

PHOTOMETRIC TEST REPORT

IO 665 MATT BLACK

astro

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LIGHT EFFICIENCY:

87 Lumen/Watt

OUTPUT: 725 lm

LIGHT QUALITY:

CRI: 95.2

PEAK: 125 cd

COLOR TEMPERATURE:

3023 K

POWER: 8.3 W

PF: 0.97



Tracking number: [n/a](#)

Product name:

io 665 Matt Black

Item number:

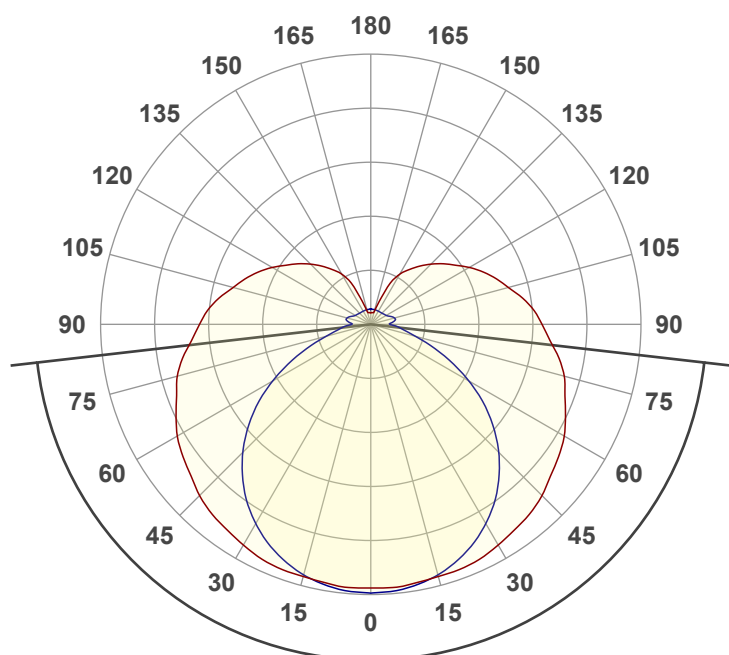
1409059

Date and time:

28/09/2022 12:47:27

Description:

IP44 Indoor Dimmable LED Bathroom Light

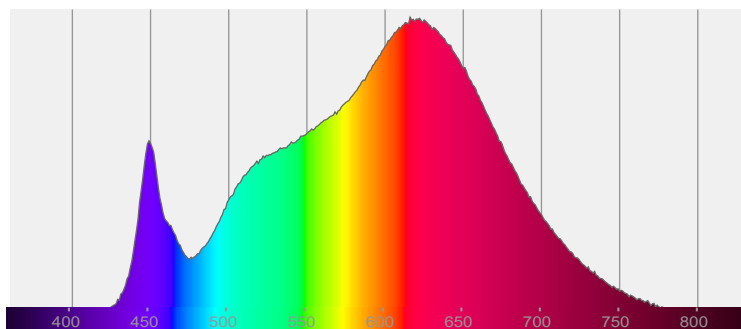


166.9°

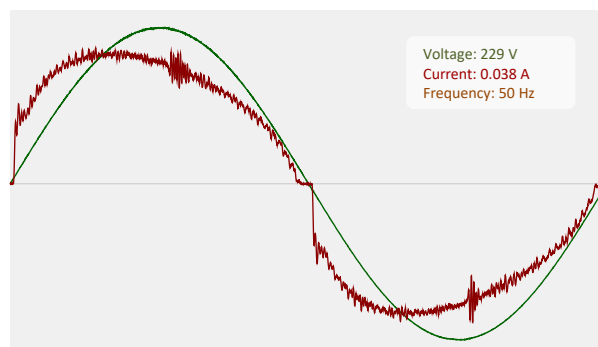


CIE 1931
x: 0.434
y: 0.399

SPECTRA

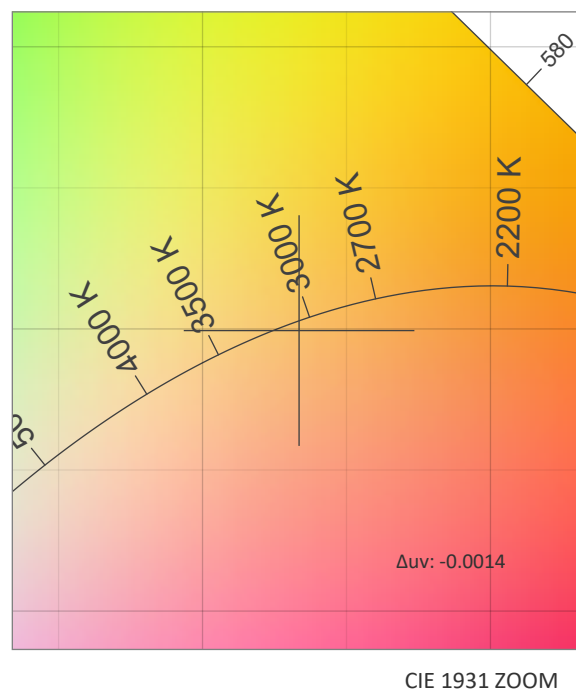
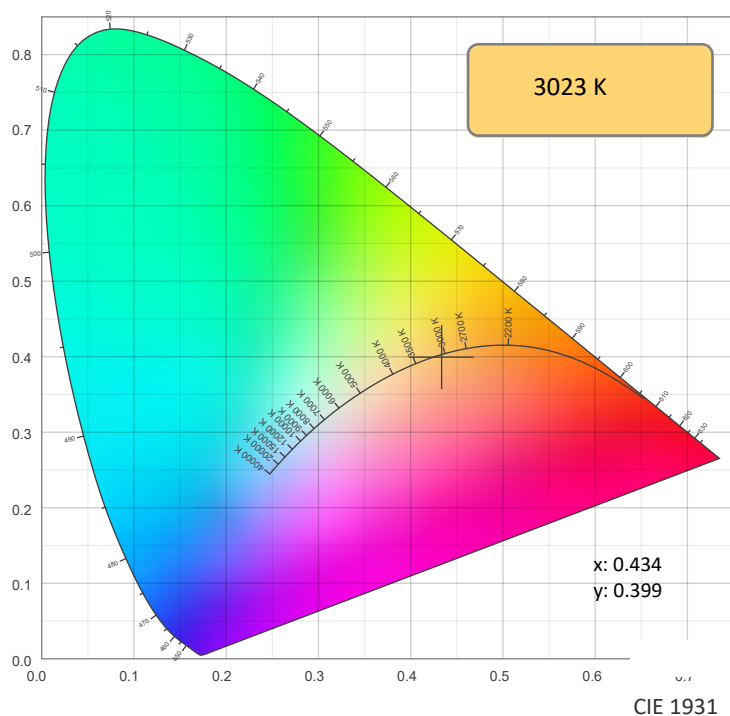


POWER

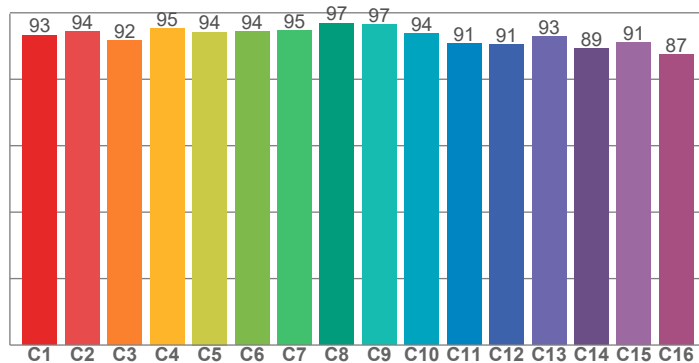


Voltage: 229 V
Current: 0.038 A
Frequency: 50 Hz

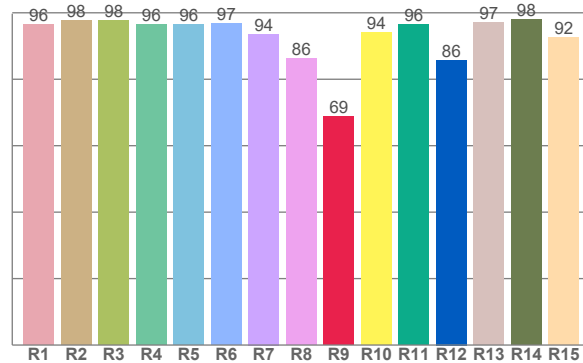
COLOR DETAILS



TM30: 93.1



CRI: 95.2 (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
96.5	97.7	97.8	96.5	96.5	96.8	93.6	86.4	68.7	94.1	96.4	85.8	97.1	98.1	92.5

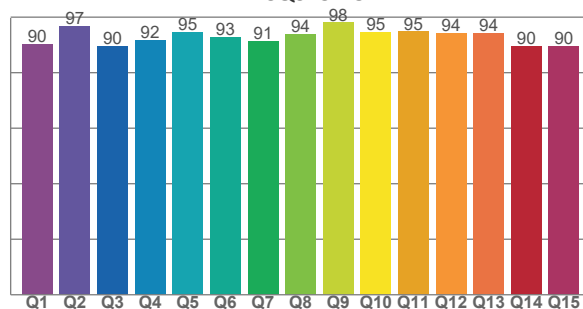
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
93.3	94.5	91.6	95.2	94.2	94.3	94.6	96.9	96.5	93.7	90.7	90.5	92.9	89.3	91.1	87.5

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
90.3	96.9	89.7	91.9	94.7	92.7	91.4	93.8	98.0	94.5	94.8	94.4	94.2	89.6	89.6

CQS: 92.5



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
3023 K	95.2	68.7	93.1	101.5	92.5	0.434	0.399	0.250	0.346	-0.0014

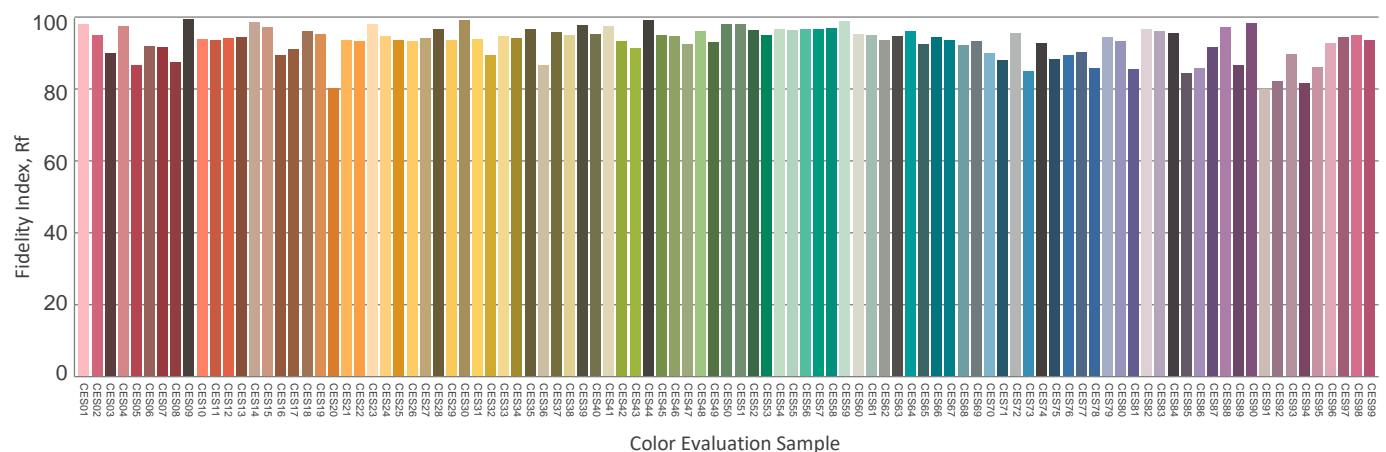
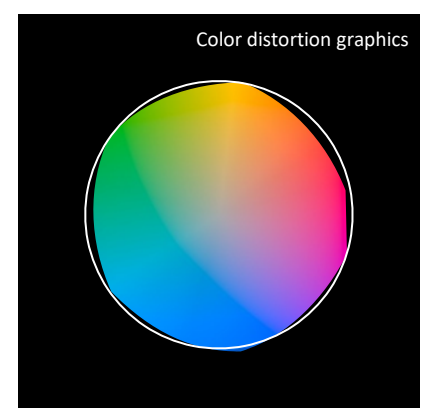
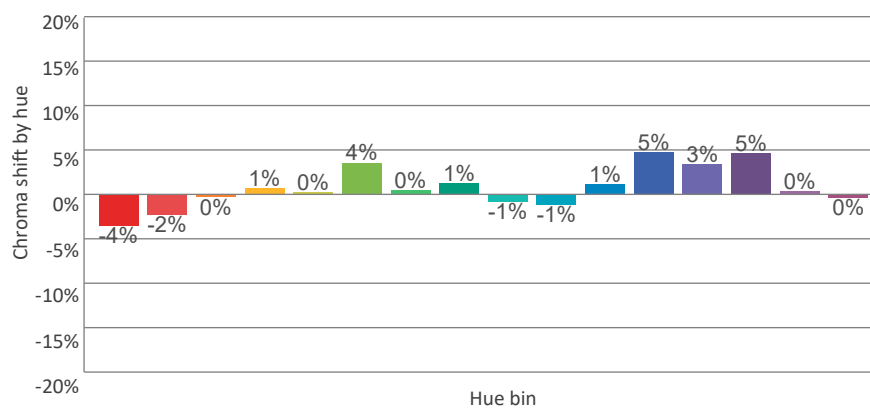
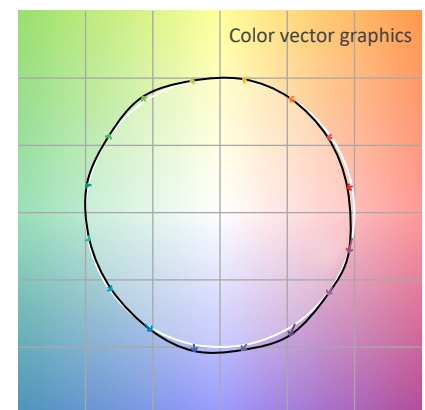
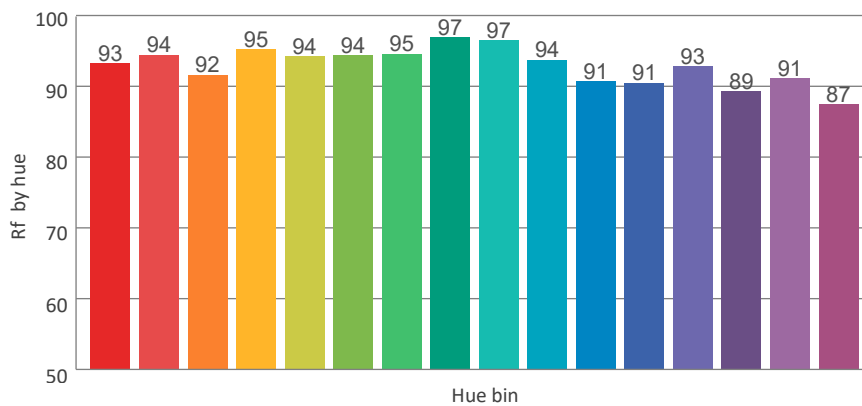
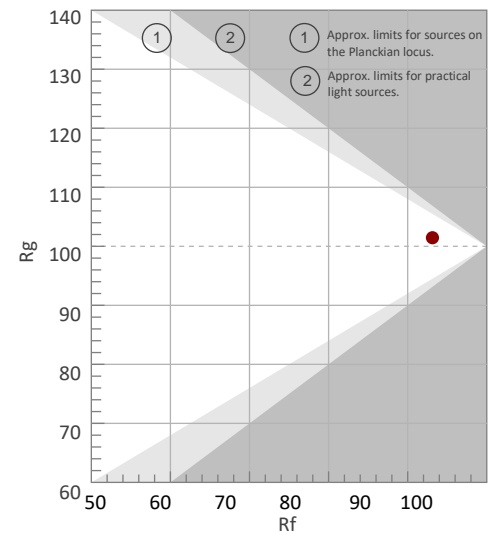
Rf 93.1

Fidelity index Rf

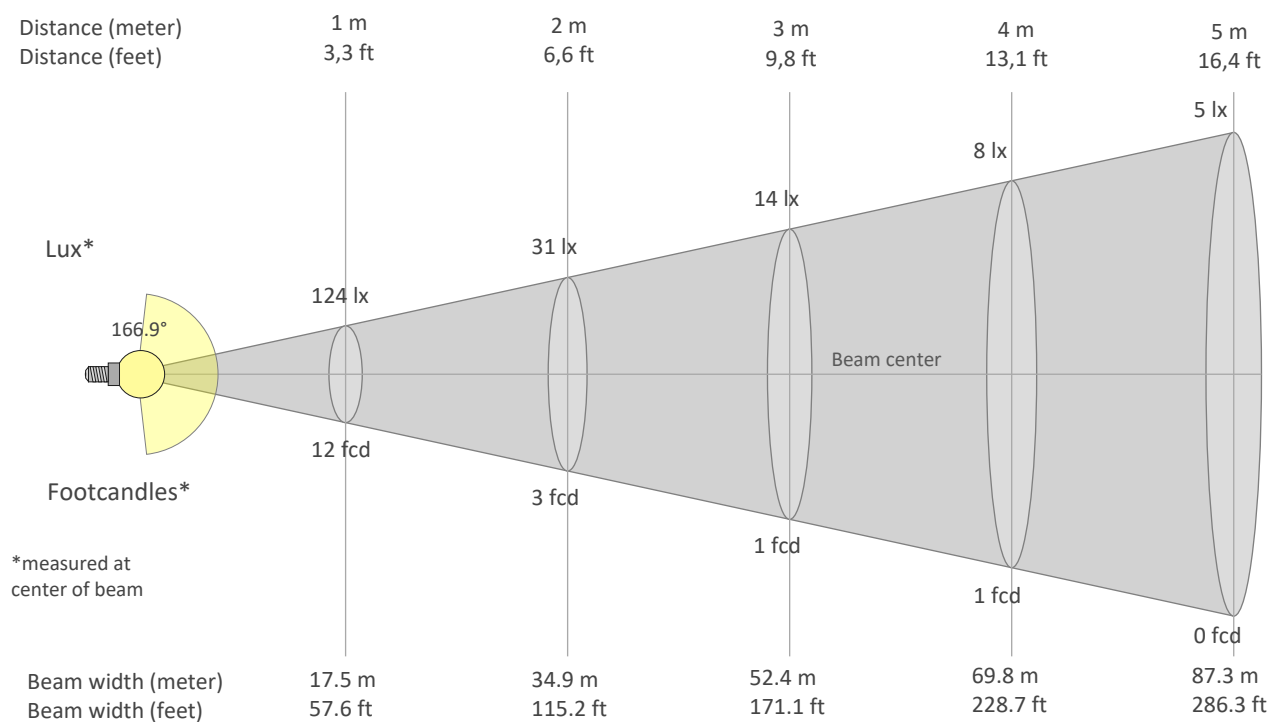
Rg 101.5

Gammut index Rg

Hue Bin	Graphic shifts (%)		
	Rf	Chroma	Hue
1	93	-4%	-1%
2	94	-2%	2%
3	92	0%	4%
4	95	1%	2%
5	94	0%	2%
6	94	4%	0%
7	95	0%	-2%
8	97	1%	-2%
9	97	-1%	1%
10	94	-1%	3%
11	91	1%	6%
12	91	5%	1%
13	93	3%	-4%
14	89	5%	-7%
15	91	0%	-6%
16	87	0%	-10%



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
124lx	31lx	14lx	8lx	5lx	3lx	3lx	2lx	2lx	1lx	1lx	1lx	1lx	1lx	1lx	0lx	0lx	0lx	0lx	0lx
11.5fcd	2.9fcd	1.3fcd	0.7fcd	0.5fcd	0.3fcd	0.2fcd	0.2fcd	0.1fcd	0.1fcd	0.1fcd	0.1fcd	0.1fcd	0.1fcd	0.1fcd	0fcd	0fcd	0fcd	0fcd	0fcd

Intensities in 0° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°
124	122	121	119	116	112	107	101	95	88	80	72	64	56	47	40	32	23	9	6
100%	99%	98%	96%	94%	91%	87%	82%	77%	71%	64%	58%	51%	45%	38%	32%	26%	19%	7%	4%

Intensities in 90° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°
124	123	118	110	99	84	66	46	27	15	9	11	11	9	8	7	7	7	7	7
100%	99%	96%	89%	80%	68%	53%	37%	22%	12%	7%	9%	9%	7%	6%	6%	6%	6%	6%	6%

Intensities in 180° c-plane

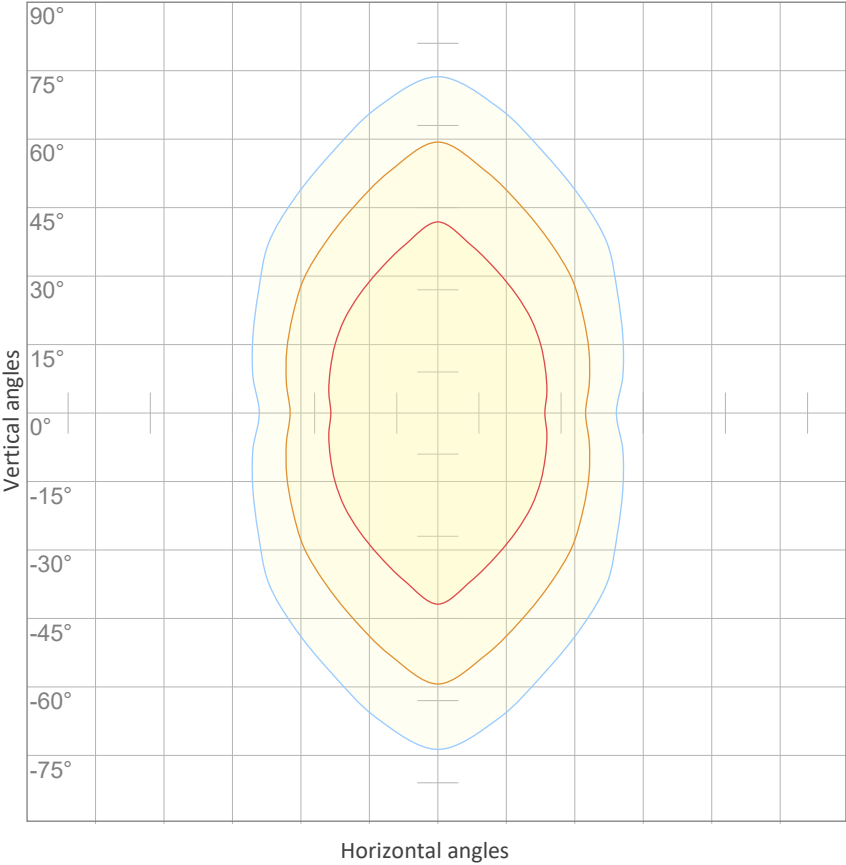
0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°
124	122	121	119	116	112	107	101	95	88	80	72	64	56	47	40	32	23	9	6
100%	99%	98%	96%	94%	91%	87%	82%	77%	71%	64%	58%	51%	45%	38%	32%	26%	19%	7%	4%

Intensities in 270° c-plane

0°	9°	18°	27°	36°	45°	54°	63°	72°	81°	90°	99°	108°	117°	126°	135°	144°	153°	162°	171°
124	123	118	110	99	84	66	46	27	15	9	11	11	9	8	7	7	7	7	7
100%	99%	96%	89%	80%	68%	53%	37%	22%	12%	7%	9%	9%	7%	6%	6%	6%	6%	6%	6%

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
166.9°	273.5°	360°	44.5%	28.3%

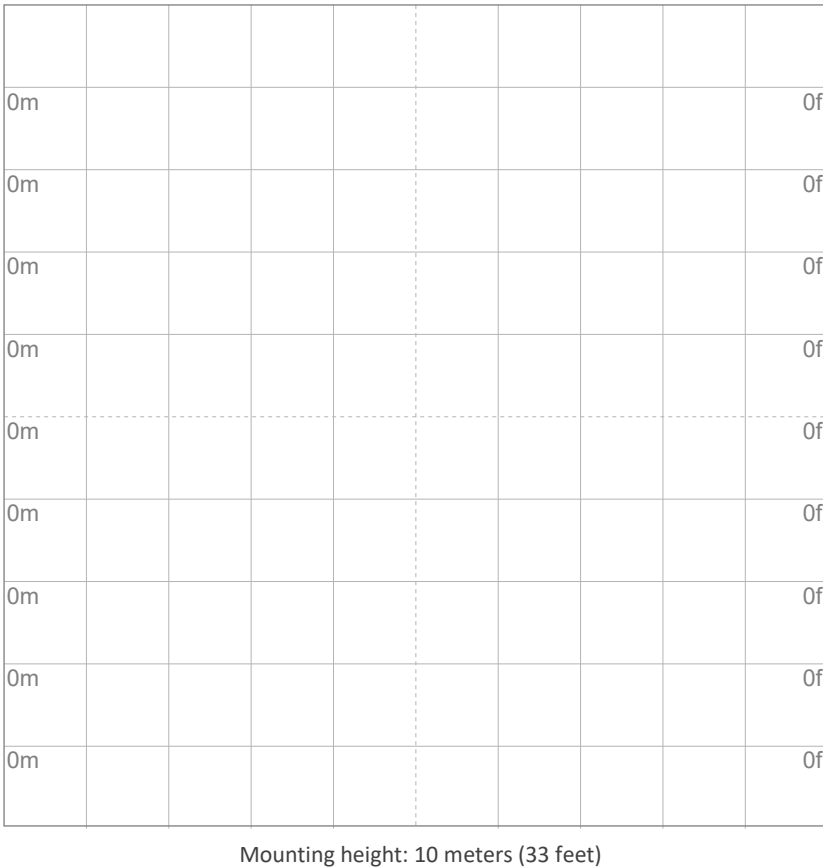
ISO CANDELA DIAGRAM



10%	12 cd
20%	25 cd
30%	37 cd
40%	50 cd
50%	62 cd
60%	74 cd
70%	87 cd
80%	99 cd
90%	111 cd

Conditions:
Number of c-planes: 8
Candela at center: 124 cd

ISO LUX DIAGRAM



3%	37.2m lx
5%	61.9m lx
10%	0.124 lx
30%	0.372 lx
50%	{LUX_10M50} lx

Conditions:
Number of c-planes: 8
Lux at center: 1.24 lx

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

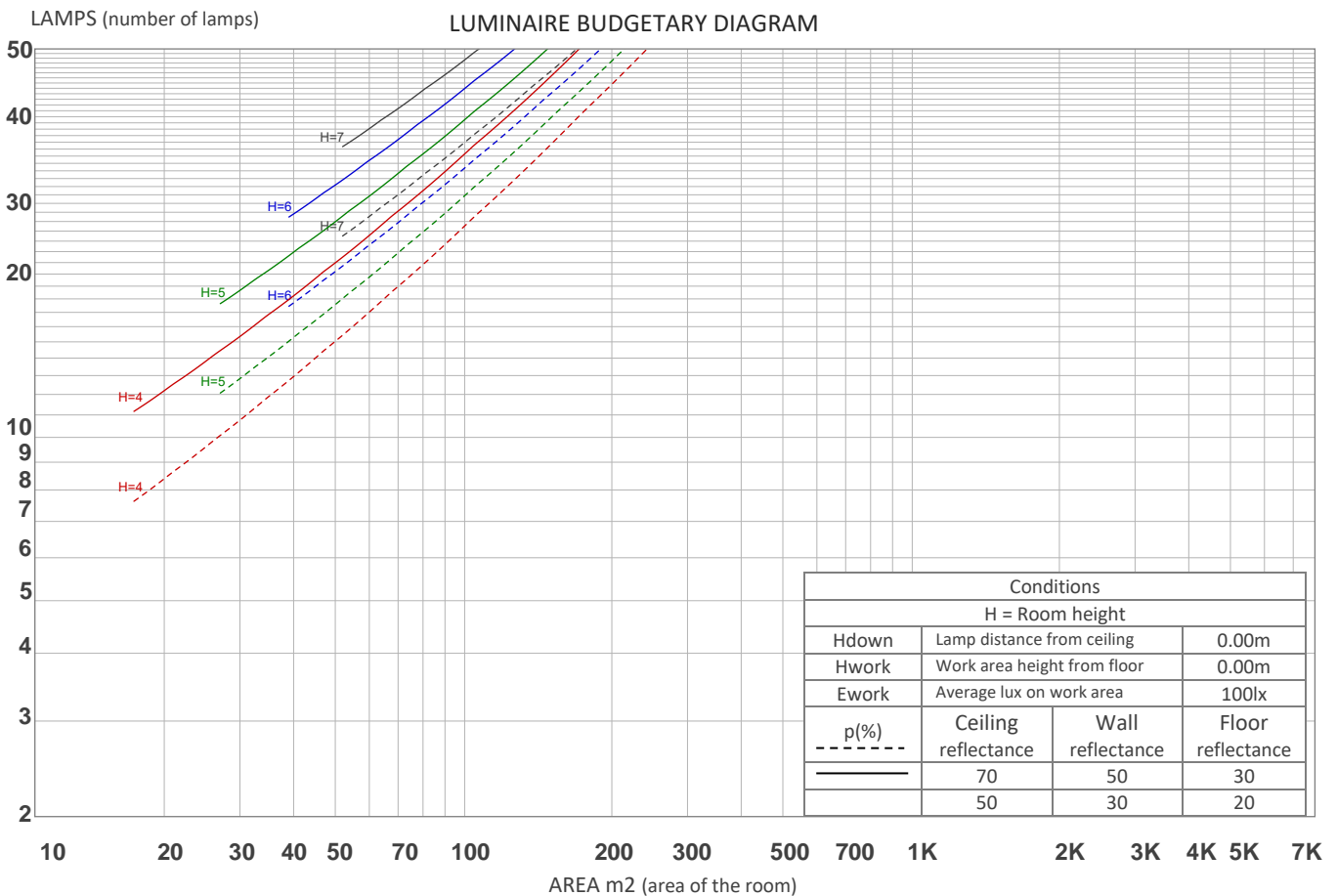
UGR

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	11.9	13.0	12.6	13.7	14.5	11.5	12.6	12.2	13.3	14.1
	3H	14.0	15.1	14.8	15.8	16.6	12.9	14.0	13.6	14.6	15.4
	4H	15.2	16.2	15.9	16.9	17.7	13.4	14.4	14.2	15.1	15.9
	6H	16.3	17.2	17.0	18.0	18.8	13.9	14.8	14.6	15.5	16.4
	8H	16.9	17.8	17.6	18.5	19.3	14.1	15.1	14.8	15.7	16.6
	12H	17.4	18.4	18.1	19.0	19.9	14.3	15.3	15.0	15.9	16.8
4H	2H	12.5	13.5	13.2	14.2	15.0	12.2	13.2	13.0	13.9	14.7
	3H	14.9	15.9	15.6	16.5	17.4	13.9	14.9	14.6	15.5	16.4
	4H	16.1	17.2	16.9	17.7	18.6	14.6	15.7	15.4	16.2	17.1
	6H	17.4	18.2	18.2	18.9	19.7	15.2	16.0	16.0	16.7	17.6
	8H	18.0	18.7	18.8	19.5	20.3	15.5	16.2	16.3	17.0	17.8
	12H	18.7	19.2	19.5	20.0	20.9	15.8	16.3	16.6	17.2	18.1
8H	4H	16.4	17.1	17.2	17.9	18.7	15.2	15.8	16.0	16.6	17.5
	6H	18.0	18.5	18.8	19.3	20.3	16.1	16.6	16.9	17.5	18.4
	8H	18.8	19.2	19.6	20.1	21.1	16.6	17.0	17.4	17.9	18.9
	12H	19.5	20.0	20.4	20.8	21.8	17.0	17.4	17.9	18.3	19.2
12H	4H	16.5	17.0	17.3	17.9	18.8	15.3	15.9	16.1	16.7	17.6
	6H	18.1	18.5	18.9	19.4	20.4	16.4	16.8	17.2	17.7	18.7
	8H	18.9	19.4	19.8	20.2	21.2	16.9	17.4	17.8	18.2	19.2
Variation of the observer position for the luminaire distance S											
S = 1.0H		0.1 / 0.0					0.1 / -0.1				
S = 1.5H		0.1 / -0.1					0.1 / -0.1				
S = 2.0H		0.2 / -0.2					0.2 / -0.4				
Standard table		n/a					n/a				
Correction summand		n/a					n/a				
Corrected glare indices referring to 725 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	112	112	112	112	107	107	107	107	96	96	96	86	86	86	77	77	77	72
1	99	93	87	83	93	88	83	79	78	75	71	70	67	64	62	59	57	53
2	89	79	71	65	83	75	68	62	67	61	56	59	55	51	52	49	46	42
3	80	69	60	52	75	65	57	50	58	51	46	51	46	41	45	41	37	34
4	73	60	51	43	68	57	48	42	51	44	38	45	39	35	40	35	31	28
5	67	53	44	37	63	50	42	35	45	38	32	40	34	29	36	31	27	24
6	61	48	38	32	58	45	37	30	40	33	28	36	30	25	32	27	23	20
7	57	43	34	27	53	41	32	26	37	29	24	33	27	22	29	24	20	18
8	53	39	30	24	49	37	29	23	33	26	21	30	24	20	27	22	18	16
9	49	35	27	21	46	34	26	21	30	24	19	27	22	18	25	20	16	14
10	46	32	25	19	43	31	24	19	28	22	17	25	20	16	23	18	15	13



ZONAL LUMEN SUMMARY

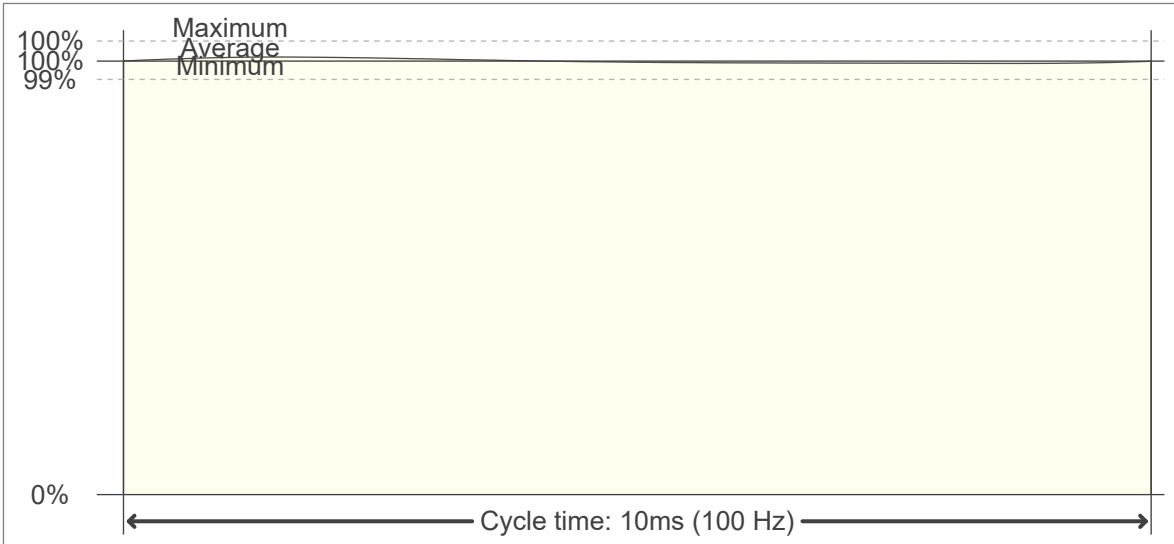
0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
11.7 lm	34.1 lm	53.6 lm	68.2 lm	76.6 lm	78.5 lm	74.4 lm	67.3 lm	59.5 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
52.3 lm	45.0 lm	36.5 lm	27.9 lm	19.7 lm	11.9 lm	5.44 lm	1.94 lm	0.596 lm

FLICKER

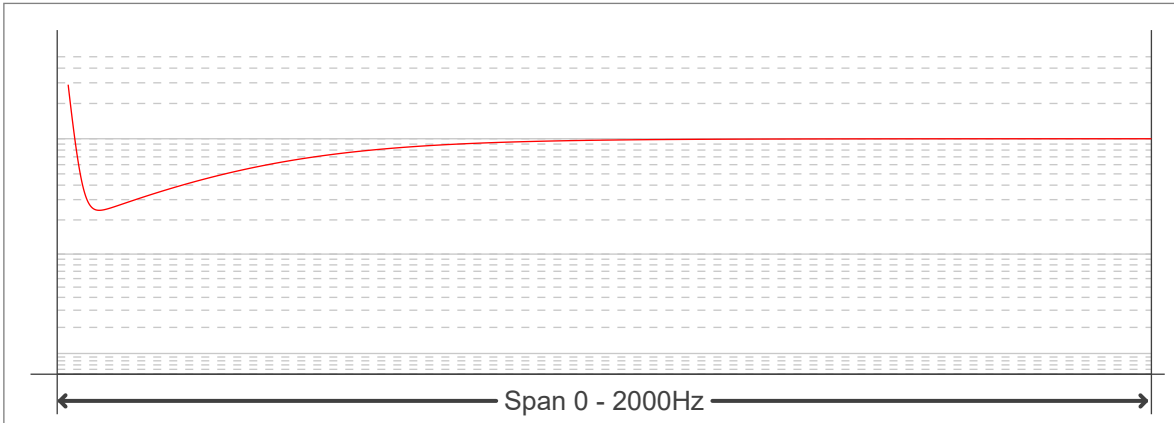
FLICKER CURVE (COMPLETE SAMPLED FLICKER)



FLICKER FRAME (FRAME OF ONE FLICKER PERIOD)



FLICKER FFT (FREQUENCY SCOPE OF FLICKER CURVE)



FLICKER RESULTS:

Flicker frequency:	100 Hz
Flicker index:	0
Flicker percentage:	0.81 %
SVM: (Visual flicker)	0.03

FLICKER CONDITIONS:

Sample rate:	20000 samples/second
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