

Light efficiency:

110 Lumen/Watt

Light quality:

CRI: 85,6

Color temperature:

3994 K

Output: 3589 lm

Peak: 1624 cd

Power: 32,7 W

PF: 0,97

No photo

Tracking number: [VT200325-008801](#)

Product name:

Frontline Beam 33W 4000K RAK110

Item number:

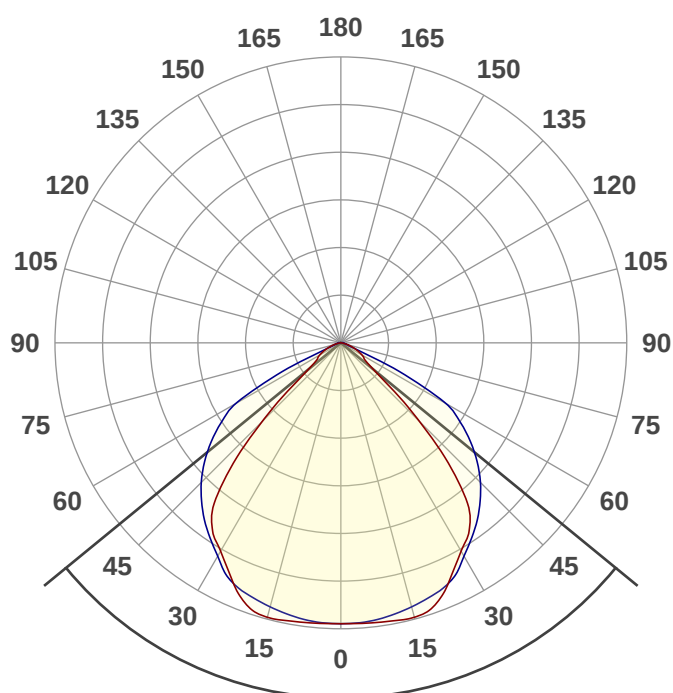
Date and time:

25-03-2020 08:57:46

Description:

Measured by Jakob D. Jepsen

Measured in 10 planes.



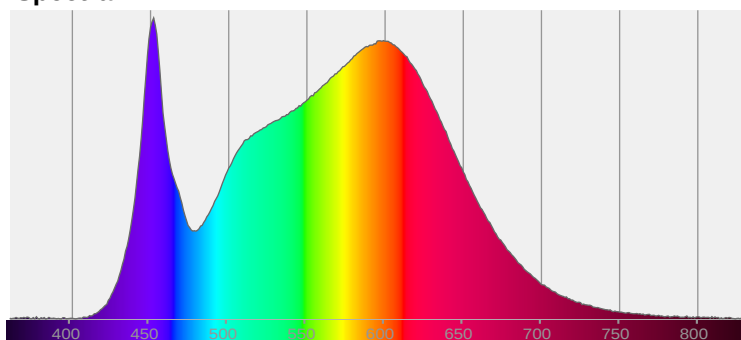
Beam angle

101,4°

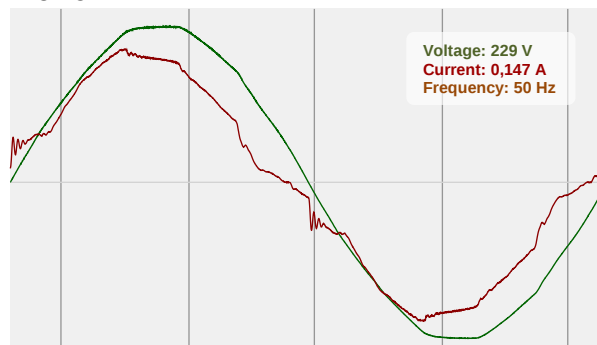


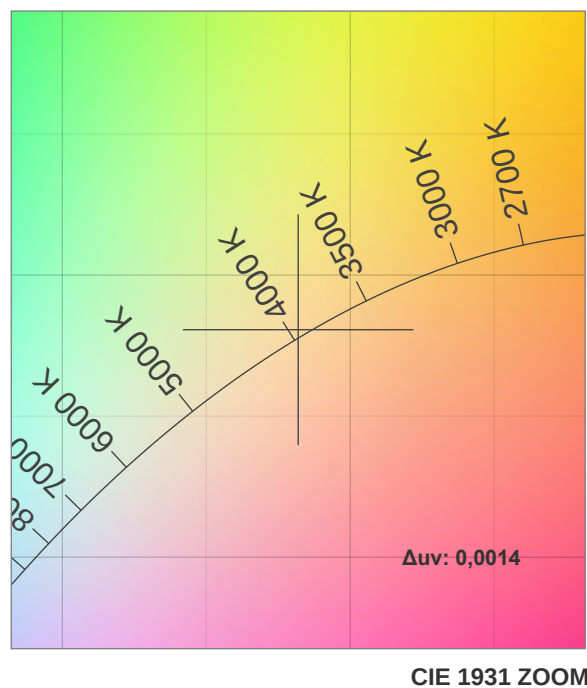
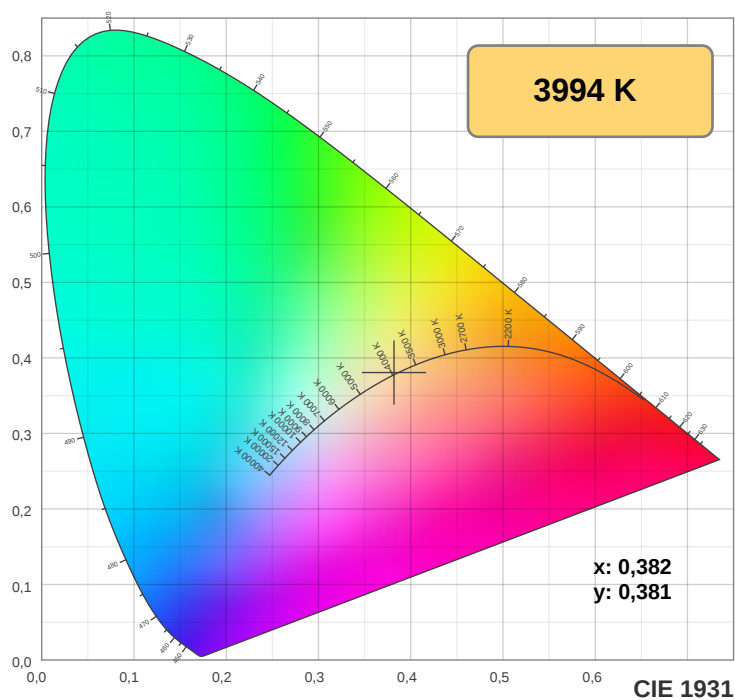
CIE 1931
x: 0,382
y: 0,381

Spectra

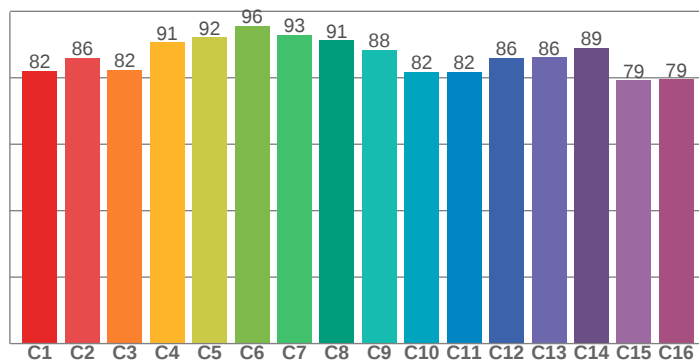


Power

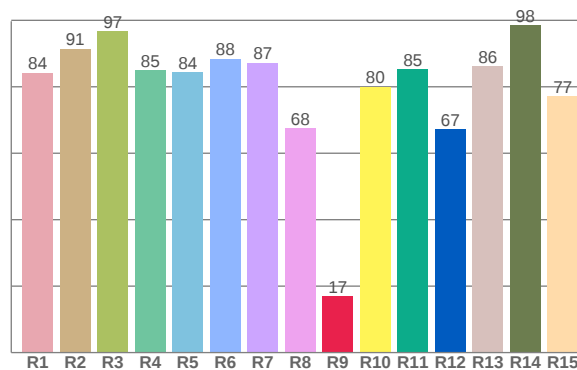




TM-30: 86,5



CRI: 85,6 (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
84,2	91,5	96,7	85,1	84,4	88,5	87,2	67,5	16,9	80,0	85,2	67,2	86,2	98,5	77,1

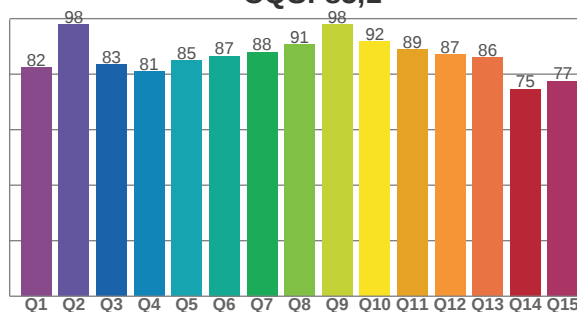
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
82,1	86,0	82,4	90,7	92,1	95,7	92,9	91,2	88,4	81,9	81,8	86,0	86,1	89,0	79,2	79,5

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
82,3	97,8	83,4	80,9	84,9	86,5	87,9	90,7	97,9	91,7	88,9	87,1	86,0	74,6	77,4

CQS: 85,1



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	Δuv
3994 K	85,6	16,9	86,5	95,6	85,1	0,382	0,381	0,225	0,336	0,0014

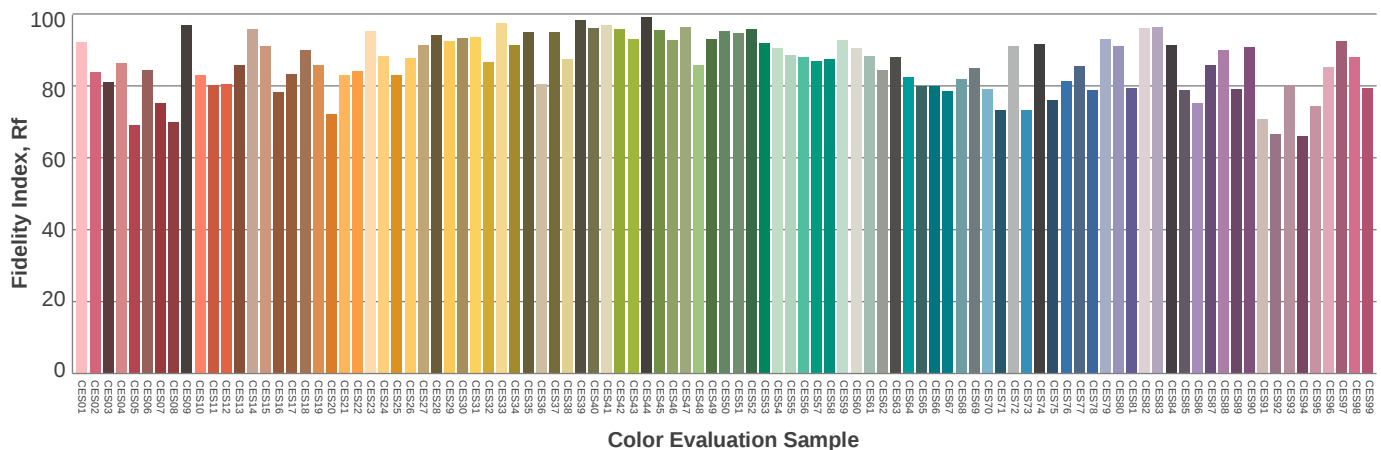
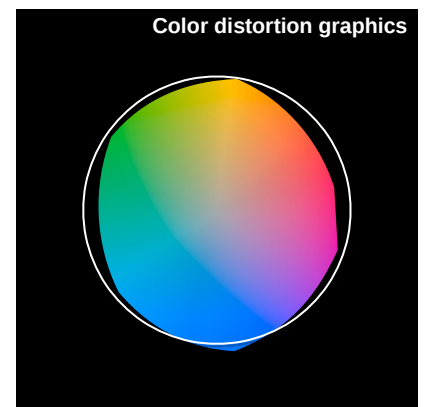
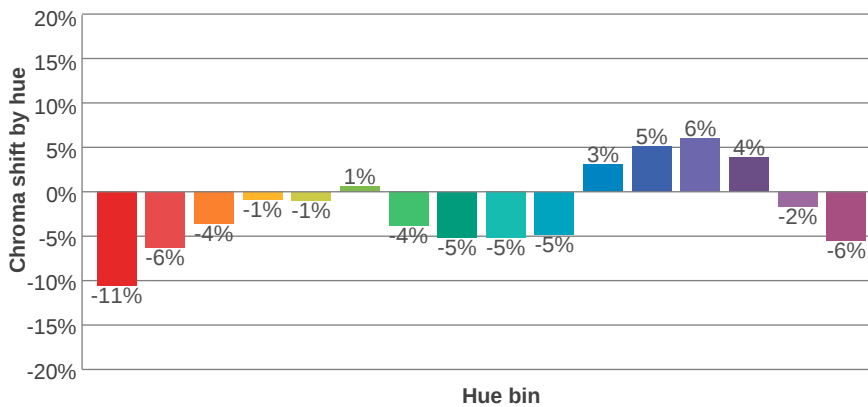
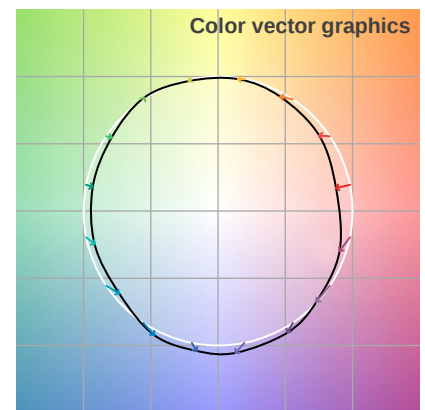
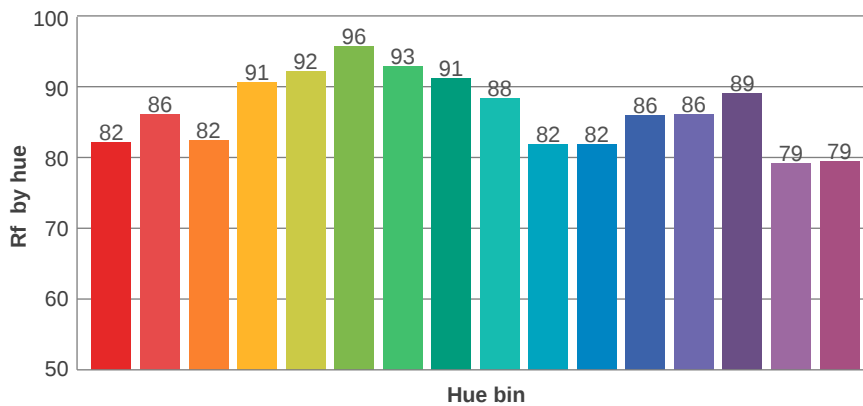
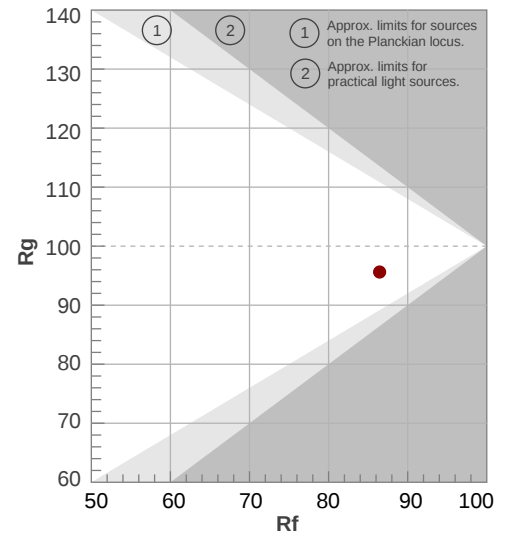
Rf 86,5

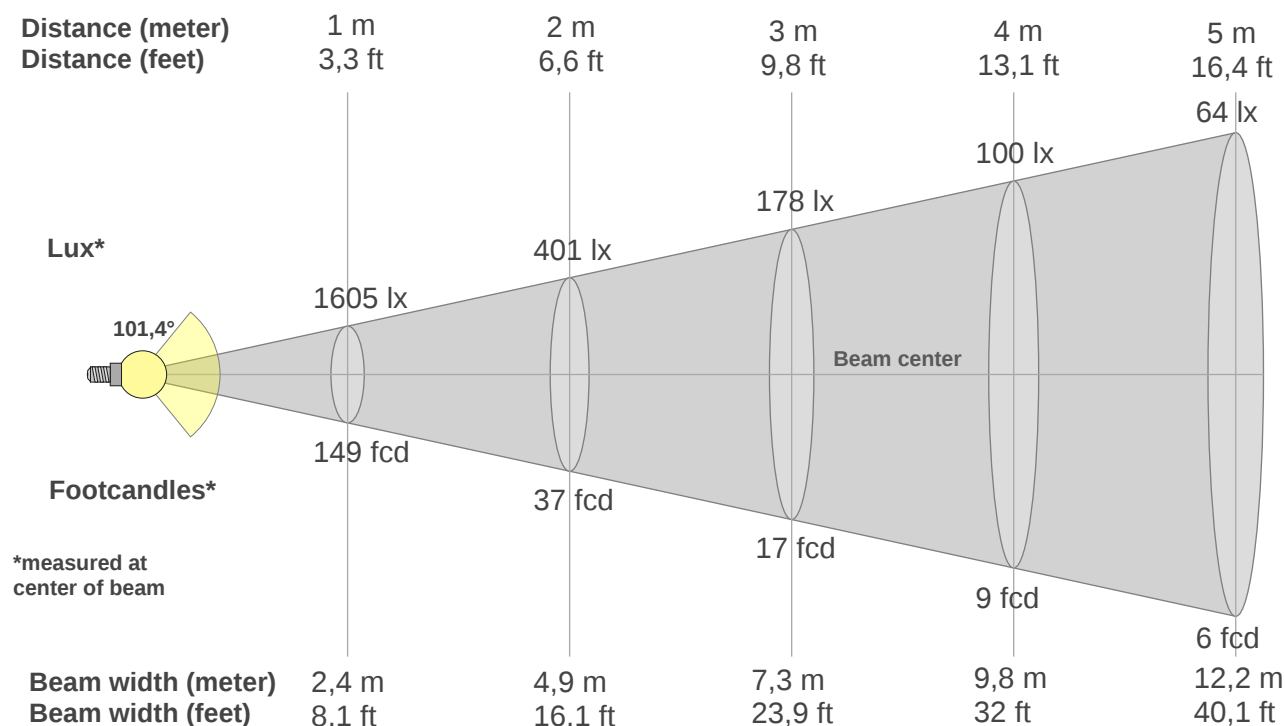
Fidelity index Rf

Rg 95,6

Gamut index Rg

Hue Bin	R _f	Shifts (%)	
		Chroma	Hue
1	82	-11%	0%
2	86	-6%	5%
3	82	-4%	9%
4	91	-1%	5%
5	92	-1%	3%
6	96	1%	-1%
7	93	-4%	-2%
8	91	-5%	1%
9	88	-5%	6%
10	82	-5%	10%
11	82	3%	12%
12	86	5%	4%
13	86	6%	-8%
14	89	4%	-7%
15	79	-2%	-15%
16	79	-6%	-11%




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
1605lx	401lx	178lx	100lx	64lx	45lx	33lx	25lx	20lx	16lx	13lx	11lx	9lx	8lx	7lx	6lx	6lx	5lx	4lx	4lx
149,2fcd	37,3fcd	16,6fcd	9,3fcd	6fcd	4,1fcd	3fcd	2,3fcd	1,8fcd	1,5fcd	1,2fcd	1fcd	0,9fcd	0,8fcd	0,7fcd	0,6fcd	0,5fcd	0,5fcd	0,4fcd	0,4fcd

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°
1605	1608	1615	1621	1583	1482	1375	1277	1045	645	274	168	139	103	69	40	17	4	0	0
100%	100%	101%	101%	99%	92%	86%	80%	65%	40%	17%	10%	9%	6%	4%	2%	1%	0%	0%	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°
1605	1600	1585	1562	1534	1493	1407	1322	1231	1128	1004	861	689	289	58	27	11	3	0	0
100%	100%	99%	97%	96%	93%	88%	82%	77%	70%	63%	54%	43%	18%	4%	2%	1%	0%	0%	0%

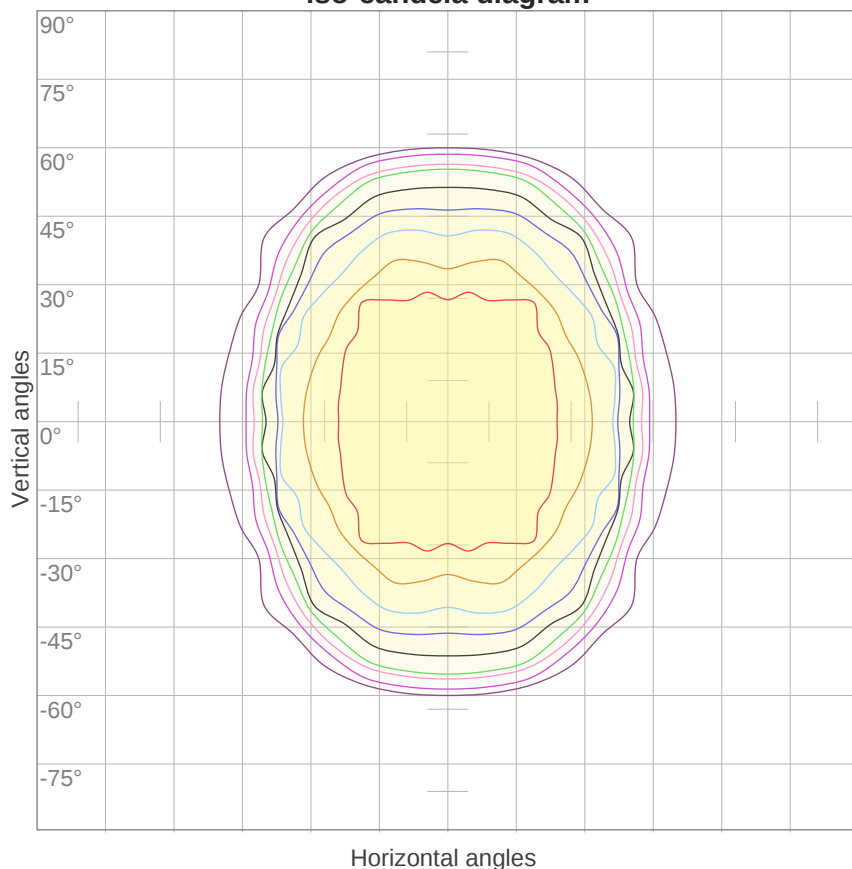
Intensities in 180° c-plane

0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	95°
1605	1608	1615	1621	1583	1482	1375	1277	1045	645	274	168	139	103	69	40	17	4	0	0
100%	100%	101%	101%	99%	92%	86%	80%	65%	40%	17%	10%	9%	6%	4%	2%	1%	0%	0%	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°
1605	1600	1585	1562	1534	1493	1407	1322	1231	1128	1004	861	689	289	58	27	11	3	0	0
100%	100%	99%	97%	96%	93%	88%	82%	77%	70%	63%	54%	43%	18%	4%	2%	1%	0%	0%	0%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
101,4°	122,9°	148,8°	93,6%	70,8%

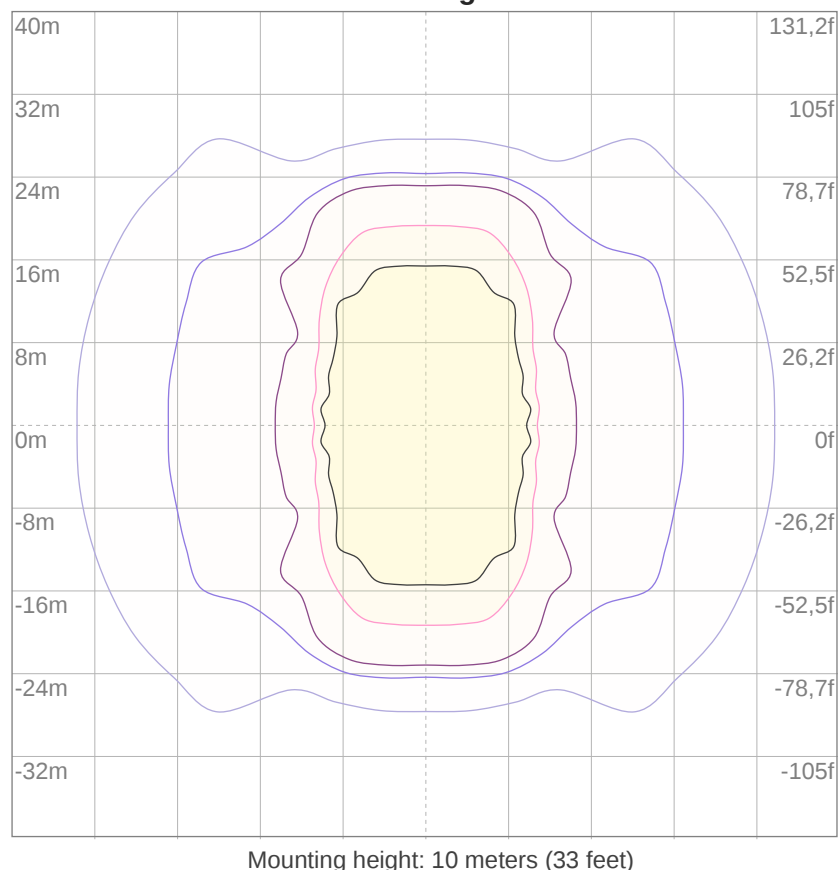
iso-candela diagram


10%	161 cd
20%	321 cd
30%	482 cd
40%	642 cd
50%	803 cd
60%	963 cd
70%	1124 cd
80%	1284 cd
90%	1445 cd

Conditions:

Number of c-planes: 20

Candela at center: 1605 cd

iso-lux diagram


3%	0,482 lx
5%	0,803 lx
10%	1,61 lx
30%	4,82 lx
50%	8,03 lx

Conditions:

Number of c-planes: 20

Lux at center: 16,1 lx

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

Glare Evaluation According to UGR

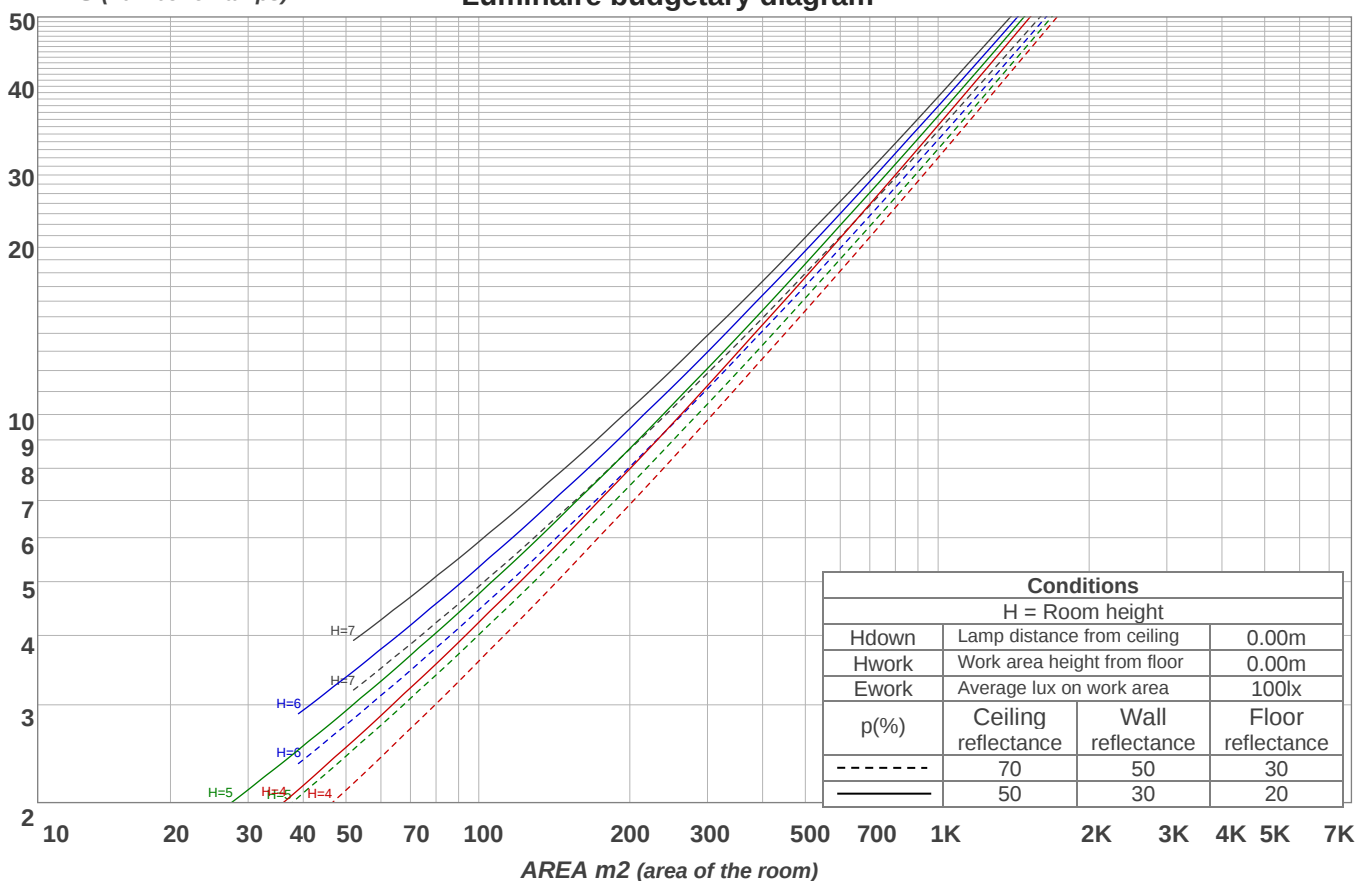
p Ceiling		70	70	50	50	30	70	70	50	50	30
p Walls		50	30	50	30	30	50	30	50	30	30
p Floor		20	20	20	20	20	20	20	20	20	20
Room size X Y		Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	26,9	27,9	27,1	28,2	28,4	32,0	32,9	32,1	33,2	33,4
	3H	26,9	28,0	27,3	28,2	28,4	32,0	33,0	32,4	33,2	33,4
	4H	27,0	28,0	27,4	28,2	28,5	31,9	32,9	32,3	33,1	33,4
	6H	27,0	27,9	27,3	28,2	28,5	31,9	32,7	32,2	33,0	33,4
	8H	27,0	27,8	27,3	28,1	28,5	31,9	32,7	32,2	33,0	33,4
	12H	26,9	27,7	27,3	28,1	28,5	31,8	32,6	32,2	32,9	33,4
4H	2H	27,4	28,3	27,8	28,6	28,8	31,7	32,7	32,1	33,0	33,2
	3H	27,6	28,4	27,9	28,7	29,2	31,9	32,7	32,3	33,1	33,5
	4H	27,6	28,3	28,0	28,7	29,3	31,8	32,5	32,2	33,0	33,5
	6H	27,6	28,3	28,1	28,6	29,0	31,7	32,5	32,2	32,8	33,2
	8H	27,6	28,2	28,1	28,6	28,9	31,7	32,4	32,2	32,7	33,1
	12H	27,5	28,0	28,0	28,5	28,9	31,6	32,2	32,1	32,6	33,1
8H	4H	27,5	28,2	28,0	28,5	28,9	31,7	32,4	32,2	32,7	33,1
	6H	27,6	28,1	28,1	28,5	29,1	31,7	32,1	32,2	32,6	33,1
	8H	27,6	28,0	28,1	28,5	29,1	31,7	32,1	32,2	32,6	33,2
	12H	27,6	27,9	28,1	28,4	29,0	31,6	31,9	32,2	32,4	33,1
12H	4H	27,5	28,0	28,0	28,4	28,9	31,7	32,2	32,2	32,6	33,1
	6H	27,6	28,0	28,1	28,5	29,1	31,7	32,1	32,2	32,6	33,2
	8H	27,6	27,9	28,1	28,4	29,0	31,6	31,9	32,2	32,5	33,1
Variation of the observer position for the luminaire distance S											
S = 1.0H		1,5 / -3,3					0,5 / -0,6				
S = 1.5H		2,8 / -4,0					1,2 / -1,6				
S = 2.0H		4,0 / -4,7					2,8 / -7,2				
Standard table		n/a					n/a				
Correction summand		n/a					n/a				
Corrected glare indices referring to 3589 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	111	108	104	101	109	105	102	100	101	99	97	97	95	94	94	92	91	89
2	103	96	91	86	101	95	90	85	91	87	83	88	85	82	85	82	80	78
3	95	87	80	74	93	85	79	74	82	77	72	80	75	71	77	73	70	68
4	88	78	70	65	86	77	70	64	74	68	63	72	67	63	70	66	62	60
5	82	70	63	57	80	69	62	56	67	61	56	66	60	55	64	59	55	53
6	76	64	56	50	74	63	56	50	61	55	50	60	54	49	58	53	49	47
7	71	58	50	45	69	58	50	45	56	49	44	55	49	44	54	48	44	42
8	66	54	46	40	64	53	45	40	52	45	40	50	44	40	49	44	40	38
9	62	49	42	37	60	49	41	37	48	41	36	47	41	36	46	40	36	34
10	58	46	38	33	57	45	38	33	44	38	33	43	37	33	42	37	33	31

LAMPS (number of lamps)

Luminaire budgetary diagram



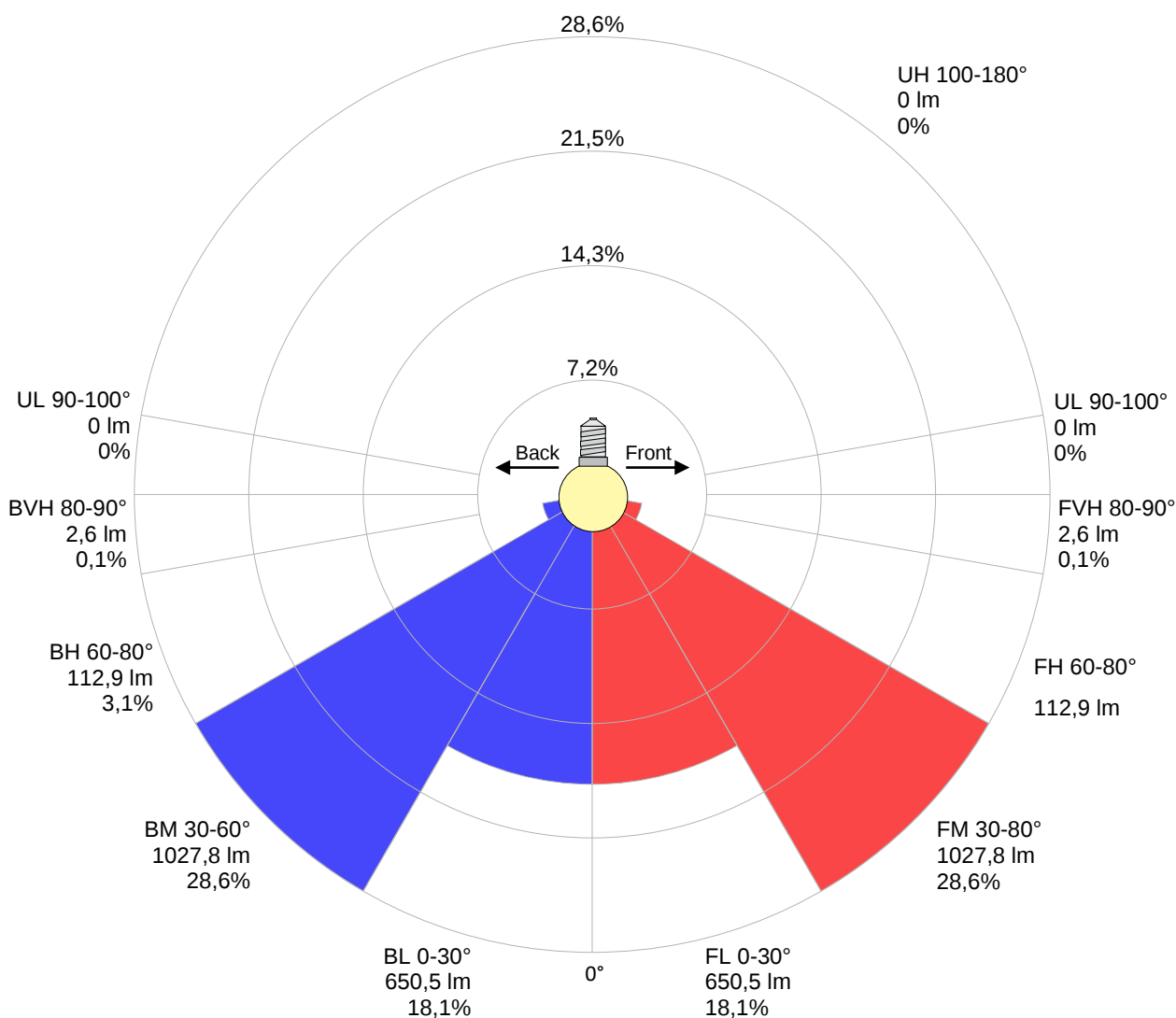
Zonal Lumen Summary

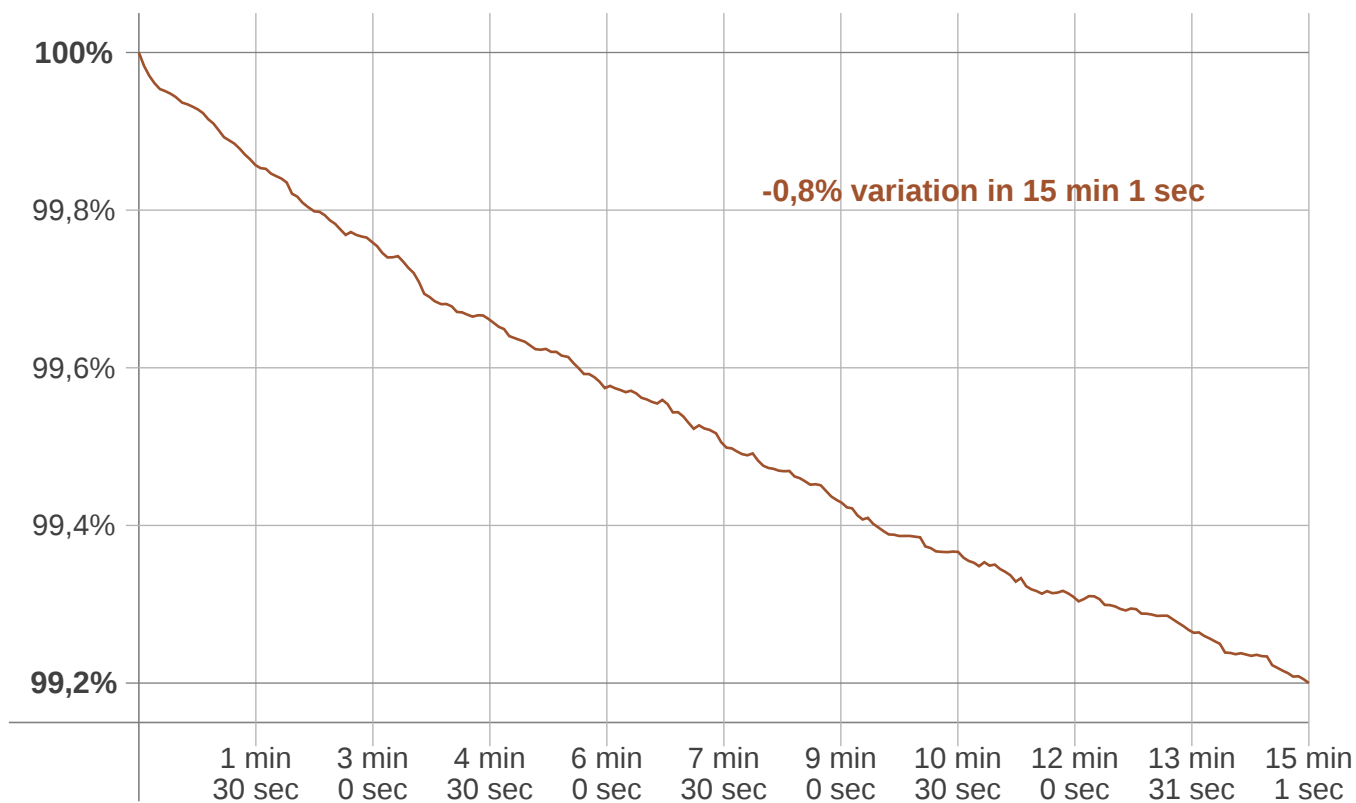
0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
{LUM0-10}	450 lm	699 lm	830 lm	758 lm	468 lm	185 lm	40,0 lm	5,18 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0,359 lm	0,199 lm	0,171 lm	0,155 lm	0,098 lm	0,054 lm	0,040 lm	0,024 lm	0,008 lm

LCS table

BUG rating:	B2 U1 G0	
Forward light	Lumens	Lumens %
Low(0-30):	650,5	18,1%
Medium(30-60):	1027,8	28,6%
High(60-80):	112,9	3,1%
Very high(80-90):	2,6	0,1%
Back light		
Low(0-30):	650,5	18,1%
Medium(30-60):	1027,8	28,6%
High(60-80):	112,9	3,1%
Very high(80-90):	2,6	0,1%
Uplight		
Low(90-100):	0	0%
High(100-180):	0	0%

LCS graph



Warmup curve

Warmup result

Warmup time:	15 min 1 sec
Warmup variation	-0,8%

Warmup conditions

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

Color temperature change

CCT start	CCT change	CCT end
3984 K	+10 K	3994 K

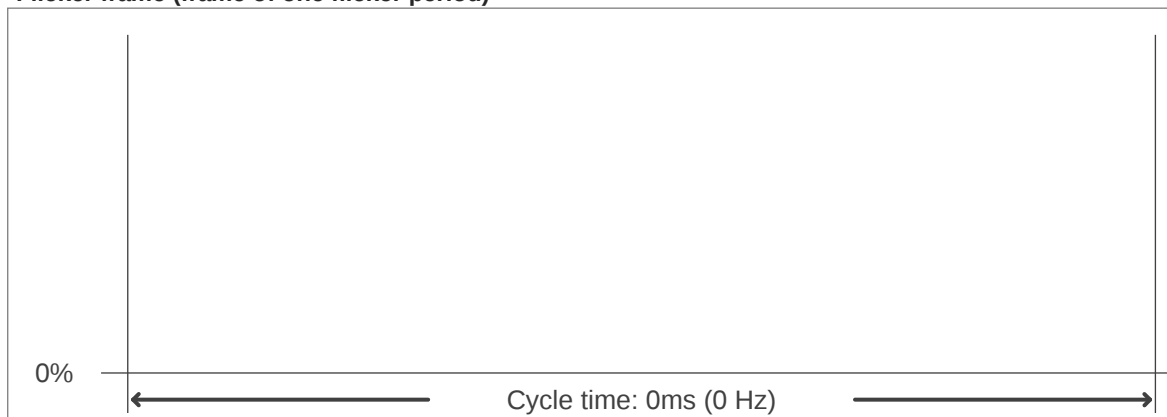
Output change

Output start	Output change	Output end
3613 lm	-24 lm	3589 lm

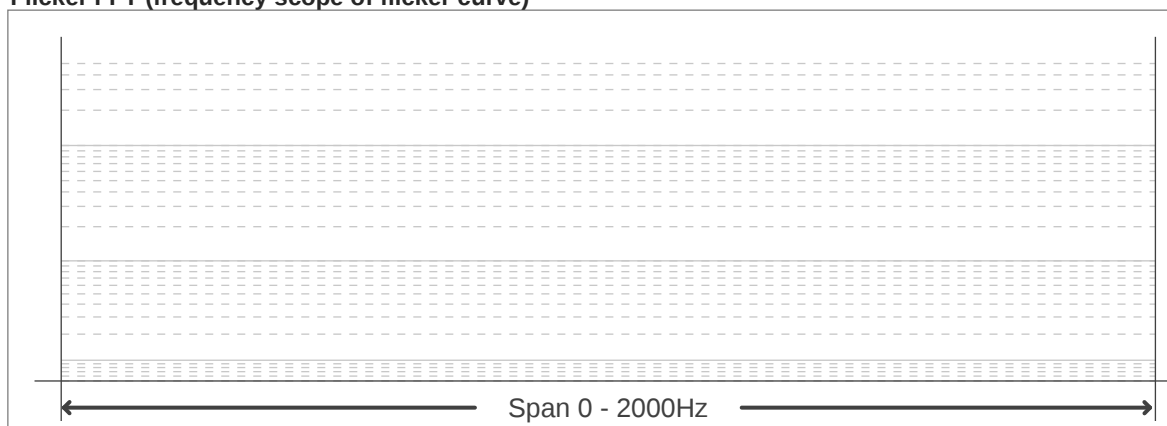
Flicker curve (complete sampled flicker signal)



Flicker frame (frame of one flicker period)



Flicker FFT (frequency scope of flicker curve)



Flicker results:

Flicker frequency:	n/a Hz	JA8/10 40Hz	n/a %
Flicker index:	n/a	JA8/10 90Hz	n/a %
Flicker percentage:	n/a %	JA8/10 200Hz	n/a %
SVM: (Visual flicker)	n/a	JA8/10 400Hz	n/a %
PstLM	n/a	JA8/10 1000Hz	n/a %

Flicker conditions:

Sample rate:	0 samples/second
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