

Light efficiency:

167 Lumen/Watt

Output: 26695 lm

Light quality:

CRI: 81.2

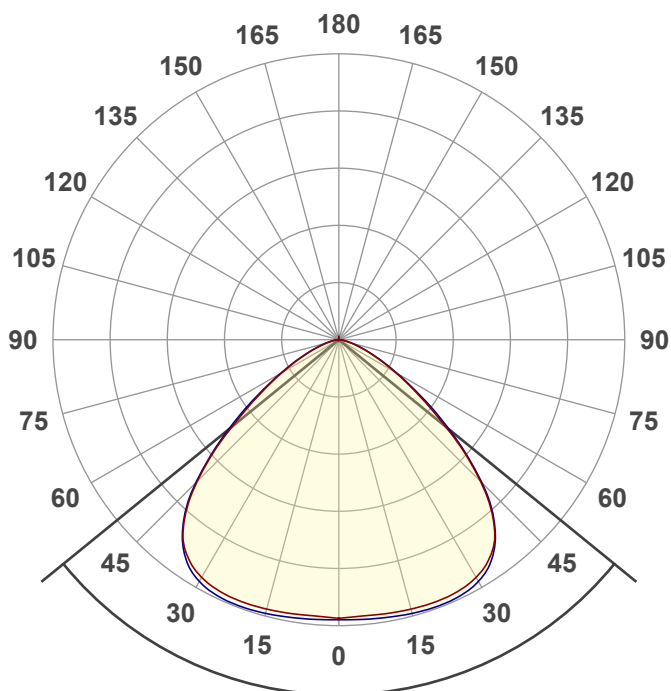
Peak: 10737 cd

Color temperature:

4991 K

Power: 159.6 W

PF: 1.0



Product name:

HBR4-50K160S-LEX39

Date and time:

7/12/2023 2:09:30 PM

Beam angle

101.7°

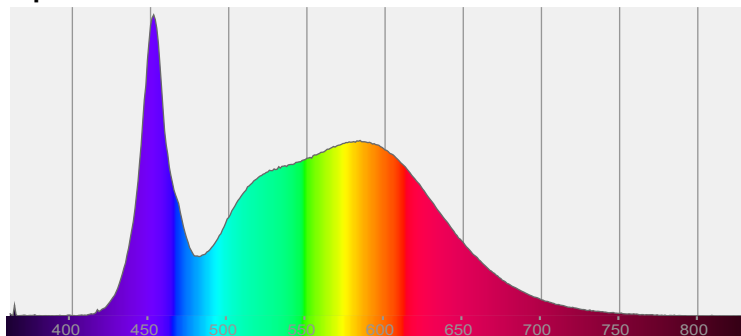


CIE 1931

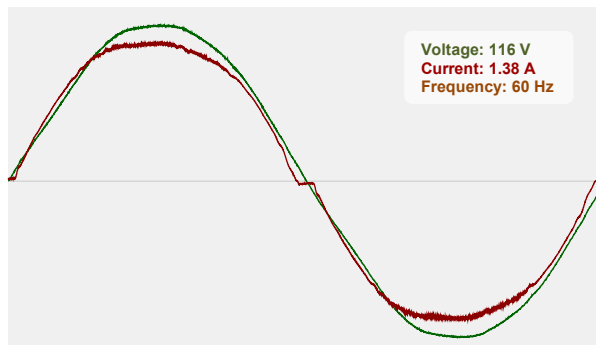
x: 0.346

y: 0.357

Spectra



Power



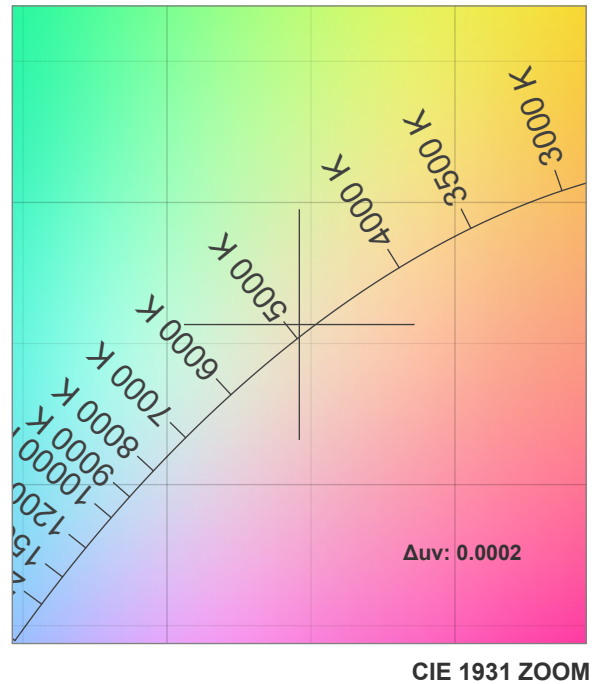
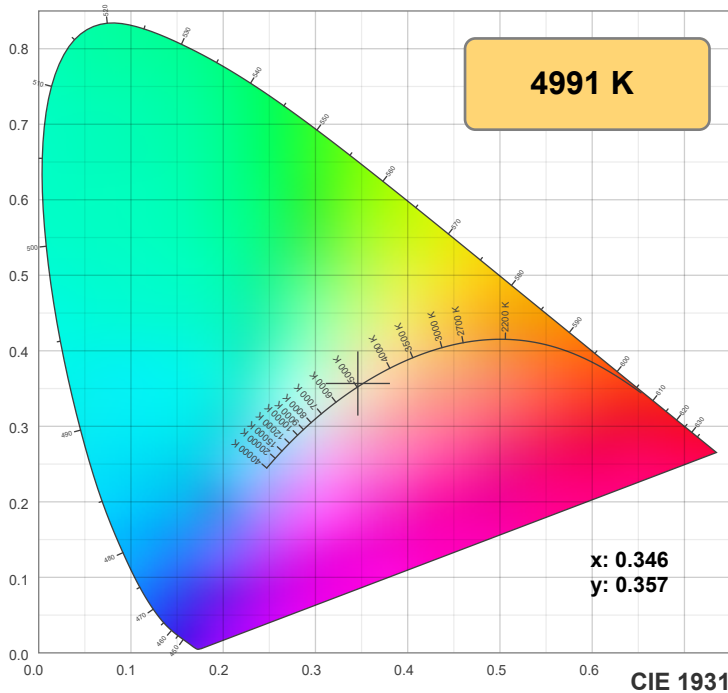
T 314.743.3067

F 314.972.6202

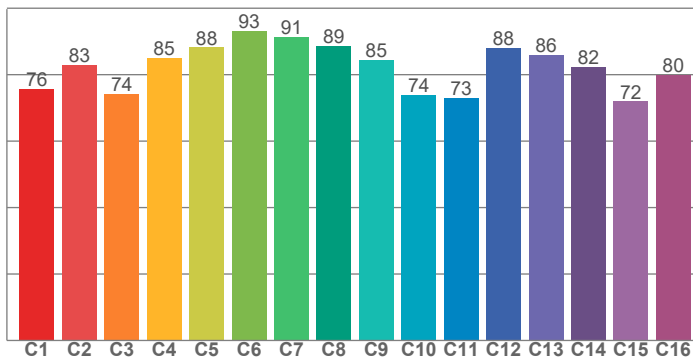
email: commercial-sales@superbrightleds.com

www.superbrightleds.com/

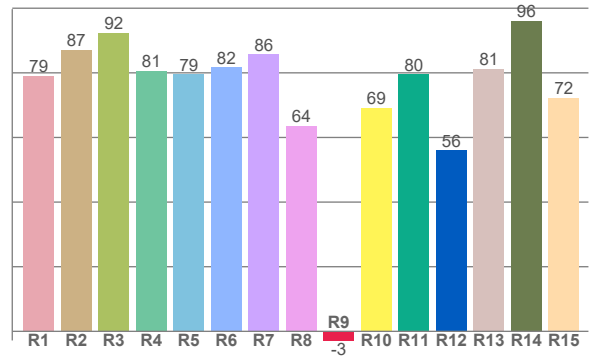
Color Specifications



TM30: 82.1



CRI: 81.2 (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
79.1	87.1	92.4	80.6	79.5	81.6	85.7	63.6	-2.8	69.2	79.6	56.0	81.3	96.1	72.2

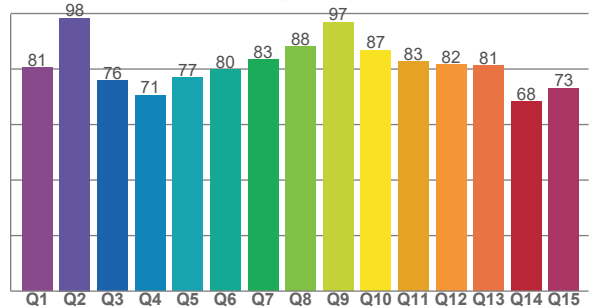
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
75.7	82.9	74.3	85.1	88.2	93.3	91.3	88.6	84.5	73.8	73.0	88.0	86.0	82.4	72.0	79.9

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
80.6	98.4	75.8	70.6	77.0	79.7	83.4	88.1	96.9	86.8	82.7	81.6	81.2	68.2	73.0

CQS: 79.8



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
4991 K	81.2	-2.8	82.1	95.3	79.8	0.346	0.357	0.210	0.325	0.0002



TM30 Report

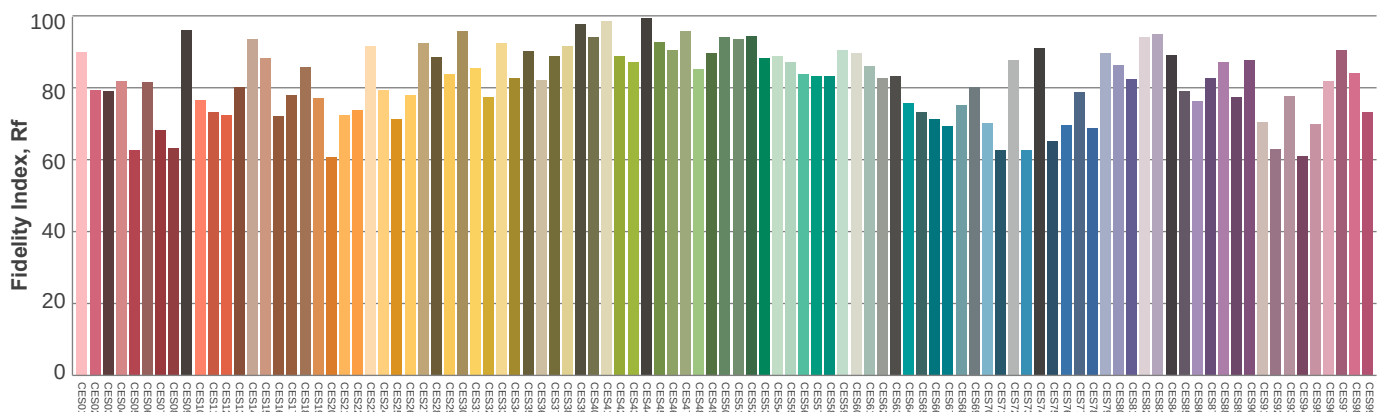
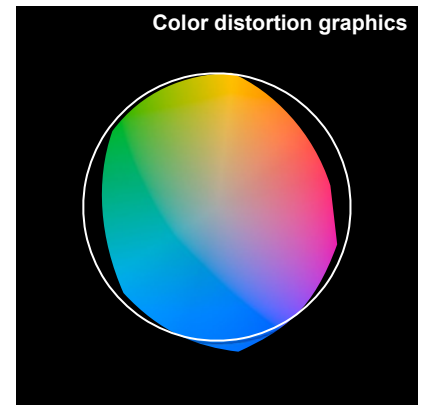
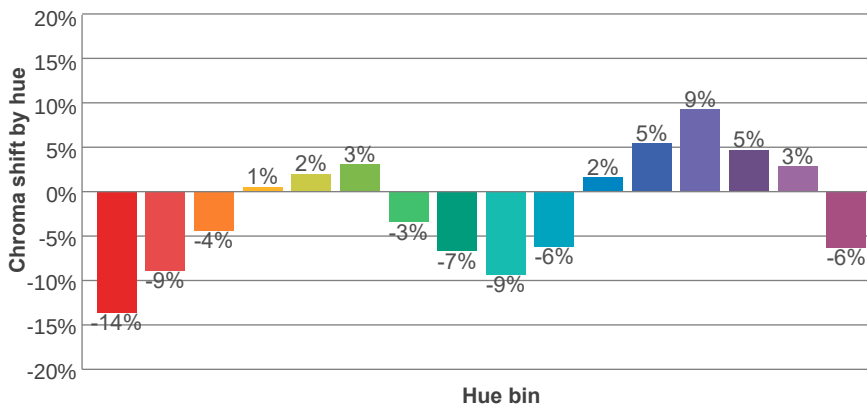
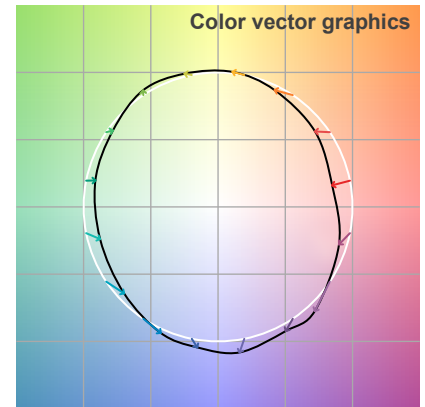
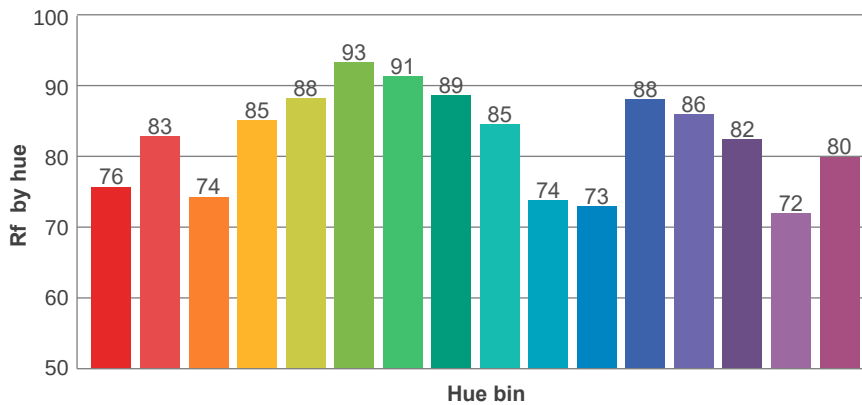
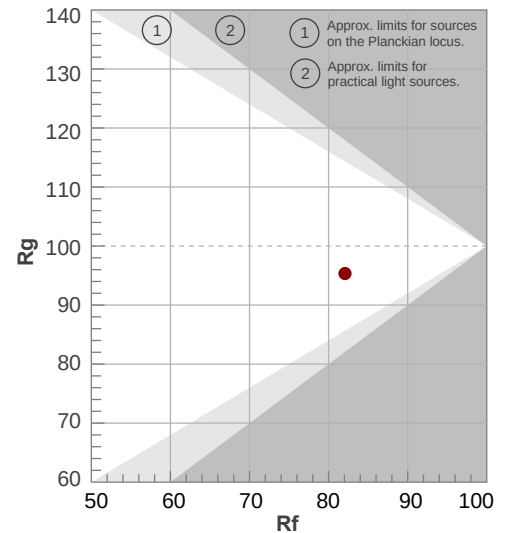
Rf 82.1

Fidelity index Rf

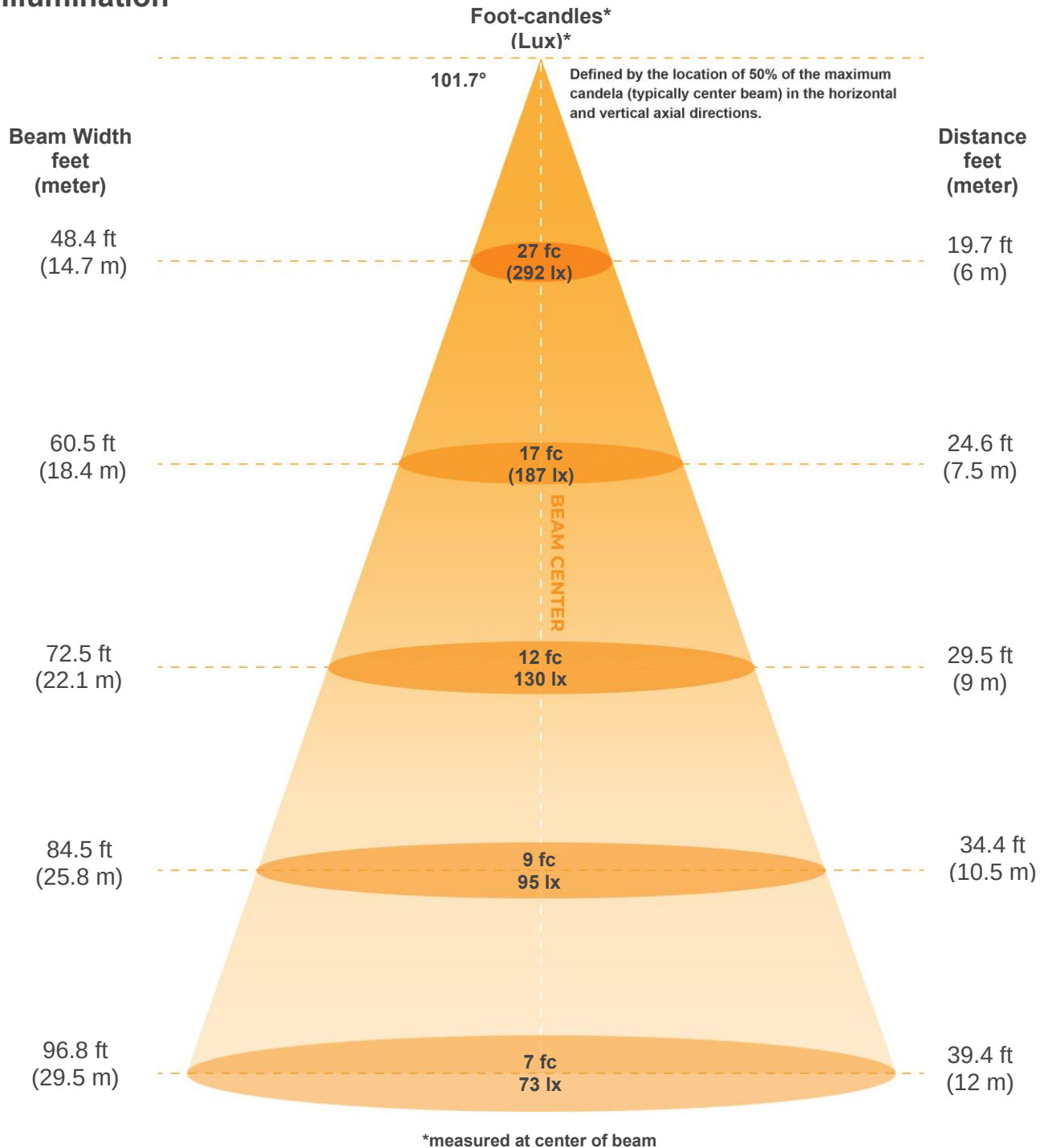
Rg 95.3

Gammut index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	76	-14%	-1%
2	83	-9%	7%
3	74	-4%	13%
4	85	1%	9%
5	88	2%	5%
6	93	3%	-2%
7	91	-3%	-4%
8	89	-7%	-1%
9	85	-9%	6%
10	74	-6%	15%
11	73	2%	17%
12	88	5%	5%
13	86	9%	-5%
14	82	5%	-9%
15	72	3%	-24%
16	80	-6%	-10%



Illumination



Beam intensities from 1-20m

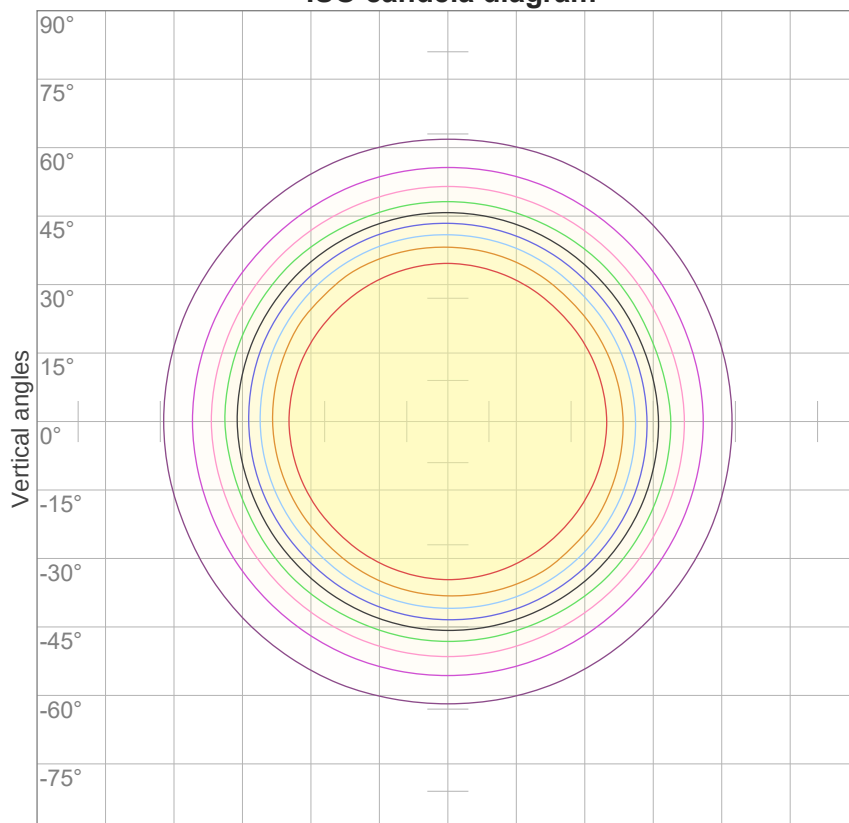
1m	2m	3m	4m	5m	6m	7m	8m	9m	10m	11m	12m	13m	14m	15m	16m	17m	18m	19m	20m
3.3ft	6.6ft	9.8ft	13.1ft	16.4ft	19.7ft	23ft	26.2ft	29.5ft	32.8ft	36.1ft	39.4ft	42.7ft	45.9ft	49.2ft	52.5ft	55.8ft	59.1ft	62.3ft	65.6ft
10520lx	2630lx	1169lx	657lx	421lx	292lx	215lx	164lx	130lx	105lx	87lx	73lx	62lx	54lx	47lx	41lx	36lx	32lx	29lx	26lx
977.3fc	244.3fc	108.6fc	61.1fcd	39.1fcd	27.1fcd	19.9fcd	15.3fcd	12.1fcd	9.8fcd	8.1fcd	6.8fcd	5.8fcd	5fcd	4.3fcd	3.8fcd	3.4fcd	3fcd	2.7fcd	2.4fcd

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%	Intensity ratio in 120° cone	Intensity ratio in 90° cone
101.7°	137.8°	158.9°	91.4%	68.3%



ISO Diagrams

ISO candela diagram



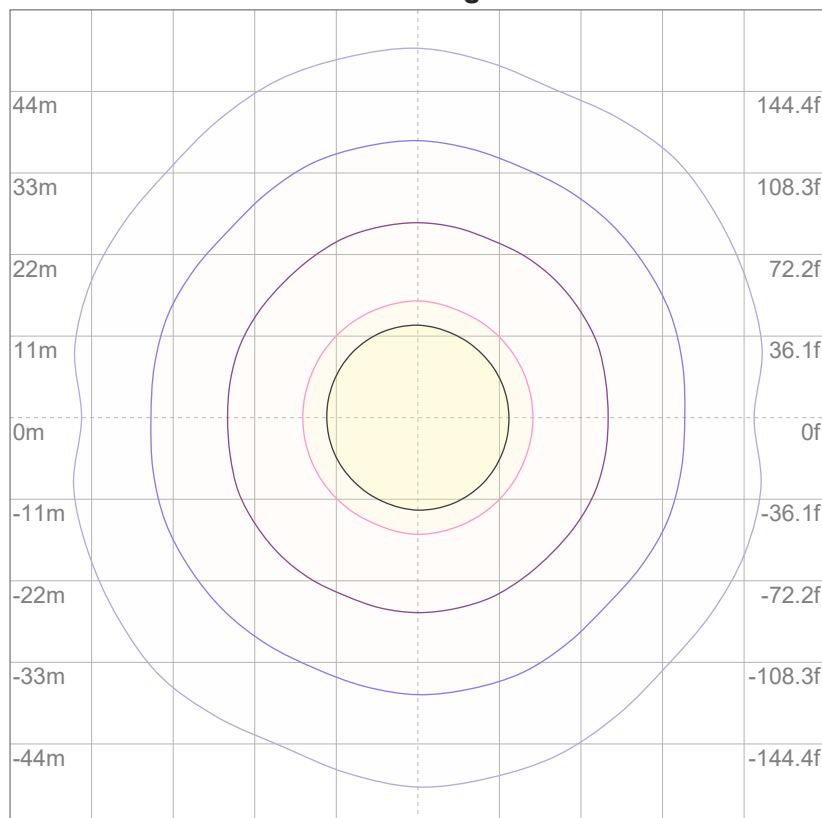
10%	1052 cd
20%	2104 cd
30%	3156 cd
40%	4208 cd
50%	5260 cd
60%	6312 cd
70%	7364 cd
80%	8416 cd
90%	9468 cd

Conditions:

Number of c-planes: 16

Candela at center: 10520 cd

ISO lux diagram



3%	3.16 lx
5%	5.26 lx
10%	10.5 lx
30%	31.6 lx
50%	52.6 lx

Conditions:

Number of c-planes: 16

Lux at center: 105 lx

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



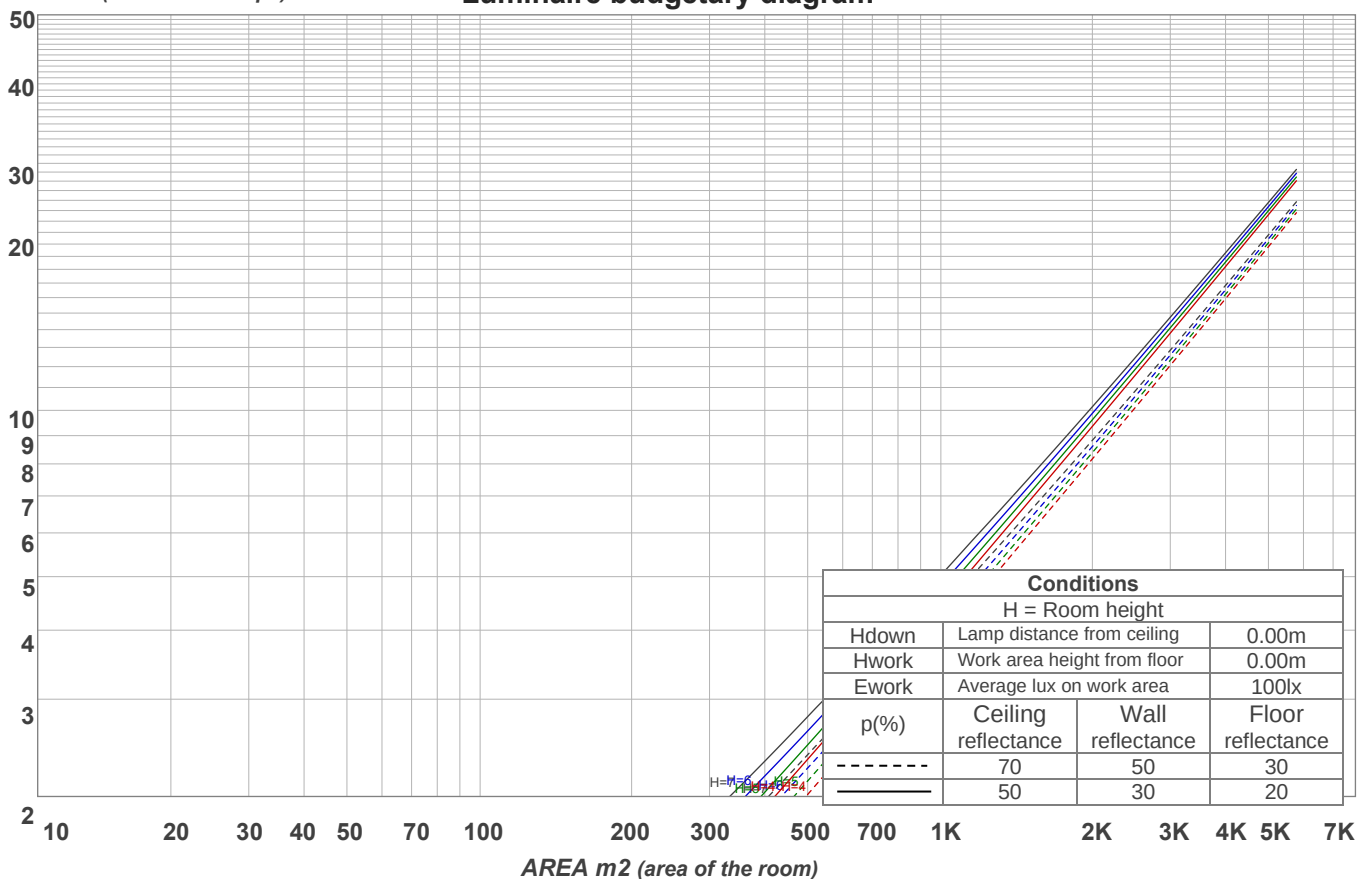
Light Planning

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	107	103	100	108	105	102	99	100	98	96	97	95	93	93	91	90	88
2	102	95	90	85	100	94	88	84	90	86	82	87	83	80	84	81	78	76
3	94	85	78	73	92	84	77	72	81	75	71	78	73	69	76	72	68	66
4	87	77	69	63	85	75	68	62	73	67	62	71	65	61	68	64	60	58
5	81	69	61	55	79	68	60	55	66	59	54	64	58	53	62	57	53	51
6	75	63	54	48	73	62	54	48	60	53	48	58	52	47	57	51	47	45
7	69	57	49	43	68	56	48	43	55	48	43	53	47	42	52	46	42	40
8	65	52	44	39	63	51	44	39	50	43	38	49	43	38	48	42	38	36
9	60	48	40	35	59	47	40	35	46	39	35	45	39	34	44	38	34	32
10	57	44	37	32	55	44	36	32	43	36	31	42	36	31	41	35	31	29

LAMPS (number of lamps)

Luminaire budgetary diagram



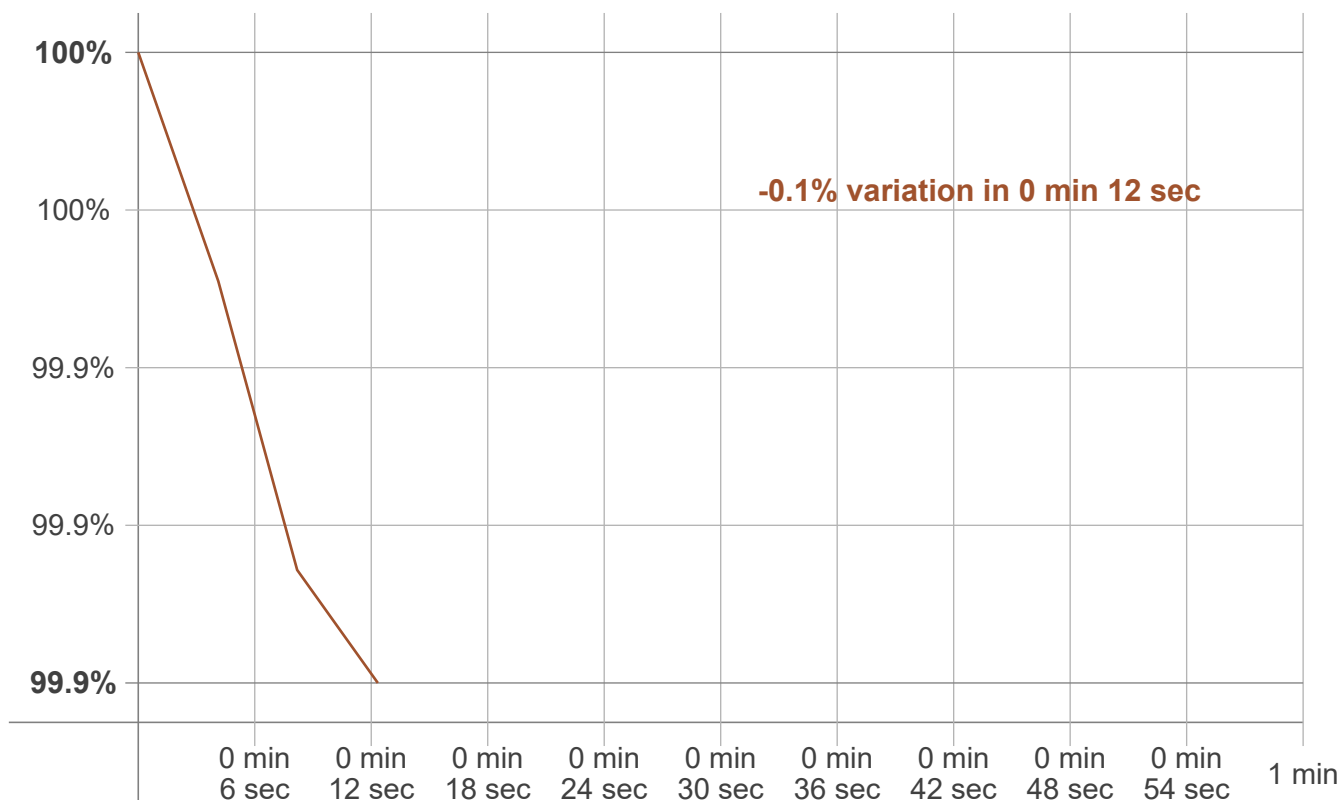
Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
1004 lm	3001 lm	4886 lm	6220 lm	5810 lm	3468 lm	1576 lm	542 lm	109 lm
90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
7.57 lm	6.24 lm	8.76 lm	11.2 lm	12.9 lm	12.3 lm	10.4 lm	7.02 lm	2.51 lm



Stabilization

Warmup curve



Warmup result

Warmup time:	Not completed
Warmup variation	-0.1%

Warmup conditions

Stable period:	15 min
Stable change max:	2.0%
Minimum time:	15 min

Color temperature change

CCT start	CCT change	CCT end
4989 K	+2 K	4991 K

Output change

Output start	Output change	Output end
26723 lm	-28 lm	26695 lm

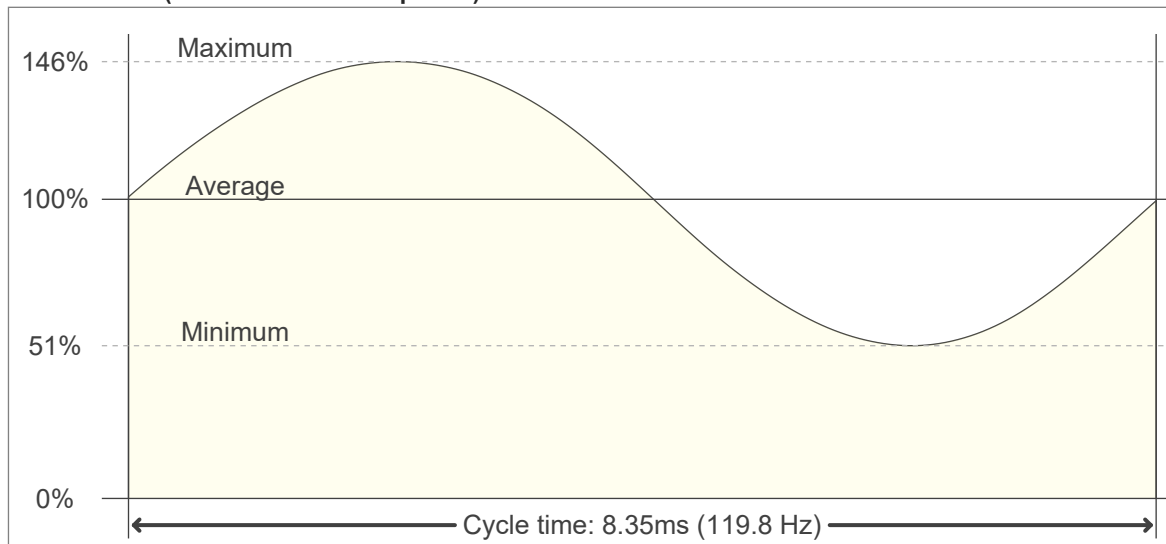


Flicker Specifications

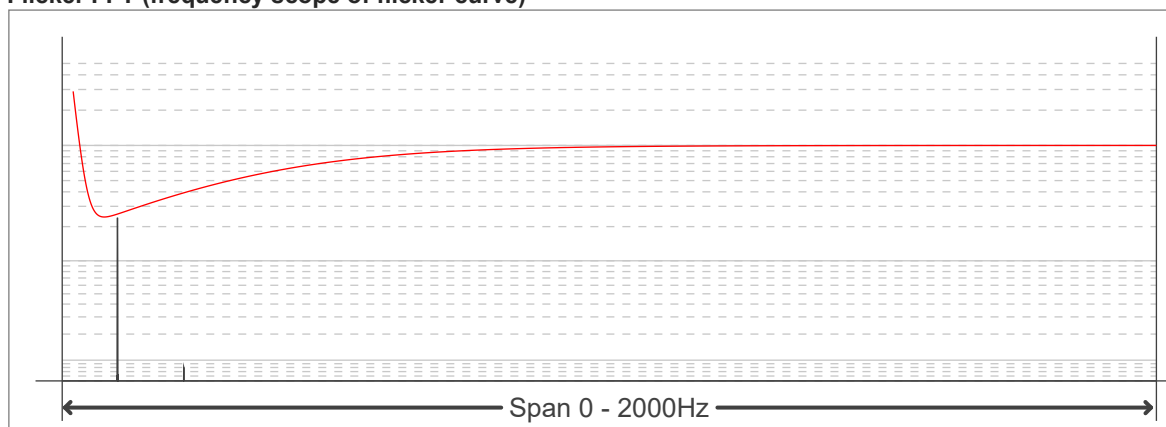
Flicker curve (complete sampled flicker signal)



Flicker frame (frame of one flicker period)



Flicker FFT (frequency scope of flicker curve)



Flicker results:

Flicker frequency:	119.76 Hz
Flicker index:	0.15
Flicker percentage:	48.35 %
SVM: (Visual flicker)	1.73

Flicker conditions:

Sample rate:	20000 samples/second
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