

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):
CRVFAD-12R/MVS/EM

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

**Type of
Luminaire:** Downlights

Report Date: 2024-07-01

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	21.0W
Rated Initial Lamp Lumen	1150lm (mode2700K)
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: 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: 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: 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	2024-06-26	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRVFAD-12R/MVS/EM	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202406150008	120.0	60	0.148	17.40	0.981

Chromaticity Measurement - Sphere-Spectroradiometer Method:

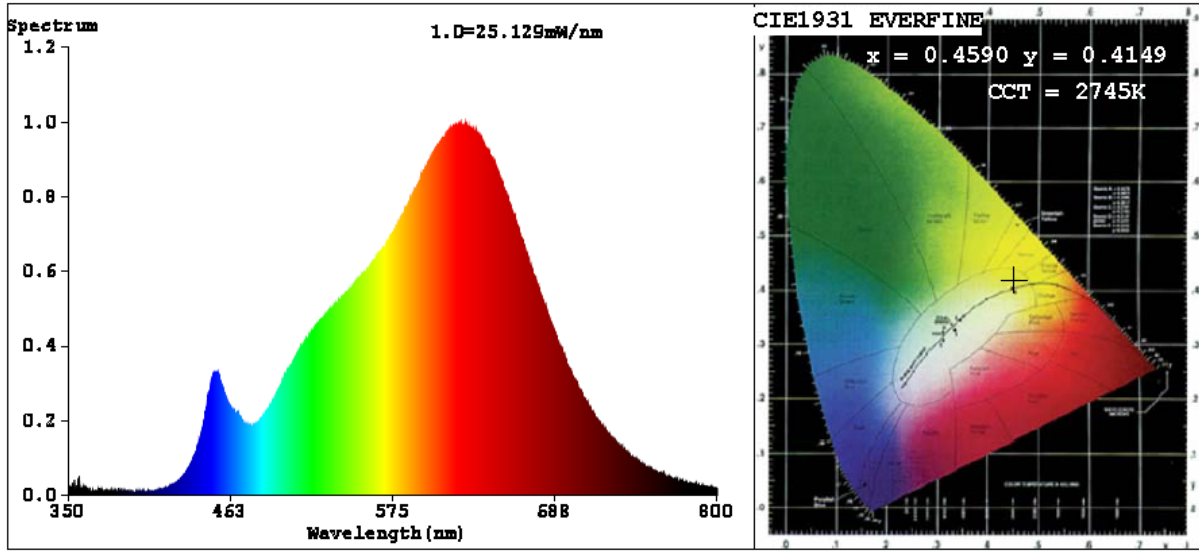
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	58
Frequency (Hz)	60	R2	96	R10	91
CCT (K)	2745	R3	99	R11	95
Duv	0.0017	R4	94	R12	84
Chromaticity (x, y)	x=0.4590 y=0.4149	R5	93	R13	94
Chromaticity (u', v')	u'=0.2600 v'=0.5289	R6	96	R14	98
Color Rendering Index (CRI)	93.1	R7	92	R15	88
R9	58	R8	81	--	--
Rg	98				
Rf	93				
Rcs,h1%	-6				

Photometric Measurement – Goniophotometer Method:

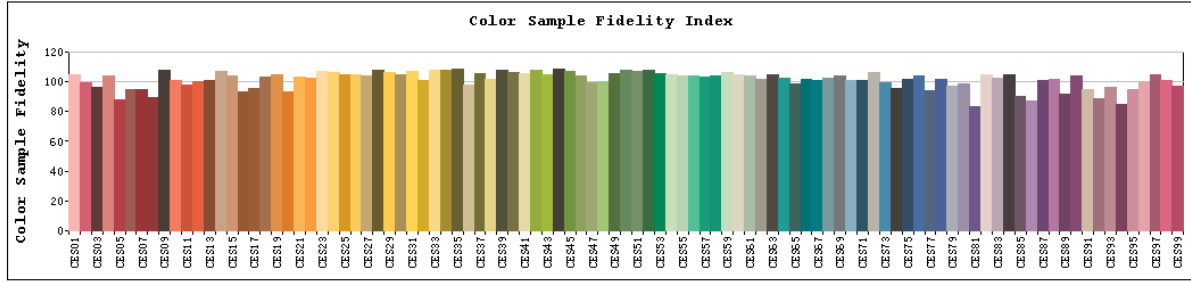
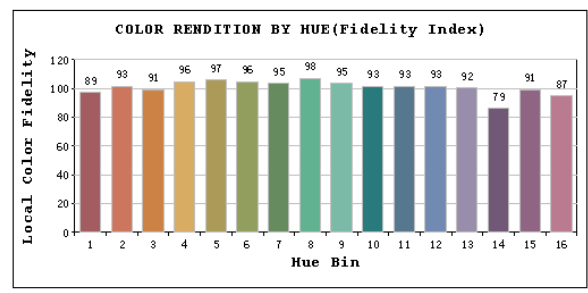
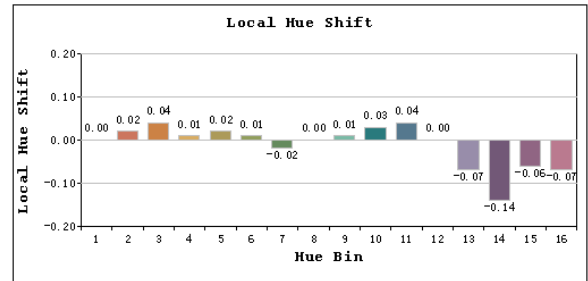
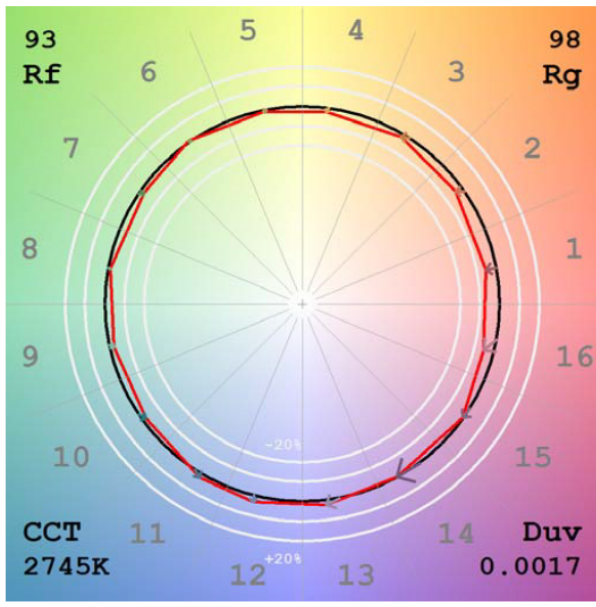
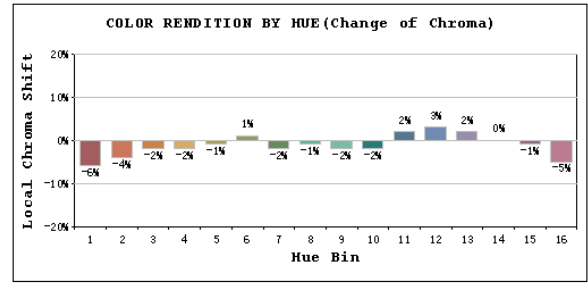
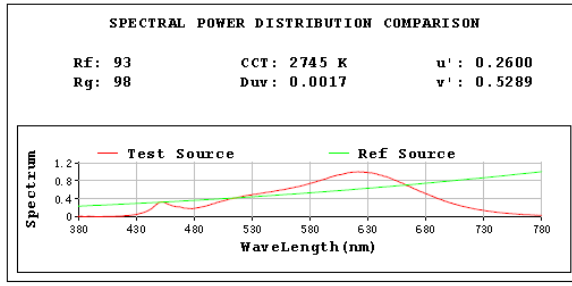
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1158.5
Luminous Efficacy (lm/W)	66.58
Beam Angle (°)	134.8
Center Beam Candle Power (cd)	262.5

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1158.0
Luminous Efficacy (lm/W)	64.51

Spectral Power Distribution & Chromaticity Diagram



TM30



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	212.3	18.3%
0-40	357.1	30.8%
0-60	675.6	58.3%
60-90	323.9	28.0%
70-100	235.1	20.3%
90-120	109.0	9.4%
0-90	999.5	86.3%
90-180	159.0	13.7%
0-180	1158.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	25.0	2.2%	90-100	50.2	4.3%
10-20	72.9	6.3%	100-110	33.9	2.9%
20-30	114.4	9.9%	110-120	25.0	2.2%
30-40	144.9	12.5%	120-130	19.9	1.7%
40-50	160.3	13.8%	130-140	15.0	1.3%
50-60	158.2	13.7%	140-150	9.3	0.8%
60-70	139.0	12.0%	150-160	4.2	0.4%
70-80	108.3	9.3%	160-170	1.3	0.1%
80-90	76.6	6.6%	170-180	0.3	0.0%

Photometric Data

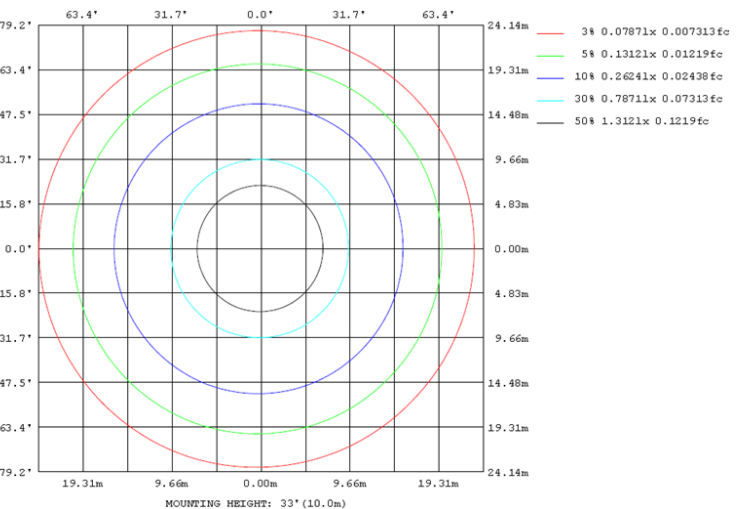
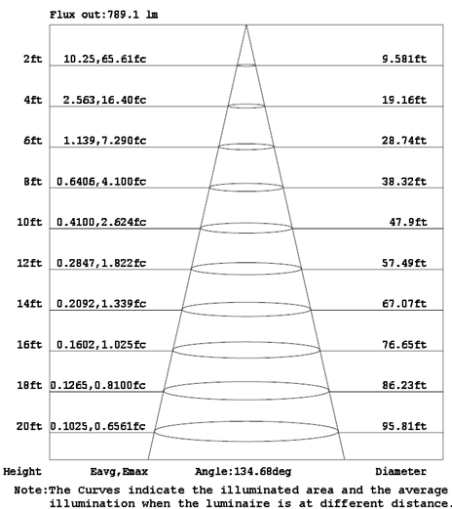
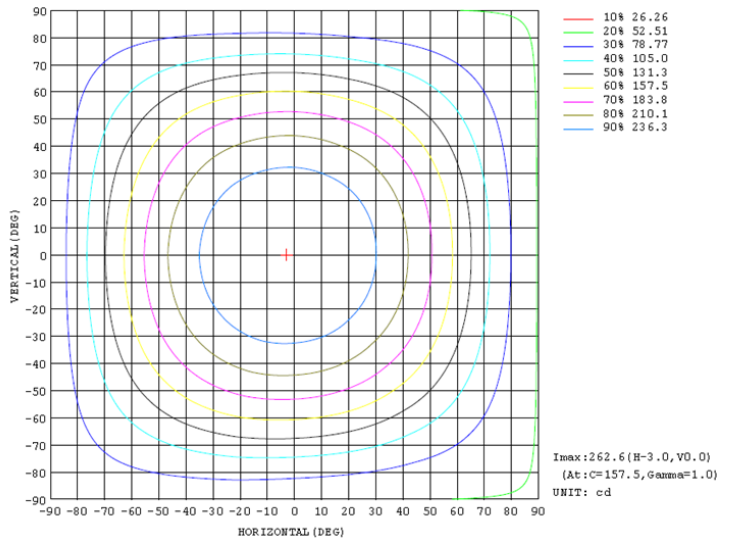
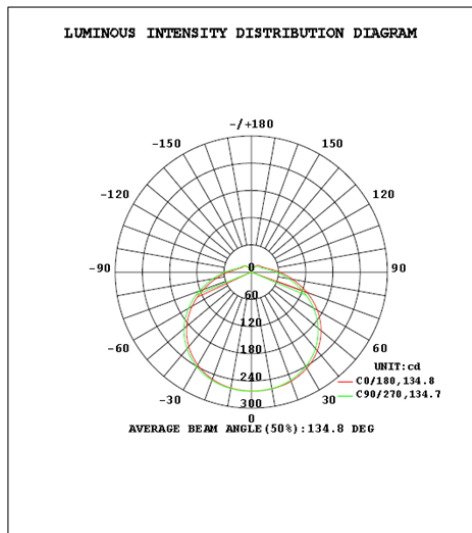


Table--1

UNIT: cd

7 (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	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262	262				
5	261	261	261	262	262	262	262	262	262	262	262	262	262	262	262	261				
10	259	259	260	260	260	261	261	261	261	261	261	261	261	260	260	260				
15	256	256	256	257	258	258	259	259	259	259	259	258	258	257	257	256				
20	251	251	252	253	254	255	255	256	256	256	255	254	254	253	252	252				
25	245	245	245	247	248	249	250	251	251	250	250	248	248	247	246	245				
30	236	237	237	239	241	242	244	244	245	244	243	241	240	239	238	237				
35	226	227	228	230	232	234	235	236	236	235	234	232	231	229	229	228				
40	215	215	216	219	221	223	225	226	226	225	223	221	220	218	217	216				
45	201	202	203	206	208	211	213	214	214	213	211	209	207	205	204	203				
50	186	187	188	191	194	197	199	200	201	199	197	194	192	190	189	187				
55	169	170	171	174	178	181	183	184	185	183	181	178	176	173	172	171				
60	151	152	153	157	160	164	166	167	168	166	164	160	158	155	154	153				
65	132	133	134	138	141	145	147	149	149	147	145	142	139	136	135	134				
70	113	113	115	118	122	126	128	129	130	128	126	122	120	117	116	114				
75	94.4	95.0	96.2	99.8	103	107	109	110	111	108	106	103	101	98.5	97.5	96.0				
80	77.9	78.6	79.7	83.0	86.0	89.5	91.1	92.2	92.5	90.2	88.4	85.6	83.9	81.6	80.8	79.5				
85	63.6	64.4	65.5	68.2	71.0	74.1	75.3	76.2	76.3	74.2	72.6	70.0	68.8	66.7	66.1	65.0				
90	51.1	52.0	53.2	55.6	57.9	60.3	61.4	62.2	62.2	60.5	58.9	56.4	55.4	53.7	53.2	52.3				
95	41.2	42.1	43.1	45.1	46.6	48.3	49.1	50.0	50.0	48.5	47.1	45.0	44.3	42.9	42.6	42.0				
100	34.4	35.1	35.9	37.2	38.2	39.3	39.8	40.5	40.6	39.4	38.3	36.8	36.0	35.0	34.7	34.5				
105	29.7	30.6	31.3	32.0	32.6	33.2	33.6	34.0	34.1	33.4	32.5	31.2	30.4	29.5	29.3	29.5				
110	26.2	27.4	28.1	28.6	28.8	29.2	29.5	29.9	30.0	29.6	28.8	27.4	26.5	25.4	25.3	25.8				
115	23.3	25.0	25.6	25.8	25.9	25.9	26.2	26.6	26.9	26.7	26.0	24.2	23.2	22.2	22.2	22.8				
120	22.6	23.7	24.1	24.0	23.9	23.7	23.9	24.3	24.7	24.6	24.0	22.6	21.6	20.5	20.6	21.6				
125	21.6	22.7	23.1	23.1	23.1	23.0	23.1	23.3	23.6	23.6	23.2	21.9	20.7	19.6	19.6	20.6				
130	20.3	21.4	21.8	21.9	21.8	21.8	21.9	22.1	22.5	22.5	22.1	20.8	19.5	18.3	18.3	19.2				
135	18.5	19.6	20.0	20.1	20.1	20.2	20.3	20.5	20.9	21.0	20.5	19.2	17.8	16.6	16.6	17.4				
140	16.3	17.4	17.8	17.9	17.9	18.2	18.3	18.5	18.9	19.0	18.5	17.1	15.8	14.6	14.4	15.1				
145	13.7	14.7	15.1	15.3	15.4	15.7	15.8	16.1	16.5	16.6	16.1	14.8	13.3	12.2	12.0	12.6				
150	10.8	11.7	12.1	12.4	12.5	12.9	13.0	13.3	13.7	13.8	13.3	12.1	10.6	9.49	9.24	9.79				
155	7.46	8.34	8.80	9.27	9.42	9.83	9.97	10.3	10.7	10.7	10.2	8.95	7.74	6.67	6.44	6.81				
160	4.70	5.11	5.48	5.94	6.24	6.61	6.78	7.15	7.53	7.18	6.63	5.67	4.99	4.53	4.48	4.54				
165	3.70	3.86	4.07	4.22	4.29	4.37	4.48	4.67	4.85	4.68	4.39	4.08	3.83	3.70	3.70	3.68				
170	3.30	3.42	3.56	3.60	3.62	3.64	3.68	3.76	3.83	3.78	3.63	3.47	3.36	3.34	3.34	3.32				
175	3.06	3.20	3.31	3.32	3.35	3.38	3.42	3.43	3.44	3.43	3.36	3.30	3.21	3.13	3.02	3.00				
180	3.08	3.06	3.00	2.98	2.97	2.96	2.98	2.98	3.07	3.05	3.00	2.98	2.98	2.97	2.99	3.00				

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-06-26	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRVFAD-12R/MVS/EM	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202406150008	120.0	60	0.146	17.20	0.981

Chromaticity Measurement - Sphere-Spectroradiometer Method:

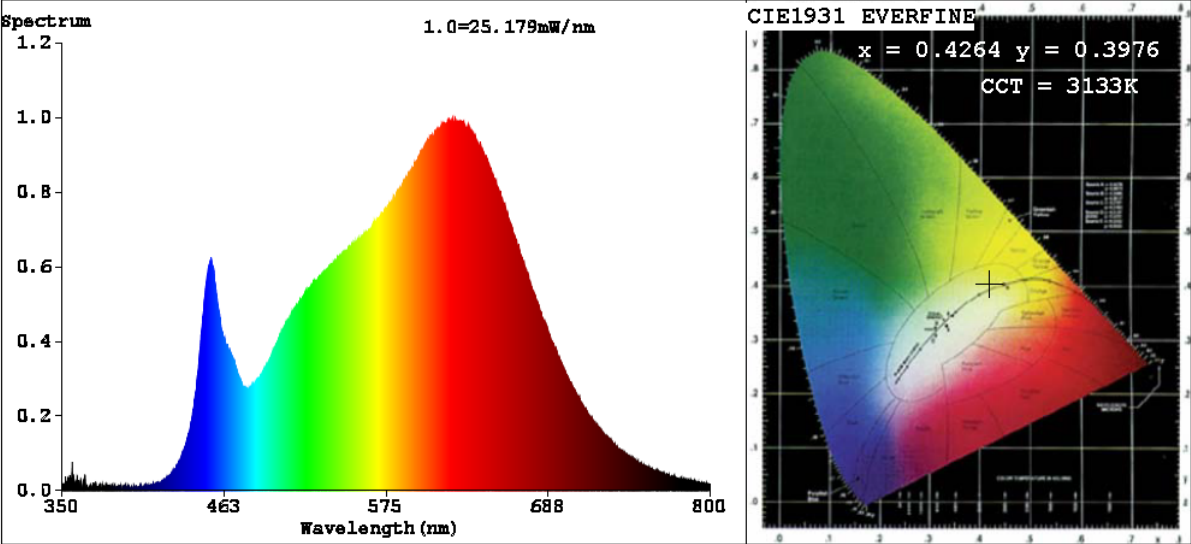
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	68
Frequency (Hz)	60	R2	98	R10	94
CCT (K)	3133	R3	99	R11	96
Duv	-0.0011	R4	95	R12	82
Chromaticity (x, y)	x=0.4264 y=0.3976	R5	95	R13	97
Chromaticity (u', v')	u'=0.2465 v'=0.5172	R6	96	R14	99
Color Rendering Index (CRI)	94.7	R7	93	R15	92
R9	68	R8	86	--	--
Rg	100				
Rf	93				
Rcs,h1%	-4				

Photometric Measurement – Goniophotometer Method:

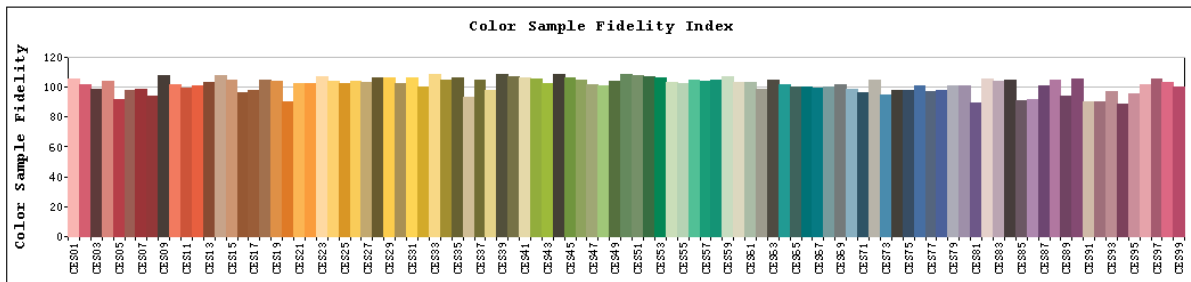
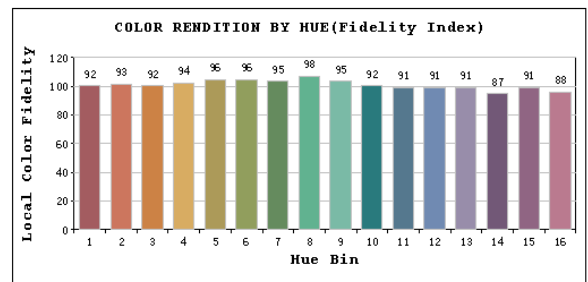
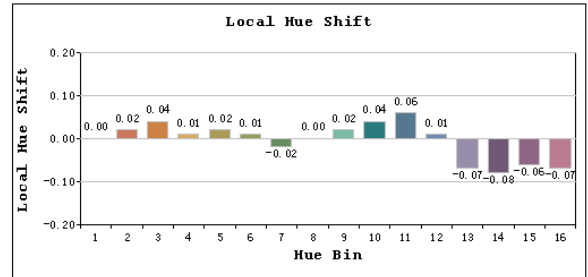
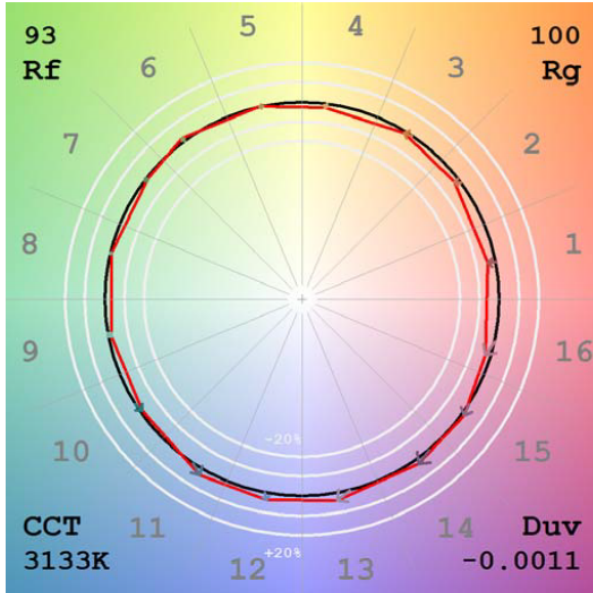
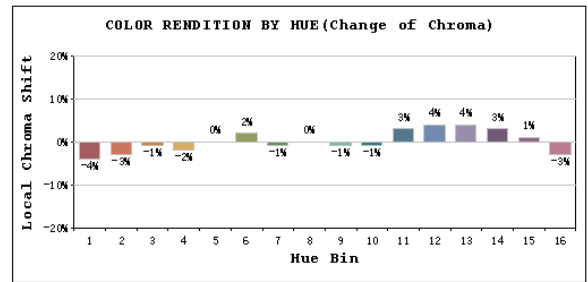
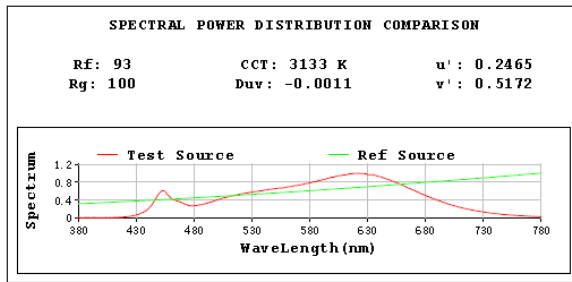
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1290.0
Luminous Efficacy (lm/W)	75.00

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1286.0
Luminous Efficacy (lm/W)	72.61

Spectral Power Distribution & Chromaticity Diagram



TM30



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-06-26	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRVFAD-12R/MVS/EM	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202406150008	120.0	60	0.144	16.90	0.980

Chromaticity Measurement - Sphere-Spectroradiometer Method:

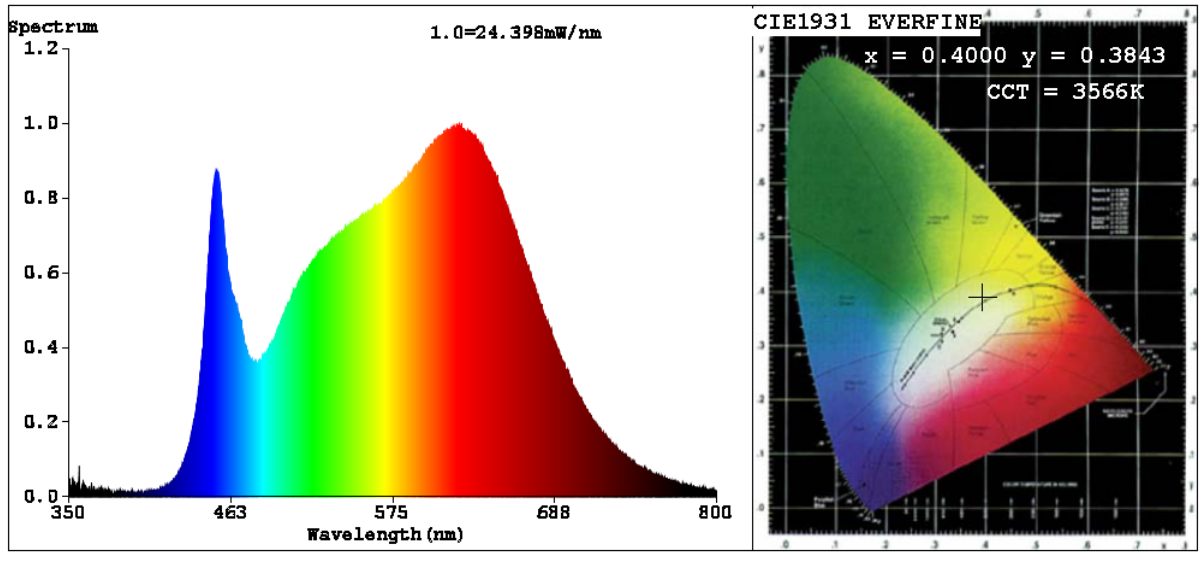
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	74
Frequency (Hz)	60	R2	98	R10	94
CCT (K)	3566	R3	98	R11	96
Duv	-0.0017	R4	96	R12	79
Chromaticity (x, y)	x=0.4000 y=0.3843	R5	96	R13	97
Chromaticity (u', v')	u'=0.2349 v'=0.5078	R6	96	R14	98
Color Rendering Index (CRI)	95.3	R7	95	R15	94
R9	74	R8	89	--	--
Rg	100				
Rf	93				
Rcs,h1%	-4				

Photometric Measurement – Goniophotometer Method:

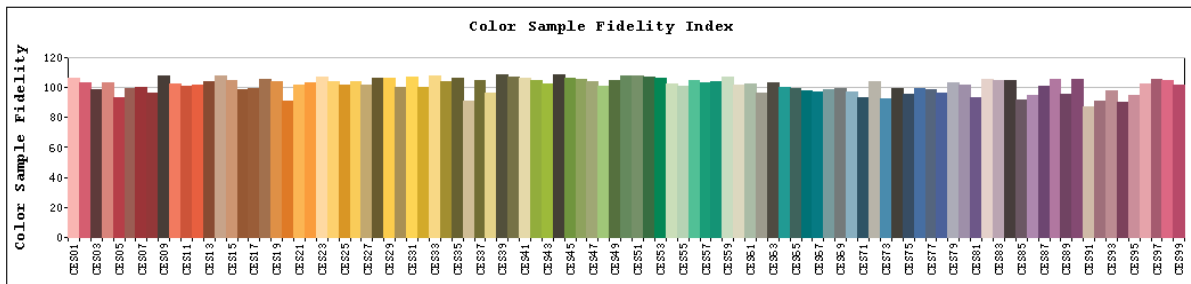
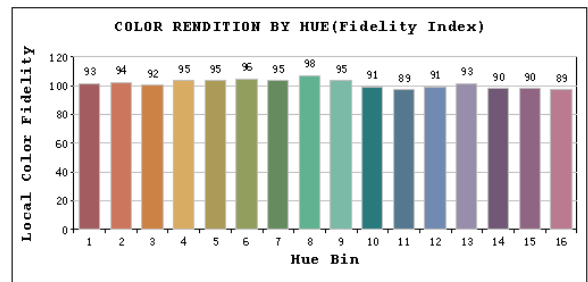
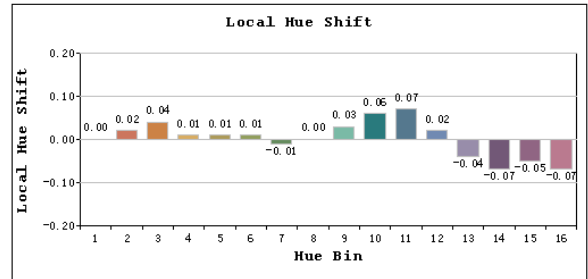
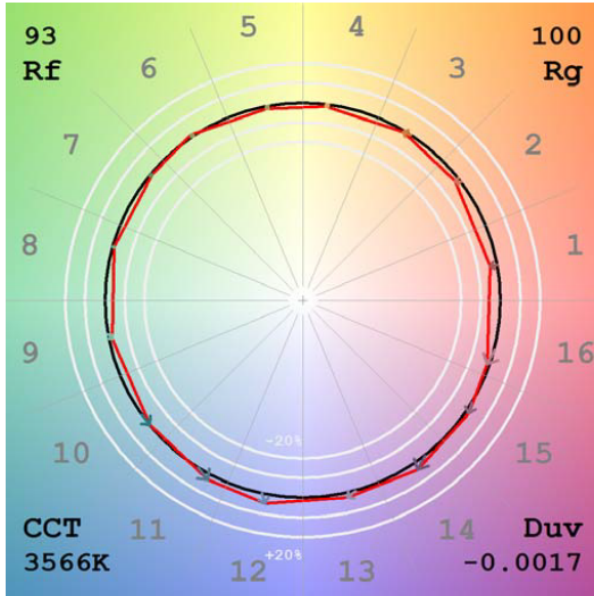
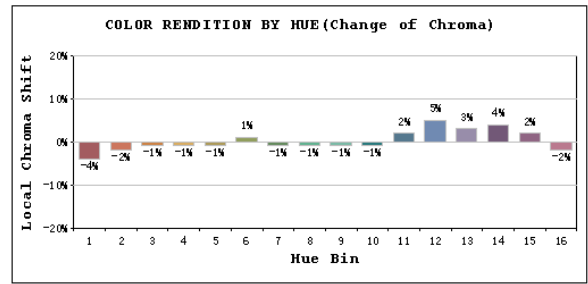
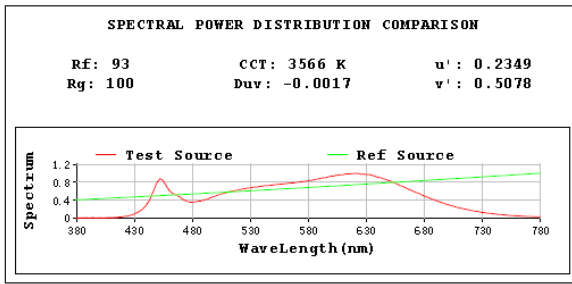
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1346.5
Luminous Efficacy (lm/W)	79.67

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1344.0
Luminous Efficacy (lm/W)	77.02

Spectral Power Distribution & Chromaticity Diagram



TM30



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-06-26	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRVFAD-12R/MVS/EM	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202406150008	120.0	60	0.145	17.10	0.980

Chromaticity Measurement - Sphere-Spectroradiometer Method:

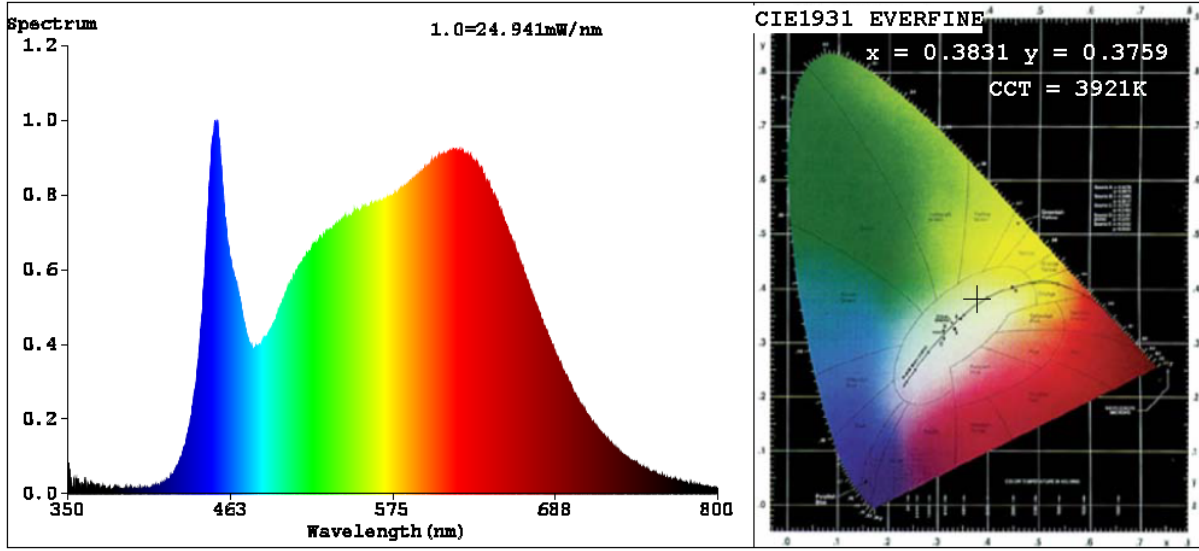
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	75
Frequency (Hz)	60	R2	98	R10	93
CCT (K)	3921	R3	97	R11	95
Duv	-0.0012	R4	95	R12	76
Chromaticity (x, y)	x=0.3831 y=0.3759	R5	95	R13	97
Chromaticity (u', v')	u'=0.2272 v'=0.5016	R6	95	R14	98
Color Rendering Index (CRI)	95.1	R7	94	R15	94
R9	75	R8	89	--	--
Rg	100				
Rf	93				
Rcs,h1%	-4				

Photometric Measurement – Goniophotometer Method:

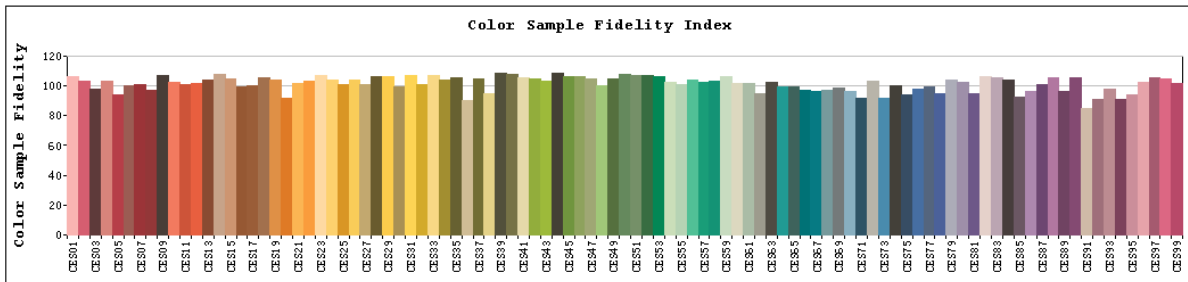
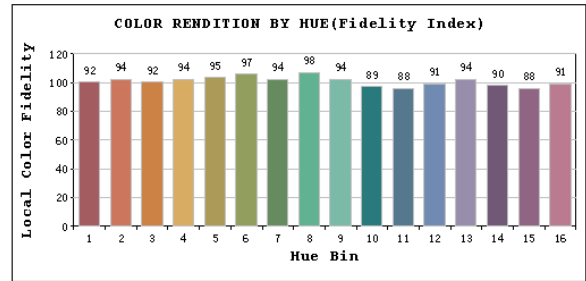
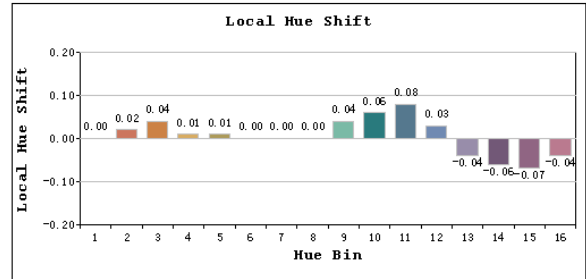
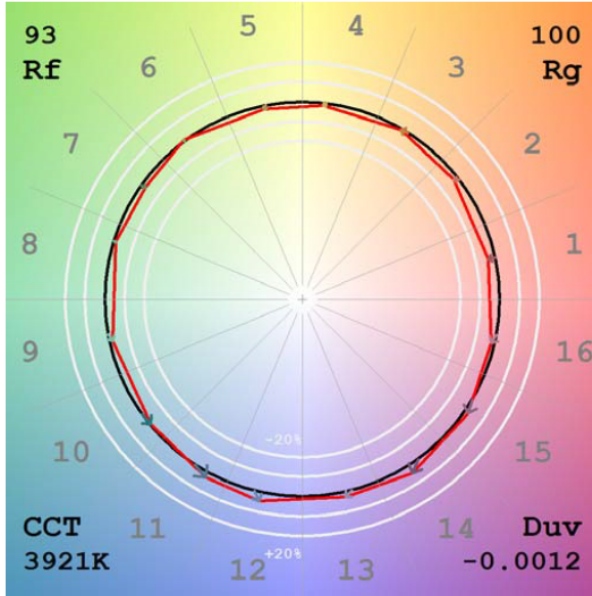
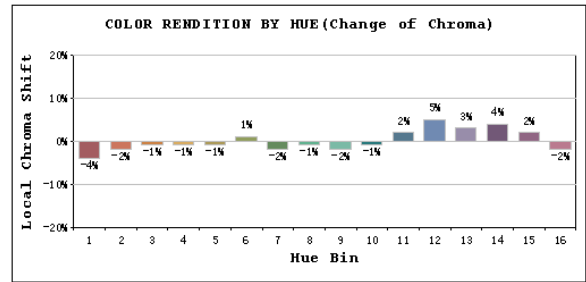
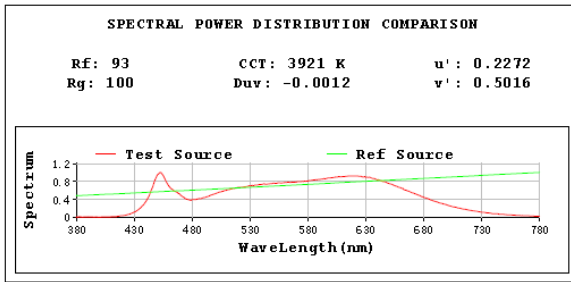
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1356.6
Luminous Efficacy (lm/W)	79.33

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1351.0
Luminous Efficacy (lm/W)	76.72

Spectral Power Distribution & Chromaticity Diagram



TM30



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-06-26	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CRVFAD-12R/MVS/EM	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202406150008	120.0	60	0.148	17.40	0.981

Chromaticity Measurement - Sphere-Spectroradiometer Method:

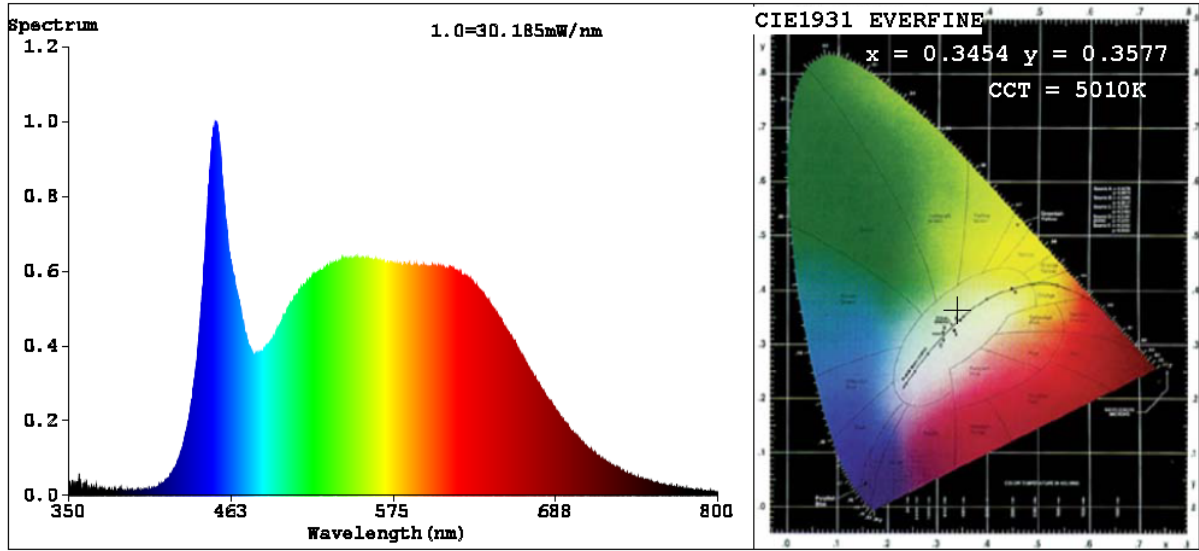
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	92	R9	61
Frequency (Hz)	60	R2	95	R10	86
CCT (K)	5010	R3	95	R11	92
Duv	0.0029	R4	92	R12	73
Chromaticity (x, y)	x=0.3454 y=0.3577	R5	92	R13	93
Chromaticity (u', v')	u'=0.2093 v'=0.4876	R6	92	R14	97
Color Rendering Index (CRI)	92.2	R7	94	R15	90
R9	61	R8	86	--	--
Rg	99				
Rf	91				
Rcs,h1%	-6				

Photometric Measurement – Goniophotometer Method:

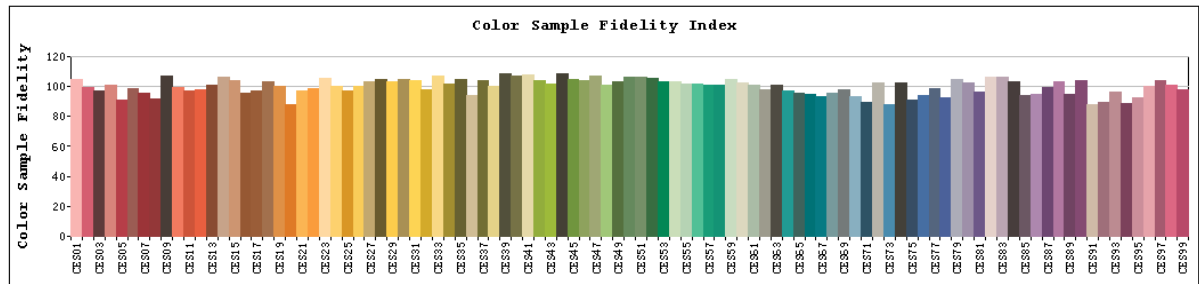
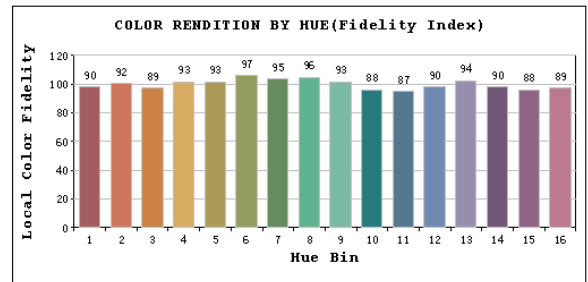
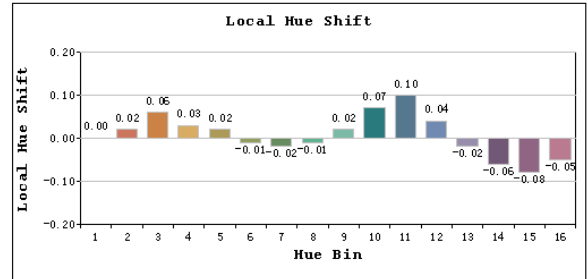
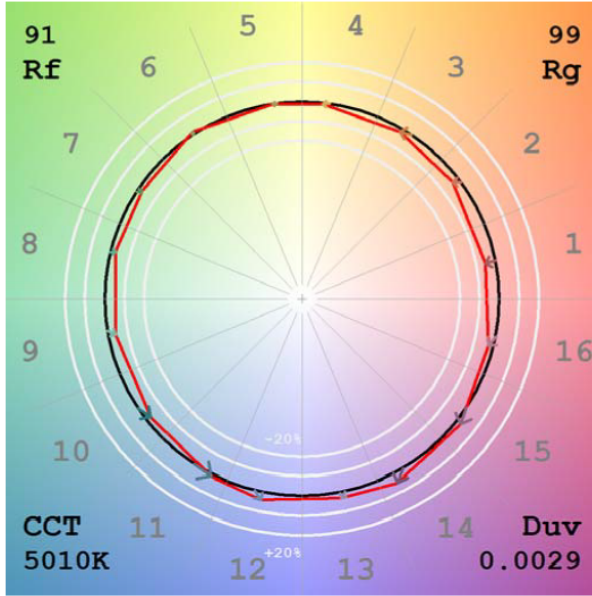
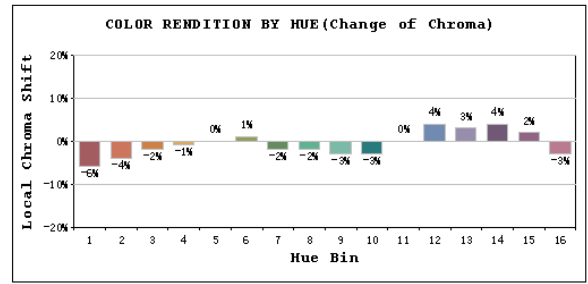
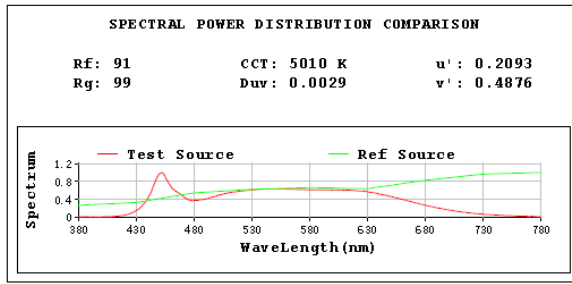
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1289.1
Luminous Efficacy (lm/W)	74.09

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1286.0
Luminous Efficacy (lm/W)	71.84

Spectral Power Distribution & Chromaticity Diagram

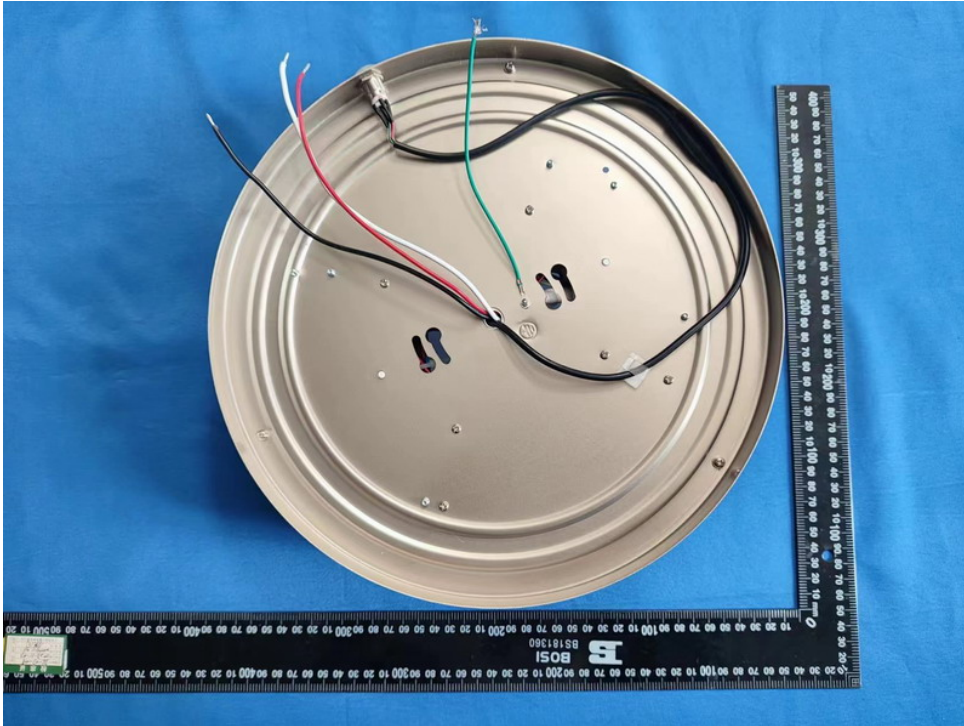


TM30



Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
CRVFAD-12R/MVS/EM	2700K setting	120	1158.5	17.40	66.58
		277	1158.0	17.95	64.51
	3000K setting	120	1290.0	17.20	75.00
		277	1286.0	17.71	72.61
	3500K setting	120	1346.5	16.90	79.67
		277	1344.0	17.45	77.02
	4000K setting	120	1356.6	17.10	79.33
		277	1351.0	17.61	76.72
	5000K setting	120	1289.1	17.40	74.09
		277	1286.0	17.90	71.84

3. Product Photo



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