

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):
DLW0086(WFRLA4R89FA120WS)

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

**Type of
Luminaire:** Downlights

Report Date: 2022-07-18

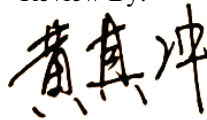
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	8.0 W
Rated Initial Lamp Lumen	650 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	2022-07-18	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0086(WFRLA4R89FA120WS)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202207120056	120.0	60	0.066	7.78	0.972

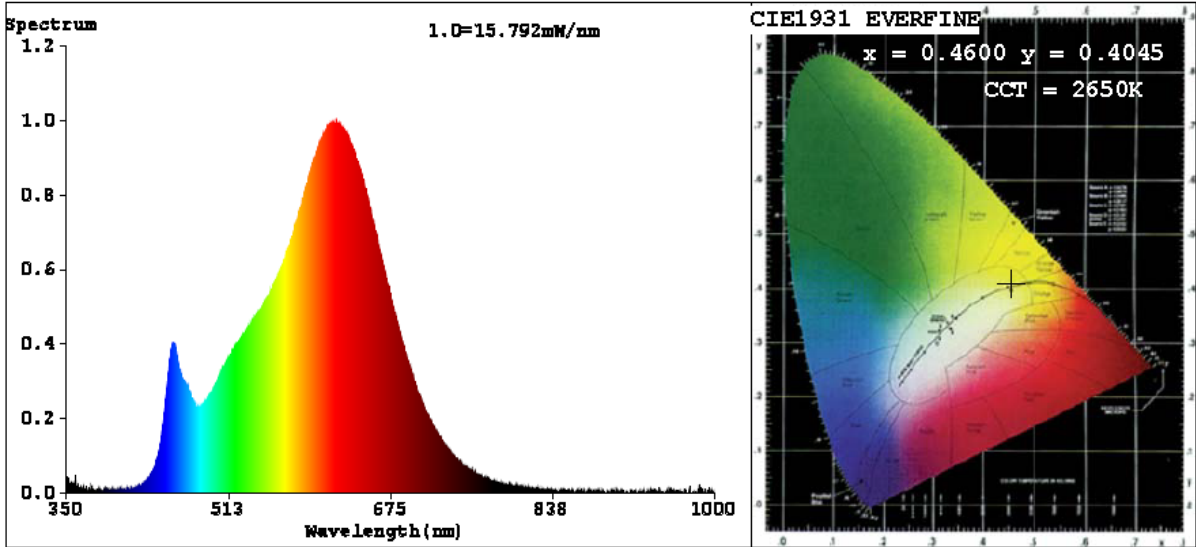
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	94	R9	54
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	2650	R3	95	R11	93
Duv	-0.0023	R4	91	R12	85
Chromaticity (x, y)	x=0.4600 y=0.4045	R5	94	R13	96
Chromaticity (u', v')	u'=0.2654 v'=0.5250	R6	95	R14	98
Color Rendering Index (CRI)	91.5	R7	87	R15	88
R9	54	R8	77	--	--

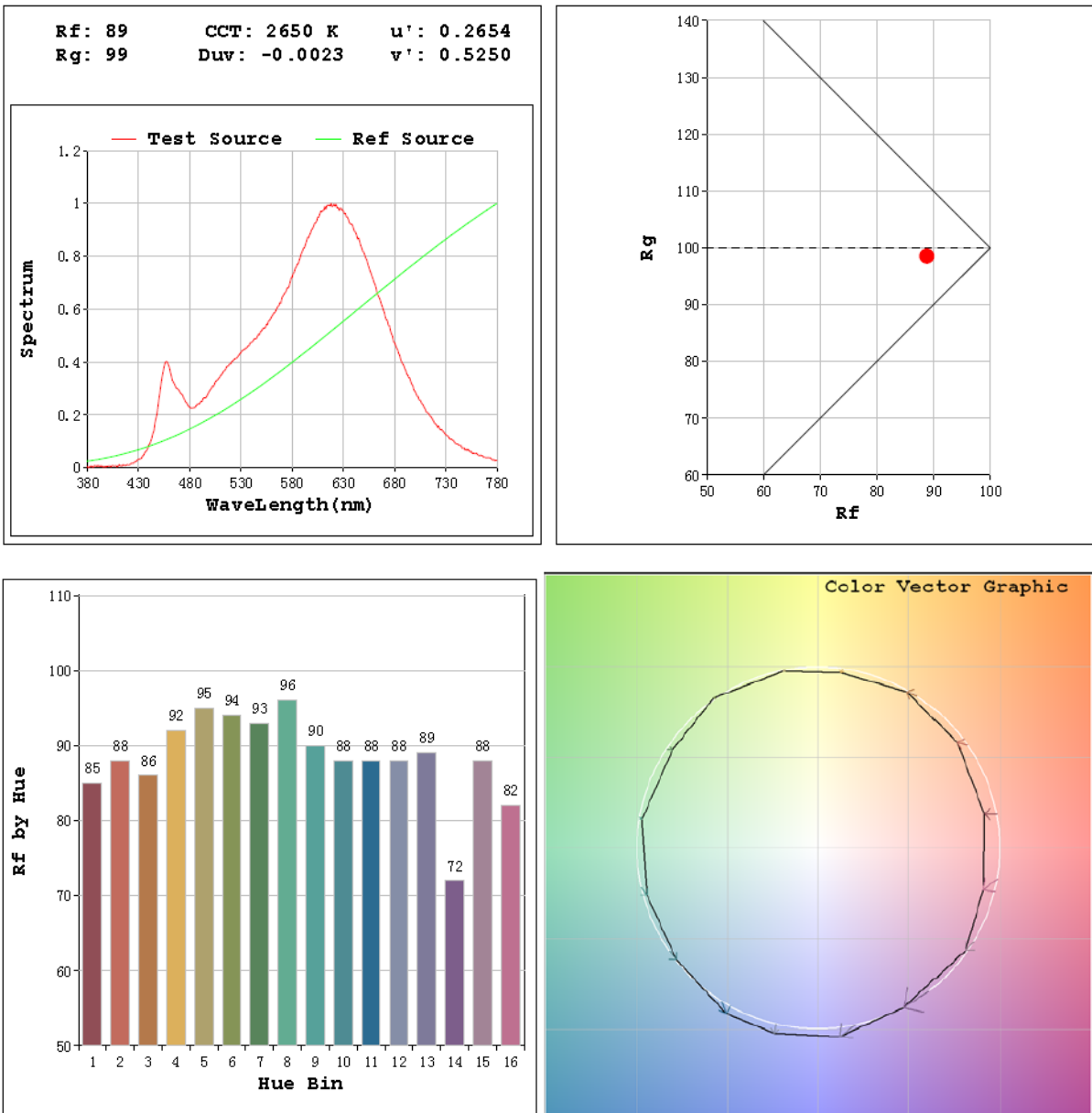
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	698.9
Luminous Efficacy (lm/W)	89.8
Beam Angle (°)	112.9
Center Beam Candle Power (cd)	246.6

Spectral Power Distribution & Chromaticity Diagram



TM30

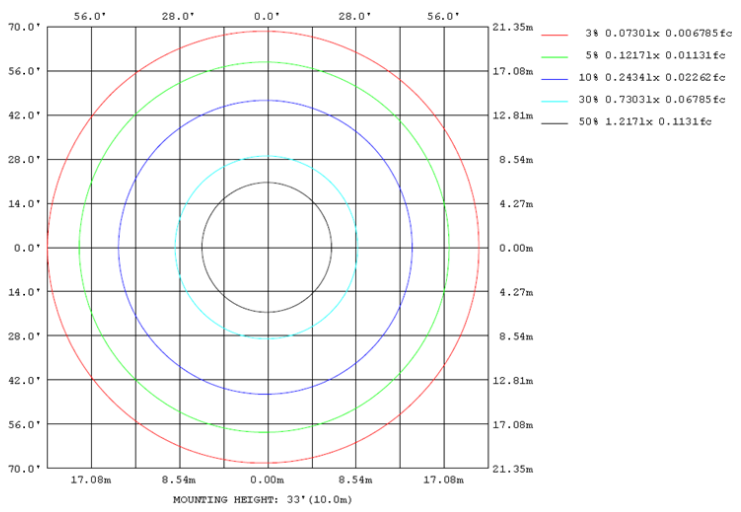
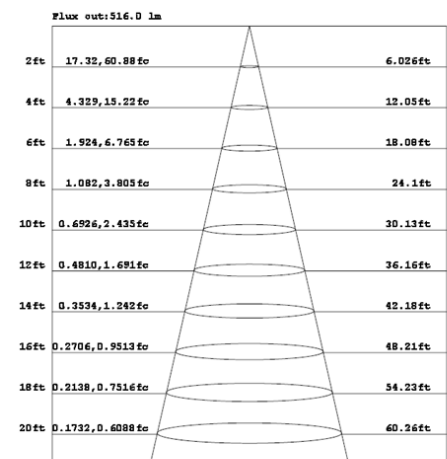
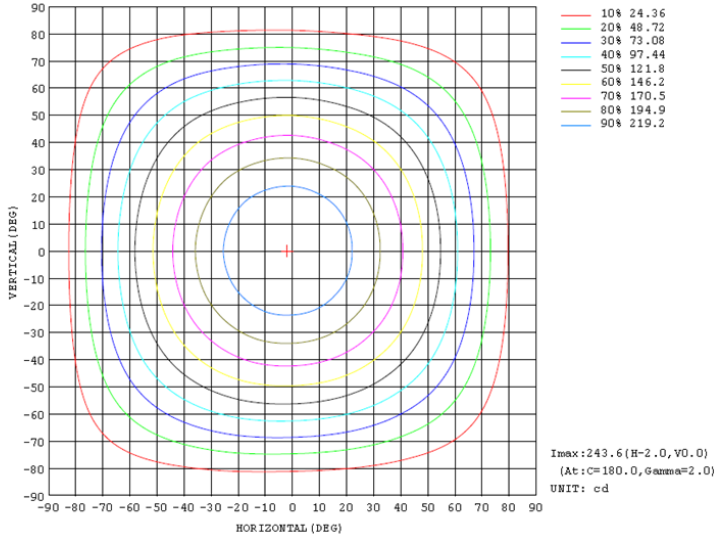
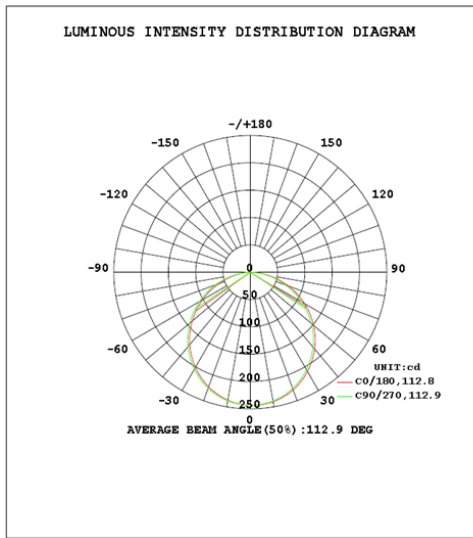


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	188.8	27.0%
0-40	309.2	44.2%
0-60	547.9	78.4%
60-90	151.0	21.6%
70-100	63.8	9.1%
90-120	0.0	0.0%
0-90	698.9	100.0%
90-180	0.0	0.0%
0-180	698.9	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	23.0	3.3%	90-100	0.0	0.0%
10-20	65.9	9.4%	100-110	0.0	0.0%
20-30	99.8	14.3%	110-120	0.0	0.0%
30-40	120.4	17.2%	120-130	0.0	0.0%
40-50	125.1	17.9%	130-140	0.0	0.0%
50-60	113.6	16.2%	140-150	0.0	0.0%
60-70	87.2	12.5%	150-160	0.0	0.0%
70-80	50.7	7.2%	160-170	0.0	0.0%
80-90	13.2	1.9%	170-180	0.0	0.0%

Photometric Data



Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2022-07-18	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0086(WFRLA4R89FA120WS)	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202207120056	120.0	60	0.065	7.67	0.971

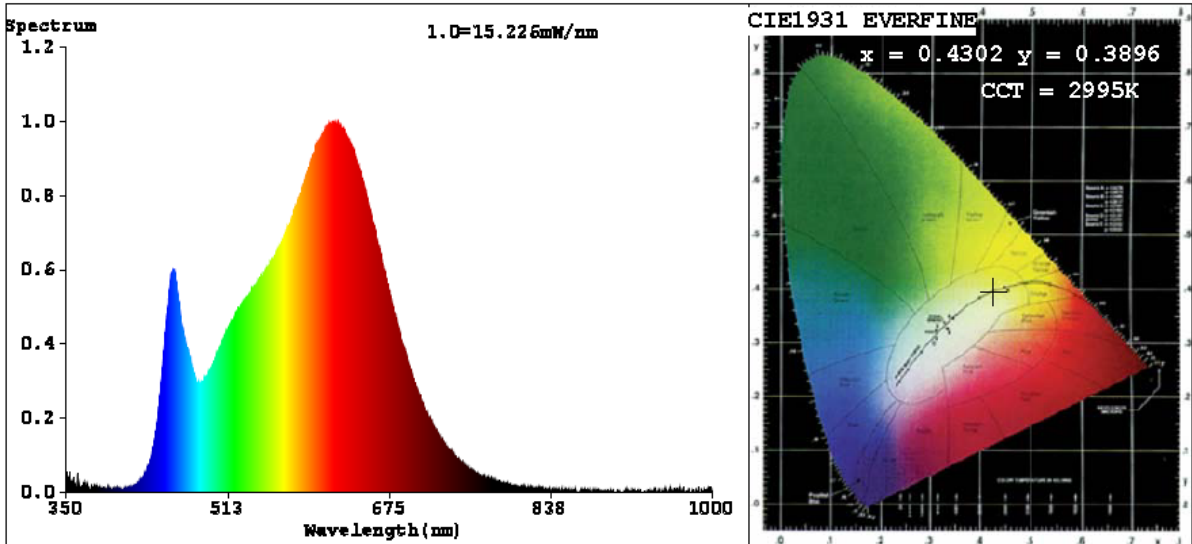
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	67
Frequency (Hz)	60	R2	98	R10	98
CCT (K)	2995	R3	95	R11	95
Duv	-0.0050	R4	94	R12	83
Chromaticity (x, y)	x=0.4302 y=0.3896	R5	97	R13	99
Chromaticity (u', v')	u'=0.2525 v'=0.5145	R6	94	R14	99
Color Rendering Index (CRI)	93.3	R7	89	R15	93
R9	67	R8	83	--	--

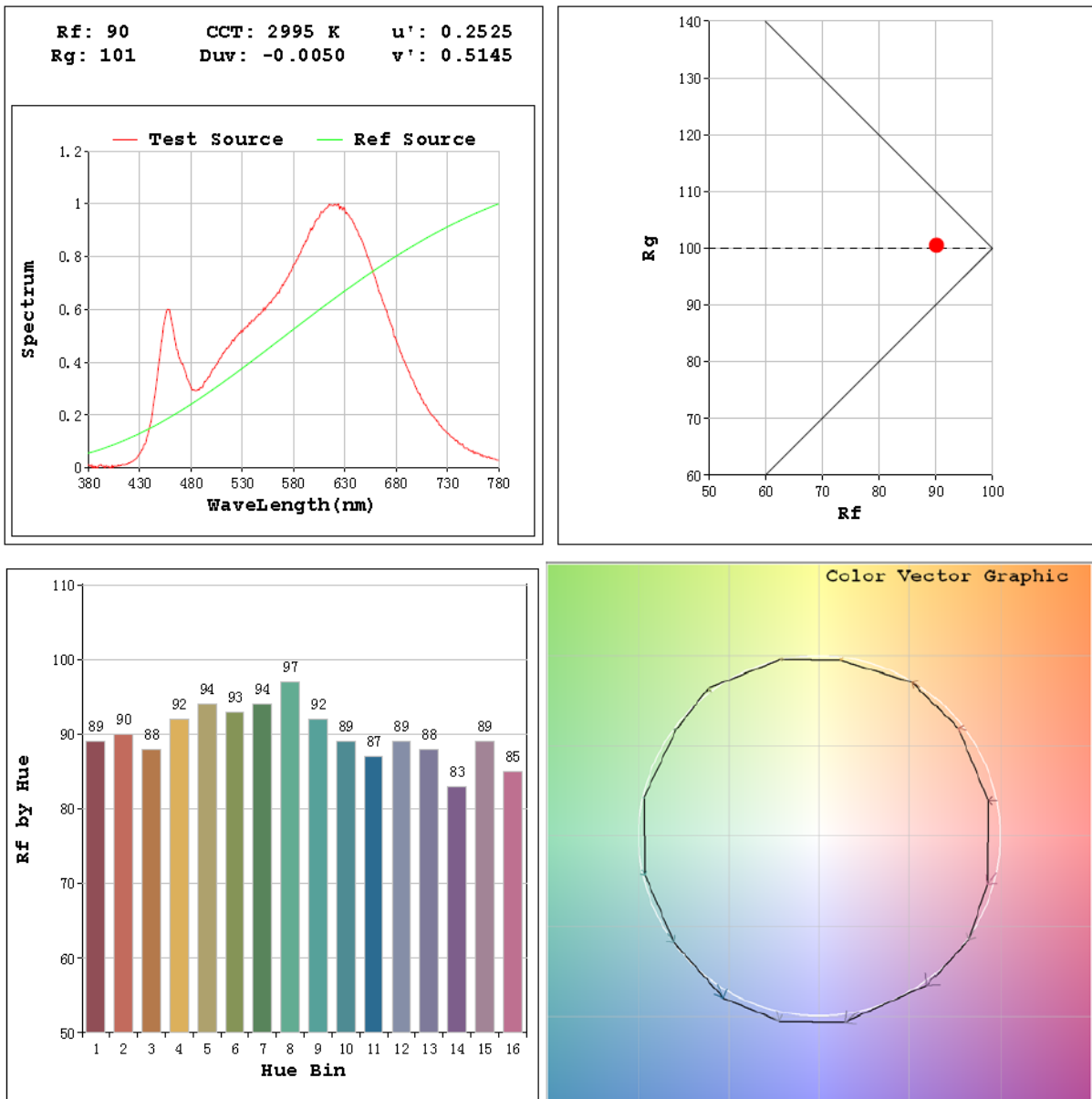
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	734.5
Luminous Efficacy (lm/W)	95.77
Beam Angle (°)	112.9
Center Beam Candle Power (cd)	255.9

Spectral Power Distribution & Chromaticity Diagram



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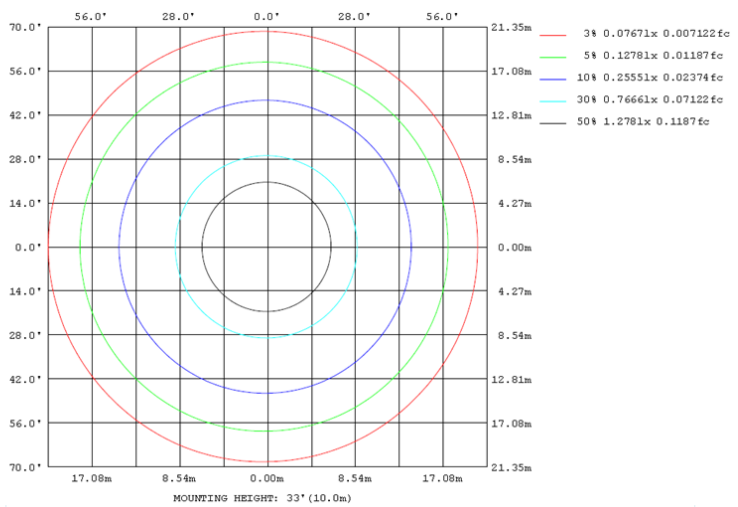
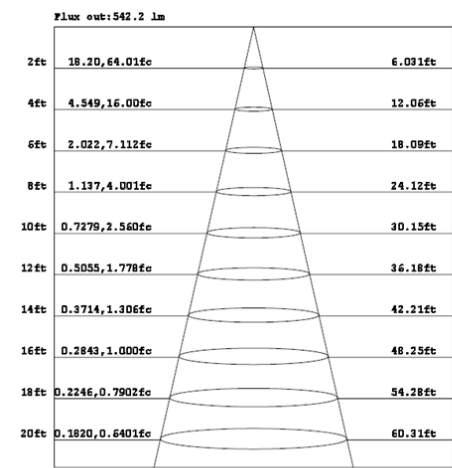
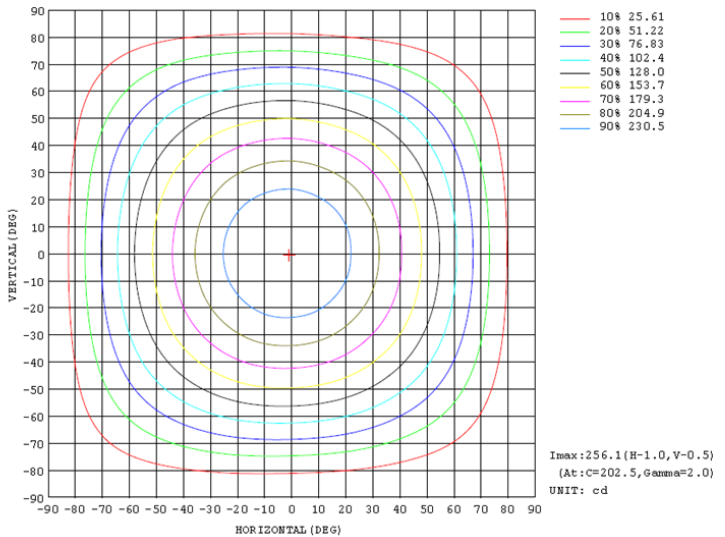
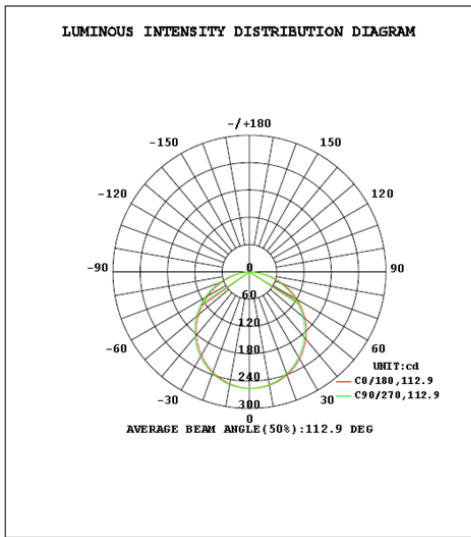


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	198.4	27.0%
0-40	324.9	44.2%
0-60	575.8	78.4%
60-90	158.8	21.6%
70-100	67.1	9.1%
90-120	0.0	0.0%
0-90	734.5	100.0%
90-180	0.0	0.0%
0-180	734.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	24.2	3.3%	90-100	0.0	0.0%
10-20	69.3	9.4%	100-110	0.0	0.0%
20-30	104.9	14.3%	110-120	0.0	0.0%
30-40	126.5	17.2%	120-130	0.0	0.0%
40-50	131.5	17.9%	130-140	0.0	0.0%
50-60	119.4	16.3%	140-150	0.0	0.0%
60-70	91.7	12.5%	150-160	0.0	0.0%
70-80	53.2	7.2%	160-170	0.0	0.0%
80-90	13.9	1.9%	170-180	0.0	0.0%

Photometric Data



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2022-07-18	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0086(WFRLA4R89FA120WS)		3500K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202207120056	120.0	60	0.065	7.67	0.971

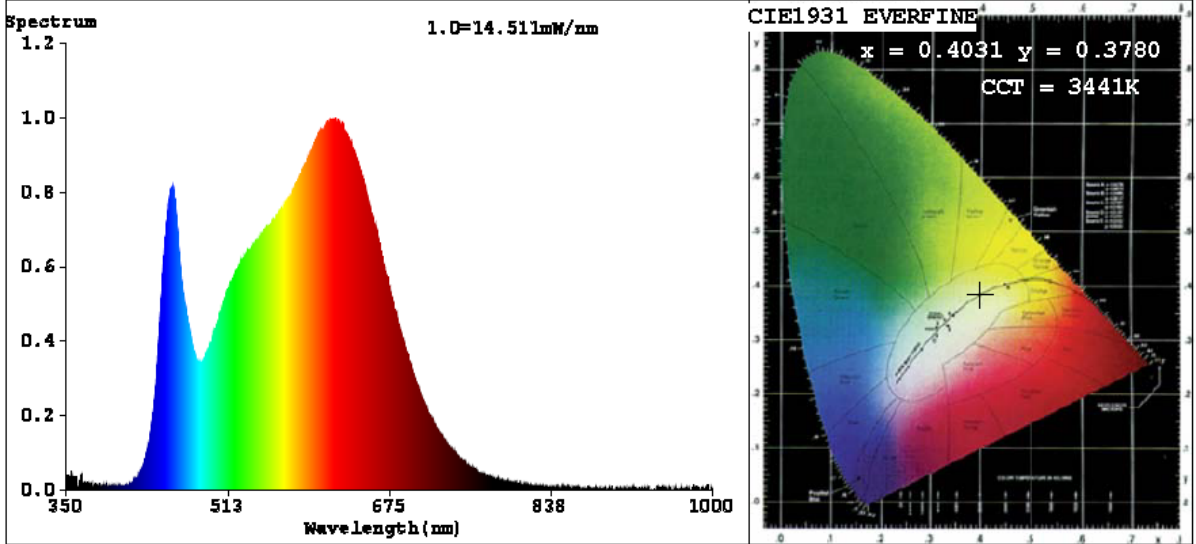
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	74
Frequency (Hz)	60	R2	99	R10	97
CCT (K)	3441	R3	98	R11	95
Duv	-0.0052	R4	95	R12	79
Chromaticity (x, y)	x=0.4031 y=0.3780	R5	96	R13	99
Chromaticity (u', v')	u'=0.2396 v'=0.5055	R6	95	R14	99
Color Rendering Index (CRI)	95.0	R7	92	R15	96
R9	74	R8	88	--	--

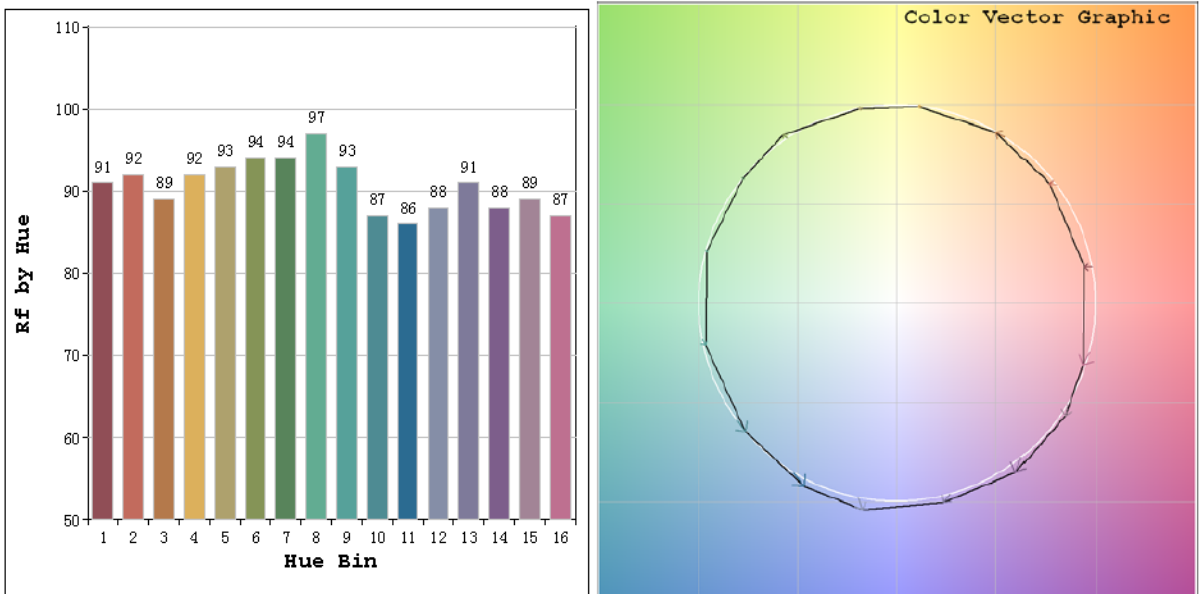
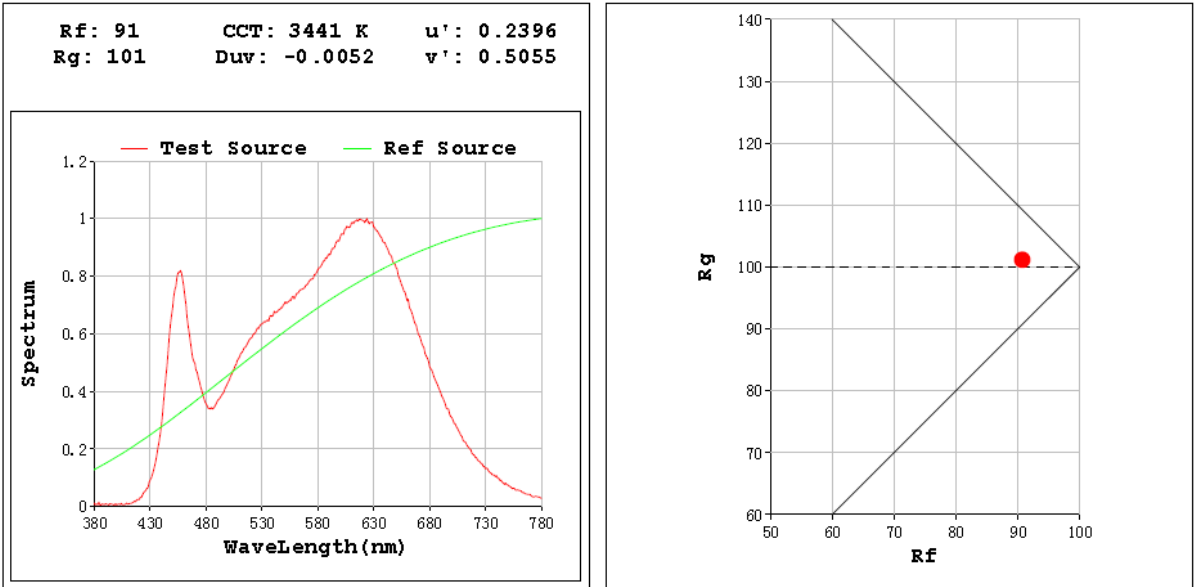
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	758.7
Luminous Efficacy (lm/W)	100.49
Beam Angle (°)	112.9
Center Beam Candle Power (cd)	264.3

Spectral Power Distribution & Chromaticity Diagram



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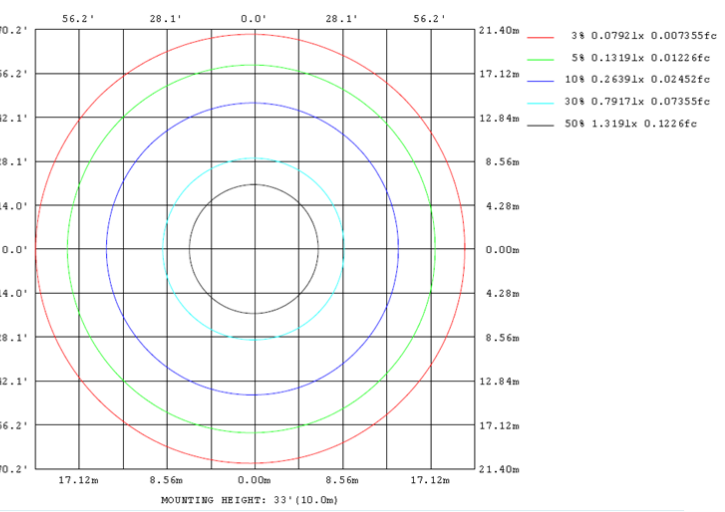
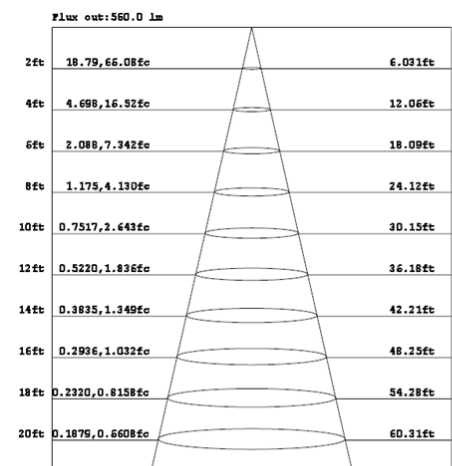
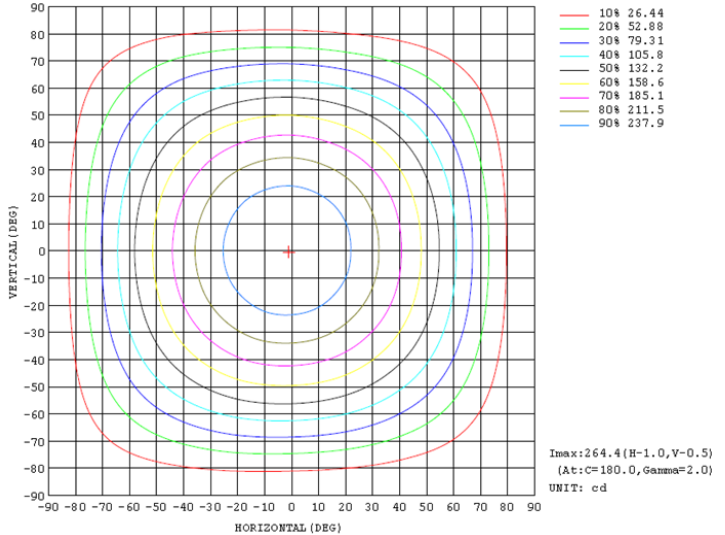
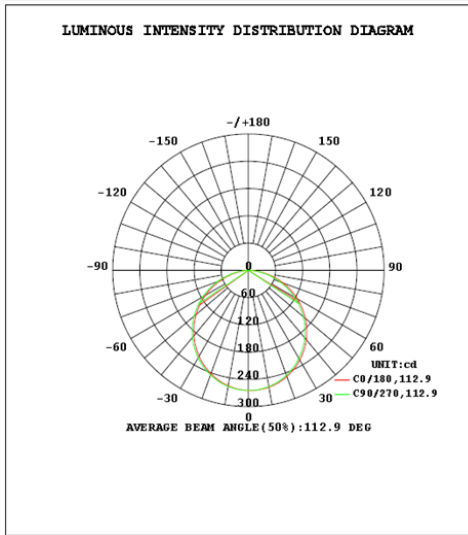


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	204.9	27.0%
0-40	335.5	44.2%
0-60	594.7	78.4%
60-90	164.0	21.6%
70-100	69.3	9.1%
90-120	0.0	0.0%
0-90	758.7	100.0%
90-180	0.0	0.0%
0-180	758.7	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	25.0	3.3%	90-100	0.0	0.0%
10-20	71.5	9.4%	100-110	0.0	0.0%
20-30	108.3	14.3%	110-120	0.0	0.0%
30-40	130.7	17.2%	120-130	0.0	0.0%
40-50	135.8	17.9%	130-140	0.0	0.0%
50-60	123.3	16.3%	140-150	0.0	0.0%
60-70	94.7	12.5%	150-160	0.0	0.0%
70-80	55.0	7.2%	160-170	0.0	0.0%
80-90	14.3	1.9%	170-180	0.0	0.0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2022-07-18	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0086(WFRLA4R89FA120WS)		4000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202207120056	120.0	60	0.065	7.60	0.971

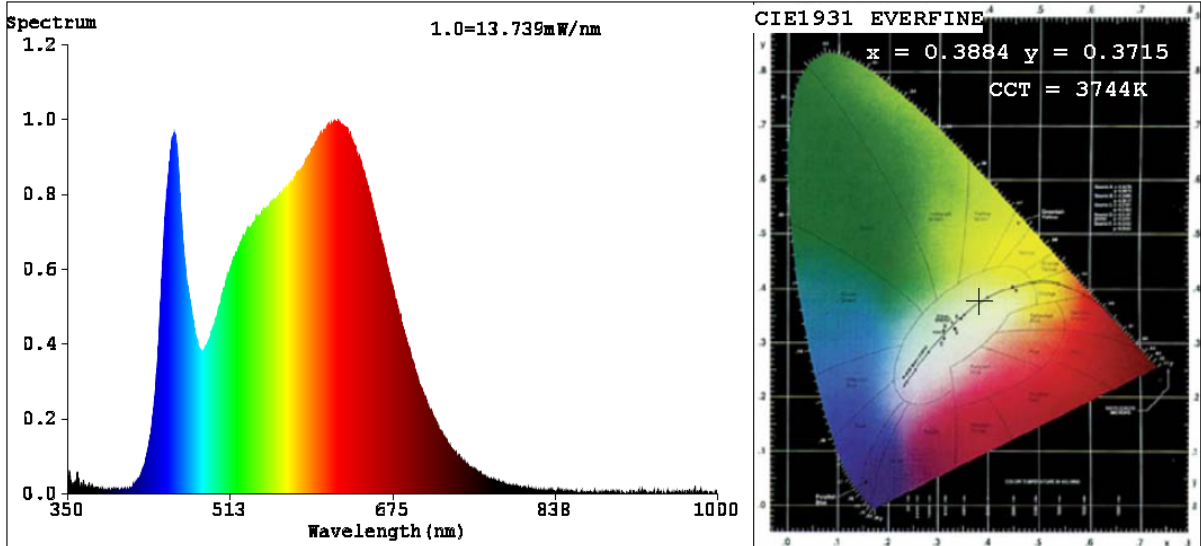
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	77
Frequency (Hz)	60	R2	98	R10	95
CCT (K)	3744	R3	97	R11	95
Duv	-0.0047	R4	95	R12	77
Chromaticity (x, y)	x=0.3884 y=0.3715	R5	96	R13	98
Chromaticity (u', v')	u'=0.2326 v'=0.5004	R6	95	R14	98
Color Rendering Index (CRI)	95.2	R7	94	R15	96
R9	77	R8	90	--	--

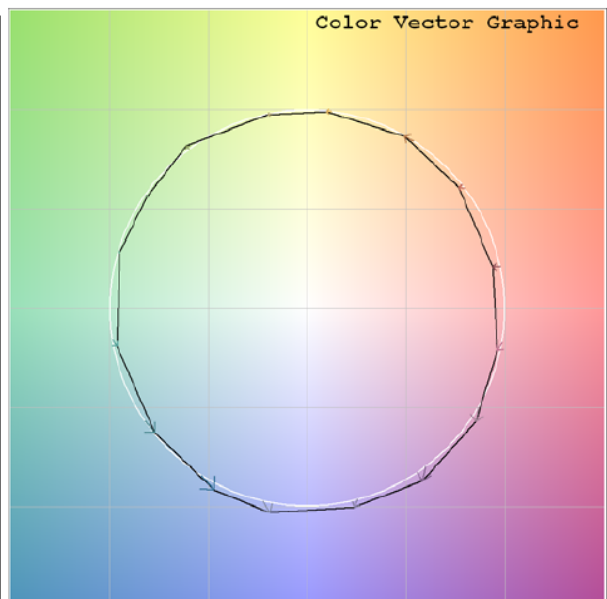
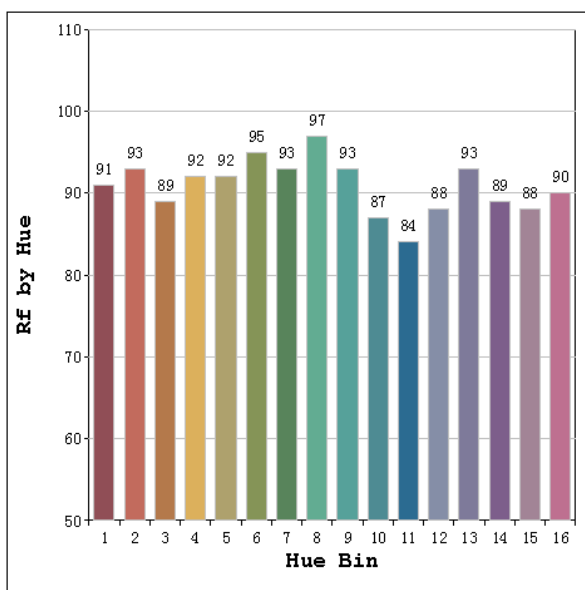
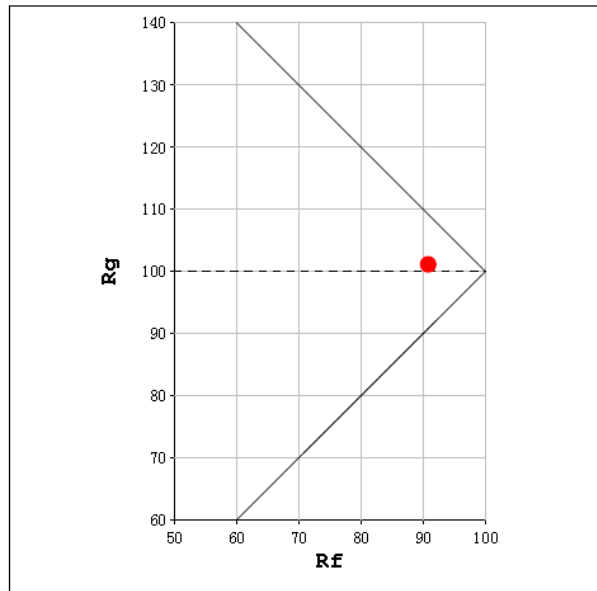
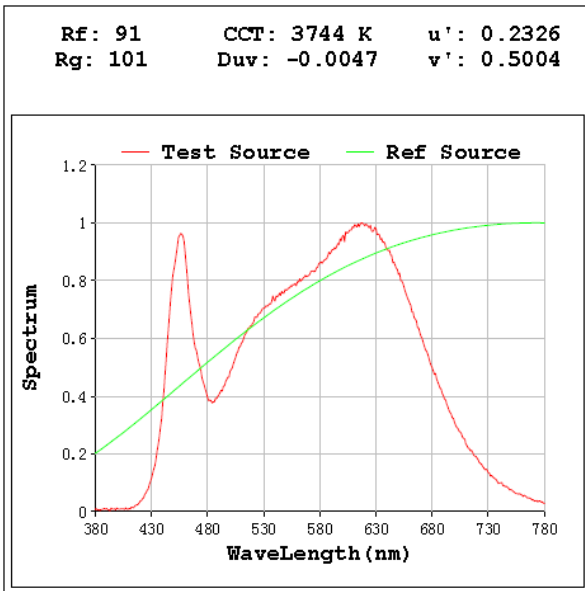
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	767.4
Luminous Efficacy (lm/W)	100.97
Beam Angle (°)	112.9
Center Beam Candle Power (cd)	267.3

Spectral Power Distribution & Chromaticity Diagram



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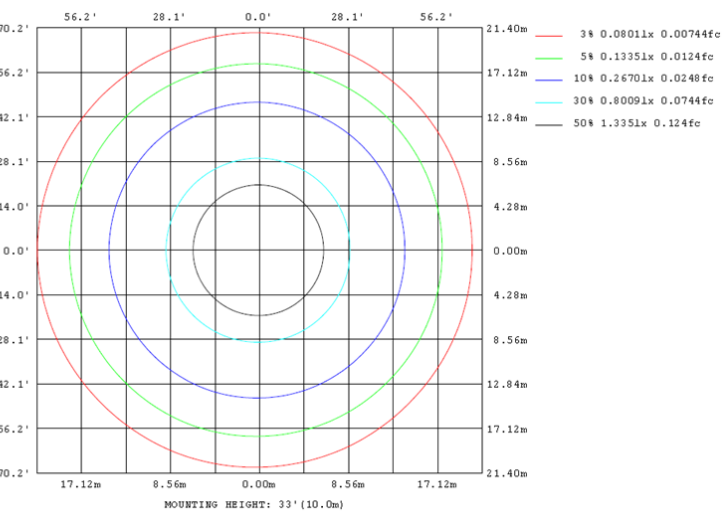
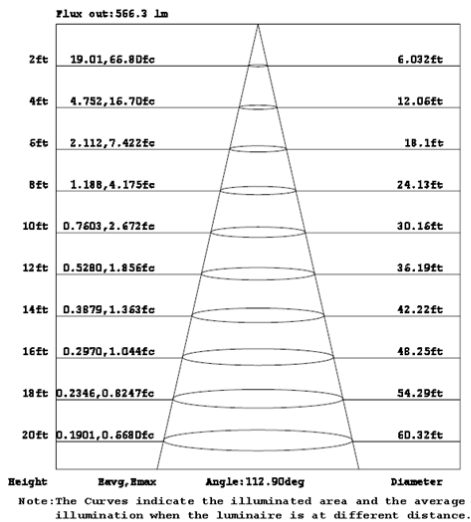
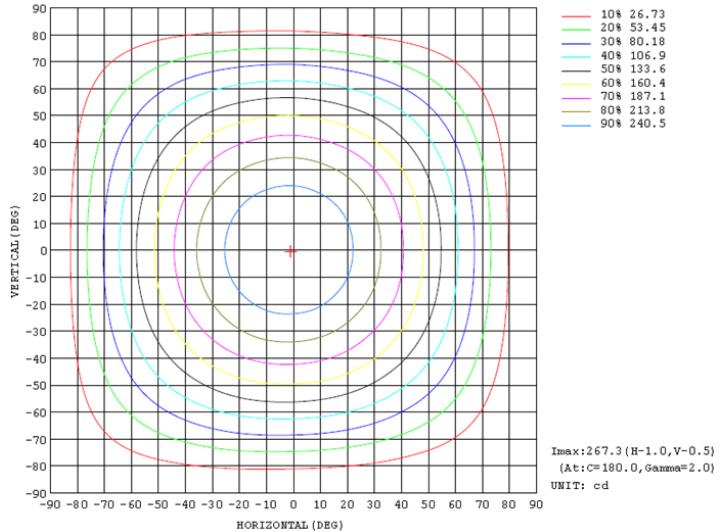
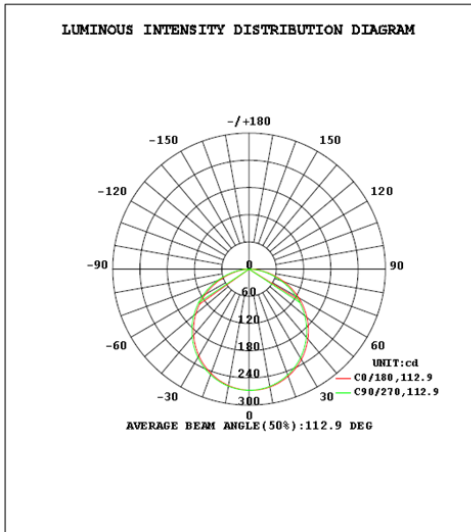


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	207.2	27.0%
0-40	339.3	44.2%
0-60	601.4	78.4%
60-90	166.0	21.6%
70-100	70.2	9.1%
90-120	0.0	0.0%
0-90	767.4	100.0%
90-180	0.0	0.0%
0-180	767.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	25.3	3.3%	90-100	0.0	0.0%
10-20	72.3	9.4%	100-110	0.0	0.0%
20-30	109.6	14.3%	110-120	0.0	0.0%
30-40	132.2	17.2%	120-130	0.0	0.0%
40-50	137.4	17.9%	130-140	0.0	0.0%
50-60	124.7	16.3%	140-150	0.0	0.0%
60-70	95.8	12.5%	150-160	0.0	0.0%
70-80	55.7	7.3%	160-170	0.0	0.0%
80-90	14.5	1.9%	170-180	0.0	0.0%

Photometric Data



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2022-07-18	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0086(WFRLA4R89FA120WS)	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202207120056	120.0	60	0.067	7.85	0.973

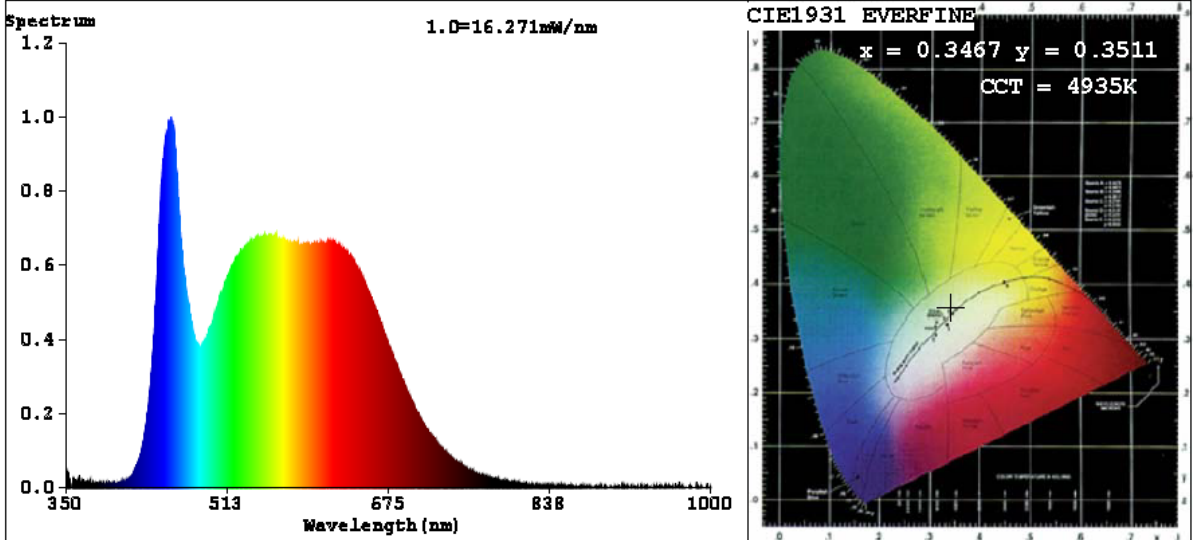
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	79
Frequency (Hz)	60	R2	96	R10	89
CCT (K)	4935	R3	95	R11	92
Duv	-0.0009	R4	93	R12	68
Chromaticity (x, y)	x=0.3467 y=0.3511	R5	93	R13	96
Chromaticity (u', v')	u'=0.2127 v'=0.4846	R6	92	R14	97
Color Rendering Index (CRI)	93.9	R7	96	R15	94
R9	79	R8	92	--	--

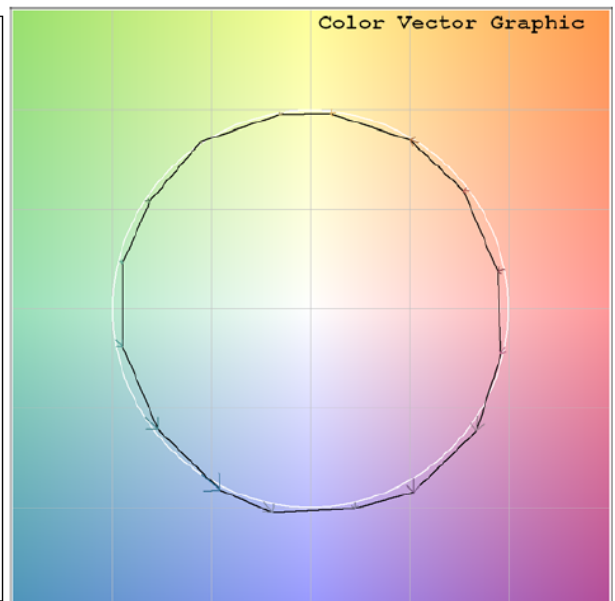
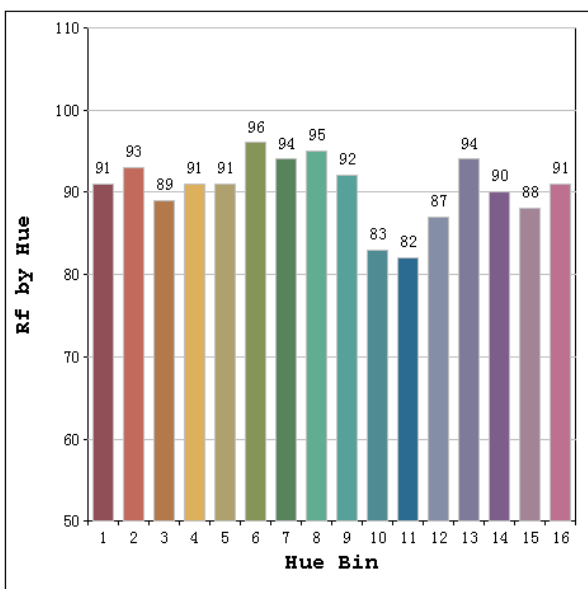
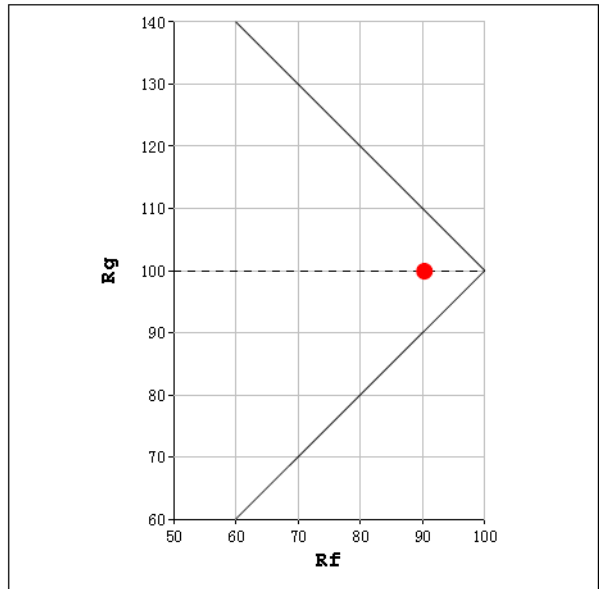
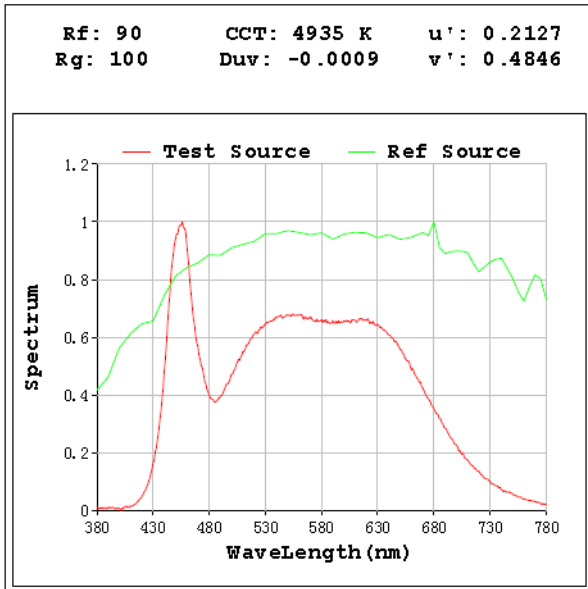
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	749.3
Luminous Efficacy (lm/W)	95.45
Beam Angle (°)	113.0
Center Beam Candle Power (cd)	260.8

Spectral Power Distribution & Chromaticity Diagram



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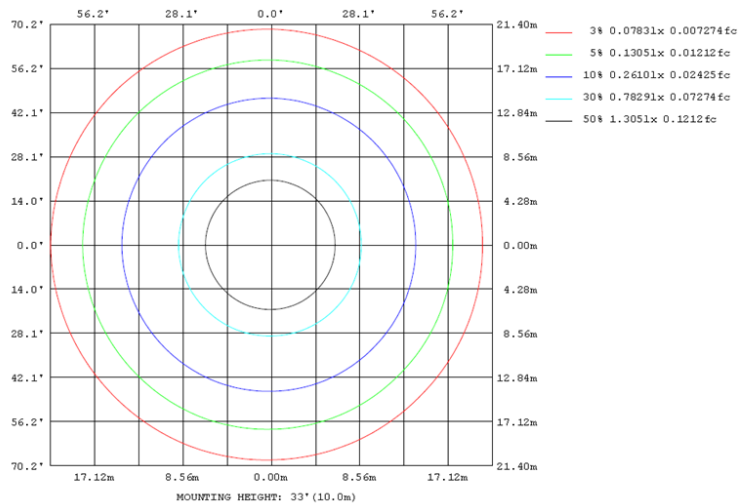
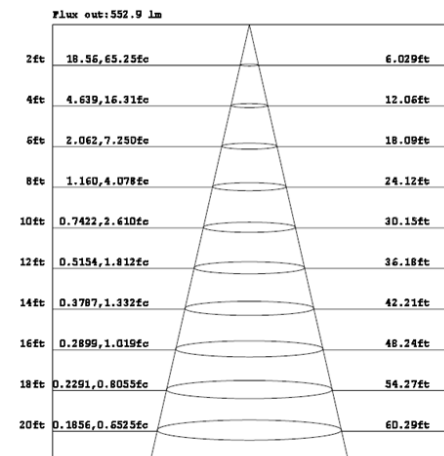
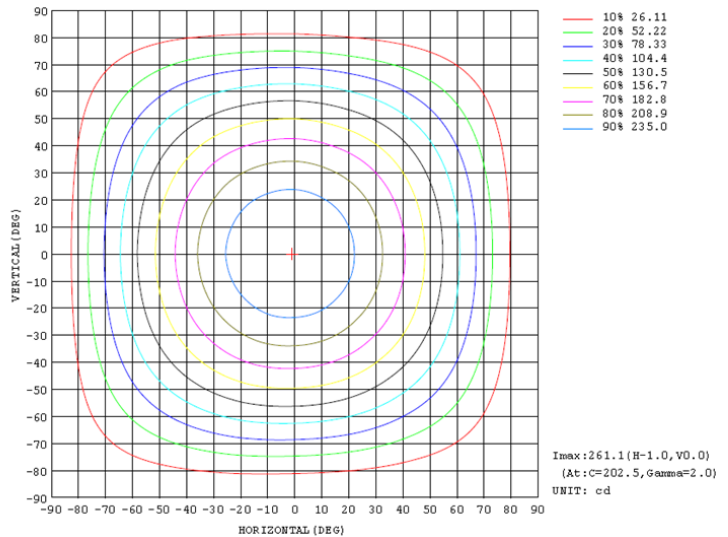
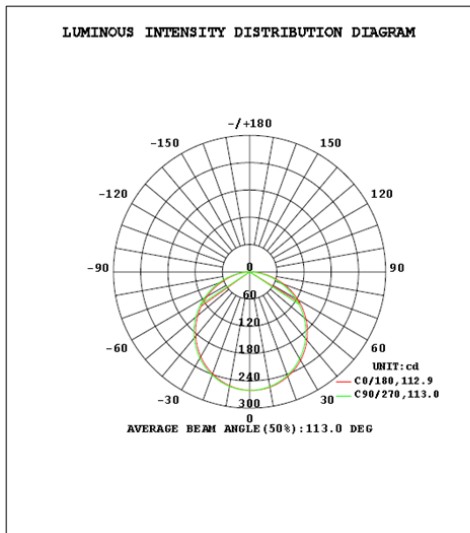


Zonal Lumen Tabulation

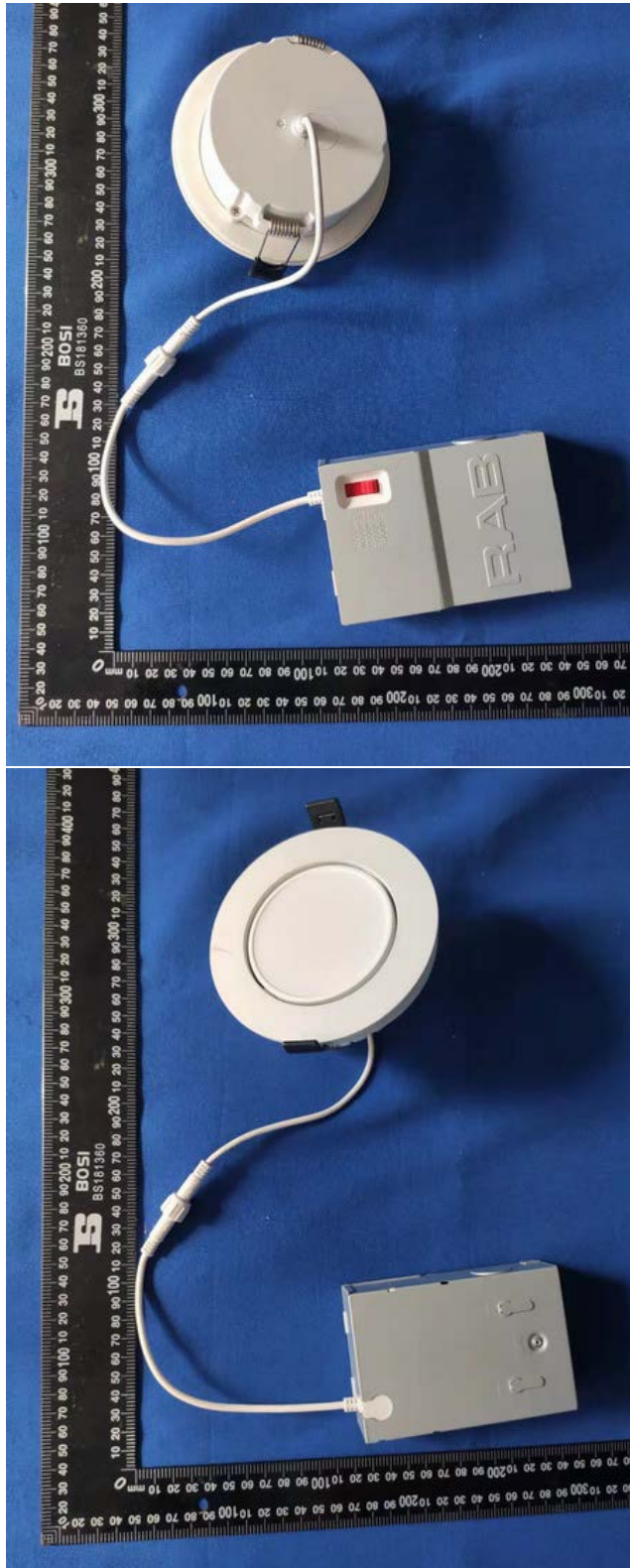
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	202.2	27.0%
0-40	331.2	44.2%
0-60	587.1	78.4%
60-90	162.1	21.6%
70-100	68.6	9.2%
90-120	0.0	0.0%
0-90	749.3	100.0%
90-180	0.0	0.0%
0-180	749.3	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	24.7	3.3%	90-100	0.0	0.0%
10-20	70.6	9.4%	100-110	0.0	0.0%
20-30	106.9	14.3%	110-120	0.0	0.0%
30-40	129.0	17.2%	120-130	0.0	0.0%
40-50	134.1	17.9%	130-140	0.0	0.0%
50-60	121.8	16.3%	140-150	0.0	0.0%
60-70	93.6	12.5%	150-160	0.0	0.0%
70-80	54.4	7.3%	160-170	0.0	0.0%
80-90	14.2	1.9%	170-180	0.0	0.0%

Photometric Data



3. Product Photo



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