

Light efficiency:

70 Lumen/Watt

Light quality:

CRI: 92,7

Color temperature:

2767 K

Output: 320 lm

Peak: 530 cd

Power: 4,5 W

PF: 1,0



Product name:

F L-S O - 2-4 C -1 0 0-W-LSWT-W2

Item number:

F L / S O - 2 / 4 C / 1 0 0 / W / LSWT / W2

Date and time:

08.03.2019 15:36:21

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

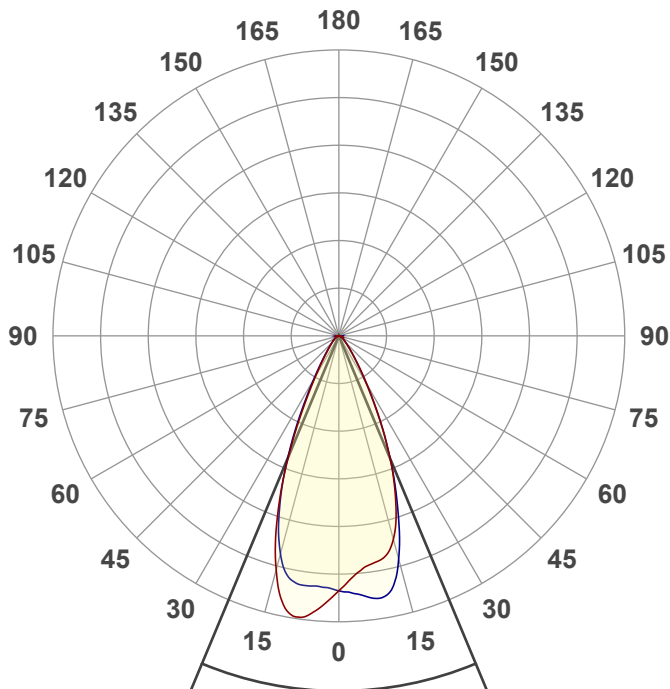
Master of Engineering

Pruefort:

Lichtlabor

Gaustasse13-15

55411 Bingen am Rhein



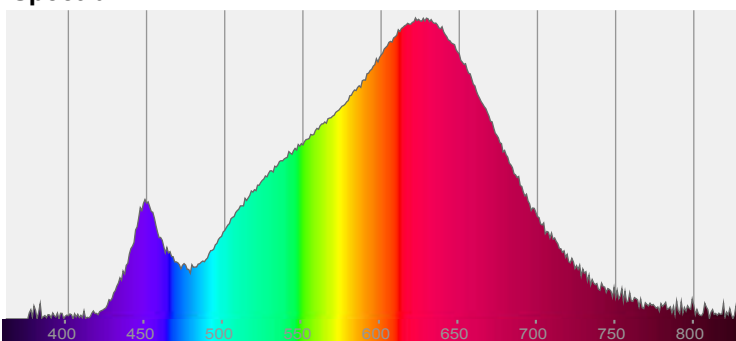
Beam angle

45,3°

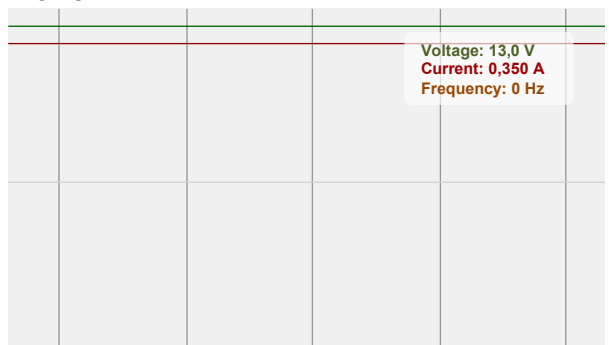


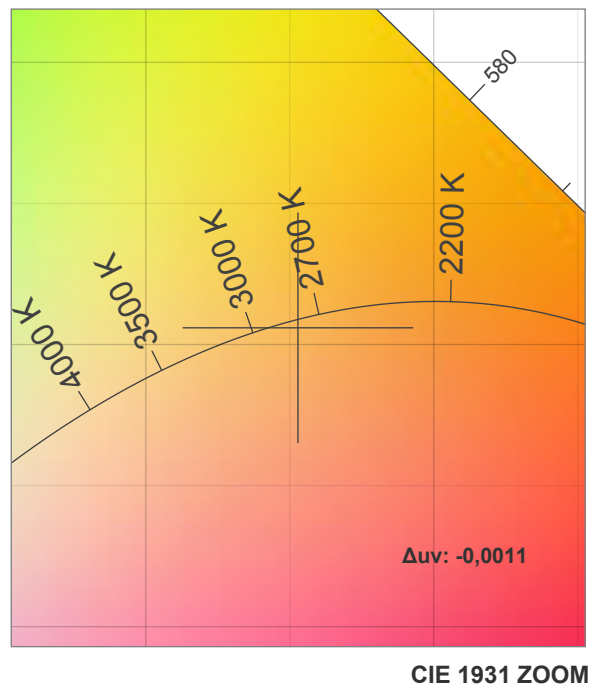
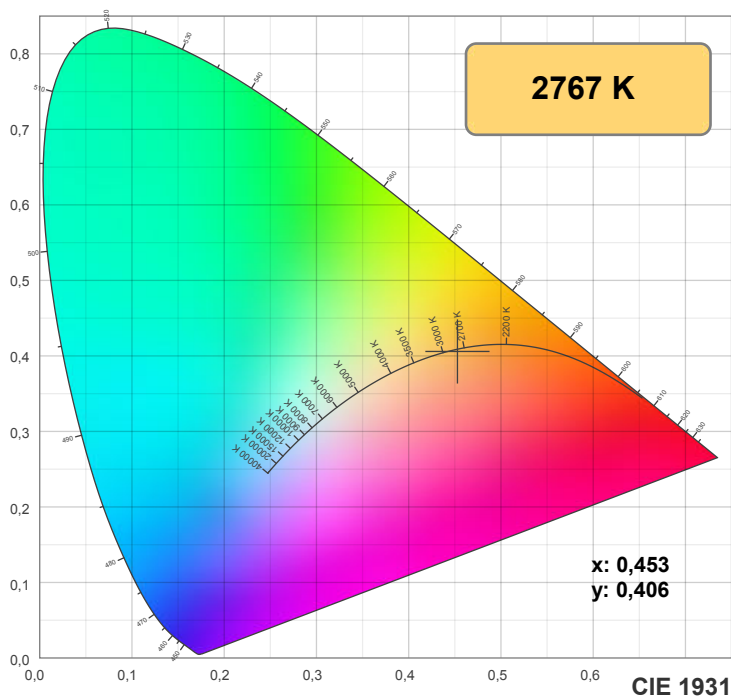
CIE 1931
x: 0,453
y: 0,406

Spectra

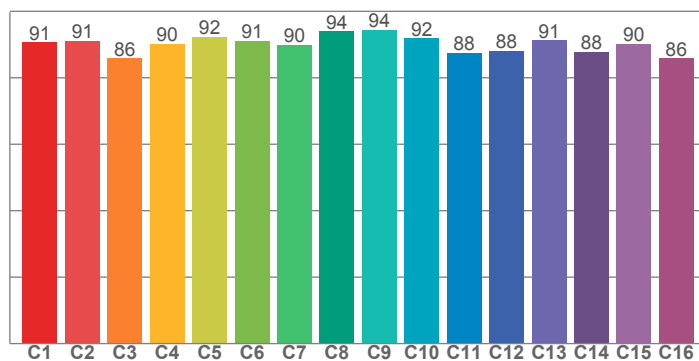


Power

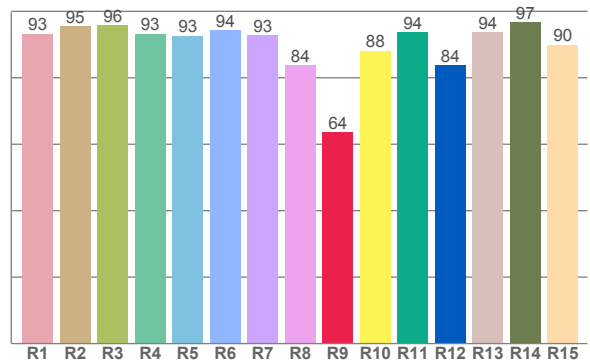




TM30: 90,2



CRI: 92,7 (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
93,3	95,5	95,7	93,2	92,6	94,4	92,8	83,9	63,5	88,1	93,7	83,8	93,8	96,7	89,9

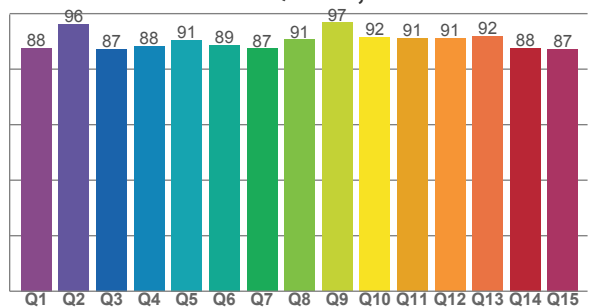
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90,7	91,1	85,8	90,1	92,3	91,1	90,0	93,9	94,4	91,9	87,6	88,1	91,2	87,8	90,1	85,9

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
87,6	96,3	87,2	88,2	90,5	88,8	87,4	90,6	96,8	91,7	91,2	91,2	91,8	87,6	87,3

CQS: 89,7



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
2767 K	92,7	63,5	90,2	101,5	89,7	0,453	0,406	0,260	0,350	-0,0011

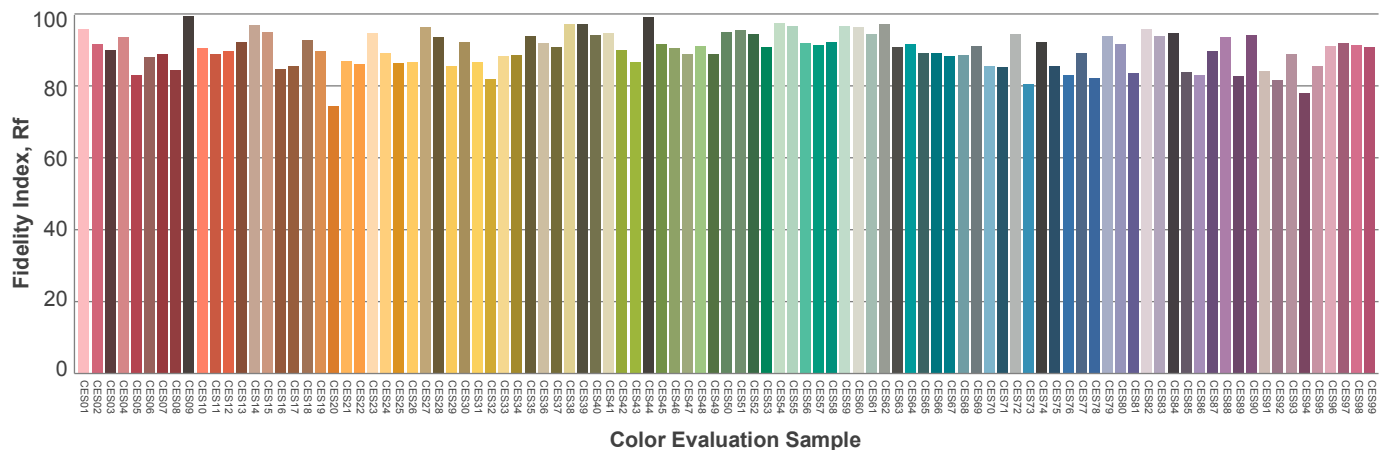
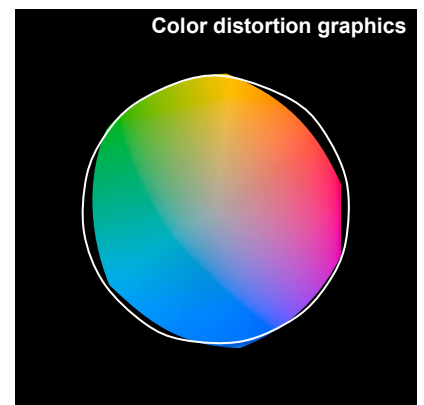
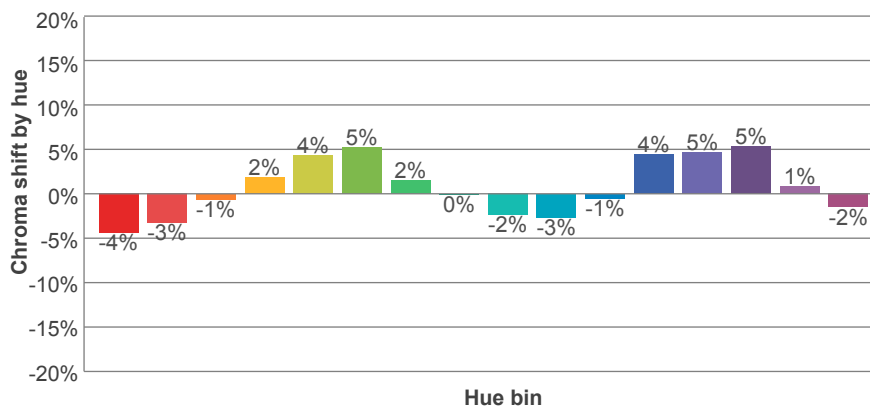
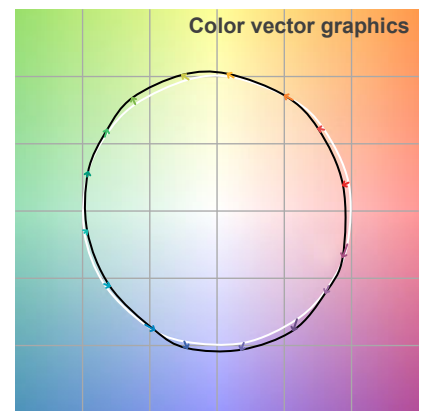
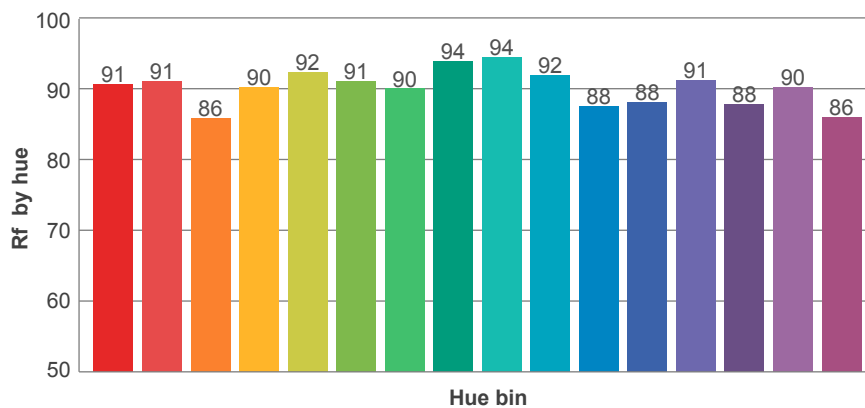
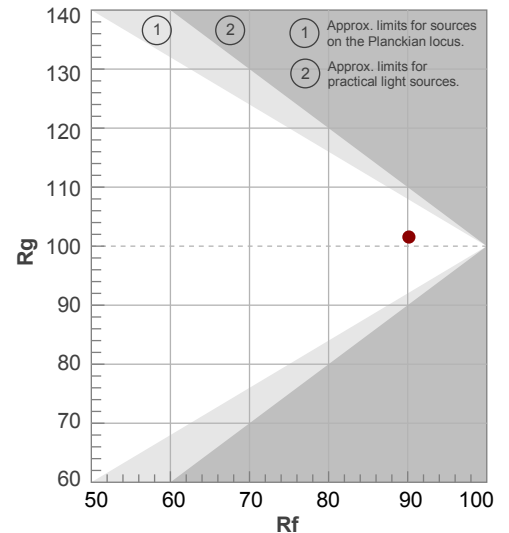
Rf 90,2

Fidelity index Rf

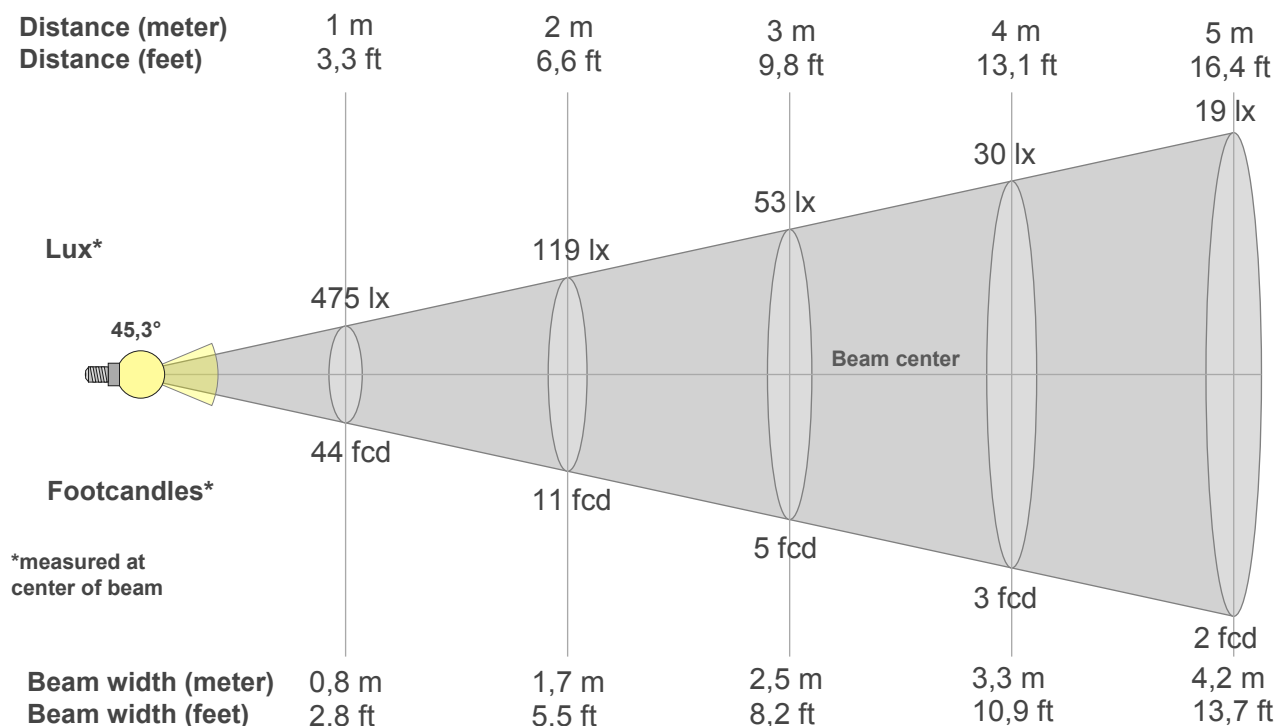
Rg 101,5

Gamut index Rg

Hue Bin	R _f	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	2%	-5%
8	94	0%	-4%
9	94	-2%	-1%
10	92	-3%	4%
11	88	-1%	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
475lx	119lx	53lx	30lx	19lx	13lx	10lx	7lx	6lx	5lx	4lx	3lx	3lx	2lx	2lx	2lx	2lx	1lx	1lx	1lx
44,1fcd	11fcd	4,9fcd	2,8fcd	1,8fcd	1,2fcd	0,9fcd	0,7fcd	0,5fcd	0,4fcd	0,4fcd	0,3fcd	0,3fcd	0,2fcd	0,2fcd	0,2fcd	0,2fcd	0,1fcd	0,1fcd	0,1fcd

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°
475	459	446	435	430	426	419	404	379	345	305	263	218	176	137	106	81	63	49	39
100%	97%	94%	92%	90%	90%	88%	85%	80%	73%	64%	55%	46%	37%	29%	22%	17%	13%	10%	8%

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°
475	477	482	488	494	493	480	451	409	361	312	264	217	172	133	101	77	58	46	36
100%	101%	101%	103%	104%	104%	101%	95%	86%	76%	66%	56%	46%	36%	28%	21%	16%	12%	10%	8%

Intensities in 180° c-plane

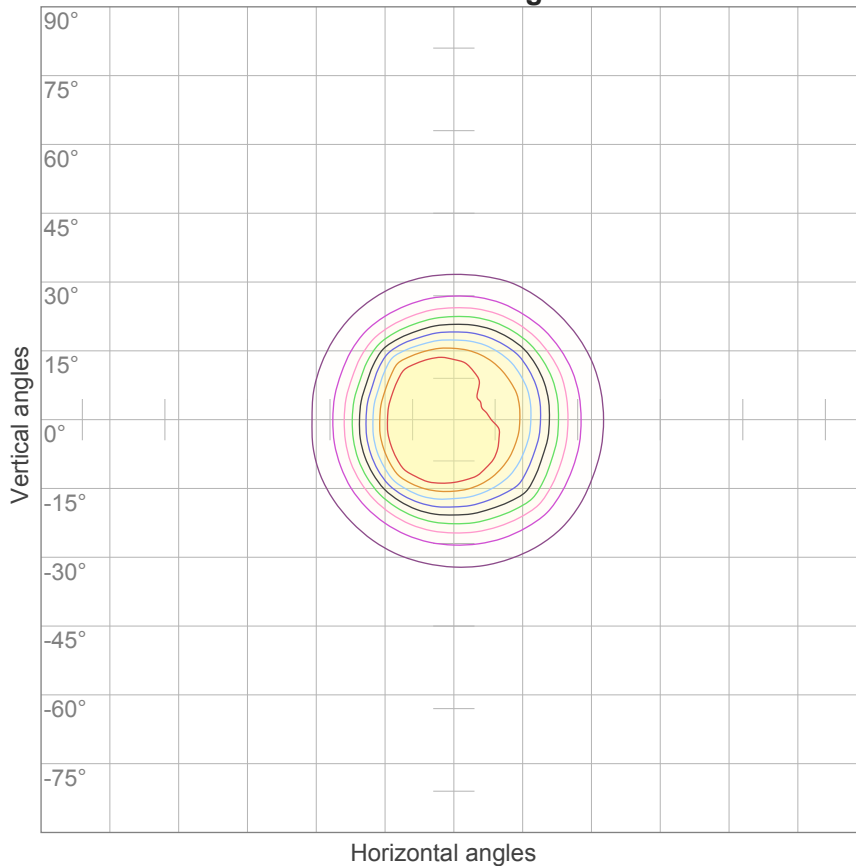
0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°
475	491	508	522	529	525	507	473	429	378	321	263	206	156	116	87	66	50	40	32
100%	103%	107%	110%	111%	111%	107%	100%	90%	80%	68%	55%	43%	33%	24%	18%	14%	11%	8%	7%

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°
475	471	469	469	469	467	457	436	403	363	316	265	214	166	125	94	71	55	44	35
100%	99%	99%	99%	99%	98%	96%	92%	85%	76%	66%	56%	45%	35%	26%	20%	15%	12%	9%	7%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
45,3°	70,1°	101,2°	97,5%	92,7%

ISO candela diagram



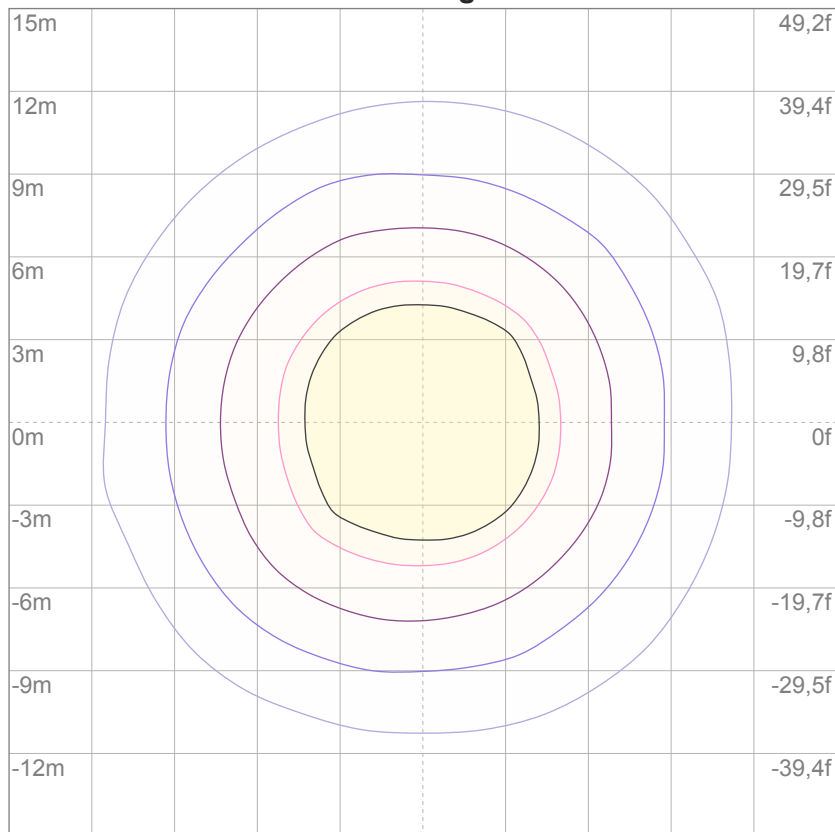
10%	47 cd
20%	95 cd
30%	142 cd
40%	190 cd
50%	237 cd
60%	285 cd
70%	332 cd
80%	380 cd
90%	427 cd

Conditions:

Number of c-planes: 16

Candela at center: 475 cd

ISO lux diagram



3%	0,142 lx
5%	0,237 lx
10%	0,475 lx
30%	1,42 lx
50%	2,37 lx

Conditions:

Number of c-planes: 16

Lux at center: 4,75 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	11,0	11,7	11,2	11,9	12,1	10,7	11,4	10,9	11,6	11,8
	3H	11,4	12,0	11,6	12,3	12,5	11,1	11,7	11,4	12,0	12,2
	4H	11,5	12,2	11,8	12,4	12,7	11,3	11,9	11,6	12,1	12,4
	6H	11,7	12,3	12,1	12,6	12,9	11,5	12,0	11,8	12,3	12,6
	8H	11,8	12,4	12,2	12,7	13,0	11,5	12,1	11,9	12,4	12,7
	12H	12,0	12,5	12,3	12,8	13,1	11,6	12,2	12,0	12,5	12,8
4H	2H	11,1	11,8	11,4	12,0	12,3	10,8	11,5	11,1	11,7	12,0
	3H	11,6	12,1	12,0	12,4	12,8	11,3	11,9	11,7	12,2	12,5
	4H	11,9	12,4	12,3	12,7	13,0	11,6	12,1	12,0	12,4	12,8
	6H	12,2	12,6	12,6	12,9	13,3	11,9	12,3	12,3	12,7	13,1
	8H	12,3	12,7	12,8	13,1	13,5	12,1	12,4	12,5	12,8	13,2
	12H	12,5	12,8	13,0	13,2	13,7	12,2	12,5	12,7	12,9	13,4
8H	4H	11,9	12,3	12,4	12,7	13,1	11,7	12,0	12,1	12,4	12,8
	6H	12,3	12,6	12,8	13,0	13,4	12,1	12,3	12,5	12,8	13,2
	8H	12,5	12,8	13,0	13,2	13,7	12,3	12,5	12,7	12,9	13,4
	12H	12,8	13,0	13,3	13,5	14,0	12,5	12,7	13,0	13,2	13,7
12H	4H	11,9	12,2	12,4	12,6	13,0	11,7	12,0	12,1	12,4	12,8
	6H	12,3	12,5	12,8	13,0	13,4	12,1	12,3	12,5	12,7	13,2
	8H	12,6	12,7	13,0	13,2	13,7	12,3	12,5	12,8	13,0	13,5
Variation of the observer position for the luminaire distance S											
S = 1,0H		+1,8 / -1,2					+1,8 / -1,2				
S = 1,5H		+3,6 / -1,8					+3,5 / -1,9				
S = 2,0H		+5,2 / -2,4					+5,2 / -2,4				
Standard table		BK03					BK03				
Correction summand		-5,2					-5,5				
Corrected glare indices referring to 320 lm total luminous flux											

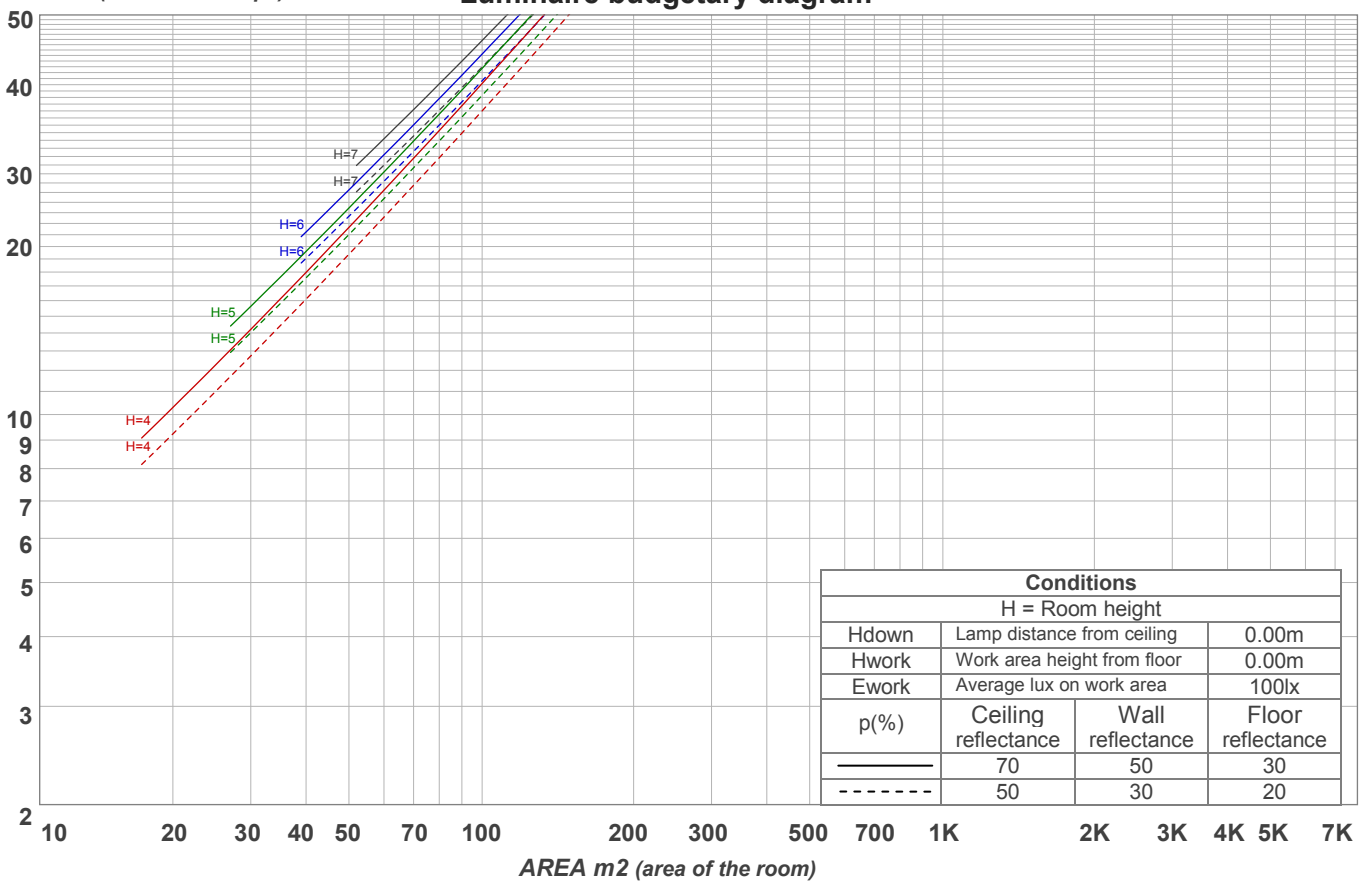
UGR data could be incorrect as lamp output is not symmetrical. Goto Edit->Photometric->Corrections and select Correct asymmetry.

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	113	111	108	106	111	109	106	104	105	103	101	101	99	98	97	96	95	93
2	108	103	99	96	106	102	98	95	98	95	93	95	93	91	93	91	89	87
3	103	97	92	88	101	95	91	87	93	89	86	90	87	85	88	86	83	82
4	98	91	86	82	96	90	85	81	88	83	80	86	82	79	84	81	78	77
5	94	86	80	76	92	85	80	76	83	78	75	81	77	74	80	76	74	72
6	89	81	75	71	88	80	75	71	79	74	71	77	73	70	76	72	70	68
7	86	77	71	67	84	76	71	67	75	70	67	74	69	66	73	69	66	65
8	82	73	67	63	81	72	67	63	71	67	63	70	66	63	69	66	63	61
9	79	69	64	60	77	69	64	60	68	63	60	67	63	60	66	62	60	58
10	75	66	61	57	74	66	61	57	65	60	57	64	60	57	64	60	57	56

LAMPS (number of lamps)

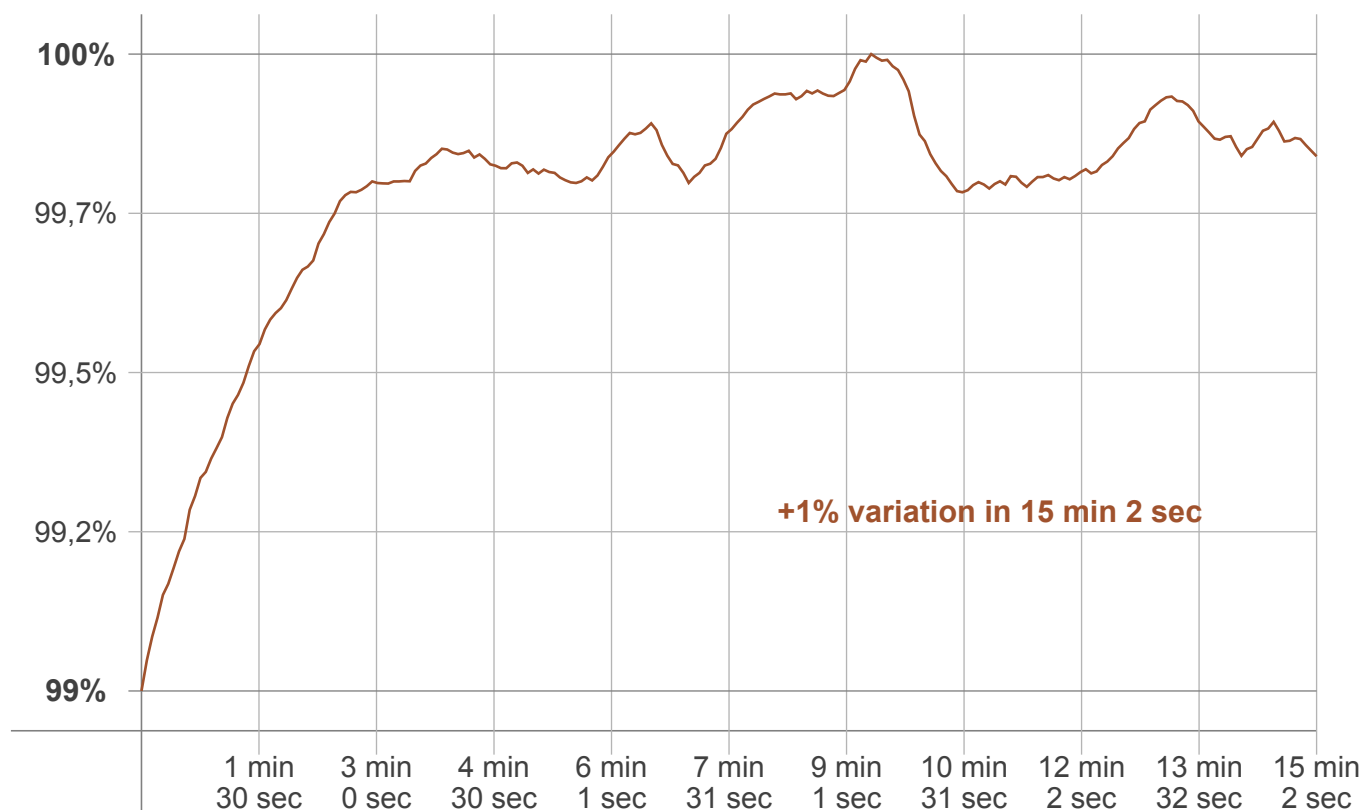
Luminaire budgetary diagram



Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
{LUM0-10}	116 lm	91,3 lm	34,6 lm	15,4 lm	8,78 lm	4,69 lm	2,27 lm	1,03 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,017 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
2770 K	-3 K	2767 K

Output change

Output start	Output change	Output end
318 lm	+2 lm	320 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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