

Light efficiency:

74 Lumen/Watt

Light quality:

CRI: 92,6

Color temperature:

2774 K

Output: 336 lm

Peak: 1224 cd

Power: 4,5 W

PF: 1,0



Product name:

F L-S O - 2-4 C -1 0 0-W-LSMT-M

Item number:

F L / S O - 2 / 4 C / 1 0 0 / W / LSMT / M

Date and time:

14.03.2019 09:35:55

Description:

Toleranzen:

Lumen +/-4%

Candela +/-2,5%

Colour Temp +/-35 Grad K

CRI +/-0,7

Angular Resolution 1 Grad step

Last Calibration 06.06.2018

Pruefer:

Mourad Benzineb

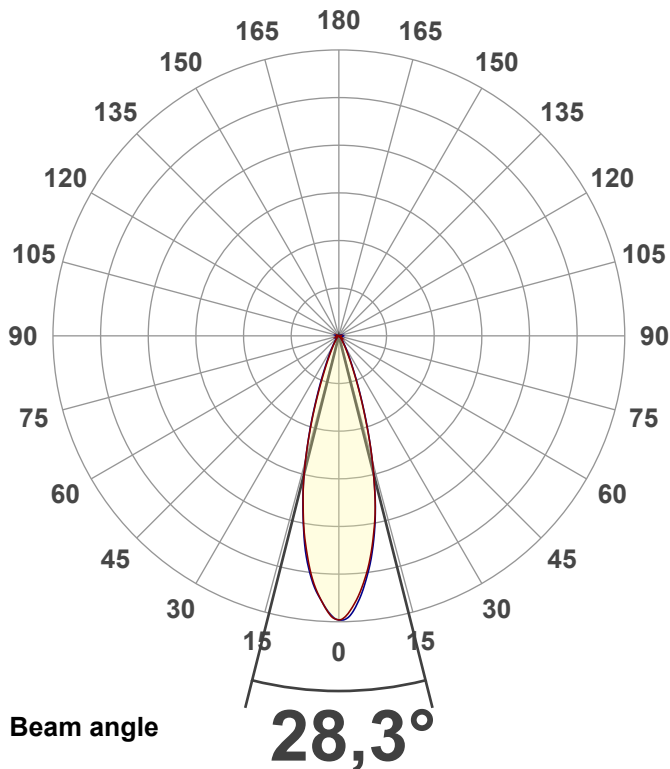
Master of Engineering

Pruefort:

Lichtlabor

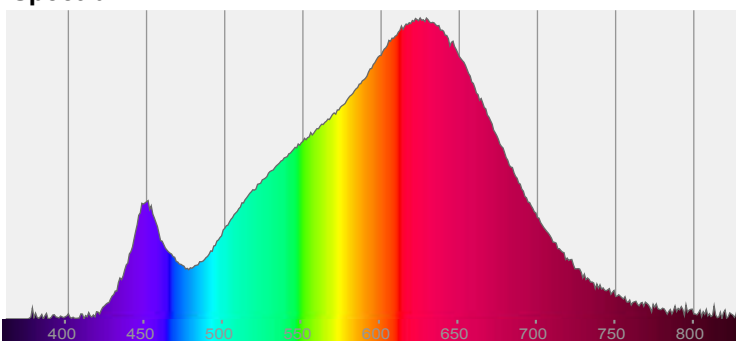
Gaustasse13-15

55411 Bingen am Rhein

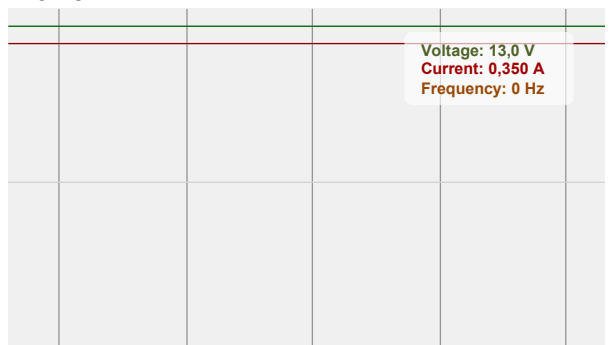


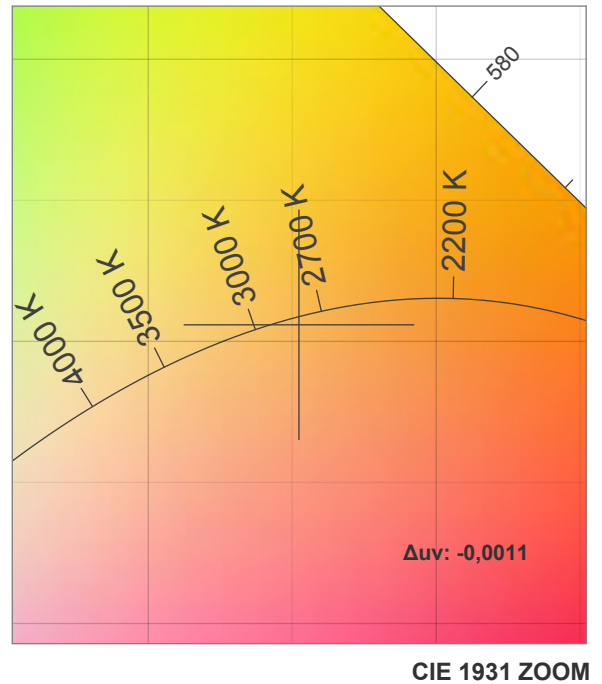
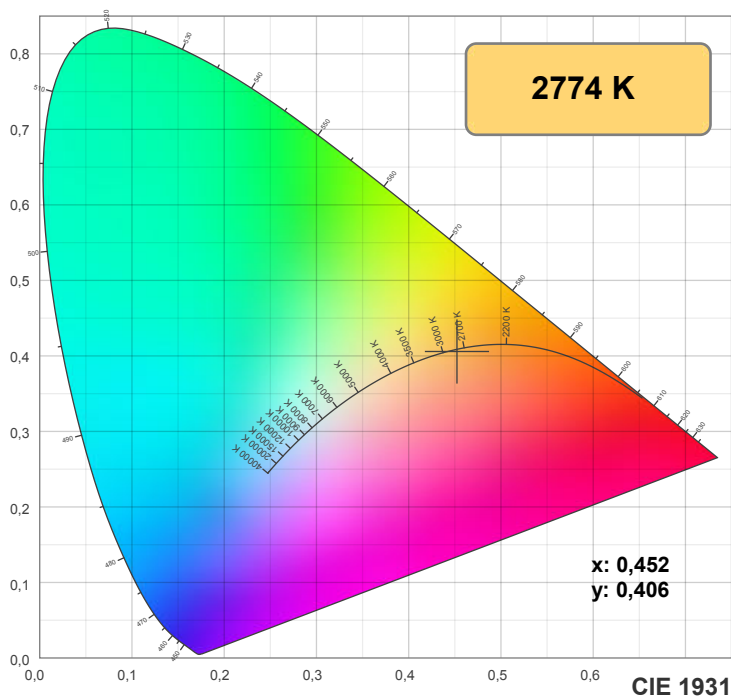
CIE 1931  
x: 0,452  
y: 0,406

Spectra

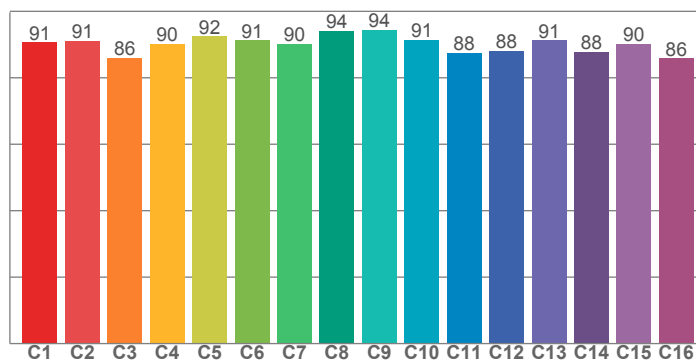


Power

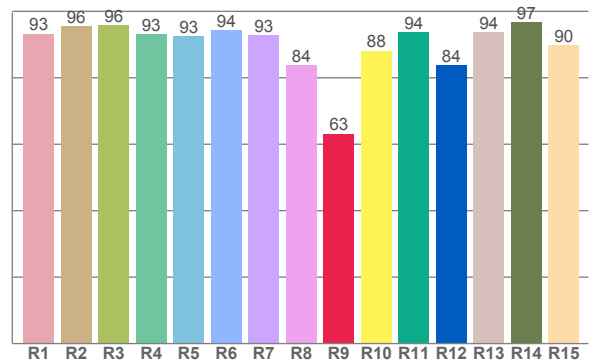




TM30: 90,2



CRI: 92,6 (R1-R8)



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
93,2	95,5	95,8	93,2	92,6	94,4	92,7	83,7	63,1	88,2	93,7	83,8	93,8	96,7	89,8

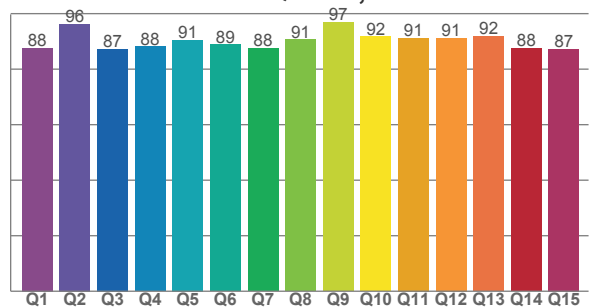
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90,6	91,1	85,9	90,3	92,5	91,3	90,2	94,1	94,5	91,4	87,5	88,1	91,2	87,8	90,2	85,8

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
87,7	96,3	87,2	88,2	90,5	88,9	87,5	90,6	96,9	91,7	91,3	91,3	91,8	87,5	87,2

CQS: 89,8



## Color parameters

Color temperature	Color rendering index	Red component	Color fidelity	Color gamut	Color quality scale	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate	Color deviation from black body
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
2774 K	92,6	63,1	90,2	101,4	89,8	0,452	0,406	0,260	0,350	-0,0011

## TM30 details

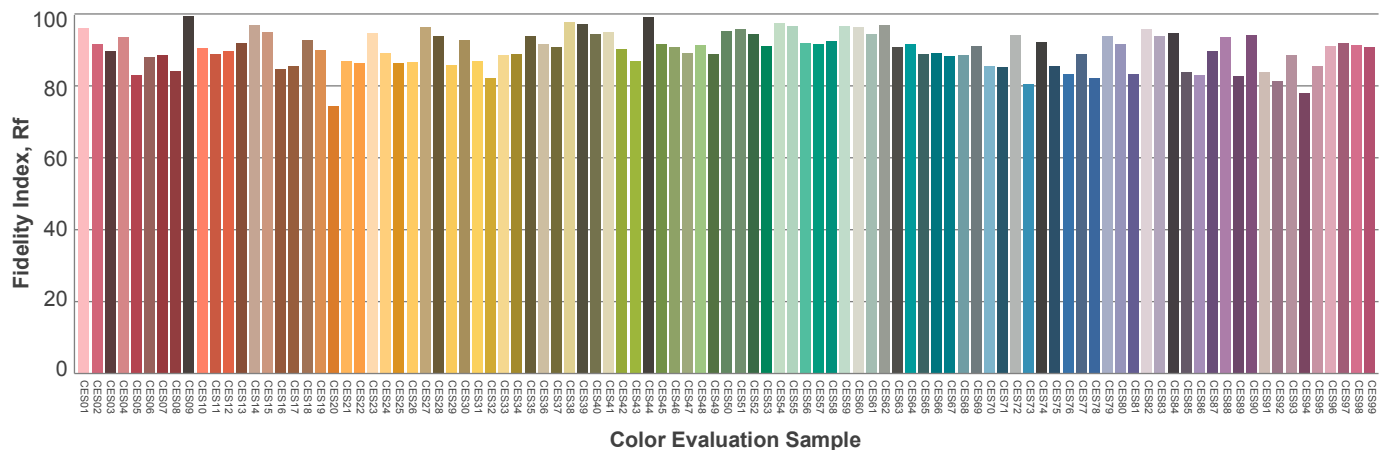
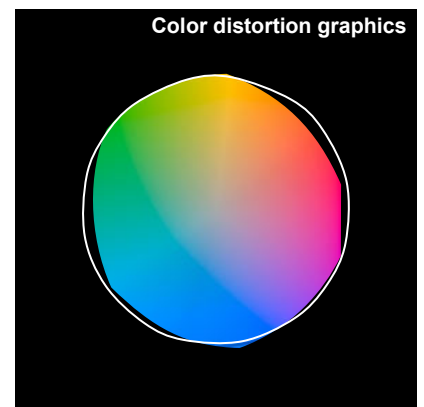
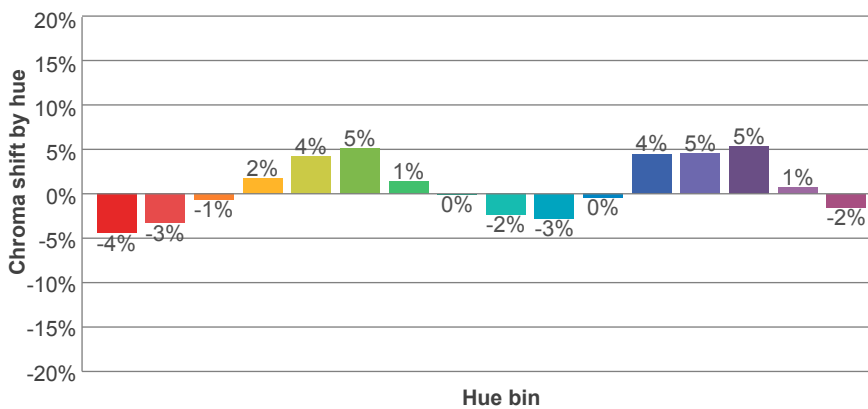
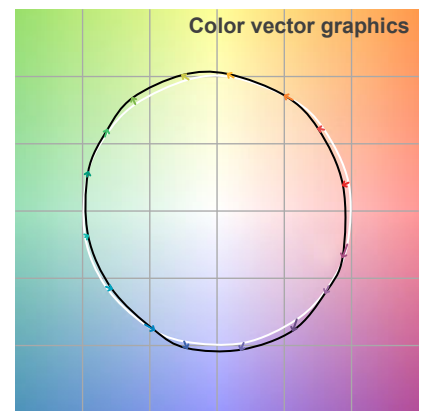
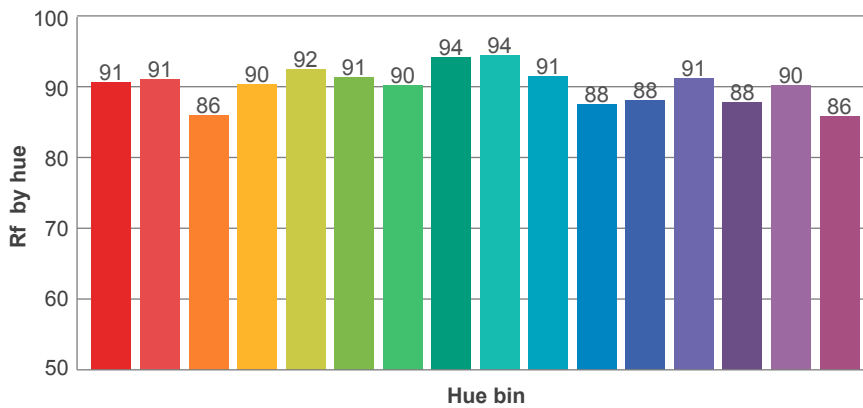
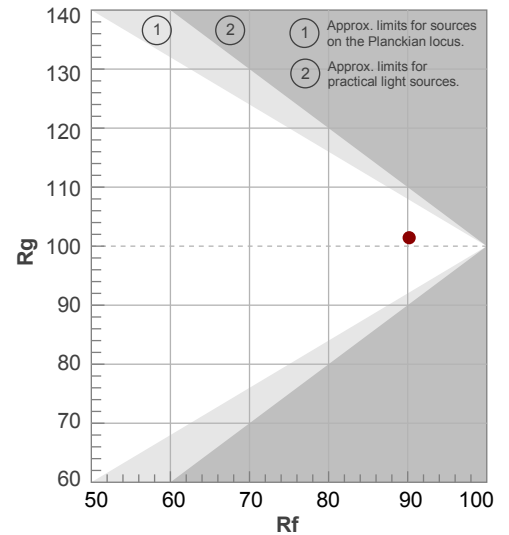
**Rf 90,2**

Fidelity index Rf

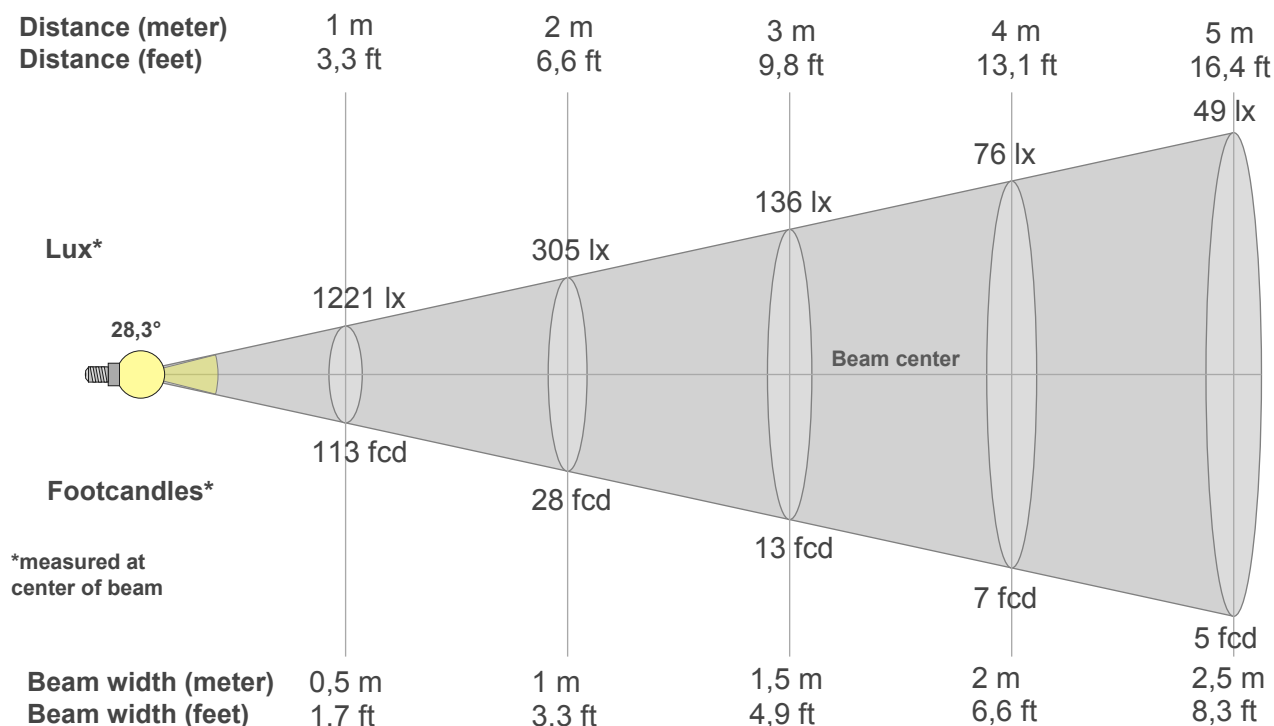
**Rg 101,4**

Gammut index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	91	-4%	-1%
2	91	-3%	3%
3	86	-1%	7%
4	90	2%	5%
5	92	4%	4%
6	91	5%	-1%
7	90	1%	-5%
8	94	0%	-3%
9	94	-2%	-1%
10	91	-3%	4%
11	88	0%	8%
12	88	4%	3%
13	91	5%	-3%
14	88	5%	-7%
15	90	1%	-5%
16	86	-2%	-10%



## Beam details



### Beam intensities from 1-20m

1m	2m	3m	4m	5m	6m	7m	8m	9m	10m	11m	12m	13m	14m	15m	16m	17m	18m	19m	20m
3,3ft	6,6ft	9,8ft	13,1ft	16,4ft	19,7ft	23ft	26,2ft	29,5ft	32,8ft	36,1ft	39,4ft	42,7ft	45,9ft	49,2ft	52,5ft	55,8ft	59,1ft	62,3ft	65,6ft
1221lx	305lx	136lx	76lx	49lx	34lx	25lx	19lx	15lx	12lx	10lx	8lx	7lx	6lx	5lx	5lx	4lx	4lx	3lx	3lx
113,4fcd	28,3fcd	12,6fcd	7,1fcd	4,5fcd	3,1fcd	2,3fcd	1,8fcd	1,4fcd	1,1fcd	0,9fcd	0,8fcd	0,7fcd	0,6fcd	0,5fcd	0,4fcd	0,4fcd	0,3fcd	0,3fcd	0,3fcd

### 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°
1221	1193	1133	1057	967	863	753	621	491	363	262	183	128	90	65	47	35	26	20	15
100%	98%	93%	87%	79%	71%	62%	51%	40%	30%	21%	15%	10%	7%	5%	4%	3%	2%	2%	1%

### 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°
1221	1211	1154	1073	981	874	756	619	491	370	270	192	139	102	76	58	45	35	27	22
100%	99%	95%	88%	80%	72%	62%	51%	40%	30%	22%	16%	11%	8%	6%	5%	4%	3%	2%	2%

### Intensities in 180° c-plane

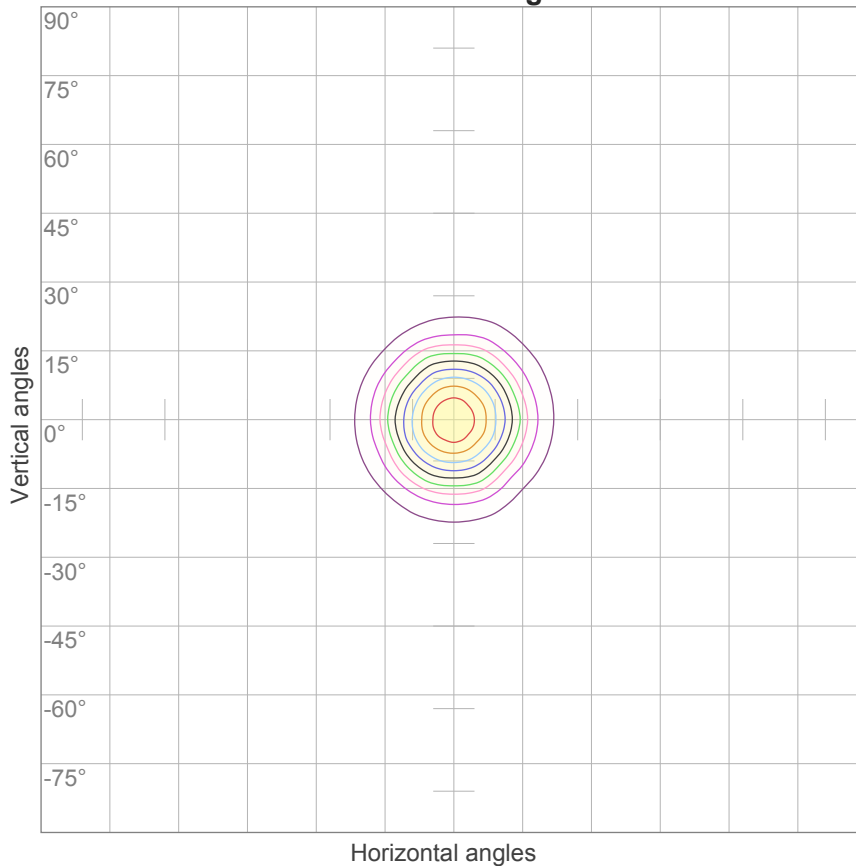
0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°
1221	1197	1135	1061	964	859	740	621	489	364	255	176	123	88	64	48	36	28	22	17
100%	98%	93%	87%	79%	70%	61%	51%	40%	30%	21%	14%	10%	7%	5%	4%	3%	2%	2%	1%

### 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°
1221	1193	1136	1070	980	867	745	619	489	373	271	195	140	103	77	58	45	35	28	21
100%	98%	93%	88%	80%	71%	61%	51%	40%	31%	22%	16%	11%	8%	6%	5%	4%	3%	2%	2%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
28,3°	48,9°	67,8°	98,4%	96,3%

ISO candela diagram



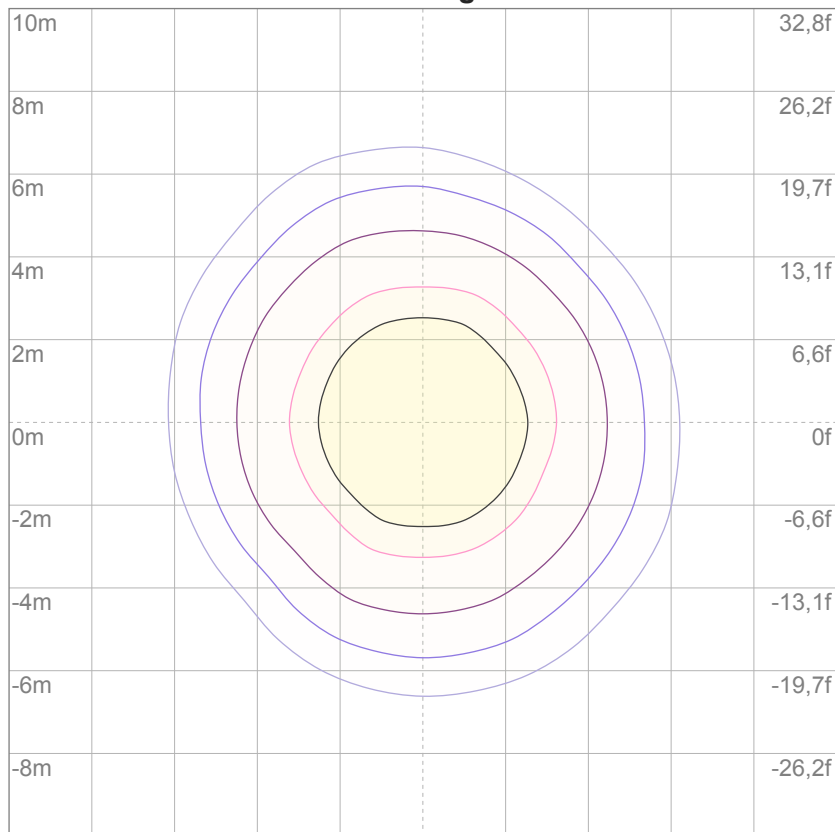
10%	122 cd
20%	244 cd
30%	366 cd
40%	488 cd
50%	610 cd
60%	732 cd
70%	854 cd
80%	976 cd
90%	1098 cd

Conditions:

Number of c-planes: 16

Candela at center: 1221 cd

ISO lux diagram



3%	0,366 lx
5%	0,610 lx
10%	1,22 lx
30%	3,66 lx
50%	6,10 lx

Conditions:

Number of c-planes: 16

Lux at center: 12,2 lx

*Lux distribution on a surface  
when lamp is mounted at 10  
meters from the surface.*

## Glare Evaluation According to UGR

p Ceiling		70	70	50	50	30	70	70	50	50	30
p Walls		50	30	50	30	30	50	30	50	30	30
p Floor		20	20	20	20	20	20	20	20	20	20
Room size X      Y		Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	5,1	5,7	5,3	5,9	6,1	6,2	6,9	6,5	7,1	7,3
	3H	5,8	6,4	6,0	6,6	6,9	6,8	7,4	7,1	7,6	7,9
	4H	6,2	6,8	6,5	7,0	7,3	7,1	7,7	7,4	7,9	8,2
	6H	6,6	7,2	7,0	7,5	7,7	7,5	8,0	7,8	8,3	8,6
	8H	7,0	7,5	7,3	7,8	8,1	7,7	8,2	8,0	8,5	8,8
	12H	7,2	7,7	7,6	8,0	8,3	7,9	8,4	8,2	8,7	9,0
4H	2H	5,4	5,9	5,7	6,2	6,5	6,4	7,0	6,7	7,2	7,5
	3H	6,2	6,7	6,6	7,0	7,3	7,1	7,5	7,4	7,9	8,2
	4H	6,7	7,2	7,1	7,5	7,8	7,5	7,9	7,9	8,3	8,6
	6H	7,4	7,8	7,8	8,1	8,5	8,0	8,4	8,4	8,8	9,1
	8H	7,8	8,1	8,2	8,5	8,9	8,3	8,6	8,7	9,0	9,4
	12H	8,2	8,5	8,6	8,9	9,3	8,6	8,9	9,0	9,3	9,7
8H	4H	6,9	7,2	7,3	7,6	8,0	7,6	7,9	8,0	8,3	8,7
	6H	7,8	8,0	8,2	8,4	8,9	8,3	8,5	8,7	8,9	9,4
	8H	8,3	8,5	8,8	8,9	9,4	8,6	8,8	9,1	9,2	9,7
	12H	8,8	9,0	9,3	9,5	10,0	9,1	9,3	9,6	9,7	10,2
12H	4H	6,9	7,2	7,4	7,6	8,0	7,6	7,9	8,0	8,3	8,7
	6H	7,9	8,1	8,3	8,5	9,0	8,3	8,5	8,8	9,0	9,4
	8H	8,5	8,6	8,9	9,1	9,6	8,7	8,9	9,2	9,3	9,8
Variation of the observer position for the luminaire distance S											
S = 1,0H		+1,2 / -0,7					+1,5 / -0,8				
S = 1,5H		+2,5 / -1,2					+3,1 / -1,1				
S = 2,0H		+3,9 / -1,5					+4,7 / -1,6				
Standard table		BK05					BK04				
Correction summand		-9,4					-9,2				
Corrected glare indices referring to 336 lm total luminous flux											

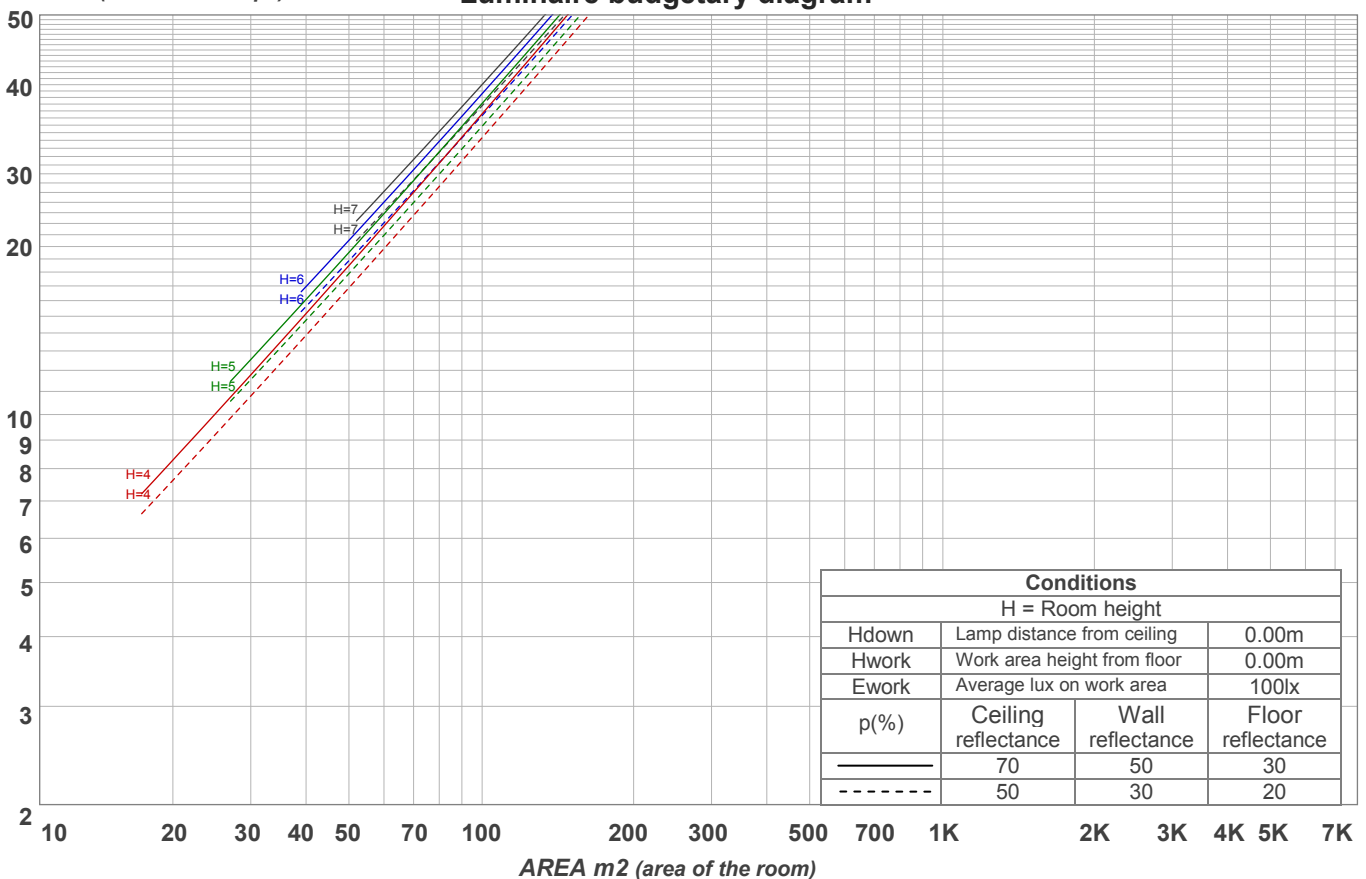
UGR data could be incorrect as lamp output is not symmetrical. Goto Edit->Photometric->Corrections and select Correct asymmetry.

## 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 Lumens delivered to the task surface																	
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	114	112	110	108	112	110	108	106	106	104	103	102	101	100	99	98	97	95
2	110	106	103	100	108	104	101	99	101	99	97	98	96	95	96	94	93	91
3	106	101	97	94	104	100	96	93	97	94	91	95	92	90	93	91	89	87
4	102	96	92	89	101	95	91	88	93	90	87	91	88	86	90	87	85	84
5	99	92	88	84	97	91	87	84	90	86	83	88	85	83	87	84	82	81
6	96	89	84	81	94	88	84	80	87	83	80	85	82	79	84	81	79	78
7	93	85	81	78	91	85	80	77	84	80	77	83	79	77	82	79	76	75
8	90	82	78	75	89	82	78	75	81	77	74	80	77	74	79	76	74	73
9	87	80	75	72	86	79	75	72	78	74	72	78	74	72	77	74	71	70
10	84	77	73	70	84	77	73	70	76	72	70	75	72	69	75	71	69	68

LAMPS (number of lamps)

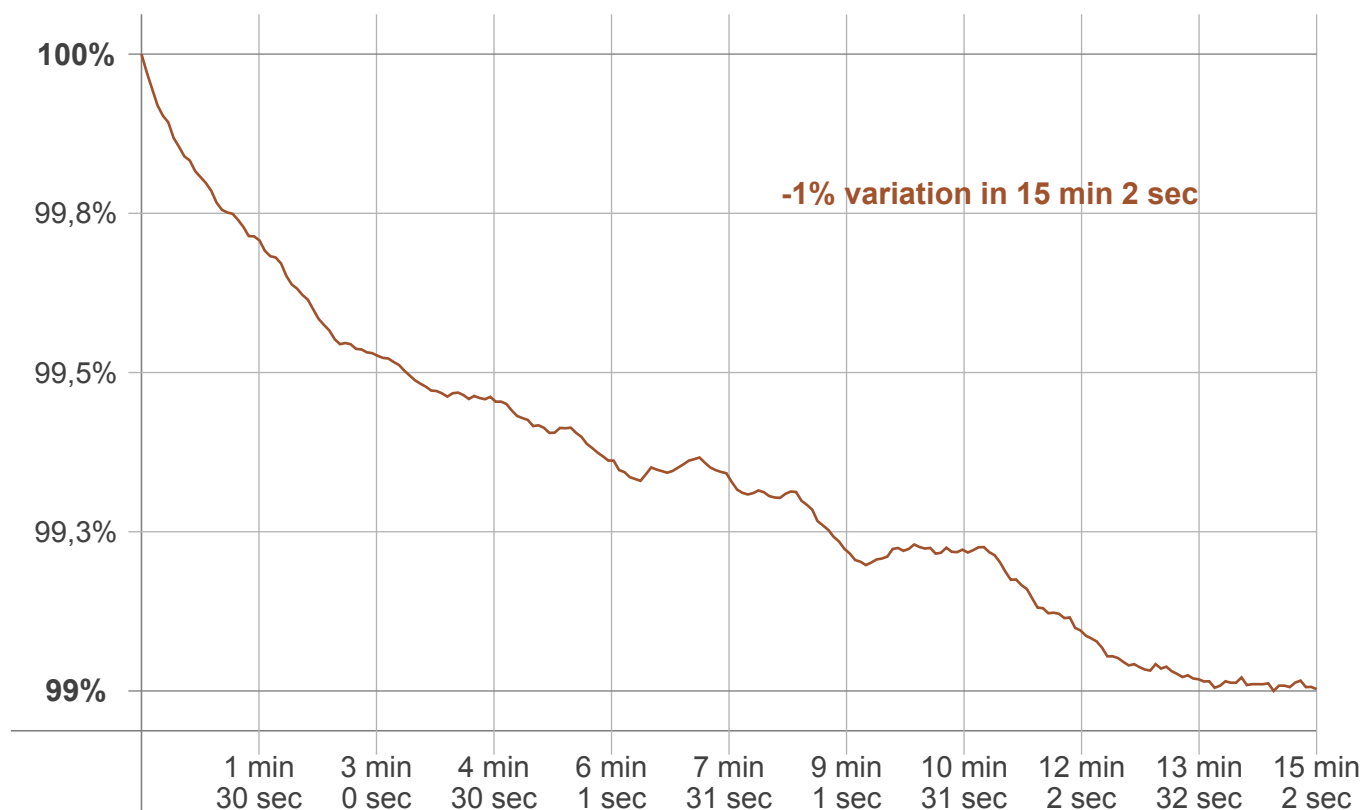
## Luminaire budgetary diagram



## Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
{LUM0-10}	148 lm	55,5 lm	17,7 lm	7,54 lm	4,19 lm	2,74 lm	1,59 lm	0,927 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,056 lm	0,000 lm	0,000 lm	0,000 lm	0,000 lm	0,000 lm	0,000 lm	0,000 lm	0,000 lm

Warmup curve



Warmup result

Warmup time:	15 min 2 sec
Warmup variation	-1,0%

Warmup conditions

Stable period:	15 min
Stable change max:	2,0%
Minimum time:	15 min

Color temperature change

CCT start	CCT change	CCT end
2786 K	-12 K	2774 K

Output change

Output start	Output change	Output end
339 lm	-3 lm	336 lm



## Flicker curve (complete sampled flicker signal)



## Flicker frame (frame of one flicker period)



## Flicker FFT (frequency scope of flicker curve)



## Flicker results:

Flicker frequency:	n/a Hz
Flicker index:	n/a
Flicker percentage:	n/a %
SVM: (Visual flicker)	n/a

## Flicker conditions:

Sample rate:	60.000 samples/second
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