

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) :

GR4STLB

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

Type of Luminaire: Downlights

Report Date: 2024-09-02

1.1 Rated Values:	
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"> 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	2024-09-02	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR4STLB	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.120	14.25	0.981

Chromaticity Measurement – Sphere-Spectroradiometer Method:

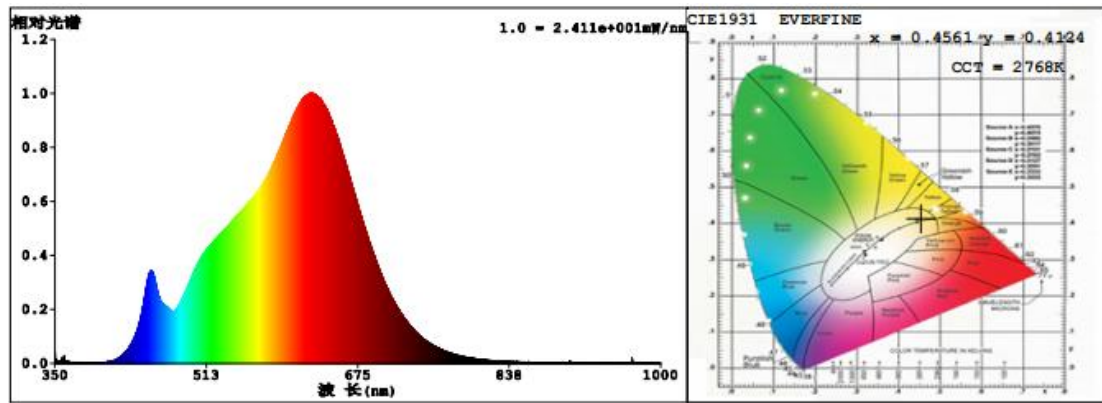
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	2768
Duv	0.00102
Chromaticity (x, y)	x=0.4561, y=0.4124
Chromaticity (u', v')	u' =0.2592, v' =0.5275
Color Rendering Index (CRI)	95.7
R9	69

Special Color Rendering Indices			
R1	96	R9	69
R2	98	R10	95
R3	99	R11	99
R4	97	R12	89
R5	96	R13	97
R6	98	R14	99
R7	94	R15	92
R8	86	--	--

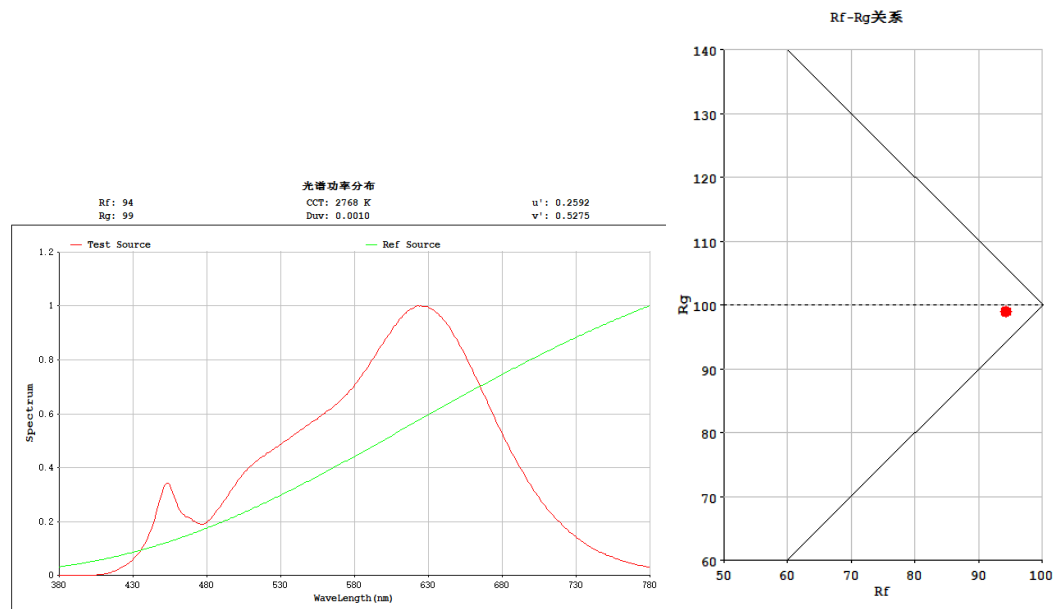
Photometric Measurement – Goniophotometer Method:

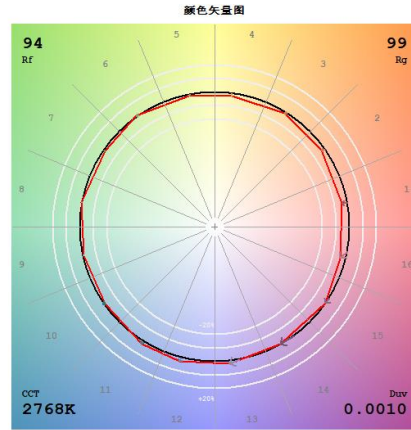
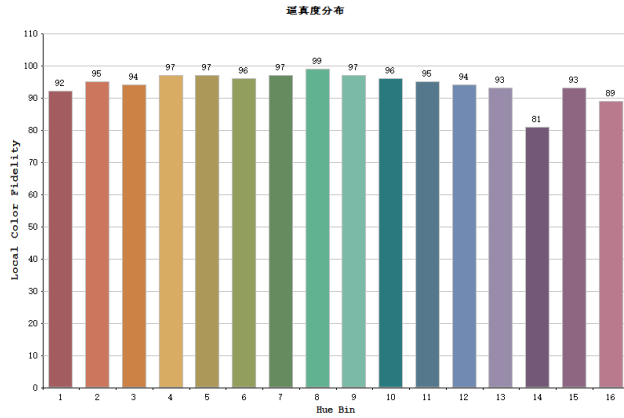
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1027.38
Luminous Efficacy (lm/W)	72.11
Beam Angle (°)	36.6
Center Beam Candle Power (cd)	2863

Spectral Power Distribution & Chromaticity Diagram



TM30



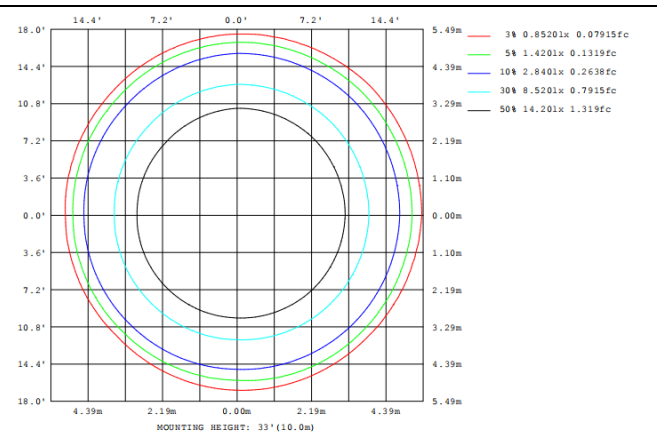
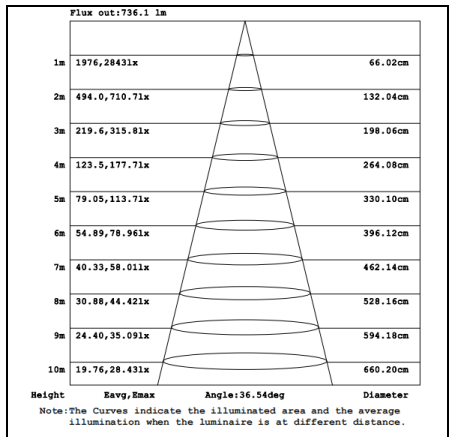
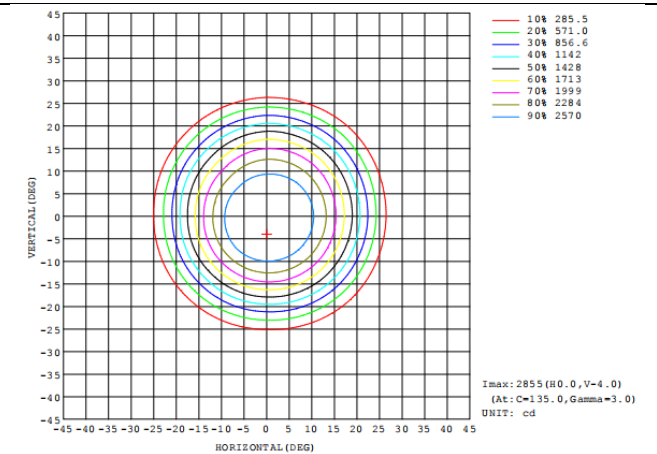
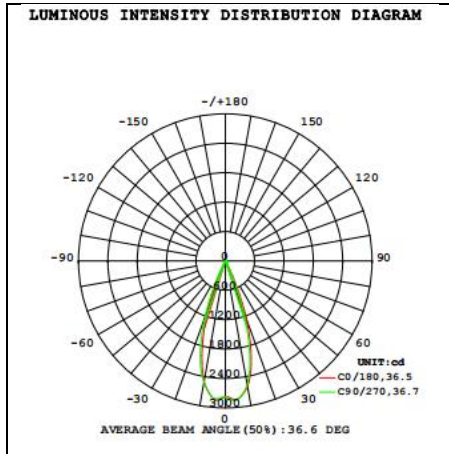


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	974.6	94.90%
0-40	1001.0	97.47%
0-60	1026.0	99.90%
60-90	1.2	0.12%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1027.0	100.00%
90-180	0.0	0.00%
0-180	1027.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	260.10	25.33%	90-100	0	0%
10-20	520.5	50.68%	100-110	0	0%
20-30	193.90	18.88%	110-120	0	0%
30-40	26.27	2.56%	120-130	0	0%
40-50	16.53	1.61%	130-140	0	0%
50-60	8.754	0.85%	140-150	0	0%
60-70	1.2040	0.12%	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

Test date	2024-09-02	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR4STLB	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.118	14.02	0.980

Chromaticity Measurement – Sphere-Spectroradiometer Method:

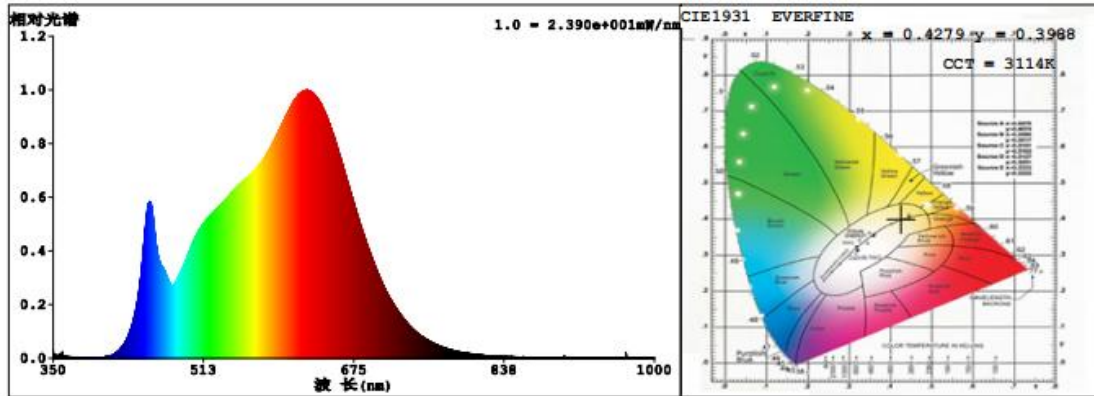
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3114
Duv	-0.000801
Chromaticity (x, y)	x=0.4279, y=0.3988
Chromaticity (u', v')	u' =0.2470, v' =0.5180
Color Rendering Index (CRI)	96.4
R9	76

Special Color Rendering Indices			
R1	98	R9	76
R2	99	R10	97
R3	99	R11	98
R4	97	R12	84
R5	97	R13	99
R6	97	R14	99
R7	94	R15	95
R8	89	--	--

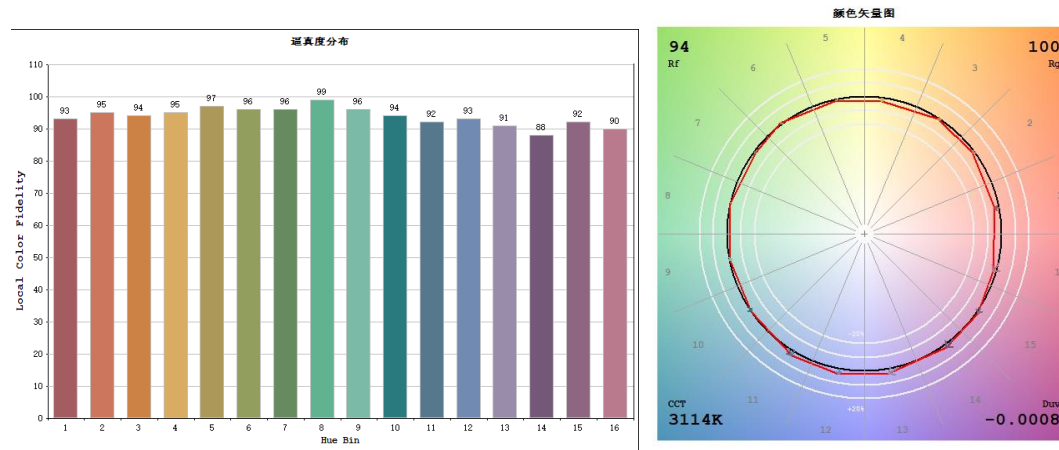
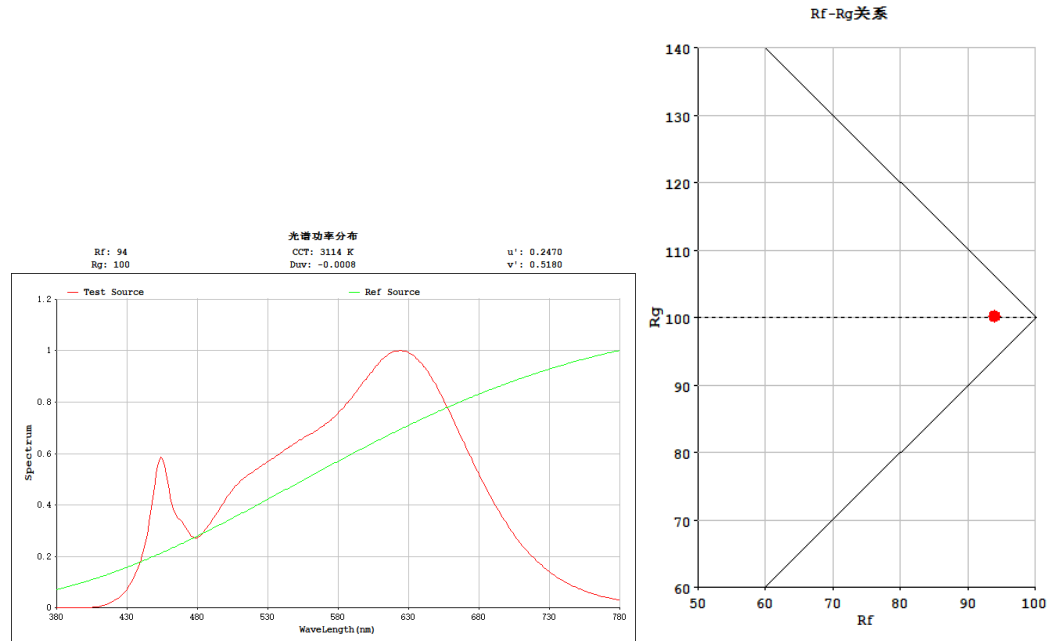
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1131.43
Luminous Efficacy (lm/W)	80.72
Beam Angle (°)	36.6
Center Beam Candle Power (cd)	3145

Spectral Power Distribution & Chromaticity Diagram



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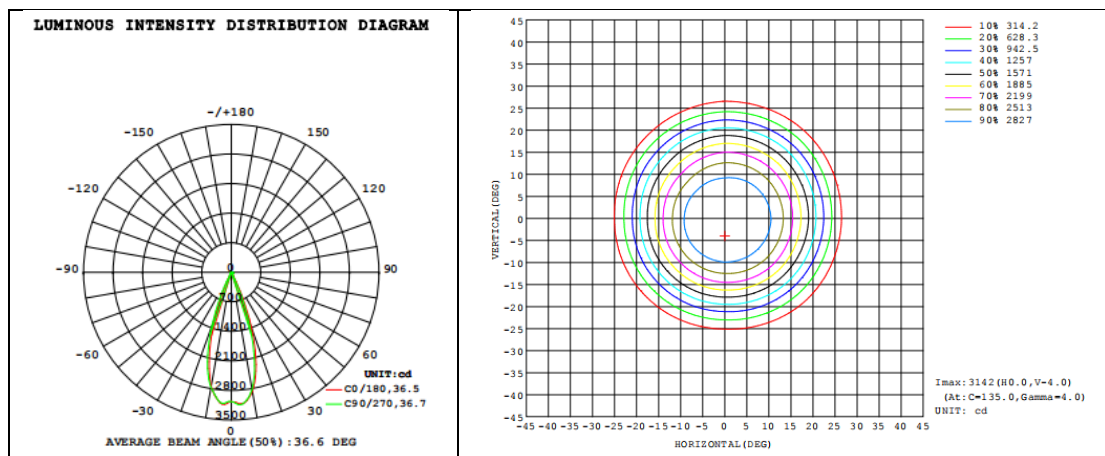


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1073.0	94.87%
0-40	1102.0	97.44%
0-60	1130.0	99.91%
60-90	1.3	0.12%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1131.0	100.00%
90-180	0.0	0.00%
0-180	1131.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	286.20	25.31%	90-100	0	0%
10-20	572.7	50.64%	100-110	0	0%
20-30	214.20	18.94%	110-120	0	0%
30-40	29.04	2.57%	120-130	0	0%
40-50	18.26	1.61%	130-140	0	0%
50-60	9.673	0.86%	140-150	0	0%
60-70	1.3400	0.12%	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

Test date	2024-09-02	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR4STLB	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.115	13.60	0.979

Chromaticity Measurement - Sphere-Spectroradiometer Method:

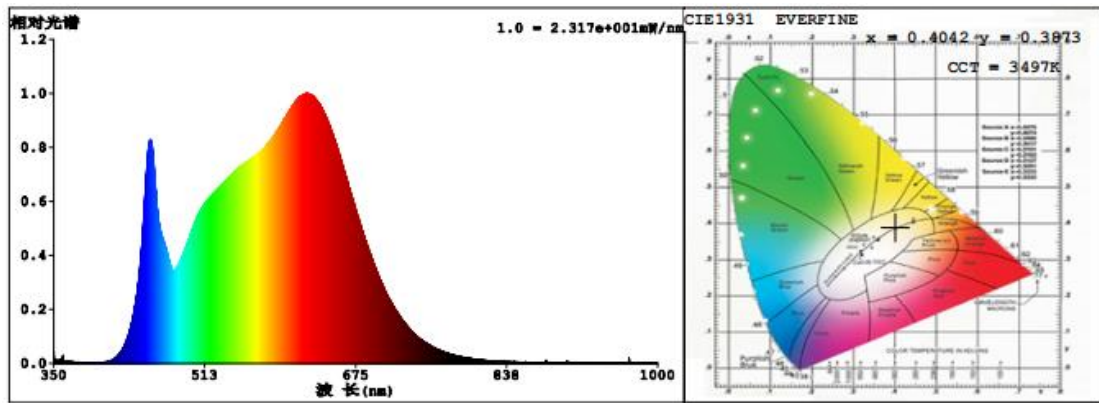
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3497
Duv	-0.00125
Chromaticity (x, y)	x=0.4042, y=0.3873
Chromaticity (u', v')	u' =0.2364, v' =0.5097
Color Rendering Index (CRI)	96.4
R9	79

Special Color Rendering Indices			
R1	98	R9	79
R2	99	R10	97
R3	99	R11	98
R4	97	R12	80
R5	97	R13	99
R6	97	R14	99
R7	95	R15	95
R8	91	--	--

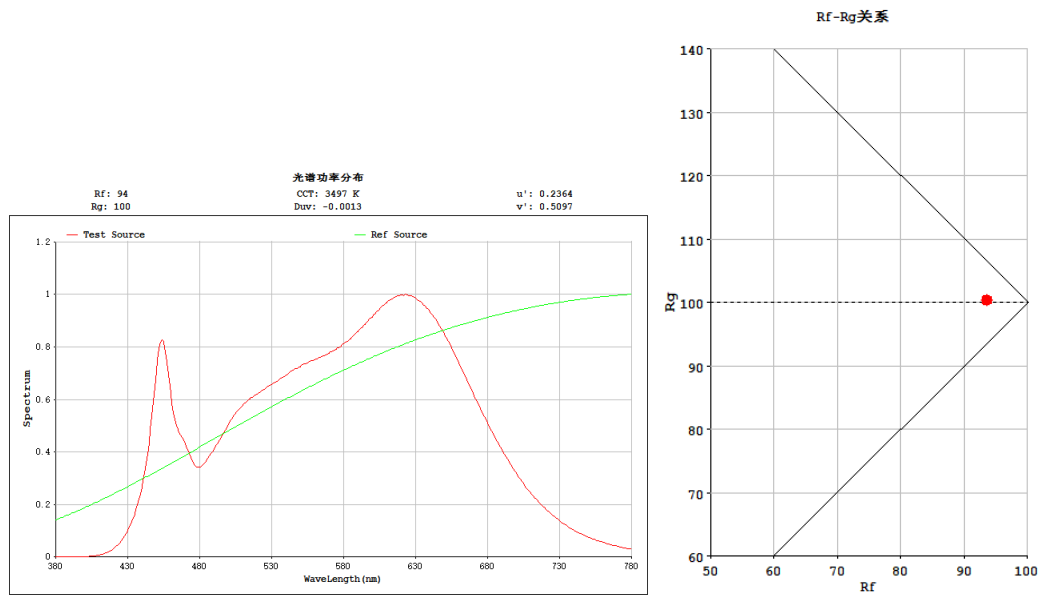
Photometric Measurement – Goniophotometer Method:

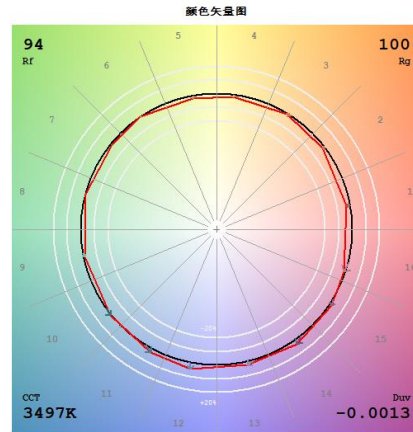
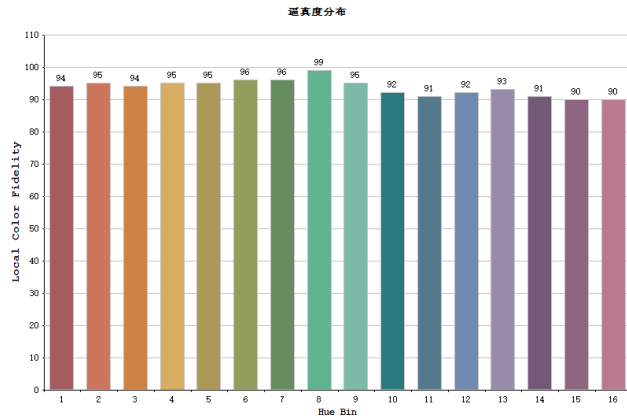
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1208.69
Luminous Efficacy (lm/W)	88.85
Beam Angle (°)	36.7
Center Beam Candle Power (cd)	3350

Spectral Power Distribution & Chromaticity Diagram



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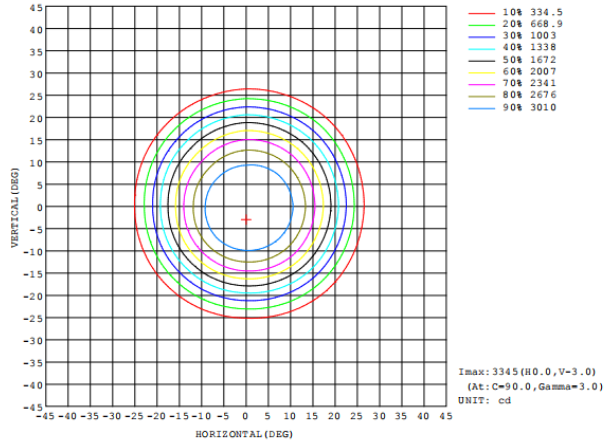
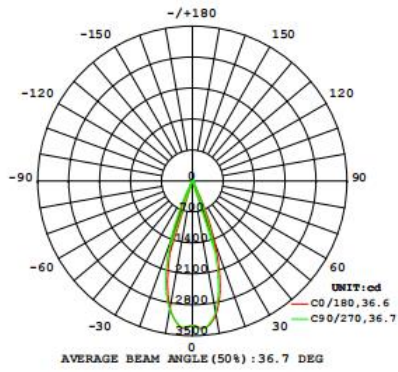
Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1146.0	94.79%
0-40	1177.0	97.35%
0-60	1207.0	99.83%
60-90	1.4	0.12%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1209.0	100.00%
90-180	0.0	0.00%
0-180	1209.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	305.10	25.24%	90-100	0	0%
10-20	611.6	50.59%	100-110	0	0%
20-30	229.50	18.98%	110-120	0	0%
30-40	31.10	2.57%	120-130	0	0%
40-50	19.54	1.62%	130-140	0	0%
50-60	10.350	0.86%	140-150	0	0%
60-70	1.4420	0.12%	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

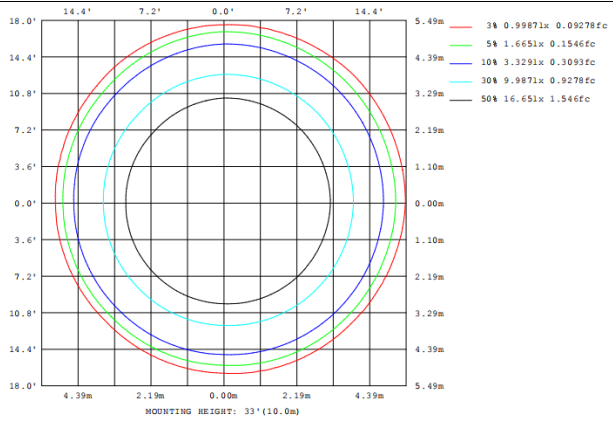
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Flux out: 864.2 lm

Height	Eavg, Emax	Angle: 36.64deg	Diameter
1m	2320, 3331lx		66.21cm
2m	580.0, 832.7lx		132.43cm
3m	257.8, 370.1lx		198.64cm
4m	145.0, 208.2lx		264.86cm
5m	92.81, 133.2lx		331.07cm
6m	64.45, 92.52lx		397.28cm
7m	47.35, 67.98lx		463.50cm
8m	36.25, 52.05lx		529.71cm
9m	28.64, 41.12lx		595.92cm
10m	23.20, 33.31lx		662.14cm

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

Test date	2024-09-02	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR4STLB	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.116	13.72	0.980

Chromaticity Measurement - Sphere-Spectroradiometer Method:

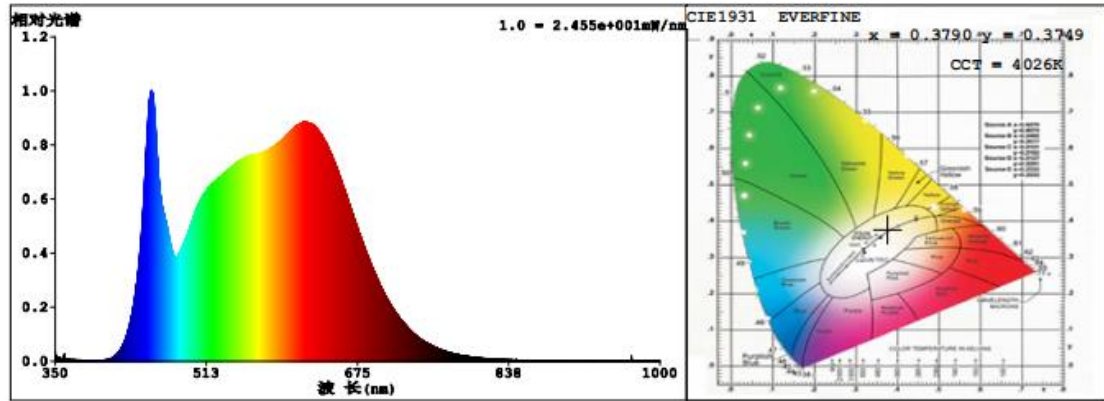
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	4026
Duv	-0.000454
Chromaticity (x, y)	x=0.3790, y=0.3749
Chromaticity (u', v')	u' =0.2249, v' =0.5005
Color Rendering Index (CRI)	95.5
R9	78

Special Color Rendering Indices			
R1	96	R9	78
R2	98	R10	94
R3	97	R11	96
R4	95	R12	75
R5	95	R13	97
R6	95	R14	98
R7	96	R15	95
R8	91	--	--

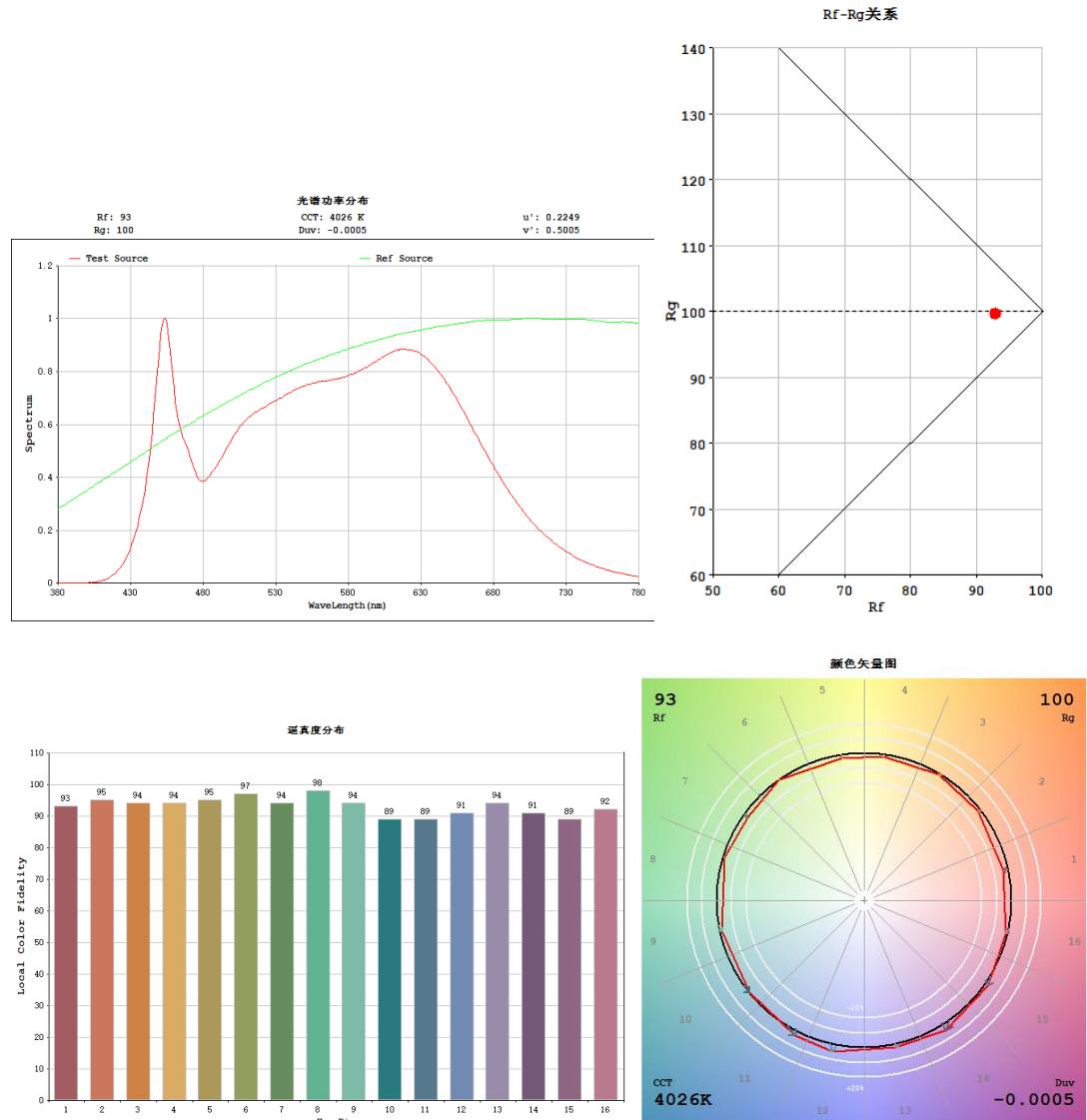
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1245.08
Luminous Efficacy (lm/W)	90.73
Beam Angle (°)	36.7
Center Beam Candle Power (cd)	3446

Spectral Power Distribution & Chromaticity Diagram



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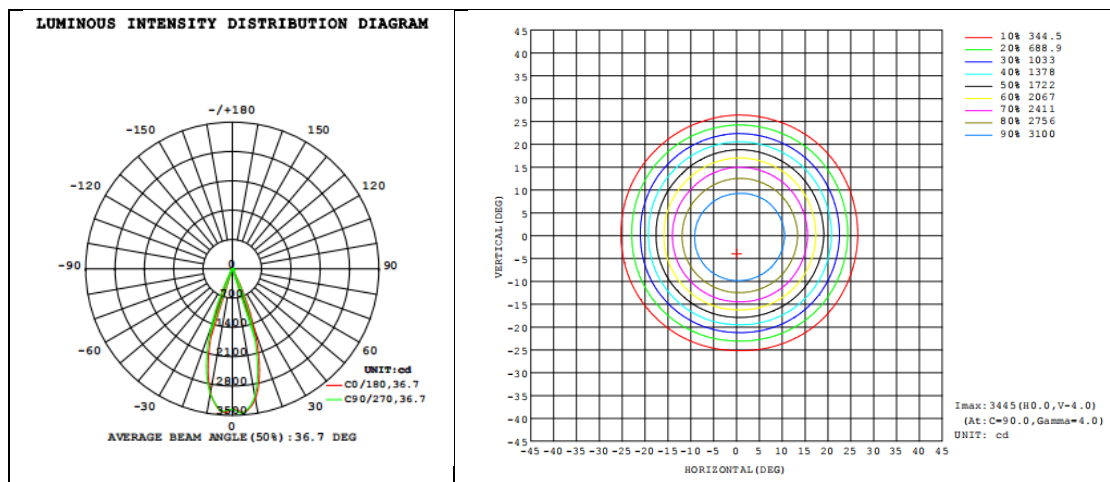


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1181.0	94.86%
0-40	1213.0	97.43%
0-60	1244.0	99.92%
60-90	1.5	0.12%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1245.0	100.00%
90-180	0.0	0.00%
0-180	1245.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	313.70	25.20%	90-100	0	0%
10-20	629.6	50.57%	100-110	0	0%
20-30	237.50	19.08%	110-120	0	0%
30-40	32.07	2.58%	120-130	0	0%
40-50	20.14	1.62%	130-140	0	0%
50-60	10.660	0.86%	140-150	0	0%
60-70	1.4880	0.12%	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

Test date	2024-09-02	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR4STLB	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.121	14.30	0.981

Chromaticity Measurement - Sphere-Spectroradiometer Method:

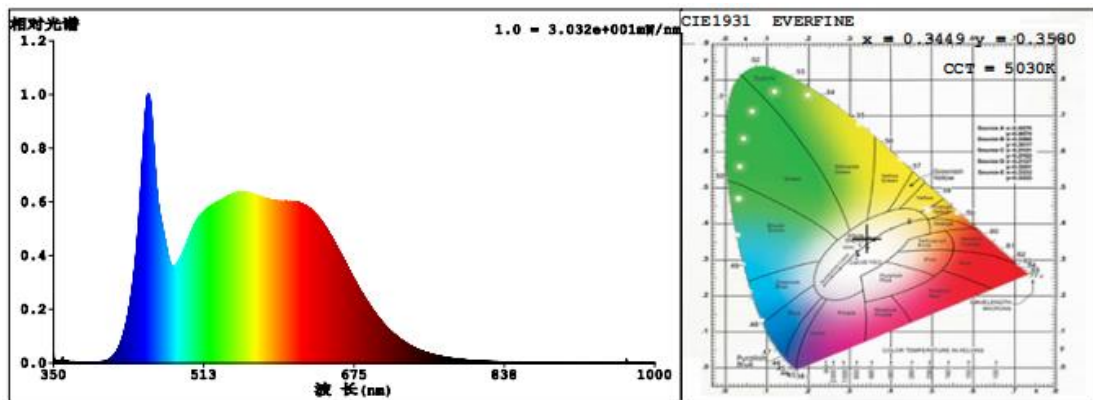
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	5030
Duv	0.00325
Chromaticity (x, y)	x=0.3449, y=0.3580
Chromaticity (u', v')	u' =0.2088, v' =0.4877
Color Rendering Index (CRI)	92.2
R9	63

Special Color Rendering Indices			
R1	92	R9	63
R2	94	R10	86
R3	95	R11	92
R4	92	R12	73
R5	92	R13	93
R6	91	R14	97
R7	95	R15	90
R8	86	--	--

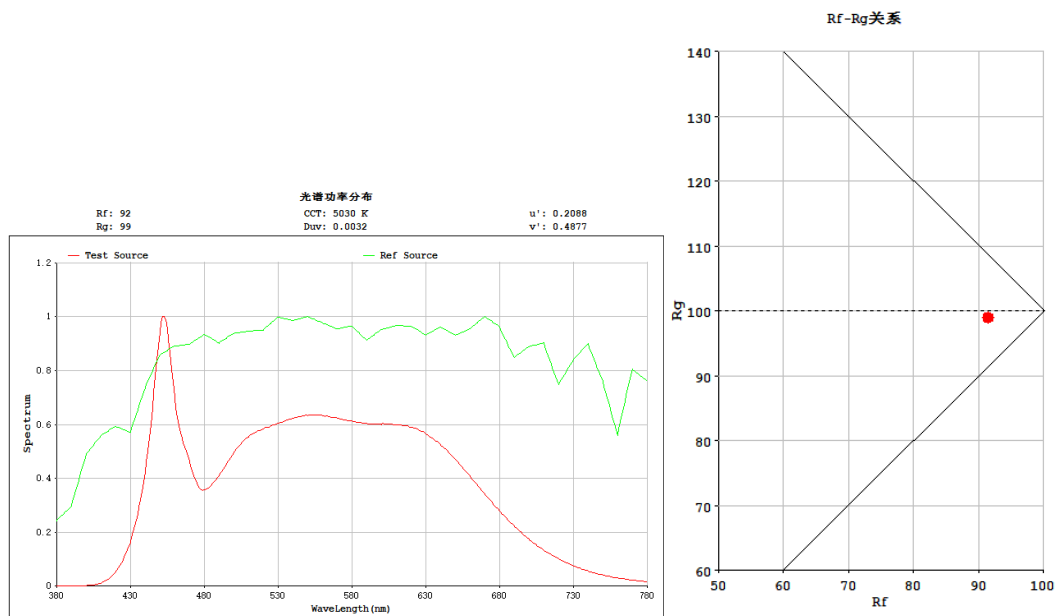
Photometric Measurement – Goniophotometer Method:

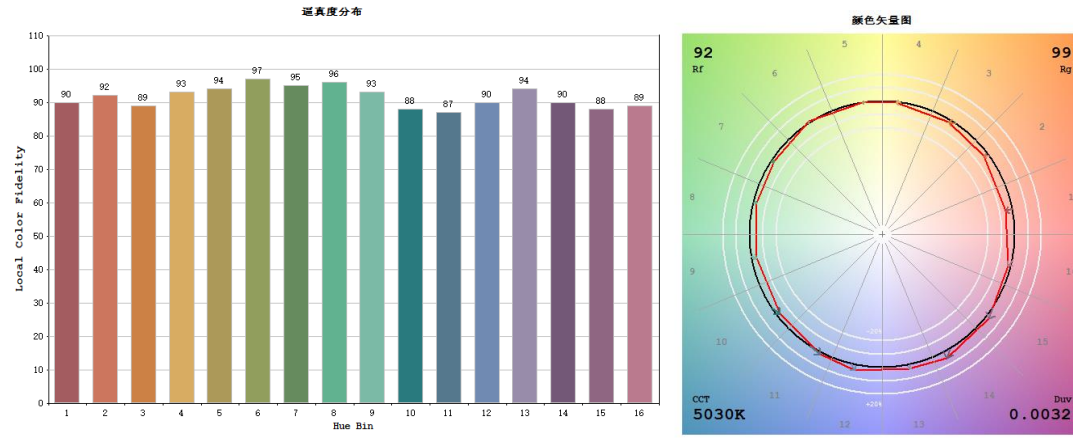
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1232.38
Luminous Efficacy (lm/W)	86.20
Beam Angle (°)	36.7
Center Beam Candle Power (cd)	3407

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1168.0	94.81%
0-40	1200.0	97.40%
0-60	1231.0	99.92%
60-90	1.5	0.12%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1232.0	100.00%
90-180	0.0	0.00%
0-180	1232.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	310.00	25.16%	90-100	0	0%
10-20	622.8	50.55%	100-110	0	0%
20-30	235.70	19.13%	110-120	0	0%
30-40	31.86	2.59%	120-130	0	0%
40-50	19.99	1.62%	130-140	0	0%
50-60	10.570	0.86%	140-150	0	0%
60-70	1.4750	0.12%	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

