

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):
DLW0070(WFRL8R239FADWS)

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

**Type of
Luminaire:** Downlights

Report Date: 2021-09-01

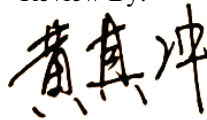
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120-277Vac, 60 Hz
Nominal Power	23W
Rated Initial Lamp Lumen	1800 lm
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

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	2021-09-01	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0070(WFRL8R239FADWS)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202108310002	120.0	60	0.177	21.1	0.994

Chromaticity Measurement - Sphere-Spectroradiometer Method:

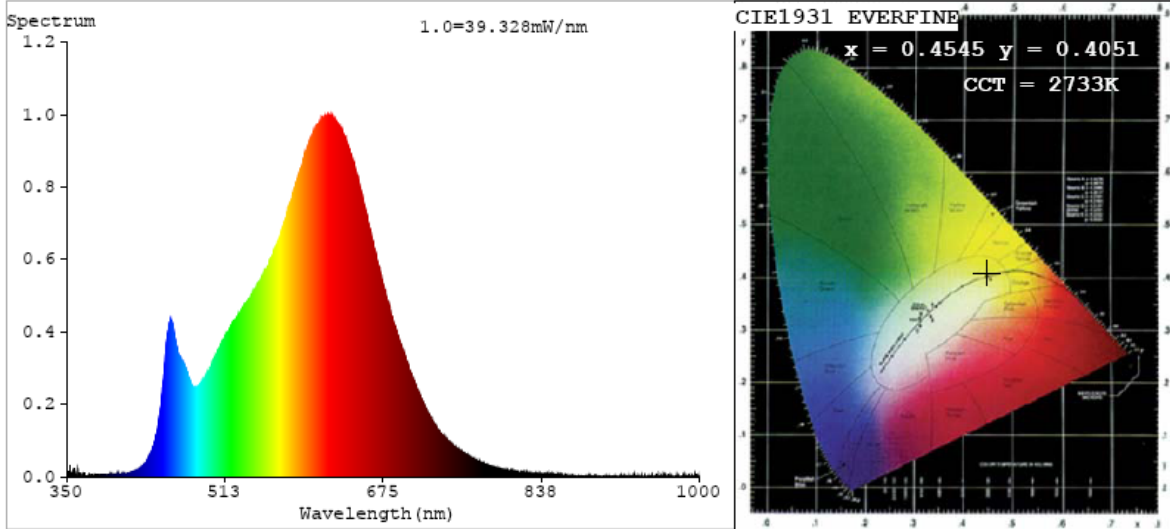
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	52
Frequency (Hz)	60	R2	99	R10	97
CCT (K)	2733	R3	95	R11	92
Duv	0.0016	R4	90	R12	84
Chromaticity (x, y)	x=0.4545 y=0.4051	R5	93	R13	95
Chromaticity (u', v')	u'=0.2615 v'=0.5244	R6	96	R14	98
Color Rendering Index (CRI)	91.3	R7	88	R15	87
R9	52	R8	76	--	--

Photometric Measurement – Goniophotometer Method:

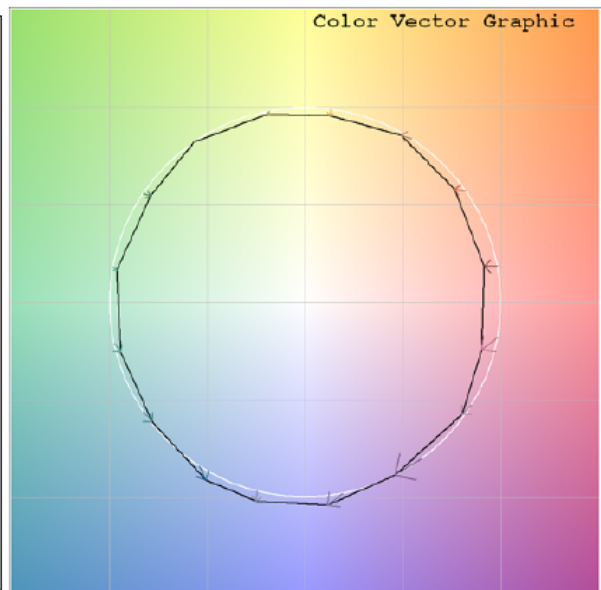
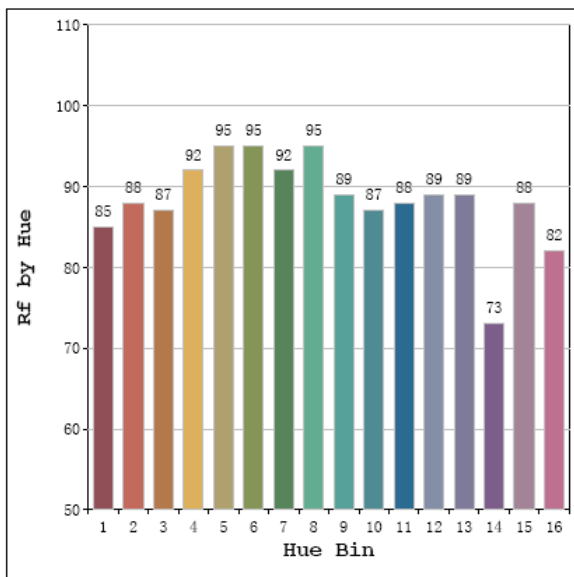
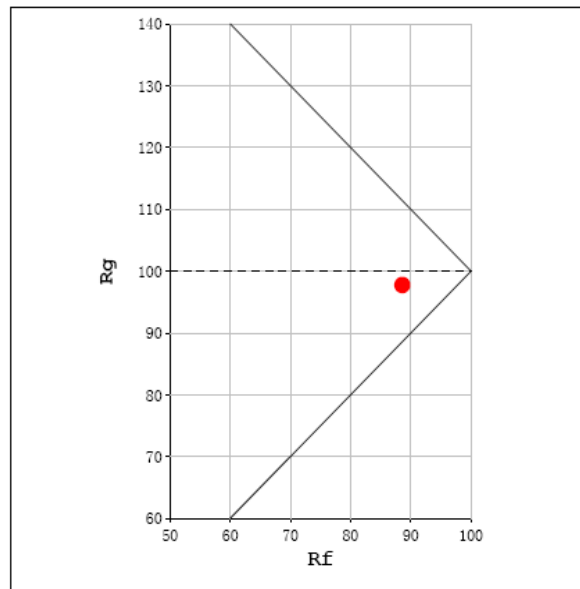
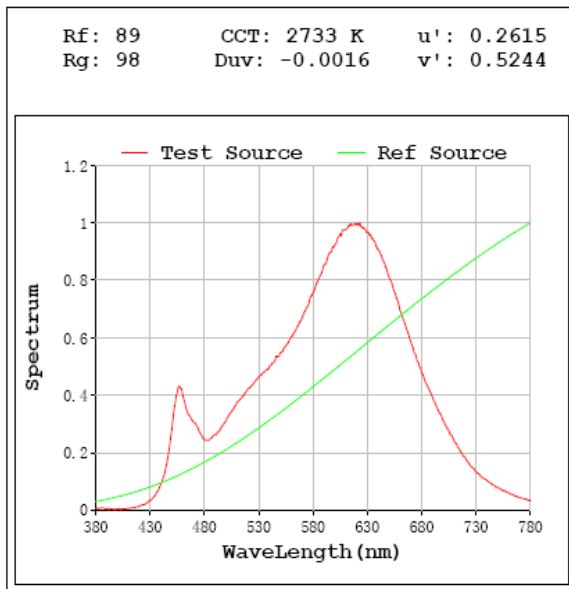
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1804.6
Luminous Efficacy (lm/W)	85.53
Beam Angle (°)	110.4
Center Beam Candle Power (cd)	636

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1802
Luminous Efficacy (lm/W)	84.7

Spectral Power Distribution & Chromaticity Diagram



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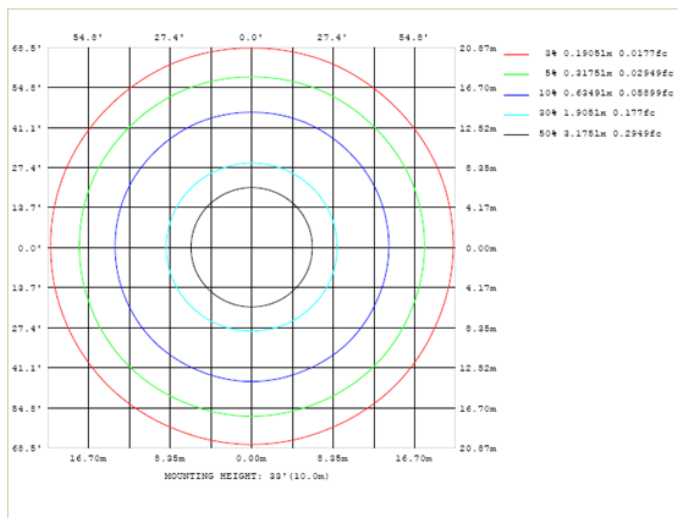
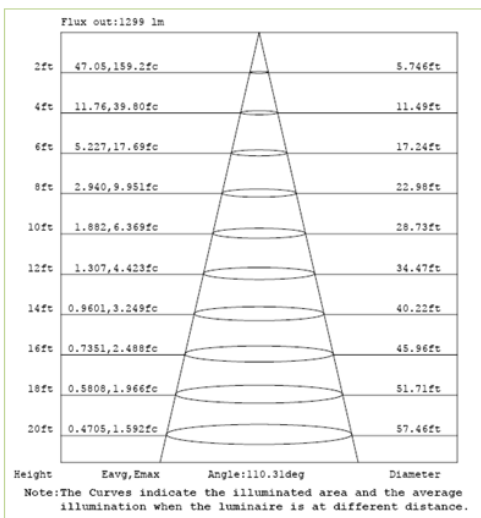
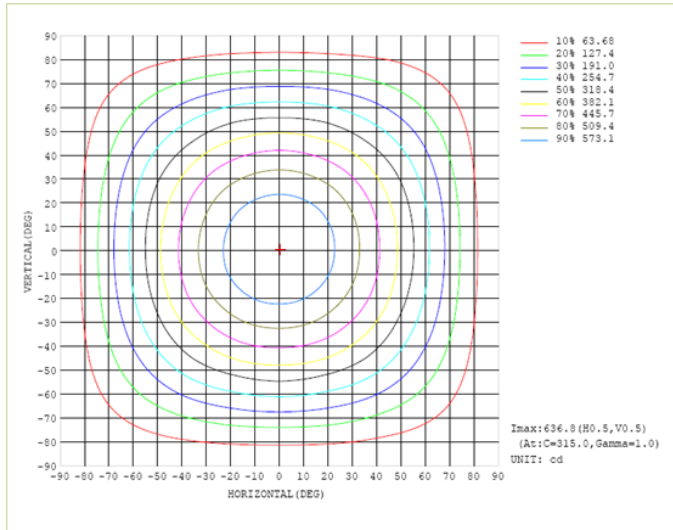
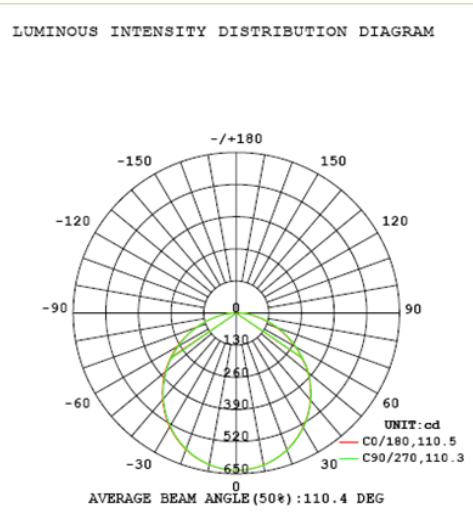


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	490.7	61.9%
0-40	801.0	101.1%
0-60	1407.6	177.6%
60-90	397.0	50.1%
70-100	177.5	22.4%
90-120	0.0	0.0%
0-90	1804.6	227.7%
90-180	0.0	0.0%
0-180	792.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	60.1	7.6%	90-100	0.0	0.0%
10-20	171.7	21.7%	100-110	0.0	0.0%
20-30	258.9	32.7%	110-120	0.0	0.0%
30-40	310.3	39.2%	120-130	0.0	0.0%
40-50	319.9	40.4%	130-140	0.0	0.0%
50-60	286.8	36.2%	140-150	0.0	0.0%
60-70	219.5	27.7%	150-160	0.0	0.0%
70-80	131.1	16.5%	160-170	0.0	0.0%
80-90	46.3	5.8%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-01	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0070(WFRL8R239FADWS)	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202108310002	120.0	60	0.175	20.91	0.993

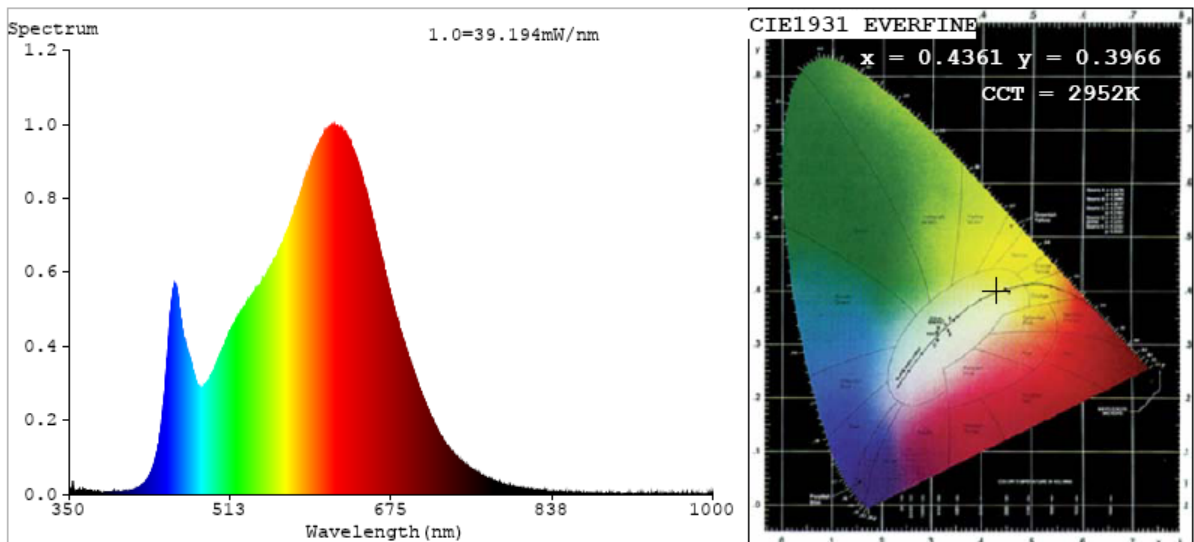
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2952
Duv	0.0029
Chromaticity (x, y)	x=0.4361 y=0.3966
Chromaticity (u', v')	u'=0.2533 v'=0.5183
Color Rendering Index (CRI)	92.6
R9	60
Total Luminous (lm)	1897
Luminous Efficacy (lm/W)	90.73

Special Color Rendering Indices			
R1	95	R9	60
R2	99	R10	98
R3	96	R11	93
R4	92	R12	82
R5	95	R13	97
R6	95	R14	99
R7	89	R15	90
R8	80	--	--

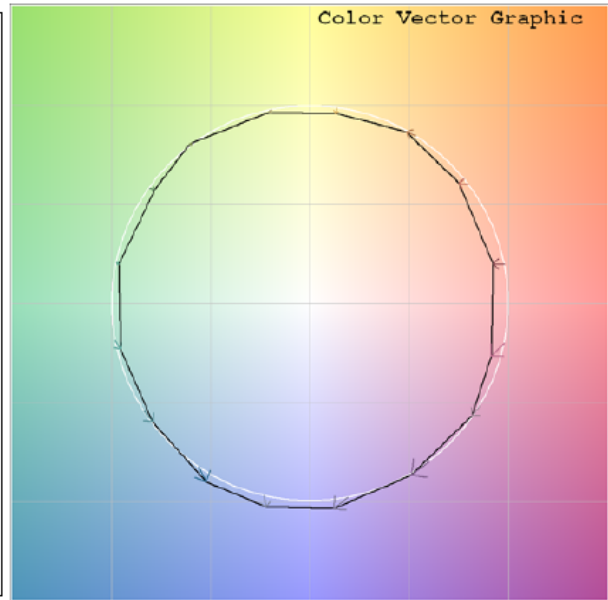
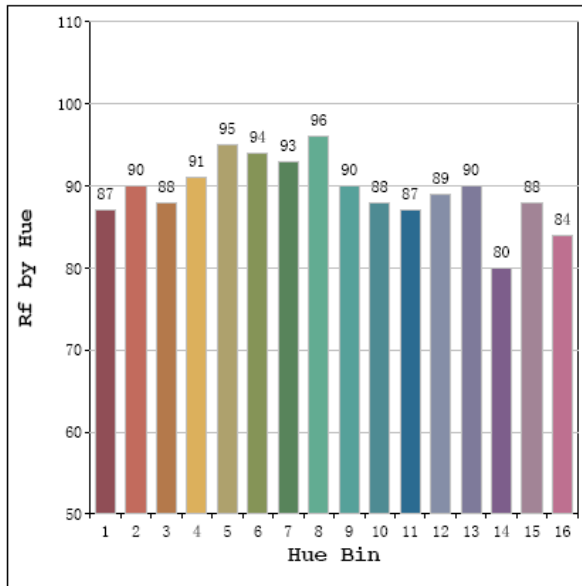
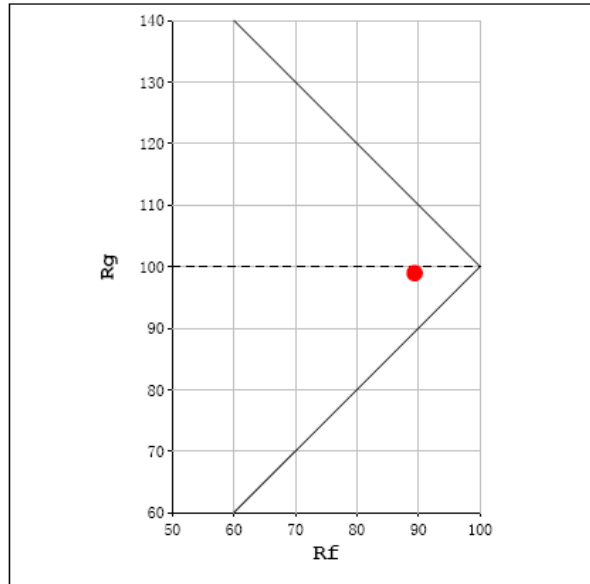
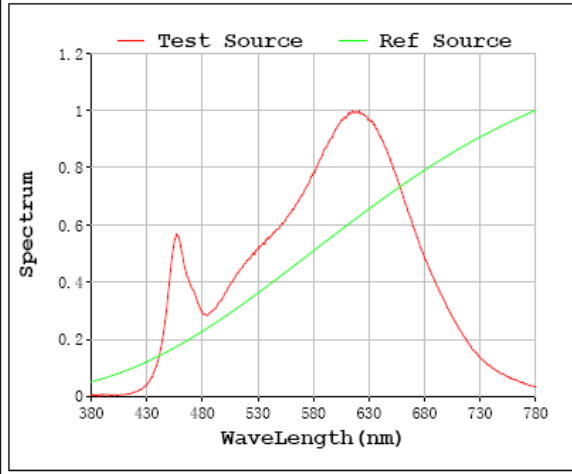
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1878
Luminous Efficacy (lm/W)	88.87

Spectral Power Distribution & Chromaticity Diagram



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Rf: 89 CCT: 2952 K u': 0.2533
 Rg: 99 Duv: -0.0029 v': 0.5183



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-01	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0070(WFRL8R239FADWS)	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202108310002	120.0	60	0.172	20.51	0.993

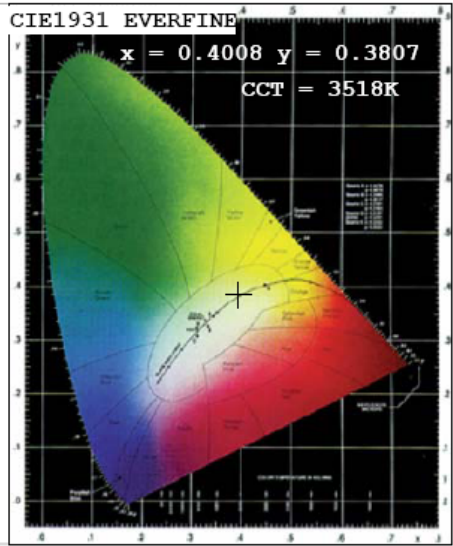
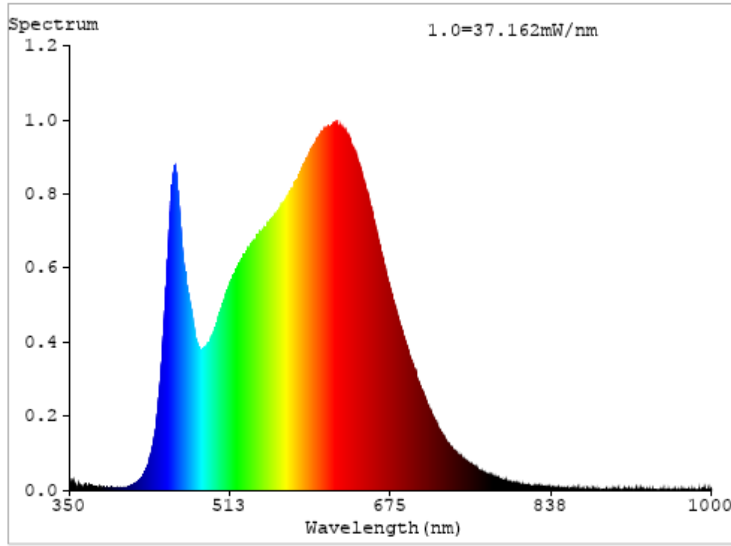
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3518
Duv	0.0035
Chromaticity (x, y)	x=0.4008 y=0.3807
Chromaticity (u', v')	u'=0.2369 v'=0.5063
Color Rendering Index (CRI)	94.5
R9	72
Total Luminous (lm)	2027
Luminous Efficacy (lm/W)	98.81

Special Color Rendering Indices			
R1	96	R9	72
R2	99	R10	98
R3	98	R11	94
R4	94	R12	77
R5	95	R13	98
R6	95	R14	100
R7	92	R15	94
R8	87	--	--

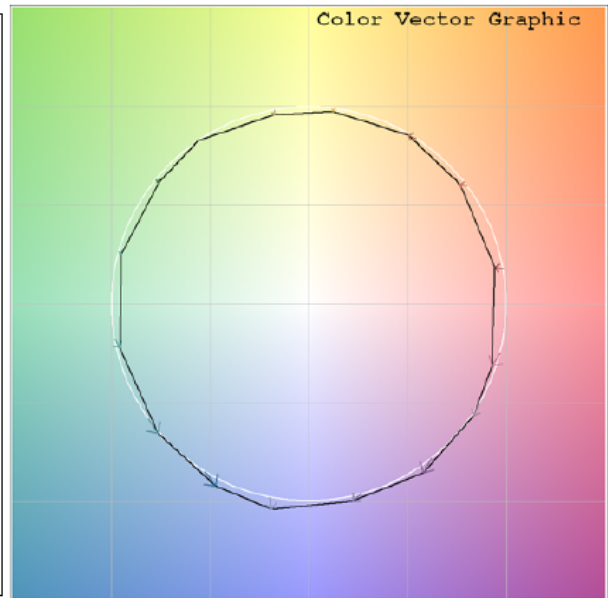
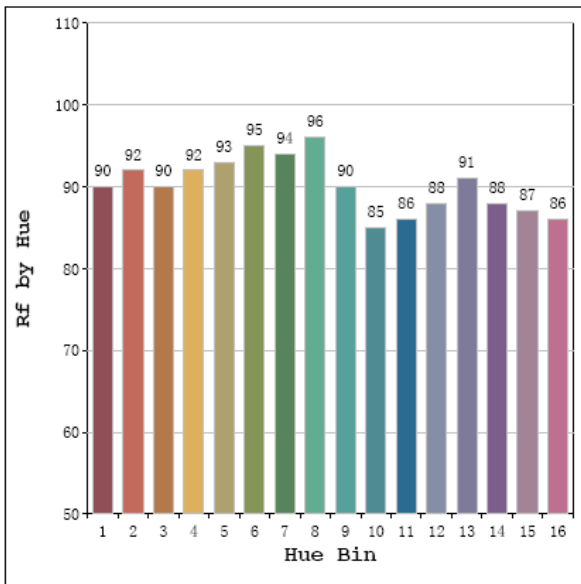
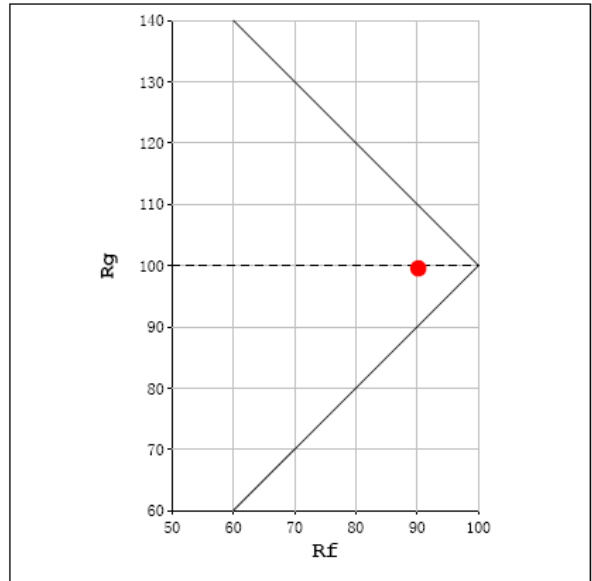
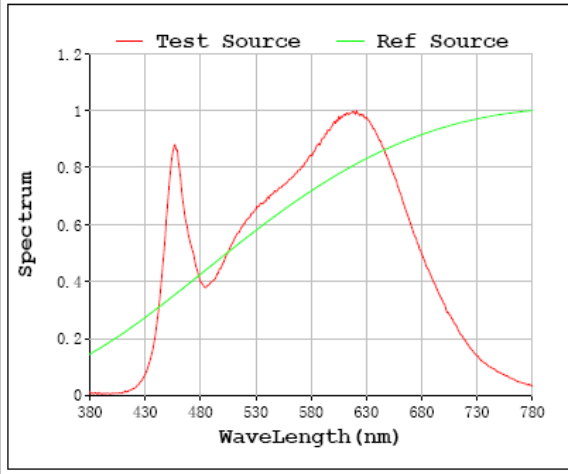
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	2012
Luminous Efficacy (lm/W)	96.97

Spectral Power Distribution & Chromaticity Diagram



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Rf: 90 CCT: 3518 K u': 0.2369
 Rg: 99 Duv: -0.0035 v': 0.5063



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-01	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0070(WFRL8R239FADWS) 4000K		

Electrical Measurement:

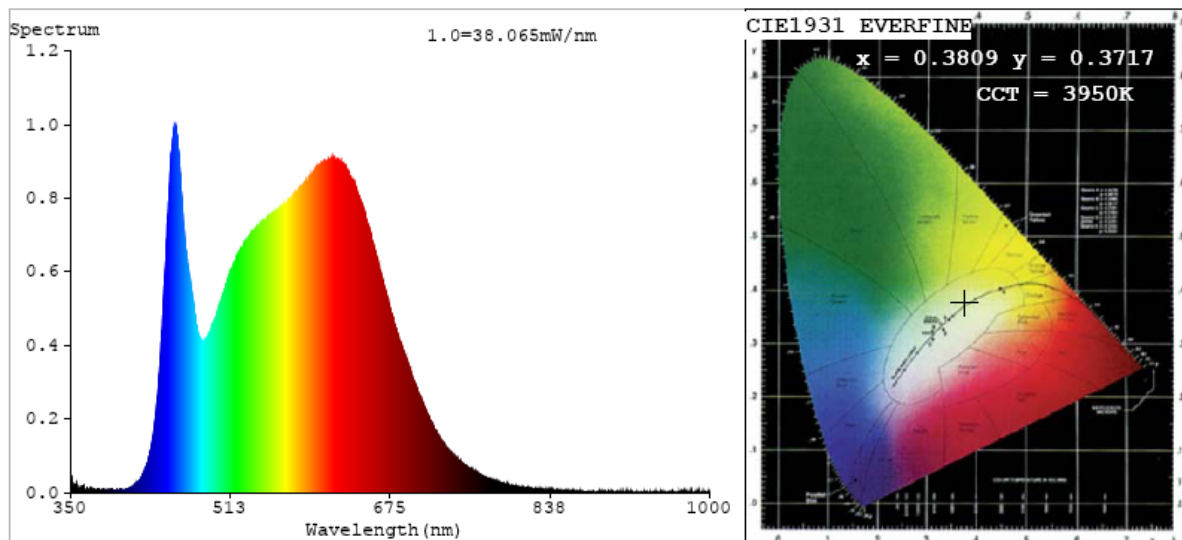
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202108310002	120.0	60	0.173	20.65	0.993

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	76
Frequency (Hz)	60	R2	99	R10	96
CCT (K)	3950	R3	98	R11	94
Duv	0.0025	R4	93	R12	73
Chromaticity (x, y)	x=0.3809 y=0.3717	R5	94	R13	98
Chromaticity (u', v')	u'=0.2274 v'=0.4994	R6	95	R14	99
Color Rendering Index (CRI)	94.8	R7	93	R15	95
R9	76	R8	89	--	--
Total Luminous (lm)	2065				
Luminous Efficacy (lm/W)	100.02				

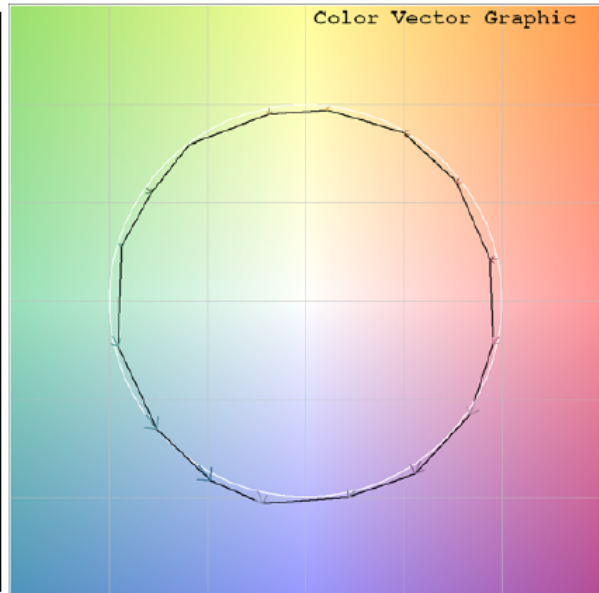
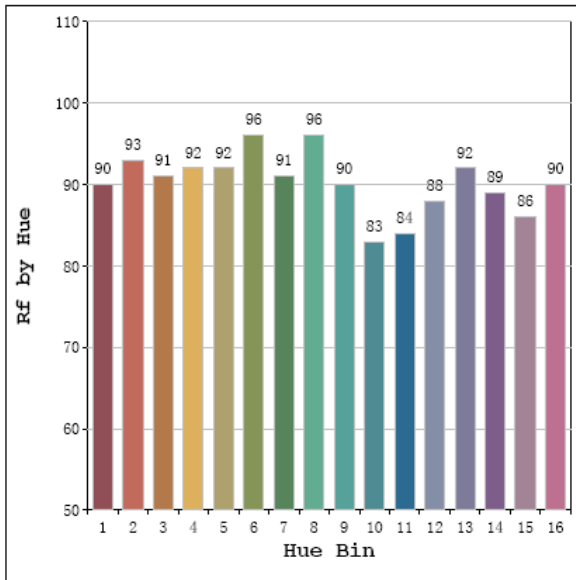
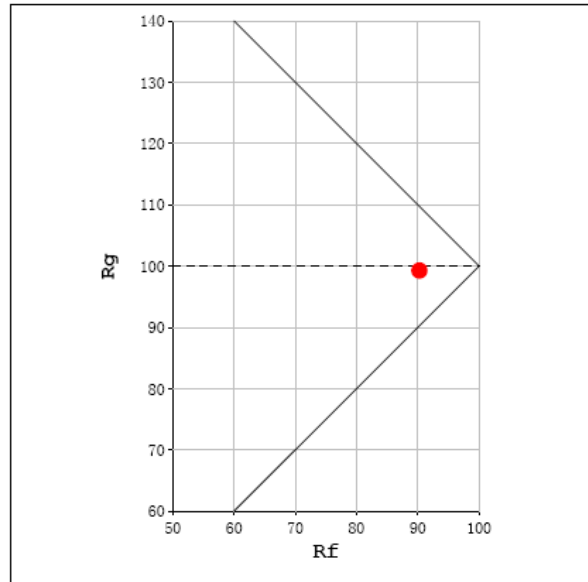
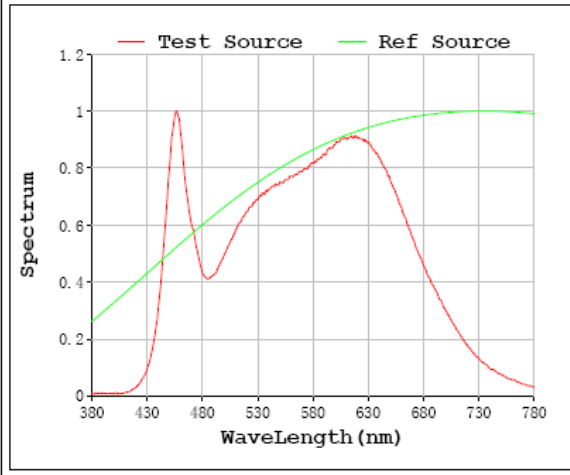
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	2045
Luminous Efficacy (lm/W)	97.85

Spectral Power Distribution & Chromaticity Diagram



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Rf: 90 CCT: 3950 K u': 0.2274
 Rg: 99 Duv: -0.0025 v': 0.4994



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2021-09-01	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0070(WFRL8R239FADWS)		5000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202108310002	120.0	60	0.177	21.1	0.994

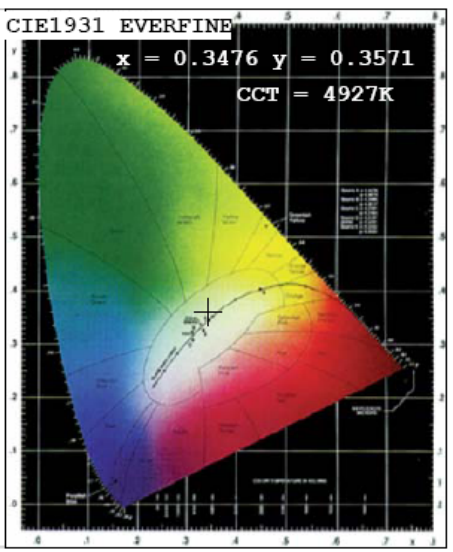
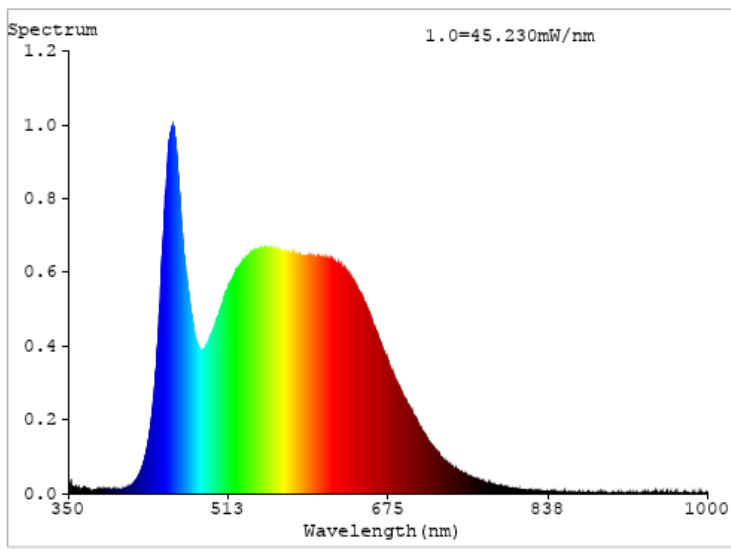
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4927
Duv	0.0018
Chromaticity (x, y)	x=0.3476 y=0.3571
Chromaticity (u', v')	u'=0.2110 v'=0.4877
Color Rendering Index (CRI)	92.5
R9	70
Total Luminous (lm)	2043
Luminous Efficacy (lm/W)	96.86

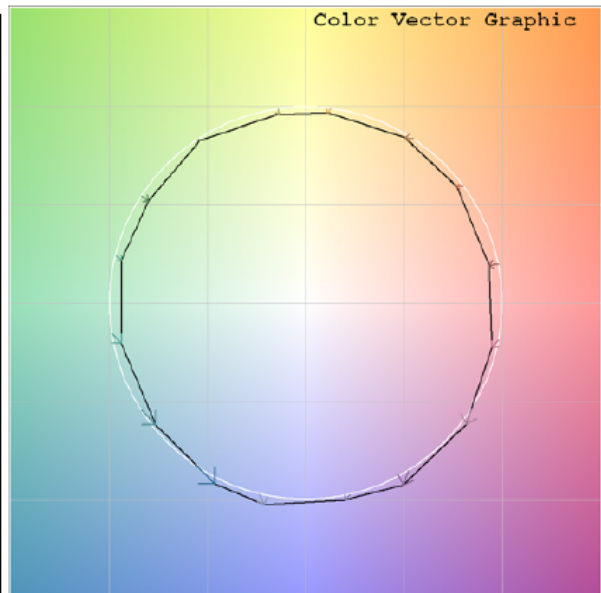
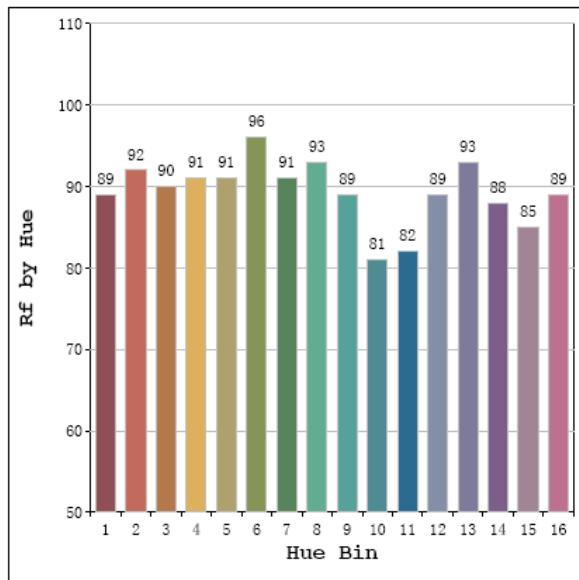
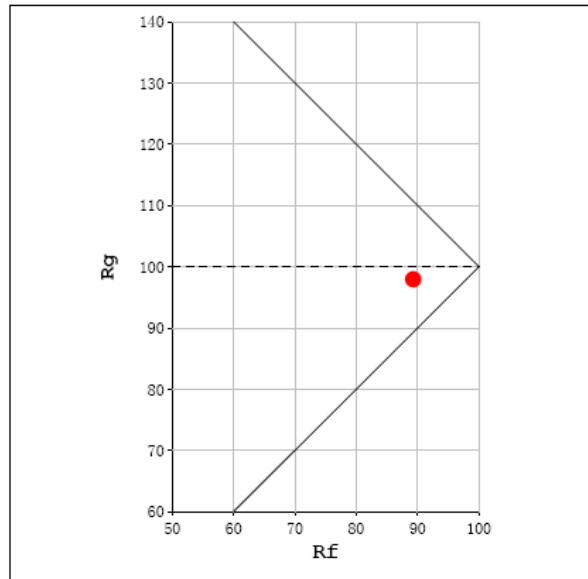
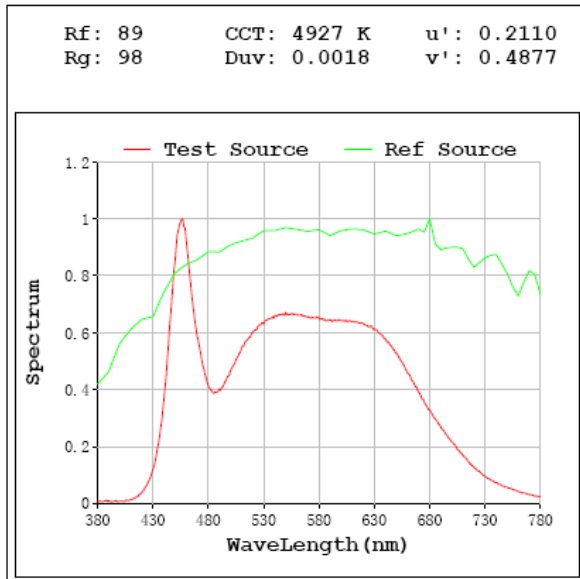
Special Color Rendering Indices			
R1	93	R9	70
R2	96	R10	89
R3	96	R11	90
R4	90	R12	65
R5	91	R13	94
R6	92	R14	98
R7	94	R15	91
R8	88	--	--

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	2027
Luminous Efficacy (lm/W)	95.25

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
DLW0070(WFRL8R239FADWS)	2700K setting	120.0	1804.6	21.1	85.53
		277.0	1802	21.28	84.7
	3000K setting	120.0	1897	20.91	90.73
		277.0	1878	21.13	88.87
	3500K setting	120.0	2027	20.51	98.81
		277.0	2012	20.75	96.97
	4000K setting	120.0	2065	20.65	100.02
		277.0	2045	20.9	97.85
	5000K setting	120.0	2043	21.1	96.86
		277.0	2027	21.28	95.25

3. Product Photo



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