



Light efficiency:

67 Lumen/Watt

Light quality:

CRI: 93,1

Color temperature:

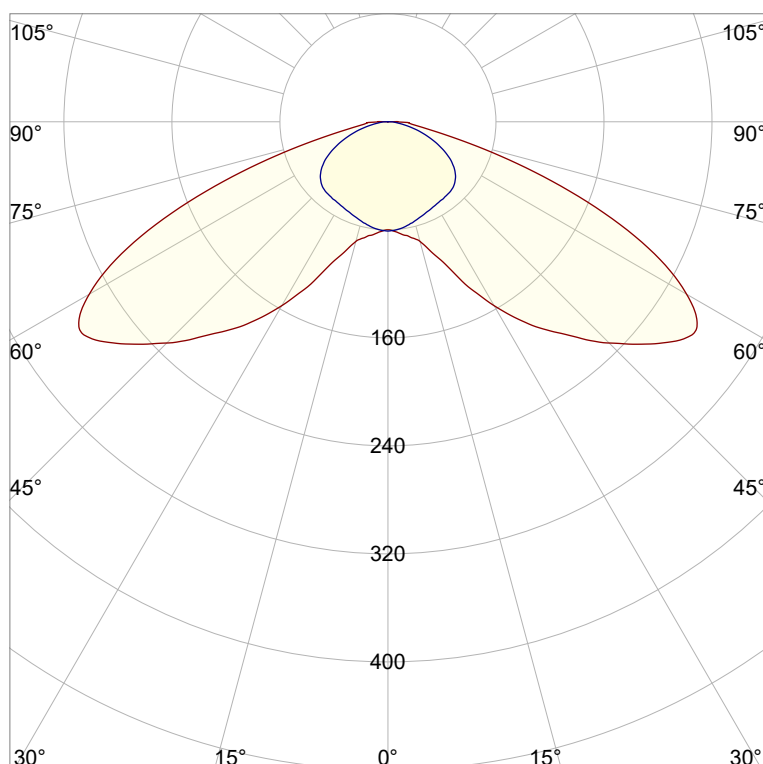
2731 K

Output: 642 lm

Peak: 275 cd

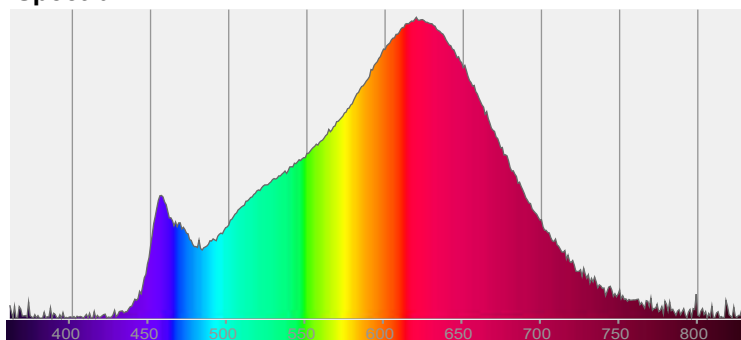
Power: 9,6 W

PF: 1,0



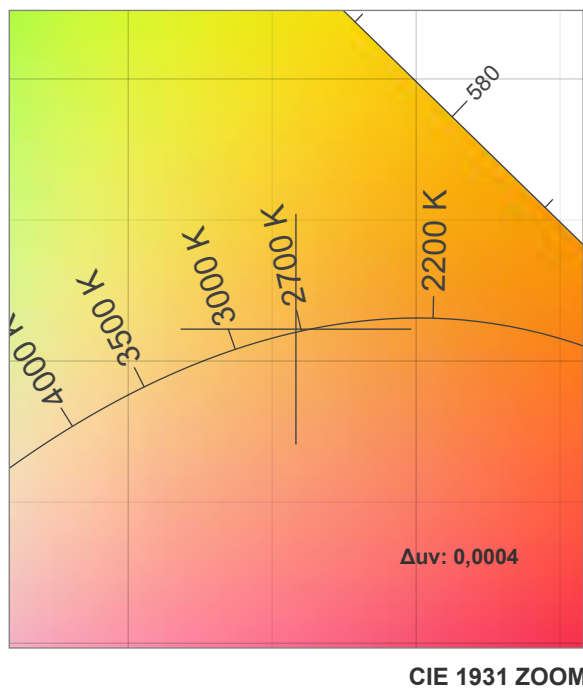
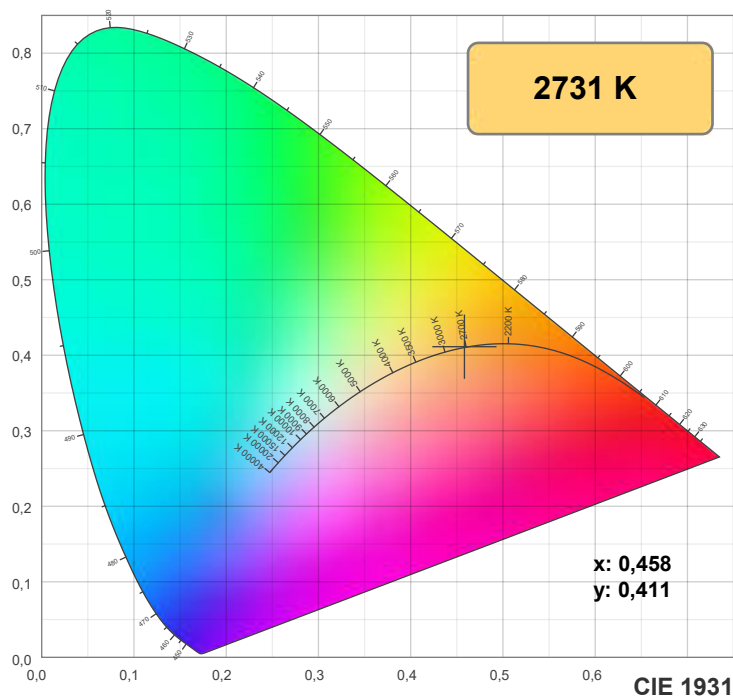
CIE 1931  
x: 0,458  
y: 0,411

Spectra

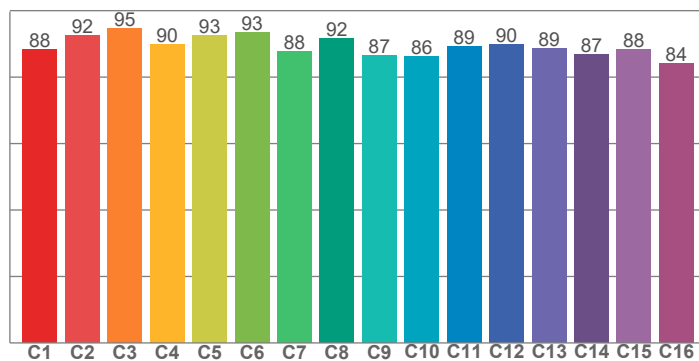


Power

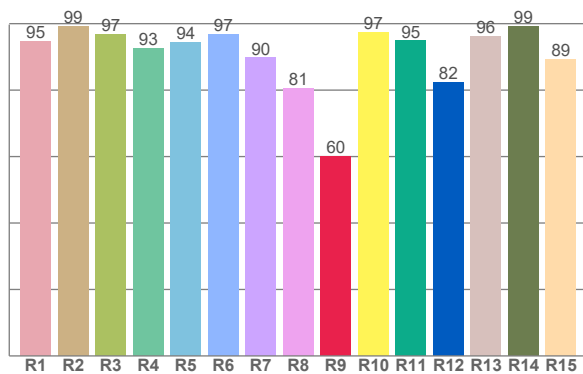
Voltage: 48,0 V  
Current: 0,200 A  
Frequency: 0 Hz



**TM30: 89,4**



**CRI: 93,1 (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
94,6	99,2	96,8	92,6	94,3	96,7	89,7	80,6	60,2	97,3	94,8	82,4	96,3	99,1	89,2

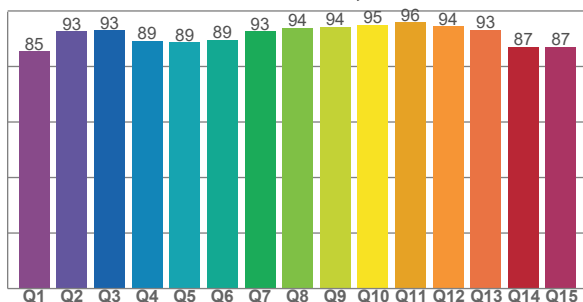
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
88,2	92,4	94,6	89,9	92,6	93,5	87,8	91,7	86,6	86,2	89,1	89,8	88,5	86,8	88,4	84,1

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
85,4	92,7	93,0	89,3	88,7	89,5	92,7	93,8	94,2	95,0	95,8	94,5	93,1	87,1	87,0

**CQS: 90,7**



## 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	$\Delta uv$
2731 K	93,1	60,2	89,4	95,4	90,7	0,458	0,411	0,261	0,352	0,0004



## TM30 details



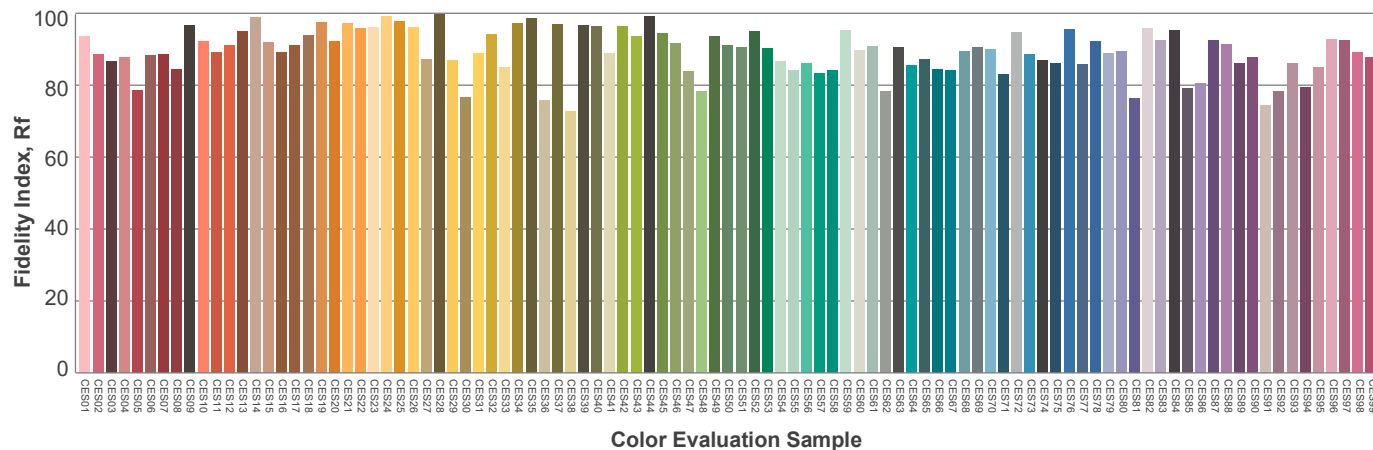
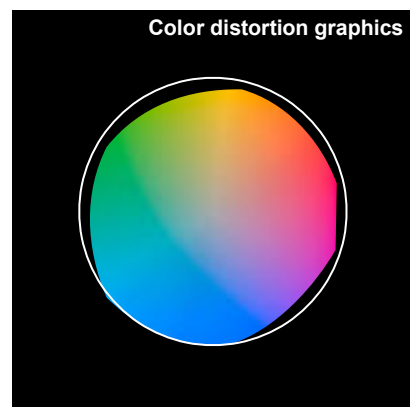
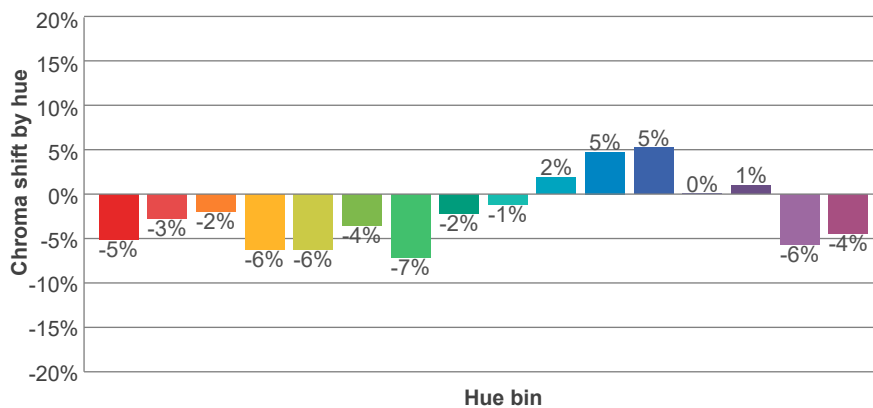
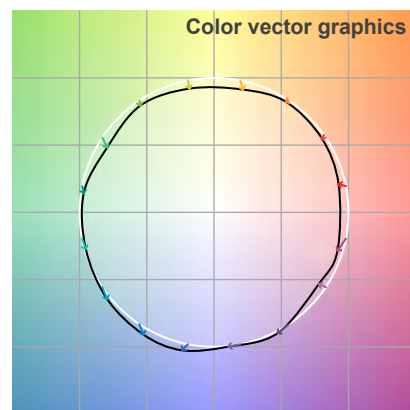
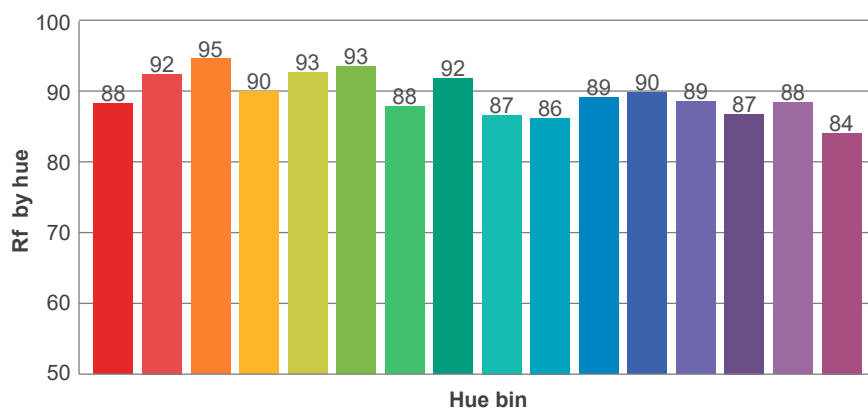
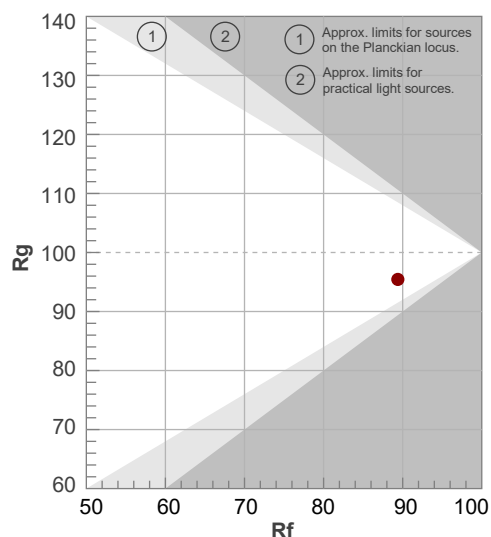
**Rf 89,4**

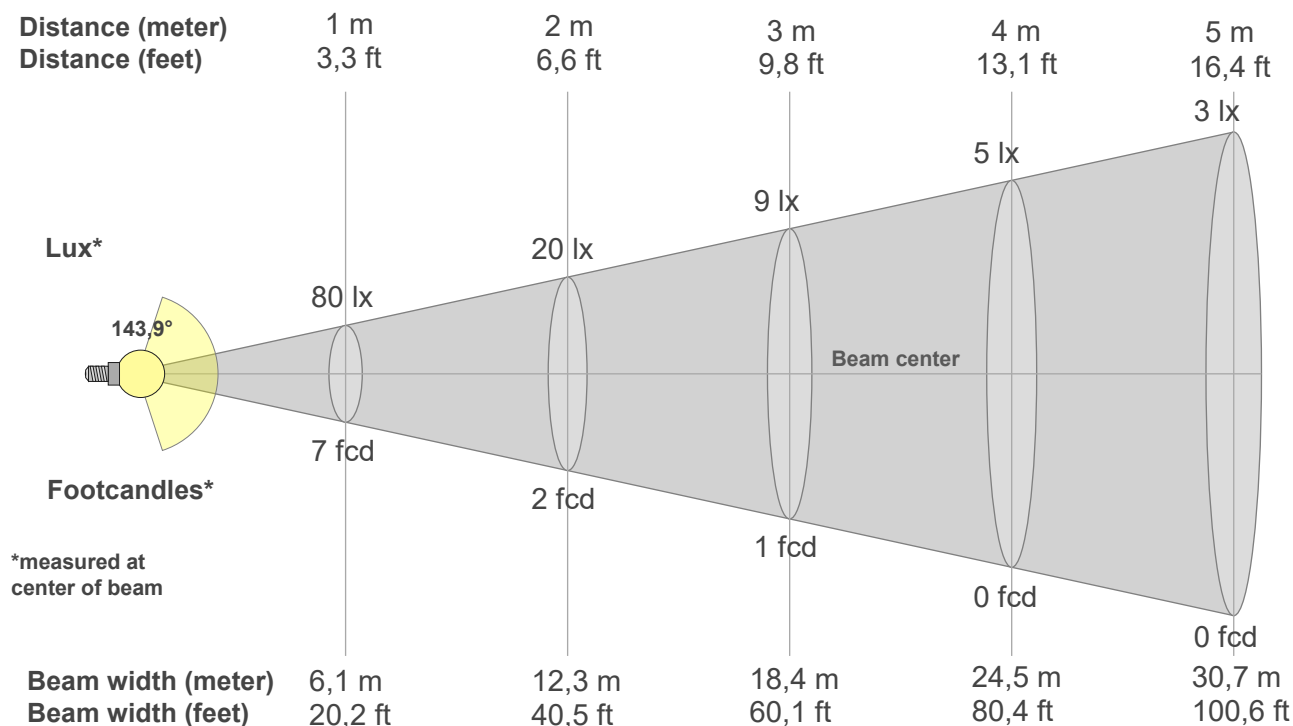
Fidelity index Rf

**Rg 95,4**

Gammut index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	88	-5%	2%
2	92	-3%	2%
3	95	-2%	1%
4	90	-6%	-3%
5	93	-6%	0%
6	93	-4%	1%
7	88	-7%	4%
8	92	-2%	5%
9	87	-1%	8%
10	86	2%	9%
11	89	5%	7%
12	90	5%	-3%
13	89	0%	-9%
14	87	1%	-11%
15	88	-6%	-1%
16	84	-4%	-10%





## 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
80lx	20lx	9lx	5lx	3lx	2lx	2lx	1lx	1lx	1lx	1lx	1lx	0lx	0lx	0lx	0lx	0lx	0lx	0lx	0lx
7,5fcd	1,9fcd	0,8fcd	0,5fcd	0,3fcd	0,2fcd	0,2fcd	0,1fcd	0,1fcd	0,1fcd	0,1fcd	0,1fcd	0fcd	0fcd	0fcd	0fcd	0fcd	0fcd	0fcd	0fcd

## Intensities in 0° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
80	82	86	92	107	131	157	183	206	232	256	275	255	203	131	64	29	17	7	0
100%	102%	107%	114%	132%	162%	195%	228%	256%	288%	318%	342%	317%	253%	162%	80%	35%	21%	8%	0%

## Intensities in 90° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
80,5	80,1	78,4	76,2	74,1	72,4	71,0	70,2	69,5	68,4	65,2	59,9	52,0	41,8	31,0	20,5	11,3	5,6	1,6	1,5
100%	100%	97%	95%	92%	90%	88%	87%	86%	85%	81%	74%	65%	52%	39%	25%	14%	7%	2%	2%

## Intensities in 180° c-plane

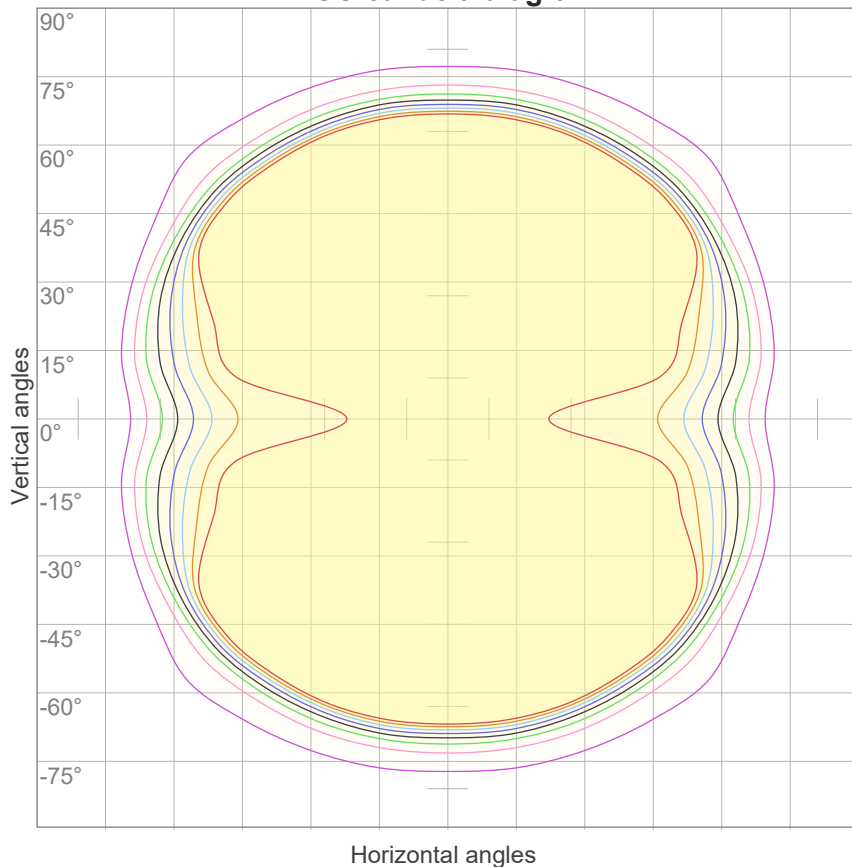
0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
80	82	86	92	107	131	157	183	206	232	256	275	255	203	131	64	29	17	7	0
100%	102%	107%	114%	132%	162%	195%	228%	256%	288%	318%	342%	317%	253%	162%	80%	35%	21%	8%	0%

## Intensities in 270° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
80,5	80,1	78,4	76,2	74,1	72,4	71,0	70,2	69,5	68,4	65,2	59,9	52,0	41,8	31,0	20,5	11,3	5,6	1,6	1,5
100%	100%	97%	95%	92%	90%	88%	87%	86%	85%	81%	74%	65%	52%	39%	25%	14%	7%	2%	2%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
143,9°	169,9°	188,1°	64,9%	32,4%

## ISO candela diagram



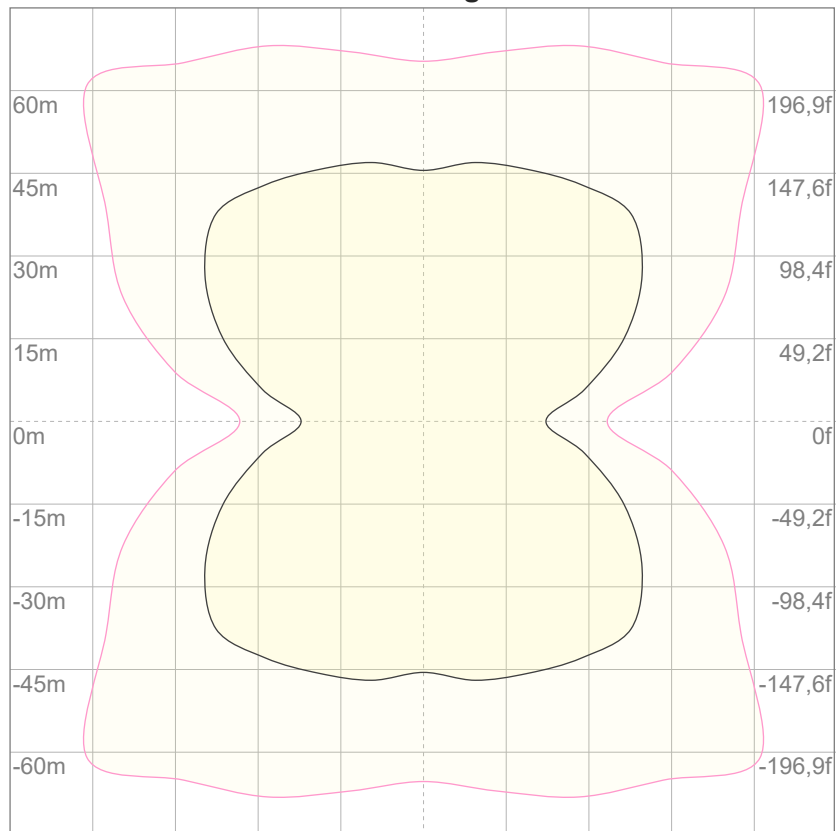
10%	8 cd
20%	16 cd
30%	24 cd
40%	32 cd
50%	40 cd
60%	48 cd
70%	56 cd
80%	64 cd
90%	72 cd

### Conditions:

Number of c-planes: 16

Candela at center: 80 cd

## ISO lux diagram



3%	24,1m lx
5%	40,2m lx
10%	80,5m lx
30%	0,241 lx
50%	0,402 lx

### Conditions:

Number of c-planes: 16

Lux at center: 0,805 lx

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

### Glare Evaluation According to UGR

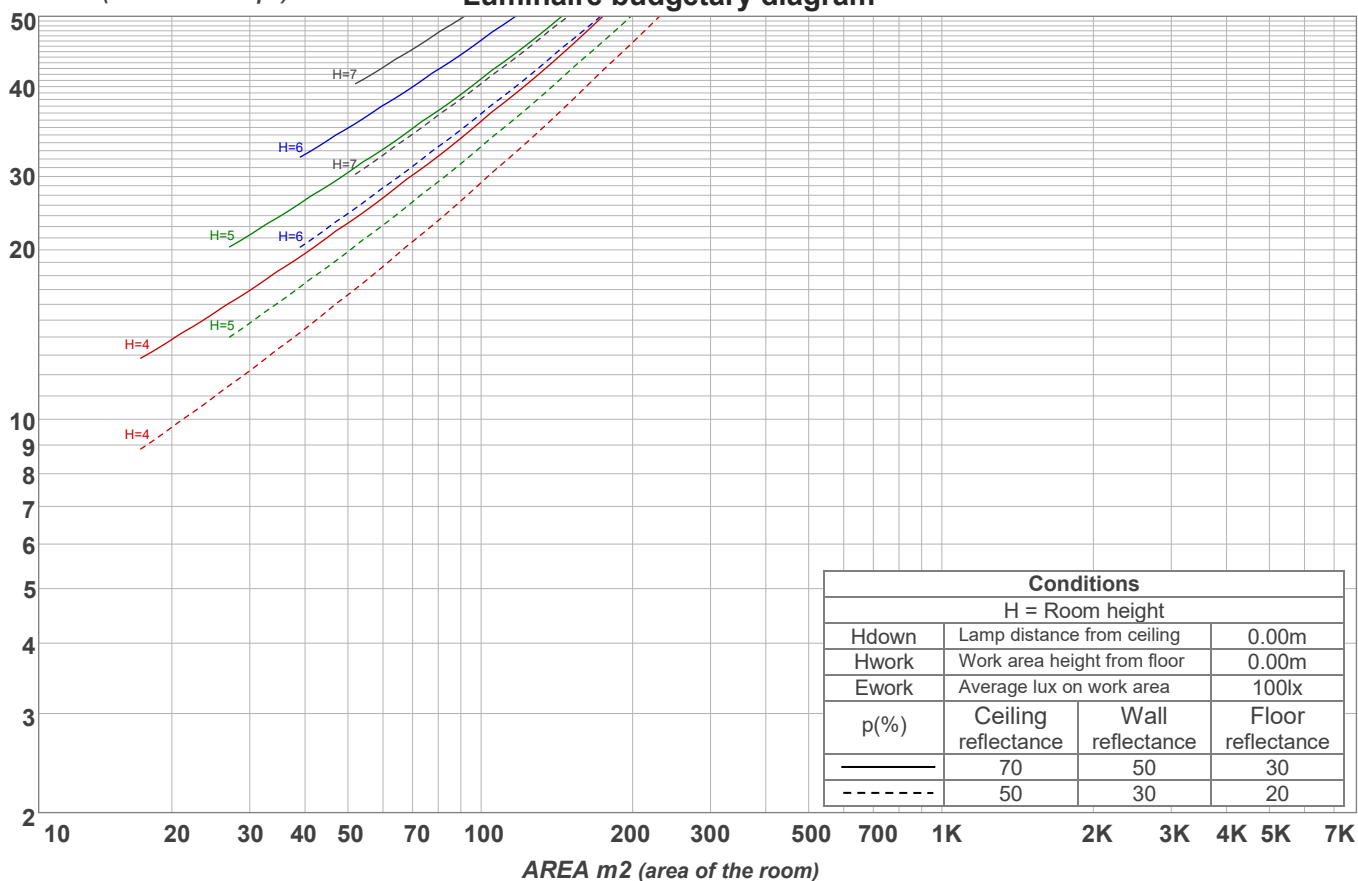
p Ceiling		70	70	50	50	30	70	70	50	50	30
p Walls		50	30	50	30	30	50	30	50	30	30
p Floor		20	20	20	20	20	20	20	20	20	20
Room size X      Y		Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	25,8	27,3	26,1	27,6	27,9	19,7	21,2	20,0	21,6	21,8
	3H	27,3	28,8	27,7	29,1	29,3	21,0	22,5	21,4	22,8	23,1
	4H	27,5	29,0	27,9	29,2	29,5	21,5	23,0	21,9	23,3	23,5
	6H	27,6	28,9	27,9	29,2	29,6	21,9	23,2	22,2	23,4	23,8
	8H	27,6	28,8	28,0	29,1	29,6	21,9	23,2	22,3	23,5	23,9
	12H	27,6	28,8	28,0	29,1	29,6	22,0	23,1	22,3	23,5	23,9
4H	2H	26,2	27,6	26,6	27,9	28,2	22,3	23,7	22,7	24,0	24,3
	3H	28,0	29,2	28,3	29,5	29,9	23,6	24,8	24,0	25,1	25,6
	4H	28,2	29,3	28,7	29,7	30,3	24,0	25,1	24,5	25,5	26,1
	6H	28,3	29,3	28,8	29,7	30,1	24,3	25,3	24,8	25,7	26,1
	8H	28,3	29,3	28,8	29,6	30,0	24,4	25,3	24,9	25,7	26,1
	12H	28,3	29,1	28,8	29,5	30,0	24,4	25,2	24,9	25,6	26,1
8H	4H	28,3	29,3	28,8	29,6	30,0	24,7	25,6	25,2	26,0	26,4
	6H	28,5	29,2	29,0	29,7	30,3	25,1	25,8	25,6	26,3	26,8
	8H	28,5	29,2	29,1	29,7	30,4	25,2	25,9	25,7	26,4	27,0
	12H	28,6	29,1	29,2	29,6	30,3	25,3	25,9	25,9	26,4	27,0
12H	4H	28,3	29,1	28,8	29,5	30,0	24,7	25,5	25,2	25,9	26,4
	6H	28,5	29,2	29,0	29,7	30,3	25,1	25,8	25,7	26,3	27,0
	8H	28,6	29,1	29,1	29,6	30,2	25,3	25,9	25,9	26,4	27,0
Variation of the observer position for the luminaire distance S											
S = 1.0H		0,1 / -0,1					0,1 / -0,1				
S = 1.5H		0,5 / -0,5					0,3 / -0,3				
S = 2.0H		1,2 / -1,3					1,1 / -1,2				
Standard table		n/a					n/a				
Correction summand		n/a					n/a				
Corrected glare indices referring to 642 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	110	110	110	105	105	105	100	100	100	98
1	106	100	95	90	103	98	93	89	93	89	86	89	85	83	85	82	80	77
2	94	84	76	69	91	82	75	68	78	72	66	74	69	64	71	67	63	60
3	84	72	62	54	81	70	61	54	66	59	52	63	57	51	60	55	50	47
4	76	61	51	43	73	60	50	43	57	49	42	54	47	41	52	46	40	38
5	68	53	43	35	66	52	42	35	50	41	34	47	40	34	45	39	33	31
6	62	47	37	29	60	46	36	29	44	35	29	42	34	28	40	33	28	25
7	57	42	32	25	55	41	31	25	39	30	24	37	30	24	36	29	24	21
8	53	37	28	21	51	37	27	21	35	27	21	34	26	21	32	25	20	18
9	49	34	25	19	47	33	24	18	32	24	18	30	23	18	29	23	18	16
10	45	31	22	16	44	30	22	16	29	21	16	28	21	16	27	20	16	14

LAMPS (number of lamps)

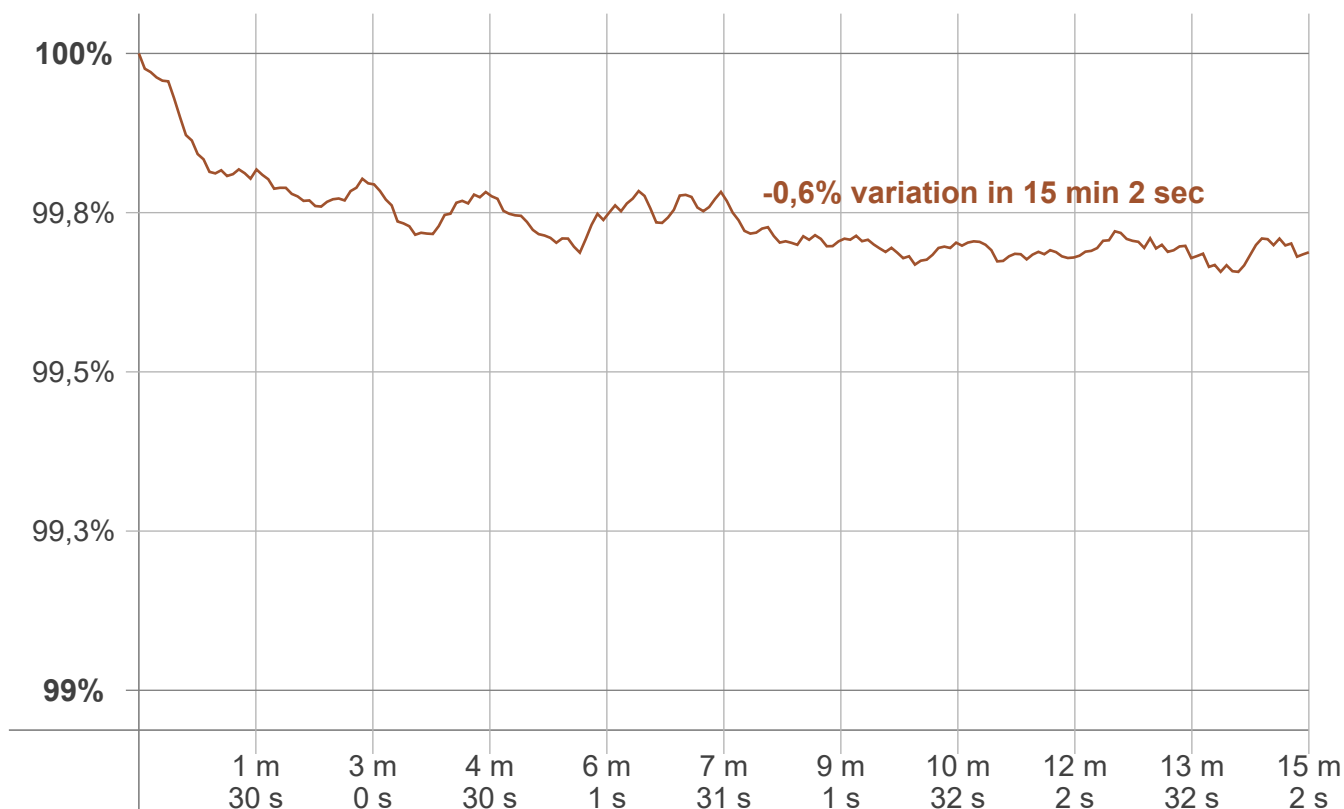
Luminaire budgetary diagram



## Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
7,81 lm	24,2 lm	46,2 lm	77,6 lm	114 lm	147 lm	131 lm	63,4 lm	18,2 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
5,39 lm	1,73 lm	1,45 lm	1,32 lm	1,05 lm	0,791 lm	0,583 lm	0,357 lm	0,120 lm

## Warmup curve



## Warmup result

Warmup time:	Lamp stabilized in 15 min 2 sec
Warmup variation	-0,6%

## Warmup conditions

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

## Color temperature change

CCT start	CCT change	CCT end
2729 K	+2 K	2731 K

## Output change

Output start	Output change	Output end
644 lm	-2 lm	642 lm