

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) :

R2STL

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

Type of Luminaire: Downlights

Report Date: 2024-09-05

1.1 Rated Values:	
Rated Voltage / Frequency	120V, 60HZ
Nominal Power	9W
Rated Initial Lamp Lumen	600lm (5000k)
Declared CCT	2700k/3000k/3500k/4000k/5000k

1.2 Test Specifications:

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

1.3 Test Methods

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

Test date	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R2STL	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.077	9.13	0.980

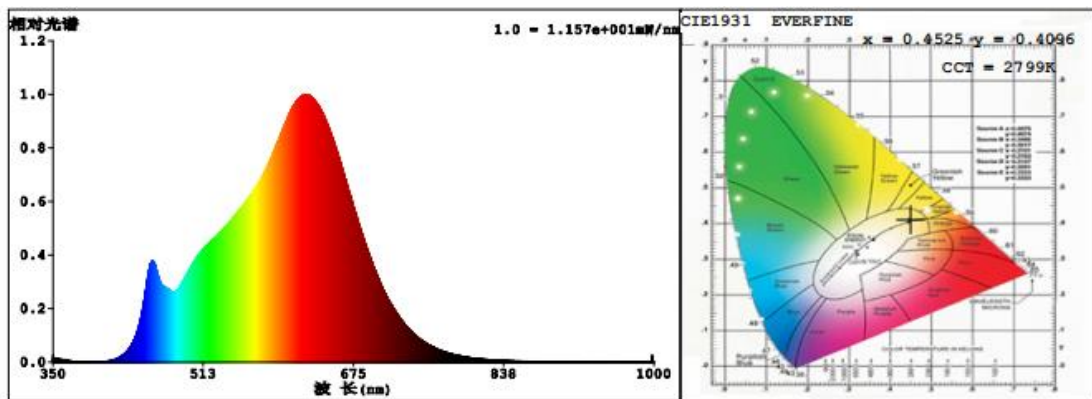
Chromaticity Measurement – Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	2799
Duv	0.000313
Chromaticity (x, y)	x=0.4525, y=0.4096
Chromaticity (u', v')	u' =0.2582, v' =0.5259
Color Rendering Index (CRI)	94.7
R9	68
Special Color Rendering Indices	
R1	97
R2	100
R3	97
R4	95
R5	97
R6	96
R7	92
R8	85
R9	68
R10	99
R11	98
R12	87
R13	98
R14	99
R15	92
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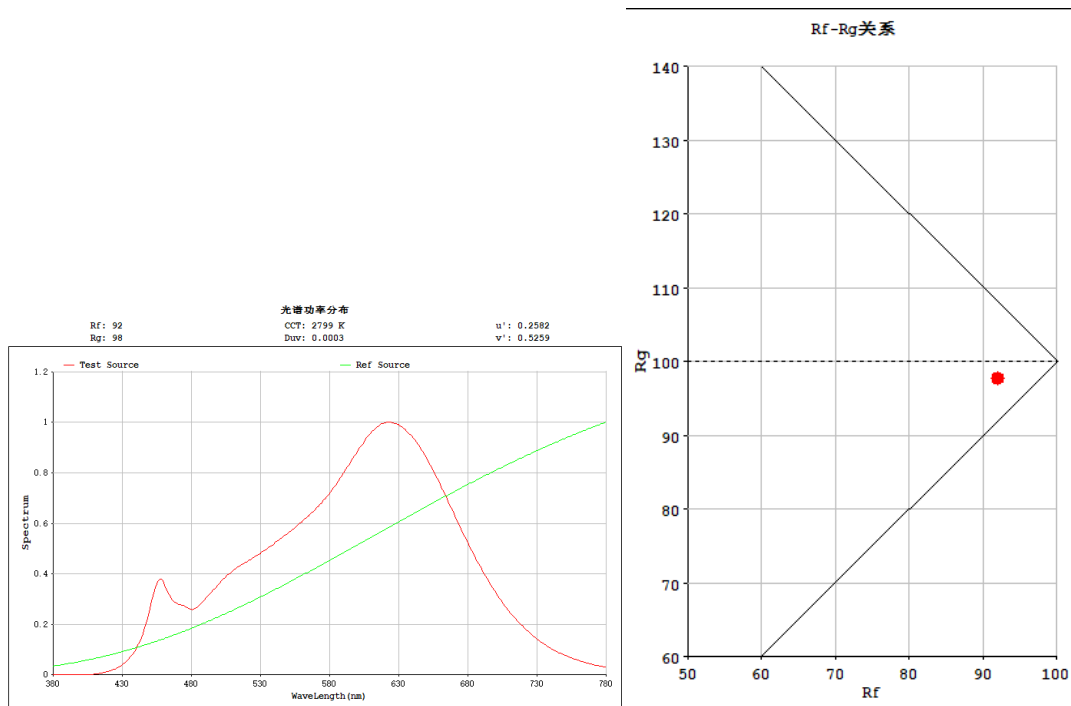
Photometric Measurement – Goniophotometer Method:

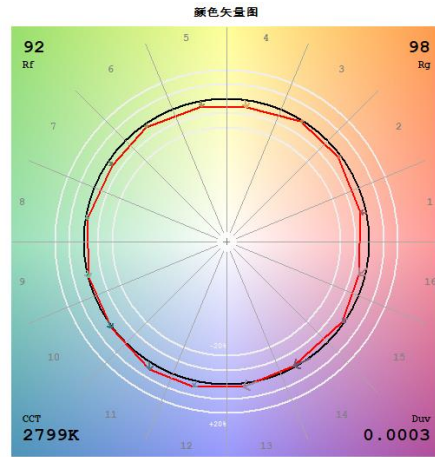
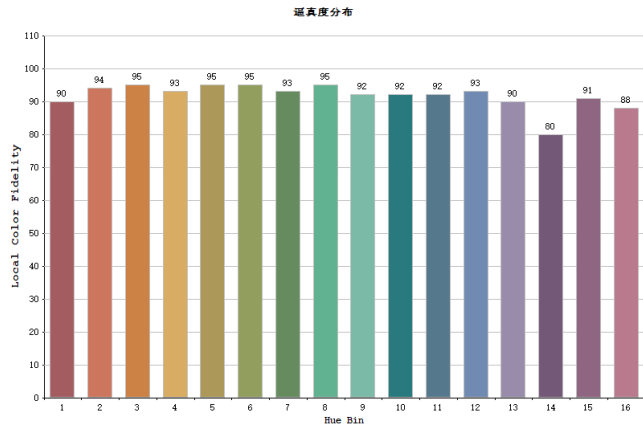
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	542.936
Luminous Efficacy (lm/W)	59.44
Beam Angle (°)	35.9
Center Beam Candle Power (cd)	1271

Spectral Power Distribution & Chromaticity Diagram



TM30



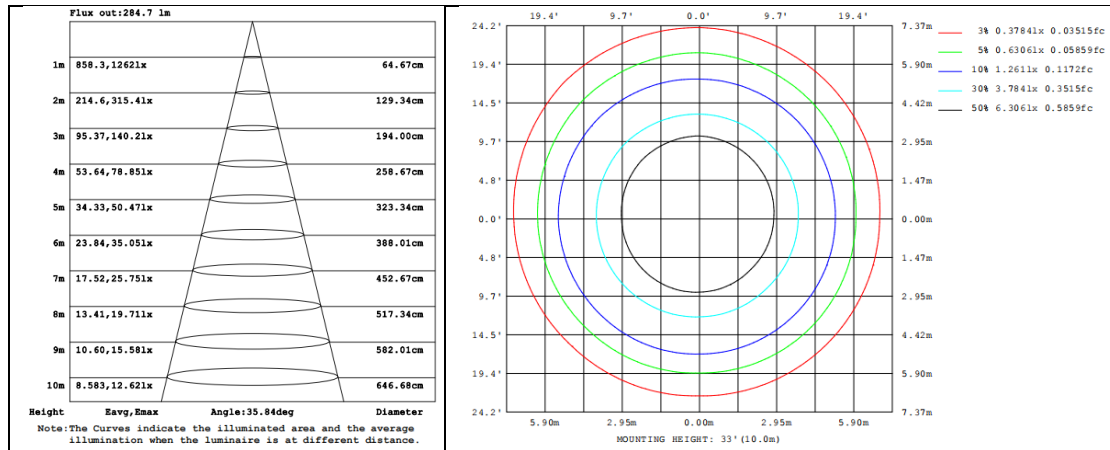
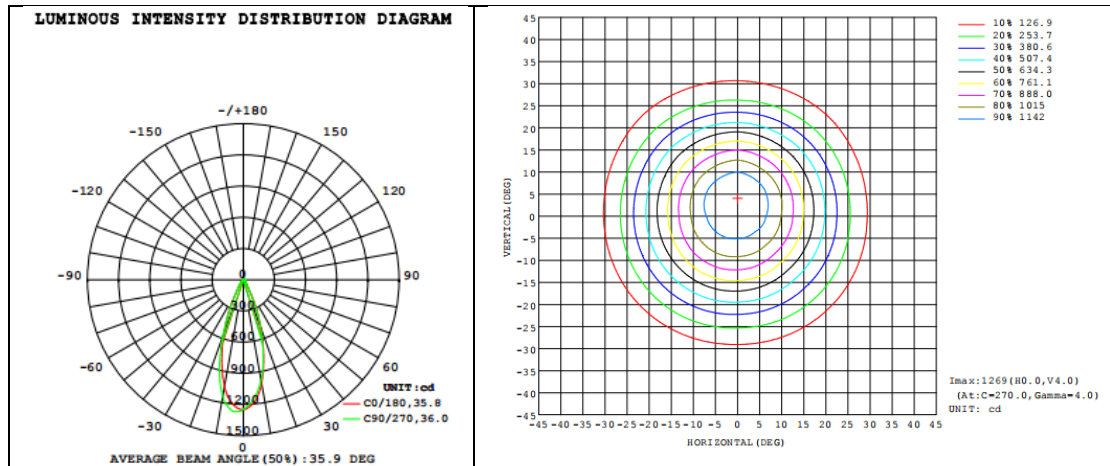


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	460.0	84.73%
0-40	505.6	93.13%
0-60	538.6	99.21%
60-90	4.4	0.80%
70-100	1.0	0.19%
90-120	0.0	0.00%
0-90	542.9	100.00%
90-180	0.0	0.00%
0-180	542.9	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	109.40	20.15%	90-100	0	0%
10-20	216.4	39.86%	100-110	0	0%
20-30	134.20	24.72%	110-120	0	0%
30-40	45.59	8.40%	120-130	0	0%
40-50	22.61	4.16%	130-140	0	0%
50-60	10.380	1.91%	140-150	0	0%
60-70	3.3430	0.62%	150-160	0	0%
70-80	0.8878	0.16%	160-170	0	0%
80-90	0.1333	0.02%	170-180	0	0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R2STL	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.075	8.92	0.979

Chromaticity Measurement – Sphere-Spectroradiometer Method:

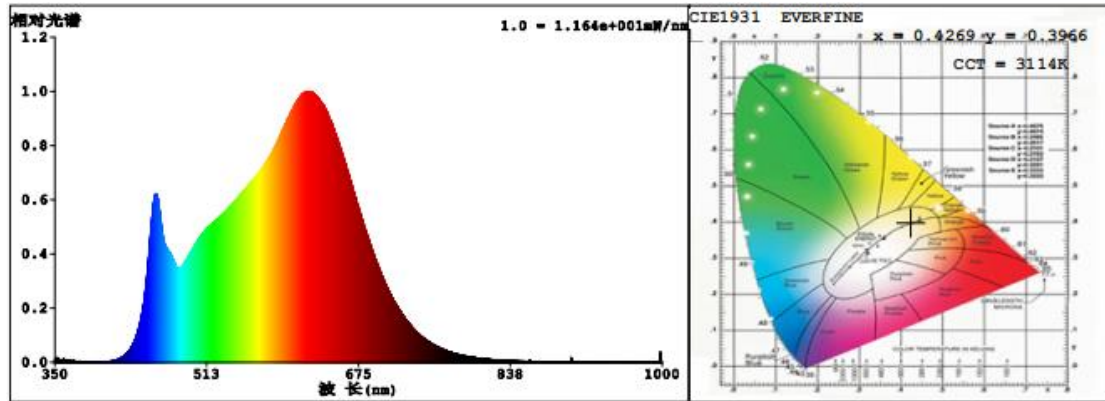
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3114
Duv	-0.00155
Chromaticity (x, y)	x=0.4269, y=0.3966
Chromaticity (u', v')	u' =0.2473, v' =0.5169
Color Rendering Index (CRI)	94.5
R9	75

Special Color Rendering Indices			
R1	98	R9	75
R2	98	R10	96
R3	96	R11	98
R4	95	R12	82
R5	97	R13	99
R6	94	R14	98
R7	91	R15	95
R8	87	--	--

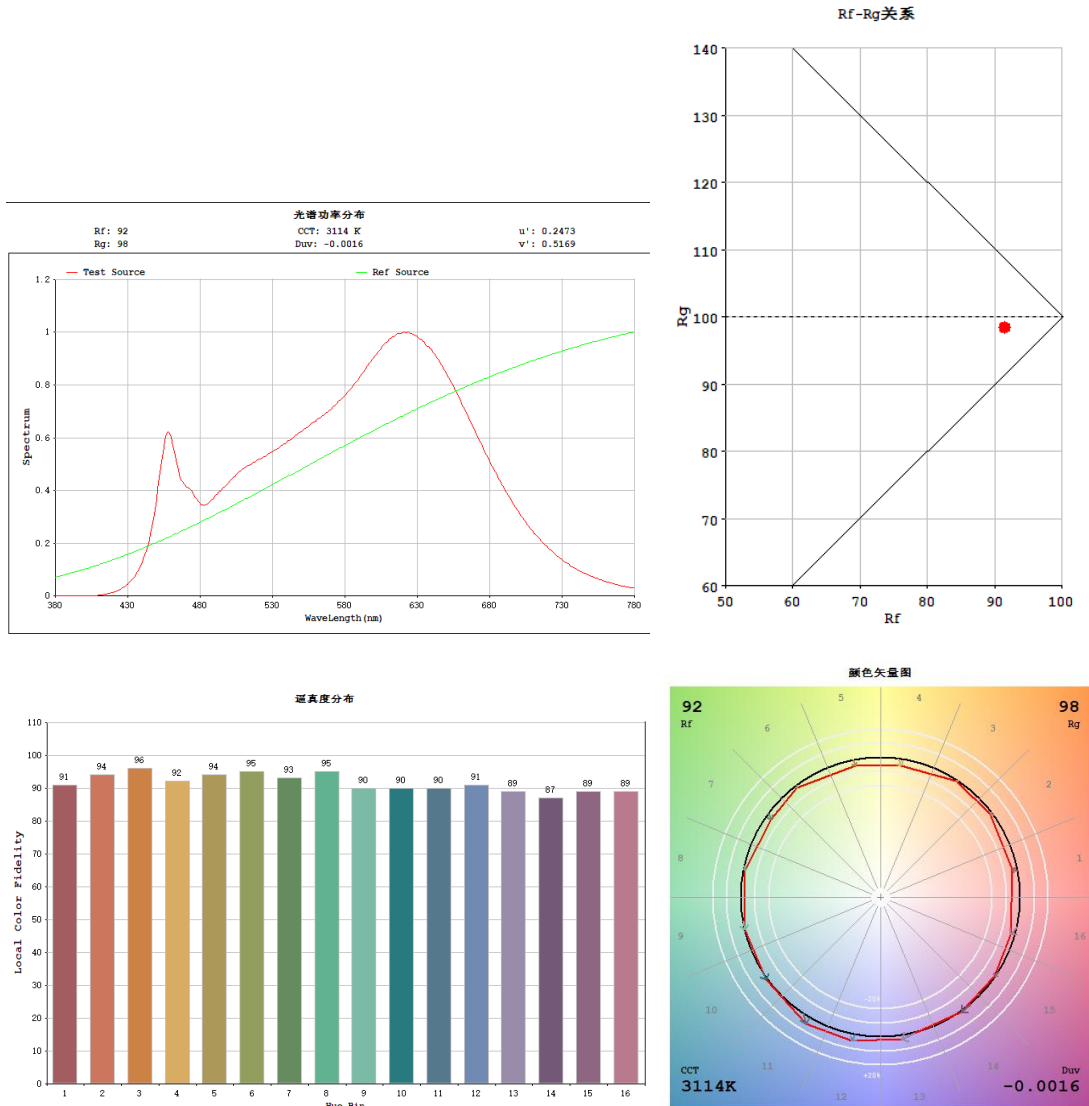
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	591.644
Luminous Efficacy (lm/W)	66.36
Beam Angle (°)	36.0
Center Beam Candle Power (cd)	1376

Spectral Power Distribution & Chromaticity Diagram



TM30



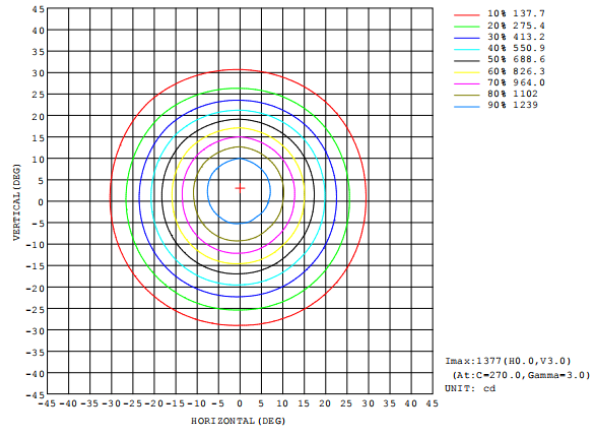
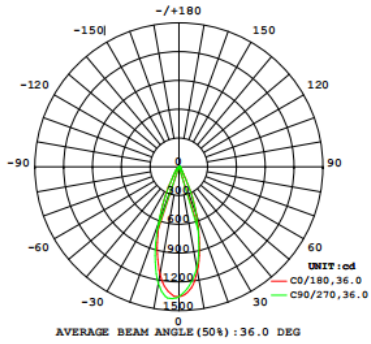
Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	501.1	84.70%
0-40	550.8	93.10%
0-60	586.8	99.19%
60-90	4.8	0.81%
70-100	1.1	0.19%
90-120	0.0	0.00%
0-90	591.6	100.00%
90-180	0.0	0.00%
0-180	591.6	100.00%

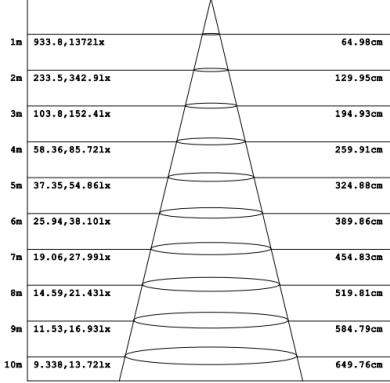
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	118.90	20.10%	90-100	0	0%
10-20	235.7	39.84%	100-110	0	0%
20-30	146.50	24.76%	110-120	0	0%
30-40	49.79	8.42%	120-130	0	0%
40-50	24.67	4.17%	130-140	0	0%
50-60	11.330	1.92%	140-150	0	0%
60-70	3.6570	0.62%	150-160	0	0%
70-80	0.9839	0.17%	160-170	0	0%
80-90	0.1559	0.03%	170-180	0	0%

Photometric Data

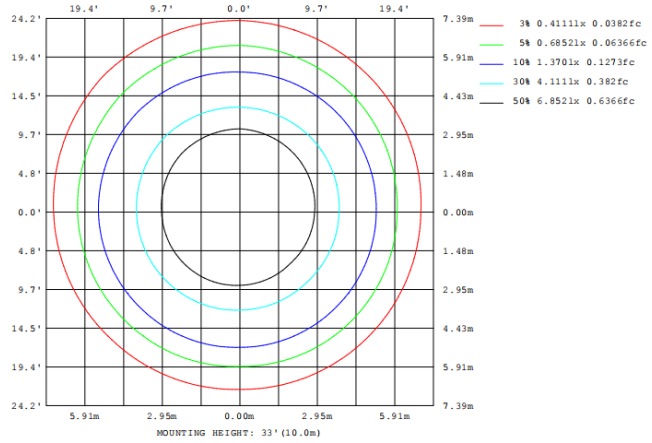
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Flux out: 309.7 lm



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



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R2STL	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.073	8.56	0.977

Chromaticity Measurement - Sphere-Spectroradiometer Method:

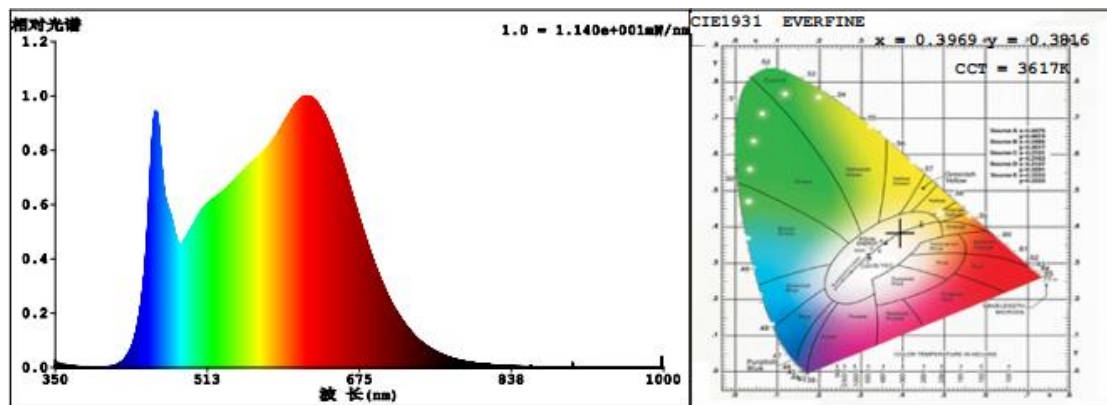
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3617
Duv	-0.00216
Chromaticity (x, y)	x=0.3969, y=0.3816
Chromaticity (u', v')	u' =0.2340, v' =0.5061
Color Rendering Index (CRI)	94.3
R9	80

Special Color Rendering Indices			
R1	98	R9	80
R2	97	R10	95
R3	96	R11	97
R4	94	R12	78
R5	96	R13	99
R6	94	R14	98
R7	91	R15	96
R8	89	--	--

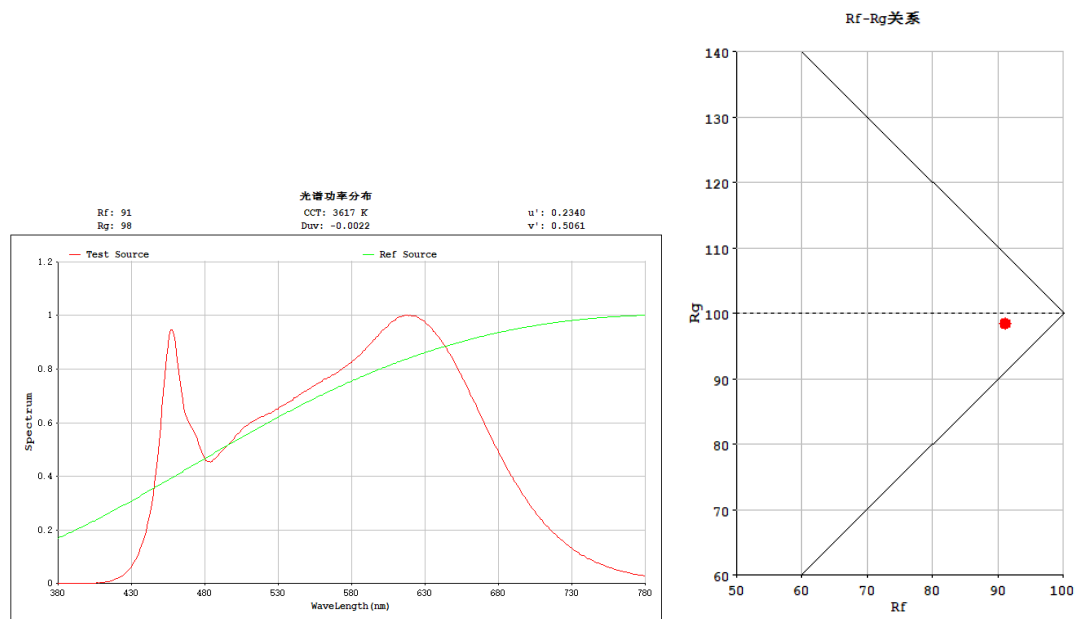
Photometric Measurement – Goniophotometer Method:

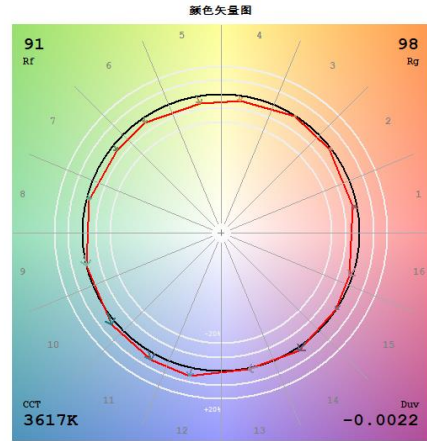
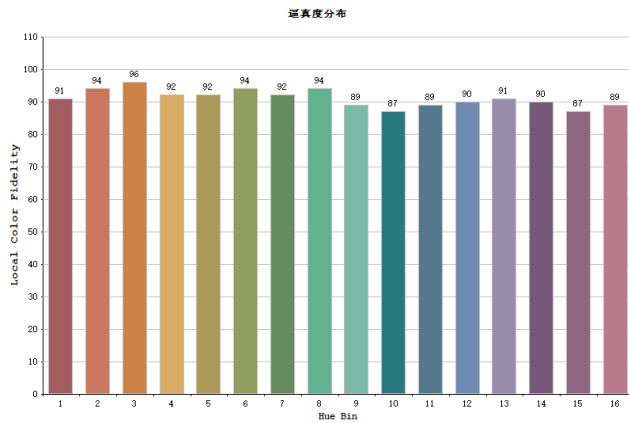
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	640.996
Luminous Efficacy (lm/W)	74.89
Beam Angle (°)	36.1
Center Beam Candle Power (cd)	1486

Spectral Power Distribution & Chromaticity Diagram



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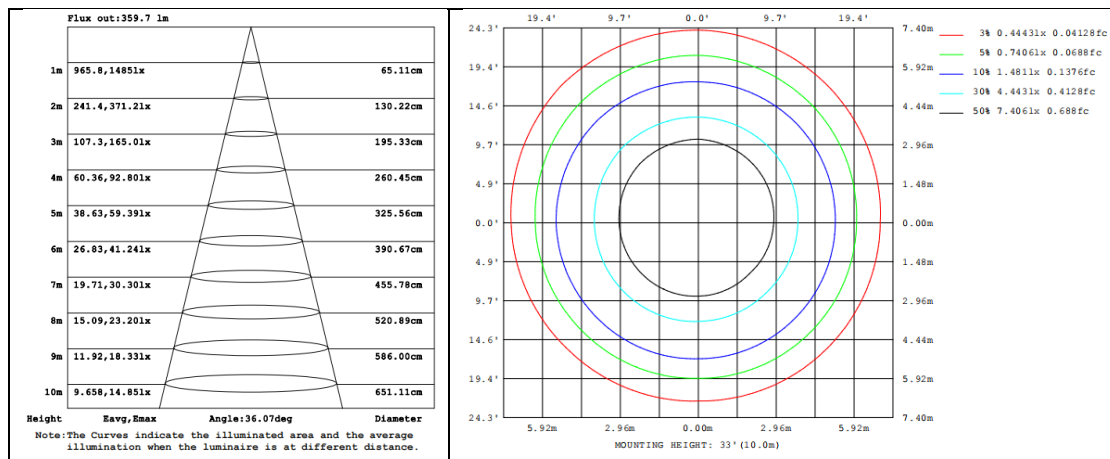
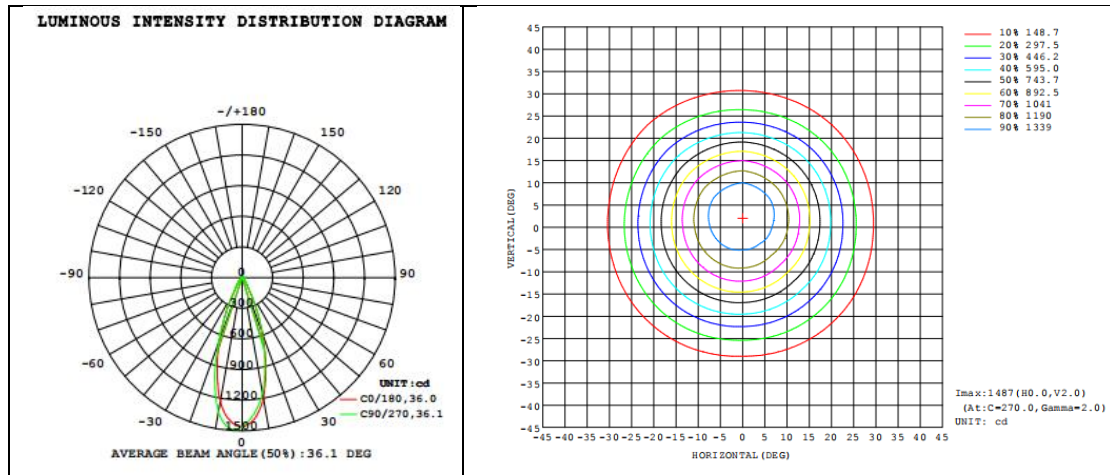


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	542.6	84.65%
0-40	596.7	93.09%
0-60	635.8	99.19%
60-90	5.2	0.82%
70-100	1.3	0.20%
90-120	0.0	0.00%
0-90	641.0	100.00%
90-180	0.0	0.00%
0-180	641.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	128.40	20.03%	90-100	0	0%
10-20	255.1	39.80%	100-110	0	0%
20-30	159.00	24.80%	110-120	0	0%
30-40	54.11	8.44%	120-130	0	0%
40-50	26.77	4.18%	130-140	0	0%
50-60	12.290	1.92%	140-150	0	0%
60-70	3.9780	0.62%	150-160	0	0%
70-80	1.0810	0.17%	160-170	0	0%
80-90	0.1788	0.03%	170-180	0	0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R2STL	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.074	8.67	0.978

Chromaticity Measurement - Sphere-Spectroradiometer Method:

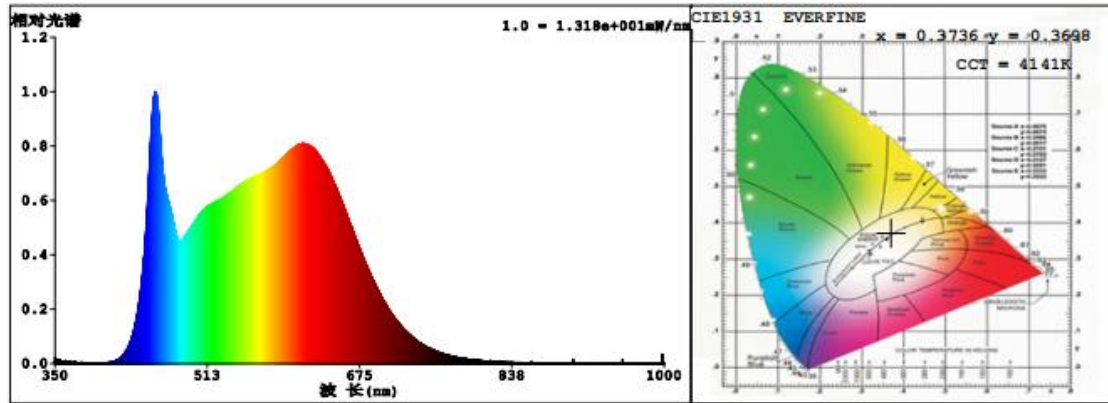
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	4141
Duv	-0.00126
Chromaticity (x, y)	x=0.3736, y=0.3698
Chromaticity (u', v')	u' =0.2234, v' =0.4974
Color Rendering Index (CRI)	94.1
R9	79

Special Color Rendering Indices			
R1	97	R9	79
R2	98	R10	97
R3	96	R11	95
R4	92	R12	74
R5	95	R13	99
R6	95	R14	99
R7	91	R15	95
R8	88	--	--

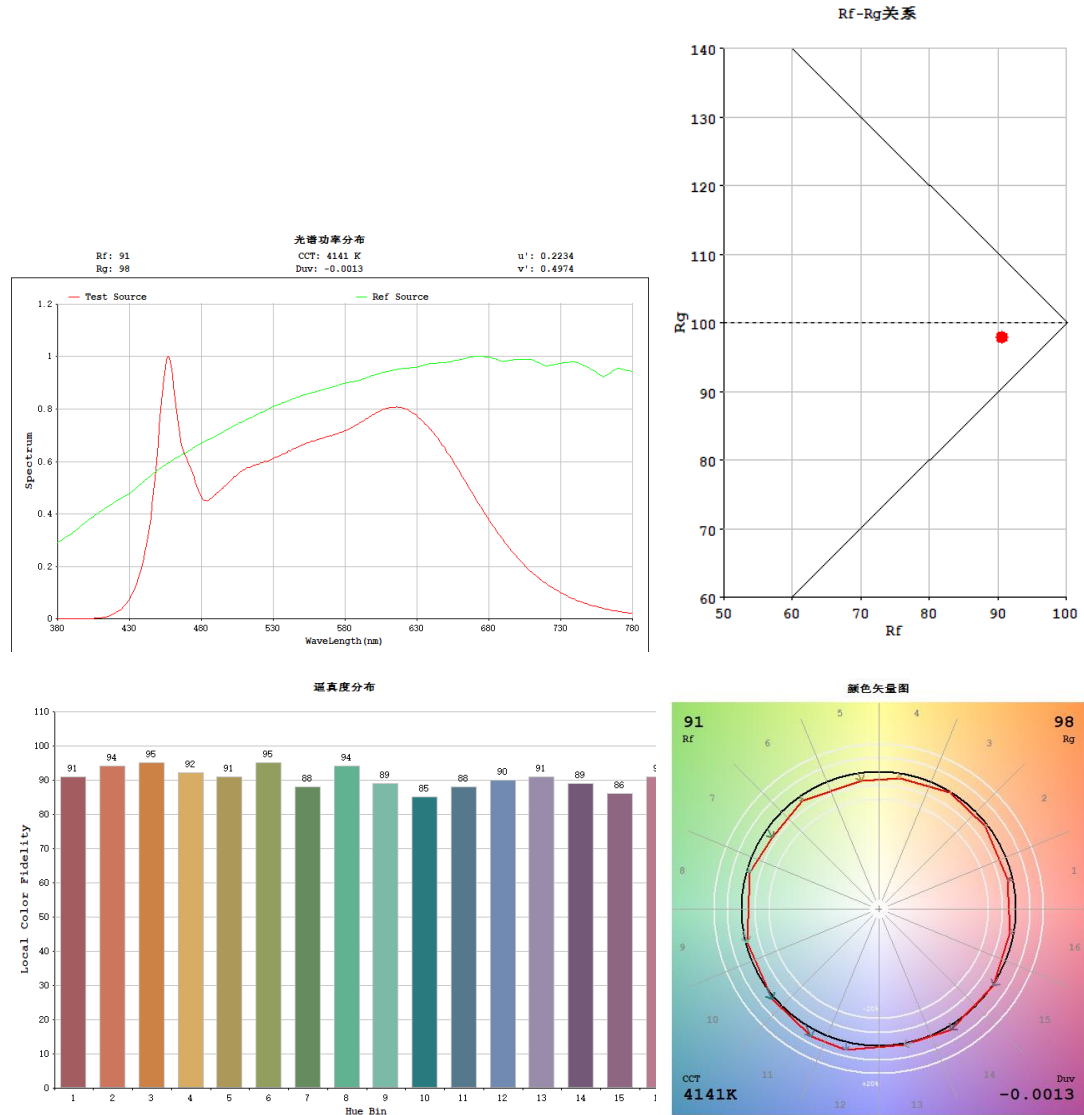
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	657.166
Luminous Efficacy (lm/W)	75.78
Beam Angle (°)	36.1
Center Beam Candle Power (cd)	1520

Spectral Power Distribution & Chromaticity Diagram



TM30



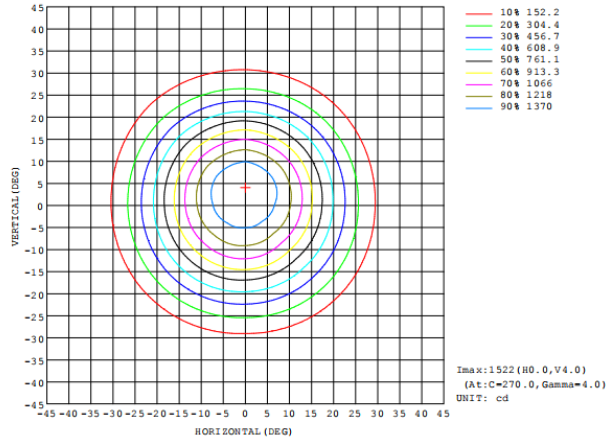
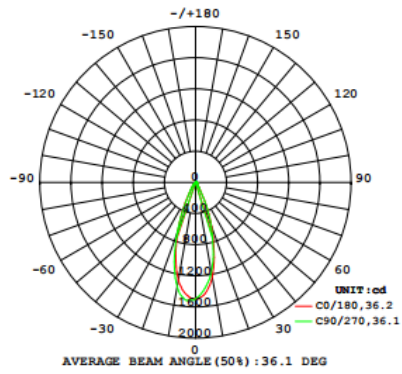
Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	556.1	84.62%
0-40	611.7	93.08%
0-60	651.8	99.18%
60-90	5.4	0.82%
70-100	1.3	0.20%
90-120	0.0	0.00%
0-90	657.2	100.00%
90-180	0.0	0.00%
0-180	657.2	100.00%

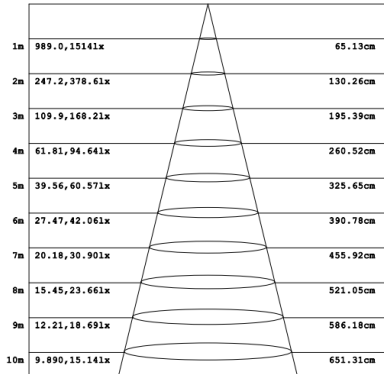
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	131.40	19.99%	90-100	0	0%
10-20	261.4	39.77%	100-110	0	0%
20-30	163.30	24.85%	110-120	0	0%
30-40	55.57	8.46%	120-130	0	0%
40-50	27.50	4.18%	130-140	0	0%
50-60	12.620	1.92%	140-150	0	0%
60-70	4.0870	0.62%	150-160	0	0%
70-80	1.1140	0.17%	160-170	0	0%
80-90	0.1866	0.03%	170-180	0	0%

Photometric Data

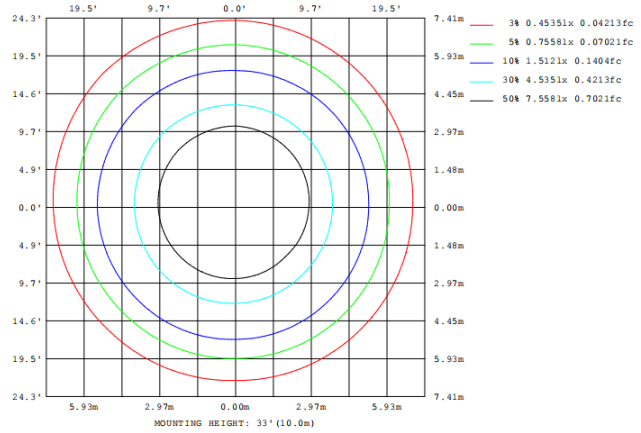
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Flux out: 368.4 lm



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

Test date	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R2STL	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.077	9.14	0.980

Chromaticity Measurement - Sphere-Spectroradiometer Method:

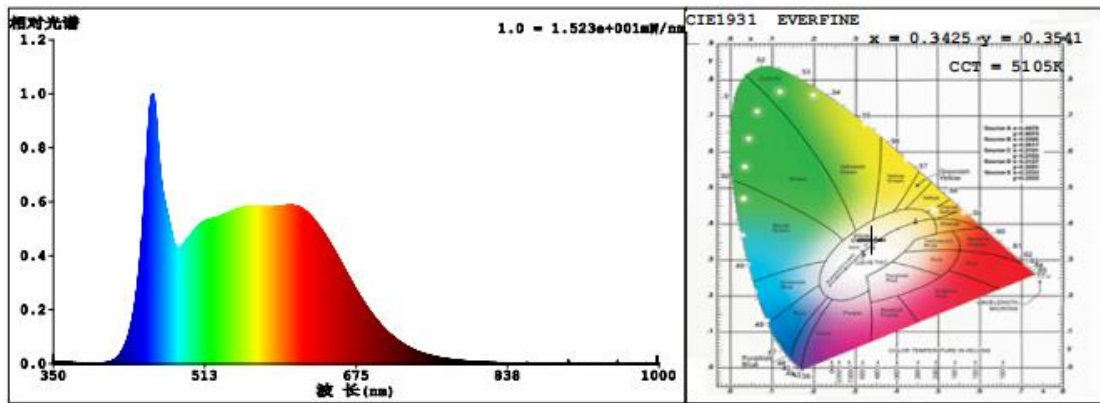
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	5105
Duv	0.00227
Chromaticity (x, y)	x=0.3425, y=0.3541
Chromaticity (u', v')	u' =0.2087, v' =0.4855
Color Rendering Index (CRI)	93.1
R9	66

Special Color Rendering Indices			
R1	94	R9	66
R2	99	R10	98
R3	97	R11	92
R4	90	R12	74
R5	93	R13	97
R6	95	R14	99
R7	91	R15	92
R8	85	--	--

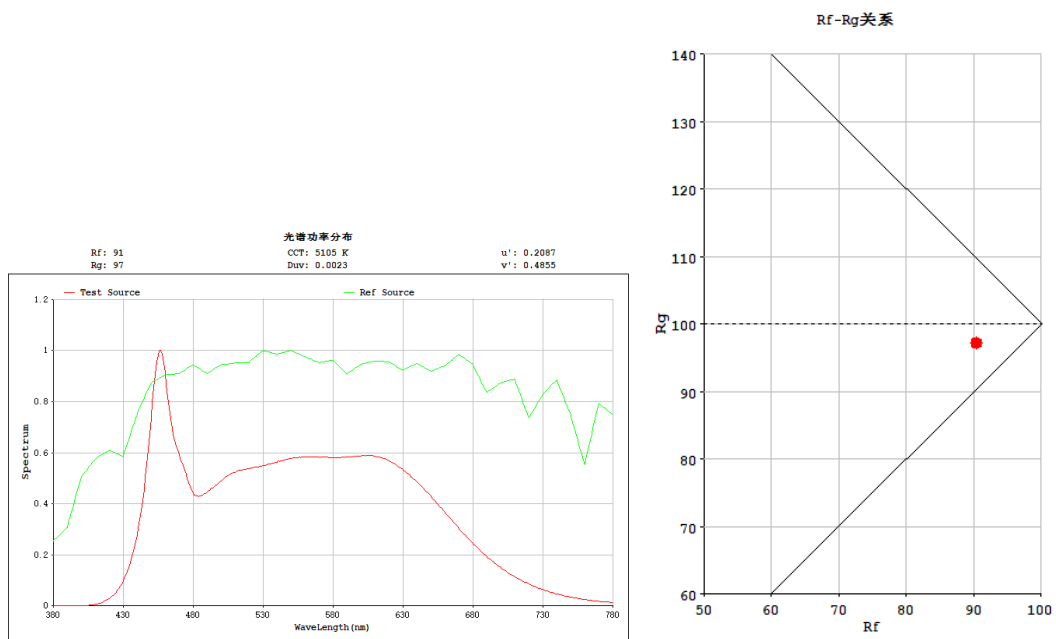
Photometric Measurement – Goniophotometer Method:

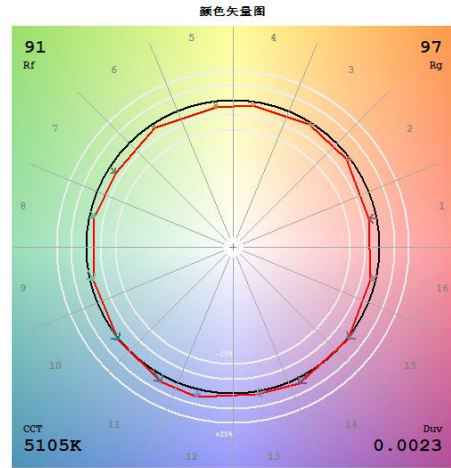
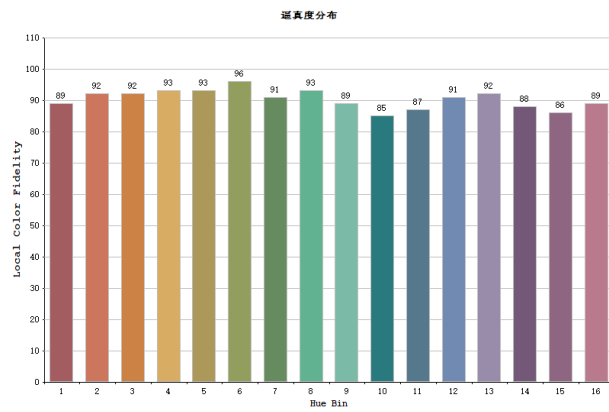
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	632.941
Luminous Efficacy (lm/W)	69.21
Beam Angle (°)	36.2
Center Beam Candle Power (cd)	1455

Spectral Power Distribution & Chromaticity Diagram



TM30





Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	535.3	84.58%
0-40	589.0	93.06%
0-60	627.8	99.19%
60-90	5.2	0.82%
70-100	1.2	0.20%
90-120	0.0	0.00%
0-90	632.9	100.00%
90-180	0.0	0.00%
0-180	632.9	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	126.10	19.92%	90-100	0	0%
10-20	251.4	39.72%	100-110	0	0%
20-30	157.70	24.92%	110-120	0	0%
30-40	53.72	8.49%	120-130	0	0%
40-50	26.56	4.20%	130-140	0	0%
50-60	12.180	1.92%	140-150	0	0%
60-70	3.9370	0.62%	150-160	0	0%
70-80	1.0710	0.17%	160-170	0	0%
80-90	0.1761	0.03%	170-180	0	0%

Photometric Data

