

# LM-79-08 Test Report

For

## RAB LIGHTING INC

(Brand Name : RAB)

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

**Model name(s) :**

**R3STLB**

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

**Type of Luminaire:** Downlights

**Report Date:** 2024-08-28

<b>1.1 Rated Values:</b>	
Rated Voltage / Frequency	120V, 60HZ
Nominal Power	15W
Rated Initial Lamp Lumen	1250lm (5000k)
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

<p><b>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</b></p> <p>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.</p>
<p><b>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</b></p> <p>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.</p>
<p><b>3) Electrical Measurements:</b></p> <p>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.</p>

### 2.1.1 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2024-08-28	<b>Test Ambient:</b>	25.3
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	15
<b>Model Number</b>	R3STLB	<b>CCT Setting</b>	2700k

#### Electrical Measurement:

<b>Sampel No.</b>	<b>Voltage (Vac)</b>	<b>Frequency (Hz )</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>
#1	120.7	60	0.123	14.58	0.982

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

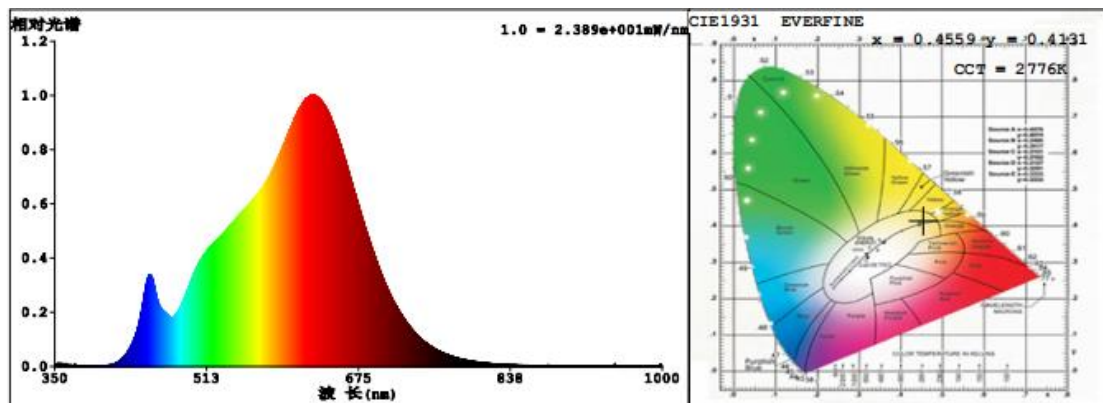
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	2776
Duv	0.00129
Chromaticity (x, y)	x=0.4559, y=0.4131
Chromaticity (u', v')	u' =0.2588, v' =0.5277
Color Rendering Index (CRI)	95.9
R9	70

<b>Special Color Rendering Indices</b>			
R1	97	R9	70
R2	98	R10	95
R3	99	R11	99
R4	98	R12	89
R5	96	R13	97
R6	98	R14	98
R7	95	R15	92
R8	87	--	--

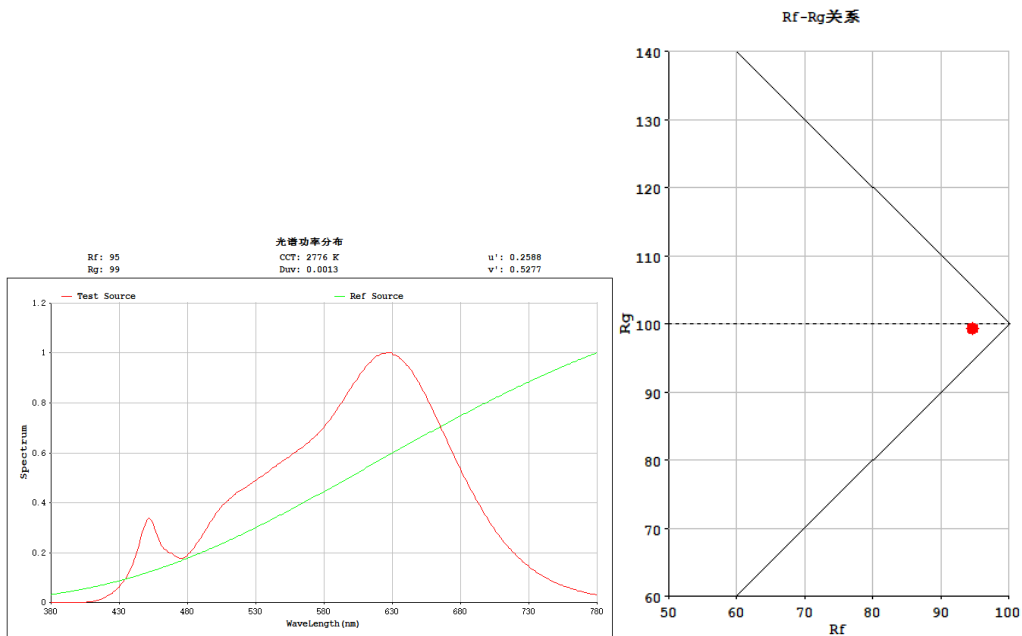
#### Photometric Measurement – Goniophotometer Method:

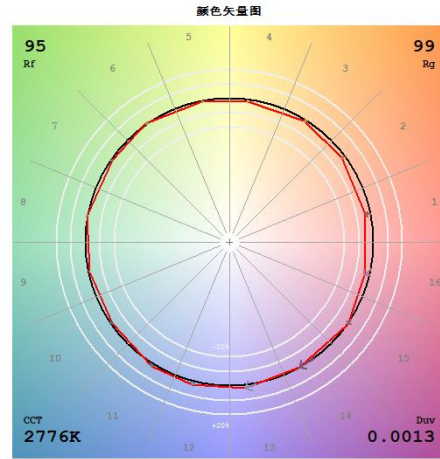
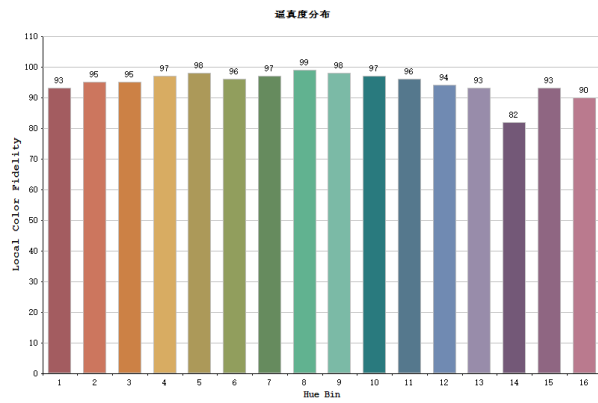
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1024.22
Luminous Efficacy (lm/W)	70.23
Beam Angle (°)	38.6
Center Beam Candle Power (cd)	2461

## Spectral Power Distribution & Chromaticity Diagram



## TM30



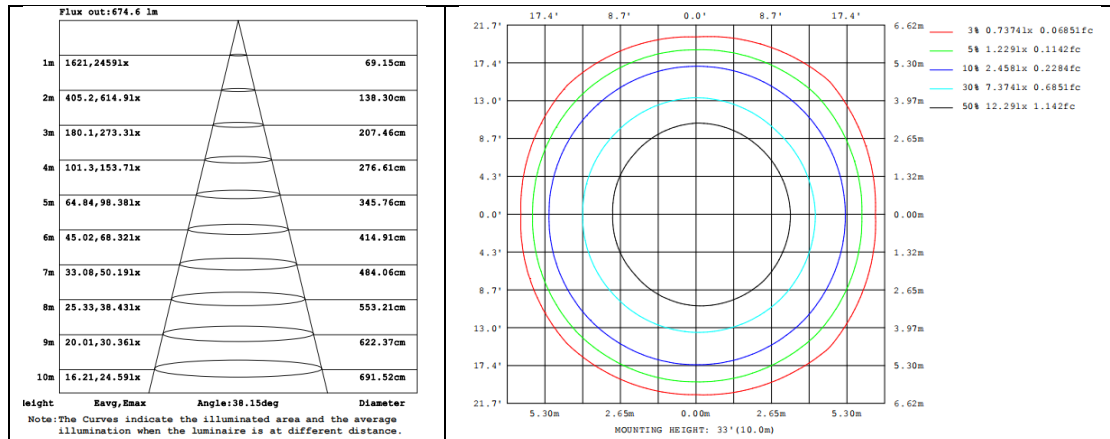
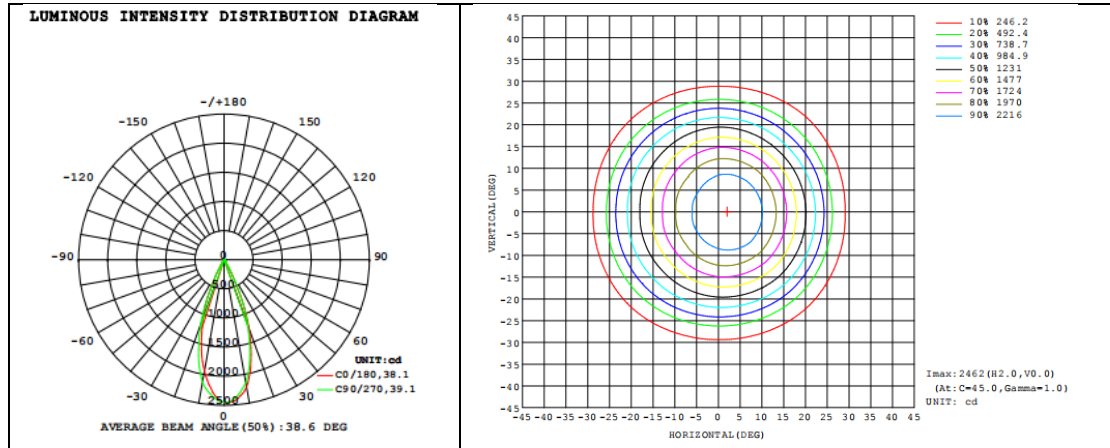


## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	953.6	93.13%
0-40	1008.0	98.44%
0-60	1024.0	100.00%
60-90	0.0	0.00%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1024.0	100.00%
90-180	0.0	0.00%
0-180	1024.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	216.90	21.18%	90-100	0	0%
10-20	457.6	44.69%	100-110	0	0%
20-30	279.00	27.25%	110-120	0	0%
30-40	54.09	5.28%	120-130	0	0%
40-50	14.33	1.40%	130-140	0	0%
50-60	2.203	0.22%	140-150	0	0%
60-70	0.0245	0.00%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

# Photometric Data





## 2.1.2 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2024-08-28	<b>Test Ambient:</b>	25.3
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	15
<b>Model Number</b>	R3STLB	<b>CCT Setting</b>	3000k

### Electrical Measurement:

<b>Sampel No.</b>	<b>Voltage (Vac)</b>	<b>Frequency (Hz)</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>
#1	120.7	60	0.120	14.23	0.981

### Chromaticity Measurement – Sphere-Spectroradiometer Method:

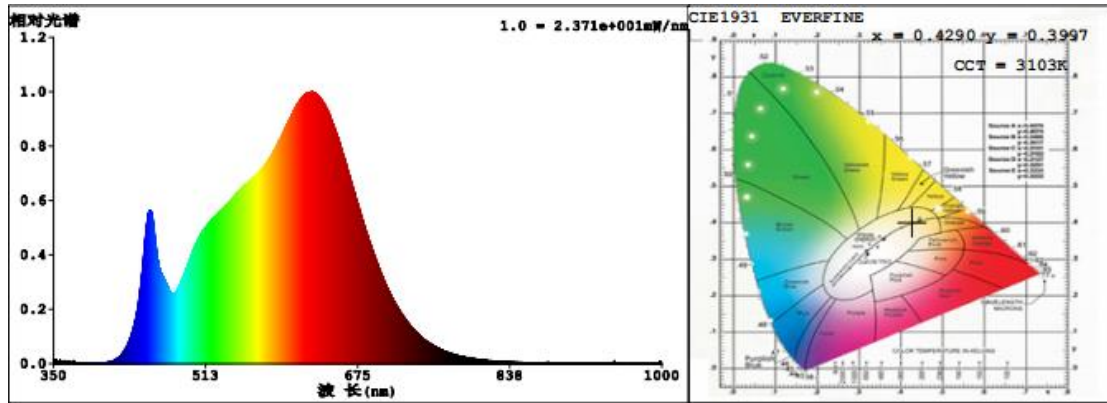
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3103
Duv	-0.000596
Chromaticity (x, y)	x=0.4290, y=0.3997
Chromaticity (u', v')	u' =0.2473, v' =0.5185
Color Rendering Index (CRI)	96.6
R9	77

<b>Special Color Rendering Indices</b>			
R1	98	R9	77
R2	99	R10	97
R3	99	R11	98
R4	98	R12	85
R5	97	R13	98
R6	97	R14	98
R7	95	R15	95
R8	90	--	--

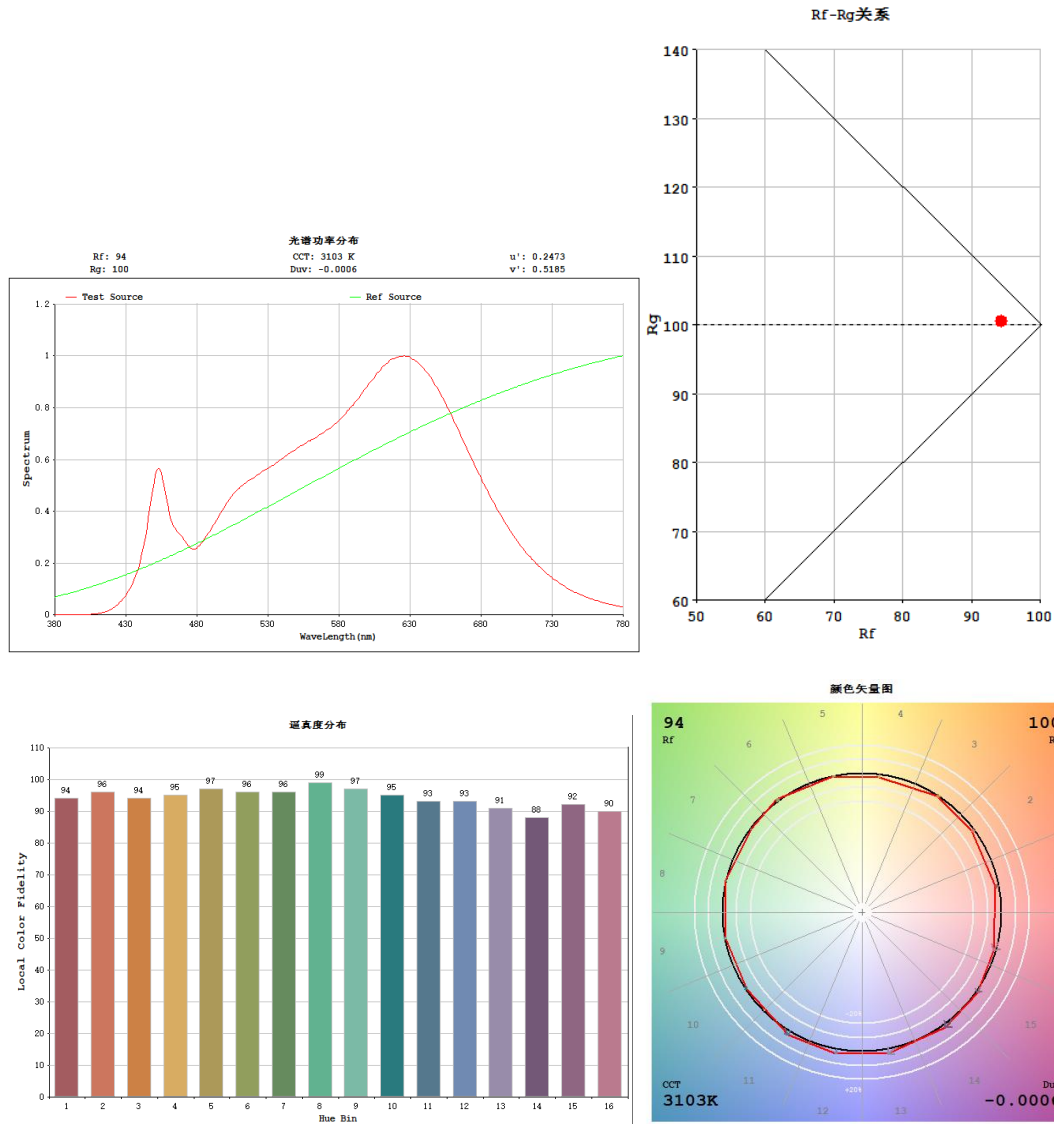
### Photometric Measurement – Goniophotometer Method:

<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1125.07
Luminous Efficacy (lm/W)	79.04
Beam Angle (°)	38.7
Center Beam Candle Power (cd)	2703

# Spectral Power Distribution & Chromaticity Diagram



## TM30

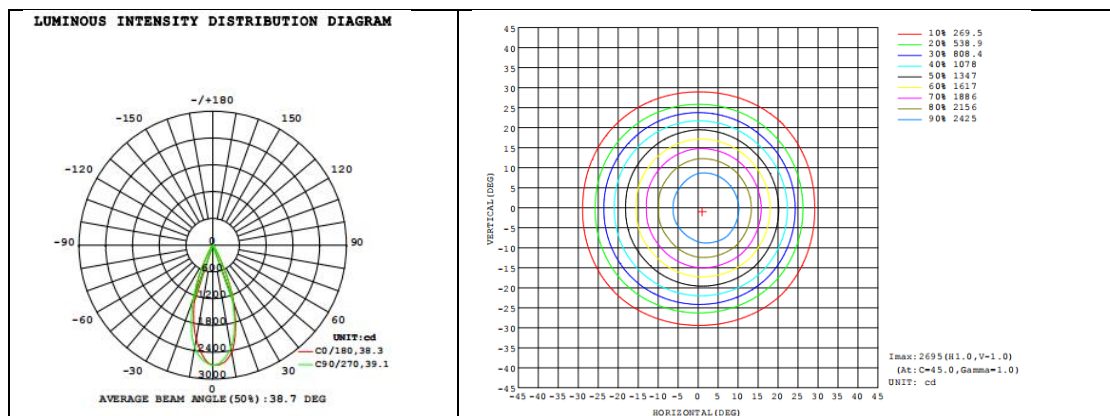


## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1047.0	93.07%
0-40	1107.0	98.40%
0-60	1125.0	100.00%
60-90	0.0	0.00%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1125.0	100.00%
90-180	0.0	0.00%
0-180	1125.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	237.90	21.15%	90-100	0	0%
10-20	502.2	44.64%	100-110	0	0%
20-30	307.00	27.29%	110-120	0	0%
30-40	59.67	5.30%	120-130	0	0%
40-50	15.76	1.40%	130-140	0	0%
50-60	2.435	0.22%	140-150	0	0%
60-70	0.0340	0.00%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

## Photometric Data





### 2.1.3 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2024-08-28	<b>Test Ambient:</b>	25.3
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	15
<b>Model Number</b>	R3STLB	<b>CCT Setting</b>	3500k

#### Electrical Measurement:

<b>Sampel No.</b>	<b>Voltage (Vac)</b>	<b>Frequency (Hz)</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>
#1	120.7	60	0.117	13.80	0.980

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

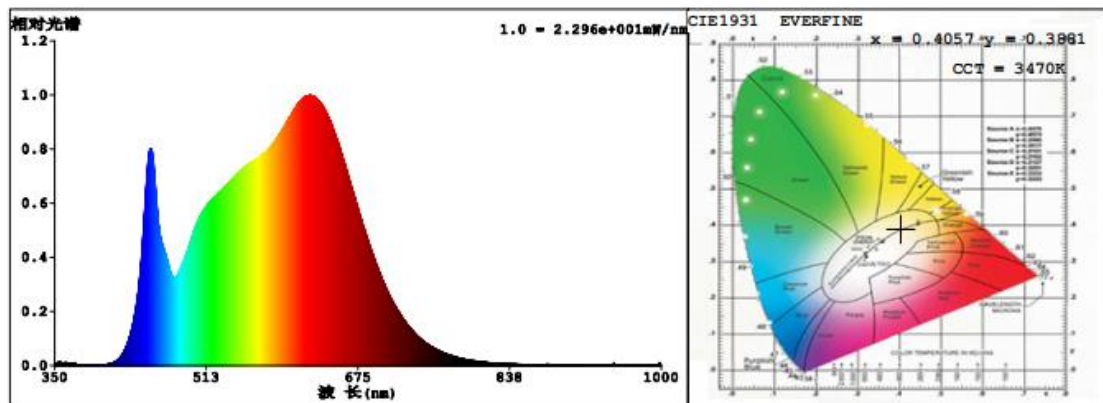
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3470
Duv	-0.00124
Chromaticity (x, y)	x=0.4057, y=0.3881
Chromaticity (u', v')	u' =0.2370, v' =0.5102
Color Rendering Index (CRI)	96.6
R9	80

<b>Special Color Rendering Indices</b>			
R1	98	R9	80
R2	99	R10	96
R3	98	R11	98
R4	97	R12	81
R5	97	R13	99
R6	97	R14	98
R7	96	R15	96
R8	91	--	--

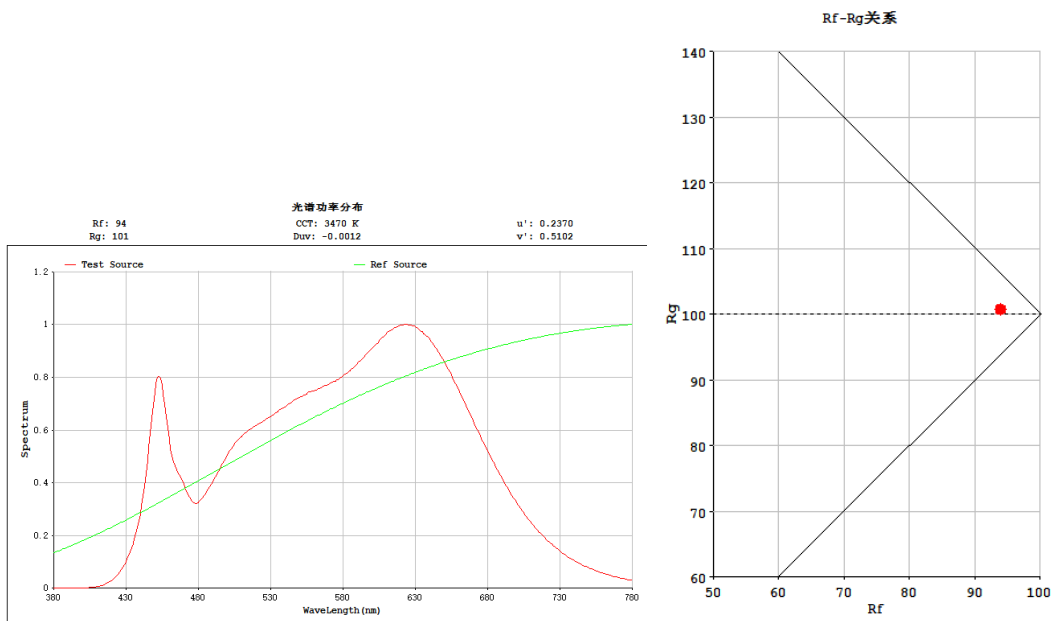
#### Photometric Measurement – Goniophotometer Method:

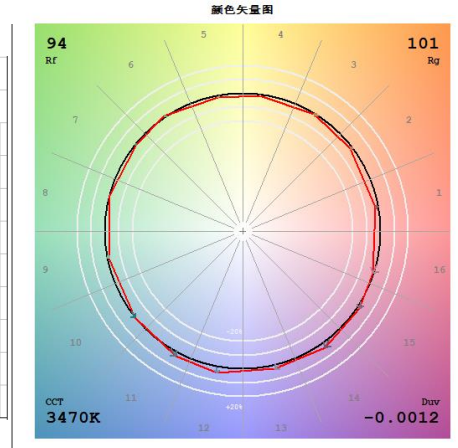
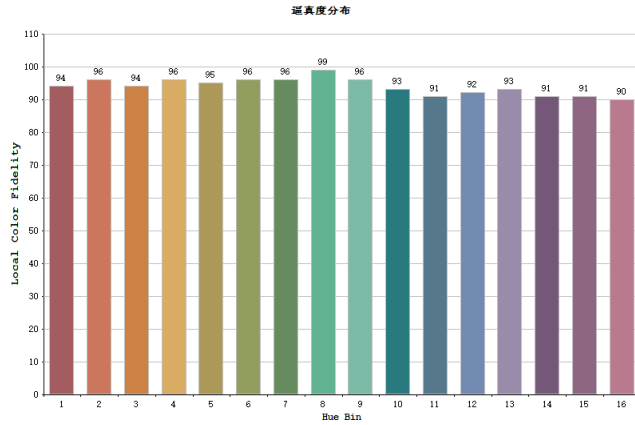
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1201.67
Luminous Efficacy (lm/W)	87.06
Beam Angle (°)	38.8
Center Beam Candle Power (cd)	2870

## Spectral Power Distribution & Chromaticity Diagram



## TM30



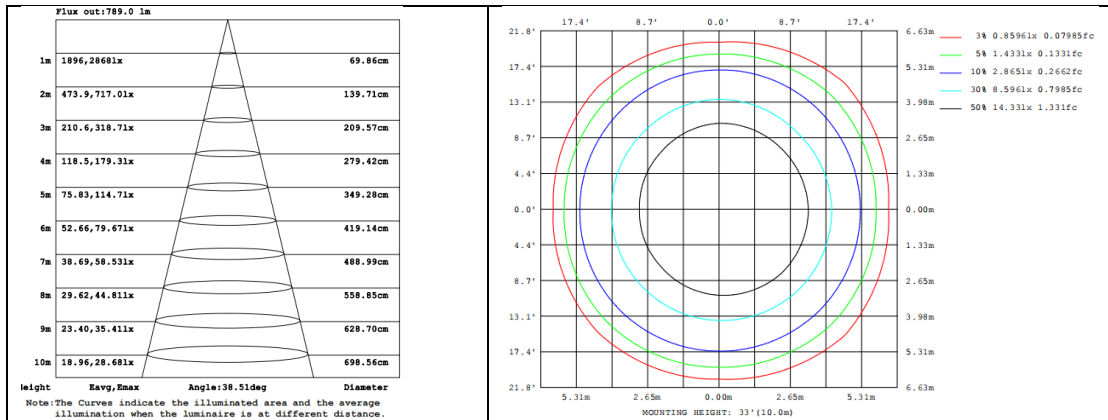
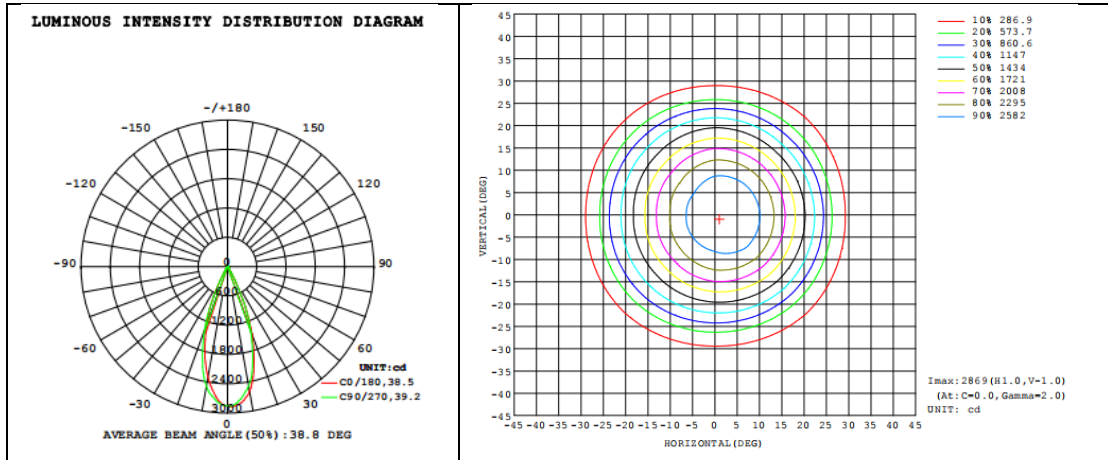


## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1118.0	93.01%
0-40	1182.0	98.34%
0-60	1202.0	100.00%
60-90	0.0	0.00%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1202.0	100.00%
90-180	0.0	0.00%
0-180	1202.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	253.40	21.08%	90-100	0	0%
10-20	535.6	44.56%	100-110	0	0%
20-30	329.00	27.37%	110-120	0	0%
30-40	64.15	5.34%	120-130	0	0%
40-50	16.89	1.41%	130-140	0	0%
50-60	2.620	0.22%	140-150	0	0%
60-70	0.0427	0.00%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

# Photometric Data





## 2.1.4 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2024-08-28	<b>Test Ambient:</b>	25.3
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	15
<b>Model Number</b>	R3STLB	<b>CCT Setting</b>	4000k

### Electrical Measurement:

<b>Sampel No.</b>	<b>Voltage (Vac)</b>	<b>Frequency (Hz)</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>
#1	120.7	60	0.118	13.94	0.980

### Chromaticity Measurement - Sphere-Spectroradiometer Method:

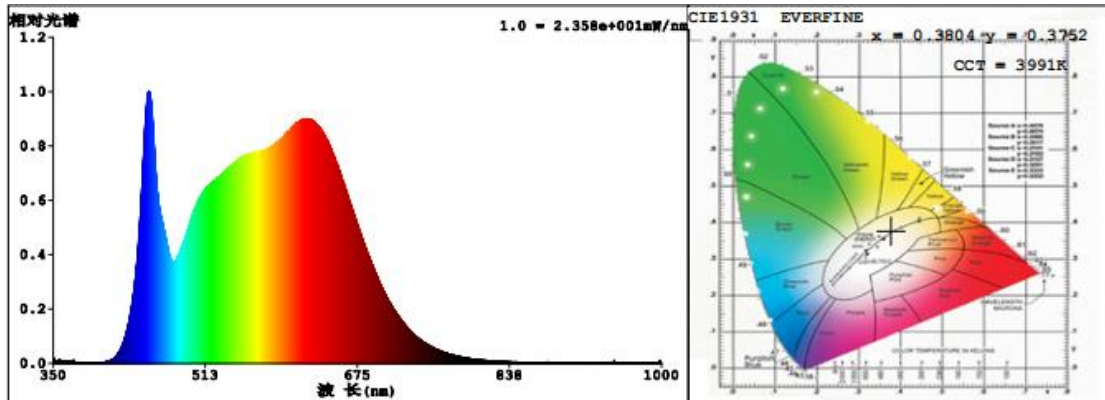
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3991
Duv	-0.000692
Chromaticity (x, y)	x=0.3804, y=0.3752
Chromaticity (u', v')	u' =0.2257, v' =0.5009
Color Rendering Index (CRI)	95.8
R9	80

<b>Special Color Rendering Indices</b>			
R1	97	R9	80
R2	98	R10	93
R3	97	R11	96
R4	96	R12	76
R5	96	R13	97
R6	95	R14	98
R7	96	R15	95
R8	92	--	--

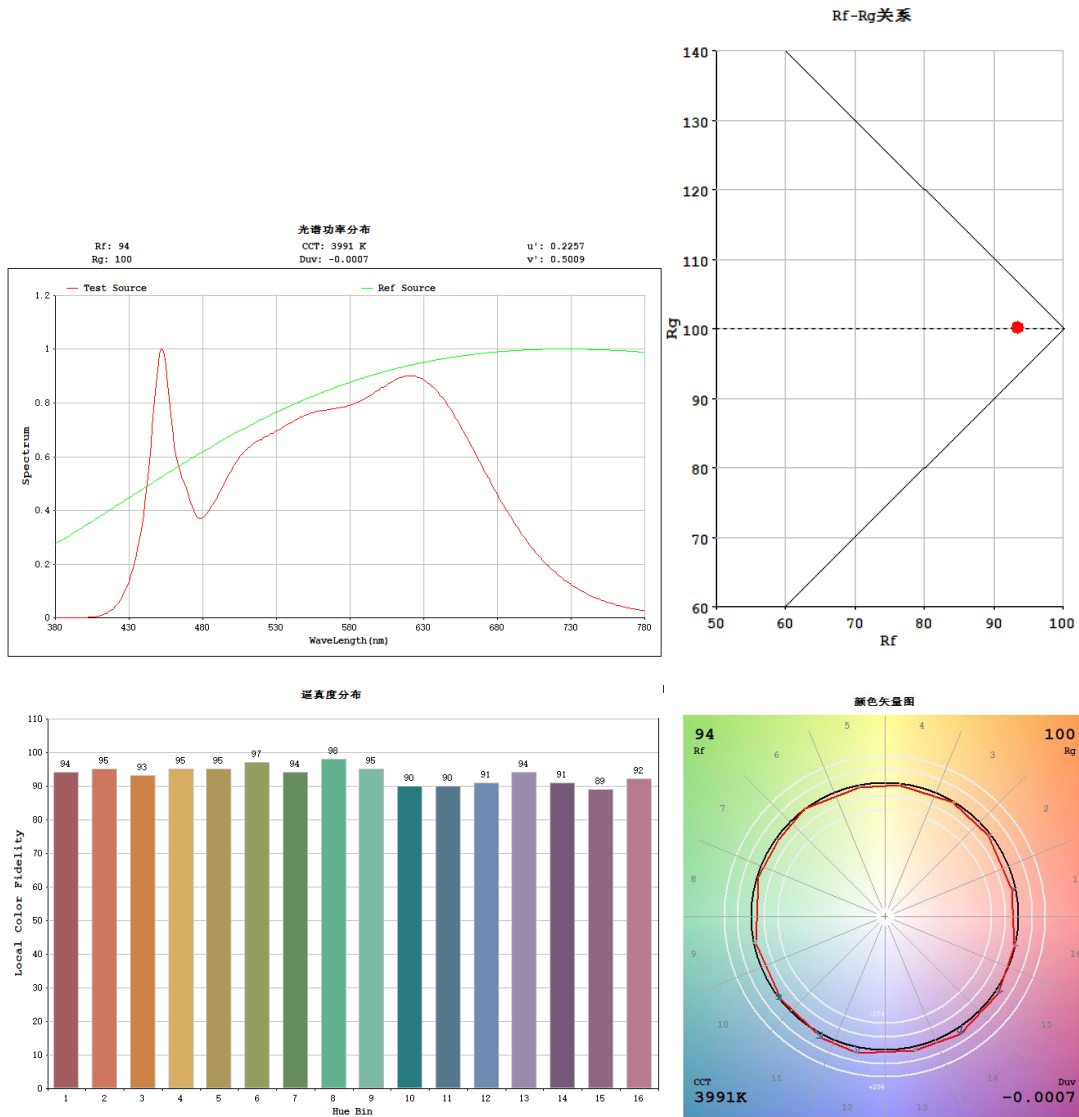
### Photometric Measurement – Goniophotometer Method:

<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1232.65
Luminous Efficacy (lm/W)	88.45
Beam Angle (°)	38.9
Center Beam Candle Power (cd)	2937

# Spectral Power Distribution & Chromaticity Diagram



## TM30

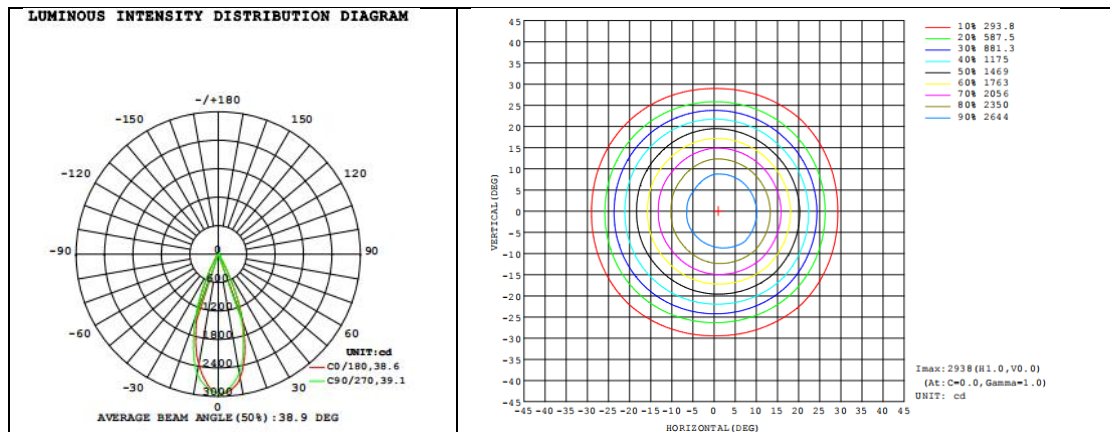


## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1147.0	93.03%
0-40	1213.0	98.38%
0-60	1233.0	100.00%
60-90	0.0	0.00%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1233.0	100.00%
90-180	0.0	0.00%
0-180	1233.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	259.60	21.05%	90-100	0	0%
10-20	549.2	44.54%	100-110	0	0%
20-30	337.70	27.39%	110-120	0	0%
30-40	66.06	5.36%	120-130	0	0%
40-50	17.34	1.41%	130-140	0	0%
50-60	2.696	0.22%	140-150	0	0%
60-70	0.0450	0.00%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

## Photometric Data





### 2.1.5 Electrical, Photometric and Chromaticity Measurements

<b>Test date</b>	2024-08-28	<b>Test Ambient:</b>	25.3
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	15
<b>Model Number</b>	R3STLB	<b>CCT Setting</b>	5000k

#### Electrical Measurement:

<b>Sampel No.</b>	<b>Voltage (Vac)</b>	<b>Frequency (Hz)</b>	<b>Current (A)</b>	<b>Power (W)</b>	<b>Power Factor</b>
#1	120.7	60	0.124	14.63	0.982

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

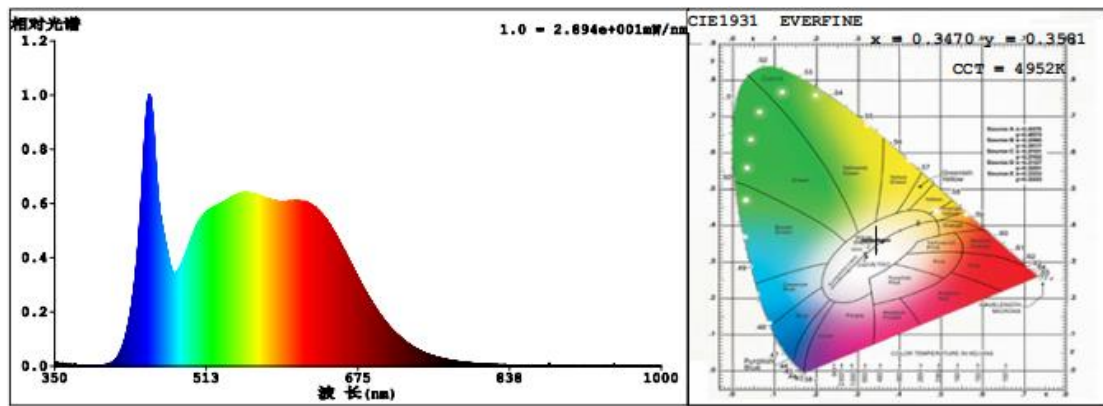
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	4952
Duv	0.00249
Chromaticity (x, y)	x=0.3470, y=0.3581
Chromaticity (u', v')	u' =0.2102, v' =0.4881
Color Rendering Index (CRI)	92.5
R9	67

<b>Special Color Rendering Indices</b>			
R1	92	R9	67
R2	94	R10	86
R3	95	R11	92
R4	92	R12	69
R5	91	R13	93
R6	91	R14	97
R7	96	R15	90
R8	88	--	--

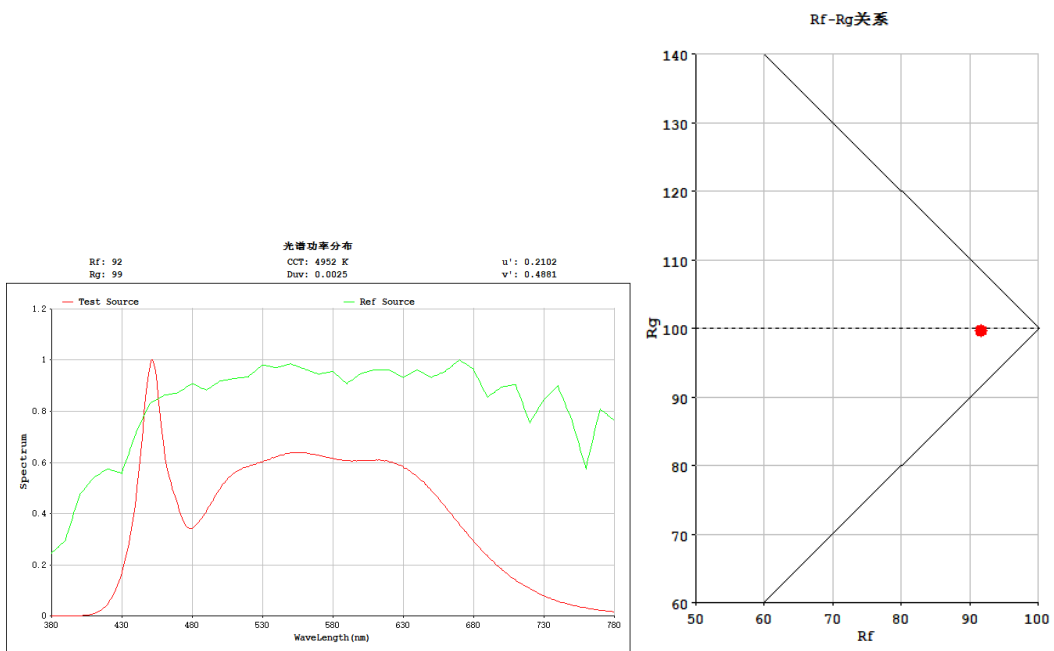
#### Photometric Measurement – Goniophotometer Method:

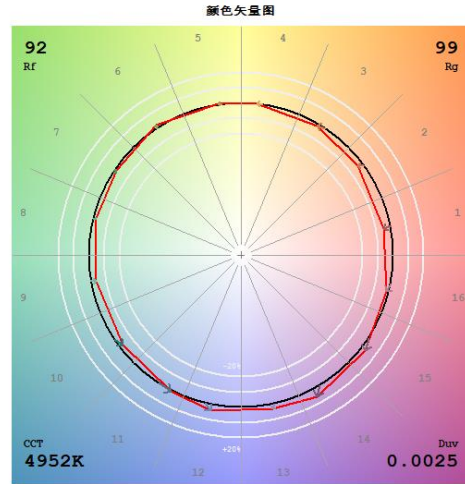
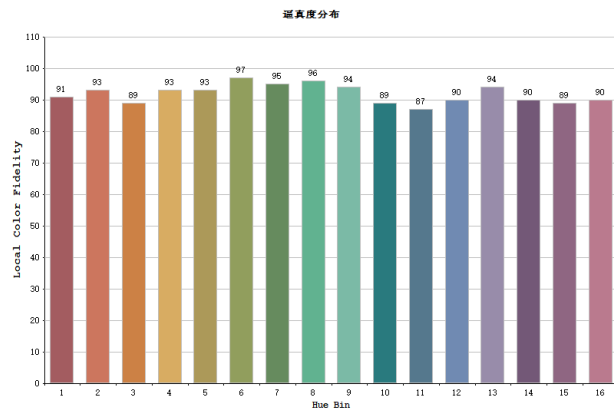
<b>Parameter</b>	<b>Result</b>
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1227.28
Luminous Efficacy (lm/W)	83.88
Beam Angle (°)	38.9
Center Beam Candle Power (cd)	2930

## Spectral Power Distribution & Chromaticity Diagram



## TM30





## Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1141.0	92.99%
0-40	1207.0	98.37%
0-60	1227.0	100.00%
60-90	0.0	0.00%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1227.0	100.00%
90-180	0.0	0.00%
0-180	1227.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	257.90	21.02%	90-100	0	0%
10-20	546.0	44.50%	100-110	0	0%
20-30	337.20	27.48%	110-120	0	0%
30-40	66.12	5.39%	120-130	0	0%
40-50	17.29	1.41%	130-140	0	0%
50-60	2.688	0.22%	140-150	0	0%
60-70	0.0454	0.00%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

# Photometric Data

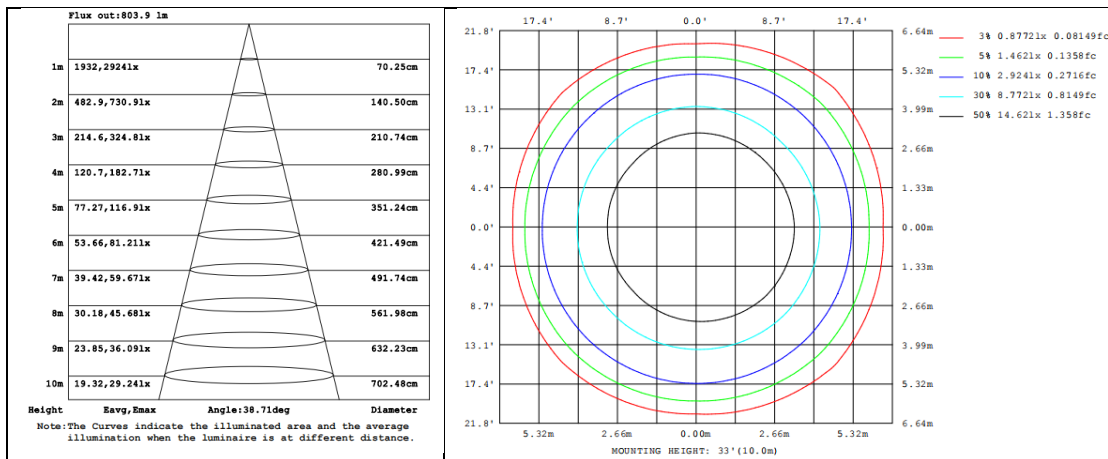
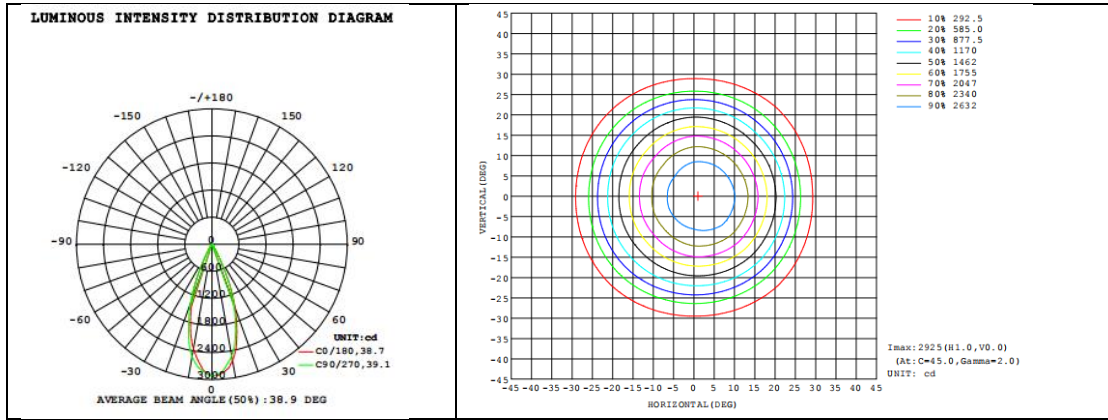


Table--1

UNIT: cd

y (DEG)	C (DEG)																			
	0	45	90	135	180	225	270	315												
0	2910	2910	2910	2910	2910	2910	2910	2910												
5	2854	2861	2806	2765	2723	2741	2795	2839												
10	2629	2637	2513	2409	2357	2405	2536	2592												
15	2136	2147	2035	1903	1854	1887	2017	2076												
20	1490	1502	1413	1331	1289	1319	1388	1402												
25	770	806	778	757	704	688	690	712												
30	244	285	257	268	226	236	214	263												
35	74.0	123	77.0	106	69.9	103	68.9	120												
40	29.7	56.4	32.9	53.2	32.3	50.5	30.1	56.1												
45	14.5	27.5	17.0	27.7	16.3	25.6	14.5	25.8												
50	5.06	13.4	5.72	14.2	5.34	12.5	4.68	11.7												
55	0.71	3.84	0.70	4.58	0.55	3.54	0.48	3.16												
60	0.20	0.26	0.20	0.38	0.13	0.23	0.17	0.22												
65	0.05	0.00	0.05	0.00	0.01	0.02	0.03	0.02												
70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												

Model Number	CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
R3STLB	2700K setting	120.7	1024.22	14.58	70.23
	3000K setting	120.7	1125.07	14.23	79.04
	3500K setting	120.7	1201.67	13.80	87.06
	4000K setting	120.7	1232.65	13.94	88.45
	5000K setting	120.7	1227.28	14.63	83.88