

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) :

R4STLB

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	20W
Rated Initial Lamp Lumen	1900lm (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	R4STLB	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.159	18.88	0.983

Chromaticity Measurement – Sphere-Spectroradiometer Method:

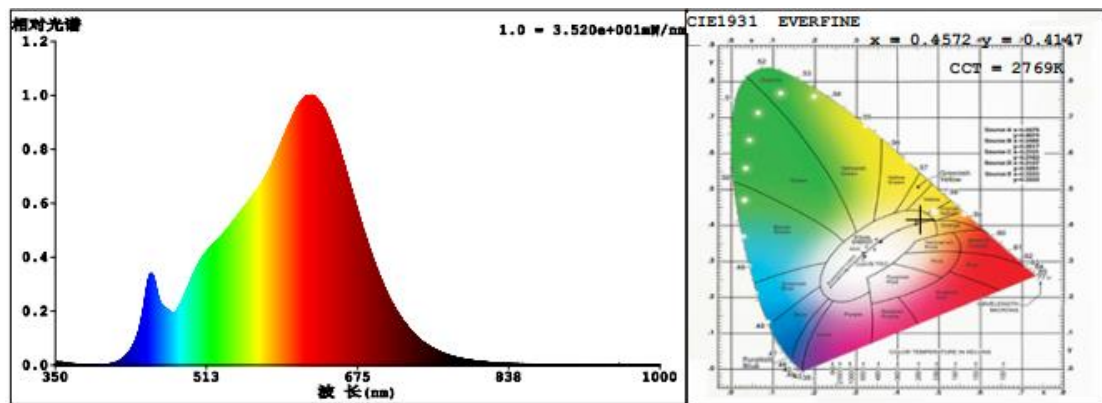
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	2769
Duv	0.00173
Chromaticity (x, y)	x=0.4572, y=0.4147
Chromaticity (u', v')	u' =0.2590, v' =0.5285
Color Rendering Index (CRI)	94.6
R9	64

Special Color Rendering Indices			
R1	95	R9	64
R2	98	R10	94
R3	100	R11	98
R4	95	R12	87
R5	95	R13	96
R6	98	R14	99
R7	93	R15	90
R8	84	--	--

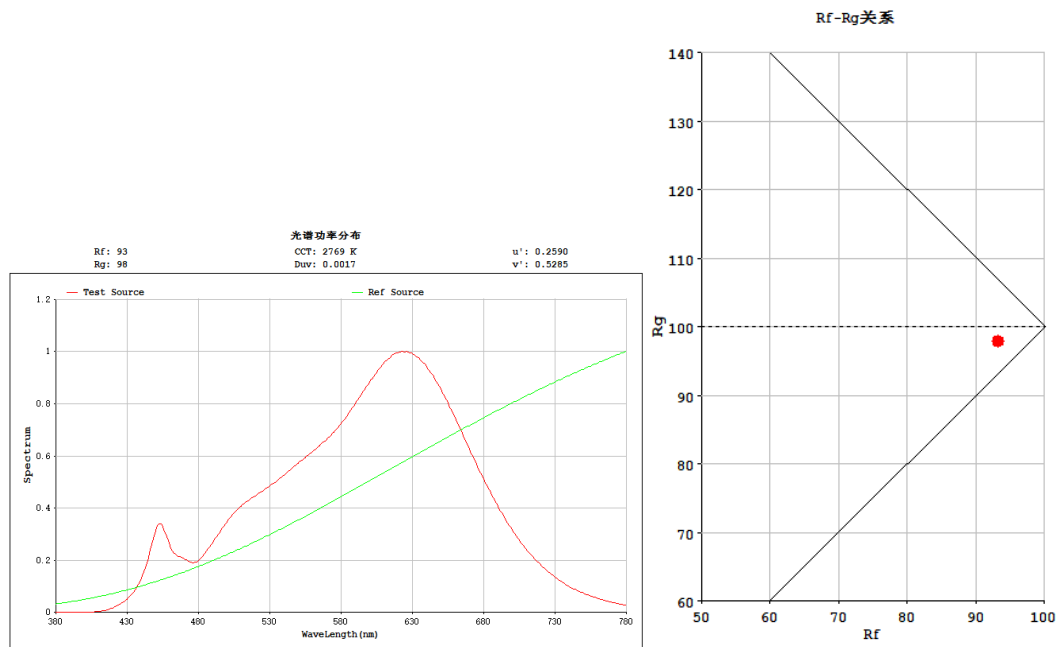
Photometric Measurement – Goniophotometer Method:

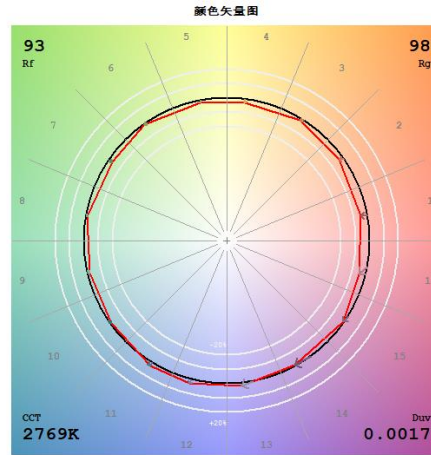
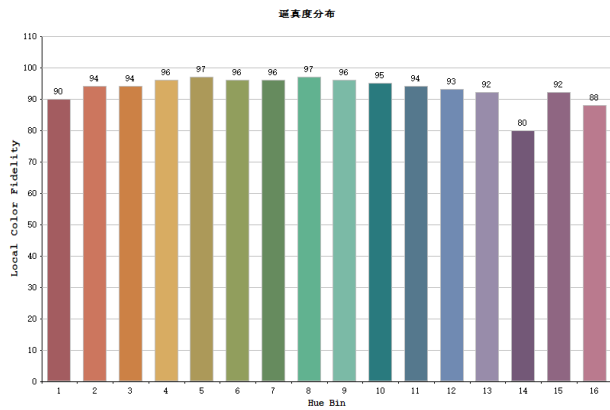
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1525.5
Luminous Efficacy (lm/W)	80.81
Beam Angle (°)	40.6
Center Beam Candle Power (cd)	3149

Spectral Power Distribution & Chromaticity Diagram



TM30



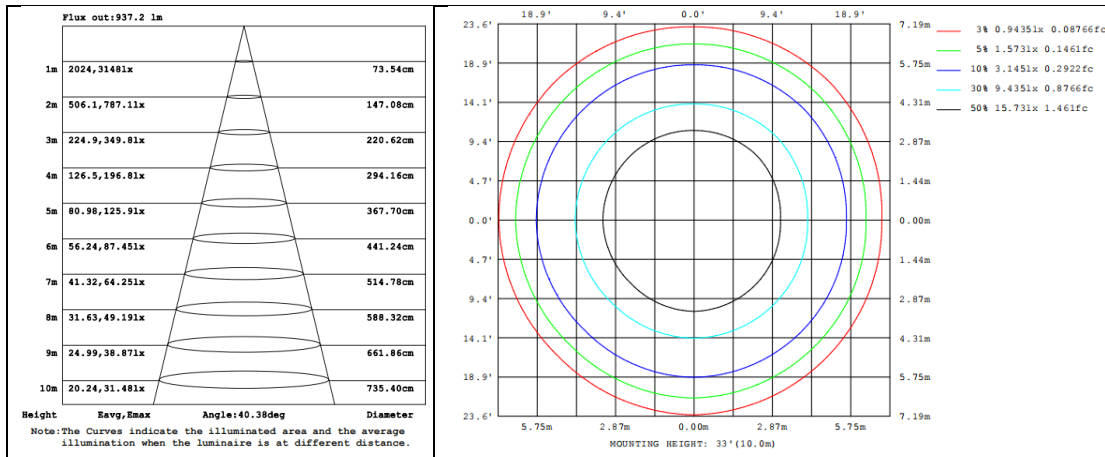
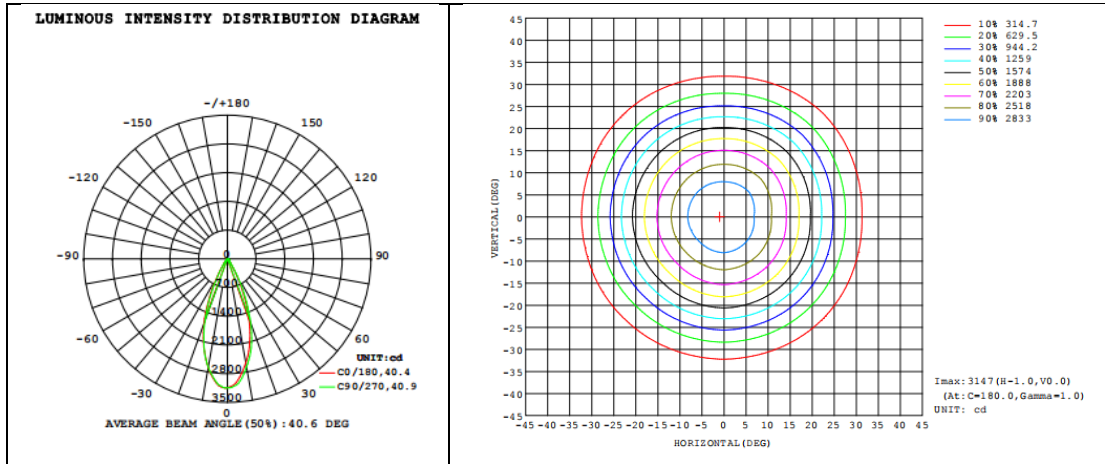


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1324.0	86.76%
0-40	1454.0	95.28%
0-60	1523.0	99.80%
60-90	2.3	0.15%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1526.0	100.00%
90-180	0.0	0.00%
0-180	1526.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	276.30	18.11%	90-100	0	0%
10-20	601.3	39.40%	100-110	0	0%
20-30	446.80	29.28%	110-120	0	0%
30-40	129.10	8.46%	120-130	0	0%
40-50	47.86	3.14%	130-140	0	0%
50-60	21.800	1.43%	140-150	0	0%
60-70	2.2990	0.15%	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	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R4STLB	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.157	18.65	0.983

Chromaticity Measurement – Sphere-Spectroradiometer Method:

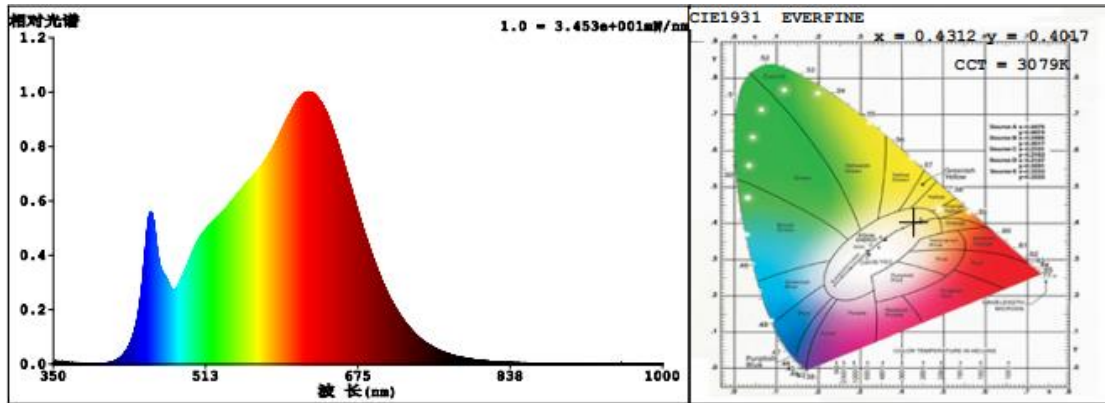
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3079
Duv	-0.000153
Chromaticity (x, y)	x=0.4312, y=0.4017
Chromaticity (u', v')	u' =0.2479, v' =0.5196
Color Rendering Index (CRI)	95.3
R9	70

Special Color Rendering Indices			
R1	96	R9	70
R2	99	R10	97
R3	99	R11	97
R4	96	R12	84
R5	96	R13	97
R6	97	R14	99
R7	93	R15	93
R8	86	--	--

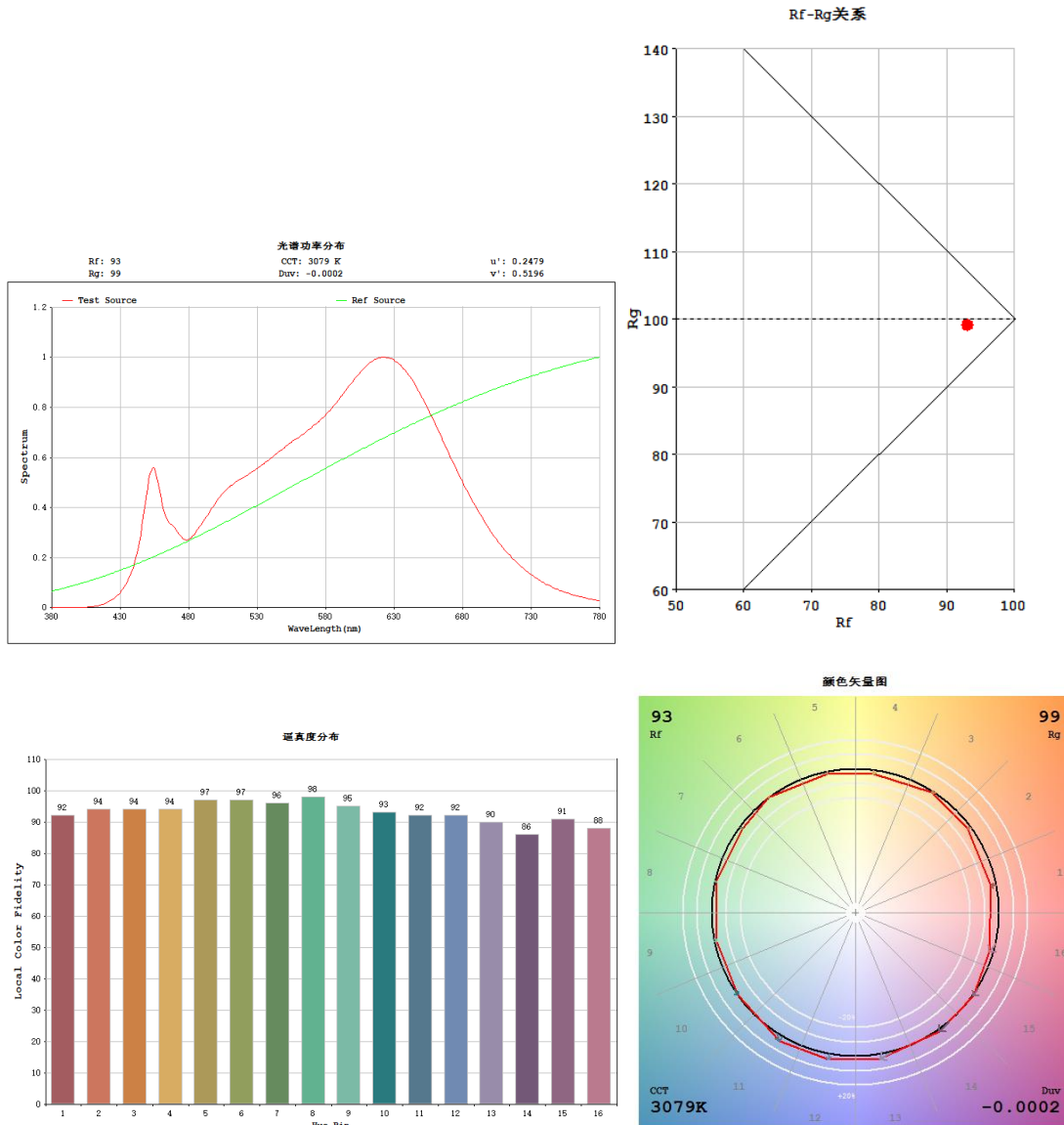
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1625.87
Luminous Efficacy (lm/W)	87.18
Beam Angle (°)	40.6
Center Beam Candle Power (cd)	3369

Spectral Power Distribution & Chromaticity Diagram



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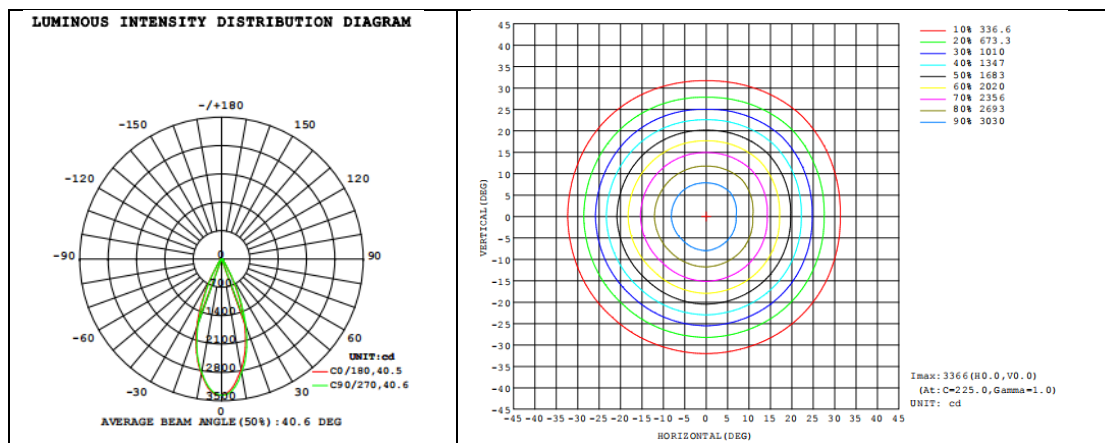


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1413.0	86.90%
0-40	1549.0	95.26%
0-60	1623.0	99.82%
60-90	2.5	0.15%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1626.0	100.00%
90-180	0.0	0.00%
0-180	1626.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	295.20	18.15%	90-100	0	0%
10-20	642.7	39.53%	100-110	0	0%
20-30	475.30	29.23%	110-120	0	0%
30-40	136.20	8.38%	120-130	0	0%
40-50	50.82	3.13%	130-140	0	0%
50-60	23.220	1.43%	140-150	0	0%
60-70	2.4570	0.15%	150-160	0	0%
70-80	0.0001	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	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R4STLB	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.154	18.29	0.983

Chromaticity Measurement - Sphere-Spectroradiometer Method:

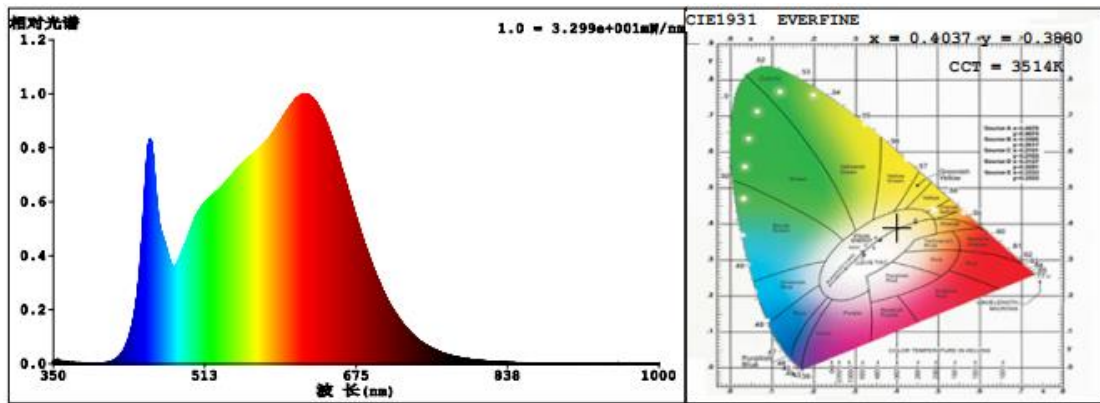
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3514
Duv	-0.00084
Chromaticity (x, y)	x=0.4037, y=0.3880
Chromaticity (u', v')	u' =0.2358, v' =0.5099
Color Rendering Index (CRI)	95.4
R9	73

Special Color Rendering Indices			
R1	97	R9	73
R2	99	R10	97
R3	99	R11	97
R4	95	R12	80
R5	96	R13	98
R6	96	R14	99
R7	94	R15	94
R8	88	--	--

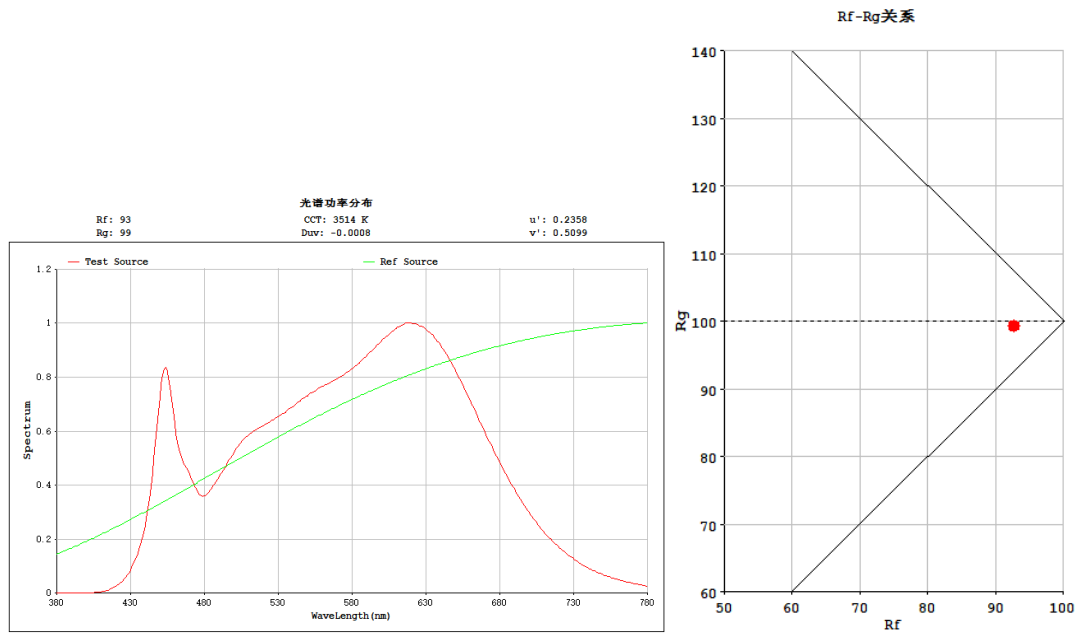
Photometric Measurement – Goniophotometer Method:

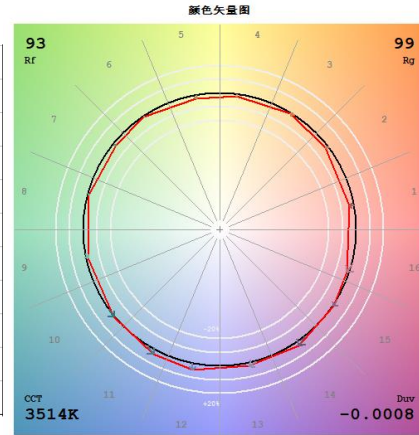
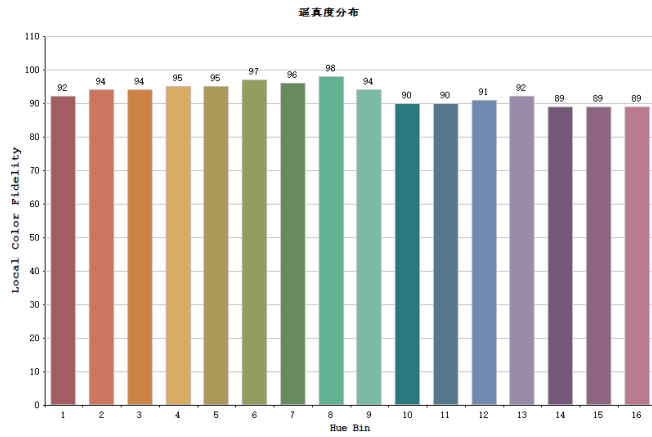
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1727.43
Luminous Efficacy (lm/W)	94.46
Beam Angle (°)	40.5
Center Beam Candle Power (cd)	3597

Spectral Power Distribution & Chromaticity Diagram



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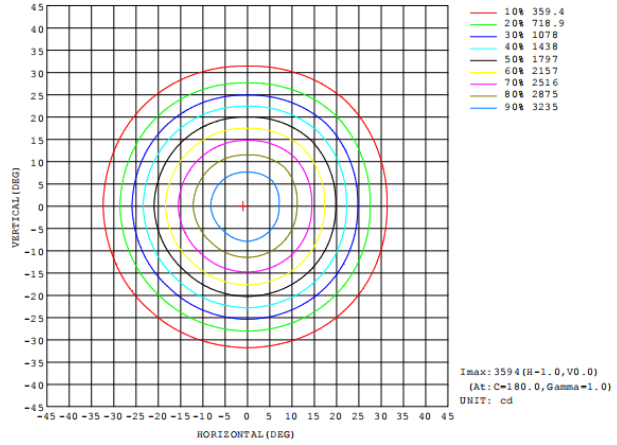
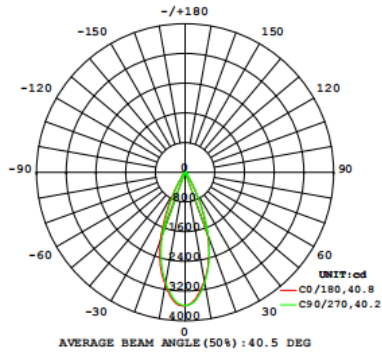
Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1504.0	87.09%
0-40	1646.0	95.31%
0-60	1725.0	99.88%
60-90	2.6	0.15%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1727.0	100.00%
90-180	0.0	0.00%
0-180	1727.0	100.00%

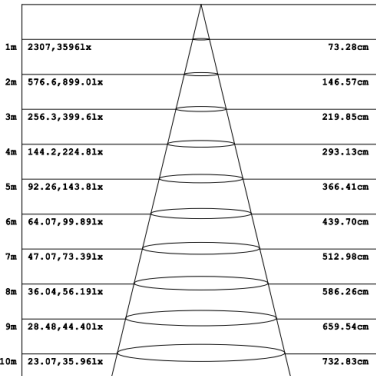
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	315.00	18.24%	90-100	0	0%
10-20	685.1	39.67%	100-110	0	0%
20-30	503.60	29.16%	110-120	0	0%
30-40	142.80	8.27%	120-130	0	0%
40-50	53.72	3.11%	130-140	0	0%
50-60	24.650	1.43%	140-150	0	0%
60-70	2.6170	0.15%	150-160	0	0%
70-80	0.0003	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data

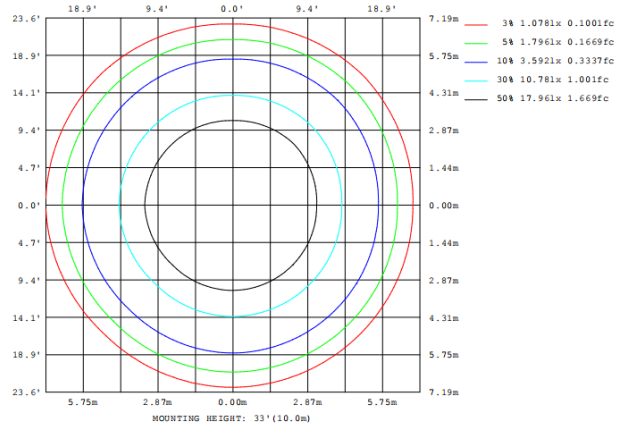
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Flux out: 1068 lm



Height Avg, Emax Angle: 40.25deg Diameter
 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	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R4STLB	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.157	18.65	0.983

Chromaticity Measurement - Sphere-Spectroradiometer Method:

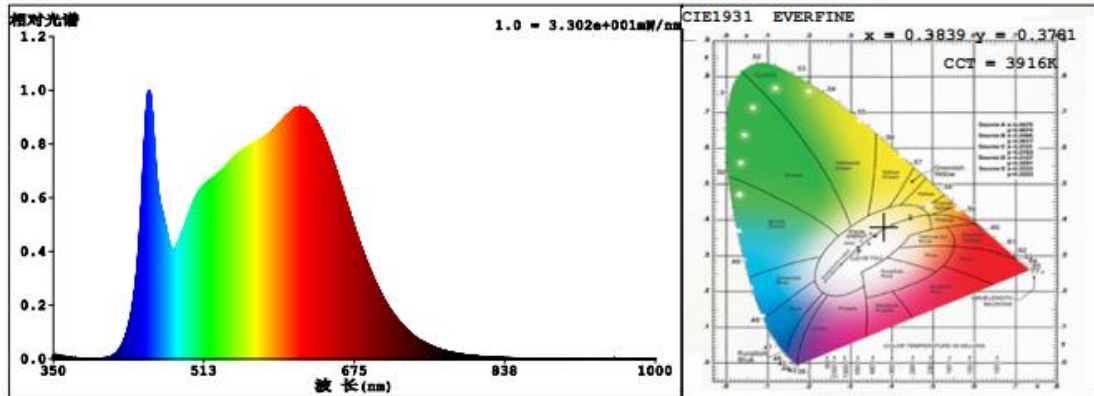
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3916
Duv	-0.000361
Chromaticity (x, y)	x=0.3839, y=0.3781
Chromaticity (u', v')	u' =0.2269, v' =0.5027
Color Rendering Index (CRI)	95.0
R9	72

Special Color Rendering Indices			
R1	96	R9	72
R2	99	R10	95
R3	99	R11	95
R4	94	R12	76
R5	95	R13	97
R6	96	R14	99
R7	94	R15	93
R8	88	--	--

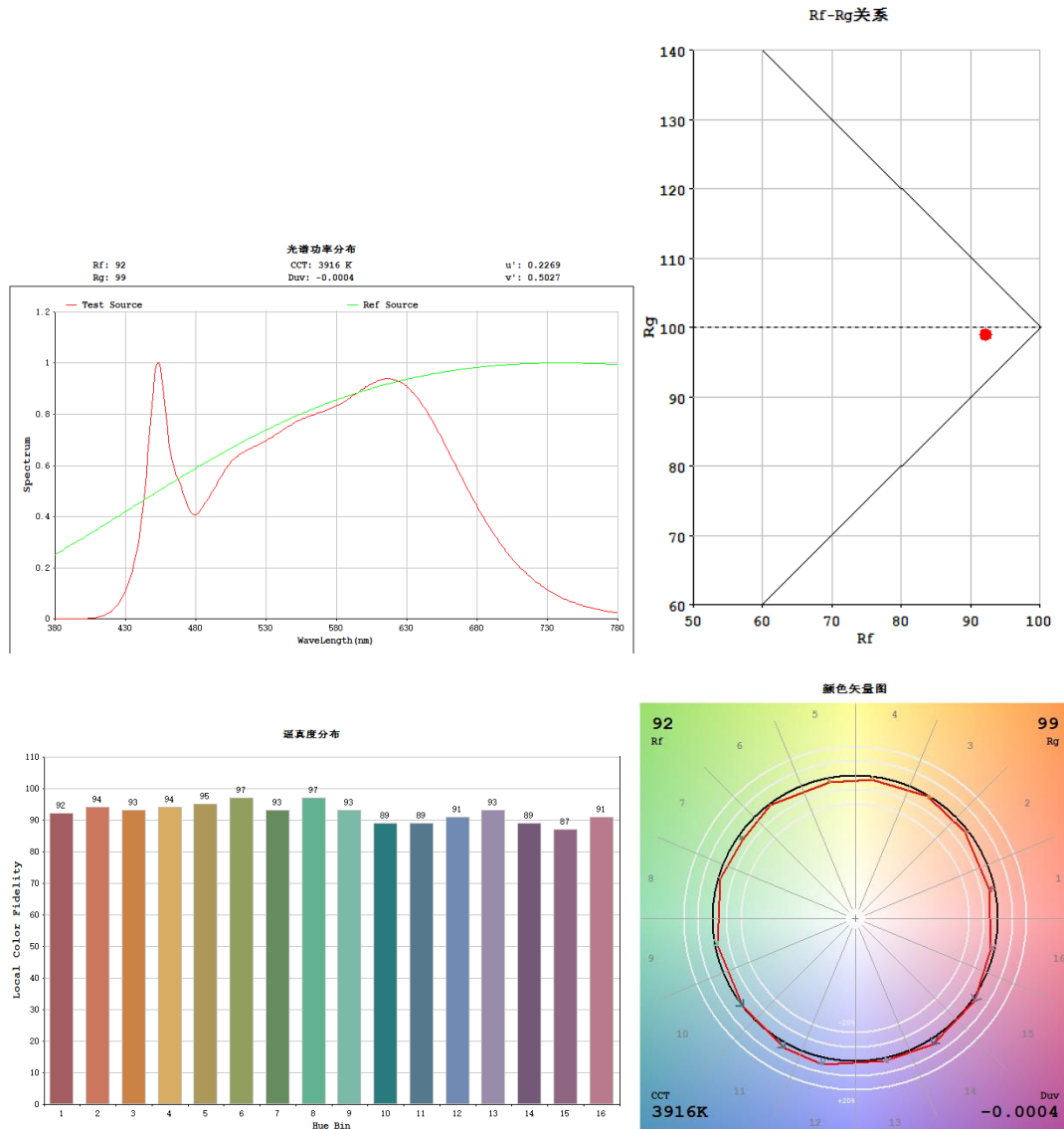
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1771.86
Luminous Efficacy (lm/W)	94.99
Beam Angle (°)	40.4
Center Beam Candle Power (cd)	3708

Spectral Power Distribution & Chromaticity Diagram



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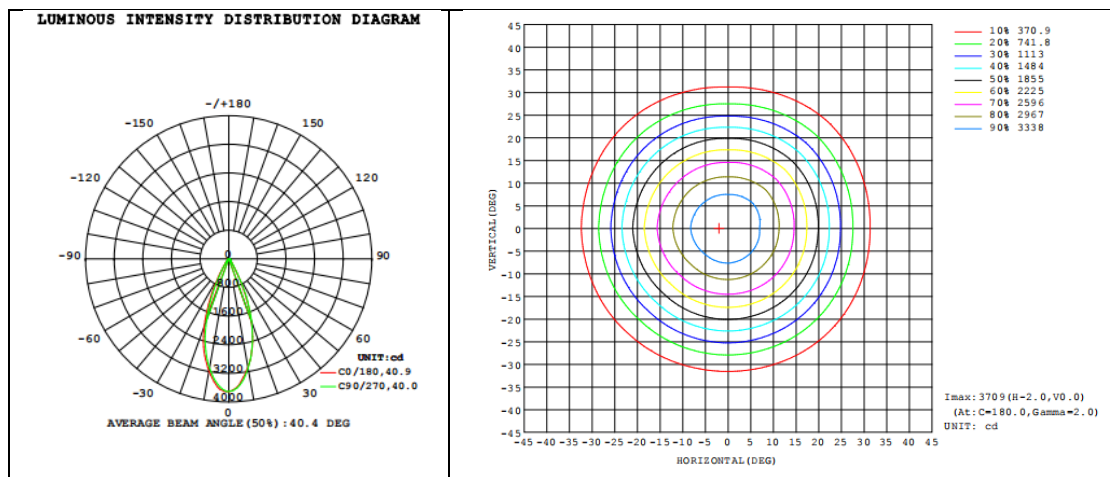


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1544.0	87.13%
0-40	1689.0	95.32%
0-60	1769.0	99.83%
60-90	2.7	0.15%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1772.0	100.00%
90-180	0.0	0.00%
0-180	1772.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	324.20	18.30%	90-100	0	0%
10-20	704.5	39.76%	100-110	0	0%
20-30	515.40	29.09%	110-120	0	0%
30-40	144.90	8.18%	120-130	0	0%
40-50	54.91	3.10%	130-140	0	0%
50-60	25.250	1.42%	140-150	0	0%
60-70	2.6870	0.15%	150-160	0	0%
70-80	0.0005	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	2024-09-05	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	R4STLB	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.163	19.39	0.984

Chromaticity Measurement - Sphere-Spectroradiometer Method:

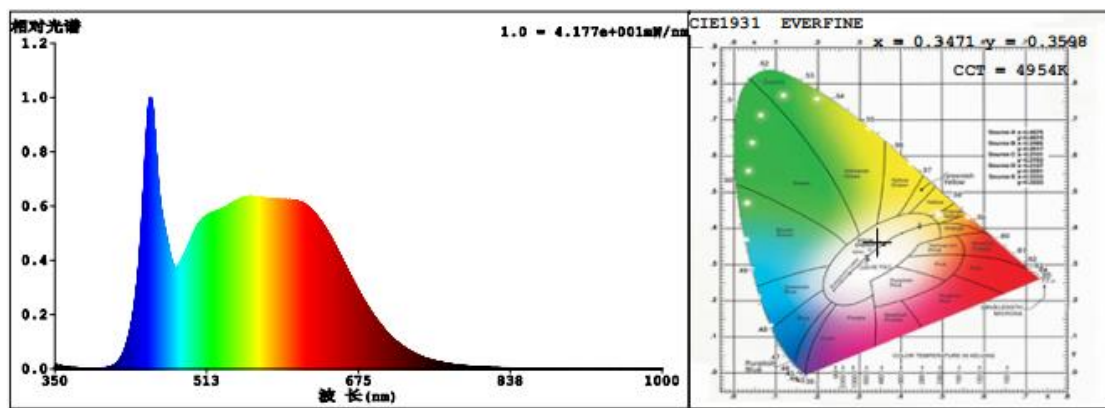
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	4954
Duv	0.00324
Chromaticity (x, y)	x=0.3471, y=0.3598
Chromaticity (u', v')	u' =0.2097, v' =0.4889
Color Rendering Index (CRI)	91.7
R9	58

Special Color Rendering Indices			
R1	91	R9	58
R2	95	R10	88
R3	97	R11	90
R4	90	R12	68
R5	90	R13	93
R6	92	R14	99
R7	94	R15	88
R8	84	--	--

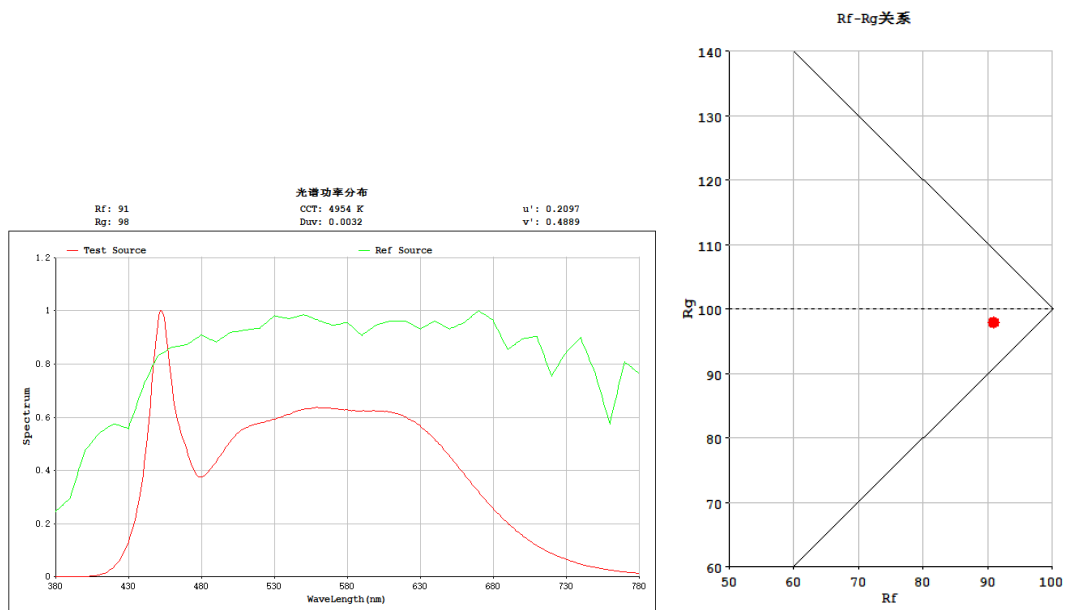
Photometric Measurement – Goniophotometer Method:

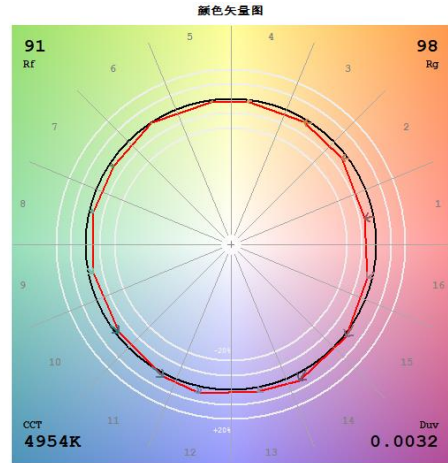
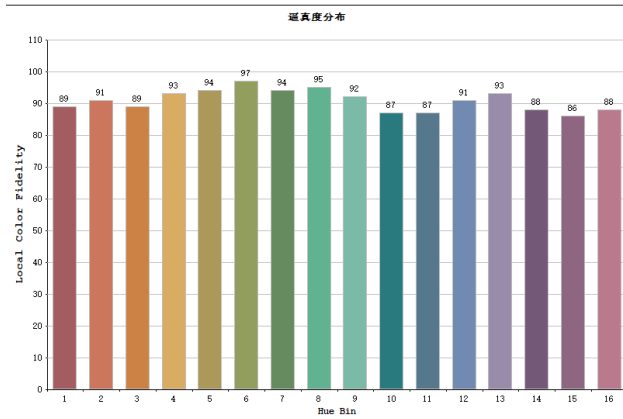
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	1754.7
Luminous Efficacy (lm/W)	90.49
Beam Angle (°)	40.3
Center Beam Candle Power (cd)	3705

Spectral Power Distribution & Chromaticity Diagram



TM30





Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1532.0	87.29%
0-40	1673.0	95.33%
0-60	1752.0	99.83%
60-90	2.7	0.15%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	1755.0	100.00%
90-180	0.0	0.00%
0-180	1755.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	322.90	18.40%	90-100	0	0%
10-20	700.9	39.94%	100-110	0	0%
20-30	508.70	28.99%	110-120	0	0%
30-40	140.70	8.02%	120-130	0	0%
40-50	53.98	3.08%	130-140	0	0%
50-60	24.950	1.42%	140-150	0	0%
60-70	2.6560	0.15%	150-160	0	0%
70-80	0.0003	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data

