

PHOTOMETRIC TEST REPORT

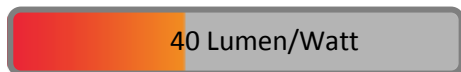
ENNA SURFACE LED MATT BLACK

astro

ENNA SURFACE LED MATT BLACK

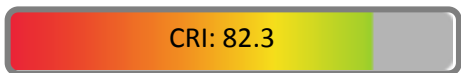
astro

LIGHT EFFICIENCY:



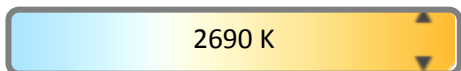
OUTPUT: 179 lm

LIGHT QUALITY:



PEAK: 899 cd

COLOR TEMPERATURE:



POWER: 4.5 W

PF: 0.4



Tracking number: [n/a](#)

Product name:

Enna Surface LED Matt Black

Item number:

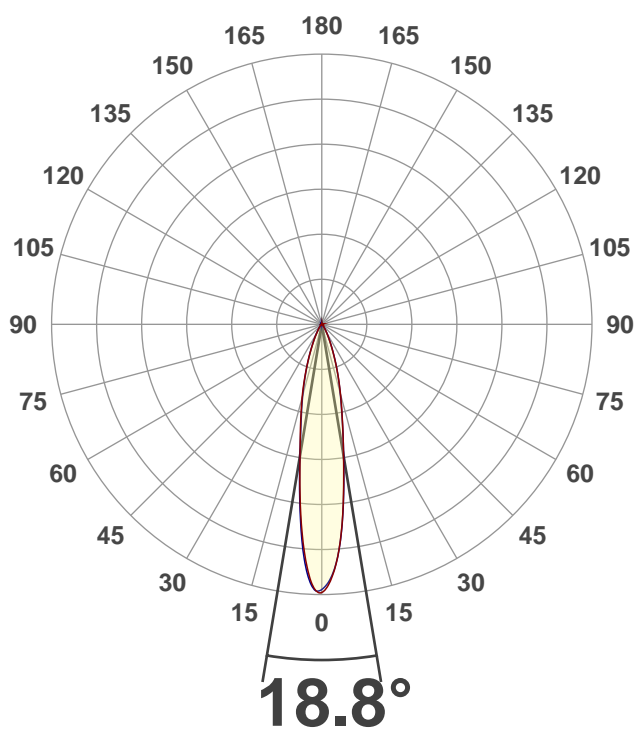
1058027

Date and time:

15/11/2019 12:03:48

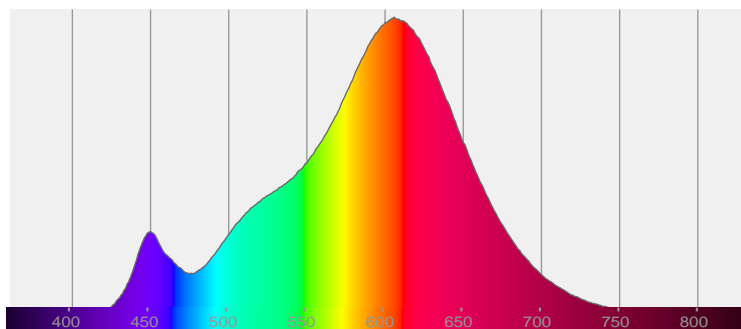
Description:

Switched LED Reading Light

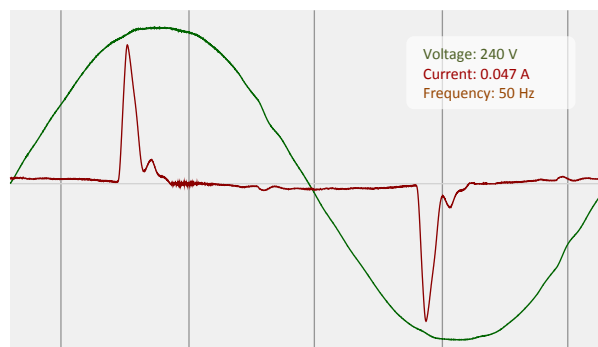


CIE 1931
x: 0.463
y: 0.415

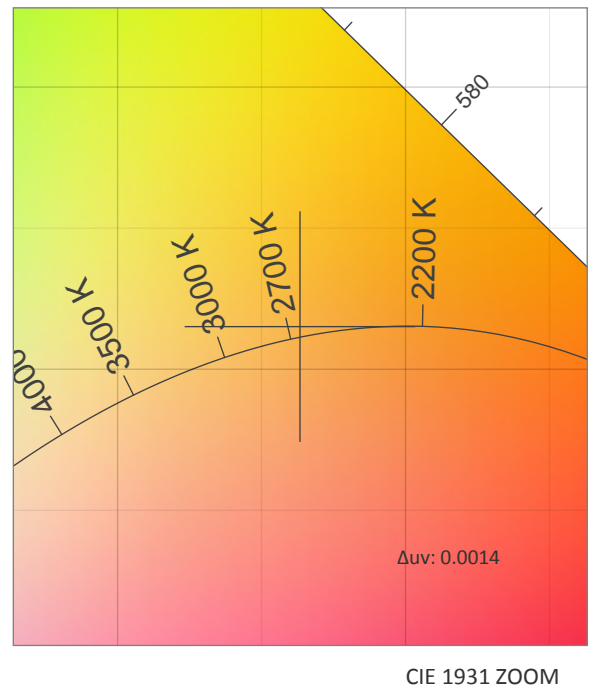
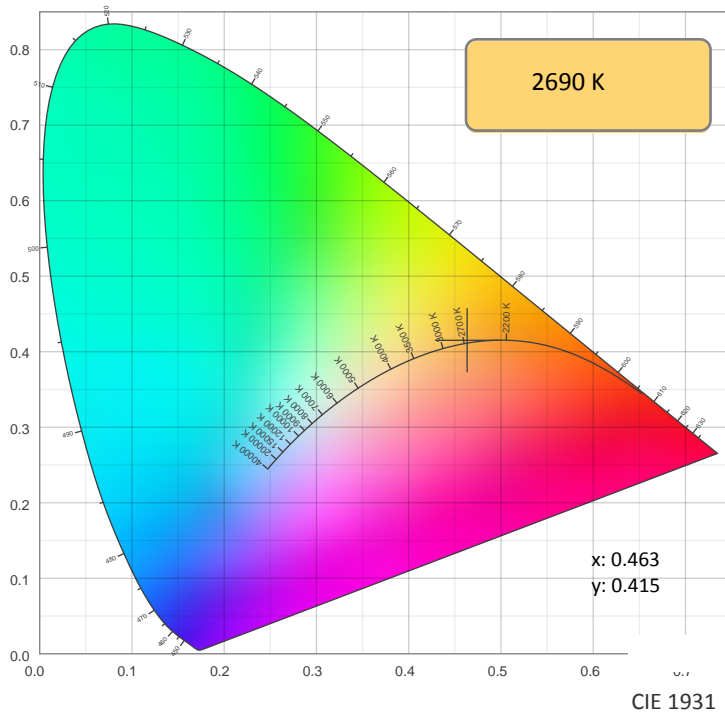
SPECTRA



POWER

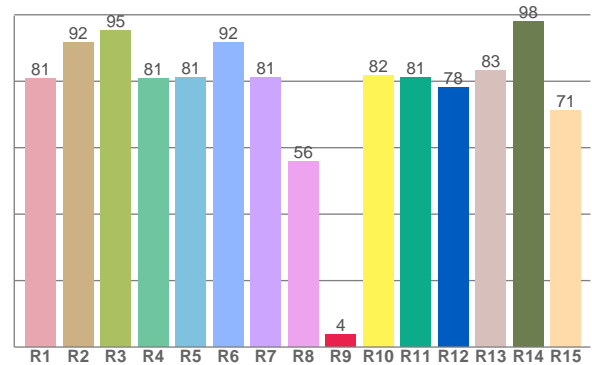
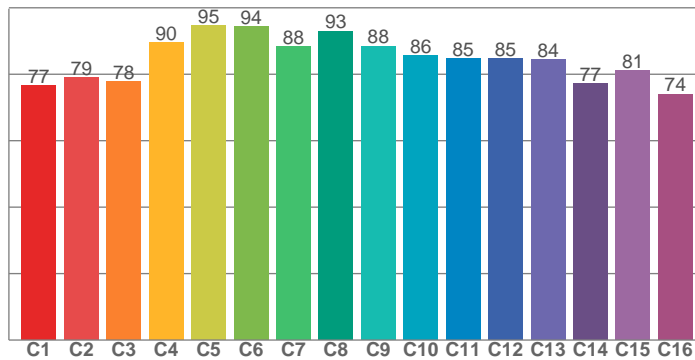


COLOR DETAILS



TM30: 84.4

CRI: 82.3 (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
80.7	91.6	95.3	80.9	81.2	91.6	81.2	55.8	3.7	81.8	81.2	78.2	83.3	98.1	71.2

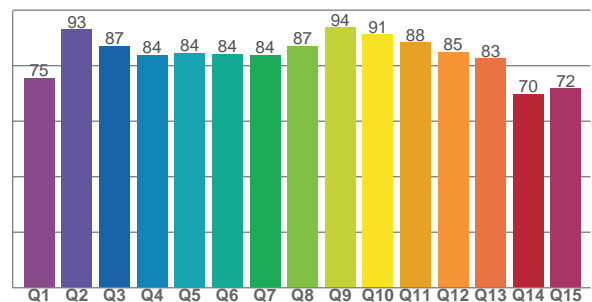
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
76.6	78.9	77.7	89.6	94.5	94.3	88.3	93.0	88.5	85.7	84.7	84.8	84.4	77.2	81.0	74.0

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
75.4	93.0	87.0	83.7	84.5	84.3	83.8	87.1	93.7	91.3	88.3	84.9	82.6	69.7	71.7

CQS: 82.4



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
2690 K	82.3	3.7	84.4	94.9	82.4	0.463	0.415	0.263	0.353	0.0014

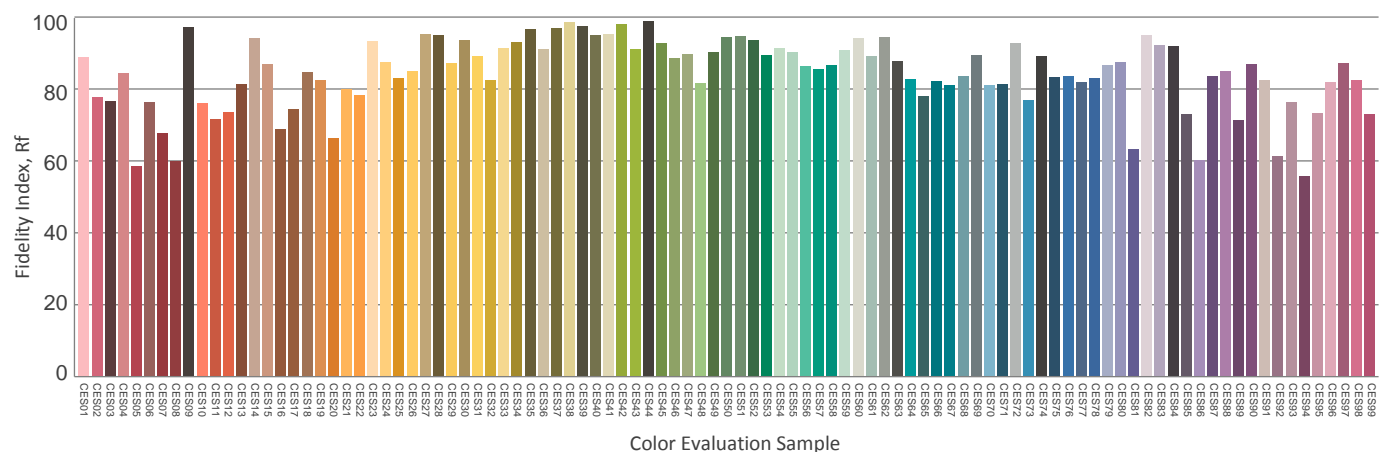
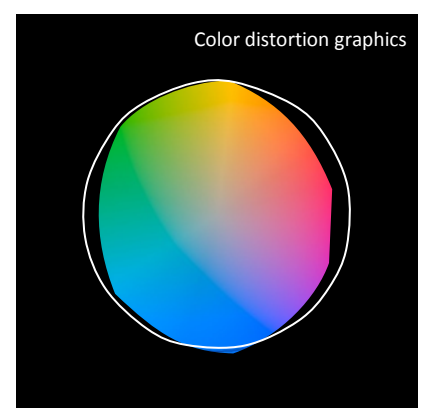
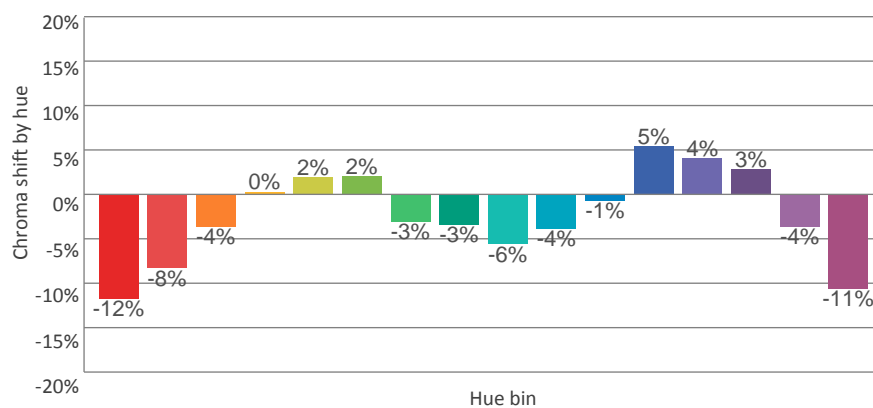
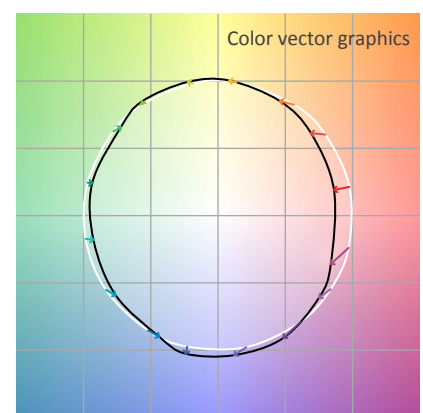
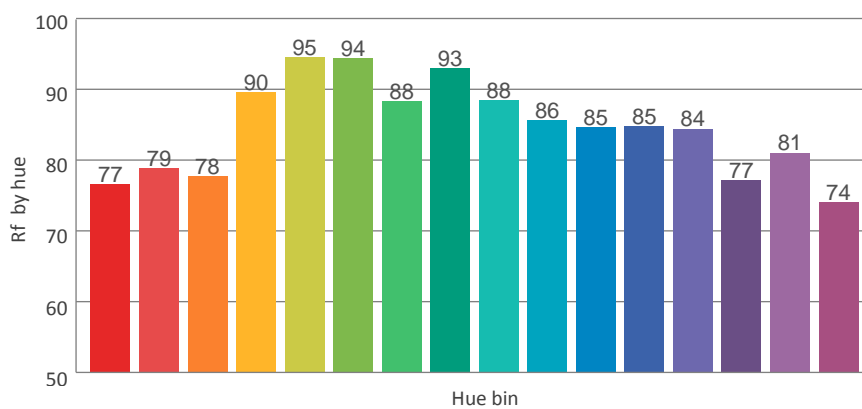
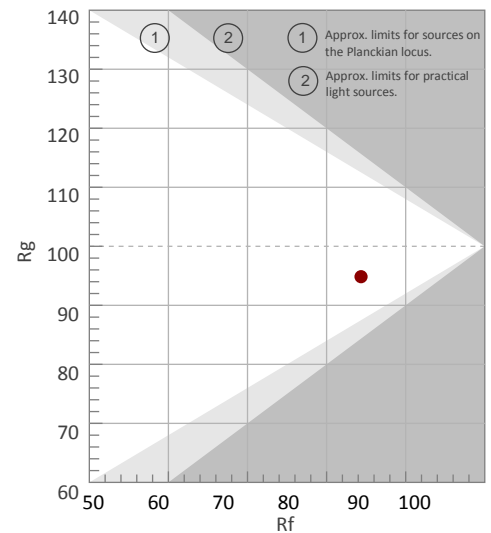
Rf 84.4

Fidelity index Rf

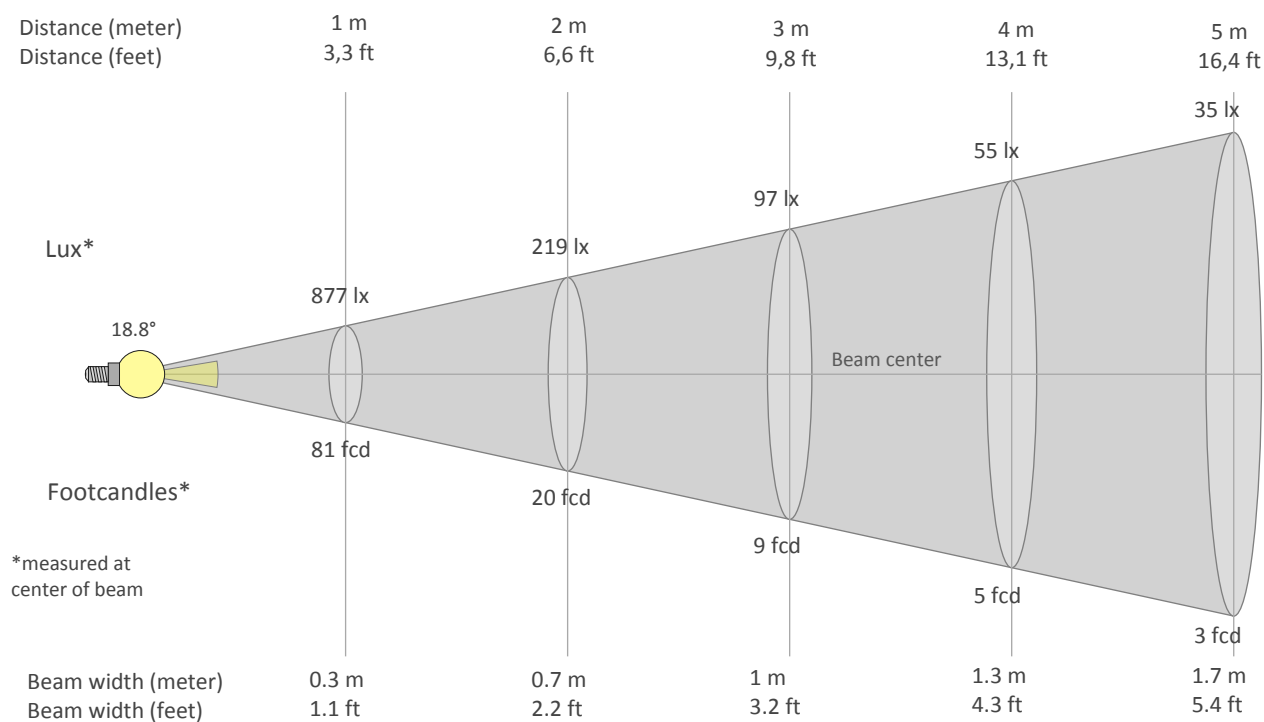
Rg 94.9

Gammut index Rg

Hue Bin	Graphic shifts (%)		
	R _f	Chroma	Hue
1	77	-12%	0%
2	79	-8%	7%
3	78	-4%	10%
4	90	0%	6%
5	95	2%	3%
6	94	2%	-1%
7	88	-3%	-6%
8	93	-3%	0%
9	88	-6%	2%
10	86	-4%	7%
11	85	-1%	10%
12	85	5%	0%
13	84	4%	-10%
14	77	3%	-17%
15	81	-4%	-10%
16	74	-11%	-14%



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
877lx	219lx	97lx	55lx	35lx	24lx	18lx	14lx	11lx	9lx	7lx	6lx	5lx	4lx	4lx	3lx	3lx	3lx	2lx	2lx
81.5fcd	20.4fcd	9.1fcd	5.1fcd	3.3fcd	2.3fcd	1.7fcd	1.3fcd	1fcd	0.8fcd	0.7fcd	0.6fcd	0.5fcd	0.4fcd	0.4fcd	0.3fcd	0.3fcd	0.3fcd	0.2fcd	0.2fcd

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°
877	844	764	649	519	411	328	266	213	169	131	99	75	57	43	33	25	19	15	12
100%	96%	87%	74%	59%	47%	37%	30%	24%	19%	15%	11%	9%	6%	5%	4%	3%	2%	2%	1%

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°
877	837	763	651	524	412	326	261	210	168	130	99	76	57	43	33	25	19	15	12
100%	95%	87%	74%	60%	47%	37%	30%	24%	19%	15%	11%	9%	7%	5%	4%	3%	2%	2%	1%

Intensities in 180° c-plane

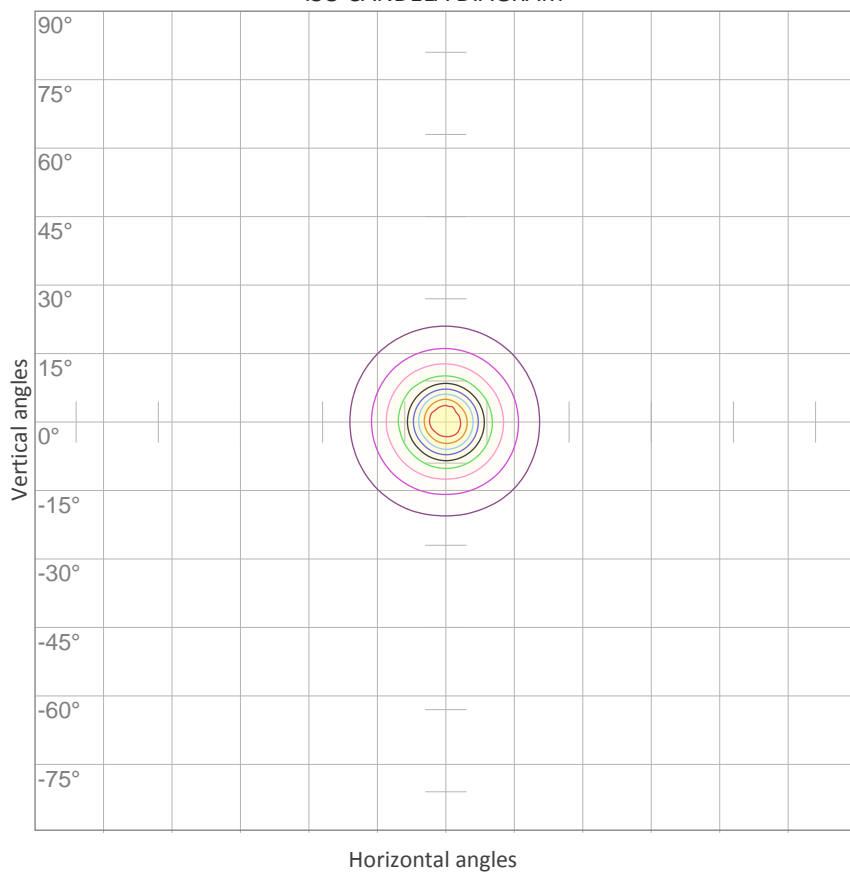
0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°
877	860	773	651	520	412	337	277	225	179	139	107	80	60	45	33	25	20	16	13
100%	98%	88%	74%	59%	47%	38%	32%	26%	20%	16%	12%	9%	7%	5%	4%	3%	2%	2%	1%

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°
877	866	790	664	528	409	328	269	218	174	137	105	80	61	47	36	28	21	17	13
100%	99%	90%	76%	60%	47%	37%	31%	25%	20%	16%	12%	9%	7%	5%	4%	3%	2%	2%	1%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
18.8°	46.4°	66.6°	98.2%	95.8%

ISO CANDELA DIAGRAM



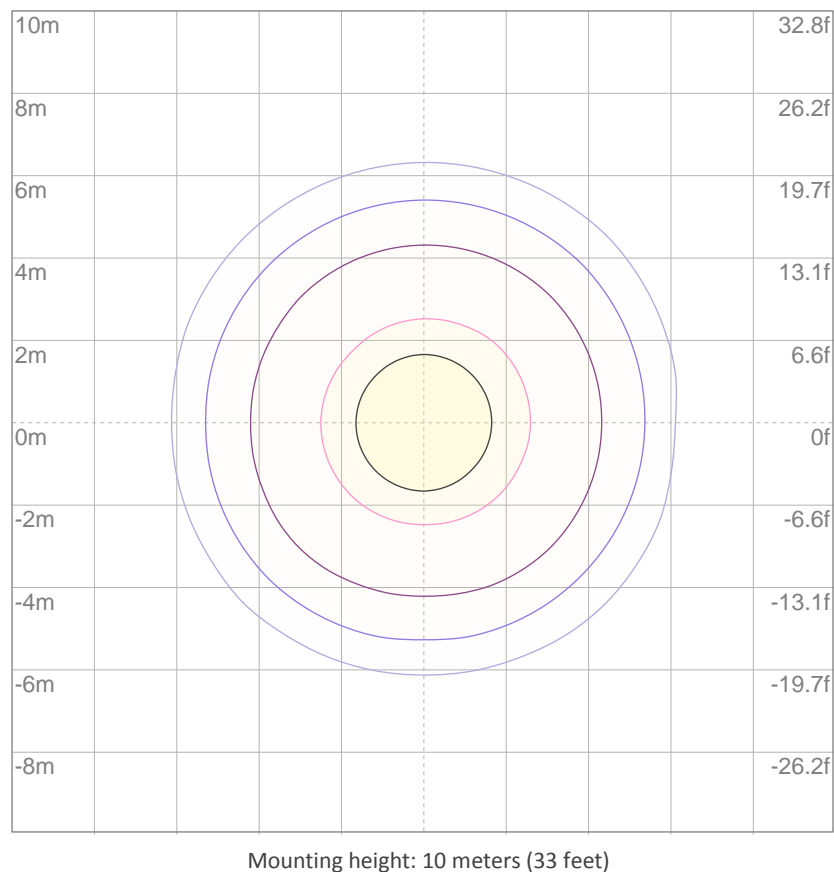
10%	88 cd
20%	175 cd
30%	263 cd
40%	351 cd
50%	438 cd
60%	526 cd
70%	614 cd
80%	702 cd
90%	789 cd

Conditions:

Number of c-planes: 8

Candela at center: 877 cd

ISO LUX DIAGRAM



3%	0.263 lx
5%	0.438 lx
10%	0.877 lx
30%	2.63 lx
50%	{LUX_10M50} lx

Conditions:

Number of c-planes: 8

Lux at center: 8.77 lx

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

UGR

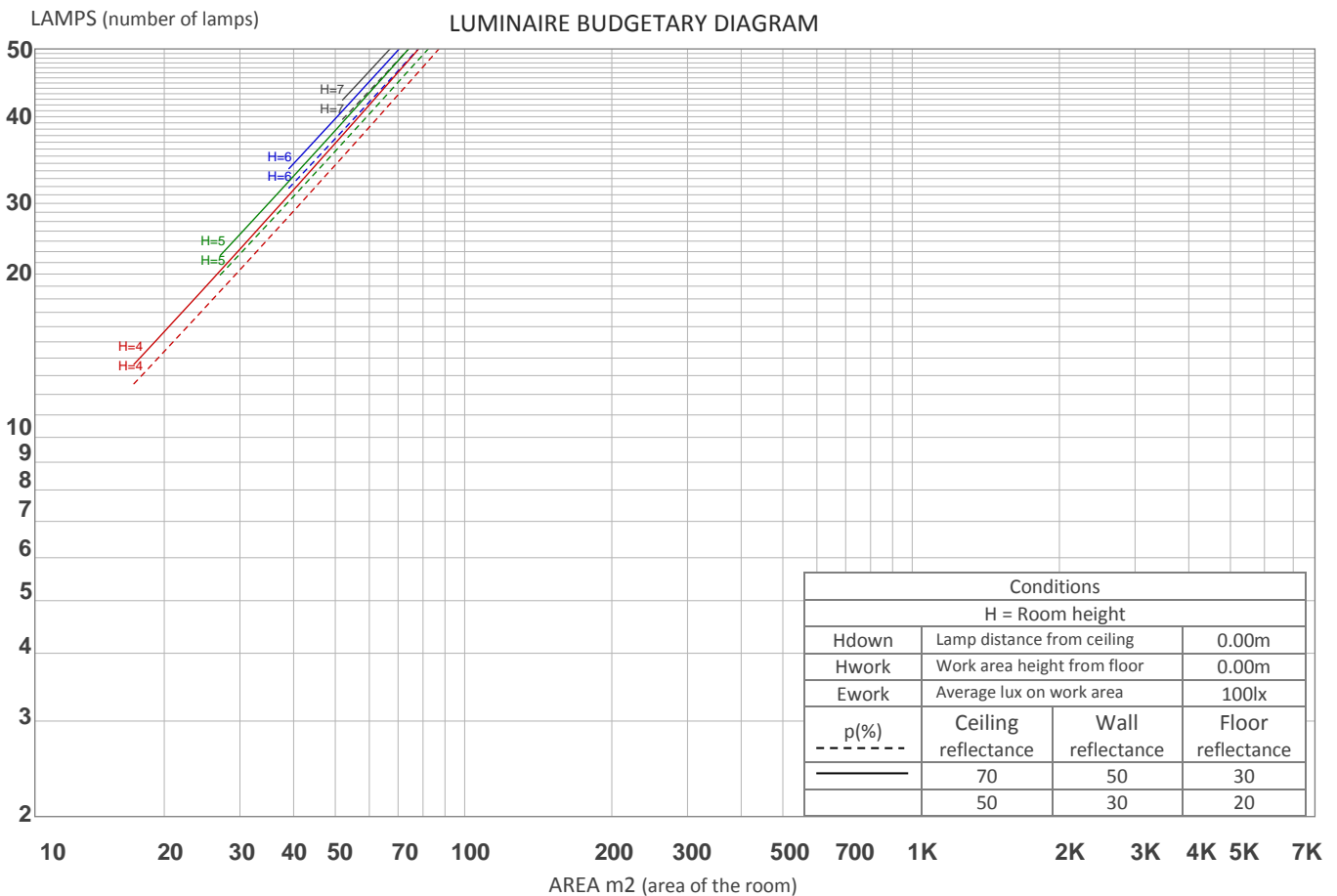
GLARE EVALUATION ACCORDING TO UGR

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	15.8	16.5	16.1	16.7	16.9	16.1	16.8	16.4	17.0	17.2
	3H	16.2	16.8	16.4	17.0	17.3	16.5	17.1	16.8	17.4	17.6
	4H	16.2	16.8	16.5	17.0	17.3	16.5	17.1	16.8	17.4	17.7
	6H	16.2	16.7	16.5	17.0	17.3	16.5	17.1	16.8	17.3	17.6
	8H	16.1	16.6	16.5	16.9	17.3	16.5	17.0	16.8	17.3	17.6
	12H	16.1	16.6	16.5	16.9	17.2	16.5	17.0	16.8	17.3	17.6
4H	2H	16.0	16.5	16.3	16.8	17.1	16.2	16.8	16.6	17.1	17.4
	3H	16.4	16.9	16.7	17.2	17.5	16.7	17.2	17.1	17.5	17.8
	4H	16.4	16.9	16.8	17.2	17.6	16.8	17.2	17.2	17.5	17.9
	6H	16.4	16.8	16.8	17.2	17.5	16.8	17.1	17.2	17.5	17.9
	8H	16.4	16.7	16.8	17.1	17.5	16.8	17.1	17.2	17.5	17.9
	12H	16.4	16.7	16.8	17.1	17.5	16.7	17.0	17.2	17.4	17.9
8H	4H	16.4	16.7	16.8	17.1	17.5	16.7	17.1	17.2	17.4	17.9
	6H	16.4	16.7	16.9	17.1	17.5	16.8	17.0	17.2	17.4	17.9
	8H	16.4	16.6	16.9	17.1	17.5	16.8	16.9	17.2	17.4	17.9
	12H	16.4	16.6	16.9	17.0	17.5	16.7	16.9	17.2	17.4	17.9
12H	4H	16.4	16.6	16.8	17.1	17.5	16.7	17.0	17.2	17.4	17.8
	6H	16.4	16.6	16.9	17.0	17.5	16.7	16.9	17.2	17.4	17.8
	8H	16.4	16.5	16.9	17.0	17.5	16.7	16.9	17.2	17.3	17.9
Variation of the observer position for the luminaire distance S											
S = 1.0H		+2.7 / -2.1					+2.5 / -1.7				
S = 1.5H		+4.9 / -3.1					+4.6 / -2.6				
S = 2.0H		+6.7 / -3.5					+6.4 / -3.2				
Standard table		BK01					BK01				
Correction summand		-1.8					-1.5				
Corrected glare indices referring to 179 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	101	101	101	99
1	114	112	110	108	112	110	108	106	106	104	103	102	101	100	98	98	97	95
2	110	106	103	100	108	104	101	99	101	99	97	98	96	94	95	94	92	91
3	106	101	97	94	104	99	96	93	97	94	91	94	92	90	92	90	88	87
4	102	96	92	88	101	95	91	88	93	90	87	91	88	86	89	87	85	83
5	99	92	88	84	97	91	87	84	89	86	83	88	85	82	86	84	82	80
6	95	88	84	80	94	88	83	80	86	82	80	85	82	79	84	81	79	77
7	92	85	80	77	91	84	80	77	83	79	77	82	79	76	81	78	76	75
8	89	82	78	74	88	82	77	74	81	77	74	80	76	74	79	76	73	72
9	87	79	75	72	86	79	75	72	78	74	71	77	74	71	76	73	71	70
10	84	77	72	70	83	76	72	69	76	72	69	75	71	69	74	71	69	68



ZONAL LUMEN SUMMARY

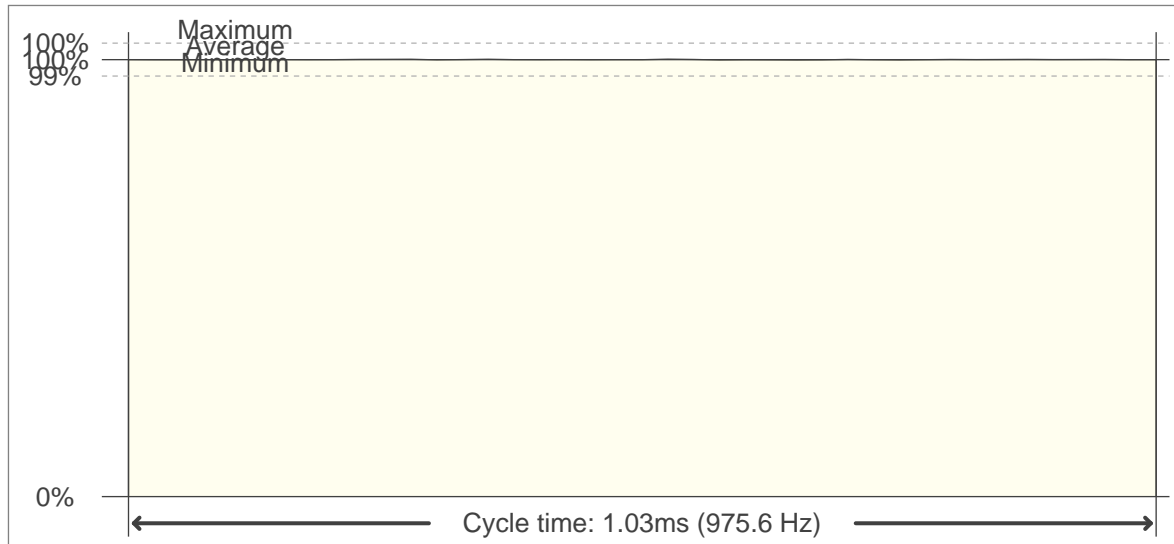
0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
57.6 lm	67.1 lm	32.8 lm	11.7 lm	4.66 lm	2.53 lm	1.44 lm	0.487 lm	0.099 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0.061 lm	0.078 lm	0.101 lm	0.139 lm	0.185 lm	0.209 lm	0.206 lm	0.138 lm	0.042 lm

FLICKER

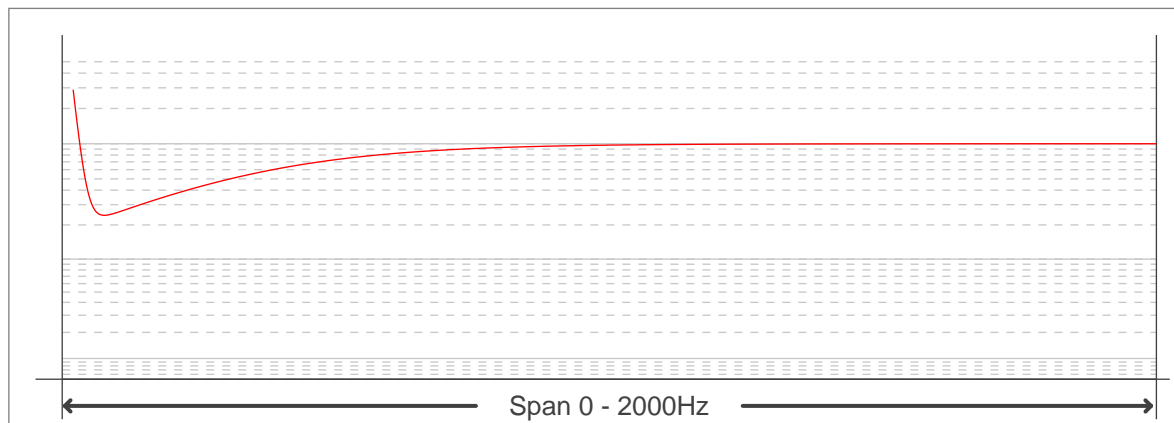
FLICKER CURVE (COMPLETE SAMPLED FLICKER)



FLICKER FRAME (FRAME OF ONE FLICKER PERIOD)



FLICKER FFT (FREQUENCY SCOPE OF FLICKER CURVE)



FLICKER RESULTS:

Flicker frequency:	975.61 Hz
Flicker index:	0
Flicker percentage:	0.24 %
SVM: (Visual flicker)	0

FLICKER CONDITIONS:

Sample rate:	40000 samples/second
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