

# PHOTOMETRIC TEST REPORT

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FUSE 3 MATT BLACK

astro

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### LIGHT EFFICIENCY:

42 Lumen/Watt

### LIGHT QUALITY:

CRI: 92.2

### COLOR TEMPERATURE:

2771 K

OUTPUT: 151 lm

PEAK: 715 cd

POWER: 3.6 W

PF: 0.51



Tracking number: [n/a](#)

Product name:

Fuse 3 Matt Black

Item number:

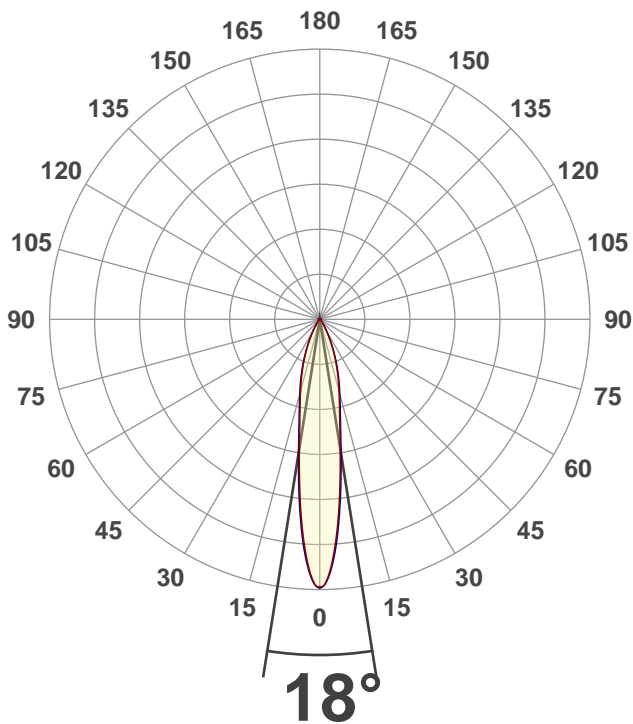
1215123

Date and time:

14/02/2020 12:24:26

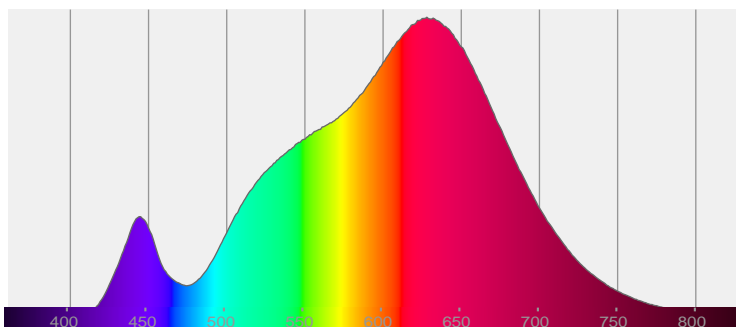
Description:

IP20 LED Reading Light

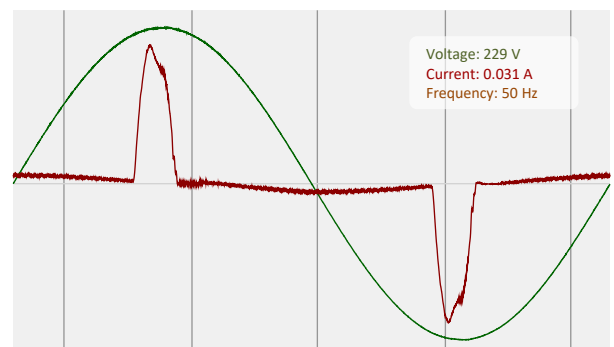


CIE 1931  
x: 0.455  
y: 0.411

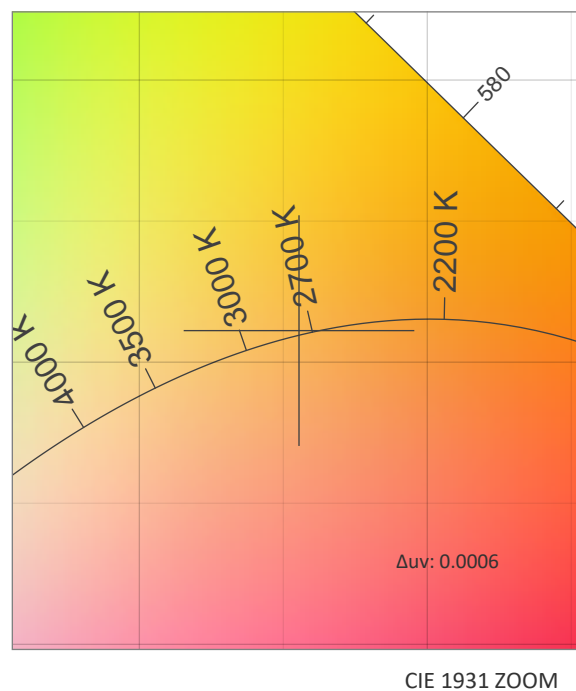
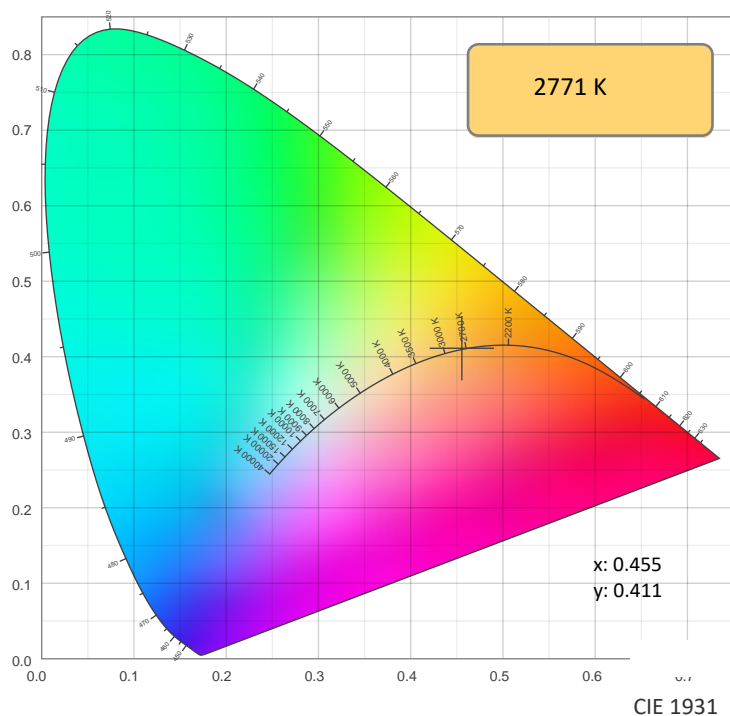
### SPECTRA



### POWER

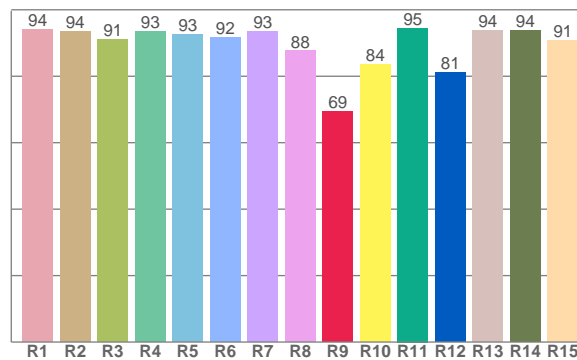
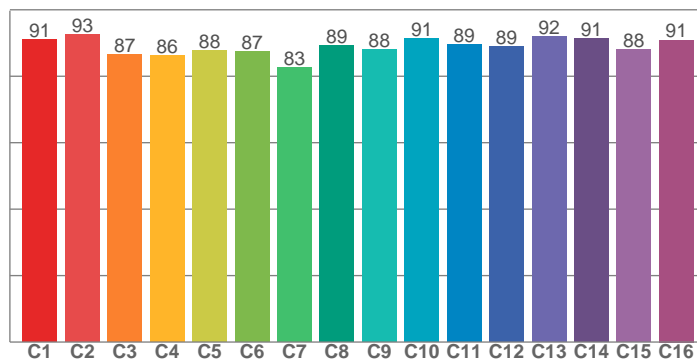


## COLOR DETAILS



TM30: 89.2

CRI: 92.2 (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
94.1	93.5	91.0	93.4	92.6	91.8	93.5	87.6	69.5	83.6	94.5	81.1	93.7	93.9	90.8

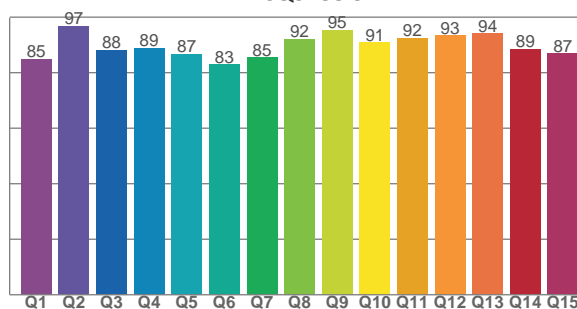
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
91.0	92.5	86.6	86.2	87.8	87.4	82.6	89.2	88.1	91.3	89.4	88.9	92.0	91.4	88.0	90.9

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
84.8	96.8	88.1	88.8	86.8	82.9	85.5	92.1	95.3	90.9	92.5	93.4	94.0	88.6	86.9

CQS: 88.9



## 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	$\Delta uv$
2771 K	92.2	69.5	89.2	103.6	88.9	0.455	0.411	0.259	0.351	0.0006

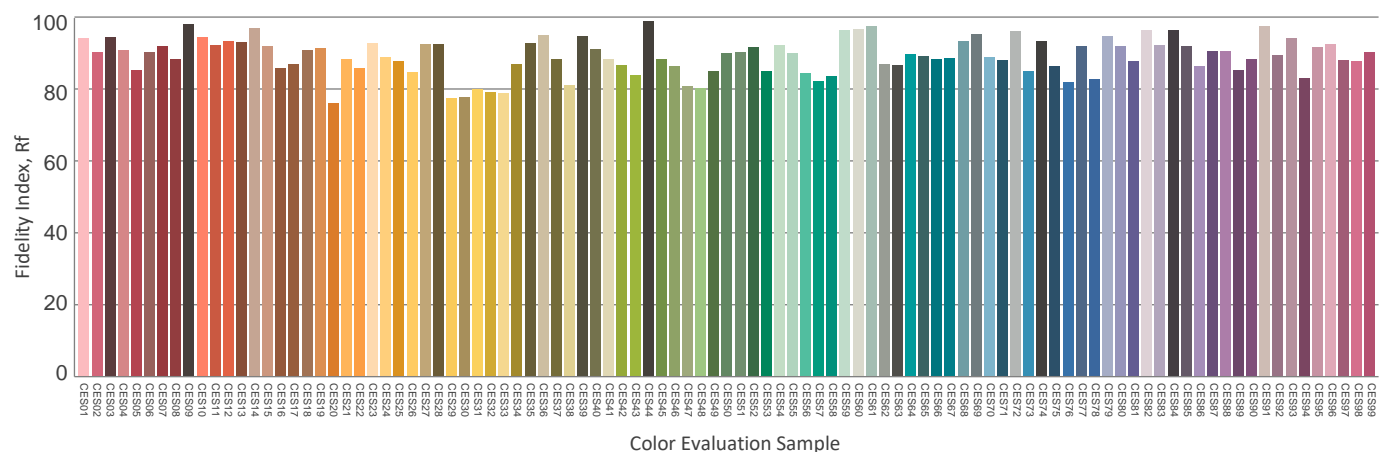
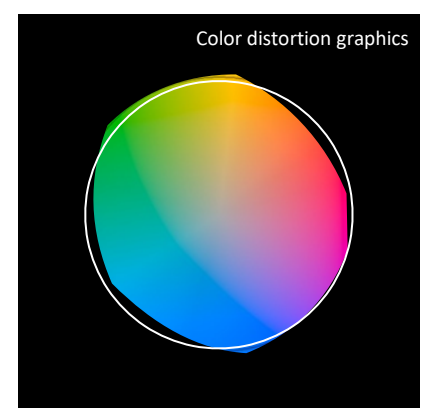
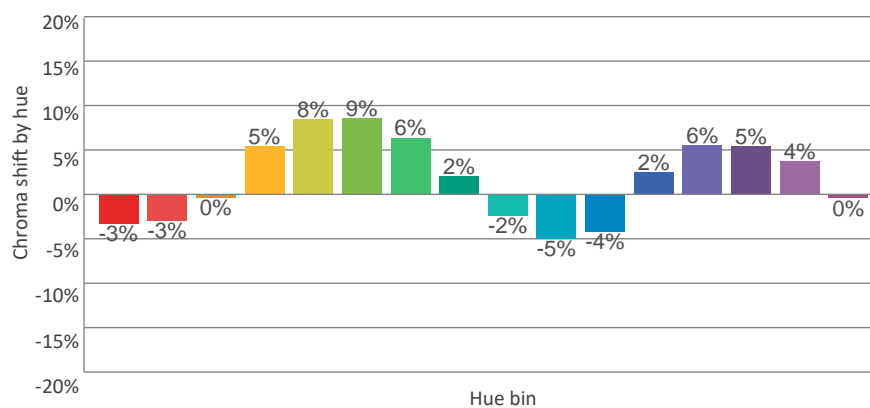
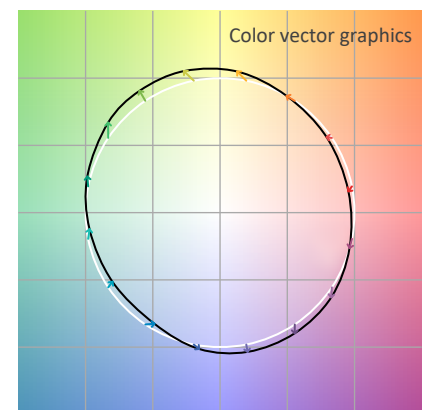
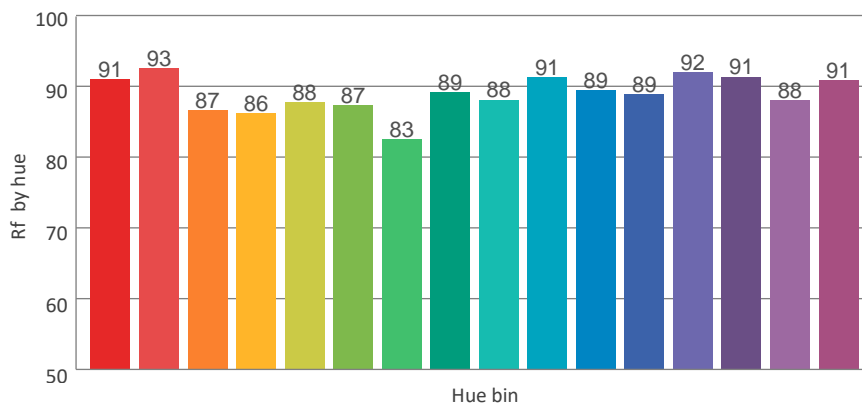
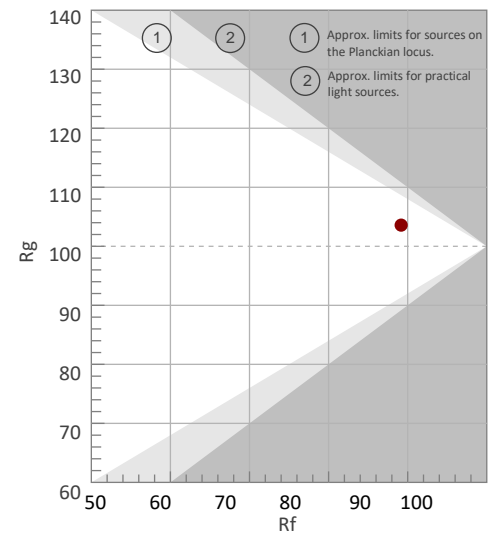
Rf 89.2

Fidelity index Rf

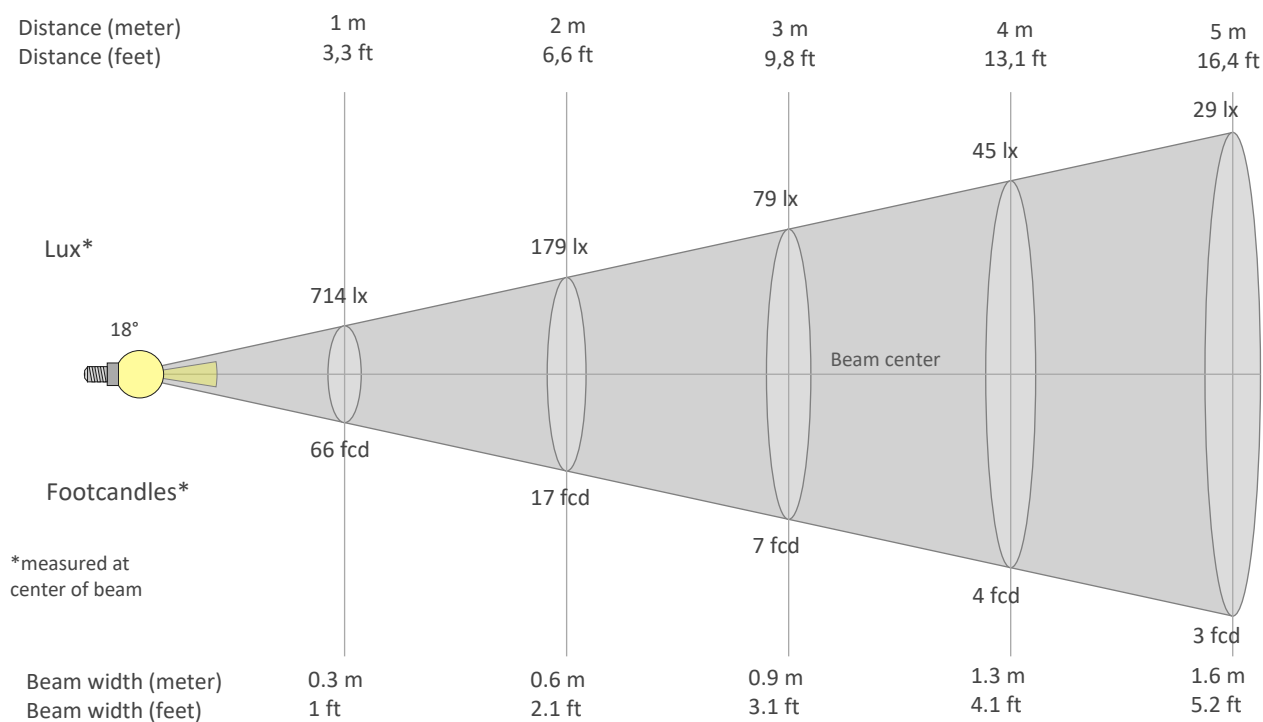
Rg 103.6

Gammut index Rg

Hue Bin	Graphic shifts (%)		
	R <sub>f</sub>	Chroma	Hue
1	91	-3%	-3%
2	93	-3%	3%
3	87	0%	7%
4	86	5%	8%
5	88	8%	6%
6	87	9%	-1%
7	83	6%	-9%
8	89	2%	-7%
9	88	-2%	-7%
10	91	-5%	-2%
11	89	-4%	5%
12	89	2%	5%
13	92	6%	0%
14	91	5%	-4%
15	88	4%	-6%
16	91	0%	-7%



## 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
714lx	179lx	79lx	45lx	29lx	20lx	15lx	11lx	9lx	7lx	6lx	5lx	4lx	4lx	3lx	3lx	2lx	2lx	2lx	2lx
66.4fcd	16.6fcd	7.4fcd	4.1fcd	2.7fcd	1.8fcd	1.4fcd	1fcd	0.8fcd	0.7fcd	0.5fcd	0.5fcd	0.4fcd	0.3fcd	0.3fcd	0.3fcd	0.2fcd	0.2fcd	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°
714	681	598	495	392	311	254	215	183	155	129	105	83	64	48	36	26	19	14	10
100%	95%	84%	69%	55%	43%	36%	30%	26%	22%	18%	15%	12%	9%	7%	5%	4%	3%	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°
714	685	609	509	408	323	264	223	190	162	135	109	87	67	50	37	27	20	15	11
100%	96%	85%	71%	57%	45%	37%	31%	27%	23%	19%	15%	12%	9%	7%	5%	4%	3%	2%	2%

Intensities in 180° c-plane

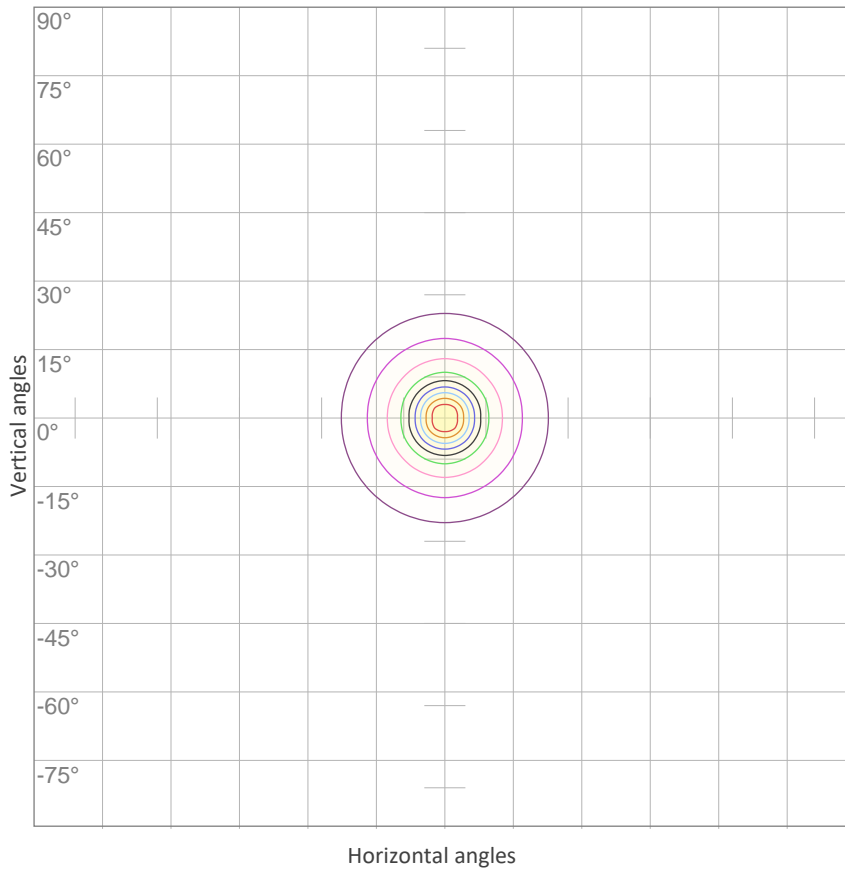
0°	2°	4°	6°	8°	10°	12°	14°	16°	18°	20°	22°	24°	26°	28°	30°	32°	34°	36°	38°
714	681	598	495	392	311	254	215	183	155	129	105	83	64	48	36	26	19	14	10
100%	95%	84%	69%	55%	43%	36%	30%	26%	22%	18%	15%	12%	9%	7%	5%	4%	3%	2%	1%

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°
714	685	609	509	408	323	264	223	190	162	135	109	87	67	50	37	27	20	15	11
100%	96%	85%	71%	57%	45%	37%	31%	27%	23%	19%	15%	12%	9%	7%	5%	4%	3%	2%	2%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
18°	50.7°	68.9°	99.5%	98.9%

ISO CANDELA DIAGRAM



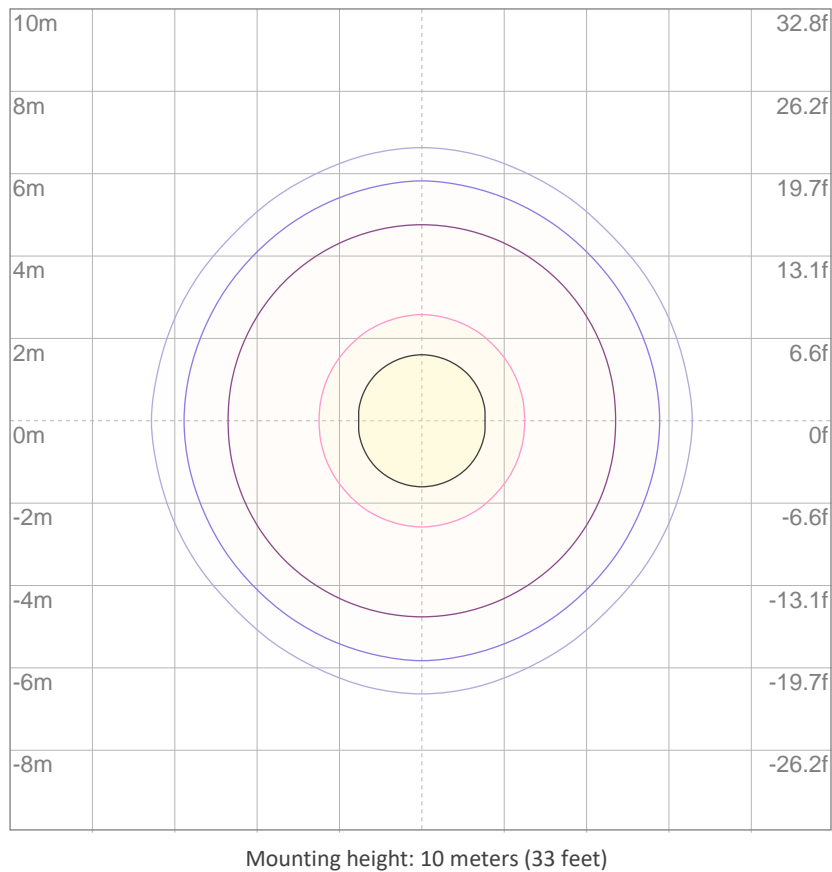
10%	71 cd
20%	143 cd
30%	214 cd
40%	286 cd
50%	357 cd
60%	429 cd
70%	500 cd
80%	572 cd
90%	643 cd

Conditions:

Number of c-planes: 8

Candela at center: 714 cd

ISO LUX DIAGRAM



3%	0.214 lx
5%	0.357 lx
10%	0.714 lx
30%	2.14 lx
50%	{LUX_10M50} lx

Conditions:

Number of c-planes: 8

Lux at center: 7.14 lx

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

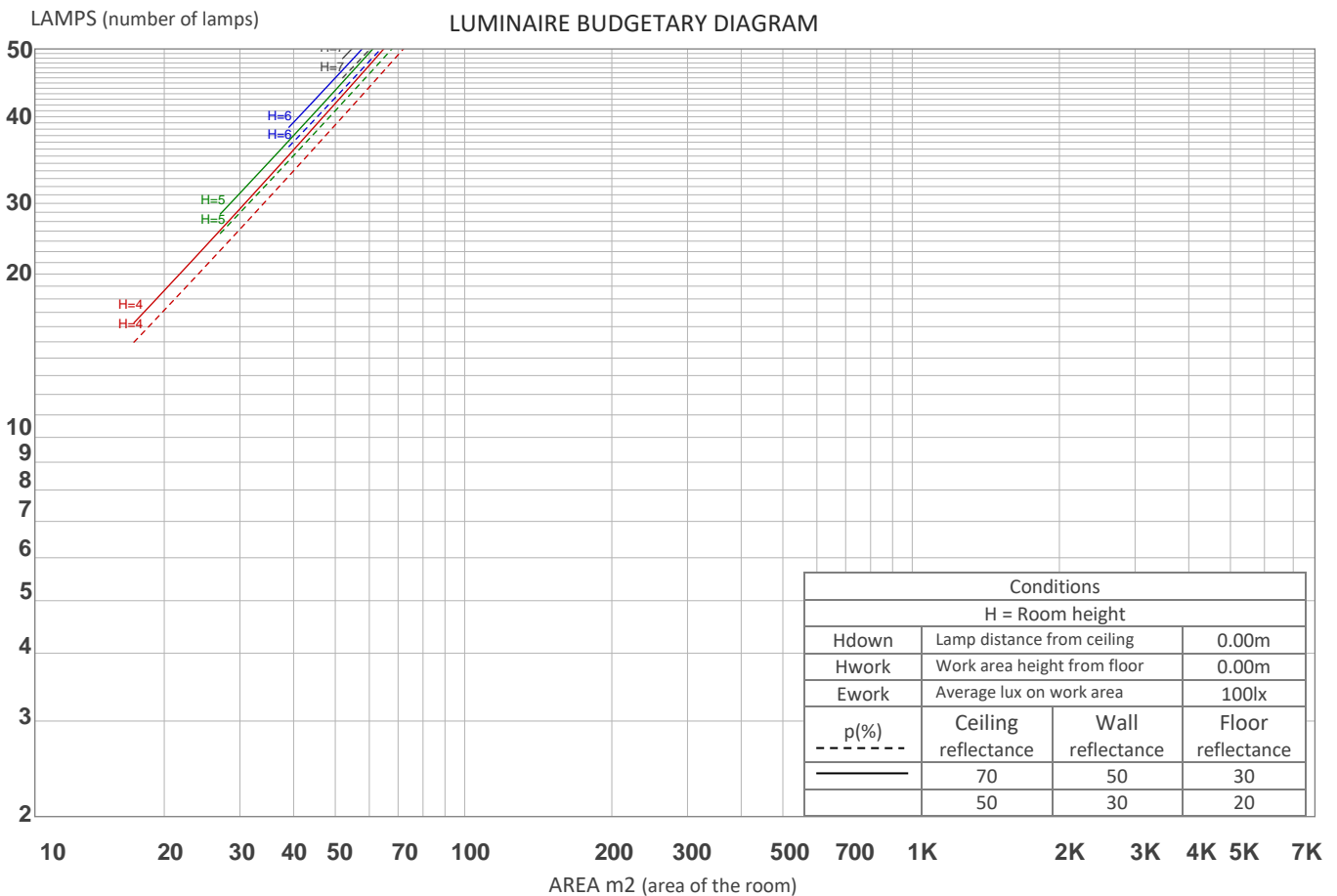
## UGR

## 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	12.5	13.0	12.6	13.2	13.4	12.7	13.1	12.8	13.3	13.5
	3H	12.2	12.8	12.6	13.0	13.2	12.4	13.0	12.7	13.2	13.4
	4H	12.1	12.7	12.5	12.9	13.2	12.3	12.9	12.7	13.1	13.4
	6H	12.1	12.6	12.4	12.9	13.2	12.3	12.8	12.6	13.1	13.4
	8H	12.1	12.5	12.4	12.9	13.2	12.3	12.7	12.6	13.0	13.4
	12H	12.0	12.5	12.4	12.8	13.2	12.2	12.7	12.5	13.0	13.4
4H	2H	12.1	12.7	12.5	12.9	13.2	12.3	12.9	12.7	13.1	13.4
	3H	12.0	12.5	12.4	12.8	13.2	12.2	12.6	12.5	13.0	13.4
	4H	11.9	12.3	12.3	12.7	13.2	12.0	12.5	12.5	12.9	13.4
	6H	11.8	12.3	12.3	12.6	12.9	12.0	12.4	12.5	12.8	13.1
	8H	11.7	12.2	12.2	12.5	12.9	11.9	12.4	12.4	12.7	13.1
	12H	11.7	12.0	12.2	12.4	12.9	11.9	12.2	12.4	12.6	13.1
8H	4H	11.7	12.2	12.2	12.5	12.9	11.9	12.3	12.4	12.7	13.0
	6H	11.7	11.9	12.2	12.4	12.9	11.8	12.1	12.4	12.6	13.1
	8H	11.7	11.9	12.2	12.4	13.0	11.8	12.1	12.4	12.6	13.2
	12H	11.6	11.8	12.2	12.3	12.9	11.8	12.0	12.4	12.5	13.1
12H	4H	11.6	12.0	12.2	12.4	12.9	11.8	12.2	12.3	12.6	13.0
	6H	11.7	11.9	12.2	12.4	13.0	11.8	12.0	12.4	12.6	13.2
	8H	11.6	11.8	12.2	12.3	12.9	11.8	12.0	12.4	12.5	13.1
Variation of the observer position for the luminaire distance S											
S = 1.0H		5.4 / -13.4					5.5 / -12.6				
S = 1.5H		8.1 / -15.4					8.1 / -14.2				
S = 2.0H		10.1 / -16.1					10.1 / -14.7				
Standard table		n/a					n/a				
Correction summand		n/a					n/a				
Corrected glare indices referring to 151 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	112	110	108	112	110	108	107	106	105	103	102	101	100	99	98	97	96
2	110	106	103	101	108	105	102	99	102	99	97	99	97	95	96	94	93	92
3	106	101	97	94	105	100	96	94	97	95	92	95	93	91	93	91	89	88
4	103	97	92	89	101	96	92	89	94	90	88	92	89	87	90	88	86	84
5	99	93	88	85	98	92	88	84	90	86	84	89	85	83	87	84	82	81
6	96	89	84	81	94	88	84	81	87	83	80	85	82	80	84	81	79	78
7	93	86	81	78	91	85	81	78	84	80	77	83	79	77	82	79	76	75
8	90	82	78	75	89	82	78	75	81	77	74	80	76	74	79	76	74	73
9	87	80	75	72	86	79	75	72	78	74	72	77	74	71	77	74	71	70
10	84	77	72	70	83	76	72	69	76	72	69	75	72	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°
44.9 lm	56.4 lm	34.6 lm	11.0 lm	2.49 lm	0.338 lm	0.083 lm	0.041 lm	0.032 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
0.035 lm	0.038 lm	0.042 lm	0.050 lm	0.071 lm	0.105 lm	0.113 lm	0.078 lm	0.019 lm

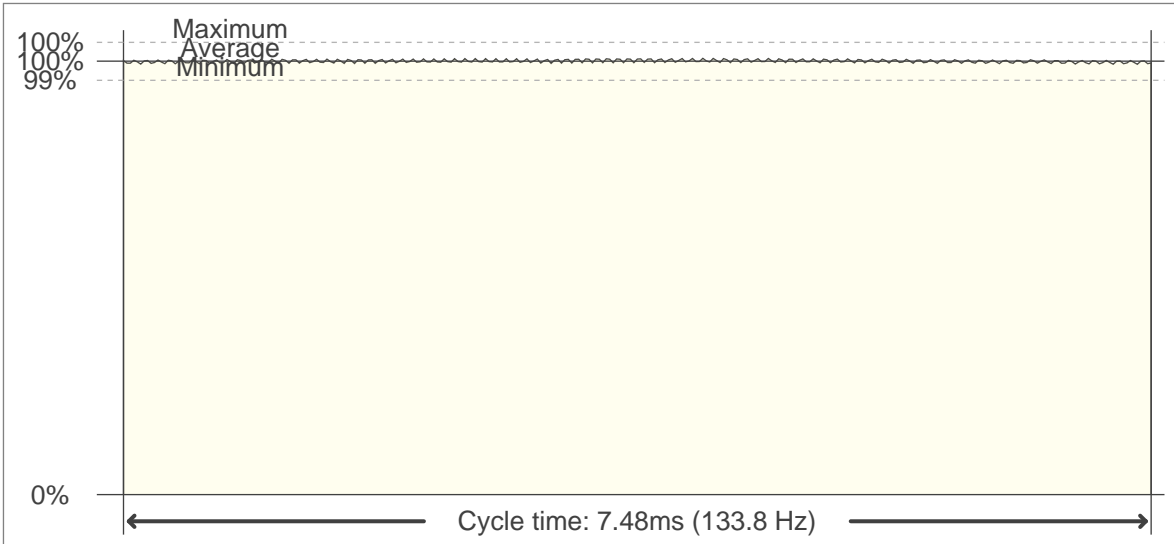


FLICKER

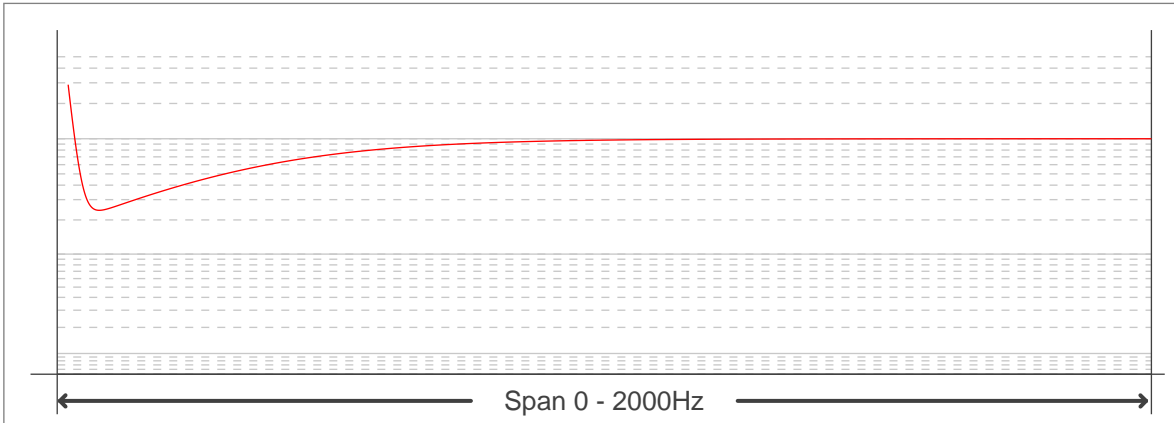
FLICKER CURVE (COMPLETE SAMPLED FLICKER)



FLICKER FRAME (FRAME OF ONE FLICKER PERIOD)



FLICKER FFT (FREQUENCY SCOPE OF FLICKER CURVE)



FLICKER RESULTS:

Flicker frequency:	133.78 Hz
Flicker index:	0
Flicker percentage:	0.9 %
SVM: (Visual flicker)	0.01

FLICKER CONDITIONS:

Sample rate:	40000 samples/second
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