

**LM-79-08 Test Report**  
For  
**RAB LIGHTING INC**

**(Brand Name: N/A)**

170 Ludlow Ave, PO BOX 970, Northvale, NJ 07647-2305 USA

**Model name(s):**  
**DLM002(HA6)**

**Report Type:** Testing and Report According to IES LM-79-2008

**Type of  
Luminaire:** Downlights

**Report Date:** 2022-07-20

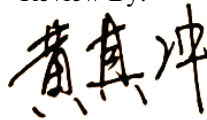
**Prepared By:**

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

<b>1.1 Rated Values:</b>	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	18.0 W
Rated Initial Lamp Lumen	1800 lm
Declared CCT	2700K/3000K/3500K/4000K/5000K

### 1.2 Test Specifications:

Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	QD25

### 1.3 Test Methods

#### 1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25°C ±1°C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1°vertical intervals and 22.5°horizontal intervals.

#### 2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25°C ±1°C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

#### 3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25°C ±1°C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

## 2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2022-07-20	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLM002(HA6)	2700K	

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202207120060	120.0	60	0.142	17.00	0.994

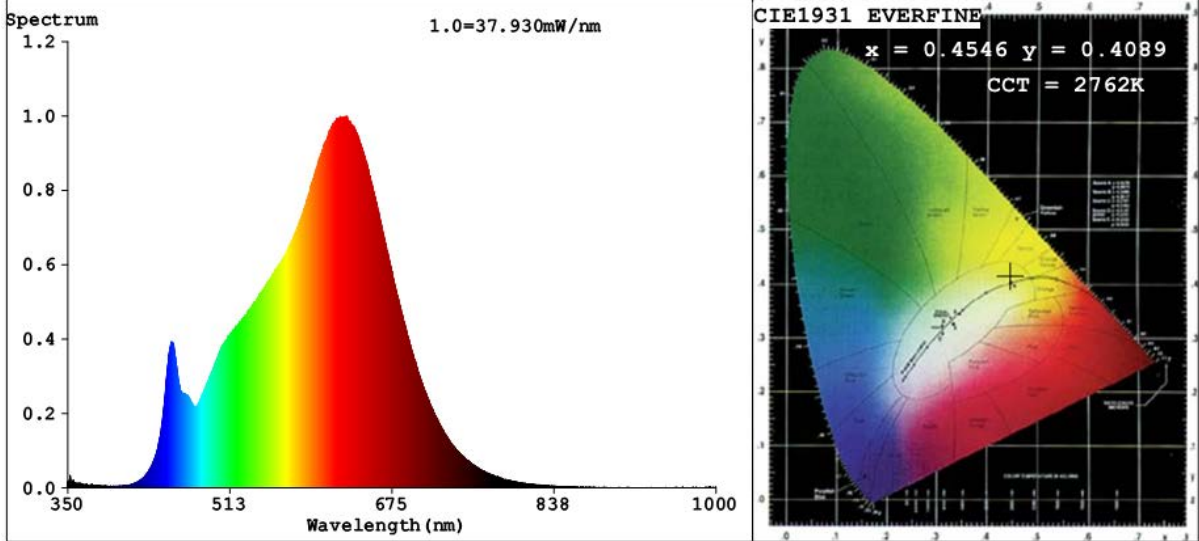
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	71
Frequency (Hz)	60	R2	100	R10	99
CCT (K)	2762	R3	98	R11	99
Duv	-0.0002	R4	97	R12	88
Chromaticity (x, y)	x=0.4546 y=0.4089	R5	98	R13	99
Chromaticity (u', v')	u'=0.2598 v'=0.5259	R6	96	R14	100
Color Rendering Index (CRI)	95.6	R7	93	R15	93
R9	71	R8	86	--	--

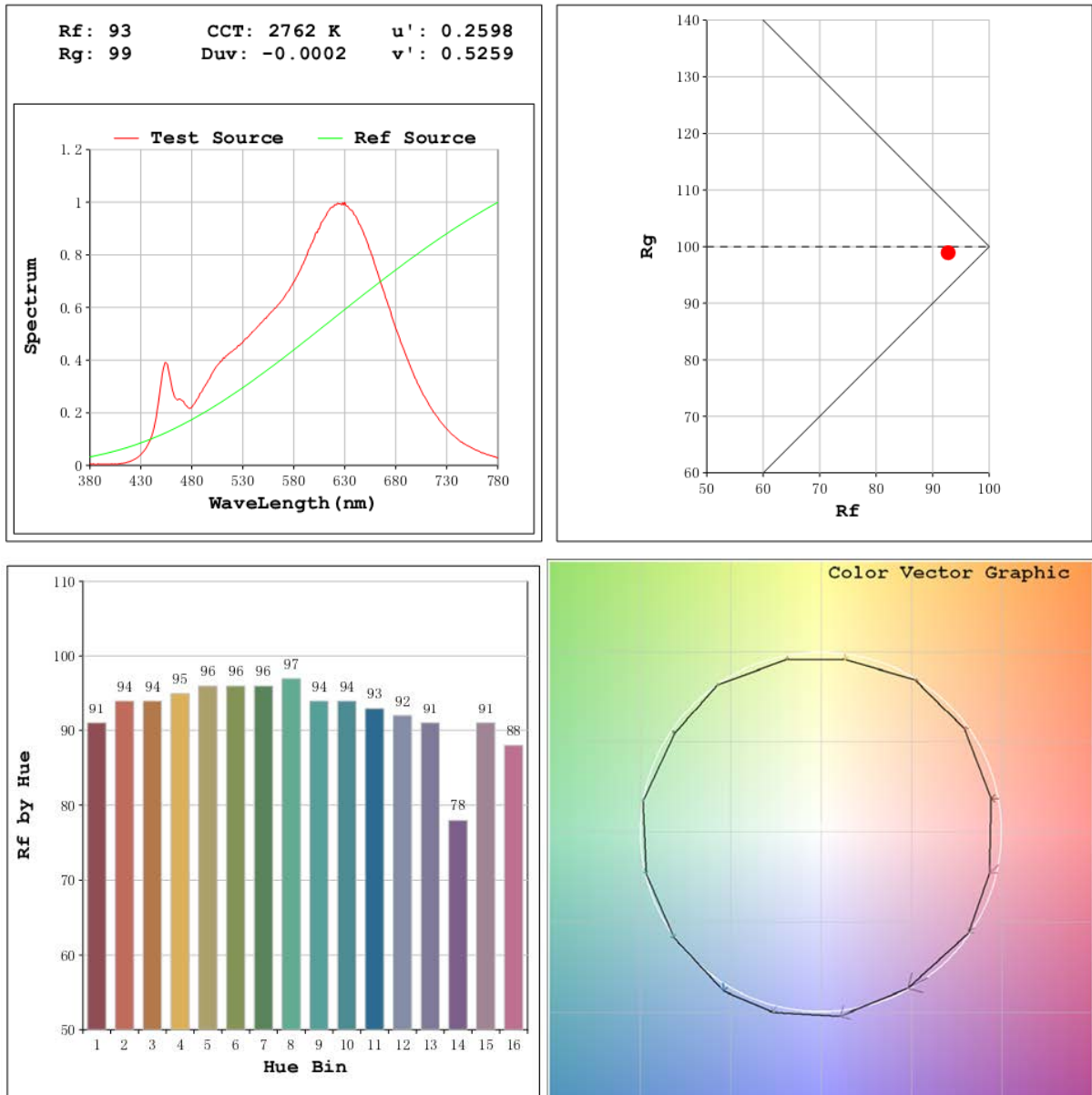
### Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1715.3
Luminous Efficacy (lm/W)	100.90
Beam Angle (°)	59.5
Center Beam Candle Power (cd)	1542

# Spectral Power Distribution & Chromaticity Diagram



## TM30

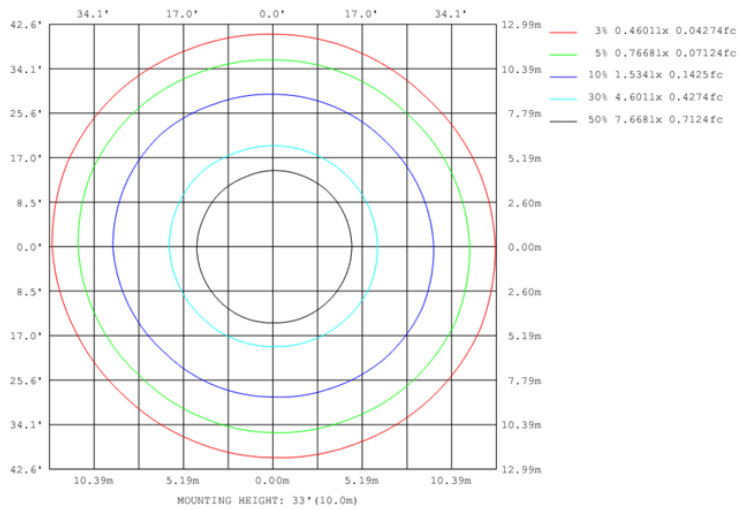
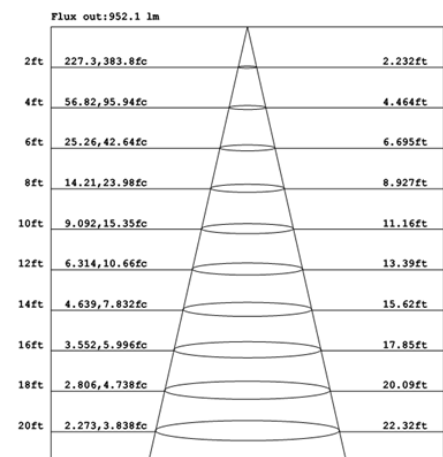
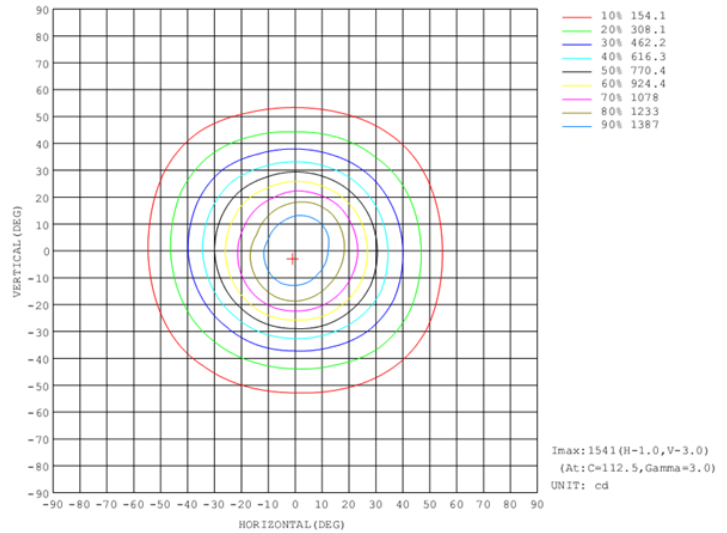
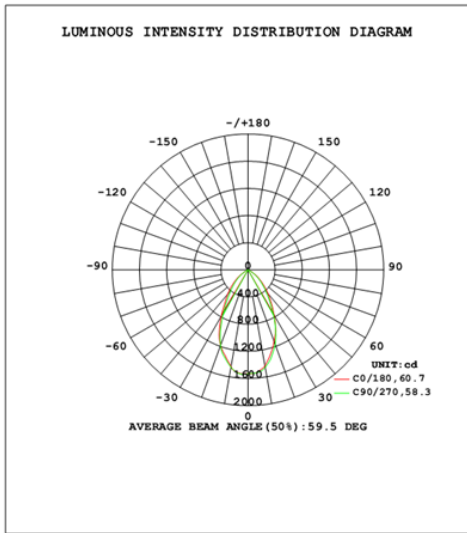


# Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	952.1	55.5%
0-40	1310.2	76.4%
0-60	1672.6	97.5%
60-90	42.6	2.5%
70-100	12.2	0.7%
90-120	0.0	0.0%
0-90	1715.3	100.0%
90-180	0.0	0.0%
0-180	1715.3	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	143.1	8.3%	90-100	0.0	0.0%
10-20	367.5	21.4%	100-110	0.0	0.0%
20-30	441.6	25.7%	110-120	0.0	0.0%
30-40	358.1	20.9%	120-130	0.0	0.0%
40-50	244.5	14.3%	130-140	0.0	0.0%
50-60	118.0	6.9%	140-150	0.0	0.0%
60-70	30.4	1.8%	150-160	0.0	0.0%
70-80	9.9	0.6%	160-170	0.0	0.0%
80-90	2.3	0.1%	170-180	0.0	0.0%

## Photometric Data





## 2.1.2 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2022-07-20	<b>Test Ambient:</b>	25.3 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	DLM002(HA6)	3000K	

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202207120060	120.0	60	0.141	16.90	0.994

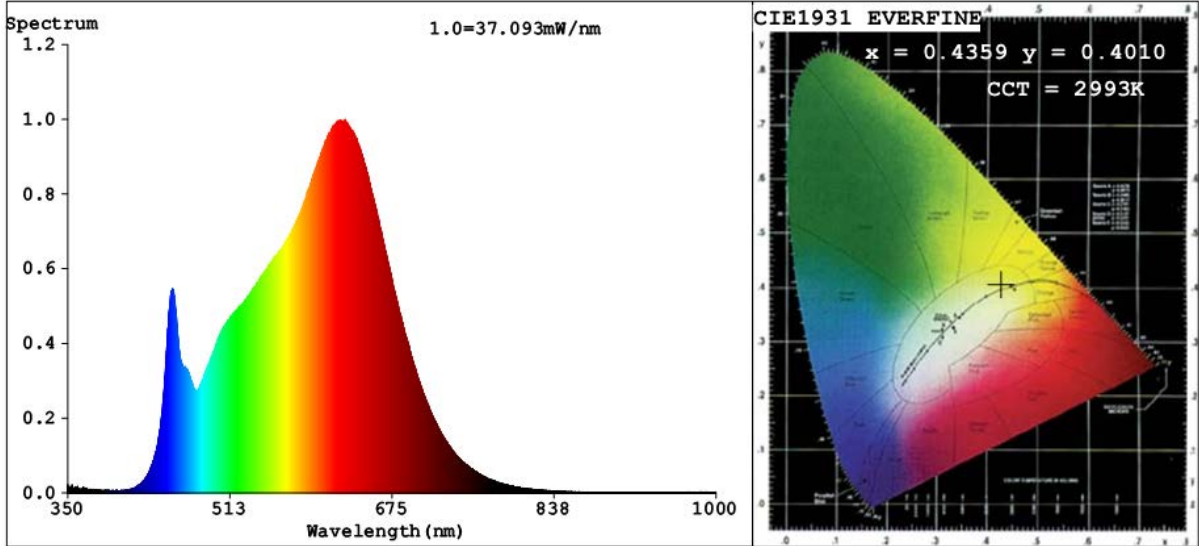
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	76
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	2993	R3	98	R11	99
Duv	-0.00011	R4	97	R12	85
Chromaticity (x, y)	x=0.4359 y=0.4010	R5	98	R13	99
Chromaticity (u', v')	u'=0.2512 v'=0.5200	R6	96	R14	100
Color Rendering Index (CRI)	95.9	R7	93	R15	95
R9	76	R8	88	--	--

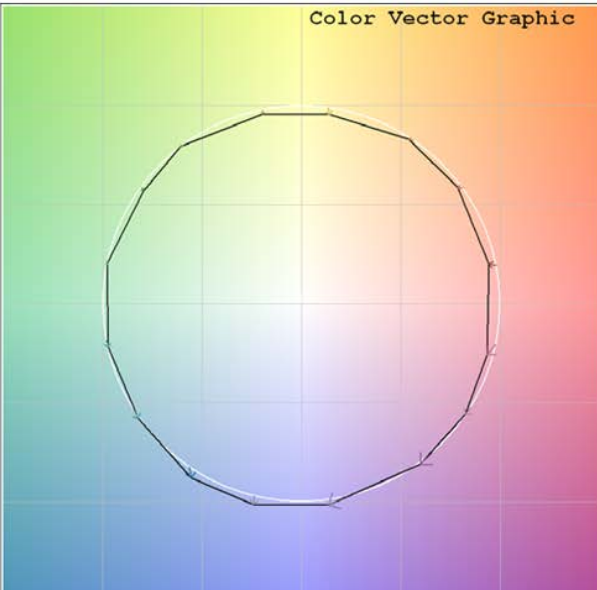
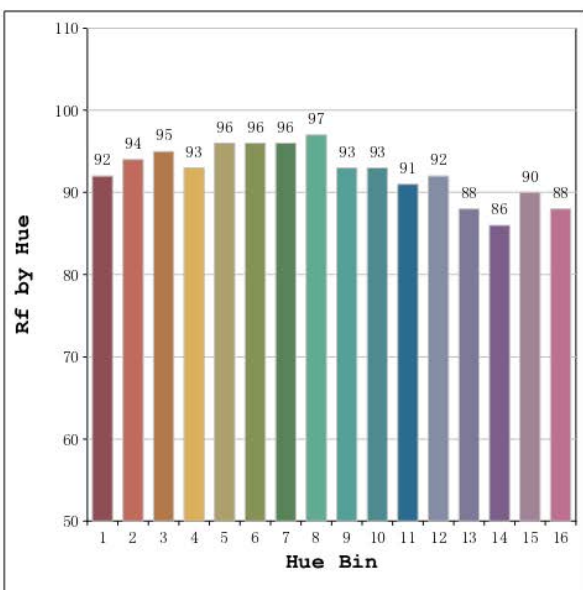
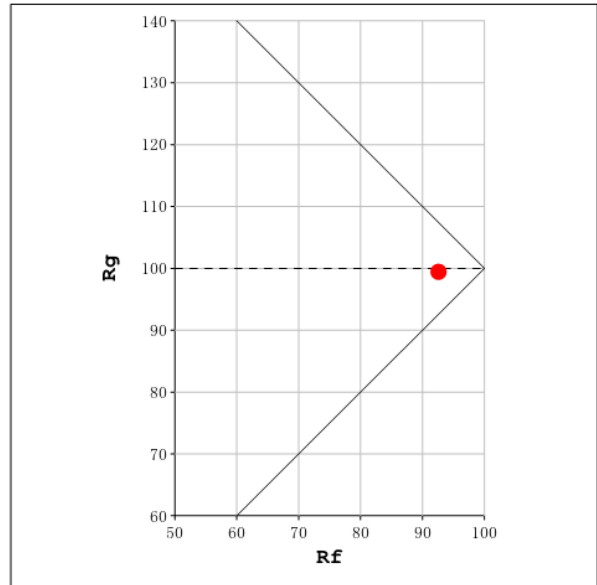
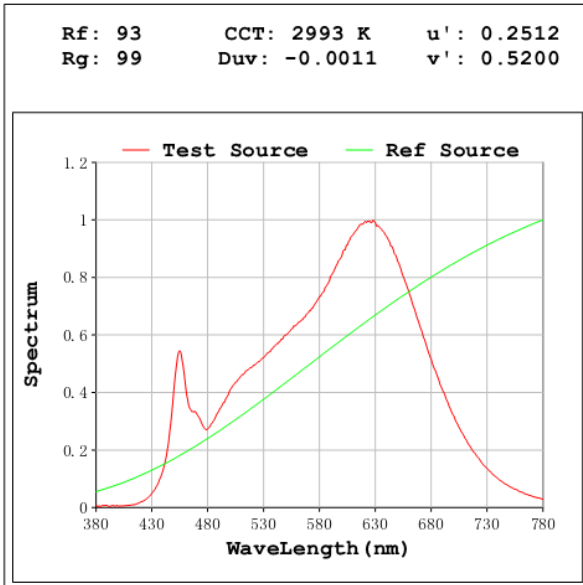
### Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1775.5
Luminous Efficacy (lm/W)	105.06
Beam Angle (°)	57.9
Center Beam Candle Power (cd)	1651

# Spectral Power Distribution & Chromaticity Diagram



## TM30

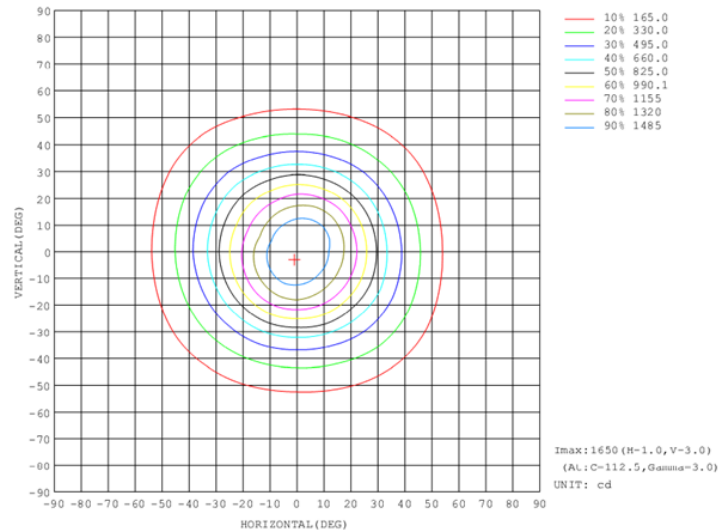
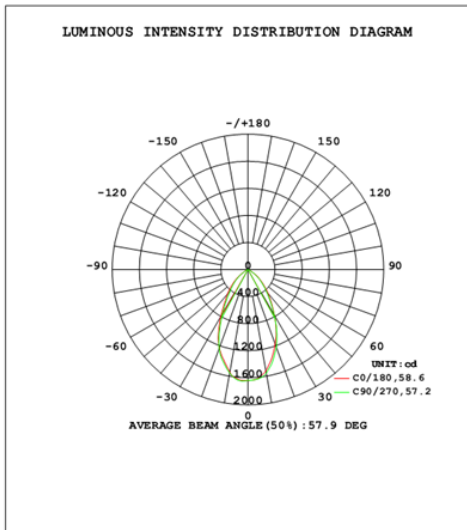


# Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	997.0	56.2%
0-40	1363.3	76.8%
0-60	1732.2	97.6%
60-90	43.3	2.4%
70-100	12.4	0.7%
90-120	0.0	0.0%
0-90	1775.5	100.0%
90-180	0.0	0.0%
0-180	1775.5	100.0%

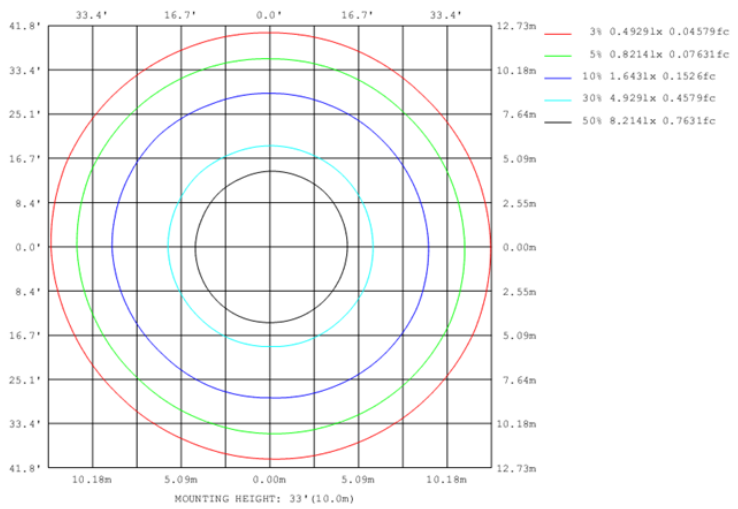
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	152.7	8.6%	90-100	0.0	0.0%
10-20	387.9	21.8%	100-110	0.0	0.0%
20-30	456.4	25.7%	110-120	0.0	0.0%
30-40	366.3	20.6%	120-130	0.0	0.0%
40-50	249.2	14.0%	130-140	0.0	0.0%
50-60	119.7	6.7%	140-150	0.0	0.0%
60-70	30.9	1.7%	150-160	0.0	0.0%
70-80	10.1	0.6%	160-170	0.0	0.0%
80-90	2.3	0.1%	170-180	0.0	0.0%

## Photometric Data



Flux out: 953.9 lm

Height	Eavg, Emax	Angle: 57.23deg	Diameter
2ft	247.0, 411.1fc		2.182ft
4ft	61.76, 102.8fc		4.364ft
6ft	27.45, 45.67fc		6.546ft
8ft	15.44, 25.69fc		8.729ft
10ft	9.882, 16.44fc		10.91ft
12ft	6.862, 11.42fc		13.09ft
14ft	5.042, 8.389fc		15.28ft
16ft	3.860, 6.423fc		17.46ft
18ft	3.050, 5.075fc		19.64ft
20ft	2.470, 4.111fc		21.82ft





### 2.1.3 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2022-07-20	<b>Test Ambient:</b>	25.3 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	DLM002(HA6)	3500K	

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202207120060	120.0	60	0.139	16.60	0.994

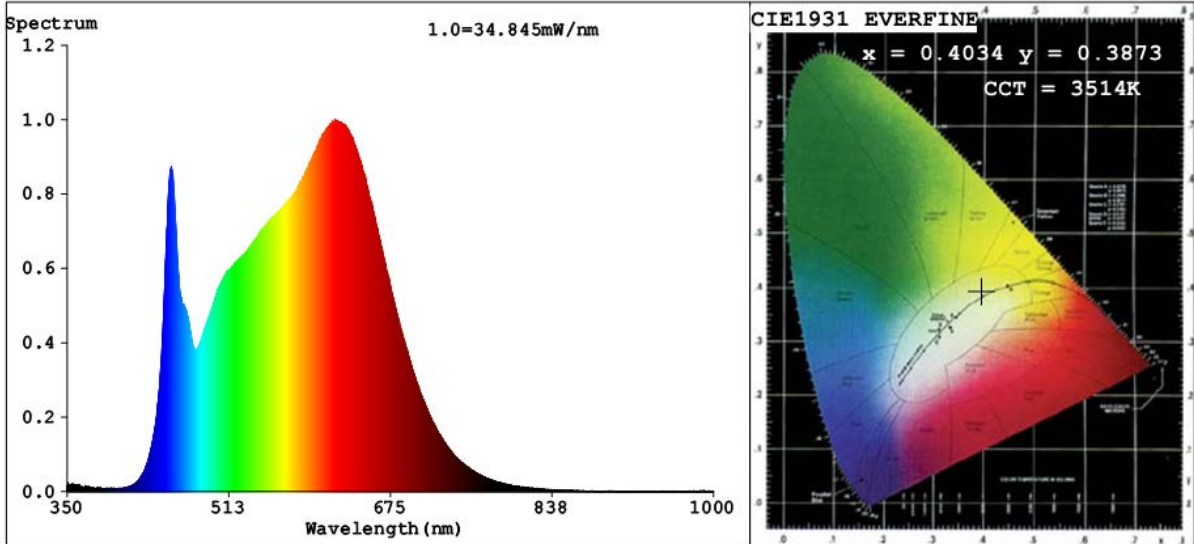
#### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	79
Frequency (Hz)	60	R2	99	R10	100
CCT (K)	3514	R3	98	R11	98
Duv	-0.0011	R4	96	R12	80
Chromaticity (x, y)	x=0.4034 y=0.3873	R5	97	R13	100
Chromaticity (u', v')	u'=0.2359 v'=0.5095	R6	96	R14	100
Color Rendering Index (CRI)	96.0	R7	94	R15	96
R9	79	R8	90	--	--

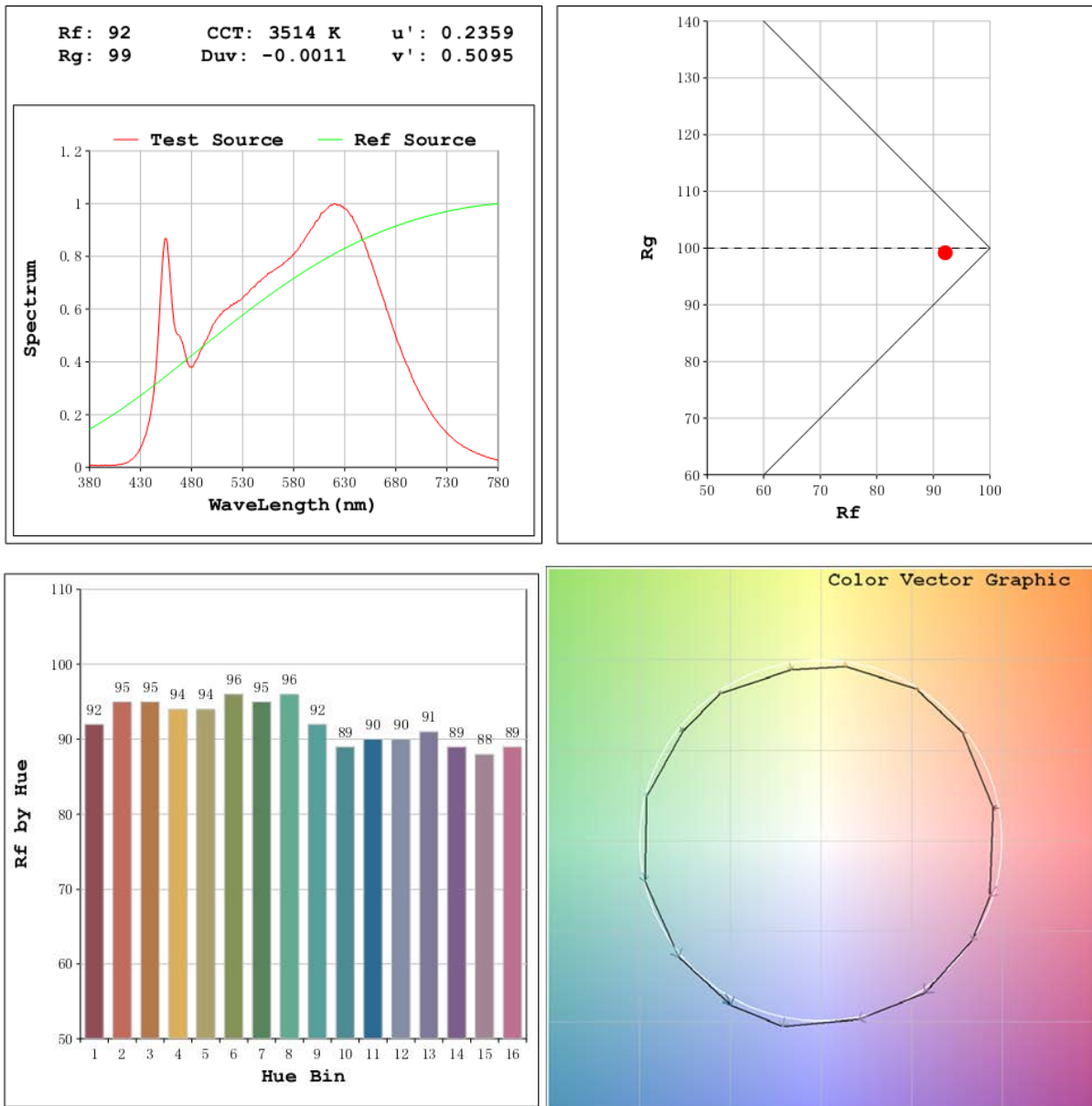
#### Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1890.1
Luminous Efficacy (lm/W)	113.86
Beam Angle (°)	55.1
Center Beam Candle Power (cd)	1869

# Spectral Power Distribution & Chromaticity Diagram



## TM30

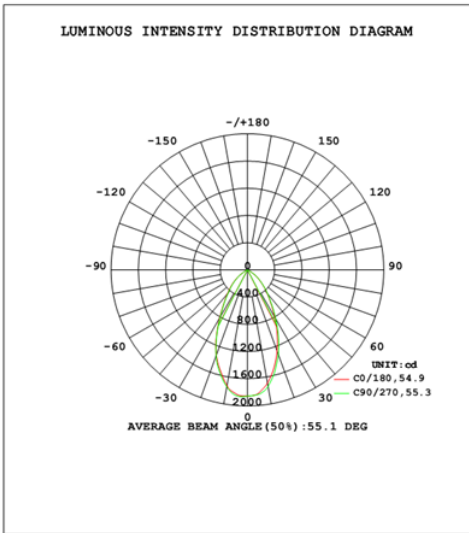


# Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1084.3	57.4%
0-40	1465.7	77.5%
0-60	1845.7	97.7%
60-90	44.4	2.3%
70-100	12.7	0.7%
90-120	0.0	0.0%
0-90	1890.1	100.0%
90-180	0.0	0.0%
0-180	1890.1	100.0%

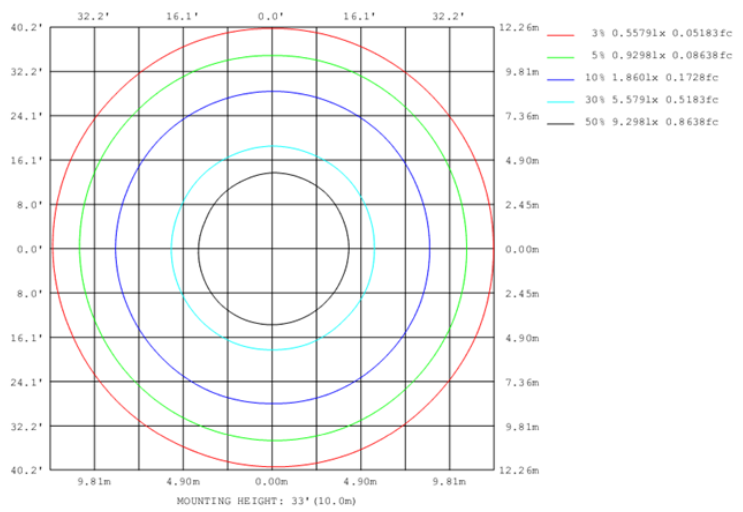
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	171.9	9.1%	90-100	0.0	0.0%
10-20	428.0	22.6%	100-110	0.0	0.0%
20-30	484.5	25.6%	110-120	0.0	0.0%
30-40	381.4	20.2%	120-130	0.0	0.0%
40-50	257.3	13.6%	130-140	0.0	0.0%
50-60	122.7	6.5%	140-150	0.0	0.0%
60-70	31.7	1.7%	150-160	0.0	0.0%
70-80	10.3	0.5%	160-170	0.0	0.0%
80-90	2.4	0.1%	170-180	0.0	0.0%

## Photometric Data



Height	Eavg, Emax	Angle: 54.92deg	Diameter
2ft	279.5, 465.3fc		2.079ft
4ft	69.87, 116.3fc		4.157ft
6ft	31.05, 51.70fc		6.236ft
8ft	17.47, 29.08fc		8.315ft
10ft	11.18, 18.61fc		10.39ft
12ft	7.763, 12.93fc		12.47ft
14ft	5.704, 9.497fc		14.55ft
16ft	4.367, 7.271fc		16.63ft
18ft	3.450, 5.745fc		18.71ft
20ft	2.795, 4.653fc		20.79ft

Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.





## 2.1.4 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2022-07-20	<b>Test Ambient:</b>	25.3 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	DLM002(HA6)	4000K	

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202207120060	120.0	60	0.140	16.80	0.994

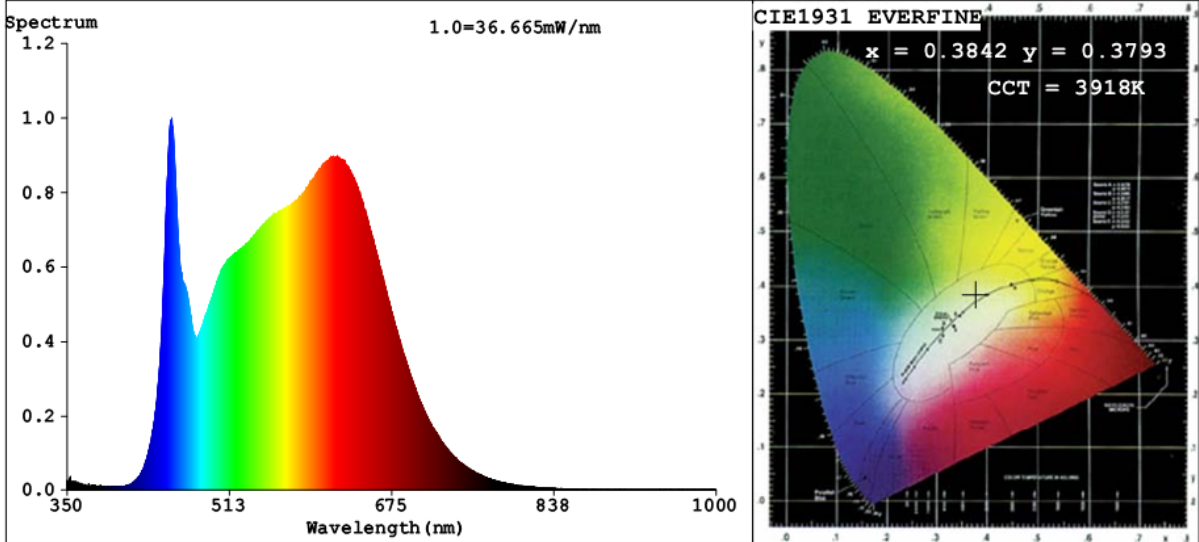
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	77
Frequency (Hz)	60	R2	100	R10	98
CCT (K)	3918	R3	99	R11	97
Duv	0.0001	R4	95	R12	76
Chromaticity (x, y)	x=0.3842 y=0.3793	R5	96	R13	98
Chromaticity (u', v')	u'=0.2266 v'=0.5032	R6	96	R14	100
Color Rendering Index (CRI)	95.7	R7	94	R15	94
R9	77	R8	89	--	--

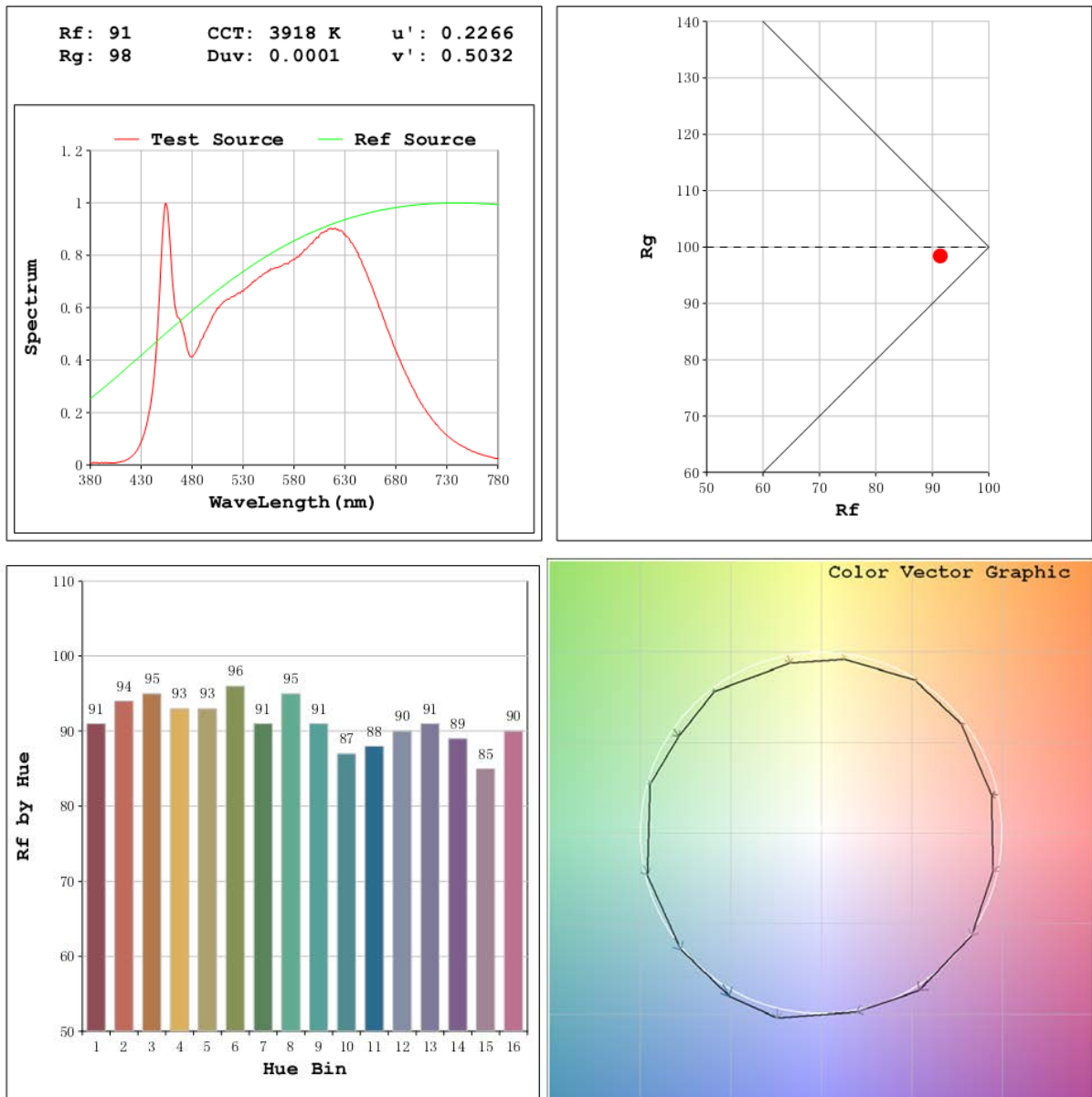
### Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1947.2
Luminous Efficacy (lm/W)	115.91
Beam Angle (°)	53.4
Center Beam Candle Power (cd)	1998

# Spectral Power Distribution & Chromaticity Diagram



## TM30

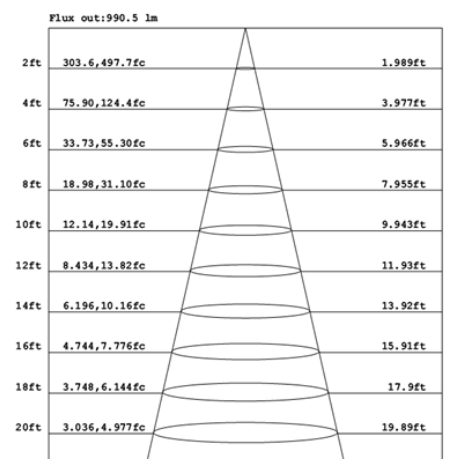
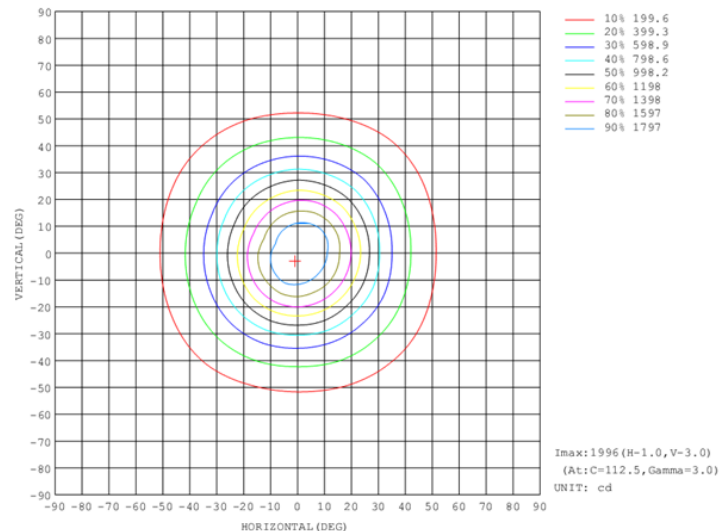
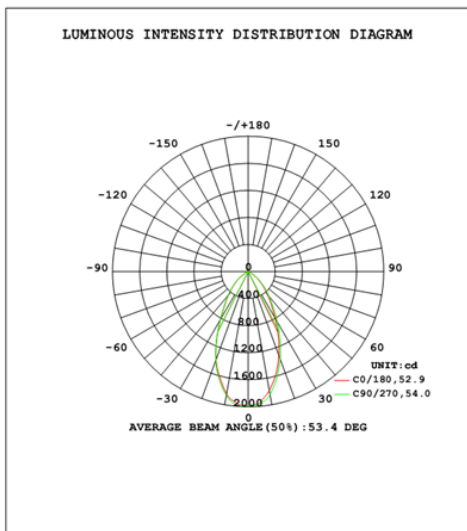


# Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1132.1	58.1%
0-40	1519.4	78.0%
0-60	1902.6	97.7%
60-90	44.7	2.3%
70-100	12.8	0.7%
90-120	0.0	0.0%
0-90	1947.2	100.0%
90-180	0.0	0.0%
0-180	1947.2	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	183.2	9.4%	90-100	0.0	0.0%
10-20	450.7	23.1%	100-110	0.0	0.0%
20-30	498.2	25.6%	110-120	0.0	0.0%
30-40	387.3	19.9%	120-130	0.0	0.0%
40-50	259.9	13.3%	130-140	0.0	0.0%
50-60	123.2	6.3%	140-150	0.0	0.0%
60-70	31.8	1.6%	150-160	0.0	0.0%
70-80	10.4	0.5%	160-170	0.0	0.0%
80-90	2.4	0.1%	170-180	0.0	0.0%

## Photometric Data



Height Avg, Emax Angle:52.87deg Diameter  
 Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.



## 2.1.5 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2022-07-20	<b>Test Ambient:</b>	25.3 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	DLM002(HA6)	5000K	

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202207120060	120.0	60	0.144	17.20	0.994

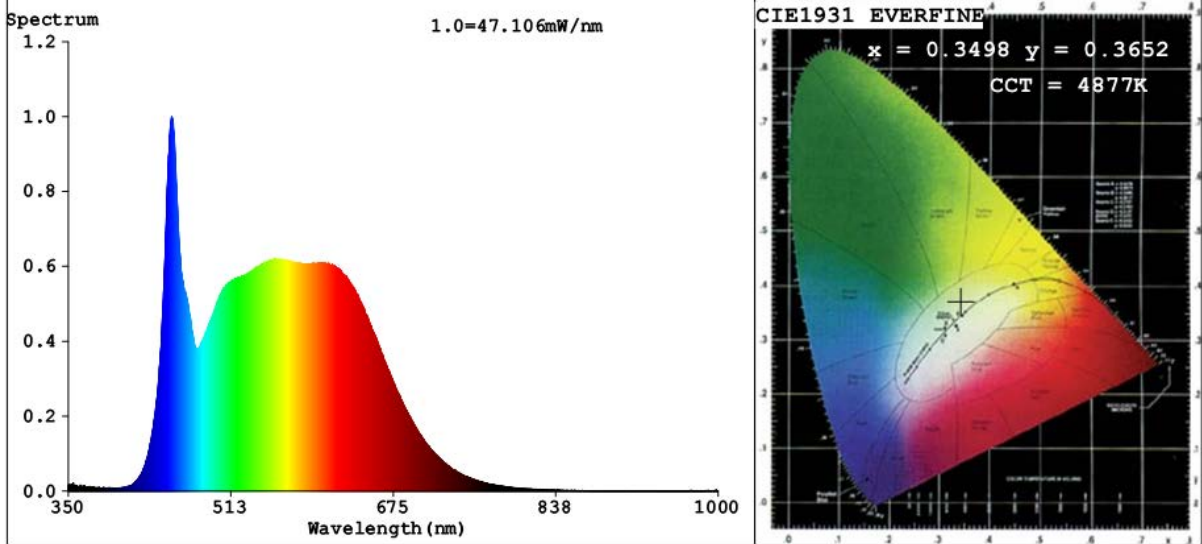
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	92	R9	61
Frequency (Hz)	60	R2	96	R10	90
CCT (K)	4877	R3	98	R11	90
Duv	0.0048	R4	89	R12	67
Chromaticity (x, y)	x=0.3498 y=0.3652	R5	90	R13	93
Chromaticity (u', v')	u'=0.2094 v'=0.4918	R6	93	R14	99
Color Rendering Index (CRI)	92.0	R7	93	R15	88
R9	61	R8	84	--	--

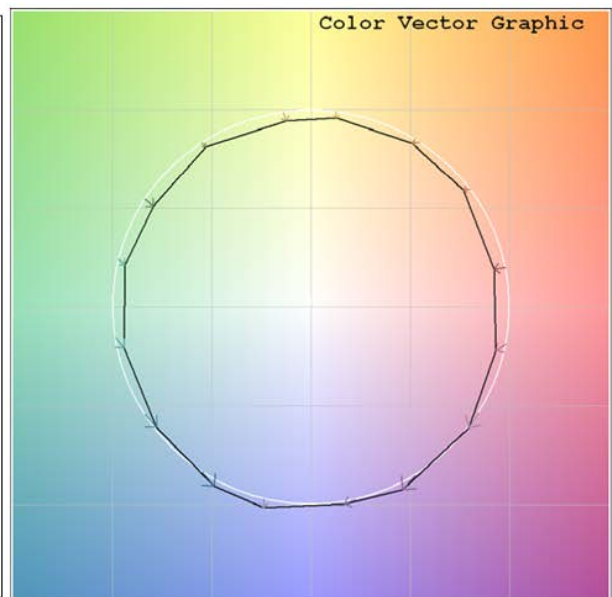
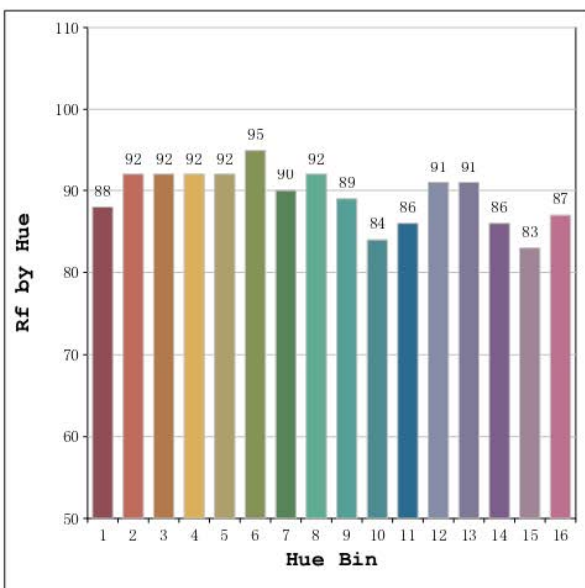
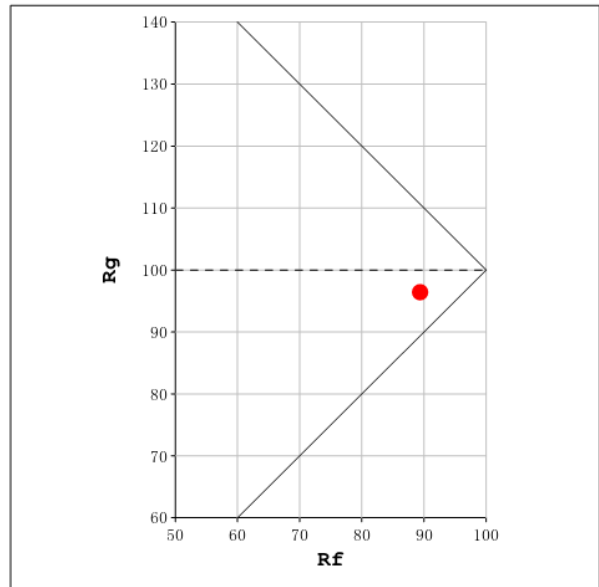
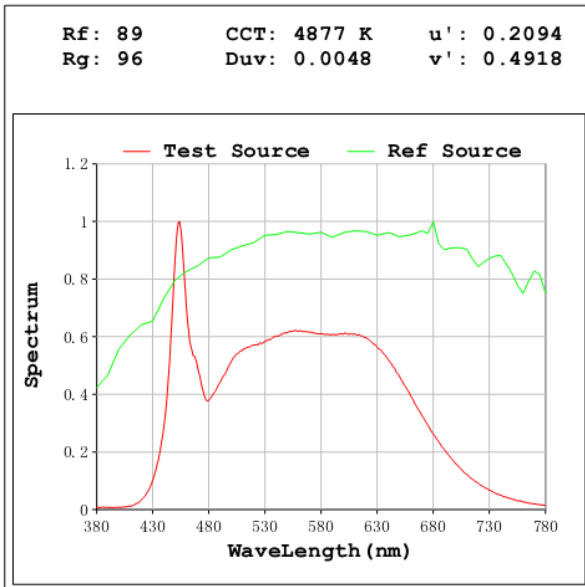
### Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1998.6
Luminous Efficacy (lm/W)	116.20
Beam Angle (°)	50.7
Center Beam Candle Power (cd)	2196

# Spectral Power Distribution & Chromaticity Diagram



## TM30

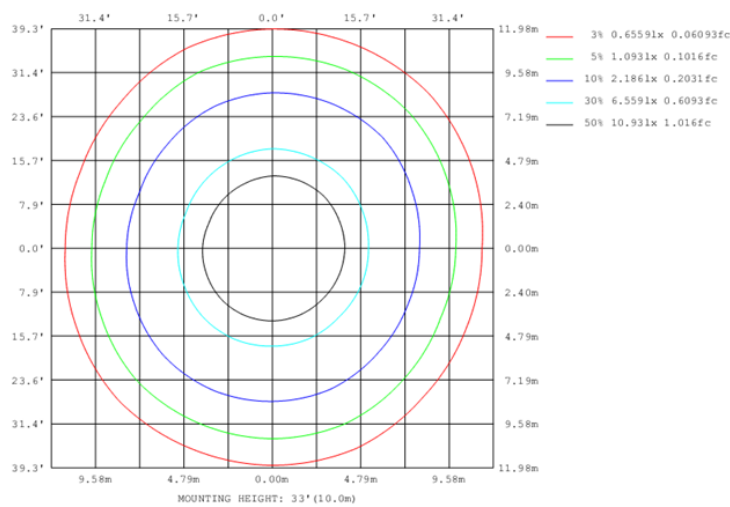
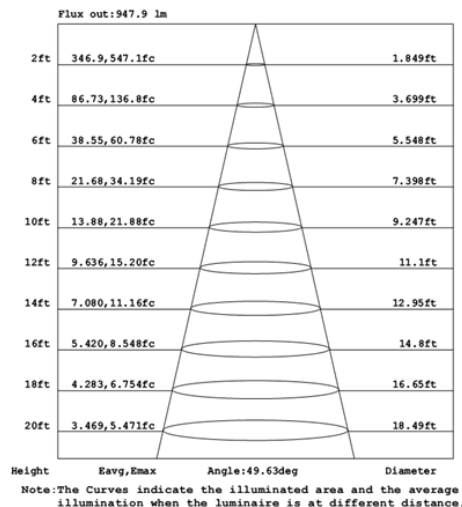
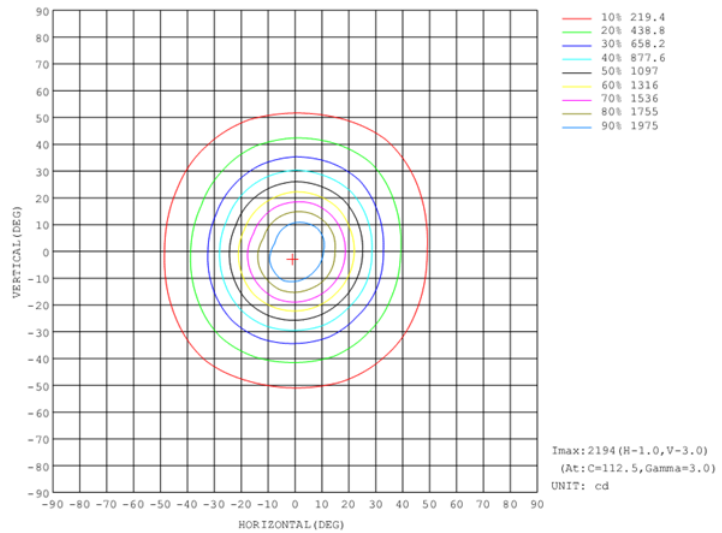
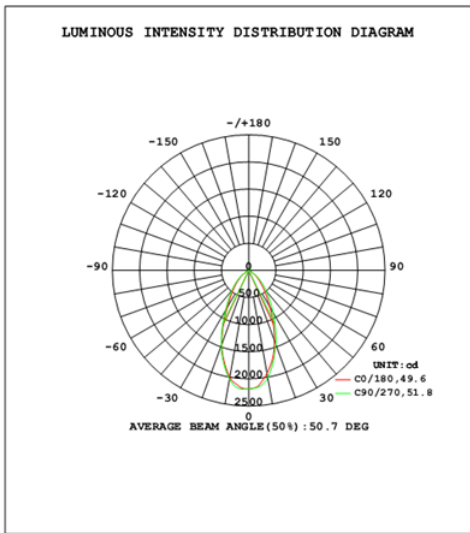


# Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1191.8	59.6%
0-40	1578.3	79.0%
0-60	1954.9	97.8%
60-90	43.6	2.2%
70-100	12.5	0.6%
90-120	0.0	0.0%
0-90	1998.6	100.0%
90-180	0.0	0.0%
0-180	1998.6	100.0%

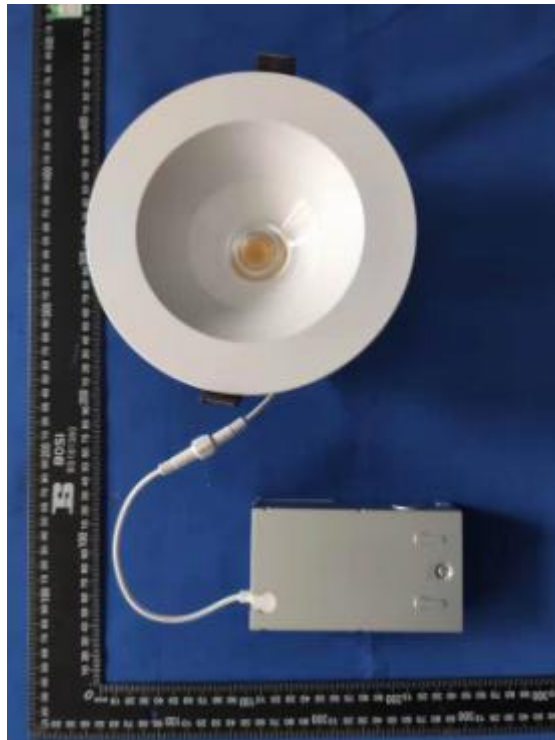
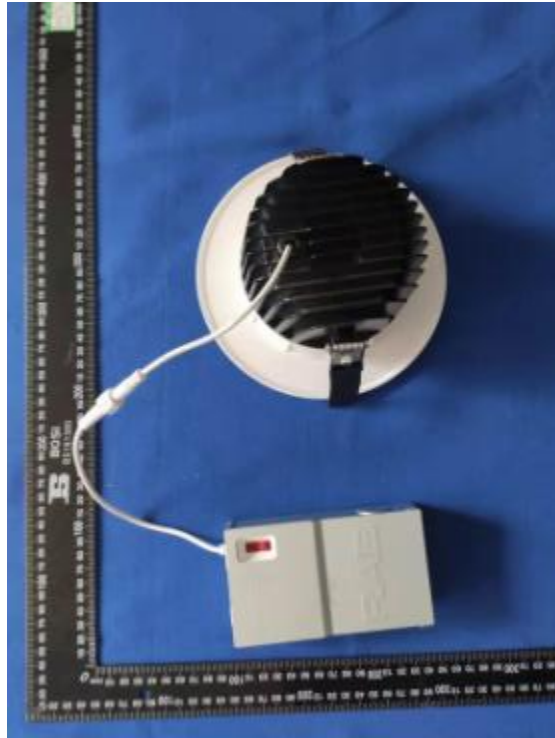
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	200.2	10.0%	90-100	0.0	0.0%
10-20	482.2	24.1%	100-110	0.0	0.0%
20-30	509.5	25.5%	110-120	0.0	0.0%
30-40	386.5	19.3%	120-130	0.0	0.0%
40-50	256.4	12.8%	130-140	0.0	0.0%
50-60	120.2	6.0%	140-150	0.0	0.0%
60-70	31.1	1.6%	150-160	0.0	0.0%
70-80	10.2	0.5%	160-170	0.0	0.0%
80-90	2.4	0.1%	170-180	0.0	0.0%

## Photometric Data





### 3. Product Photo



**\*\*\*\*\* END OF REPORT \*\*\*\*\***