

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):
CRLEDFA-6R-16S-9CCT-UNV-WS/E

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

**Type of
Luminaire:** Downlights

Report Date: 2023-02-14

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	9.0 W /12.0 W/16.0 W
Rated Initial Lamp Lumen	800 lm/1100 lm/1500 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	2023-02-14	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRLEDFA-6R-16S-9CCT-UNV-WS/E		3000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202302140003	120.0	60	0.130	15.60	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

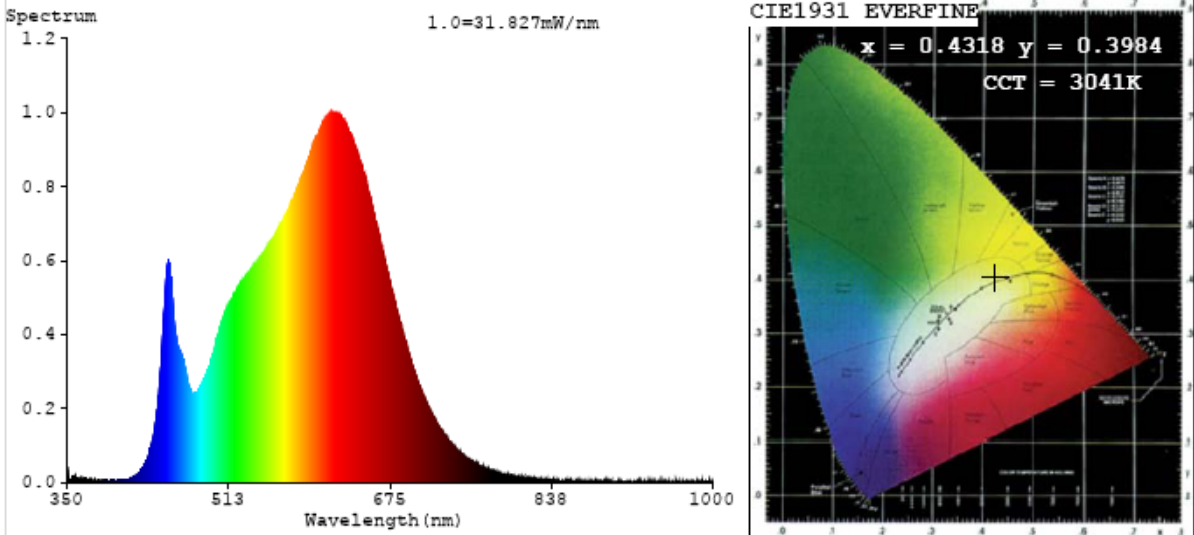
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	94	R9	62
Frequency (Hz)	60	R2	98	R10	94
CCT (K)	3041	R3	98	R11	95
Duv	-0.0016	R4	94	R12	83
Chromaticity (x, y)	x=0.4318 y=0.3984	R5	94	R13	96
Chromaticity (u', v')	u'=0.2497 v'=0.5184	R6	96	R14	99
Color Rendering Index (CRI)	93.7	R7	92	R15	90
R9	62	R8	83	--	--

Photometric Measurement – Goniophotometer Method:

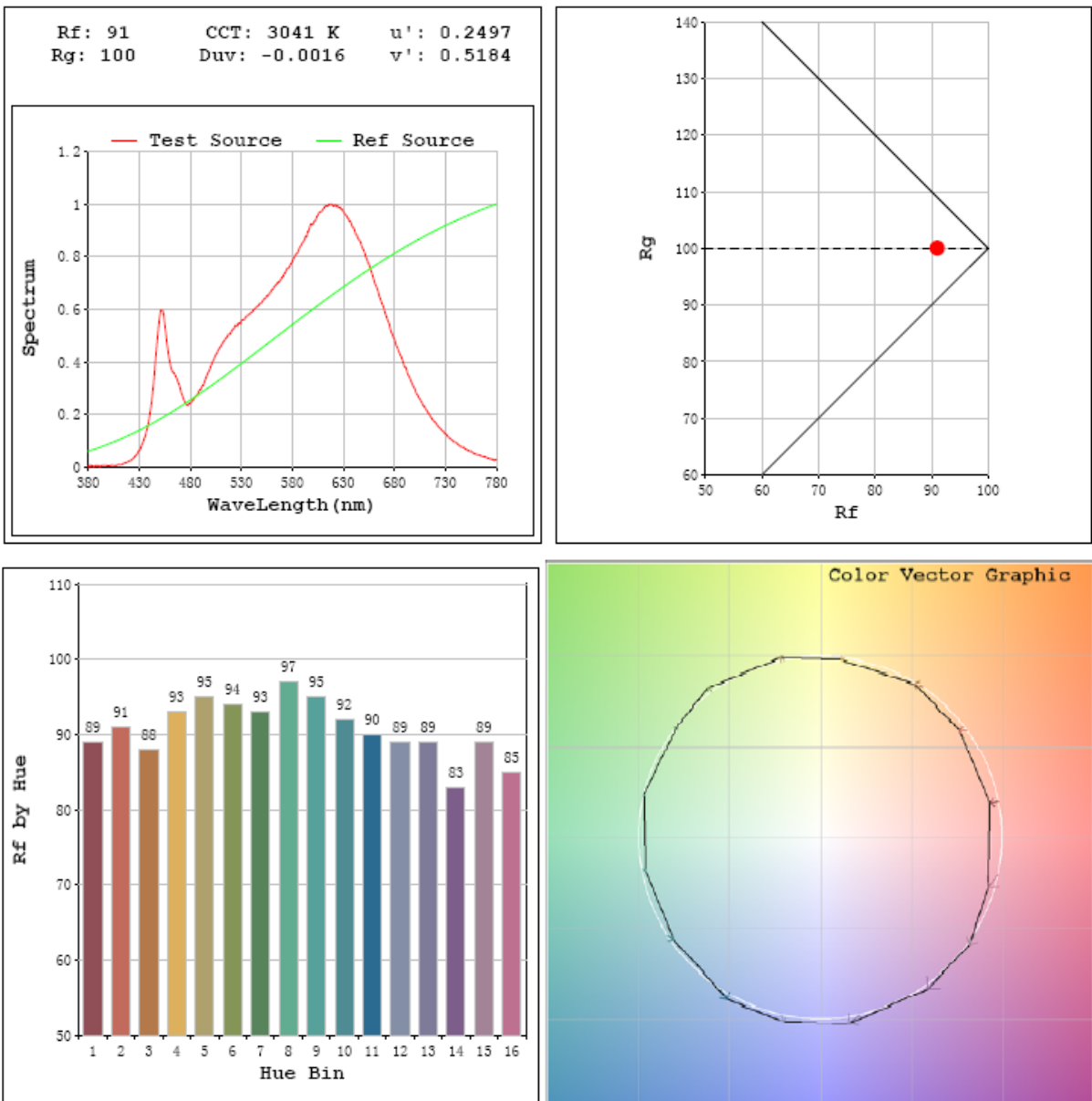
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1578.5
Luminous Efficacy (lm/W)	101.18
Beam Angle (°)	86.1
Center Beam Candle Power (cd)	852.9

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1582.0
Luminous Efficacy (lm/W)	98.83

Spectral Power Distribution & Chromaticity Diagram



TM30

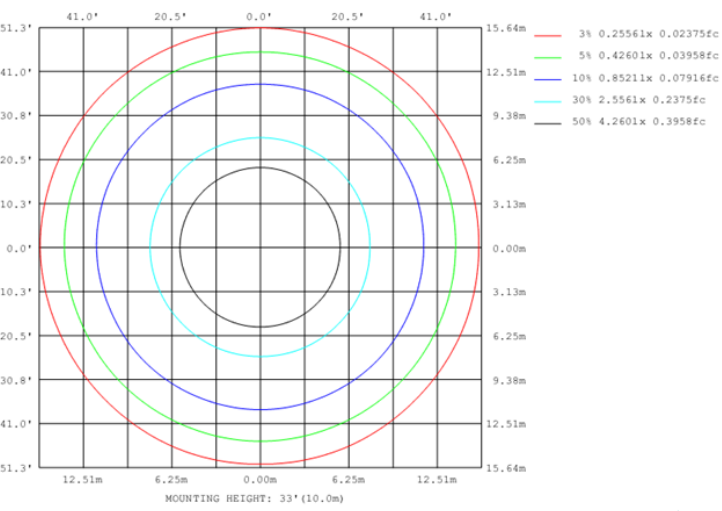
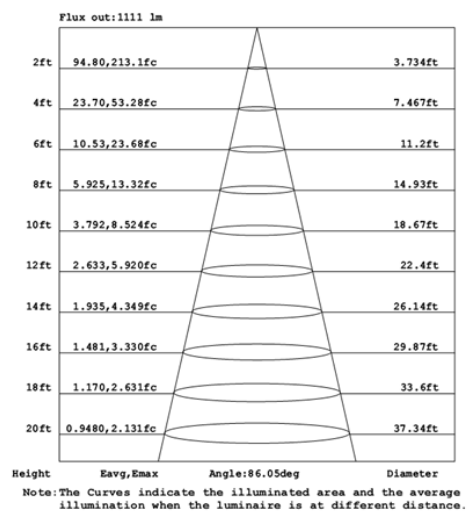
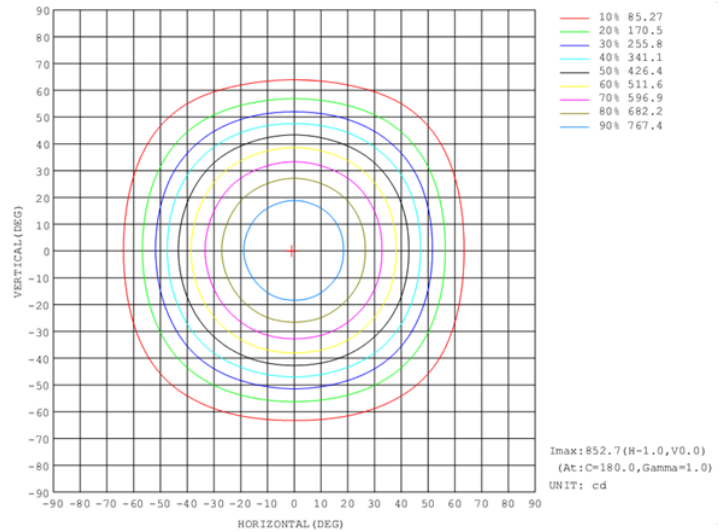
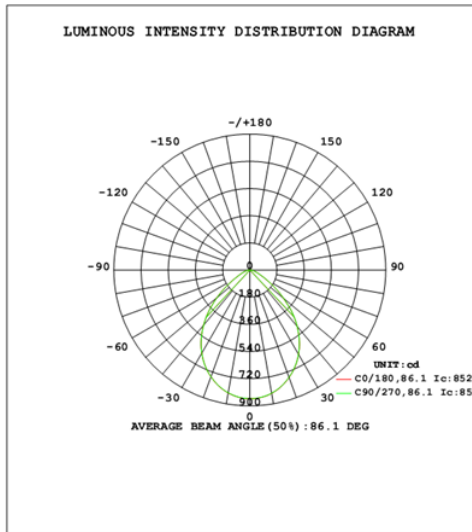


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	627.6	39.8%
0-40	980.3	62.1%
0-60	1455.0	92.2%
60-90	123.5	7.8%
70-100	45.8	2.9%
90-120	0.0	0.0%
0-90	1578.5	100.0%
90-180	0.0	0.0%
0-180	1578.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	80.2	5.1%	90-100	0.0	0.0%
10-20	224.2	14.2%	100-110	0.0	0.0%
20-30	323.2	20.5%	110-120	0.0	0.0%
30-40	352.8	22.3%	120-130	0.0	0.0%
40-50	297.4	18.8%	130-140	0.0	0.0%
50-60	177.2	11.2%	140-150	0.0	0.0%
60-70	77.8	4.9%	150-160	0.0	0.0%
70-80	35.8	2.3%	160-170	0.0	0.0%
80-90	10.0	0.6%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-02-14	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRLEDFA-6R-16S-9CCT-UNV-WS/E	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202302140003	120.0	60	0.129	15.50	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

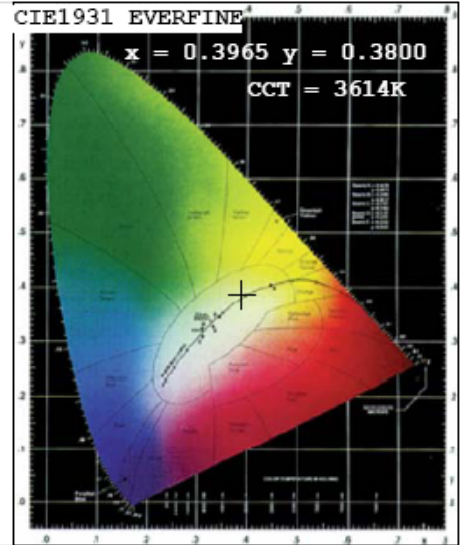
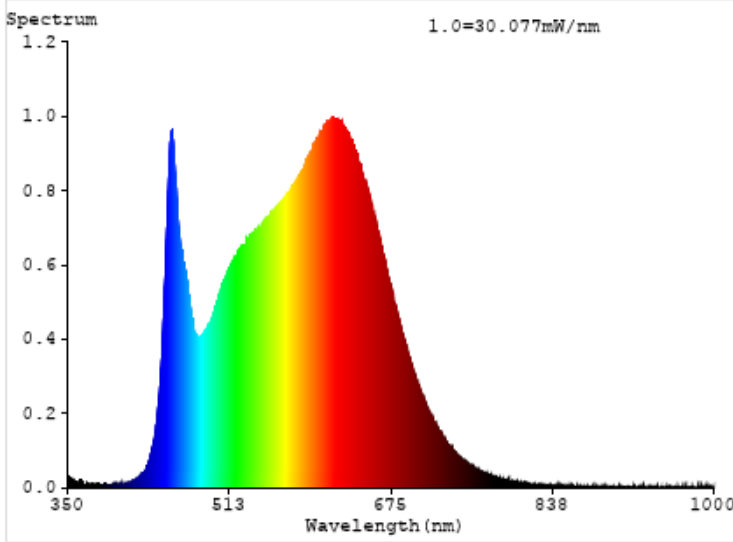
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	77
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3614	R3	98	R11	97
Duv	-0.0028	R4	95	R12	77
Chromaticity (x, y)	x=0.3965 y=0.3800	R5	96	R13	99
Chromaticity (u', v')	u'=0.2344 v'=0.5054	R6	95	R14	100
Color Rendering Index (CRI)	95.2	R7	92	R15	95
R9	77	R8	89	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1658.4
Luminous Efficacy (lm/W)	106.99
Beam Angle (°)	86.1
Center Beam Candle Power (cd)	895.3

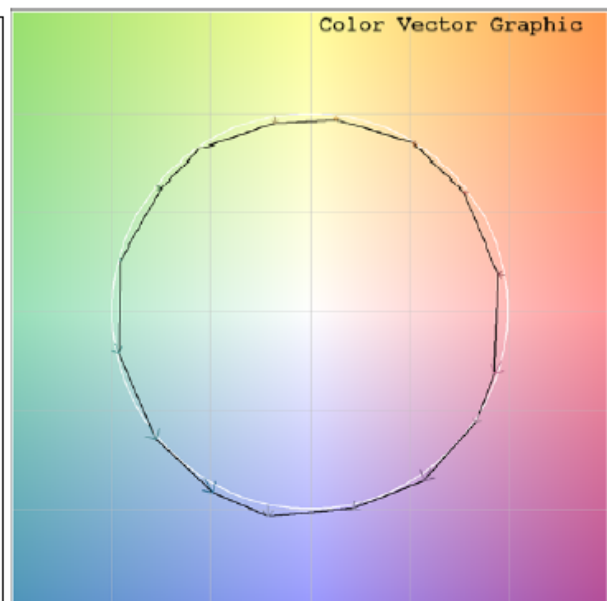
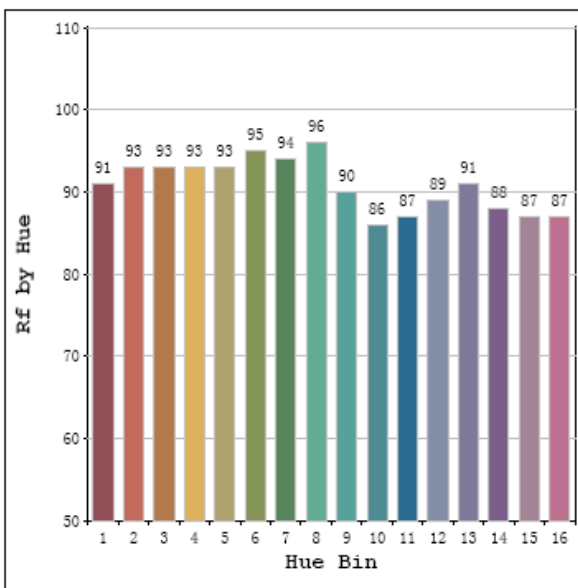
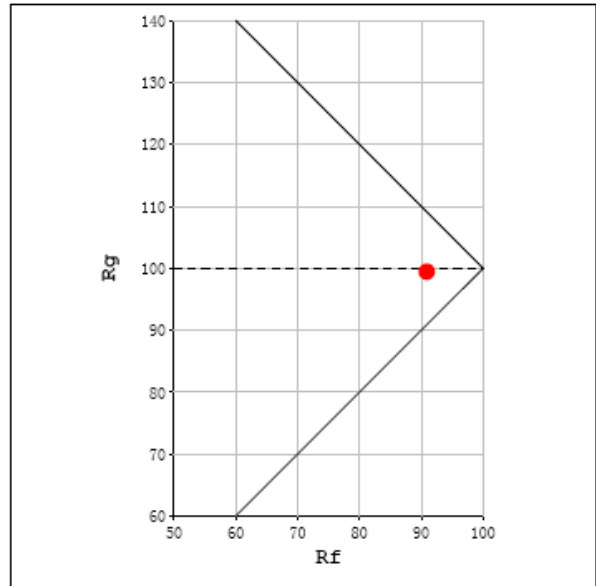
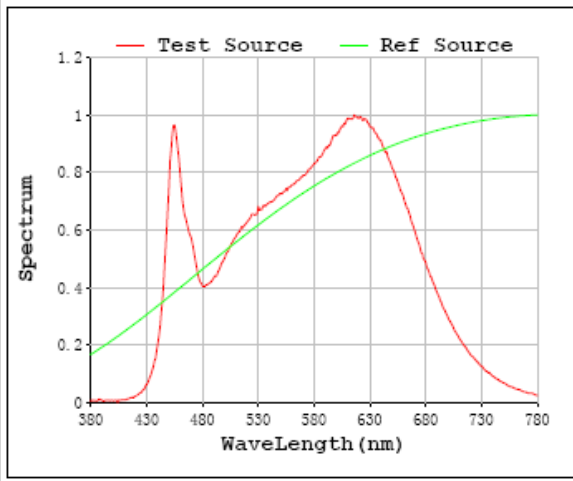
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1663.0
Luminous Efficacy (lm/W)	104.75

Spectral Power Distribution & Chromaticity Diagram



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Rf: 91 CCT: 3614 K u': 0.2344
Rg: 99 Duv: -0.0028 v': 0.5054



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	658.7	39.7%
0-40	1029.2	62.1%
0-60	1528.5	92.2%
60-90	129.8	7.8%
70-100	48.1	2.9%
90-120	0.0	0.0%
0-90	1658.4	100.0%
90-180	0.0	0.0%
0-180	1658.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	84.2	5.1%	90-100	0.0	0.0%
10-20	235.3	14.2%	100-110	0.0	0.0%
20-30	339.2	20.5%	110-120	0.0	0.0%
30-40	370.5	22.3%	120-130	0.0	0.0%
40-50	312.9	18.9%	130-140	0.0	0.0%
50-60	186.4	11.2%	140-150	0.0	0.0%
60-70	81.7	4.9%	150-160	0.0	0.0%
70-80	37.6	2.3%	160-170	0.0	0.0%
80-90	10.5	0.6%	170-180	0.0	0.0%

Photometric Data

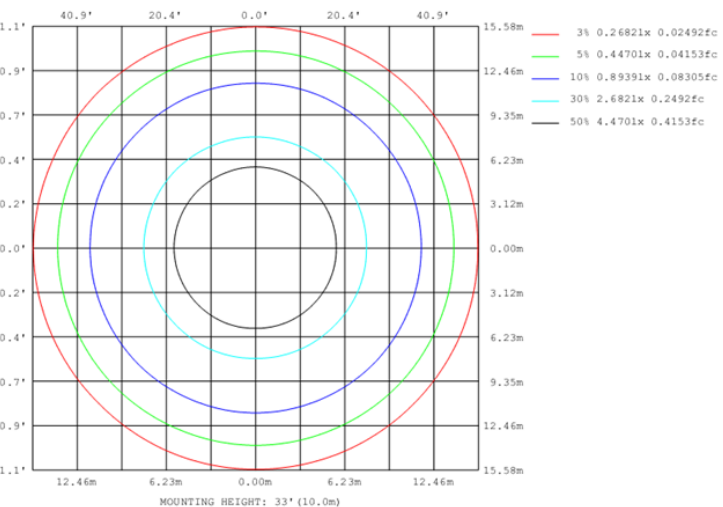
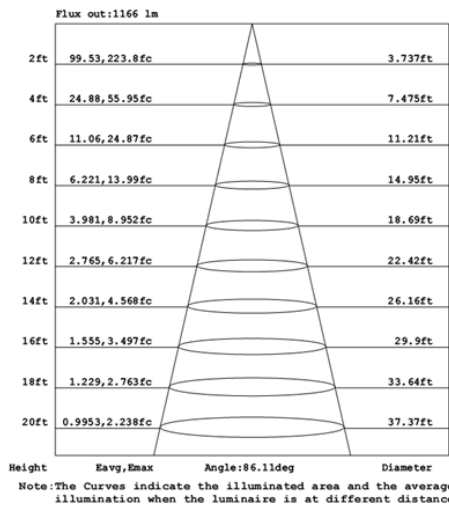
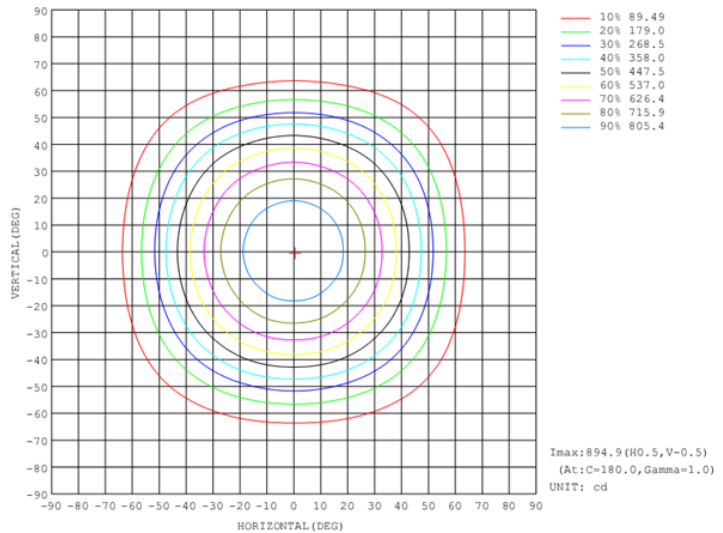
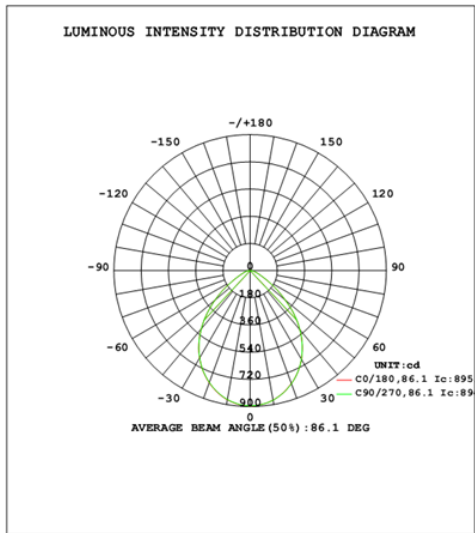


Table--1

UNIT: cd

γ (DEG)	C (DEG)															
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895	895
5	889	888	887	887	887	888	887	888	889	888	888	889	889	888	889	888
10	868	868	867	867	866	867	867	869	871	869	871	870	871	869	870	869
15	835	836	833	834	833	835	835	837	839	838	839	839	839	838	838	836
20	790	791	788	789	788	790	790	793	796	794	796	796	797	794	795	792
25	735	736	733	736	734	737	736	740	743	742	743	742	743	741	741	739
30	669	670	666	669	667	671	670	673	678	676	678	676	677	674	676	673
35	590	592	589	592	590	593	591	595	601	598	601	598	600	596	598	595
40	503	505	501	505	502	506	503	507	511	509	512	509	511	508	510	507
45	405	408	404	407	404	408	404	408	412	409	413	410	412	409	412	409
50	303	301	303	300	303	300	302	299	302	305	302	305	303	306	304	307
55	208	207	208	207	207	205	205	204	206	207	206	207	207	208	208	210
60	127	130	128	130	127	129	126	127	129	126	128	126	129	127	130	129
65	78.5	80.0	79.4	80.3	79.1	79.6	78.0	78.4	79.3	77.7	78.3	77.4	78.8	78.1	79.9	79.5
70	52.3	53.3	52.9	53.5	52.6	52.9	51.7	52.0	52.5	51.5	51.8	51.3	52.1	52.0	53.0	52.9
75	35.4	35.9	35.5	35.8	35.2	35.3	34.7	34.9	35.0	34.5	34.9	34.6	35.2	35.1	35.8	35.6
80	21.6	22.0	21.6	21.8	21.3	21.4	20.9	21.1	21.3	20.9	21.3	21.1	21.6	21.5	22.0	21.8
85	9.37	9.65	9.30	9.46	9.03	9.12	8.72	8.88	9.13	8.83	9.18	9.05	9.48	9.37	9.76	9.58
90	0.33	0.31	0.33	0.31	0.32	0.32	0.32	0.32	0.31	0.30	0.30	0.31	0.30	0.31	0.31	0.34

2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-02-14	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRLEDFA-6R-16S-9CCT-UNV-WS/E	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202302140003	120.0	60	0.128	15.40	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

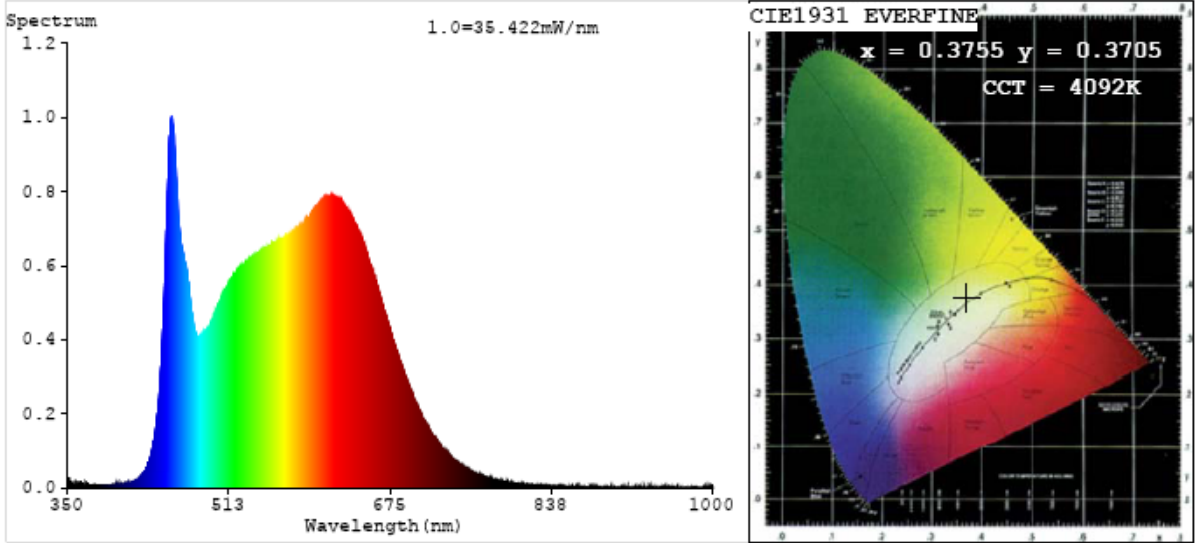
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	81
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	4092	R3	98	R11	96
Duv	-0.0015	R4	93	R12	73
Chromaticity (x, y)	x=0.3755 y=0.3705	R5	95	R13	99
Chromaticity (u', v')	u'=0.2243 v'=0.4980	R6	95	R14	100
Color Rendering Index (CRI)	95.0	R7	93	R15	95
R9	81	R8	90	--	--

Photometric Measurement – Goniophotometer Method:

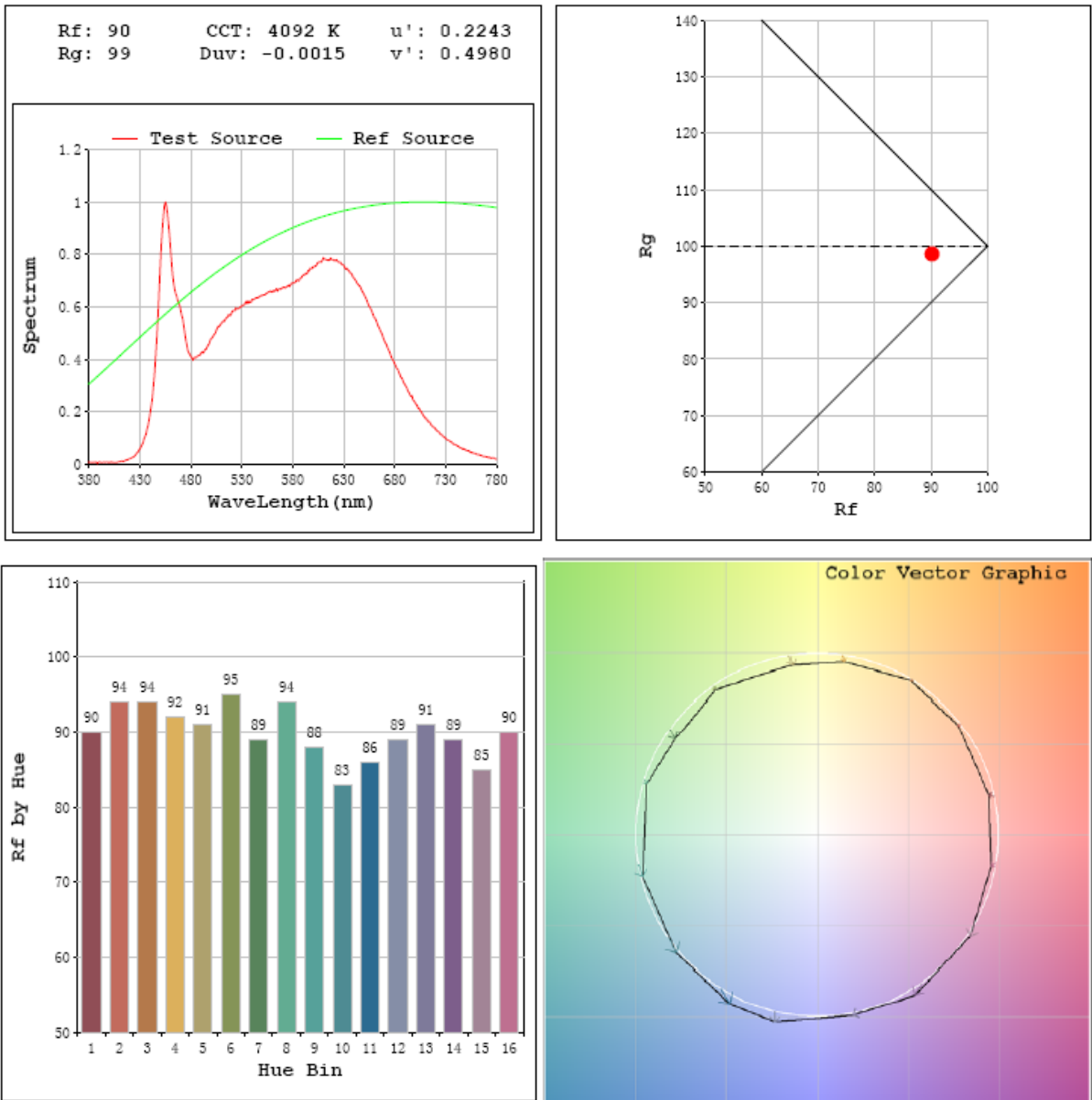
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1677.6
Luminous Efficacy (lm/W)	108.93
Beam Angle (°)	86.2
Center Beam Candle Power (cd)	904.5

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1686.0
Luminous Efficacy (lm/W)	107.01

Spectral Power Distribution & Chromaticity Diagram



TM30

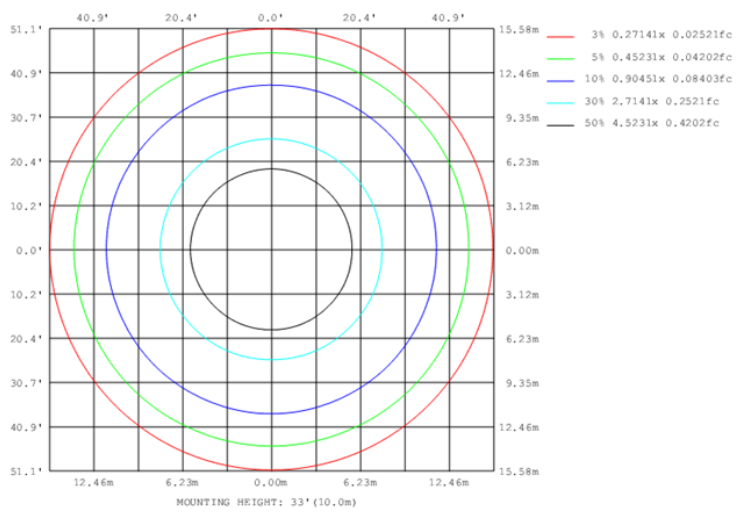
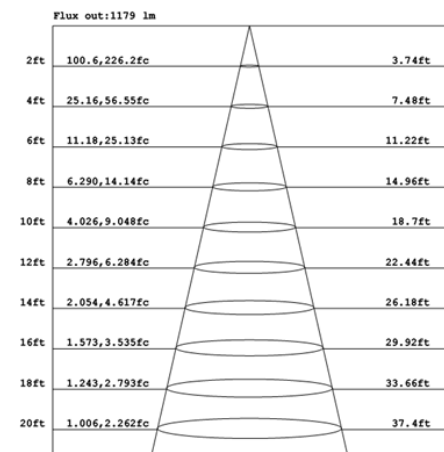
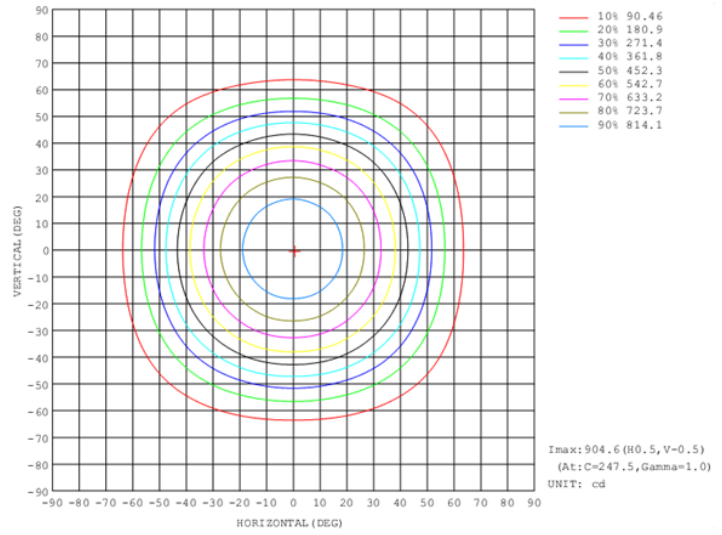
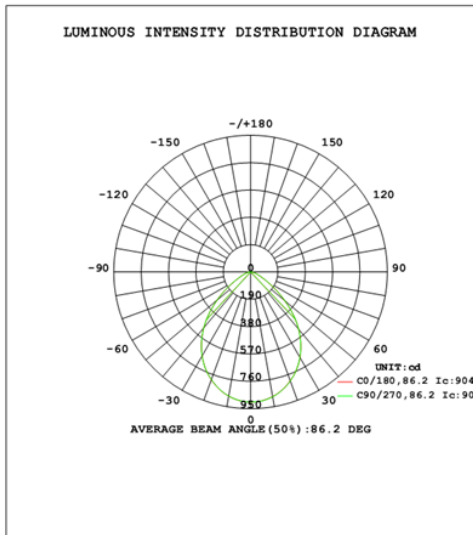


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	666.0	39.7%
0-40	1040.6	62.0%
0-60	1546.1	92.2%
60-90	131.5	7.8%
70-100	48.7	2.9%
90-120	0.0	0.0%
0-90	1677.6	100.0%
90-180	0.0	0.0%
0-180	1677.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	85.1	5.1%	90-100	0.0	0.0%
10-20	237.9	14.2%	100-110	0.0	0.0%
20-30	343.0	20.4%	110-120	0.0	0.0%
30-40	374.6	22.3%	120-130	0.0	0.0%
40-50	316.7	18.9%	130-140	0.0	0.0%
50-60	188.8	11.3%	140-150	0.0	0.0%
60-70	82.8	4.9%	150-160	0.0	0.0%
70-80	38.1	2.3%	160-170	0.0	0.0%
80-90	10.6	0.6%	170-180	0.0	0.0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-02-14	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRLEDFA-6R-16S-9CCT-UNV-WS/E	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202302140003	120.0	60	0.130	15.50	0.996

Chromaticity Measurement - Sphere-Spectroradiometer Method:

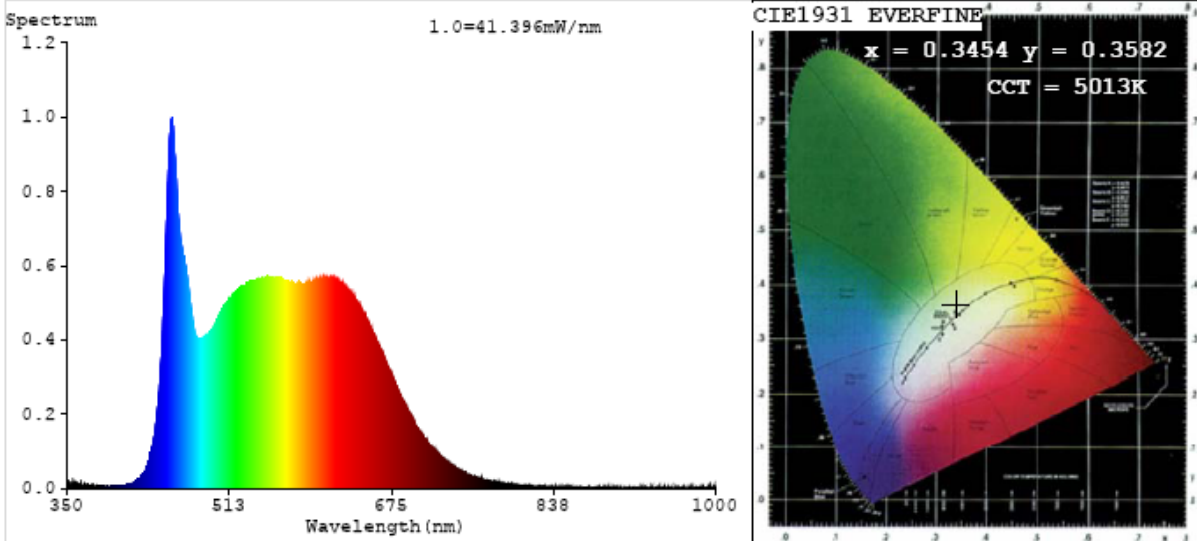
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	74
Frequency (Hz)	60	R2	99	R10	96
CCT (K)	5013	R3	98	R11	93
Duv	0.0032	R4	92	R12	72
Chromaticity (x, y)	x=0.3454 y=0.3582	R5	94	R13	97
Chromaticity (u', v')	u'=0.2091 v'=0.4879	R6	95	R14	100
Color Rendering Index (CRI)	94.2	R7	92	R15	93
R9	74	R8	88	--	--

Photometric Measurement – Goniophotometer Method:

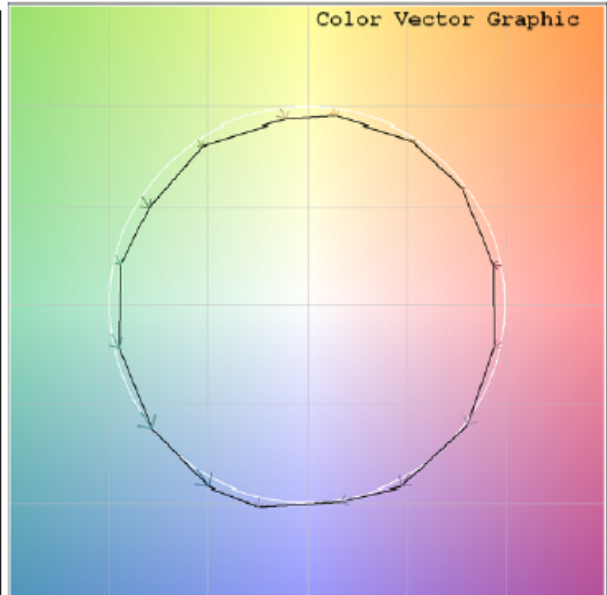
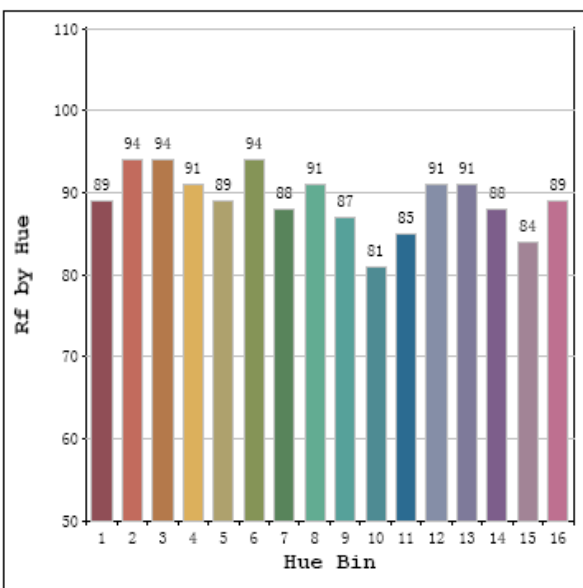
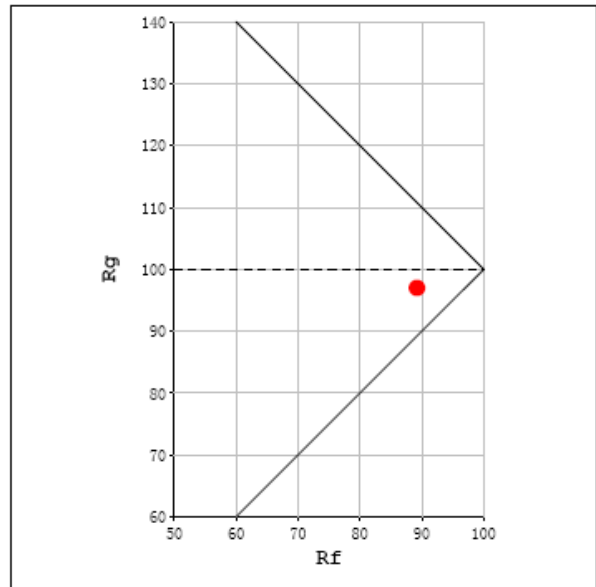
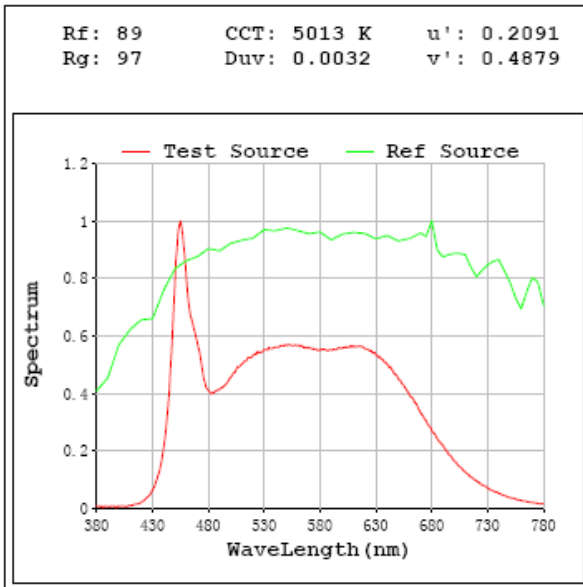
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1636.2
Luminous Efficacy (lm/W)	105.56
Beam Angle (°)	86.2
Center Beam Candle Power (cd)	881.9

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1642.0
Luminous Efficacy (lm/W)	103.50

Spectral Power Distribution & Chromaticity Diagram



TM30

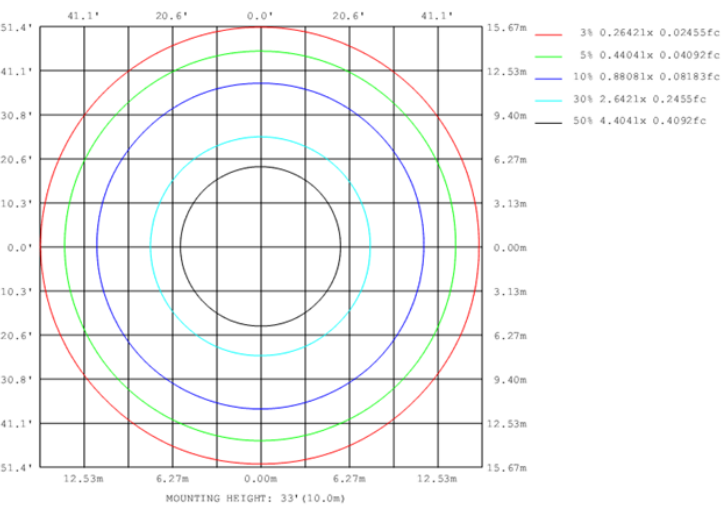
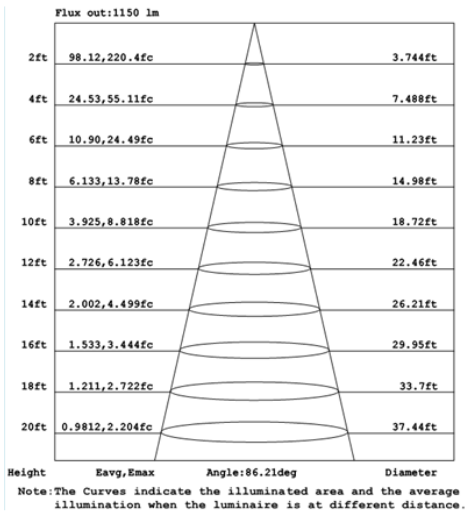
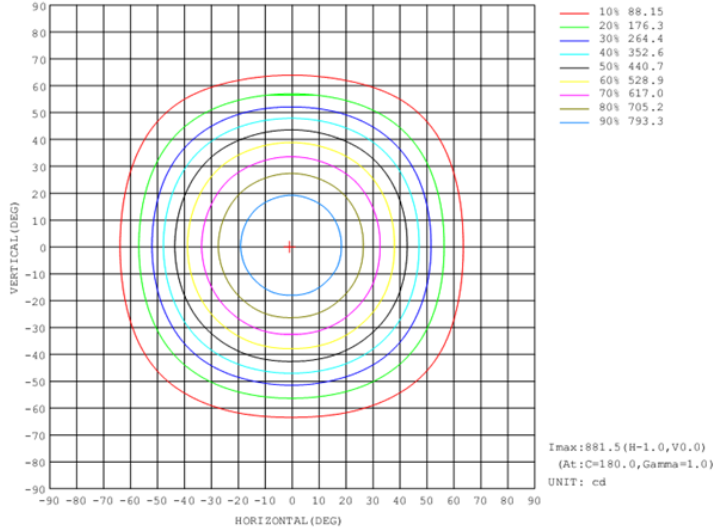
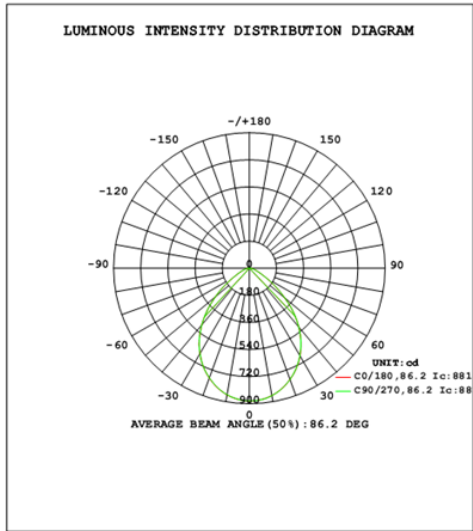


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	649.1	39.7%
0-40	1014.4	62.0%
0-60	1507.8	92.1%
60-90	128.5	7.9%
70-100	47.5	2.9%
90-120	0.0	0.0%
0-90	1636.2	100.0%
90-180	0.0	0.0%
0-180	1636.2	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	82.9	5.1%	90-100	0.0	0.0%
10-20	231.9	14.2%	100-110	0.0	0.0%
20-30	334.3	20.4%	110-120	0.0	0.0%
30-40	365.3	22.3%	120-130	0.0	0.0%
40-50	308.9	18.9%	130-140	0.0	0.0%
50-60	184.5	11.3%	140-150	0.0	0.0%
60-70	80.9	4.9%	150-160	0.0	0.0%
70-80	37.2	2.3%	160-170	0.0	0.0%
80-90	10.4	0.6%	170-180	0.0	0.0%

Photometric Data

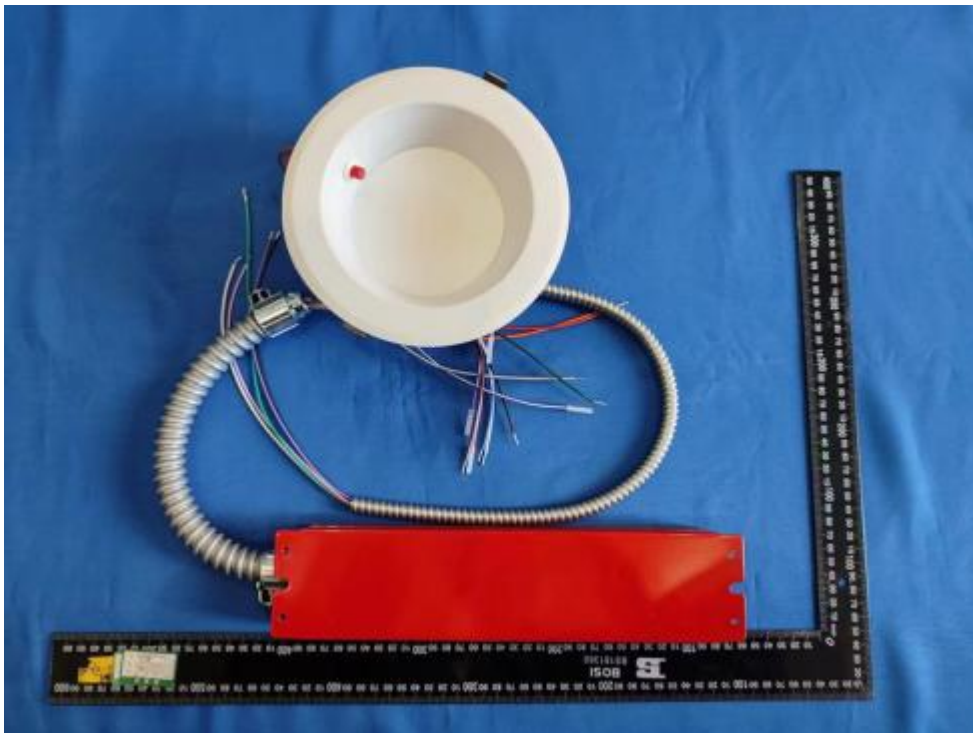


Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
CRLEDFA-6R-16S-9CCT-UNV-WS/E	9W-3000K setting	120.0	866.9	8.103	106.98
		277.0	906.0	8.932	101.43
	9W-3500K setting	120.0	896.0	8.083	110.86
		277.0	934.7	8.894	105.09
	9W-4000K setting	120.0	903.7	8.044	112.34
		277.0	944.9	8.867	106.56
	9W-5000K setting	120.0	899.8	8.077	111.40
		277.0	940.0	8.887	105.77

Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
CRLEDFA-6R-16S-9CCT-UNV-WS/E	12W-3000K setting	120.0	1123.0	10.64	105.55
		277.0	1143.0	11.28	101.31
	12W-3500K setting	120.0	1163.0	10.56	110.11
		277.0	1188.0	11.22	105.82
	12W-4000K setting	120.0	1175.0	10.49	111.97
		277.0	1195.0	11.13	107.31
	12W-5000K setting	120.0	1154.0	10.52	109.69
		277.0	1180.0	11.20	105.41

Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
CRLEDFA-6R-16S-9CCT-UNV-WS/E	16W-3000K setting	120.0	1578.0	15.55	101.44
		277.0	1582.0	16.01	98.83
	16W-3500K setting	120.0	1656.0	15.42	107.40
		277.0	1663.0	15.88	104.75
	16W-4000K setting	120.0	1676.0	15.29	109.66
		277.0	1686.0	15.76	107.01
	16W-5000K setting	120.0	1638.0	15.44	106.11
		277.0	1642.0	15.87	103.50

3. Product Photo



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