

Light efficiency:

73 Lumen/Watt

Light quality:

CRI: 92,4

Color temperature:

2721 K

Output: 333 lm

Peak: 6976 cd

Power: 4,5 W

PF: 1,0



Product name:

**F L-S O - 2-4 C -1 0 0-W-LSST-D**

Item number:

**F L / S O - 2 / 4 C / 1 0 0 / W / L S S T / D**

Date and time:

**15.03.2019 11:44:03**

Description:

**HEIDI.D8°**

**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**

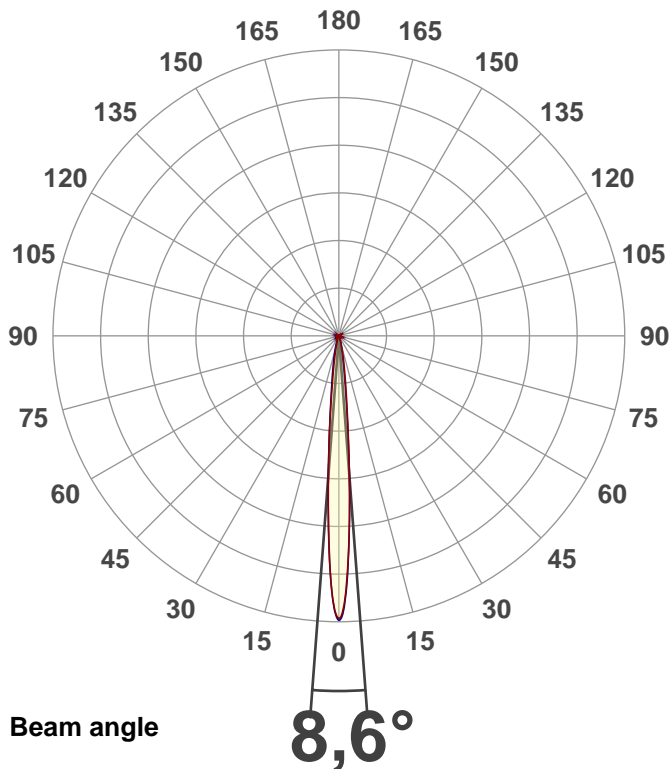
**Master of Engineering**

**Pruefort:**

**Lichtlabor**

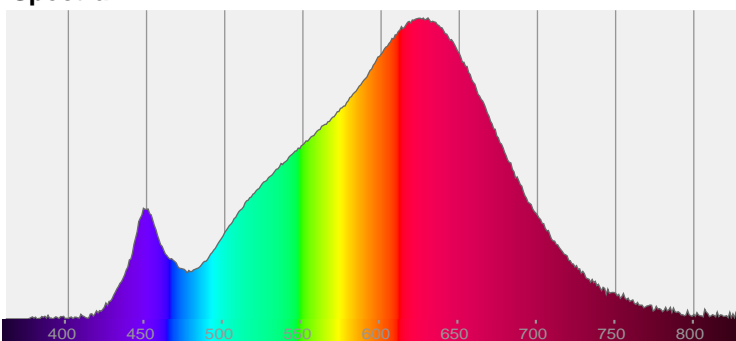
**Gaustasse13-15**

**55411 Bingen am Rhein**

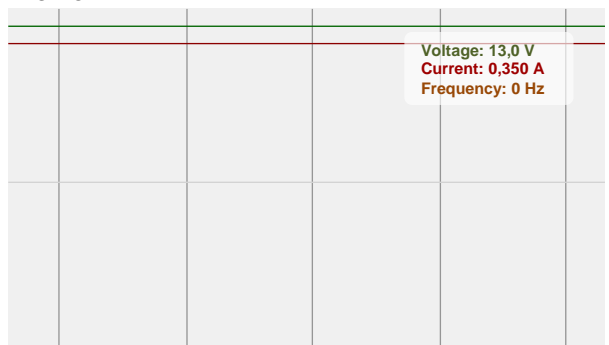


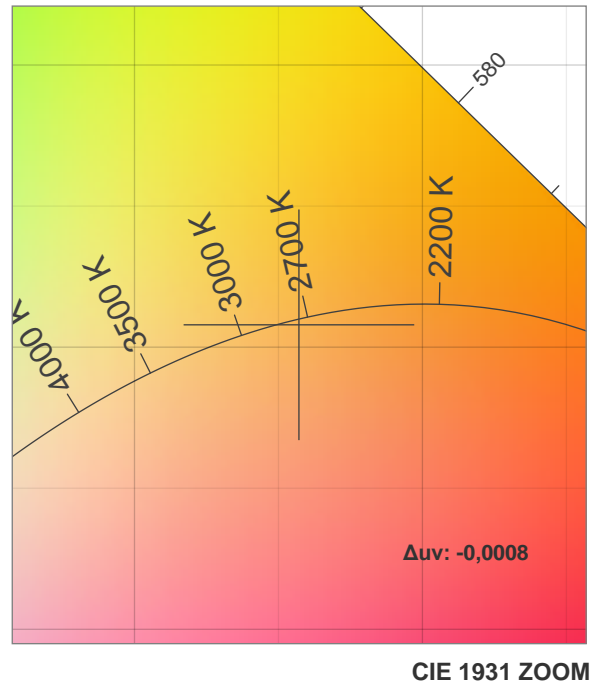
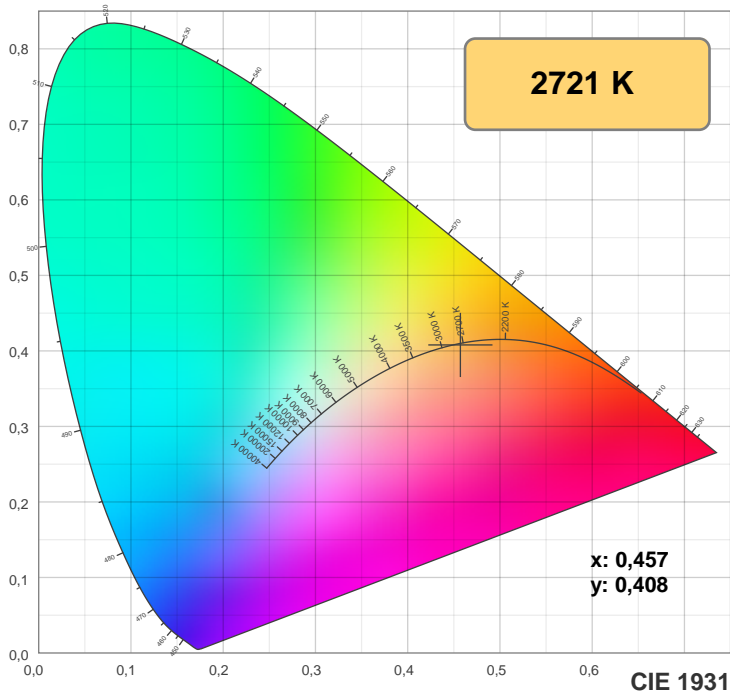
CIE 1931  
x: 0,457  
y: 0,408

Spectra

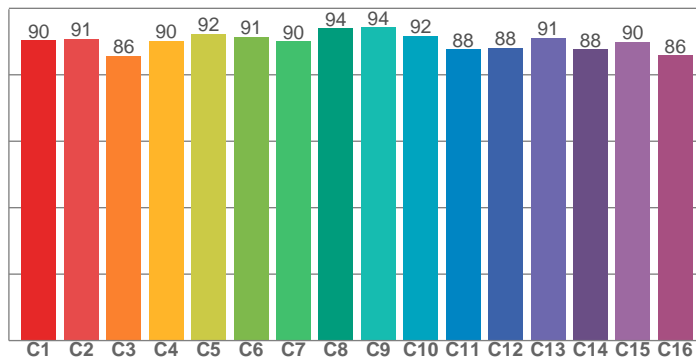


Power

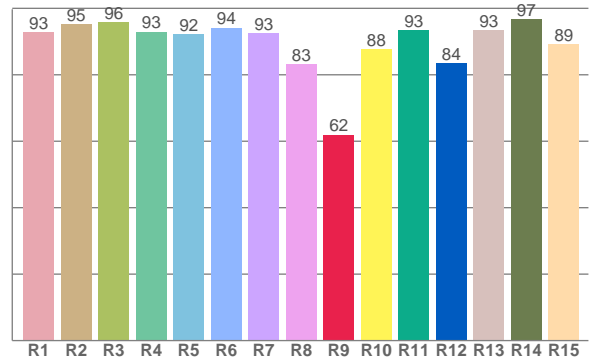




TM30: 90,1



CRI: 92,4 (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
92,8	95,3	95,8	92,9	92,1	94,2	92,6	83,1	61,9	87,7	93,4	83,5	93,4	96,7	89,3

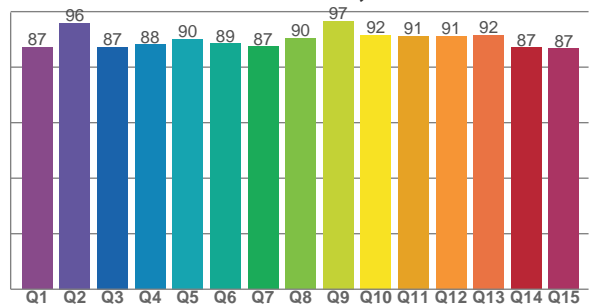
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90,3	90,8	85,7	90,2	92,4	91,4	90,1	94,0	94,3	91,8	87,6	88,1	91,1	87,6	89,9	85,8

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
87,1	96,0	87,3	88,1	90,2	88,5	87,4	90,4	96,7	91,6	91,2	91,2	91,6	87,0	86,7

CQS: 89,5



## 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
2721 K	92,4	61,9	90,1	101,3	89,5	0,457	0,408	0,262	0,351	-0,0008

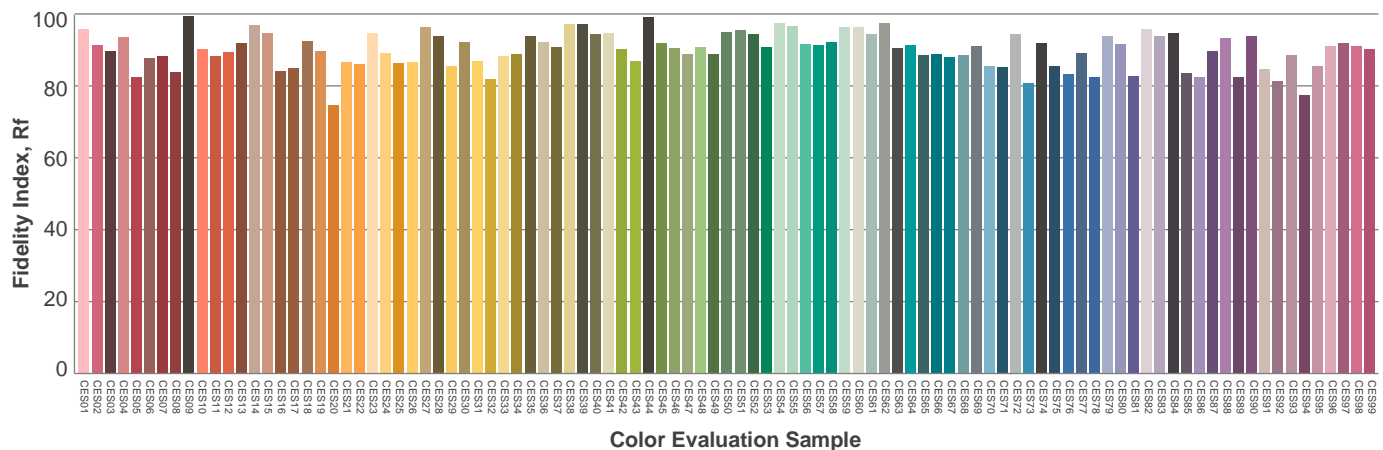
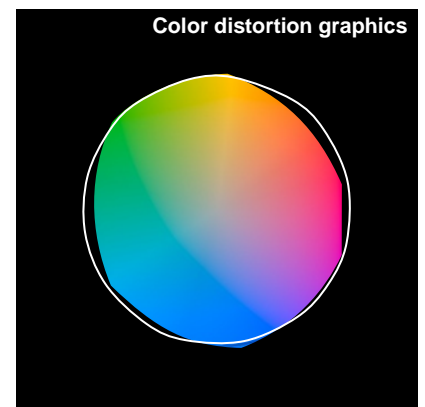
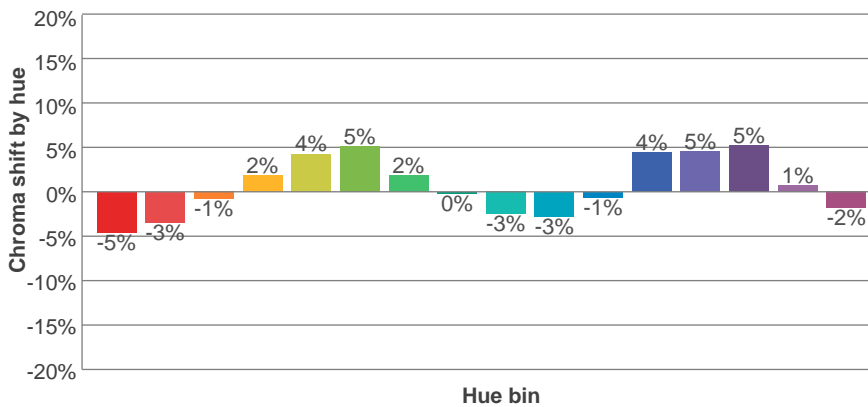
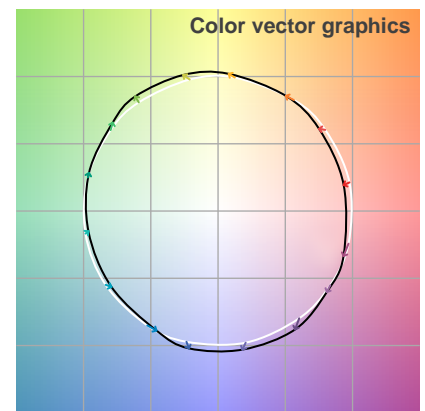
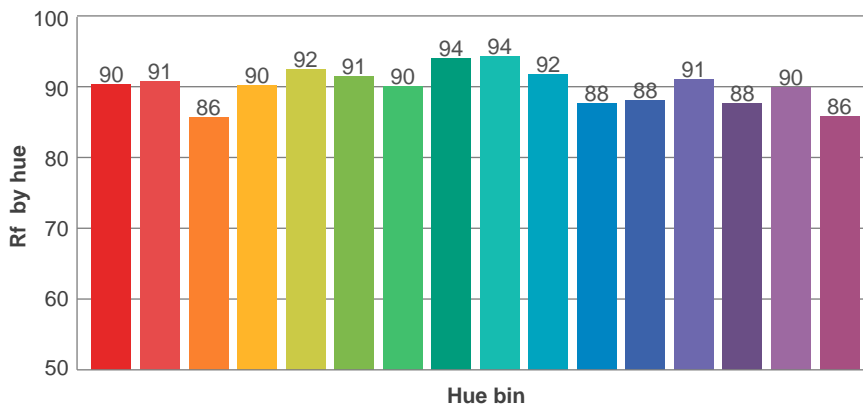
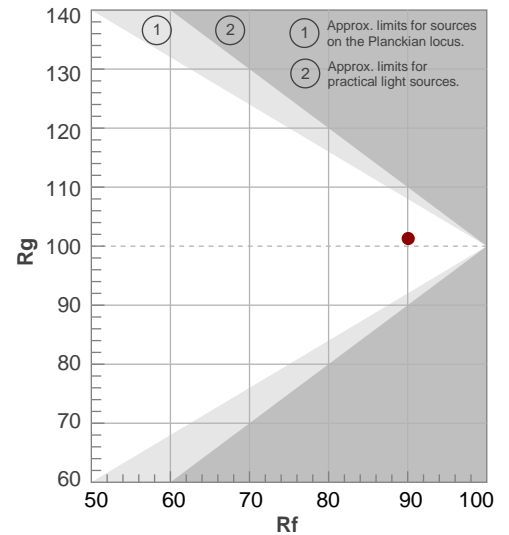
**Rf 90,1**

Fidelity index Rf

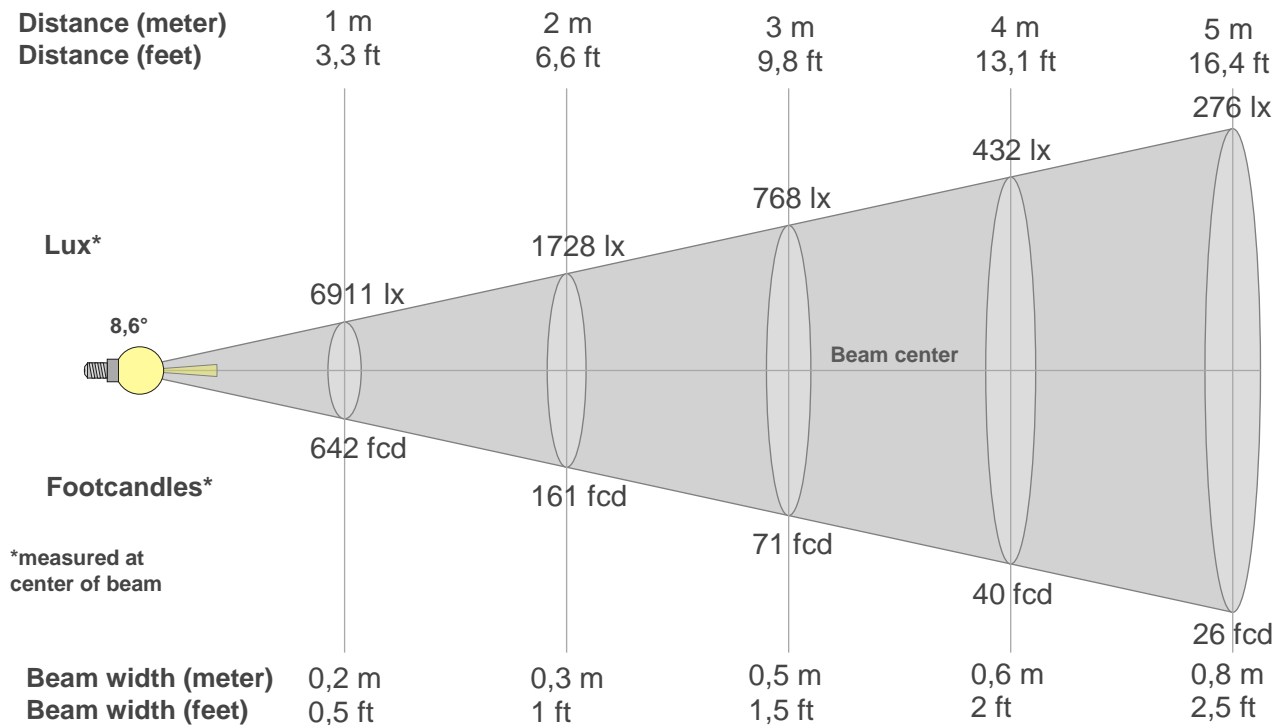
**Rg 101,3**

Gammut index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	90	-5%	-1%
2	91	-3%	3%
3	86	-1%	7%
4	90	2%	5%
5	92	4%	4%
6	91	5%	0%
7	90	2%	-5%
8	94	0%	-3%
9	94	-3%	-1%
10	92	-3%	4%
11	88	-1%	8%
12	88	4%	3%
13	91	5%	-3%
14	88	5%	-7%
15	90	1%	-6%
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
6911lx	1728lx	768lx	432lx	276lx	192lx	141lx	108lx	85lx	69lx	57lx	48lx	41lx	35lx	31lx	27lx	24lx	21lx	19lx	17lx
642,1fc	160,5fc	71,3fcd	40,1fcd	25,7fcd	17,8fcd	13,1fcd	10fcd	7,9fcd	6,4fcd	5,3fcd	4,5fcd	3,8fcd	3,3fcd	2,9fcd	2,5fcd	2,2fcd	2fcd	1,8fcd	1,6fcd

### Intensities in 0° c-plane

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
6911	6604	5844	4835	3780	2813	2070	1563	1205	942	749	607	491	395	318	258	210	170	137	114
100%	96%	85%	70%	55%	41%	30%	23%	17%	14%	11%	9%	7%	6%	5%	4%	3%	2%	2%	2%

### Intensities in 90° c-plane

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
6911	6713	5937	4847	3745	2737	1909	1334	961	700	517	396	310	246	197	164	139	119	101	88
100%	97%	86%	70%	54%	40%	28%	19%	14%	10%	7%	6%	4%	4%	3%	2%	2%	2%	1%	1%

### Intensities in 180° c-plane

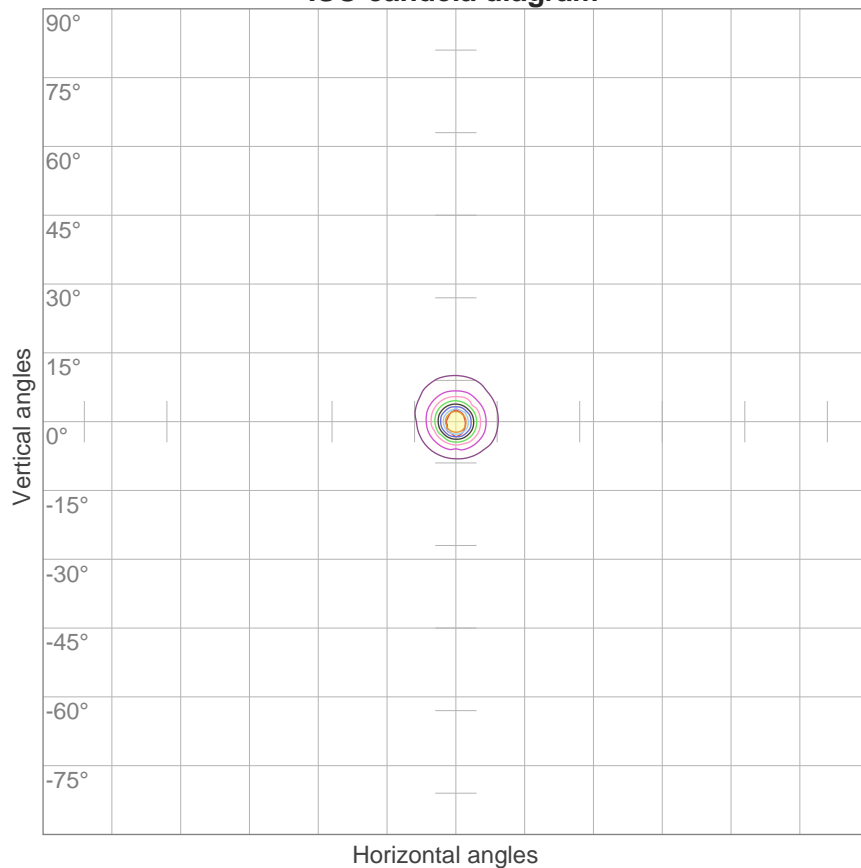
0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
6911	6604	5875	4839	3763	2838	2085	1507	1113	853	663	514	404	324	260	209	169	140	118	101
100%	96%	85%	70%	54%	41%	30%	22%	16%	12%	10%	7%	6%	5%	4%	3%	2%	2%	2%	1%

### Intensities in 270° c-plane

0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
6911	6663	5868	4781	3718	2824	2120	1618	1282	1050	864	718	610	518	432	361	304	255	212	175
100%	96%	85%	69%	54%	41%	31%	23%	19%	15%	12%	10%	9%	8%	6%	5%	4%	4%	3%	3%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
8,6°	20,4°	34,1°	98,0%	96,1%

ISO candela diagram



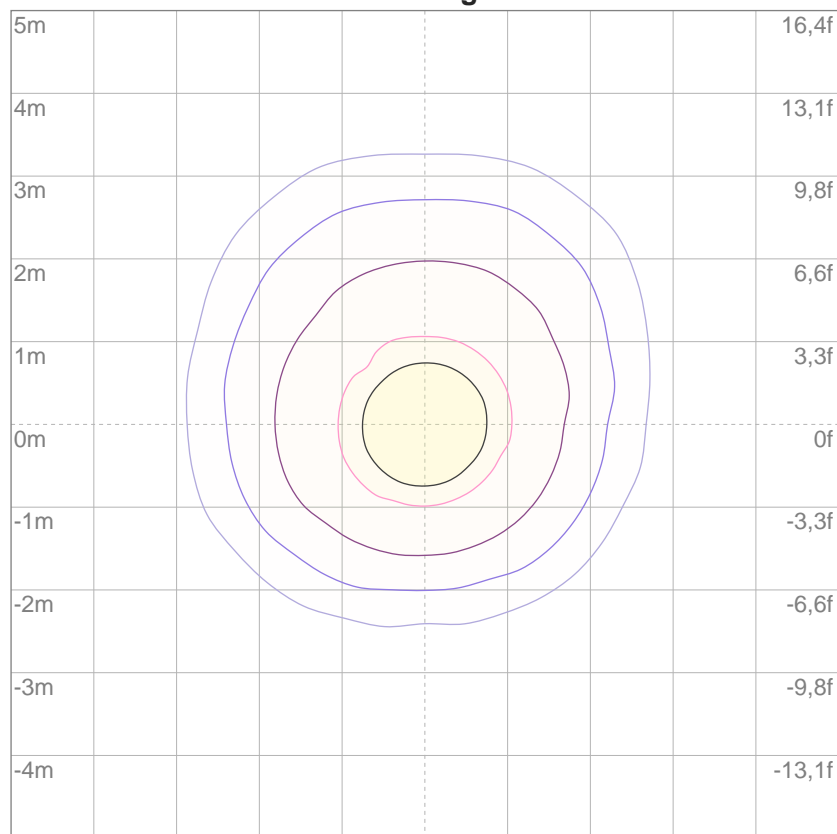
10%	691 cd
20%	1382 cd
30%	2073 cd
40%	2765 cd
50%	3456 cd
60%	4147 cd
70%	4838 cd
80%	5529 cd
90%	6220 cd

Conditions:

Number of c-planes: 16

Candela at center: 6911 cd

ISO lux diagram



3%	2,07 lx
5%	3,46 lx
10%	6,91 lx
30%	20,7 lx
50%	34,6 lx

Conditions:

Number of c-planes: 16

Lux at center: 69,1 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	3,6	4,3	3,8	4,5	4,7	3,2	3,9	3,5	4,1	4,3
	3H	4,6	5,2	4,9	5,5	5,7	4,6	5,2	4,8	5,4	5,6
	4H	5,7	6,3	6,0	6,5	6,8	5,4	6,0	5,7	6,3	6,5
	6H	6,9	7,4	7,2	7,7	8,0	6,6	7,1	6,9	7,4	7,7
	8H	7,8	8,3	8,1	8,6	8,9	7,6	8,2	8,0	8,4	8,7
	12H	8,6	9,1	8,9	9,4	9,7	8,6	9,1	8,9	9,4	9,7
4H	2H	4,1	4,7	4,4	4,9	5,2	3,8	4,4	4,1	4,6	4,9
	3H	5,5	6,0	5,8	6,3	6,6	5,5	6,0	5,8	6,3	6,6
	4H	6,7	7,1	7,1	7,5	7,8	6,6	7,0	7,0	7,4	7,7
	6H	8,2	8,5	8,6	8,9	9,3	8,0	8,4	8,4	8,7	9,1
	8H	9,3	9,6	9,7	9,9	10,3	9,2	9,5	9,6	9,9	10,3
	12H	10,1	10,4	10,5	10,8	11,2	10,3	10,5	10,7	10,9	11,3
8H	4H	7,2	7,5	7,6	7,9	8,3	7,2	7,5	7,6	7,9	8,3
	6H	9,0	9,2	9,4	9,6	10,1	8,9	9,1	9,3	9,6	10,0
	8H	10,2	10,4	10,7	10,9	11,3	10,2	10,4	10,7	10,9	11,3
	12H	11,1	11,3	11,6	11,7	12,2	11,5	11,7	12,0	12,1	12,6
12H	4H	7,3	7,6	7,8	8,0	8,4	7,4	7,6	7,8	8,0	8,5
	6H	9,3	9,5	9,7	9,9	10,4	9,2	9,4	9,6	9,8	10,3
	8H	10,6	10,8	11,1	11,2	11,7	10,6	10,7	11,1	11,2	11,7
Variation of the observer position for the luminaire distance S											
S = 1,0H		+0,2 / -0,1					+0,2 / -0,3				
S = 1,5H		+0,4 / -0,3					+0,4 / -0,4				
S = 2,0H		+0,7 / -0,6					+0,7 / -0,7				
Standard table		---					BK10				
Correction summand		---					-6,4				
Corrected glare indices referring to 333 lm total luminous flux											

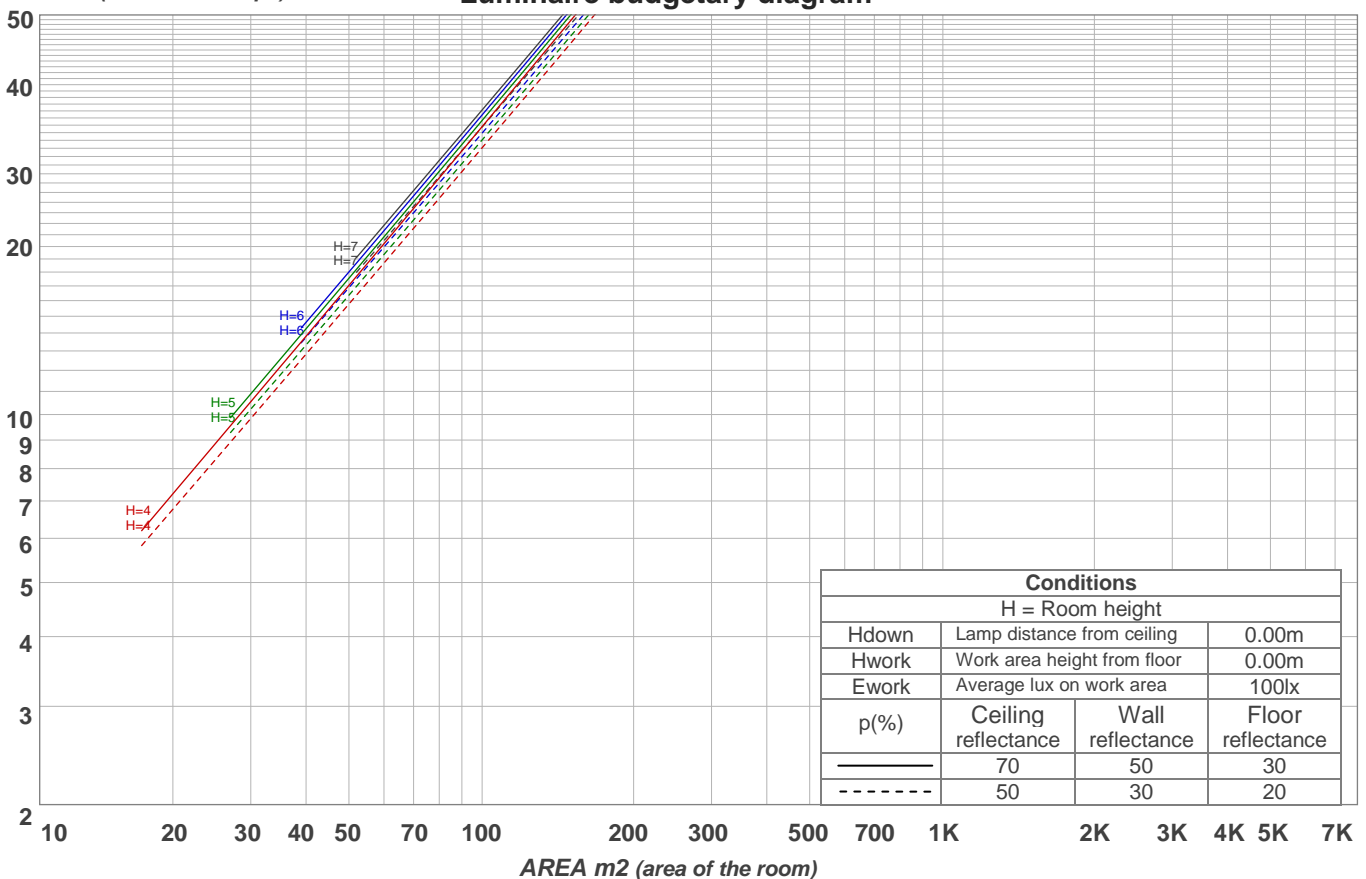
UGR data could be incorrect as lamp output is not symmetrical. Goto Edit->Photometric->Corrections and select Correct asymmetry.

## 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	115	113	111	110	113	111	109	108	107	106	105	103	102	101	100	99	98	97
2	112	108	105	103	110	107	104	102	104	102	100	101	99	98	98	97	96	94
3	109	104	101	98	107	103	100	98	101	98	96	98	96	95	96	95	93	92
4	106	101	98	95	104	100	97	94	98	95	93	96	94	92	95	93	91	90
5	104	98	95	92	102	97	94	92	96	93	91	94	92	90	93	91	89	88
6	101	96	92	90	100	95	92	89	94	91	89	93	90	88	92	89	88	87
7	99	94	90	88	98	93	90	87	92	89	87	91	88	87	90	88	86	85
8	97	92	88	86	96	91	88	86	90	87	85	90	87	85	89	86	85	84
9	96	90	87	84	95	90	86	84	89	86	84	88	86	84	88	85	83	83
10	94	89	85	83	93	88	85	83	88	85	83	87	84	83	86	84	82	82

LAMPS (number of lamps)

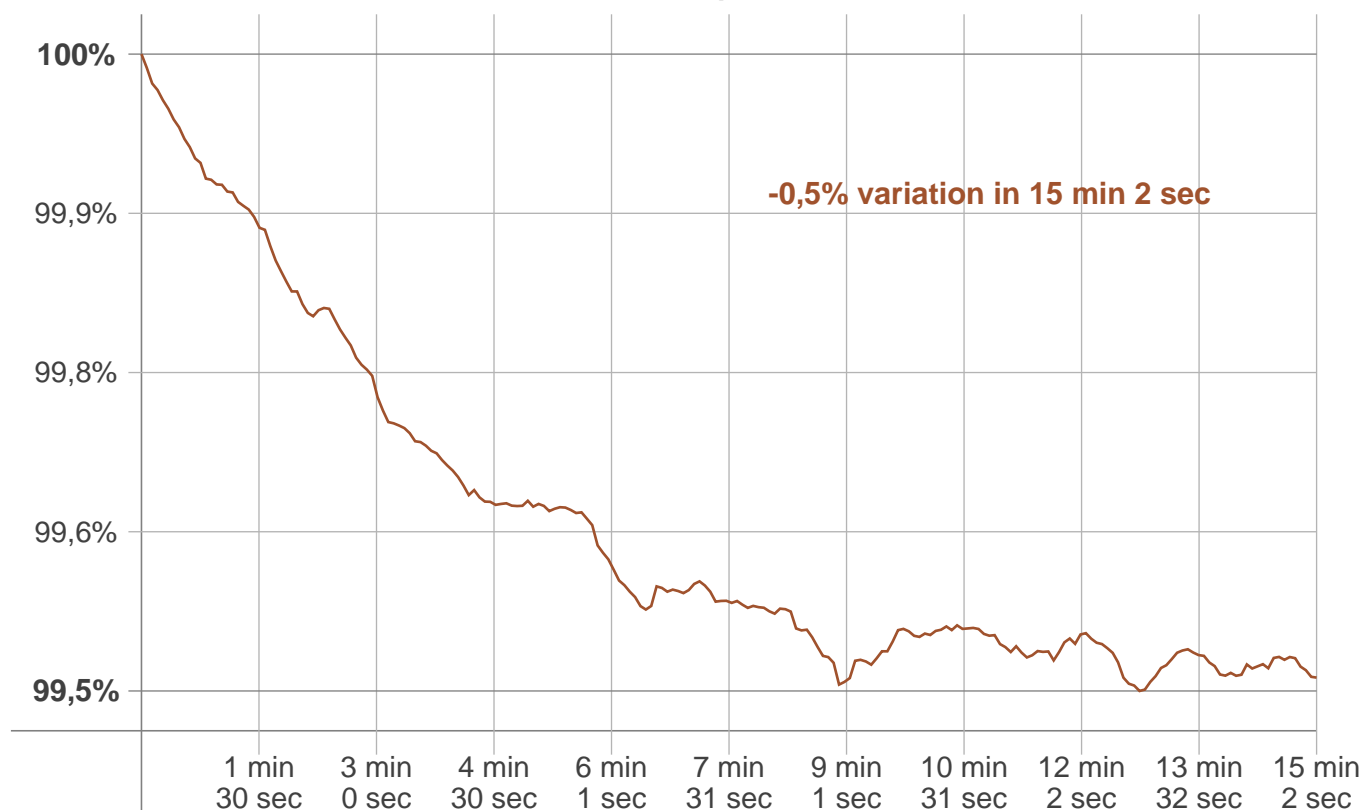
## Luminaire budgetary diagram



## Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
{LUM0-10}	79,0 lm	24,6 lm	9,91 lm	5,62 lm	3,73 lm	2,65 lm	2,17 lm	1,48 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,446 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	-0,5%

Warmup conditions

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

Color temperature change

CCT start	CCT change	CCT end
2726 K	-5 K	2721 K

Output change

Output start	Output change	Output end
334 lm	-1 lm	333 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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