

Light efficiency:



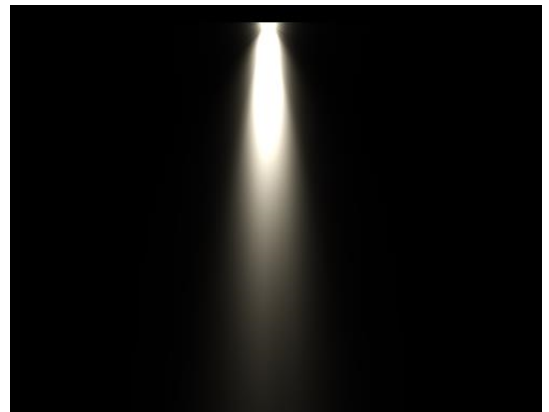
Light quality:



Color temperature:



Output: 337 lm  
Peak: 3571 cd  
Power: 13,1 W  
PF: 0,91



Product name:

br 10W ww10 Grad

Item number:

30210.827.10.XX

Date and time:

24.07.2017 15:41:01

Description:

Toleranzen:

Lumen +/-4%

Candela +/-2,5%

Colour Temp +/-35 Grad K

CRI +/-0,7

Angular Resolution 1 Grad step

Last Calibration 30.06.2017

Pruefer:

Mourad Benzineb

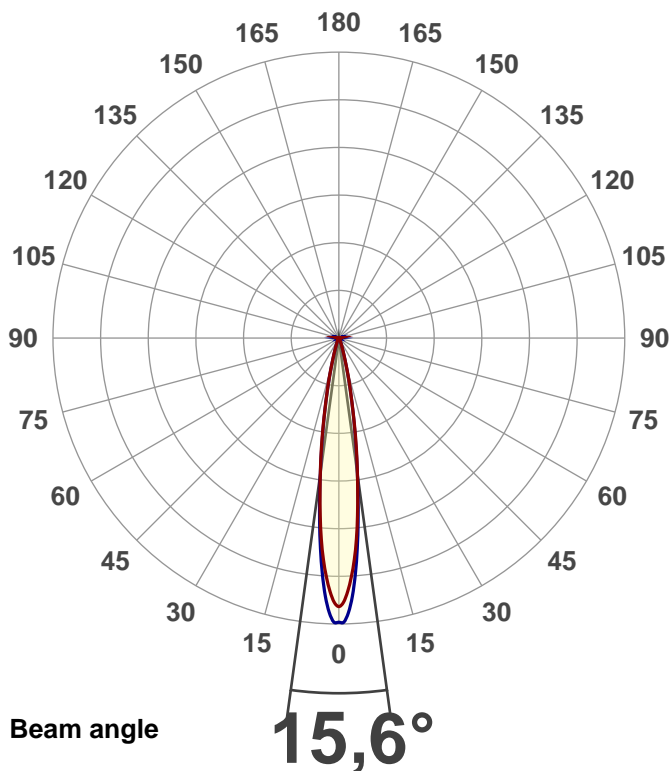
Master of Engineering

Pruefort:

Lichtlabor

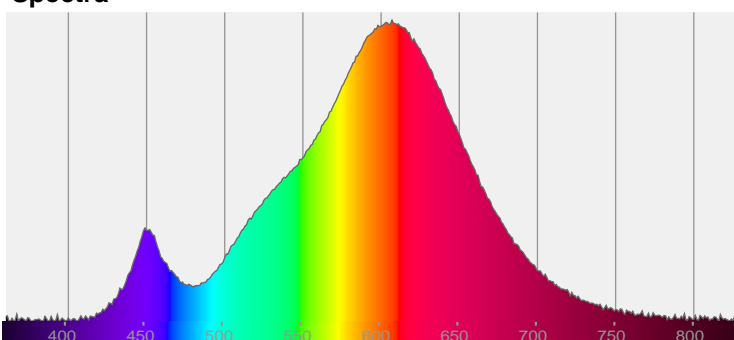
Gaustrasse13-15

55411 Bingen am Rhein

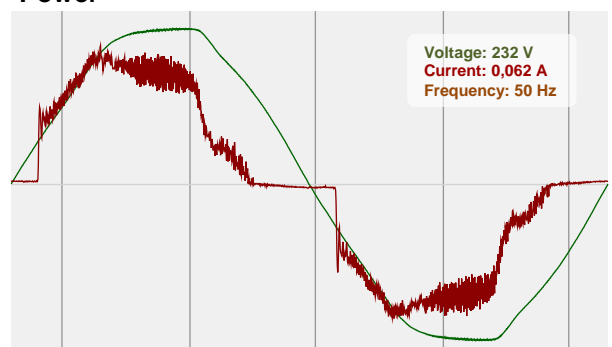


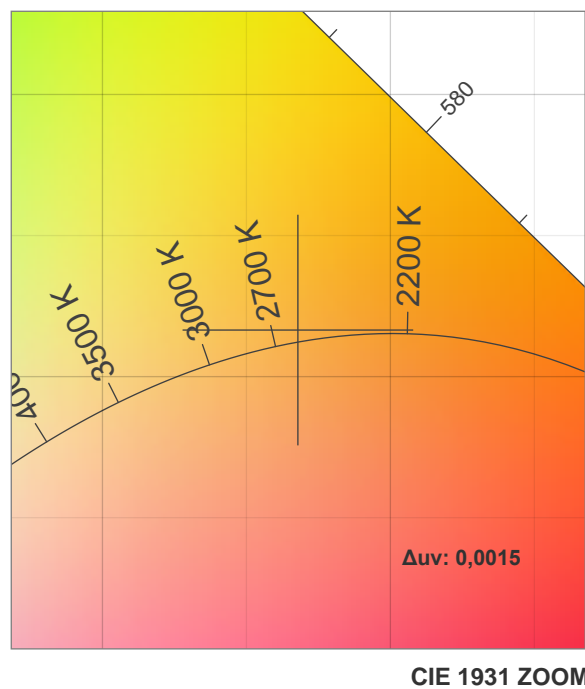
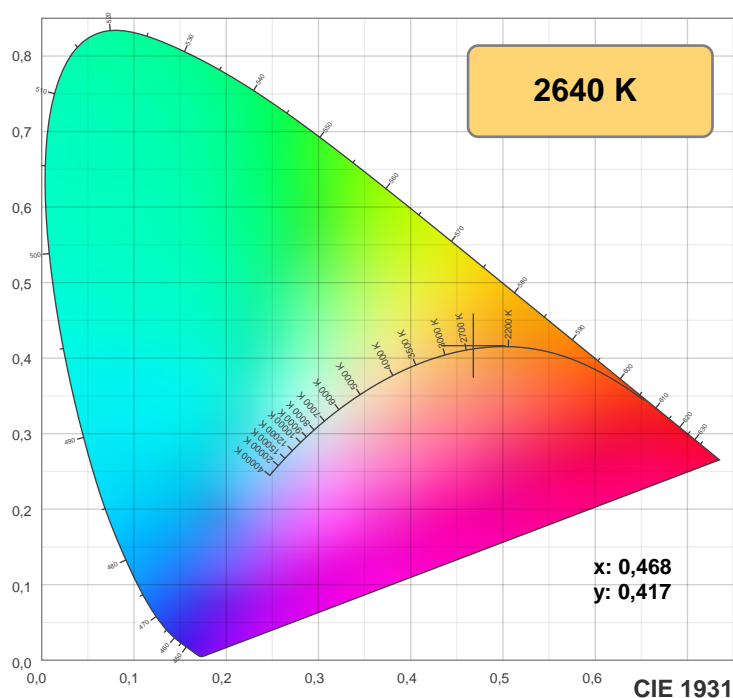
CIE 1931  
x: 0,468  
y: 0,417

Spectra

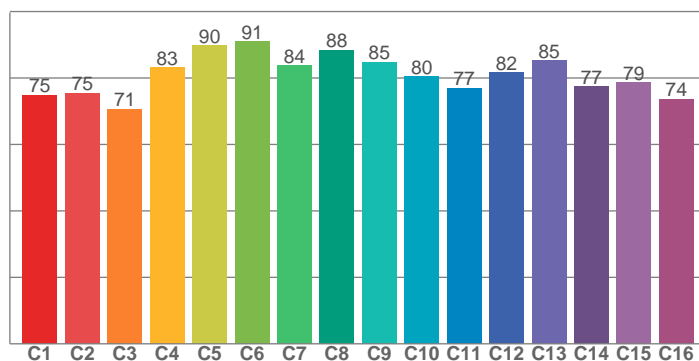


Power

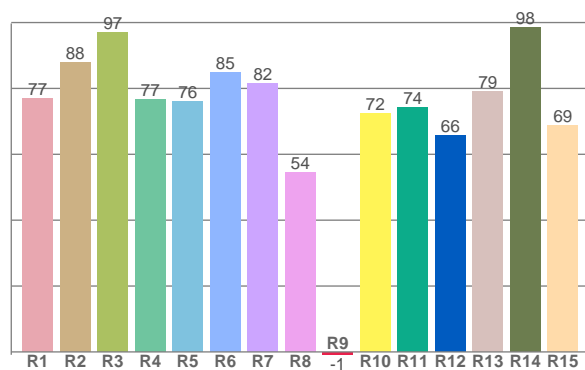




TM30: 80,5



CRI: 79,5 (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
76,9	87,9	97,1	76,7	76,0	84,9	81,6	54,4	-0,9	72,5	74,3	65,7	79,1	98,5	68,8

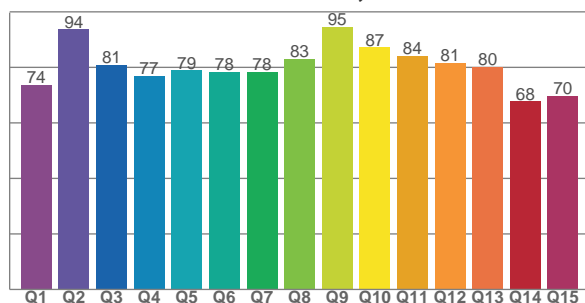
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
74,9	75,5	70,7	83,2	89,9	91,0	83,8	88,4	84,8	80,4	77,0	81,7	85,4	77,5	78,7	73,7

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
73,7	93,7	80,8	77,0	78,9	78,3	78,4	83,0	94,5	87,1	84,1	81,5	80,1	67,7	69,7

CQS: 79,1



## 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	$\Delta uv$
2640 K	79,5	-0,9	80,5	95,6	79,1	0,468	0,417	0,265	0,354	0,0015

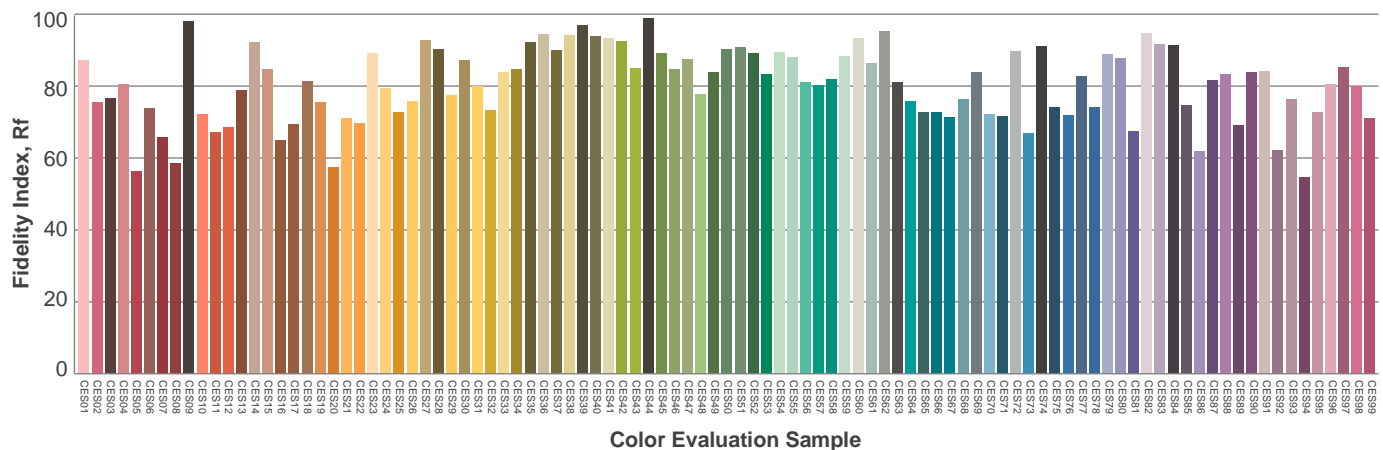
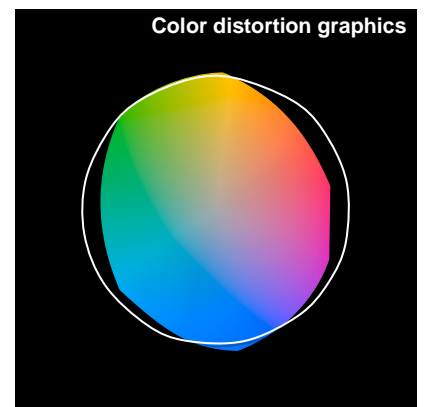
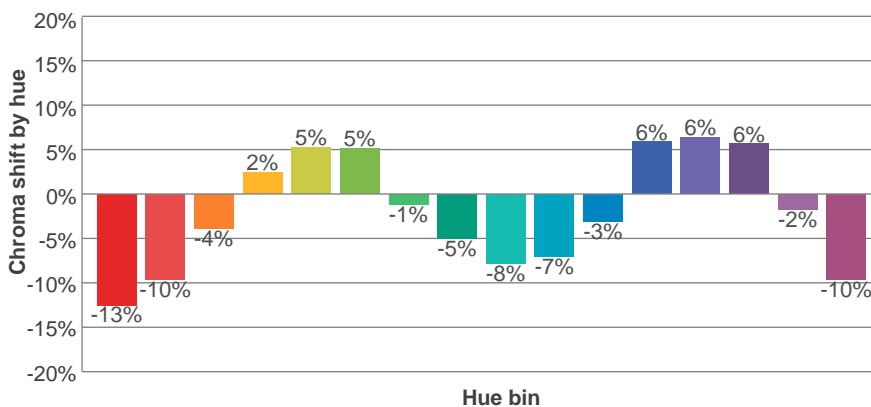
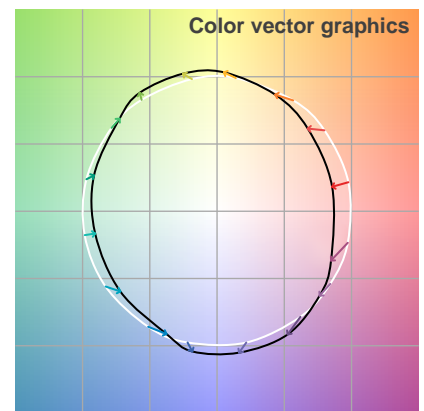
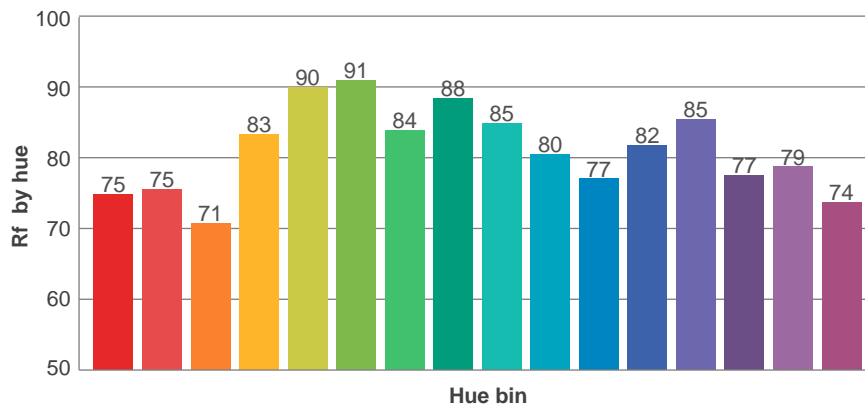
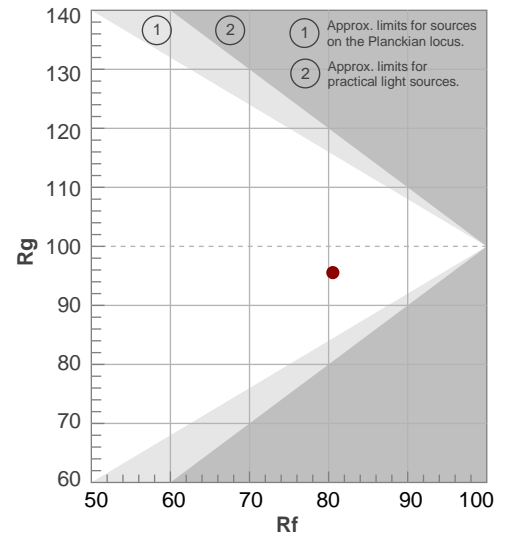
**Rf 80,5**

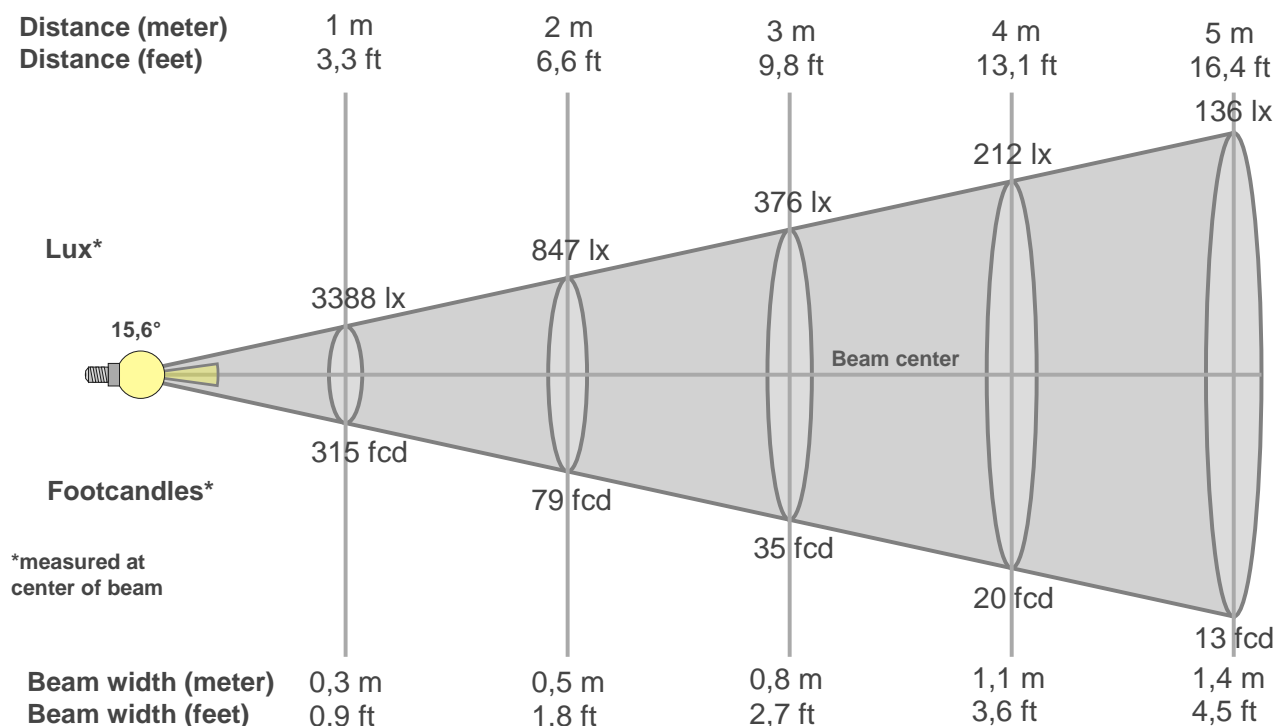
Fidelity index Rf

**Rg 95,6**

Gamut index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	75	-13%	-1%
2	75	-10%	8%
3	71	-4%	13%
4	83	2%	10%
5	90	5%	6%
6	91	5%	-2%
7	84	-1%	-9%
8	88	-5%	-4%
9	85	-8%	0%
10	80	-7%	9%
11	77	-3%	14%
12	82	6%	5%
13	85	6%	-7%
14	77	6%	-15%
15	79	-2%	-12%
16	74	-10%	-15%





#### 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
3388lx	847lx	376lx	212lx	136lx	94lx	69lx	53lx	42lx	34lx	28lx	24lx	20lx	17lx	15lx	13lx	12lx	10lx	9lx	8lx
314,7fc	78,7fcd	35fcd	19,7fcd	12,6fcd	8,7fcd	6,4fcd	4,9fcd	3,9fcd	3,1fcd	2,6fcd	2,2fcd	1,9fcd	1,6fcd	1,4fcd	1,2fcd	1,1fcd	1fcd	0,9fcd	0,8fcd

#### 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°
3388	3322	3186	3003	2788	2534	2242	1943	1664	1407	1154	925	741	594	465	350	265	210	166	131
100%	98%	94%	89%	82%	75%	66%	57%	49%	42%	34%	27%	22%	18%	14%	10%	8%	6%	5%	4%

#### 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°
3388	3571	3452	3249	2973	2654	2317	1972	1650	1363	1121	906	720	564	437	335	255	196	153	121
100%	105%	102%	96%	88%	78%	68%	58%	49%	40%	33%	27%	21%	17%	13%	10%	8%	6%	5%	4%

#### Intensities in 180° c-plane

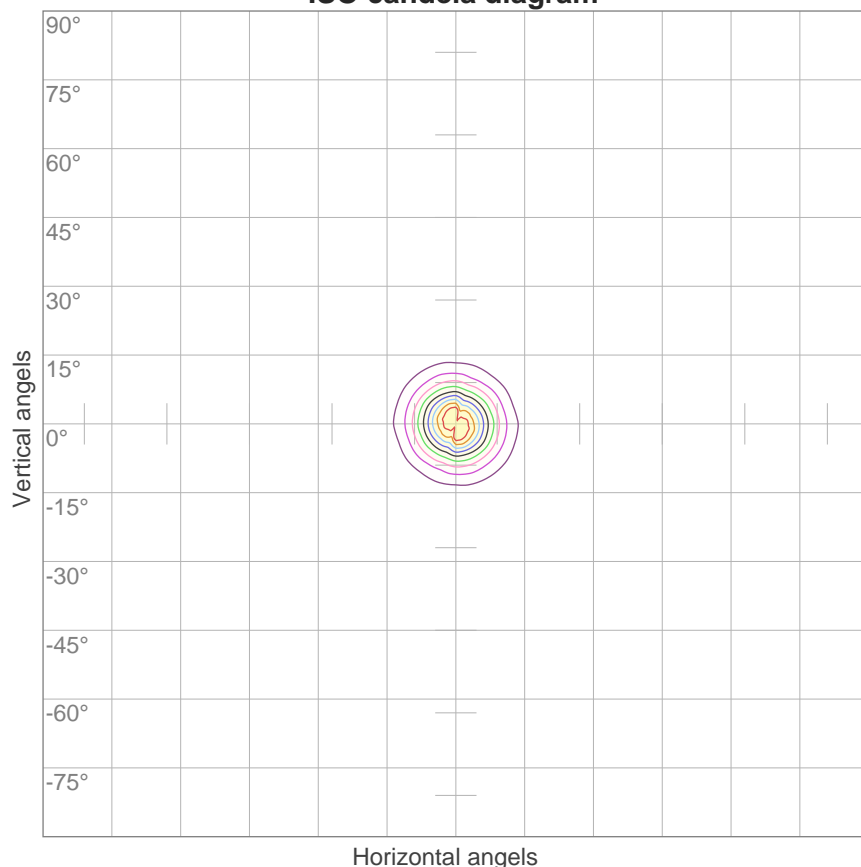
0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°
3388	3322	3186	3003	2788	2534	2242	1943	1664	1407	1154	925	741	594	465	350	265	210	166	131
100%	98%	94%	89%	82%	75%	66%	57%	49%	42%	34%	27%	22%	18%	14%	10%	8%	6%	5%	4%

#### 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°
3388	3571	3452	3249	2973	2654	2317	1972	1650	1363	1121	906	720	564	437	335	255	196	153	121
100%	105%	102%	96%	88%	78%	68%	58%	49%	40%	33%	27%	21%	17%	13%	10%	8%	6%	5%	4%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
15,6°	30°	41,5°	98,7%	98,0%

ISO candela diagram



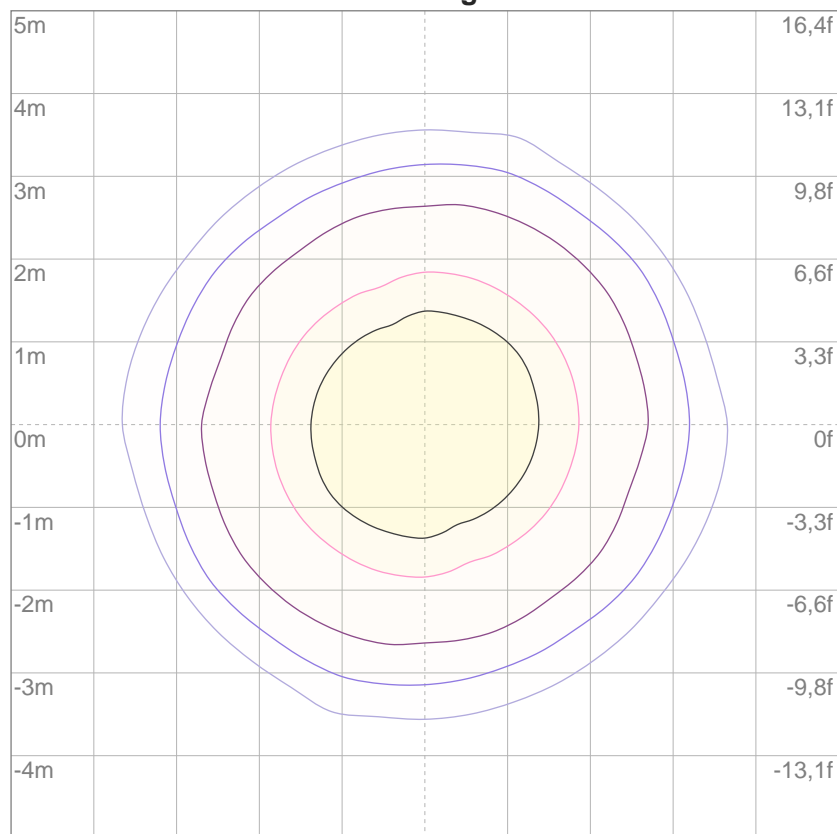
10%	339 cd
20%	678 cd
30%	1016 cd
40%	1355 cd
50%	1694 cd
60%	2033 cd
70%	2372 cd
80%	2710 cd
90%	3049 cd

Conditions:

Number of c-planes: 20

Candela at center: 3388 cd

ISO lux diagram



3%	1,02 lx
5%	1,69 lx
10%	3,39 lx
30%	10,2 lx
50%	16,9 lx

Conditions:

Number of c-planes: 20

Lux at center: 33,9 lx

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

### Glare Evaluation According to UGR

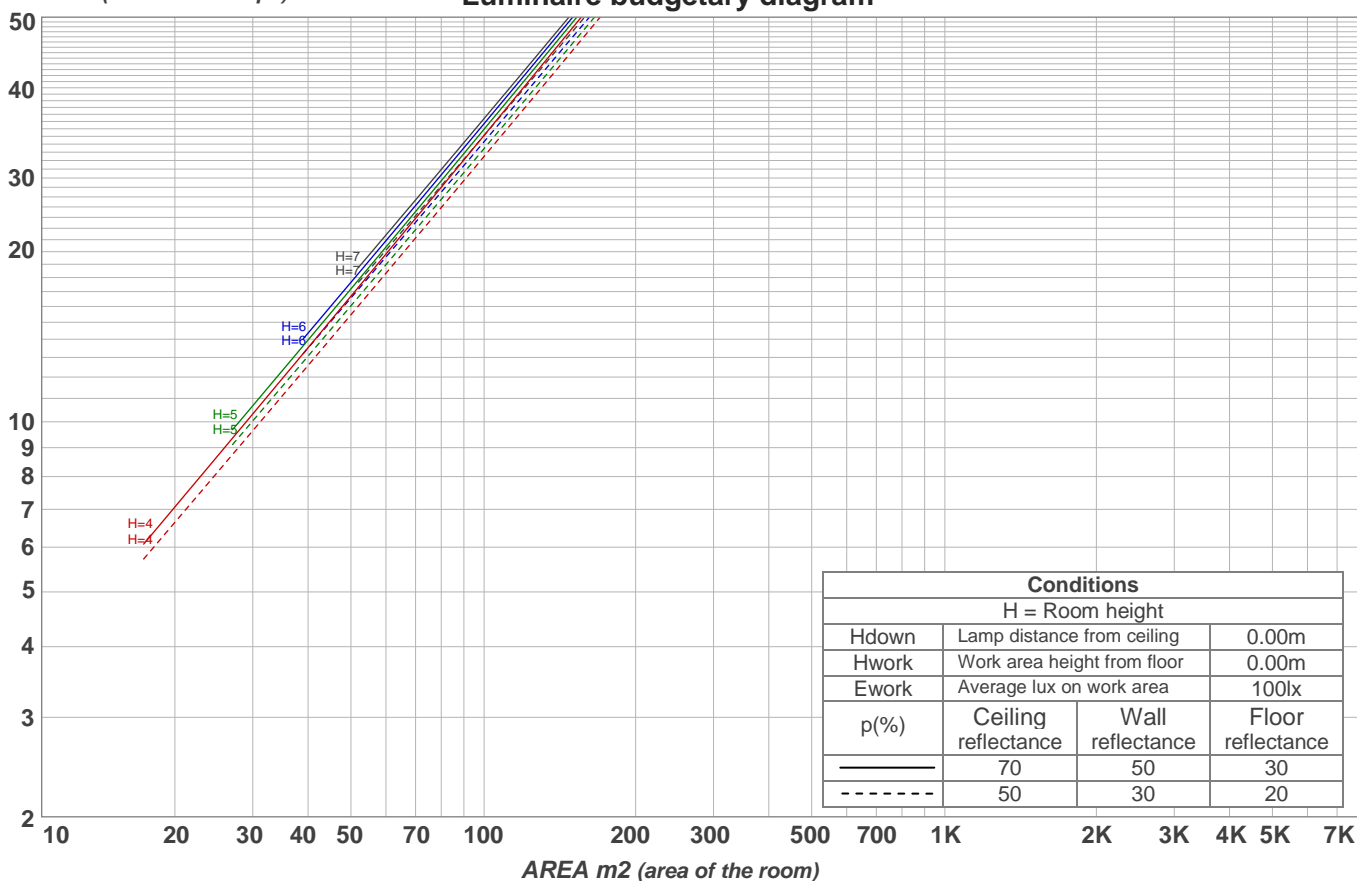
p Ceiling		70	70	50	50	30	70	70	50	50	30
p Walls		50	30	50	30	30	50	30	50	30	30
p Floor		20	20	20	20	20	20	20	20	20	20
Room size X      Y		Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	2,9	3,6	3,1	3,7	3,9	2,9	3,6	3,1	3,7	3,9
	3H	4,3	4,9	4,5	5,1	5,3	4,3	4,9	4,5	5,1	5,3
	4H	5,3	5,9	5,6	6,1	6,4	5,3	5,9	5,6	6,1	6,4
	6H	6,7	7,2	7,0	7,5	7,7	6,7	7,2	7,0	7,5	7,7
	8H	7,6	8,1	7,9	8,3	8,6	7,6	8,1	7,9	8,3	8,6
	12H	8,6	9,1	9,0	9,4	9,7	8,6	9,1	9,0	9,4	9,7
4H	2H	3,3	3,8	3,6	4,1	4,3	3,3	3,8	3,6	4,1	4,3
	3H	5,0	5,5	5,4	5,8	6,1	5,0	5,5	5,4	5,8	6,1
	4H	6,4	6,8	6,8	7,1	7,5	6,4	6,8	6,8	7,1	7,5
	6H	8,0	8,4	8,4	8,7	9,1	8,0	8,4	8,4	8,7	9,1
	8H	9,1	9,4	9,5	9,8	10,2	9,1	9,4	9,5	9,8	10,2
	12H	10,3	10,6	10,7	11,0	11,4	10,3	10,6	10,7	11,0	11,4
8H	4H	7,1	7,4	7,5	7,7	8,1	7,1	7,4	7,5	7,7	8,1
	6H	8,9	9,2	9,4	9,6	10,0	8,9	9,2	9,4	9,6	10,0
	8H	10,2	10,4	10,7	10,8	11,3	10,2	10,4	10,7	10,8	11,3
	12H	11,7	11,8	12,1	12,3	12,8	11,7	11,8	12,1	12,3	12,8
12H	4H	7,2	7,5	7,6	7,9	8,3	7,2	7,5	7,6	7,9	8,3
	6H	9,2	9,4	9,7	9,8	10,3	9,2	9,4	9,7	9,8	10,3
	8H	10,6	10,8	11,1	11,2	11,7	10,6	10,8	11,1	11,2	11,7
Variation of the observer position for the luminaire distance S											
S = 1,0H		+0,4 / -0,2					+0,4 / -0,2				
S = 1,5H		+0,9 / -0,5					+0,9 / -0,5				
S = 2,0H		+1,7 / -0,6					+1,7 / -0,6				
Standard table		---					---				
Correction summand		---					---				
Corrected glare indices referring to 337 lm total luminous flux											

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

LAMPS (number of lamps)

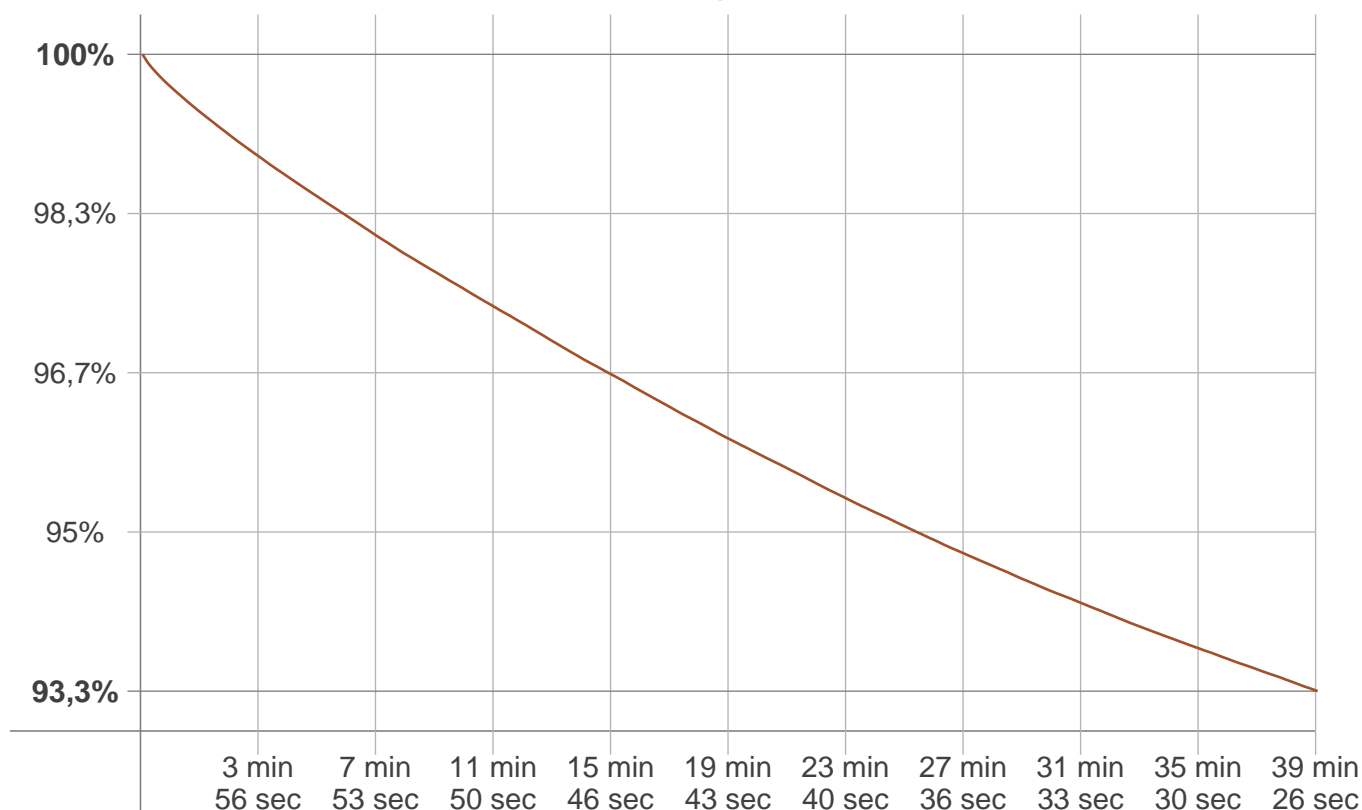
## Luminaire budgetary diagram



## Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
{LUM0-10}	107 lm	21,9 lm	7,64 lm	2,52 lm	1,58 lm	1,45 lm	1,40 lm	1,37 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,057 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:	39 min 30 sec
Warmup variation	-6,7%

### Warmup conditions

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

### Color temperature change

CCT start	CCT change	CCT end
2653 K	-13 K	2640 K

### Output change

Output start	Output change	Output end
360 lm	-23 lm	337 lm