



TECHLUME  
AUSTRALIA

## Product Overview

<b>Product Name / Code</b>	MORGAN 12W Wall Light - LC4400
<b>Description</b>	Aluminium and Glass, IP65, Black, 4000K
<b>Manufacturer</b>	Decrolux Lighting Pty Ltd



## Laboratory and Equipment

<b>System Name / Model</b>	LabSpion / Freedom VIS (Custom Viso)
<b>Manufacturer / Serial Number</b>	Ibsen Photonics, Denmark / 2417457569
<b>Sensor Name</b>	LabSensor Model2
<b>Sensor Serial Number / Calibration Date</b>	3430823524 / 7/12/2022

## Measurement Details

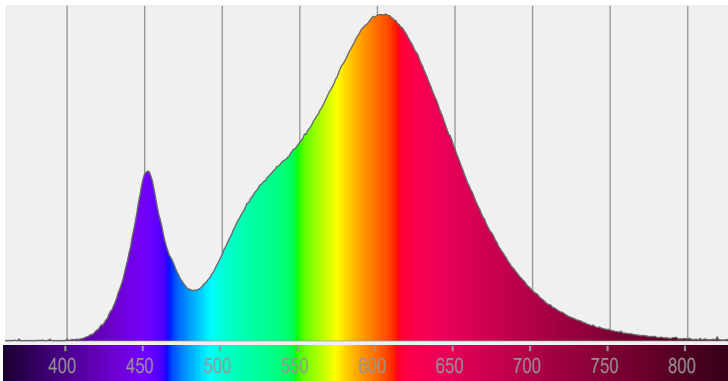
<b>Test Date and Time</b>	9/05/2023 5:17:47 PM
<b>Operator</b>	Johnny Elmer
<b>C-Planes Measured</b>	36
<b>Measurement Resolution</b>	10°
<b>Measurement Distance</b>	464.4cm
<b>Measurement Number</b>	VFR-230509-0079-MS
<b>Tracking Link</b>	<a href="http://www.visosystems.com/tracking/?id=VT230510-006349">http://www.visosystems.com/tracking/?id=VT230510-006349</a>



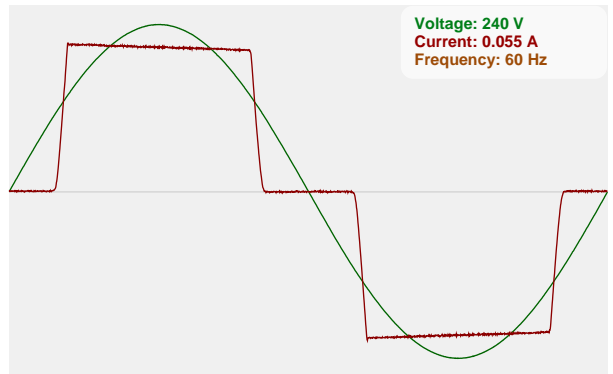
### Performance

<b>Total Lumen Output</b>	834 lm
<b>Light Efficiency</b>	65 Lumen/Watt
<b>Peak (cd)</b>	386 cd
<b>Nominal Power</b>	12.8 W
<b>Input Voltage</b>	240 V
<b>Frequency of Input Power</b>	60 Hz
<b>Power Factor</b>	0.96
<b>Warm-up (stabilisation) Time</b>	Lamp stabilized in 1 hour 1 min
<b>Warm-up Variation</b>	-8.5

### Spectral Power Distribution (SPD)



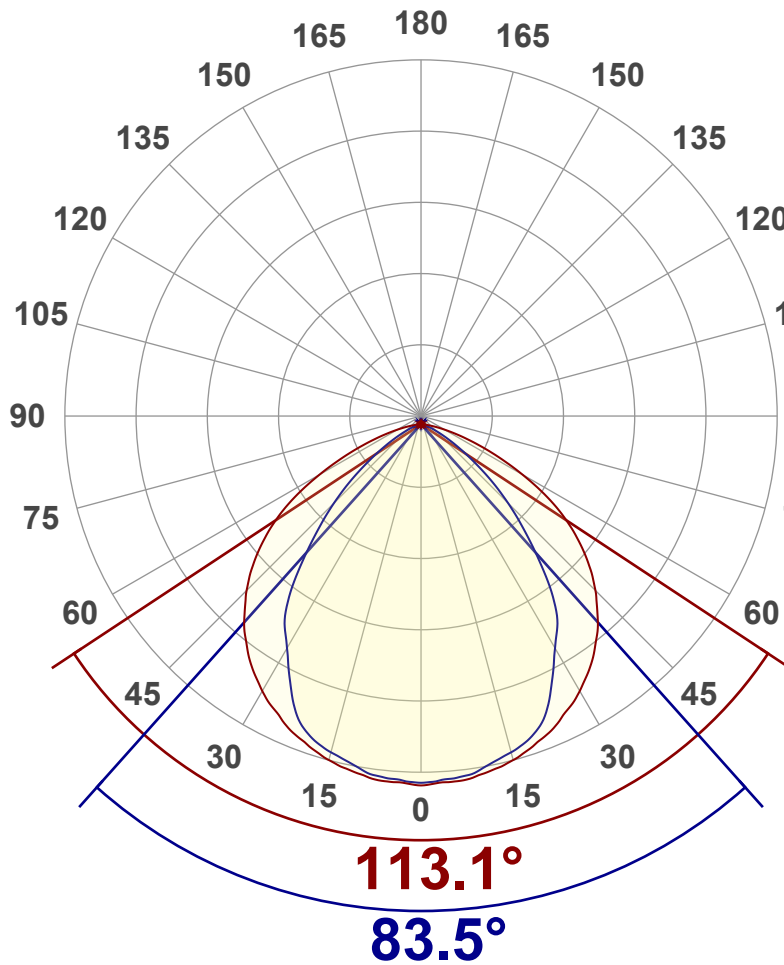
### Input Power Curve



### Optic Specifications

<b>Correlated Colour Temperature, Target</b>	3000K
<b>Correlated Colour Temperature, Measured</b>	2958K
<b>Colour Rendering Index</b>	CRI 81.3
<b>R9 Value</b>	R9 = 4.6
<b>Colour Rendering TM30-18</b>	R <sub>f</sub> 82.8 - R <sub>g</sub> 97.1
<b>Colour Quality Scale</b>	CQS = 79.8
<b>Beam Angle</b>	97.1°



**Angular Distribution – 0° / 90° Plane**

**Main Values**

<b>Total Lumen Output</b>	834 lm
<b>Lumen Up% / Down%</b>	0.1 % / 99.9%
<b>Peak Intensity</b>	386 cd
<b>Beam Angle (50%)</b>	97.1°
<b>Beam Angle (90%)</b>	83.5°
<b>Beam Angle (10%)</b>	111.6°

**Cut-off Angle**

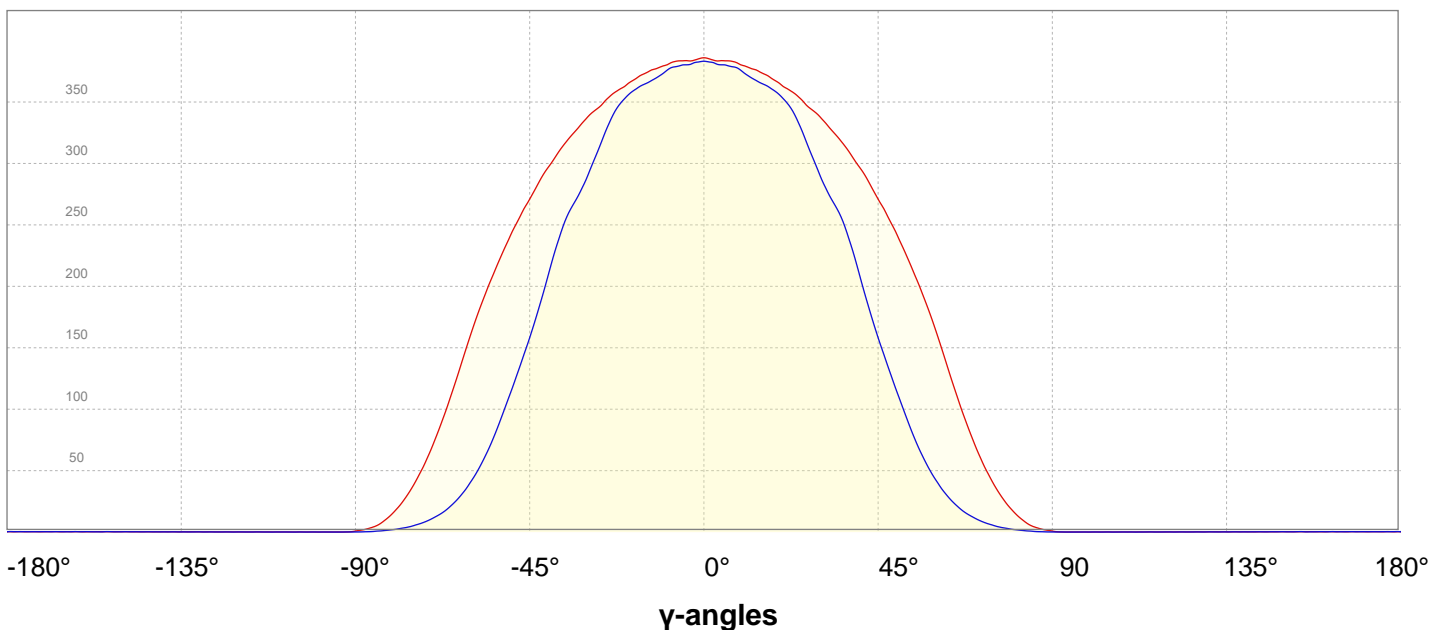
<b>Average 2.5%</b>	151.6°
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**Field Angle**

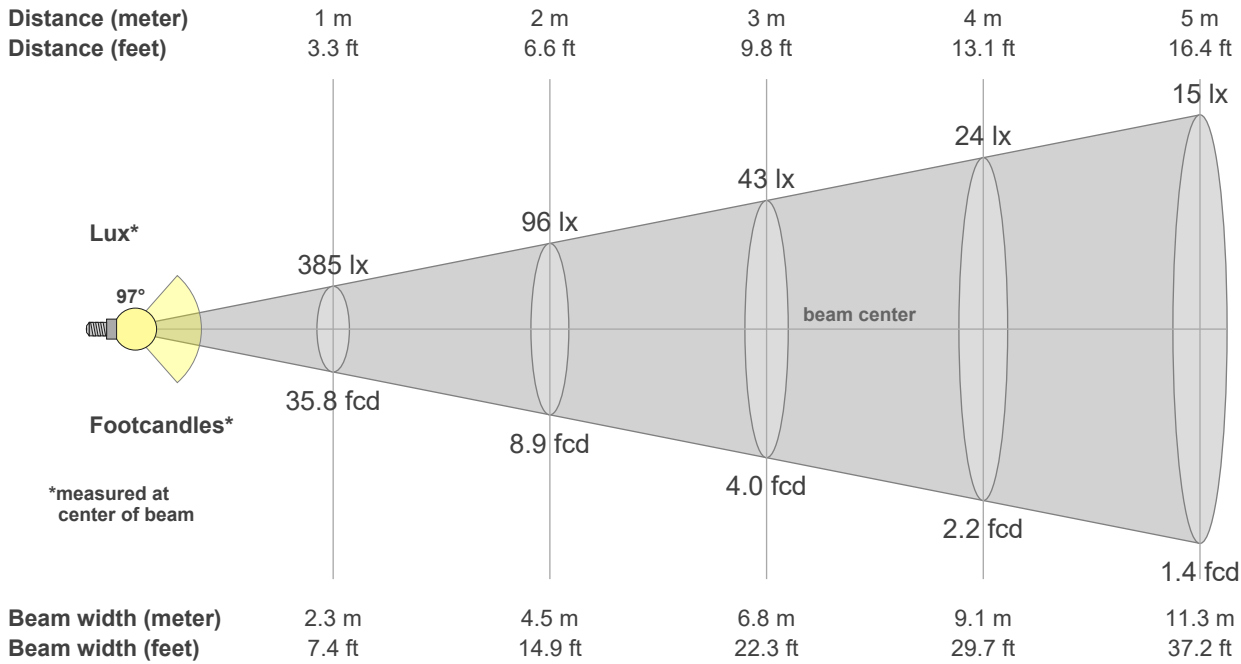
<b>Average 10%</b>	133.3°
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**Intensity Ratio**

<b>In 120° Cone</b>	91.2%
<b>In 90° Cone</b>	68.1%

**C000-C180**
**C090-C270**
**Linear Distribution Diagram – Intensity (candela) vs  $\gamma$ -angle**


### Beam Details



### Beam intensities from 1 – 20m

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	m
3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6	ft
385	96	43	24	15	11	8	6	5	4	3	3	2	2	2	2	1	1	1	1	lux
35.8	8.9	4	2.2	1.4	1	0.7	0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	fc

### 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°	γ
385	384	380	374	364	352	338	320	298	271	241	205	163	114	71	38	17	5	1	0	cd
100%	100%	99%	97%	95%	92%	88%	83%	77%	70%	63%	53%	42%	30%	18%	10%	4%	1%	0%	0%	of 0°val

### 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°	γ
385	380	375	365	354	329	290	259	211	158	113	72	42	22	11	5	2	1	0	0	cd
100%	99%	97%	95%	92%	85%	75%	67%	55%	41%	29%	19%	11%	6%	3%	1%	1%	0%	0%	0%	of 0°val

### 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°	γ
385	384	380	374	364	352	338	320	298	271	241	205	163	114	71	38	17	5	1	0	cd
100%	100%	99%	97%	95%	92%	88%	83%	77%	70%	63%	53%	42%	30%	18%	10%	4%	1%	0%	0%	of 0°val

### 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°	γ
385	380	375	365	354	329	290	259	211	158	113	72	42	22	11	5	2	1	0	0	cd
100%	99%	97%	95%	92%	85%	75%	67%	55%	41%	29%	19%	11%	6%	3%	1%	1%	0%	0%	0%	Of 0°val

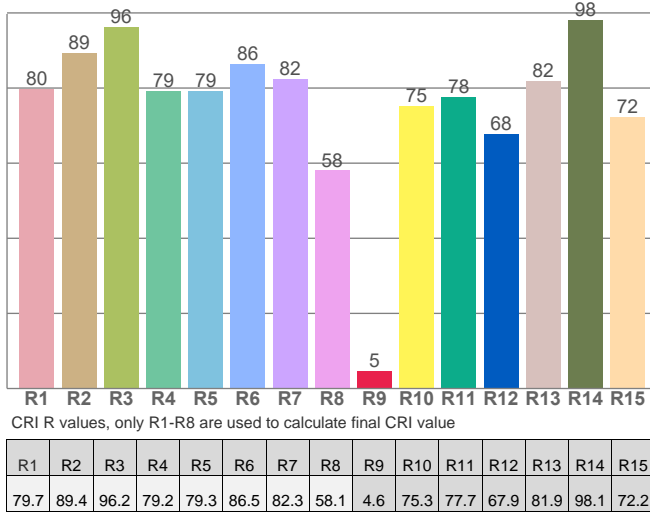


### Colour Details

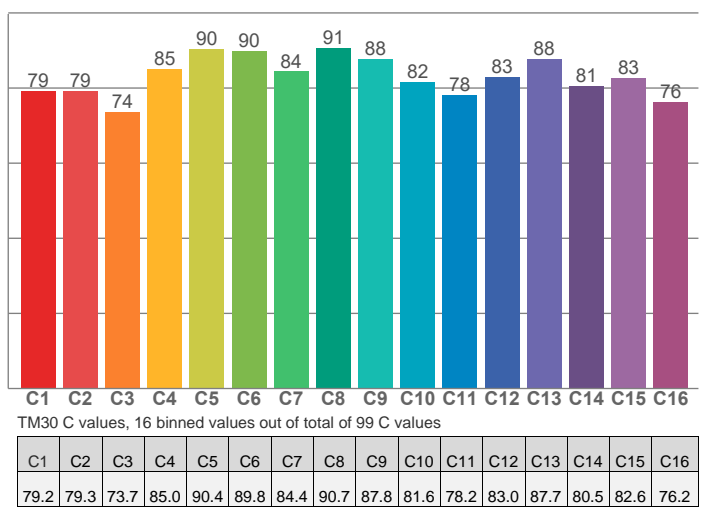
<b>Correlated Colour Temperature, Target</b>	CCT = 3000K
<b>Correlated Colour Temperature, Measured</b>	CCT = 2958K
<b>Colour Rendering Index</b>	CRI 81.3
<b>Colour Rendering Index R9 Value</b>	R9 = 4.6
<b>Colour Rendering TM30-18</b>	R <sub>f</sub> 82.8, R <sub>g</sub> 97.1
<b>Colour Quality Scale</b>	CQS = 79.8

<b>MacAdam Steps</b>	SDCM = 1.9
<b>Colour Coordinates CIE 1931</b>	(x;y) = (0.437;0.404)
<b>Colour Coordinates CIEs 1960</b>	(u;v) = (0.251; 0.348)
<b>Colour Deviation from BBL</b>	Duv = -0.0015
<b>Colour Coordinate CIEs 1976 (CIELUV)</b>	(u';v') = (0.251;0.251)

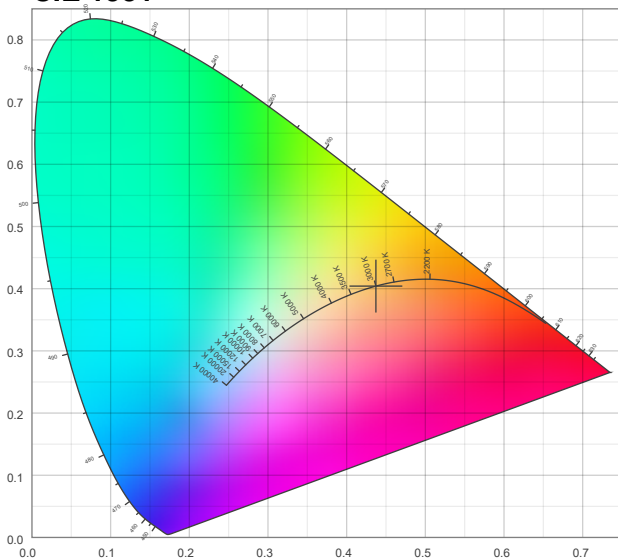
Colour Rendering Index per reference colour (CIE 1995)



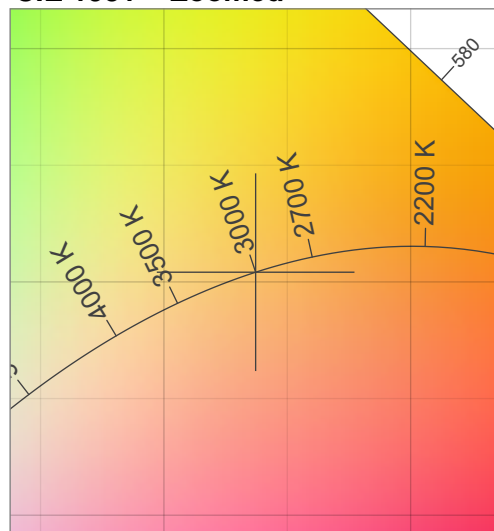
TM30-18 Rf-values per hue bin



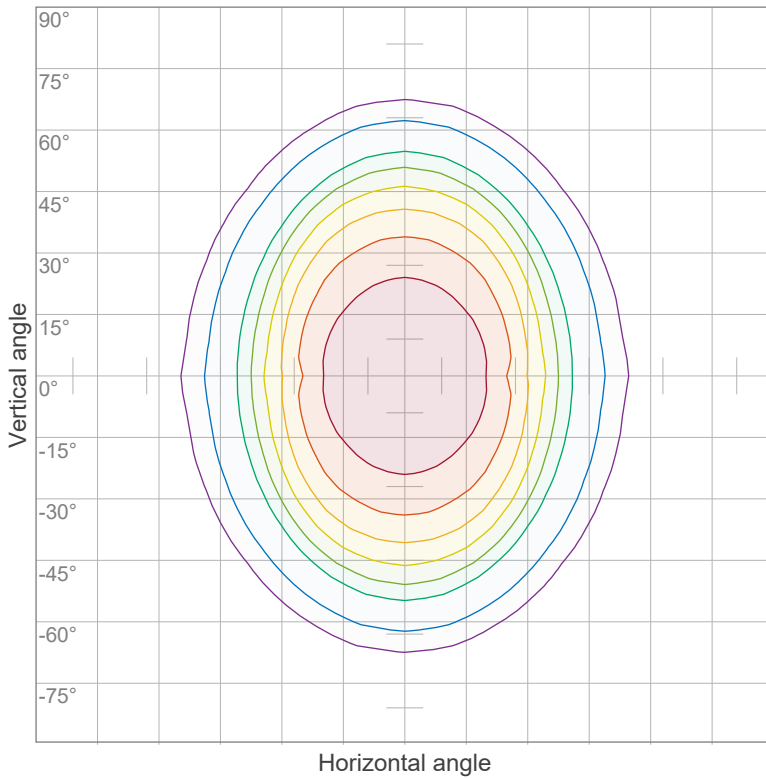
CIE 1931



CIE 1931 – Zoomed



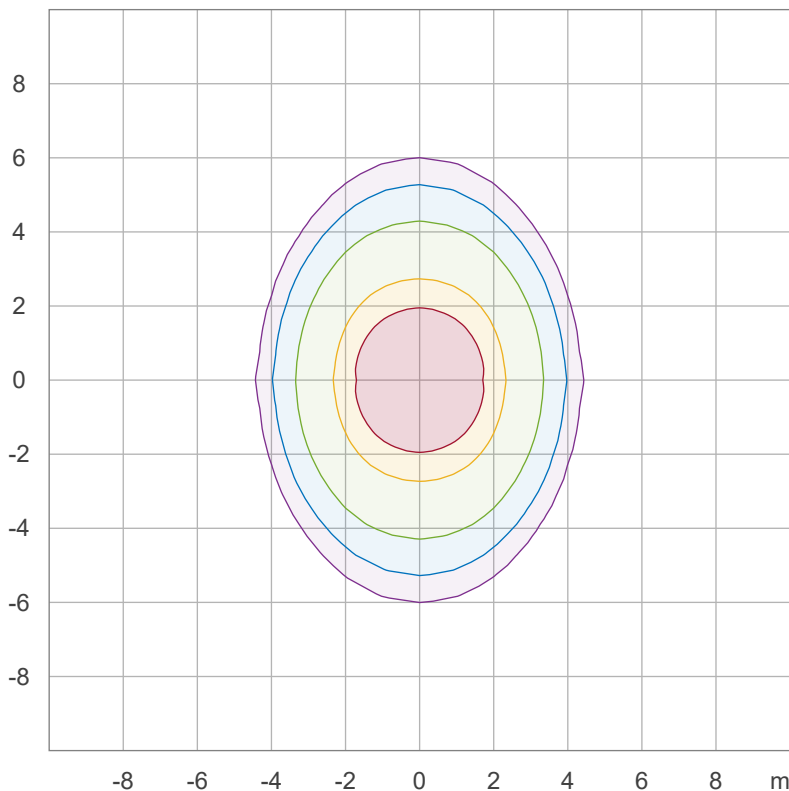
### Iso-intensity Diagram (Iso-Candela)



90 %	346.9 cd
80 %	308.3 cd
70 %	269.8 cd
60 %	231.2 cd
50 %	192.7 cd
40 %	154.2 cd
30 %	115.6 cd
20 %	77.1 cd
10 %	38.5 cd

Peak intensity: 385.4 cd  
Number of c-planes: 36

### Iso-illuminance Diagram (Iso-lux)



50.0 %	21.4 lx
30.0 %	12.8 lx
10.0 %	4.3 lx
5.0 %	2.1 lx
3.0 %	1.3 lx

Peak illuminance: 42.8 lx  
Mounting height: 3.0 m  
Number of c-planes: 36



### Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances		70	70	50	50	30	70	70	50	50	30
ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size		Viewed Crosswise					Viewed Endwise				
H = mounting height above eye level											
X	Y	(Viewing direction orthogonal to lamp length axis)					(Viewing direction parallel to lamp length axis)				
2H	2H	25.3	26.3	25.5	26.6	26.8	20.2	21.2	20.4	21.5	21.7
	3H	26.0	27.1	26.4	27.3	27.5	20.0	21.1	20.4	21.4	21.6
	4H	26.2	27.2	26.6	27.5	27.7	20.0	21.0	20.4	21.3	21.5
	6H	26.3	27.2	26.6	27.5	27.8	20.0	20.8	20.3	21.1	21.5
	8H	26.3	27.1	26.6	27.4	27.9	19.9	20.8	20.2	21.1	21.5
	12H	26.2	27.1	26.6	27.4	27.8	19.9	20.7	20.2	21.0	21.5
4H	2H	25.1	26.1	25.5	26.4	26.6	20.5	21.6	20.9	21.8	22.1
	3H	26.0	26.8	26.4	27.2	27.6	20.6	21.4	20.9	21.7	22.2
	4H	26.1	26.9	26.6	27.3	27.9	20.4	21.2	20.9	21.6	22.1
	6H	26.2	27.0	26.7	27.3	27.7	20.4	21.1	20.9	21.5	21.8
	8H	26.2	26.9	26.7	27.3	27.6	20.3	21.0	20.8	21.4	21.7
	12H	26.2	26.7	26.7	27.2	27.6	20.3	20.8	20.8	21.2	21.7
8H	4H	26.0	26.7	26.5	27.1	27.4	20.4	21.1	20.9	21.5	21.8
	6H	26.1	26.6	26.6	27.1	27.6	20.4	20.9	20.9	21.3	21.9
	8H	26.2	26.6	26.7	27.1	27.7	20.4	20.8	20.9	21.3	21.9
	12H	26.1	26.5	26.7	27.0	27.6	20.3	20.7	20.9	21.2	21.8
12H	4H	26.0	26.5	26.5	26.9	27.4	20.4	20.9	20.9	21.4	21.8
	6H	26.1	26.5	26.6	27.1	27.7	20.4	20.8	20.9	21.3	22.0
	8H	26.1	26.5	26.7	27.0	27.6	20.3	20.7	20.9	21.2	21.8

#### Variations with the observer position for the luminaire spacings, S:

S = 1.0H	0.2 / -0.3	0.9 / -2.2
S = 1.5H	1.2 / -1.8	2.1 / -5.4
S = 2.0H	2.4 / -3.9	3.4 / -8.2

### 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	0			
Floor reflectance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0			
<b>RCR (RCR: Room Cavity Ratio)</b>																		
Room Values are expressed as percentage of Lumen 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	104	101	108	105	102	99	101	98	96	97	95	93	93	92	90	88
2	103	96	90	85	100	94	89	84	90	86	82	87	84	80	84	81	79	77
3	95	86	79	73	92	84	78	72	81	76	71	79	74	70	76	72	69	67
4	87	77	69	63	85	76	68	63	73	67	62	71	66	61	69	64	61	59
5	81	70	61	56	79	68	61	55	66	60	55	65	59	54	63	58	54	52
6	75	63	55	49	73	62	55	49	60	54	49	59	53	48	57	52	48	46
7	70	58	50	44	68	57	49	44	55	48	44	54	48	43	53	47	43	41
8	65	53	45	40	64	52	45	39	51	44	39	50	44	39	49	43	39	37
9	61	49	41	36	60	48	41	36	47	40	36	46	40	35	45	39	35	34
10	57	45	38	33	56	45	37	33	44	37	32	43	37	32	42	36	32	31

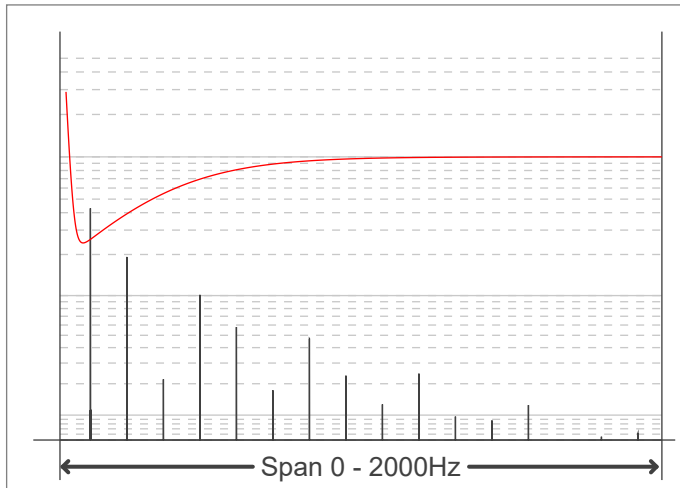


### Flicker Details

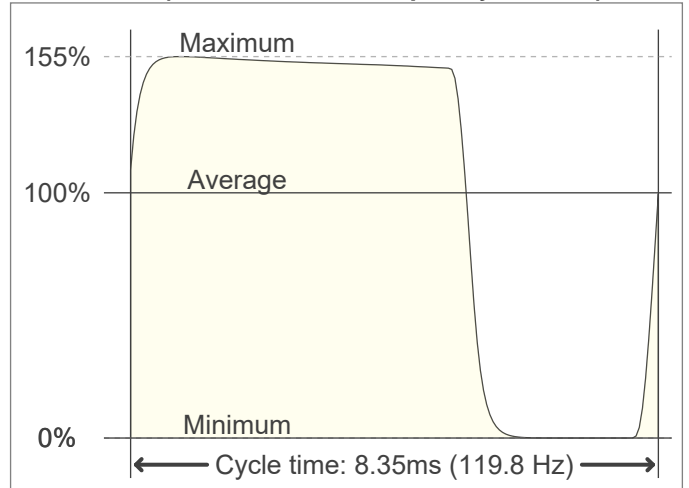
<b>Flicker Meter Type</b>	Viso Systems LabFlicker
<b>Frequency of Input Power</b>	60 Hz
<b>Flicker/TLA Sample Rate</b>	20000 sample/s
<b>Measurement Time</b>	
<b>PstLM</b>	180 sec
<b>All other indices</b>	1.2 sec

<b>Flicker Indices (IES)</b>	
<b>Flicker Percentage</b>	100%
<b>Flicker Frequency</b>	119.76 Hz
<b>Flicker Index</b>	0.33
<b>Flicker SVM Value</b>	3.13
<b>Flicker PstLM Value</b>	0.03

### Flicker Frame



### Flicker FFT (flicker curve in frequency domain)



### IEEE 1789 Frequency/Modulation Plot

