Output change	+32 lm
Output end	2874 lm

Stabilization Curve



Flicker TLA details

Flicker Meter Type: Viso Systems LabFlicker
 Frequency of input power: 0 Hz
 Flicker/TLA sample rate: n/a samples/s

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

Flicker indices according to Illuminating Engineering Society

Flicker frequency: n/a Hz
 Percent Flicker: n/a %
 Flicker index: n/a

Flicker indices according to California Energy Commission (CEC)

JA8/10 40 Hz: n/a %
 JA8/10 90 Hz: n/a %
 JA8/10 200 Hz: n/a %
 JA8/10 400 Hz: n/a %
 JA8/10 1000 Hz: n/a %

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

PstLM value (F < 80 Hz): n/a
 SVM value (80 < F < 2000 Hz): n/a

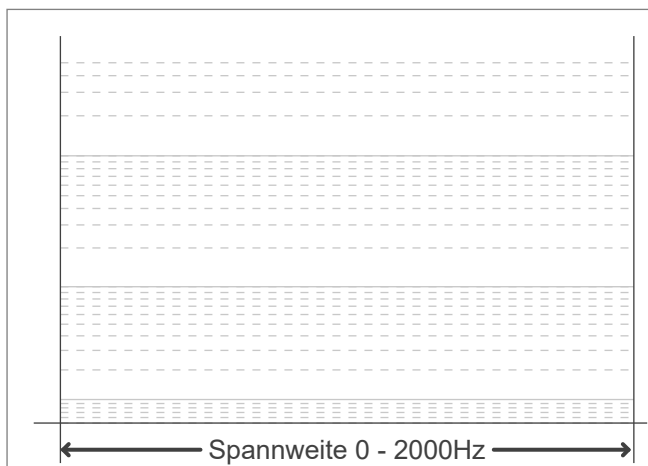
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp: n/a

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

