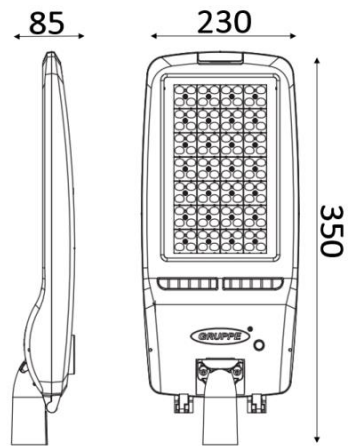


## Product Overview

<b>Product Name / Code</b>	GRANGE 60W Streetlight - LC2121-T4
<b>Description</b>	Spigot Dia 60mm, 4000K, Non-Dim, T4 Optic
<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

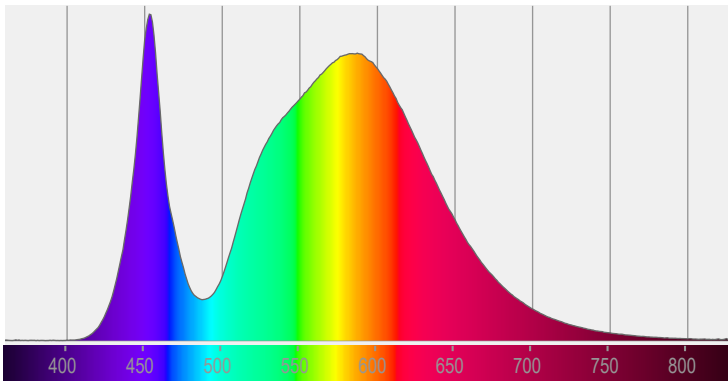
<b>Test Date and Time</b>	24/05/2023 10:54:37 AM
<b>Operator</b>	Johnny Elmer
<b>C-Planes Measured</b>	24
<b>Measurement Resolution</b>	15°
<b>Measurement Distance</b>	476.1cm
<b>Measurement Number</b>	VFR-230524-0094-MS
<b>Tracking Link</b>	<a href="http://www.visosystems.com/tracking/?id=VT230524-001202">http://www.visosystems.com/tracking/?id=VT230524-001202</a>



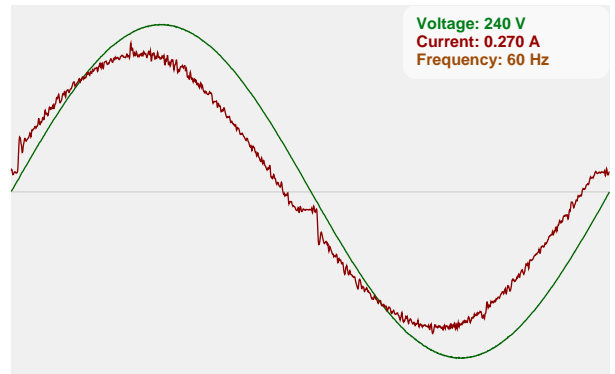
### Performance

<b>Total Lumen Output</b>	9064 lm
<b>Light Efficiency</b>	145 Lumen/Watt
<b>Peak (cd)</b>	4822 cd
<b>Nominal Power</b>	62.7 W
<b>Input Voltage</b>	240 V
<b>Frequency of Input Power</b>	60 Hz
<b>Power Factor</b>	0.97
<b>Warm-up (stabilisation) Time</b>	Lamp stabilized in 1 hour 1 min
<b>Warm-up Variation</b>	-8.5

### Spectral Power Distribution (SPD)



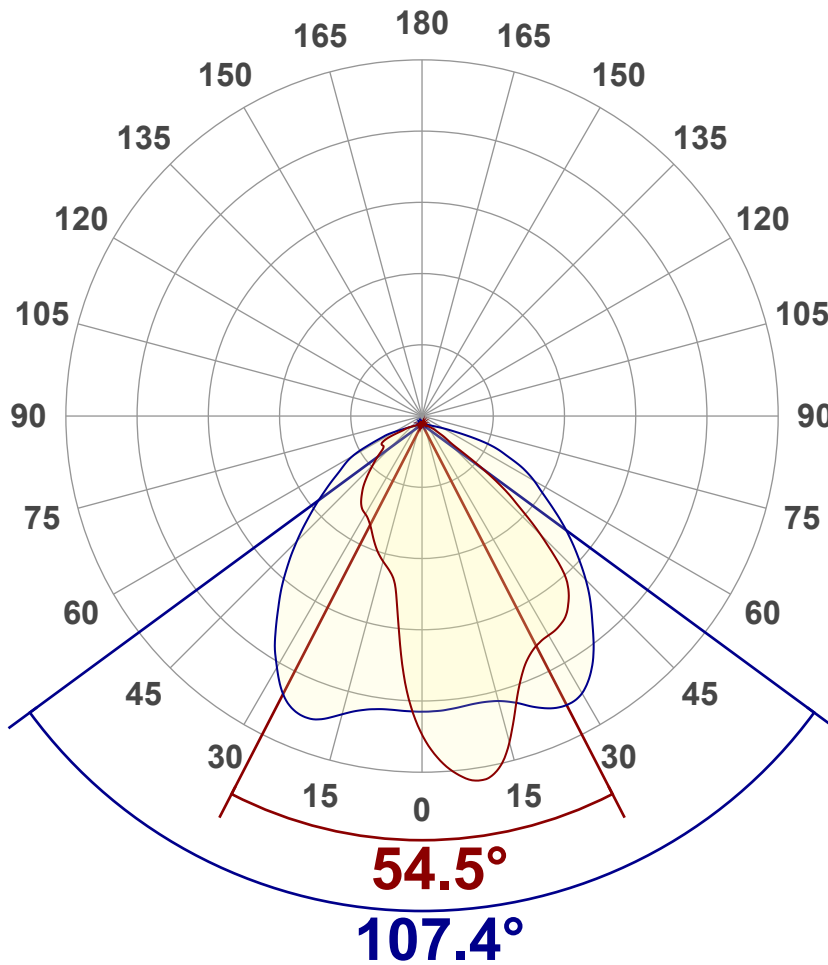
### Input Power Curve



### Optic Specifications

<b>Correlated Colour Temperature, Target</b>	4000K
<b>Correlated Colour Temperature, Measured</b>	3988K
<b>Colour Rendering Index</b>	CRI 72.6
<b>R9 Value</b>	R9 = -26.2
<b>Colour Rendering TM30-18</b>	R <sub>f</sub> 74.6 - R <sub>g</sub> 92.5
<b>Colour Quality Scale</b>	CQS = 71.2
<b>Beam Angle</b>	78.7°



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

**Main Values**

<b>Total Lumen Output</b>	9064 lm
<b>Lumen Up% / Down%</b>	0.16 % / 99.84%
<b>Peak Intensity</b>	4822 cd
<b>Beam Angle (50%)</b>	78.7°
<b>Beam Angle (90%)</b>	107.4°
<b>Beam Angle (10%)</b>	56.1°

**Cut-off Angle**

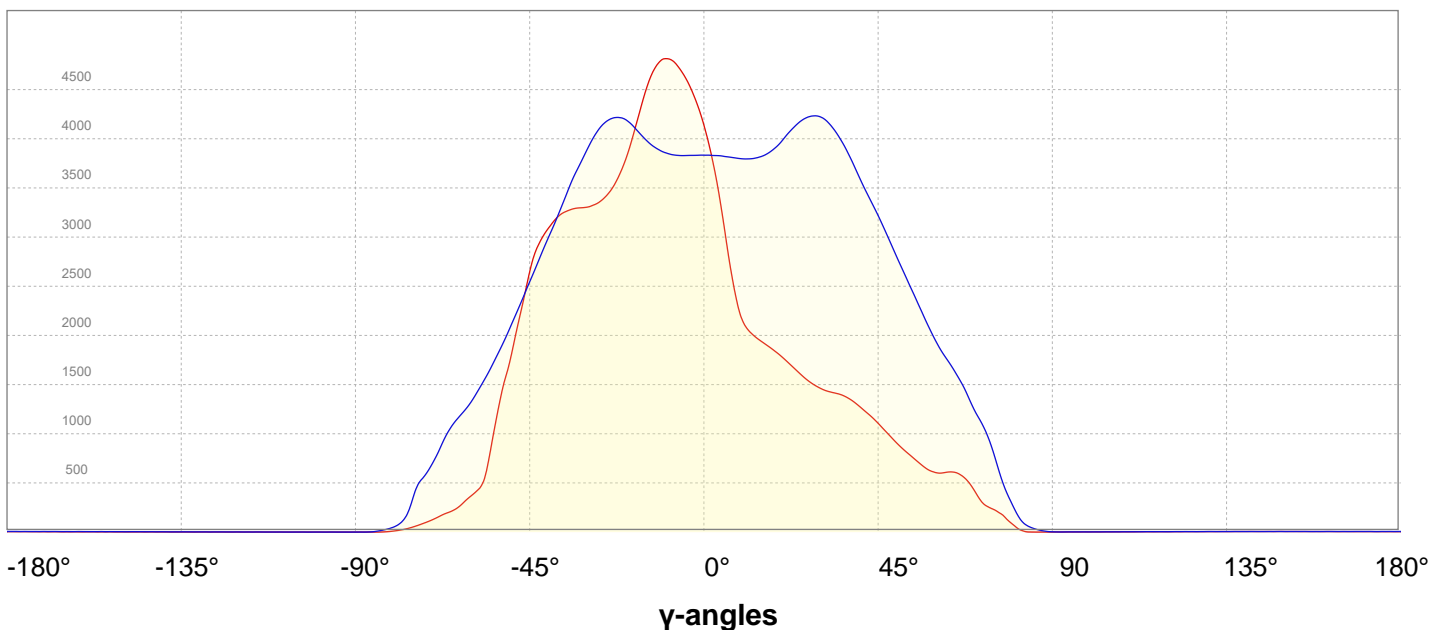
<b>Average 2.5%</b>	155.7°
---------------------	--------

**Field Angle**

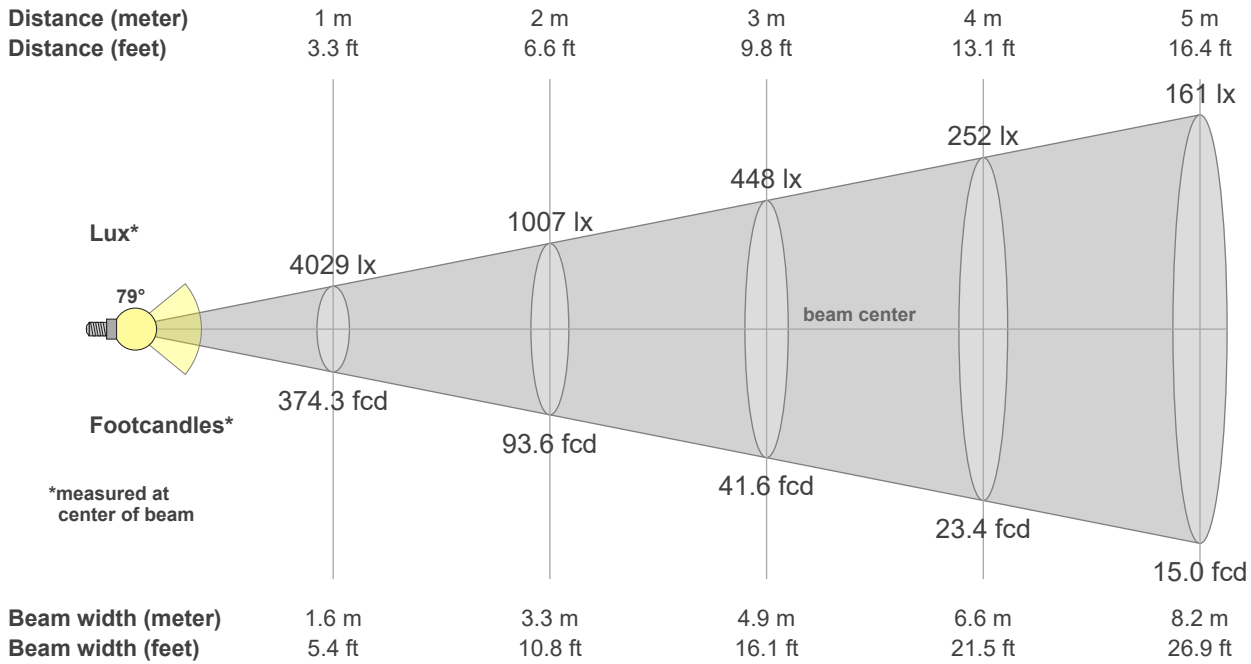
<b>Average 10%</b>	136.6°
--------------------	--------

**Intensity Ratio**

<b>In 120° Cone</b>	88.3%
<b>In 90° Cone</b>	62.9%

**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
4029	1007	448	252	161	112	82	63	50	40	33	28	24	21	18	16	14	12	11	10	lux
374.3	93.6	41.6	23.4	15	10.4	7.6	5.8	4.6	3.7	3.1	2.6	2.2	1.9	1.7	1.5	1.3	1.2	1	0.9	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
4029	4635	4812	4489	3814	3429	3306	3270	3098	2643	1758	858	372	216	128	53	11	0	0	0	cd
100%	115%	119%	111%	95%	85%	82%	81%	77%	66%	44%	21%	9%	5%	3%	1%	0%	0%	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
4029	3822	3796	3822	3971	4178	4222	4011	3620	3218	2781	2350	1935	1620	1231	779	252	39	3	2	cd
100%	95%	94%	95%	99%	104%	105%	100%	90%	80%	69%	58%	48%	40%	31%	19%	6%	1%	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
4029	3162	2153	1935	1787	1604	1464	1402	1284	1106	898	723	604	605	413	227	71	1	1	1	cd
100%	78%	53%	48%	44%	40%	36%	35%	32%	27%	22%	18%	15%	15%	10%	6%	2%	0%	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
4029	3829	3859	3990	4187	4180	3902	3484	3009	2544	2085	1673	1332	1084	707	364	54	6	0	0	cd
100%	95%	96%	99%	104%	104%	97%	86%	75%	63%	52%	42%	33%	27%	18%	9%	1%	0%	0%	0%	Of 0°val

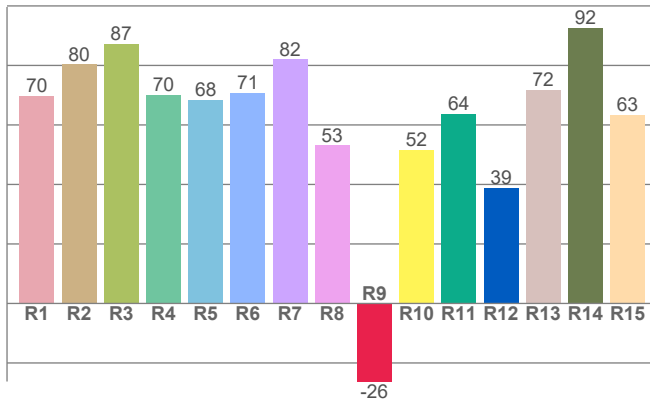


### Colour Details

<b>Correlated Colour Temperature, Target</b>	CCT = 4000K
<b>Correlated Colour Temperature, Measured</b>	CCT = 3988K
<b>Colour Rendering Index</b>	CRI 72.6
<b>Colour Rendering Index R9 Value</b>	R9 = -26.2
<b>Colour Rendering TM30-18</b>	R <sub>f</sub> 74.6, R <sub>g</sub> 92.5
<b>Colour Quality Scale</b>	CQS = 71.2

<b>MacAdam Steps</b>	SDCM = 0.6
<b>Colour Coordinates CIE 1931</b>	(x;y) = (0.381;0.377)
<b>Colour Coordinates CIEs 1960</b>	(u;v) = (0.225; 0.334)
<b>Colour Deviation from BBL</b>	Duv = 0.0006
<b>Colour Coordinate CIEs 1976 (CIELUV)</b>	(u';v') = (0.225;0.225)

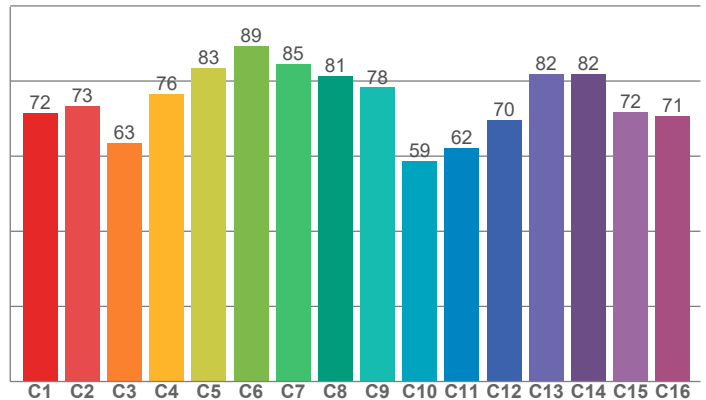
### Colour Rendering Index per reference colour (CIE 1995)



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
69.7	80.3	87.1	70.0	68.3	70.7	82.0	53.1	-26.2	51.6	63.8	38.8	71.8	92.5	63.4

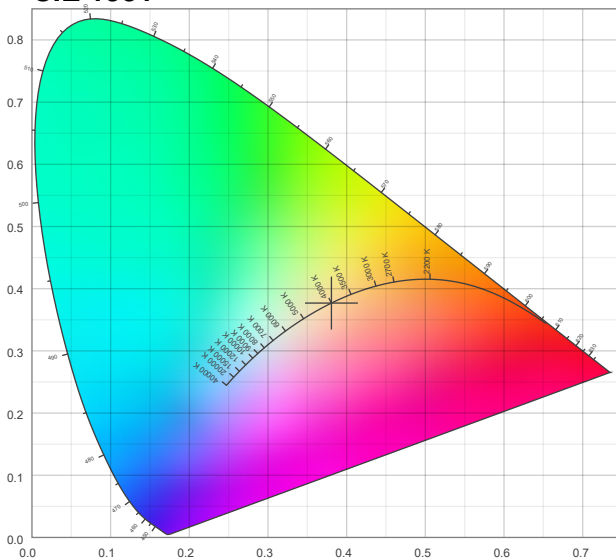
### TM30-18 Rf-values per hue bin



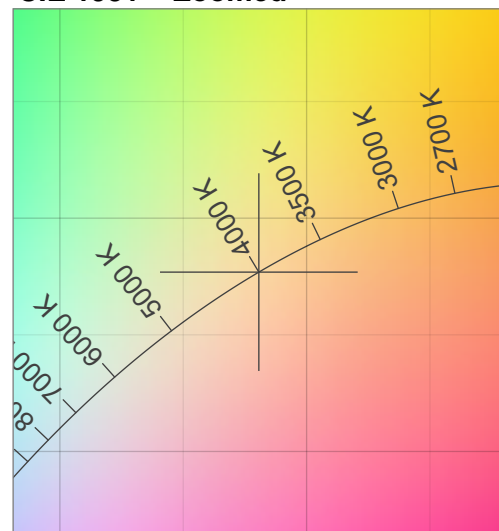
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
71.6	73.4	63.5	76.5	83.4	89.3	84.6	81.3	78.3	58.7	62.3	69.7	82.0	82.0	71.9	70.8

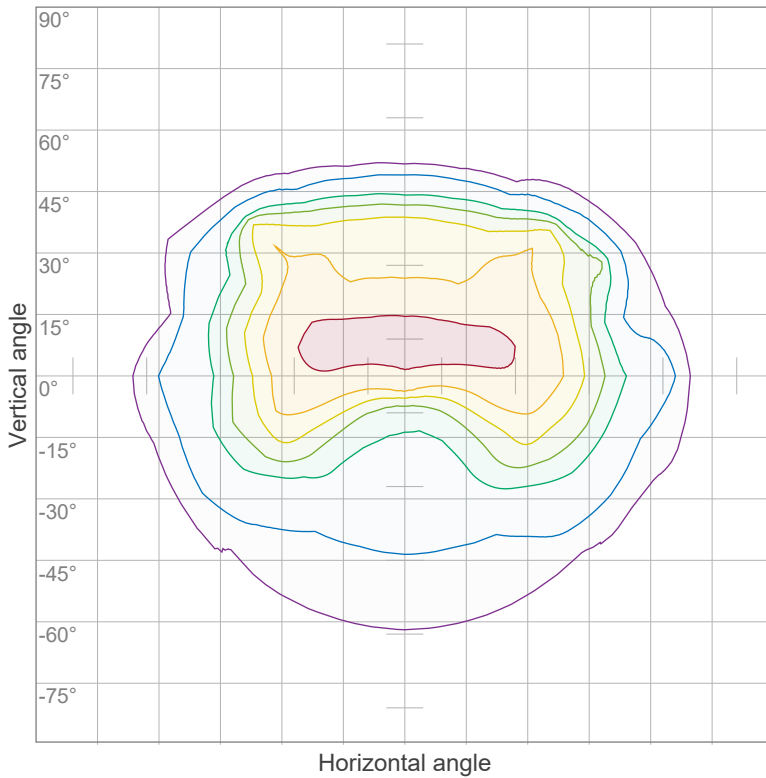
### CIE 1931



### CIE 1931 – Zoomed



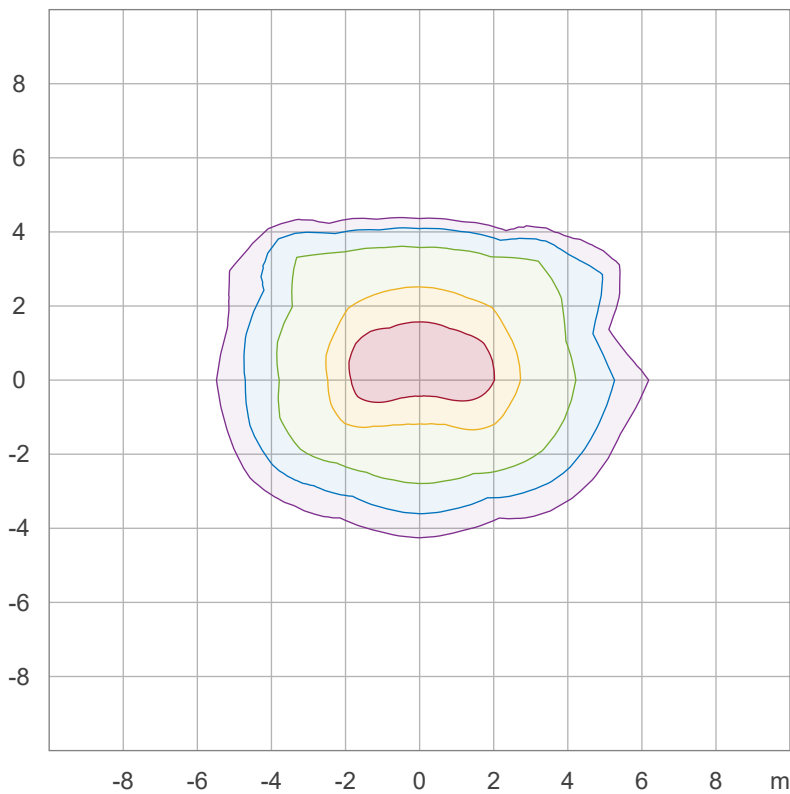
### Iso-intensity Diagram (Iso-Candela)



90 %	4338.1 cd
80 %	3856.1 cd
70 %	3374.0 cd
60 %	2892.0 cd
50 %	2410.0 cd
40 %	1928.0 cd
30 %	1446.0 cd
20 %	964.0 cd
10 %	482.0 cd

Peak intensity: 4820.1 cd  
Number of c-planes: 24

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



50.0 %	258.4 lx
30.0 %	155.0 lx
10.0 %	51.7 lx
5.0 %	25.8 lx
3.0 %	15.5 lx

Peak illuminance: 516.7 lx  
Mounting height: 3.0 m  
Number of c-planes: 24

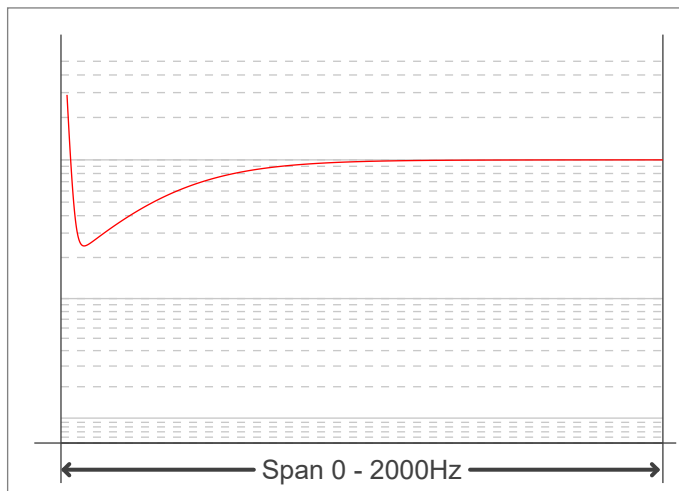
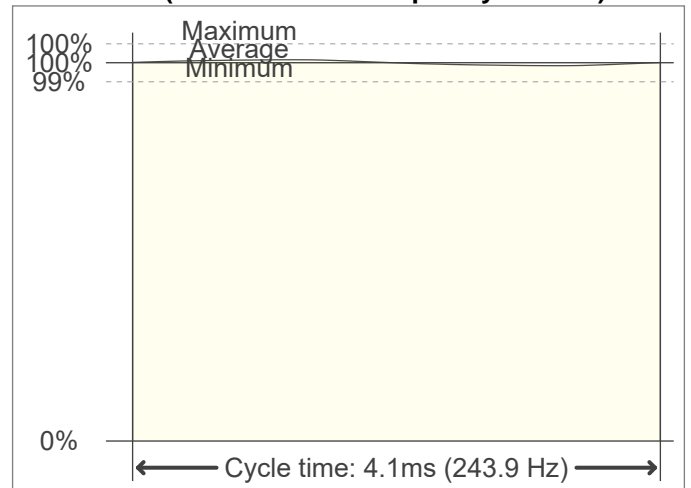




**Flicker Details**

<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>	0.85%
<b>Flicker Frequency</b>	243.9 Hz
<b>Flicker Index</b>	0
<b>Flicker SVM Value</b>	0.02
<b>Flicker PstLM Value</b>	0

**Flicker Frame**

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

**IEEE 1789 Frequency/Modulation Plot**
