

LM-79-08 Test Report
For
RAB LIGHTING INC

(Brand Name: N/A)

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

Model name(s):
DLC0054(CRLEDFA-4R-12S-9CCT-UNV-WS)

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

**Type of
Luminaire:** Downlights

Report Date: 2021-09-02

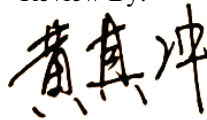
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120V-277Vac, 60 Hz
Nominal Power	7.0 W /9.0 W /12.0W
Rated Initial Lamp Lumen	600 lm /800 lm /1000 lm
Declared CCT	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

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

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.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

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.

3) Electrical Measurements:

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.

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-02	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0054(CRLEDFA-4R-12S-9CCT-UNV-WS)		12W 3000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202109020022	120.0	60	0.093	11.2	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

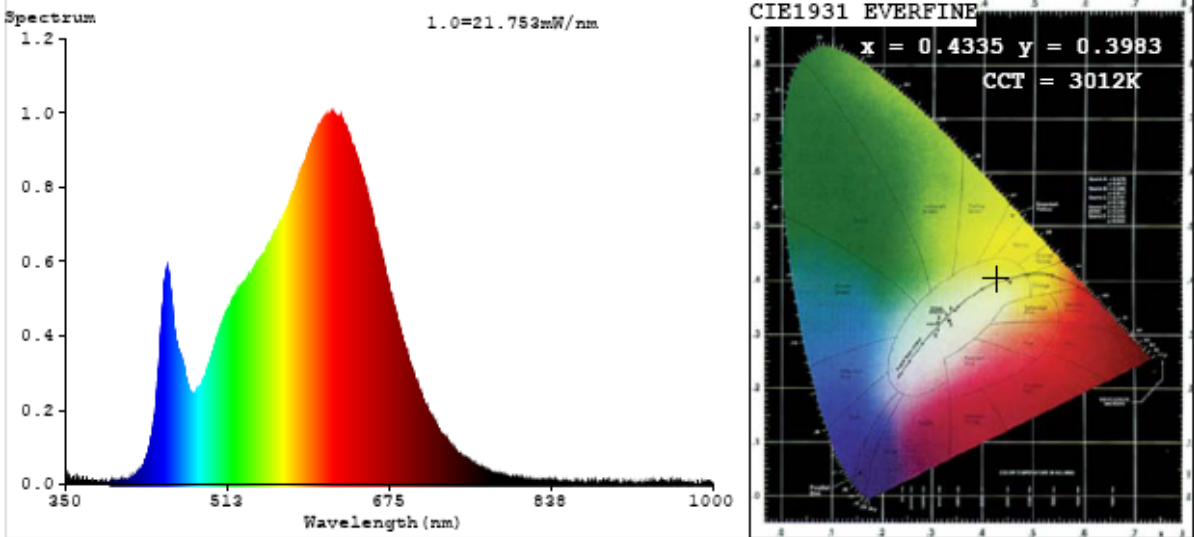
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	58
Frequency (Hz)	60	R2	97	R10	93
CCT (K)	3012	R3	98	R11	94
Duv	-0.0018	R4	93	R12	83
Chromaticity (x, y)	x=0.4335 y=0.3983	R5	93	R13	95
Chromaticity (u', v')	u'=0.2508 v'=0.5186	R6	96	R14	99
Color Rendering Index (CRI)	92.8	R7	91	R15	89
R9	58	R8	81	--	--

Photometric Measurement – Goniophotometer Method:

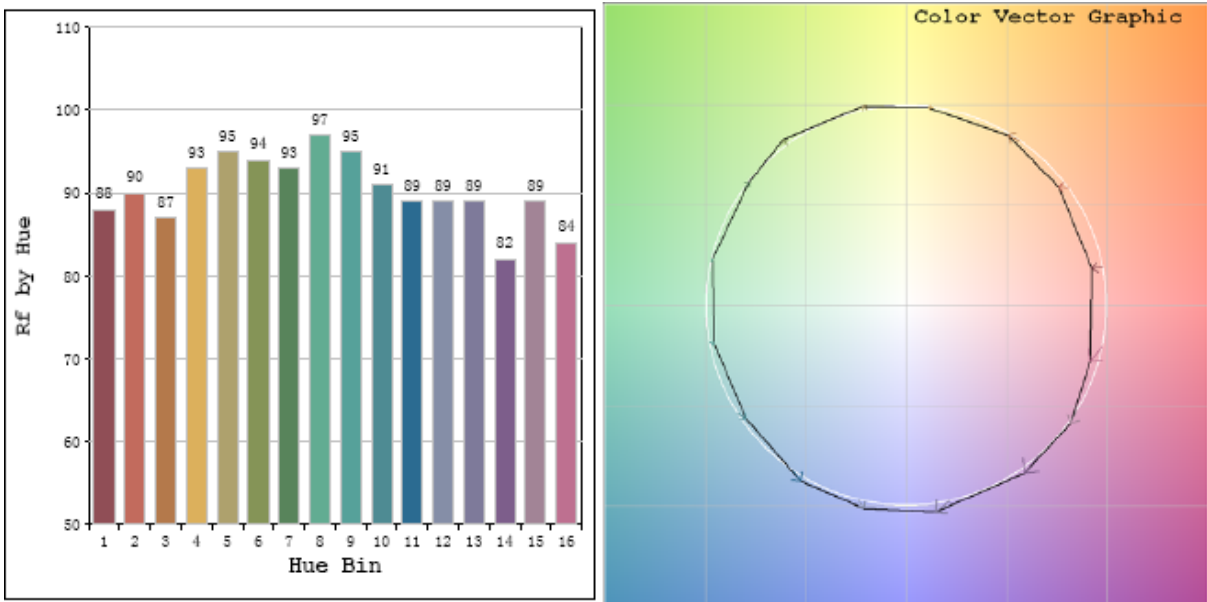
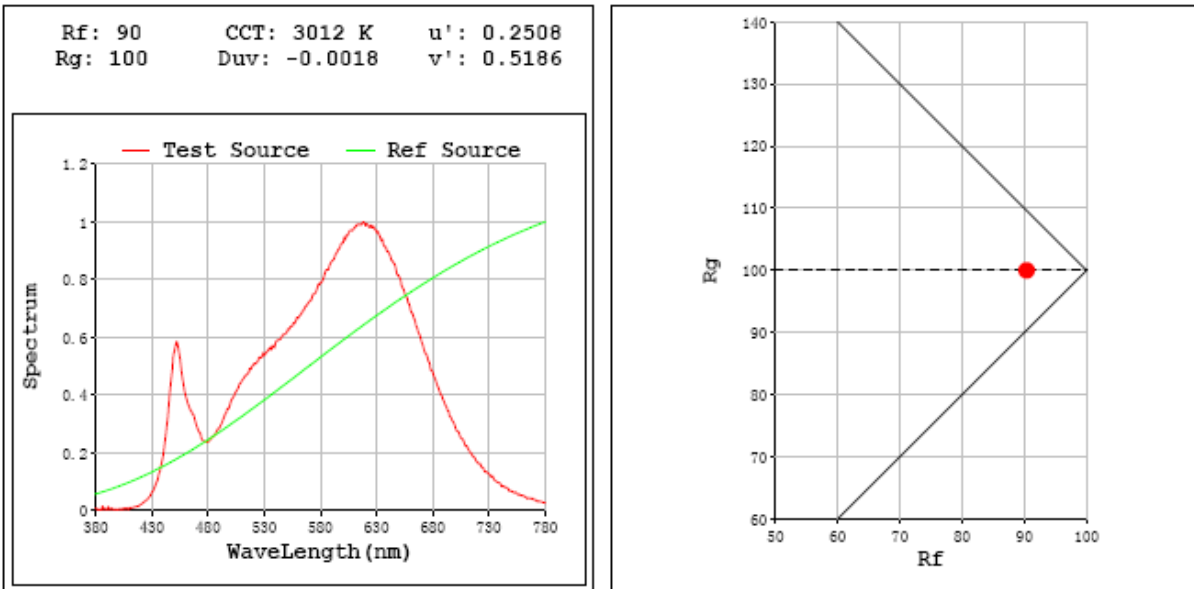
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1082.9
Luminous Efficacy (lm/W)	96.68
Beam Angle (°)	83.4
Center Beam Candle Power (cd)	565.6

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1050
Luminous Efficacy (lm/W)	94.75

Spectral Power Distribution & Chromaticity Diagram



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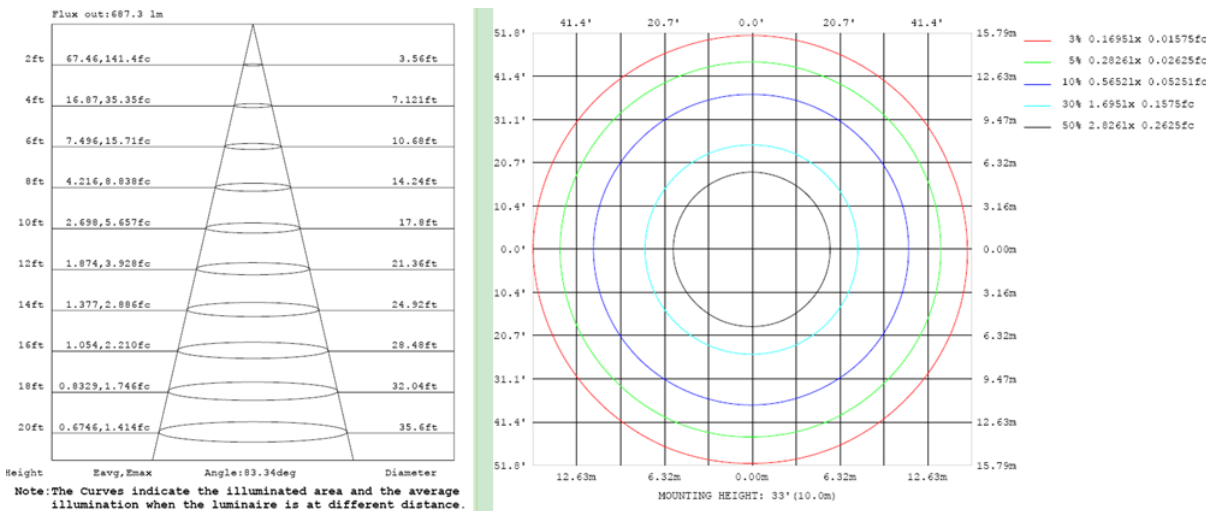
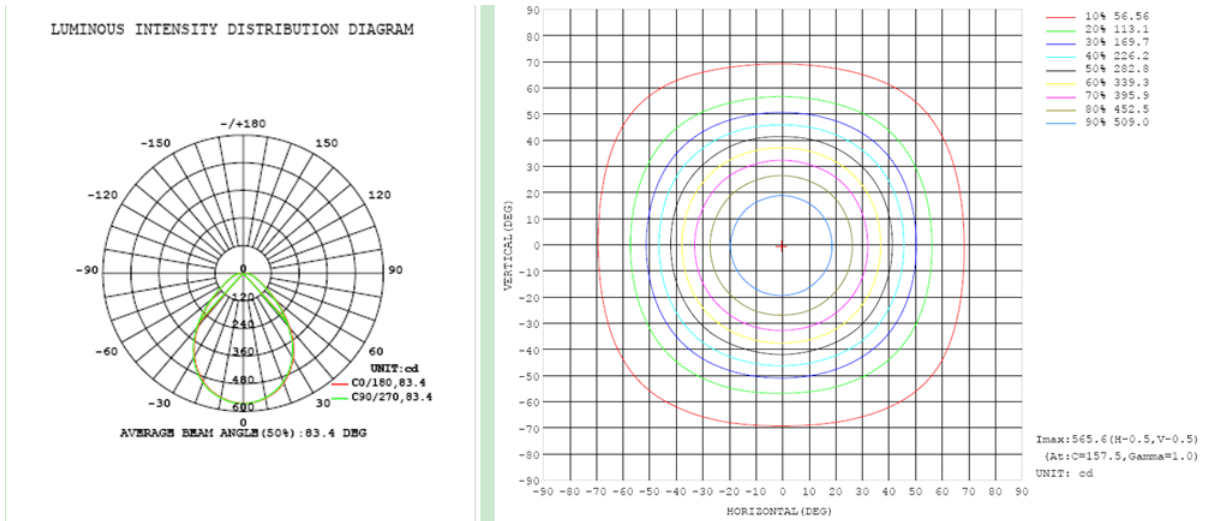


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	416.7	38.5%
0-40	645.4	59.6%
0-60	945.7	87.3%
60-90	137.2	12.7%
70-100	67.7	6.3%
90-120	0.0	0.0%
0-90	1082.9	100.0%
90-180	0.0	0.0%
0-180	1082.9	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	53.2	4.9%	90-100	0.0	0.0%
10-20	149.3	13.8%	100-110	0.0	0.0%
20-30	214.3	19.8%	110-120	0.0	0.0%
30-40	228.7	21.1%	120-130	0.0	0.0%
40-50	184.8	17.1%	130-140	0.0	0.0%
50-60	115.5	10.7%	140-150	0.0	0.0%
60-70	69.5	6.4%	150-160	0.0	0.0%
70-80	44.0	4.1%	160-170	0.0	0.0%
80-90	23.8	2.2%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-02	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0054(CRLEDFA-4R-12S-9CCT-UNV-WS)		12W 3500K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202109020022	120.0	60	0.09228	11.02	0.9951

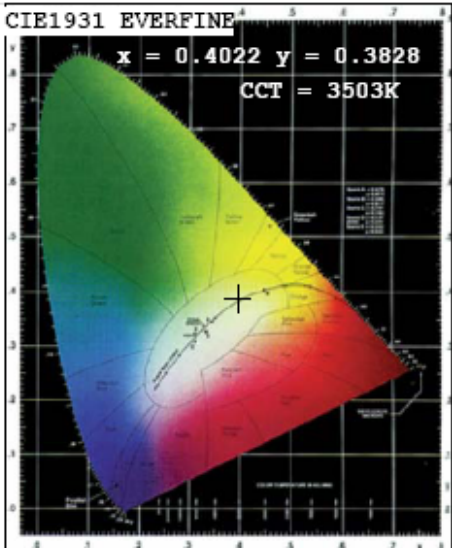
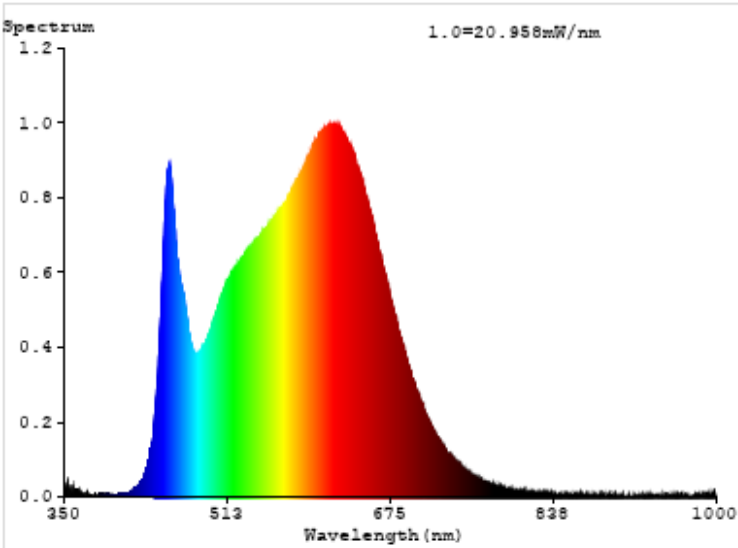
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3503
Duv	-0.0028
Chromaticity (x, y)	x=0.4022 y=0.3828
Chromaticity (u', v')	u'=0.2370 v'=0.5075
Color Rendering Index (CRI)	94.8
R9	72
Total Luminous (lm)	1137
Luminous Efficacy (lm/W)	103.17

Special Color Rendering Indices			
R1	97	R9	72
R2	99	R10	98
R3	98	R11	96
R4	94	R12	78
R5	96	R13	99
R6	95	R14	100
R7	92	R15	94
R8	87	--	--

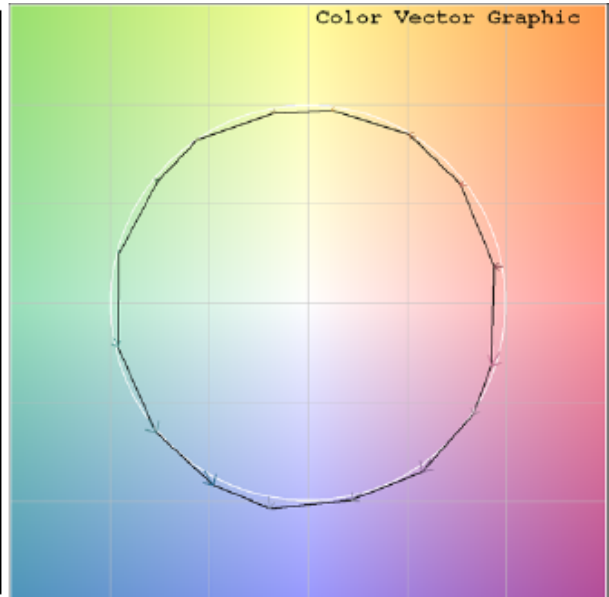
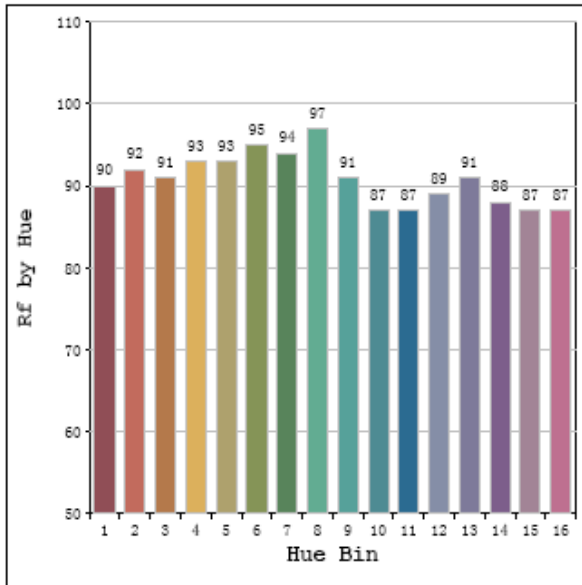
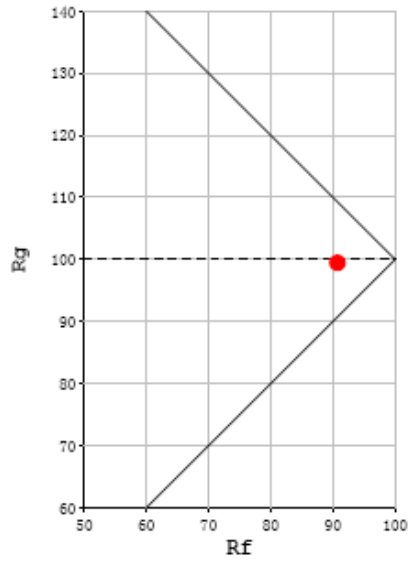
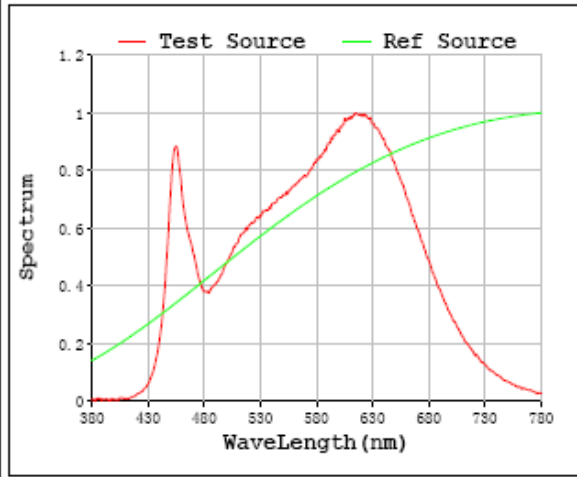
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
otal Luminous (lm)	1106
Luminous Efficacy (lm/W)	101.5

Spectral Power Distribution & Chromaticity Diagram



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Rf: 91 CCT: 3503 K u' : 0.2370
 Rg: 99 Duv: -0.0028 v' : 0.5075



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-02	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0054(CRLEDA-4R-12S-9CCT-UNV-WS)		12W 4000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202109020022	120.0	60	0.09184	10.97	0.995

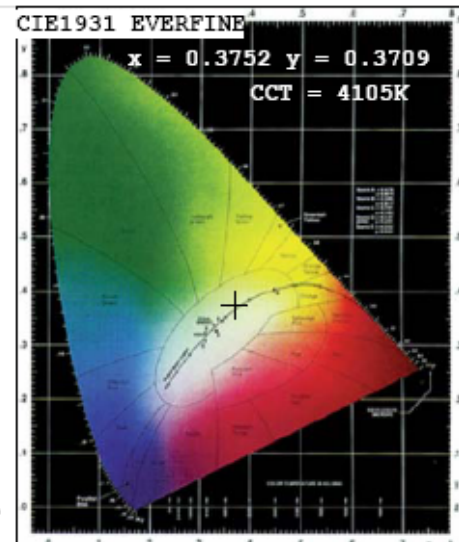
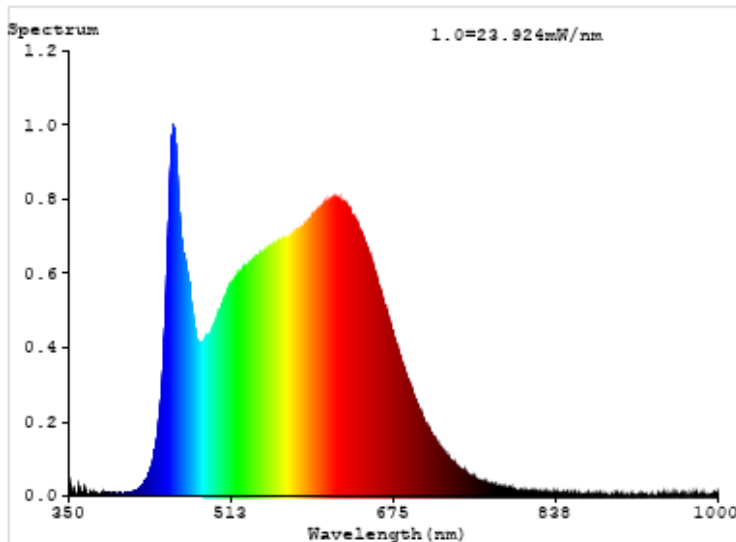
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4105
Duv	-0.0012
Chromaticity (x, y)	x=0.3752 y=0.3709
Chromaticity (u', v')	u'=0.2240 v'=0.4982
Color Rendering Index (CRI)	95.1
R9	80
Total Luminous (lm)	1159
Luminous Efficacy (lm/W)	105.71

Special Color Rendering Indices			
R1	97	R9	80
R2	99	R10	99
R3	98	R11	95
R4	93	R12	72
R5	95	R13	99
R6	95	R14	100
R7	93	R15	95
R8	90	--	--

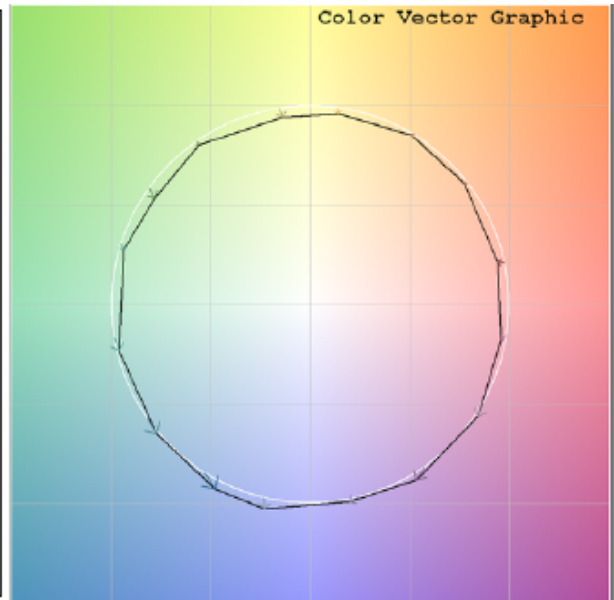
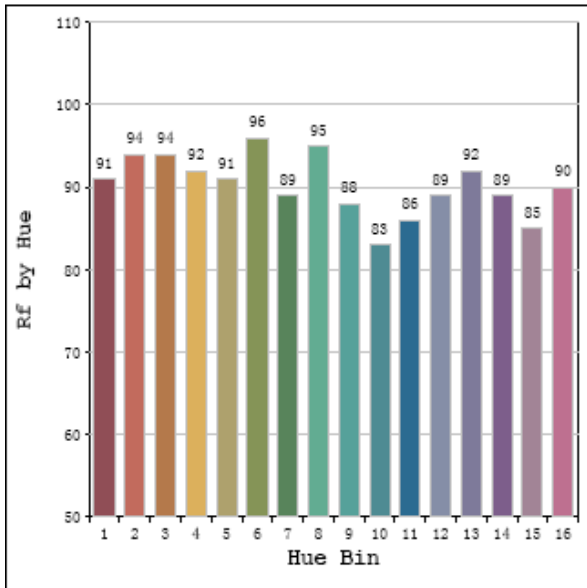
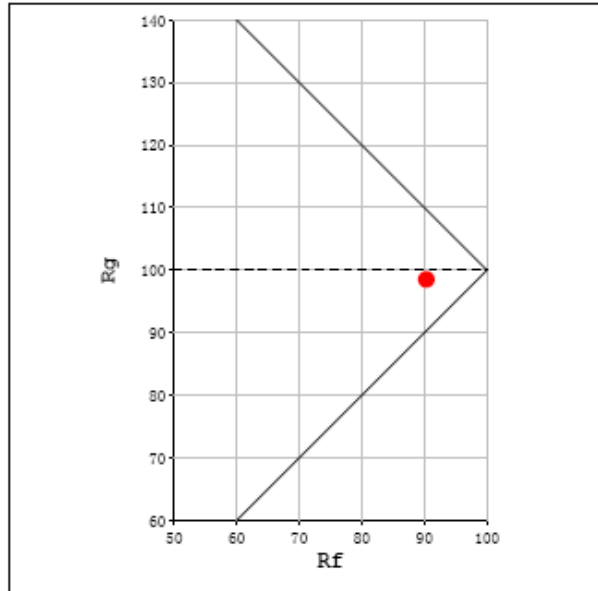
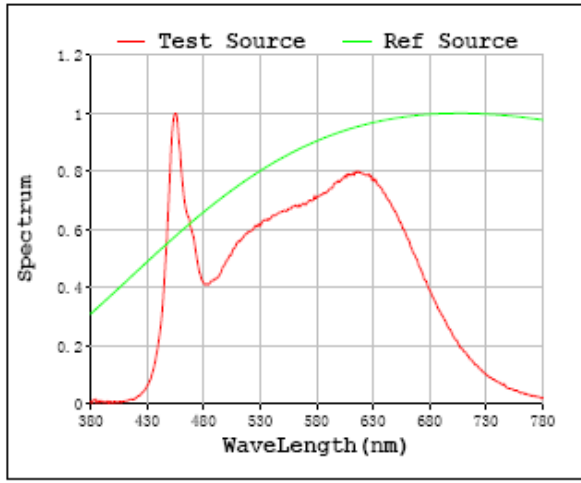
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1126
Luminous Efficacy (lm/W)	103.92

Spectral Power Distribution & Chromaticity Diagram



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Rf: 90 CCT: 4105 K u': 0.2240
 Rg: 99 Duv: -0.0012 v': 0.4982



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-02	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0054(CRLEDFA-4R-12S-9CCT-UNV-WS)		12W 5000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202109020022	120.0	60	0.09372	11.2	0.9952

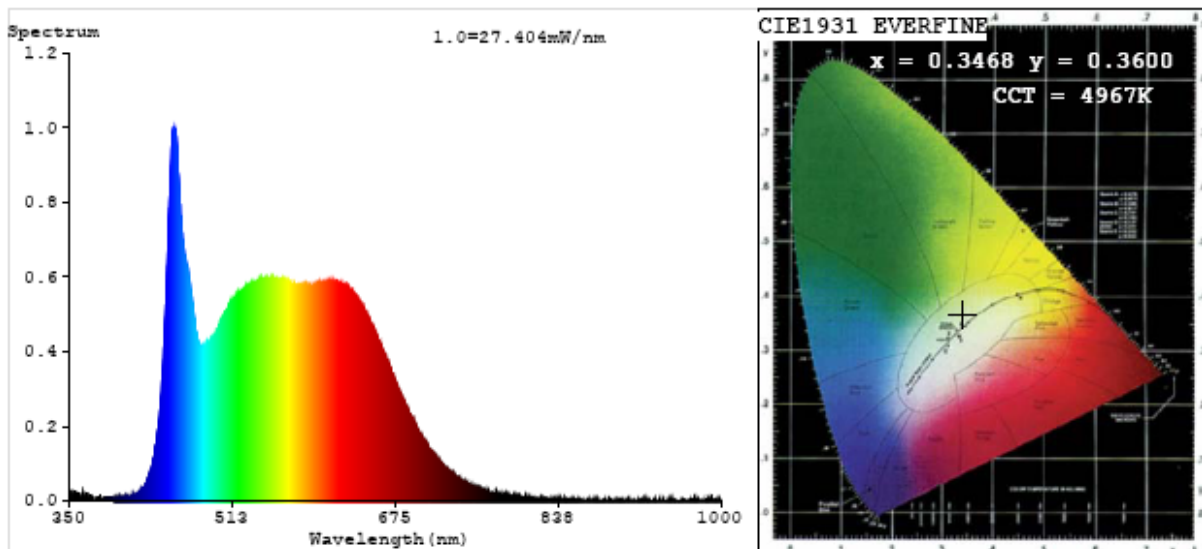
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4967
Duv	0.0035
Chromaticity (x, y)	x=0.3468 y=0.3600
Chromaticity (u', v')	u'=0.2093 v'=0.4889
Color Rendering Index (CRI)	93.6
R9	75
Total Luminous (lm)	1129
Luminous Efficacy (lm/W)	100.83

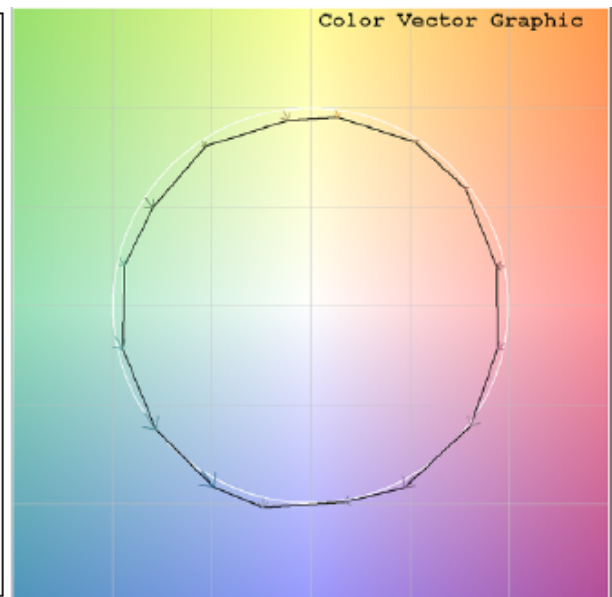
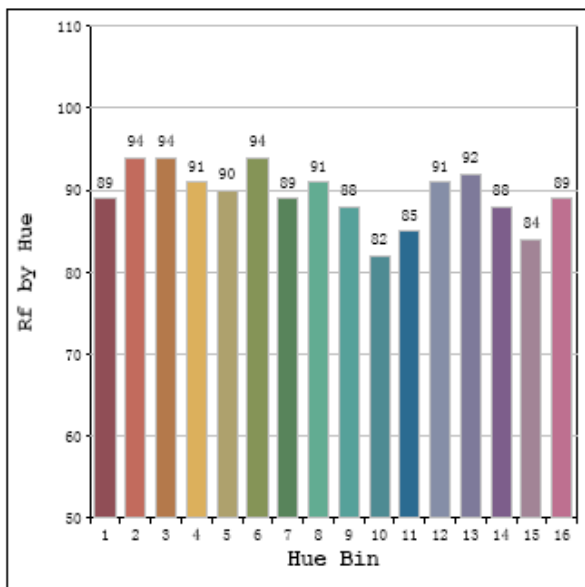
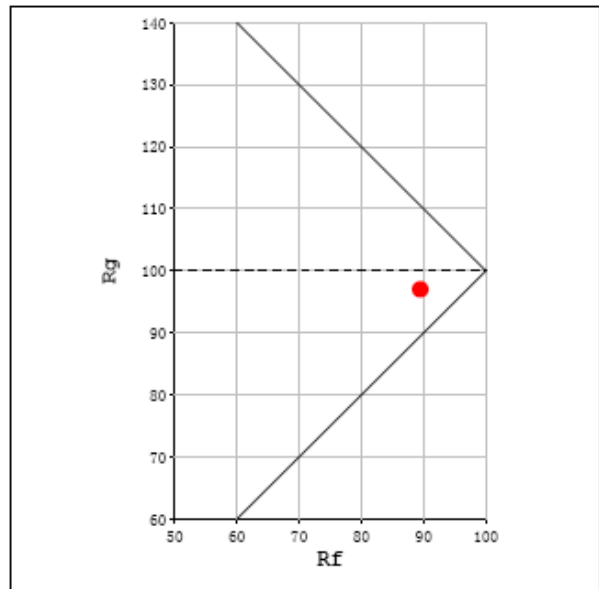
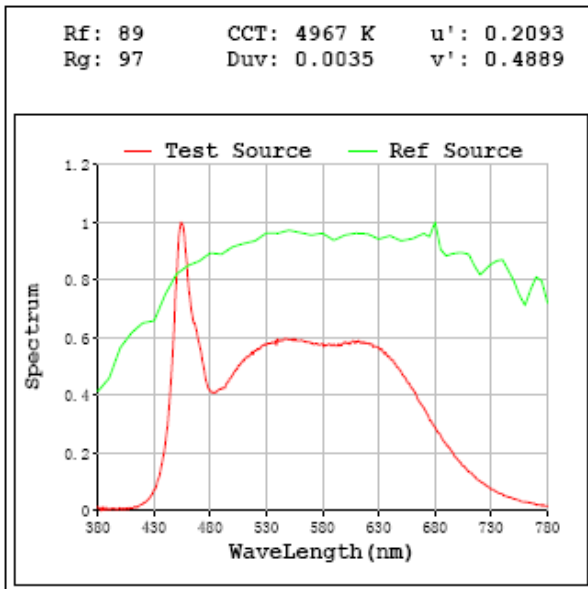
Special Color Rendering Indices			
R1	95	R9	75
R2	98	R10	95
R3	99	R11	91
R4	89	R12	66
R5	92	R13	96
R6	95	R14	99
R7	92	R15	91
R8	88	--	--

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1100
Luminous Efficacy (lm/W)	99.34

Spectral Power Distribution & Chromaticity Diagram

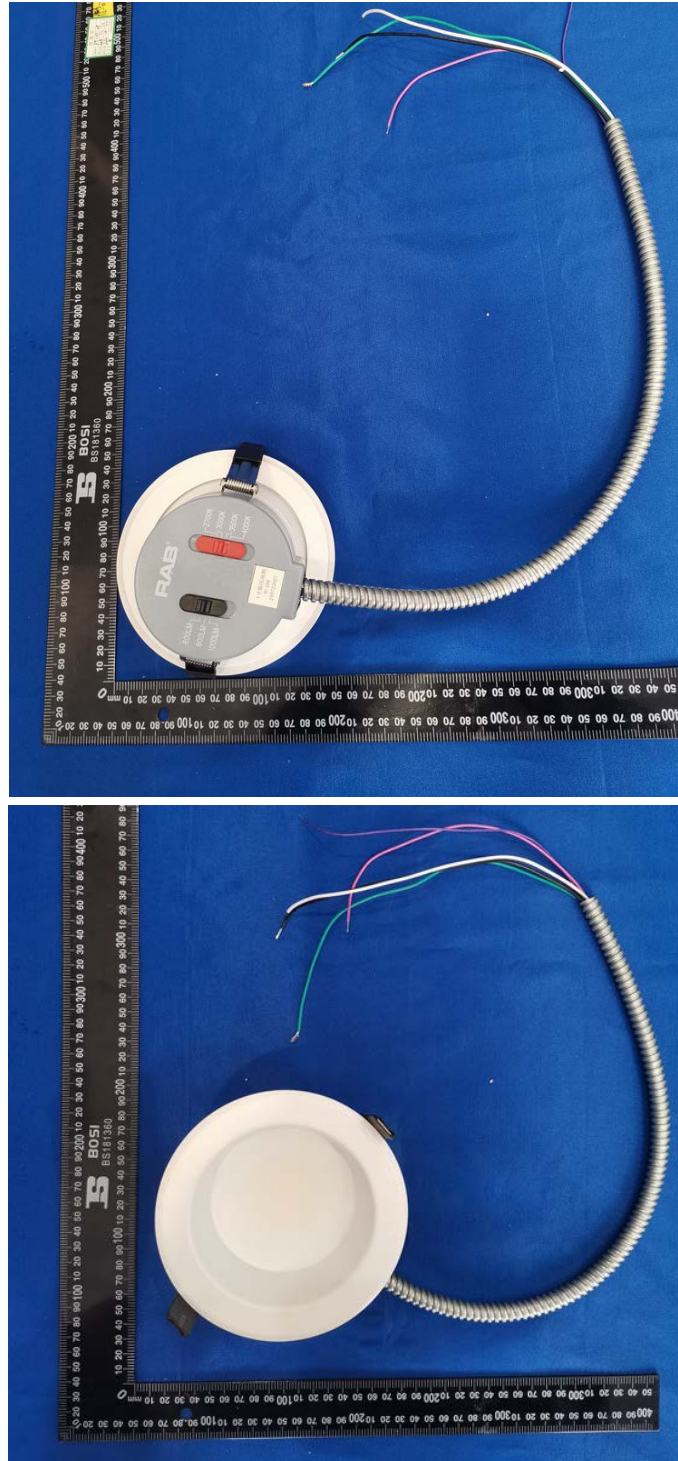


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Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
DLC0054(CRLEDFA-4R-12S-9CCT-UNV-WS)	7W 3000K setting	120.0	694.9	6.79	102.32
		277.0	674.7	6.95	97.12
	9W 3000K setting	120.0	894	9.0	99.39
		277.0	864.5	8.97	96.39
	12W 3000K setting	120.0	1082.9	11.2	96.68
		277.0	1050	11.08	94.75
	12W 3500K setting	120.0	1137	11.02	103.17
		277.0	1106	10.9	101.5
	12W 4000K setting	120.0	1159	10.97	105.71
		277.0	1126	10.83	103.92
	12W 5000K setting	120.0	1129	11.2	100.83
		277.0	1100	11.08	99.34

3. Product Photo



******* END OF REPORT *******