

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) :

GR3TLB

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

Type of Luminaire: Downlights

Report Date: 2024-09-04

1.1 Rated Values:	
Rated Voltage / Frequency	120V, 60HZ
Nominal Power	9W
Rated Initial Lamp Lumen	750lm (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	2024-09-04	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR3TLB	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.073	8.60	0.978

Chromaticity Measurement – Sphere-Spectroradiometer Method:

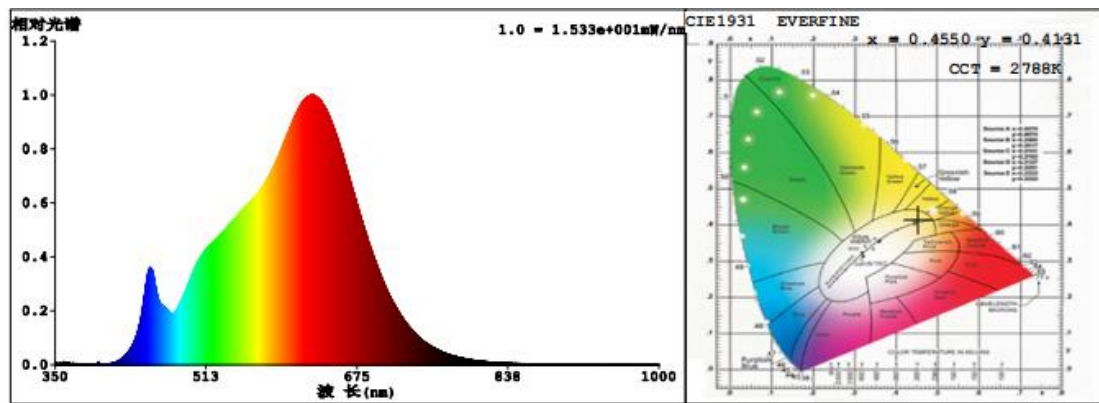
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	2788
Duv	0.00135
Chromaticity (x, y)	x=0.4550, y=0.4131
Chromaticity (u', v')	u' =0.2583, v' =0.5276
Color Rendering Index (CRI)	96.4
R9	73

Special Color Rendering Indices			
R1	97	R9	73
R2	99	R10	96
R3	99	R11	99
R4	98	R12	89
R5	97	R13	98
R6	98	R14	98
R7	95	R15	93
R8	88	--	--

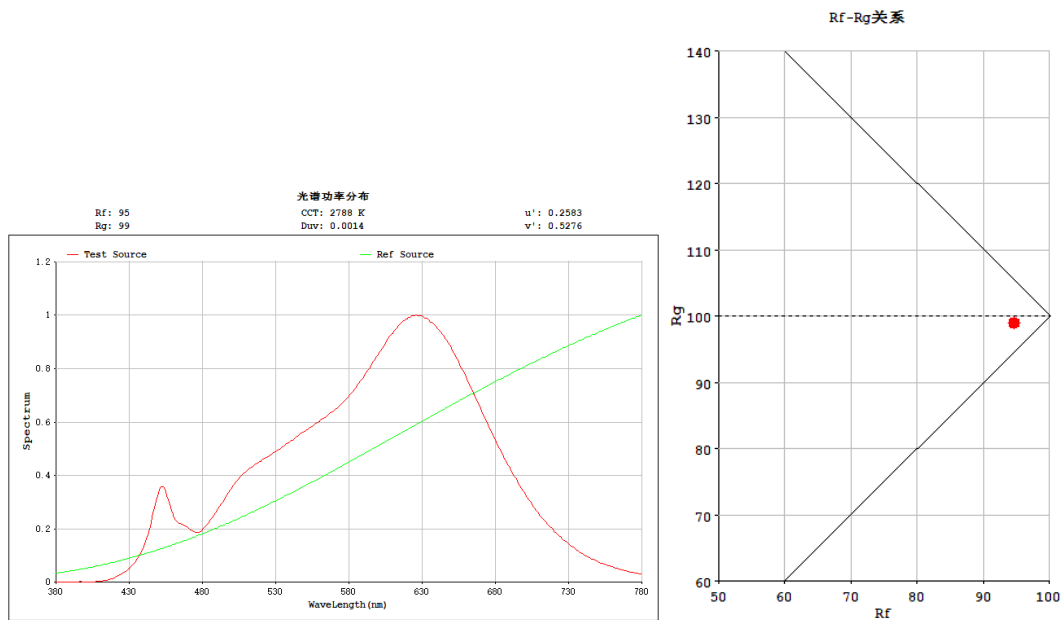
Photometric Measurement – Goniophotometer Method:

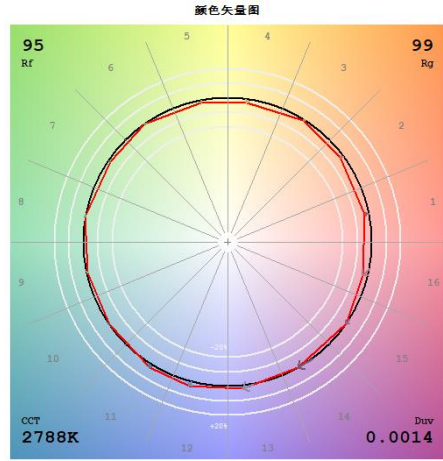
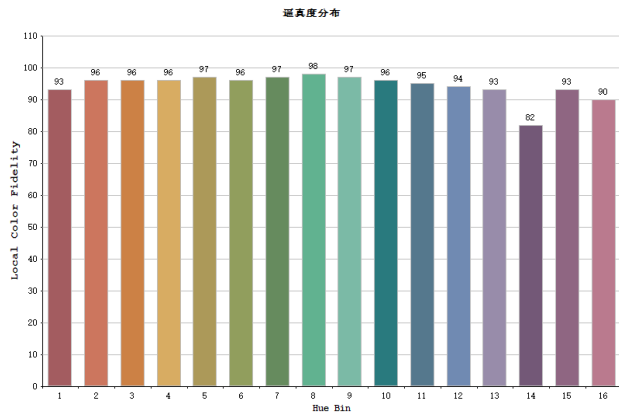
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	657.544
Luminous Efficacy (lm/W)	76.46
Beam Angle (°)	38.6
Center Beam Candle Power (cd)	1555

Spectral Power Distribution & Chromaticity Diagram



TM30



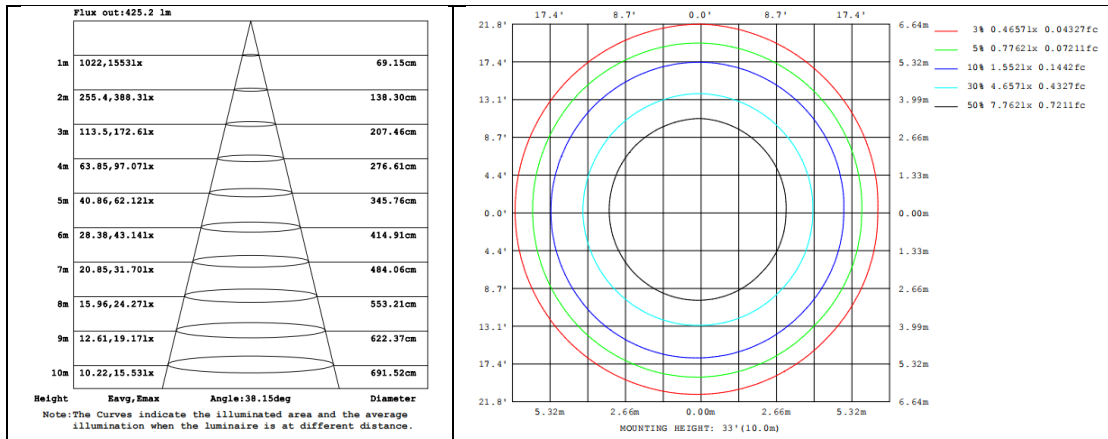
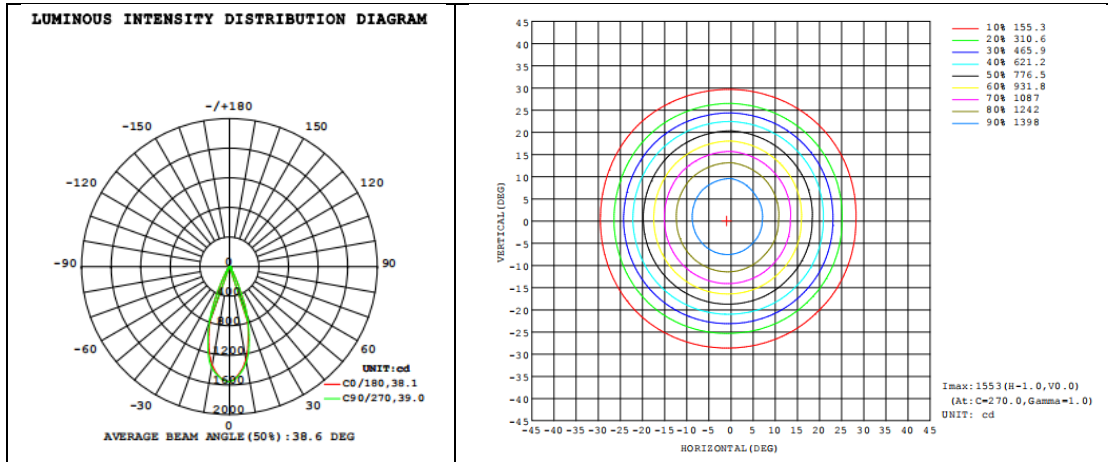


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	596.7	90.75%
0-40	636.1	96.75%
0-60	657.0	99.92%
60-90	0.5	0.08%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	657.5	100.00%
90-180	0.0	0.00%
0-180	657.5	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	136.80	20.81%	90-100	0	0%
10-20	288.4	43.86%	100-110	0	0%
20-30	171.50	26.08%	110-120	0	0%
30-40	39.38	5.99%	120-130	0	0%
40-50	15.01	2.28%	130-140	0	0%
50-60	5.876	0.89%	140-150	0	0%
60-70	0.5705	0.09%	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	2024-09-04	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR3TLB	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.072	8.49	0.977

Chromaticity Measurement – Sphere-Spectroradiometer Method:

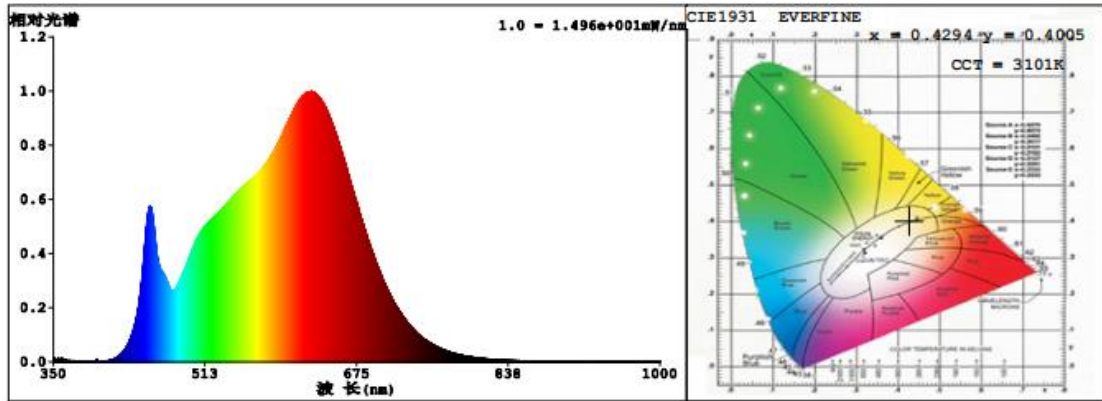
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3101
Duv	-0.000367
Chromaticity (x, y)	x=0.4294, y=0.4005
Chromaticity (u', v')	u' =0.2473, v' =0.5188
Color Rendering Index (CRI)	96.9
R9	79

Special Color Rendering Indices			
R1	98	R9	79
R2	99	R10	98
R3	99	R11	99
R4	98	R12	85
R5	98	R13	99
R6	97	R14	99
R7	95	R15	95
R8	90	--	--

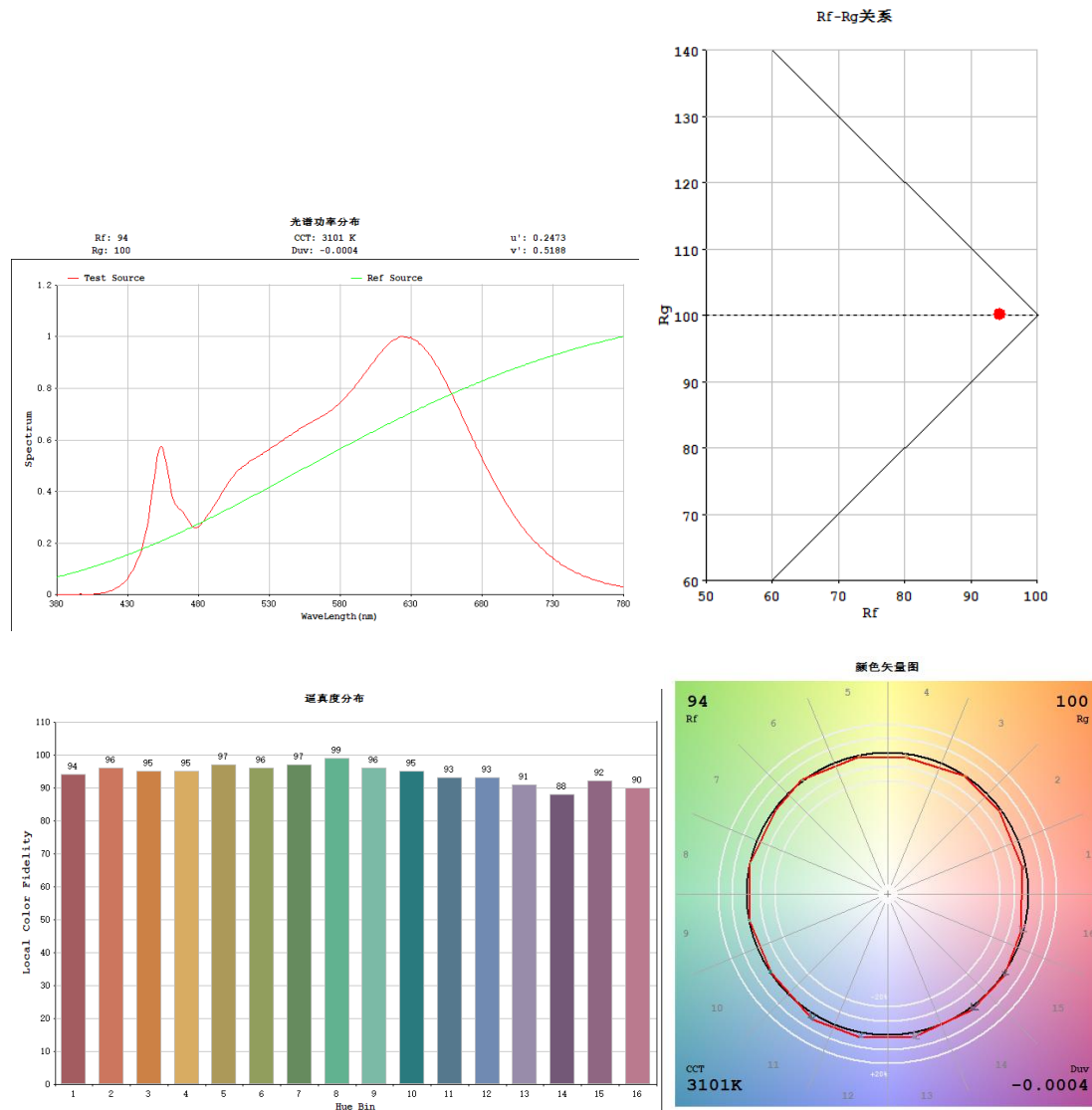
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	698.526
Luminous Efficacy (lm/W)	82.30
Beam Angle (°)	38.6
Center Beam Candle Power (cd)	1652

Spectral Power Distribution & Chromaticity Diagram



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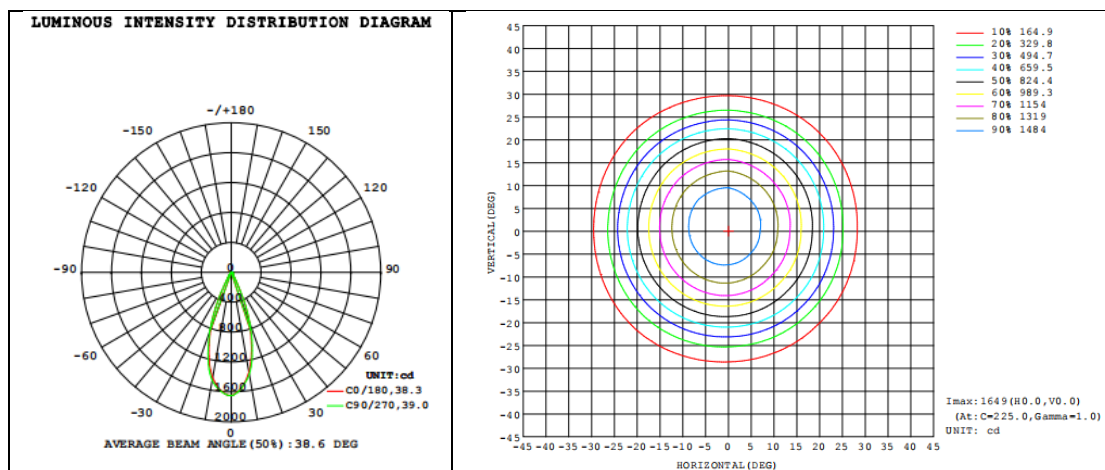


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	633.7	90.72%
0-40	675.7	96.74%
0-60	697.9	99.91%
60-90	0.6	0.09%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	698.5	100.00%
90-180	0.0	0.00%
0-180	698.5	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	145.10	20.77%	90-100	0	0%
10-20	306.1	43.82%	100-110	0	0%
20-30	182.50	26.13%	110-120	0	0%
30-40	42.00	6.01%	120-130	0	0%
40-50	15.99	2.29%	130-140	0	0%
50-60	6.262	0.90%	140-150	0	0%
60-70	0.6144	0.09%	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	2024-09-04	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR3TLB	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.071	8.34	0.976

Chromaticity Measurement - Sphere-Spectroradiometer Method:

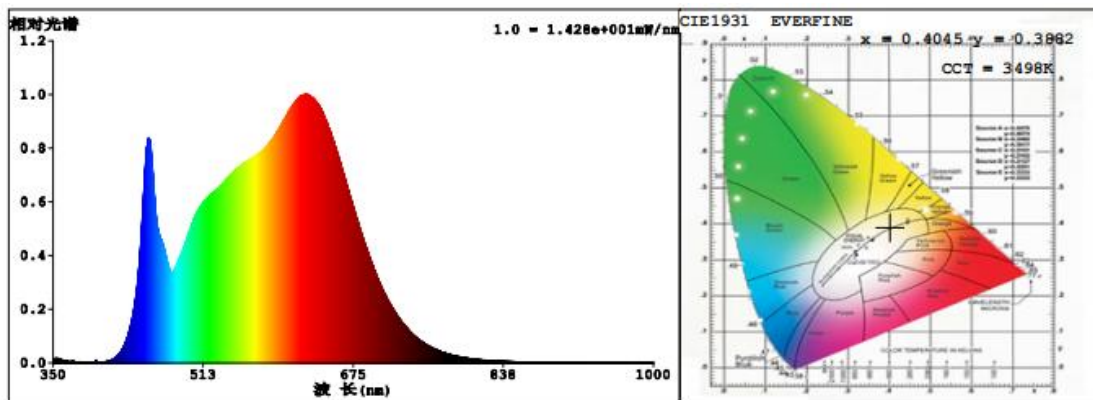
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3498
Duv	-0.000933
Chromaticity (x, y)	x=0.4045, y=0.3882
Chromaticity (u', v')	u' =0.2362, v' =0.5101
Color Rendering Index (CRI)	96.9
R9	82

Special Color Rendering Indices			
R1	98	R9	82
R2	99	R10	97
R3	99	R11	98
R4	98	R12	80
R5	97	R13	99
R6	97	R14	99
R7	96	R15	96
R8	92	--	--

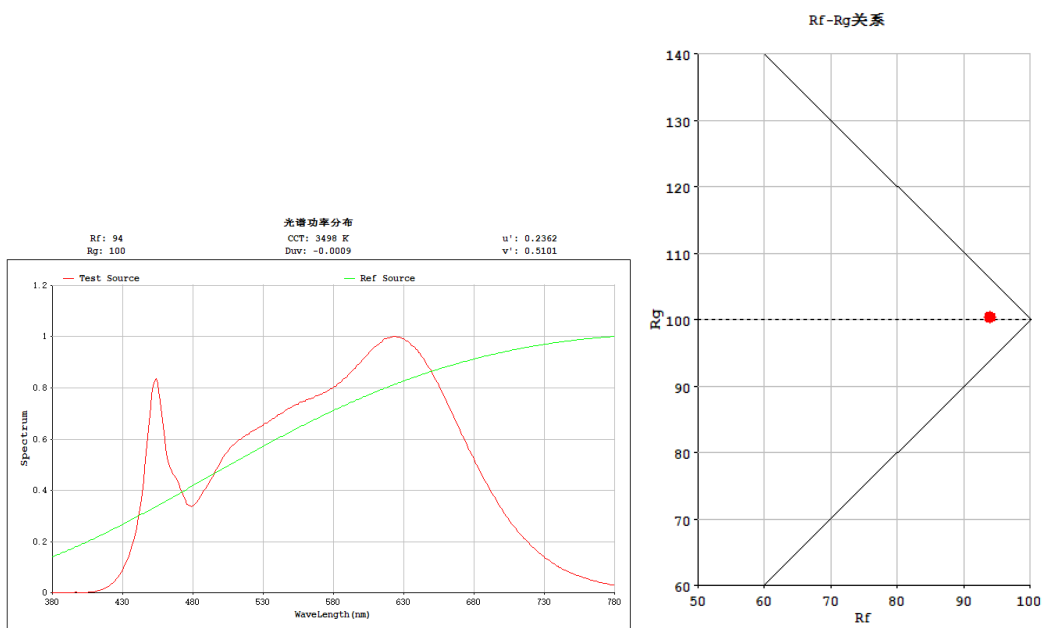
Photometric Measurement – Goniophotometer Method:

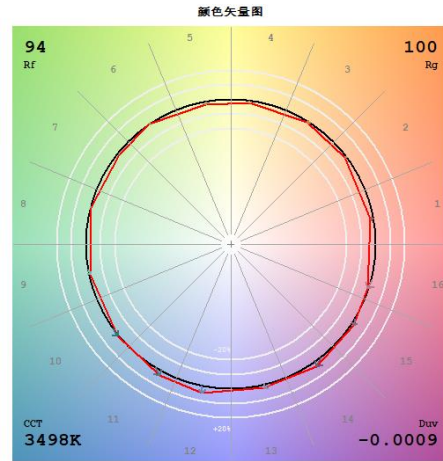
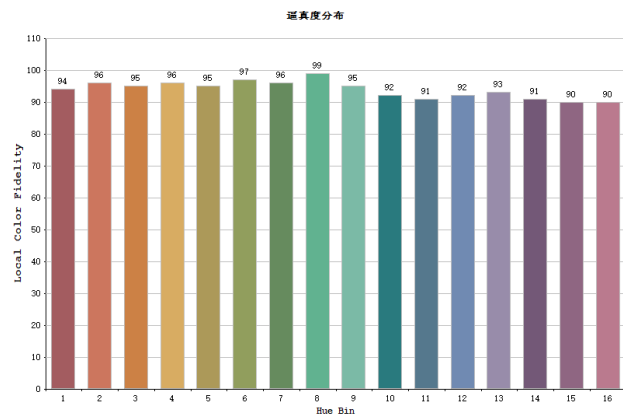
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	735.633
Luminous Efficacy (lm/W)	88.17
Beam Angle (°)	38.6
Center Beam Candle Power (cd)	1734

Spectral Power Distribution & Chromaticity Diagram



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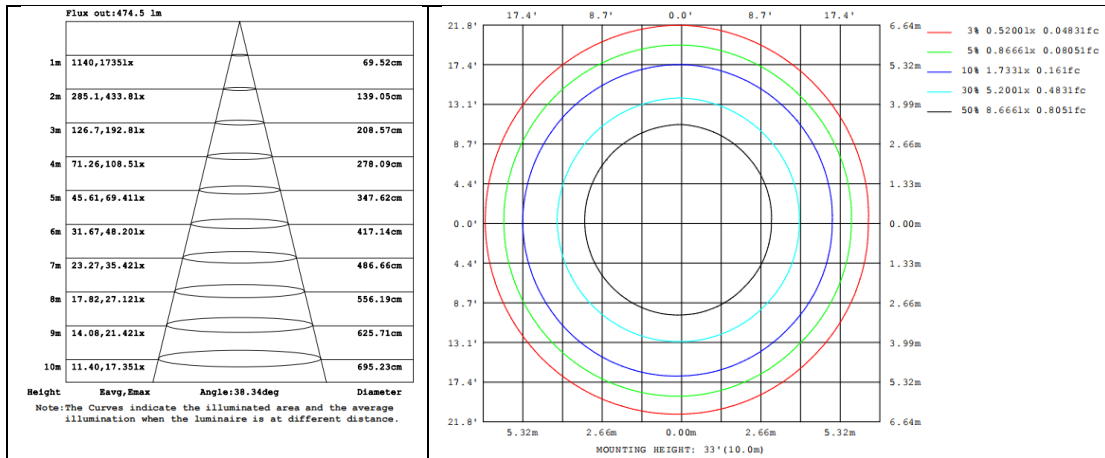
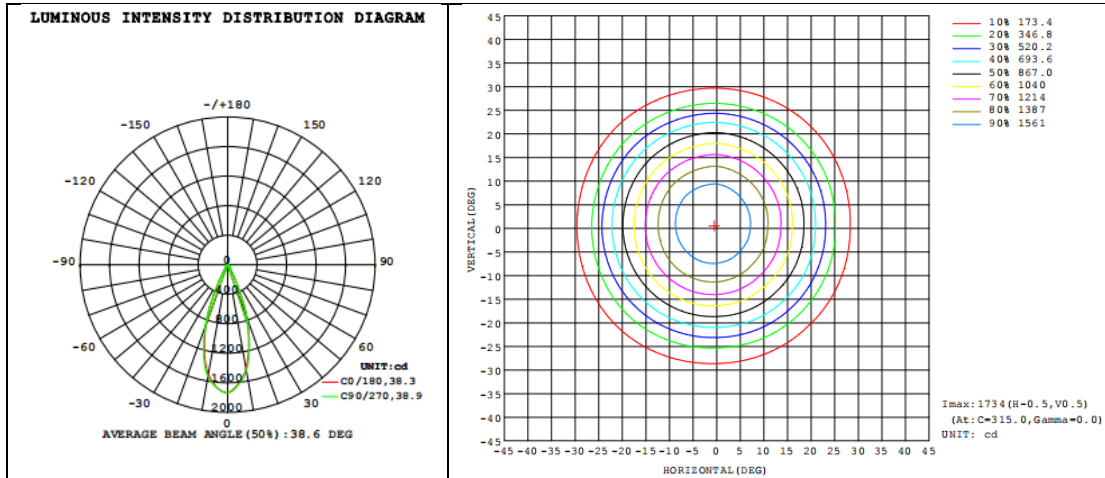


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	667.1	90.69%
0-40	711.5	96.72%
0-60	735.0	99.92%
60-90	0.6	0.08%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	735.6	100.00%
90-180	0.0	0.00%
0-180	735.6	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	152.50	20.73%	90-100	0	0%
10-20	322.0	43.77%	100-110	0	0%
20-30	192.60	26.18%	110-120	0	0%
30-40	44.37	6.03%	120-130	0	0%
40-50	16.88	2.29%	130-140	0	0%
50-60	6.612	0.90%	140-150	0	0%
60-70	0.6533	0.09%	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

Test date	2024-09-04	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR3TLB	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.071	8.35	0.976

Chromaticity Measurement - Sphere-Spectroradiometer Method:

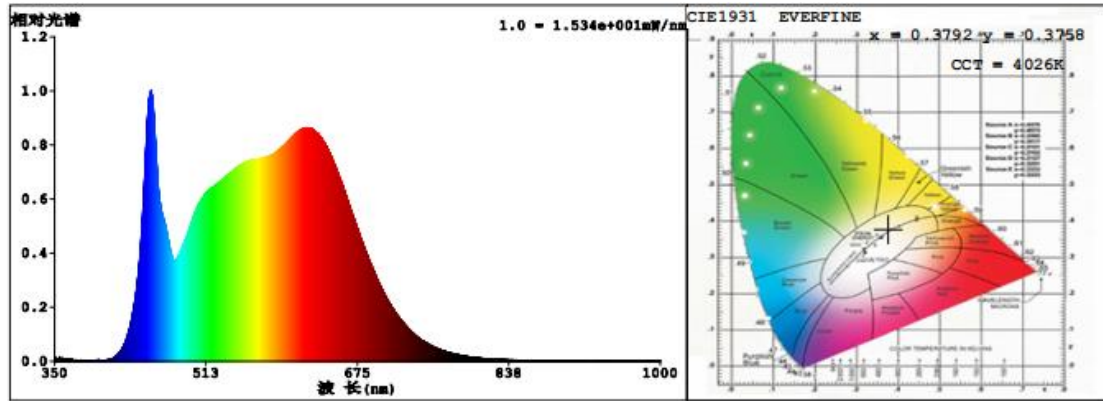
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	4026
Duv	-0.0000884
Chromaticity (x, y)	x=0.3792, y=0.3758
Chromaticity (u', v')	u' =0.2247, v' =0.5010
Color Rendering Index (CRI)	96.0
R9	81

Special Color Rendering Indices			
R1	97	R9	81
R2	98	R10	95
R3	98	R11	97
R4	96	R12	75
R5	96	R13	98
R6	95	R14	98
R7	96	R15	95
R8	92	--	--

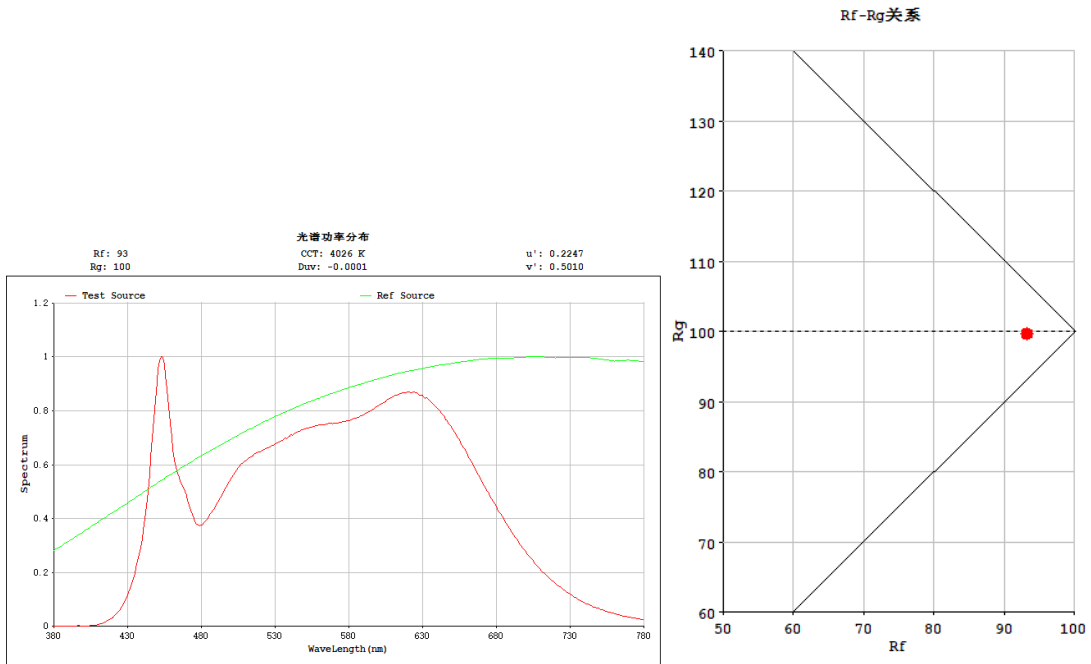
Photometric Measurement – Goniophotometer Method:

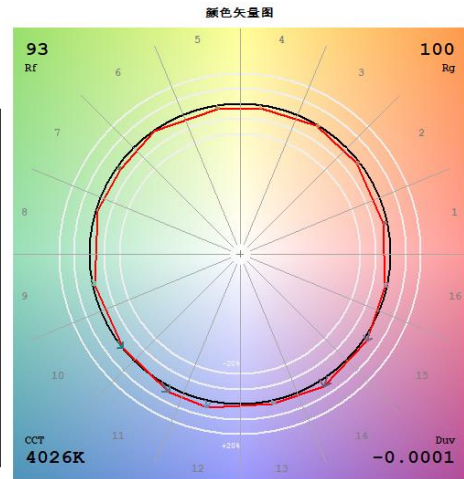
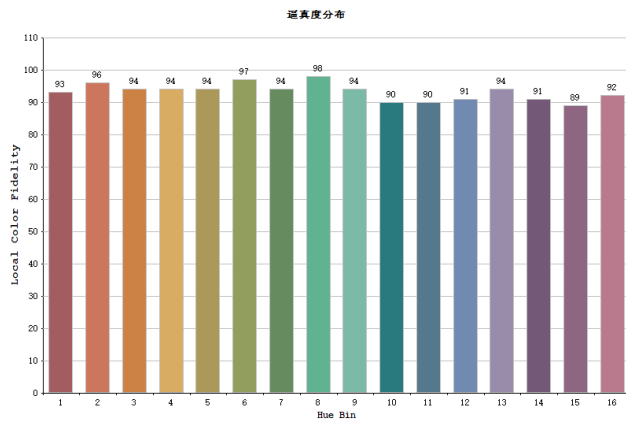
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	762.087
Luminous Efficacy (lm/W)	91.27
Beam Angle (°)	38.7
Center Beam Candle Power (cd)	1797

Spectral Power Distribution & Chromaticity Diagram



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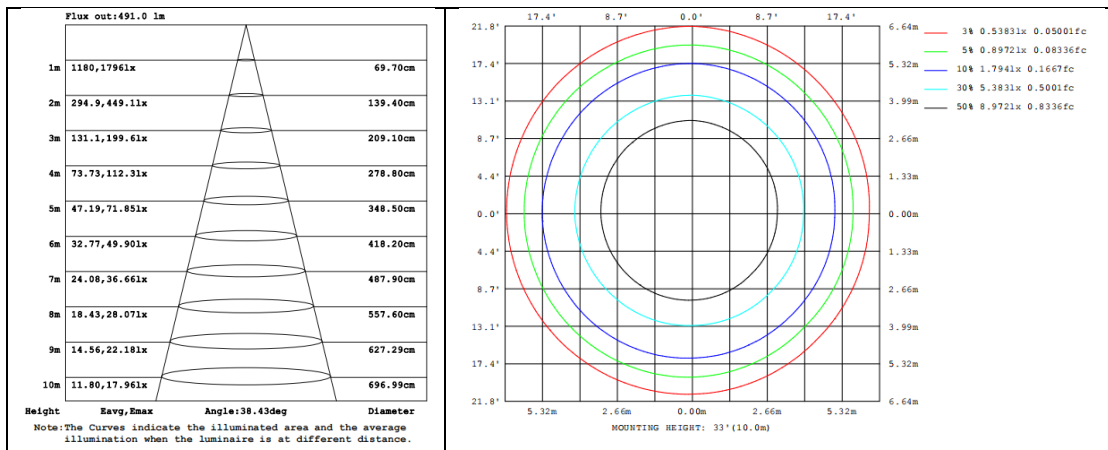
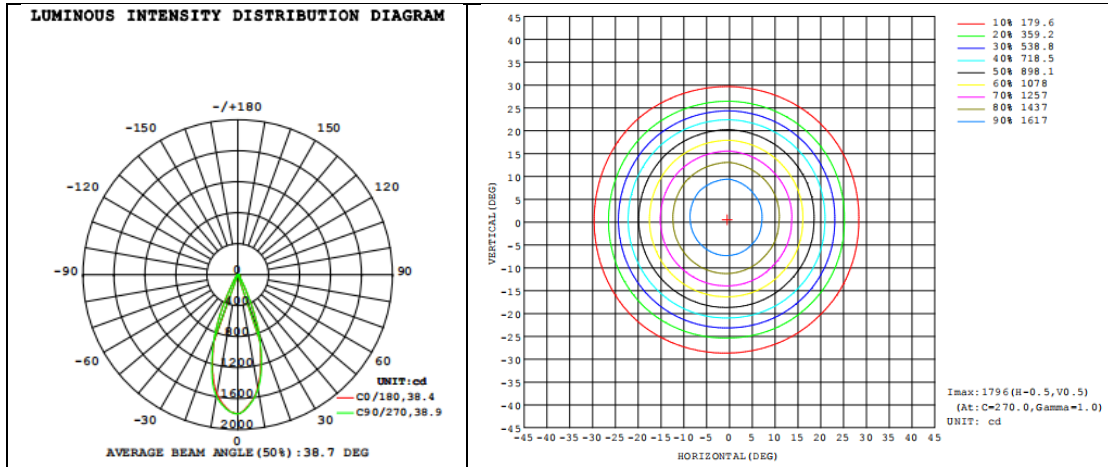


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	690.8	90.64%
0-40	737.0	96.71%
0-60	761.4	99.91%
60-90	0.7	0.09%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	762.1	100.00%
90-180	0.0	0.00%
0-180	762.1	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	157.80	20.71%	90-100	0	0%
10-20	333.1	43.71%	100-110	0	0%
20-30	199.90	26.23%	110-120	0	0%
30-40	46.16	6.06%	120-130	0	0%
40-50	17.54	2.30%	130-140	0	0%
50-60	6.868	0.90%	140-150	0	0%
60-70	0.6827	0.09%	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	2024-09-04	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR3TLB	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.073	8.61	0.978

Chromaticity Measurement - Sphere-Spectroradiometer Method:

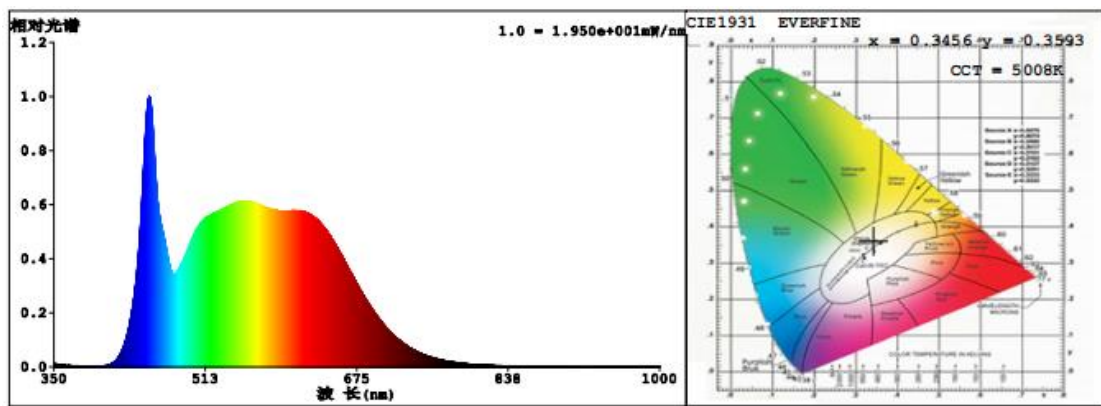
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	5008
Duv	0.00361
Chromaticity (x, y)	x=0.3456, y=0.3593
Chromaticity (u', v')	u' =0.2088, v' =0.4884
Color Rendering Index (CRI)	92.6
R9	65

Special Color Rendering Indices			
R1	92	R9	65
R2	95	R10	87
R3	96	R11	93
R4	93	R12	73
R5	92	R13	93
R6	92	R14	98
R7	95	R15	90
R8	87	--	--

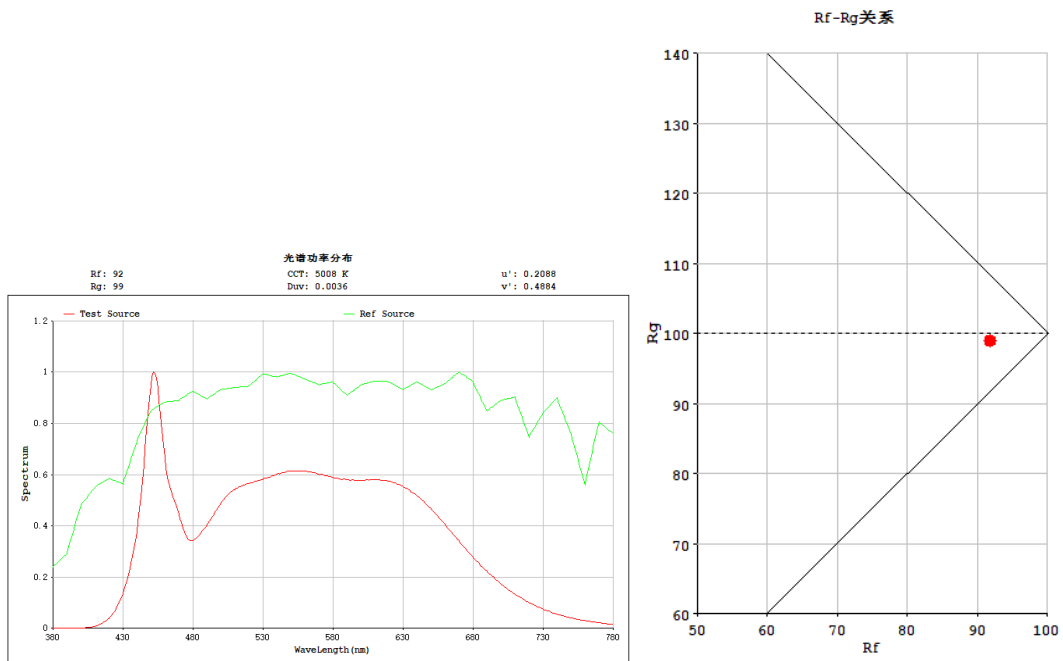
Photometric Measurement – Goniophotometer Method:

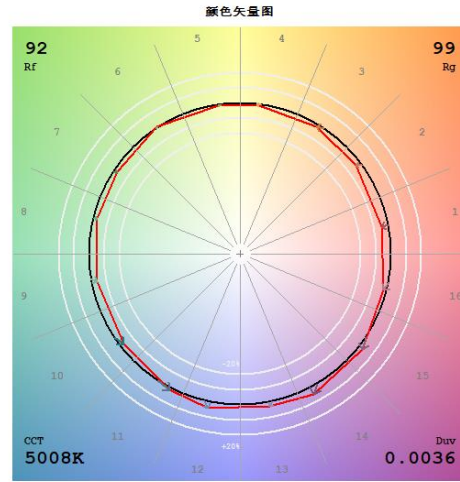
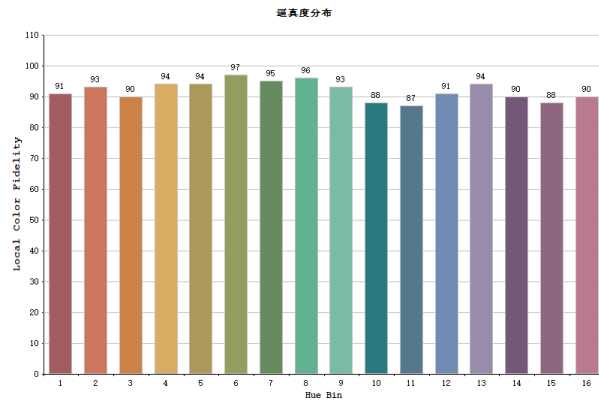
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	768.6
Luminous Efficacy (lm/W)	89.31
Beam Angle (°)	38.7
Center Beam Candle Power (cd)	1808

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	696.3	90.59%
0-40	743.2	96.70%
0-60	767.9	99.91%
60-90	0.7	0.09%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	768.6	100.00%
90-180	0.0	0.00%
0-180	768.6	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	158.80	20.66%	90-100	0	0%
10-20	335.4	43.64%	100-110	0	0%
20-30	202.10	26.29%	110-120	0	0%
30-40	46.86	6.10%	120-130	0	0%
40-50	17.76	2.31%	130-140	0	0%
50-60	6.946	0.90%	140-150	0	0%
60-70	0.6918	0.09%	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

