

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):
**DLS0099(CRVFAS-11R-16-9CCT-UNV-
W/MVS)**

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

**Type of
Luminaire:** Downlights

Report Date: 2021-10-12

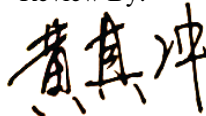
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:

Rated Voltage / Frequency	120V-277Vac, 60 Hz
Nominal Power	16.0W
Rated Initial Lamp Lumen	1150 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	2021-10-12	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0099(CRVFAS-11R-16-9CCT-UNV-W/MVS)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202110120040	120.0	60	0.137	16.40	0.995

Chromaticity Measurement - Sphere-Spectroradiometer Method:

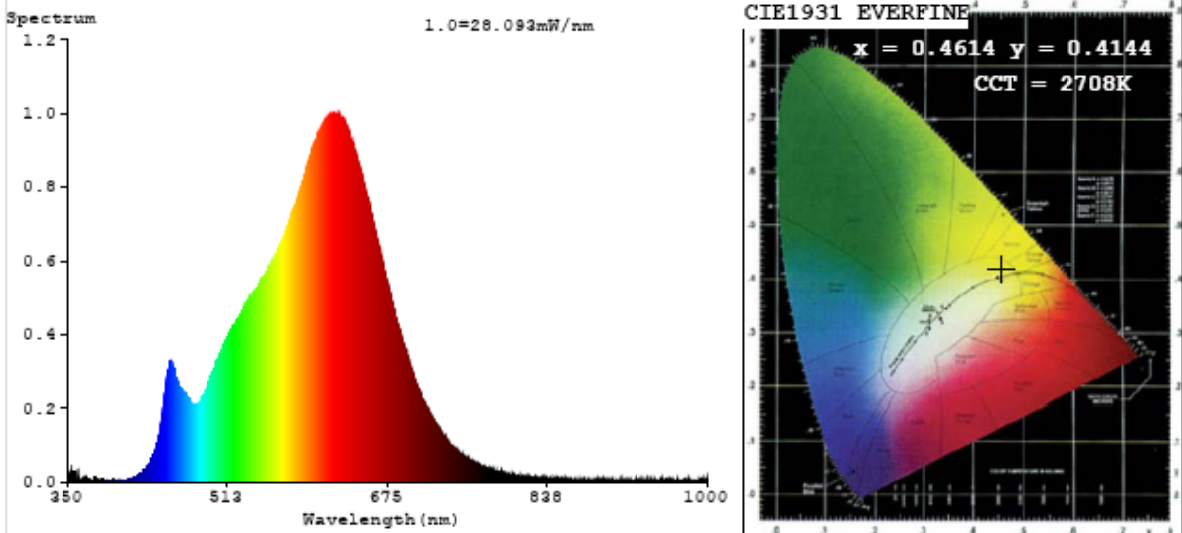
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	54
Frequency (Hz)	60	R2	97	R10	93
CCT (K)	2708	R3	99	R11	94
Duv	0.0013	R4	92	R12	85
Chromaticity (x, y)	x=0.4614 y=0.4144	R5	93	R13	94
Chromaticity (u', v')	u'=0.2618 v'=0.5290	R6	98	R14	100
Color Rendering Index (CRI)	92.6	R7	90	R15	87
R9	54	R8	79	--	--

Photometric Measurement – Goniophotometer Method:

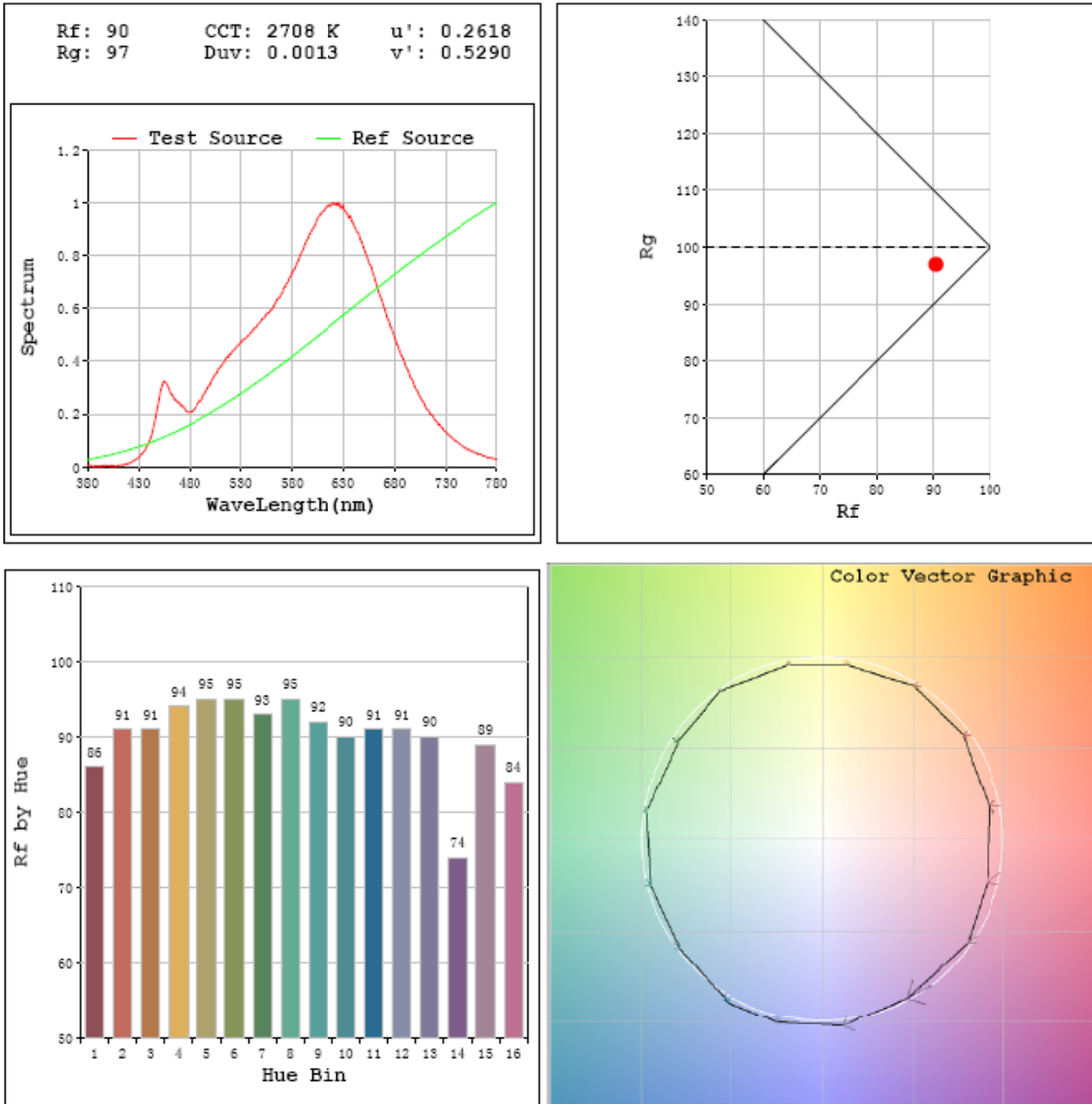
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1283.5
Luminous Efficacy (lm/W)	78.26
Beam Angle (°)	123.0
Center Beam Candle Power (cd)	340.1

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1280.0
Luminous Efficacy (lm/W)	77.06

Spectral Power Distribution & Chromaticity Diagram



TM30



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	268.4	20.9%
0-40	446.2	34.8%
0-60	819.7	63.9%
60-90	317.9	24.8%
70-100	204.8	16.0%
90-120	91.4	7.1%
0-90	1137.6	88.6%
90-180	145.9	11.4%
0-180	1283.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	32.2	2.5%	90-100	37.4	2.9%
10-20	92.8	7.2%	100-110	29.5	2.3%
20-30	143.5	11.2%	110-120	24.5	1.9%
30-40	177.8	13.9%	120-130	19.4	1.5%
40-50	191.4	14.9%	130-140	14.5	1.1%
50-60	182.2	14.2%	140-150	10.0	0.8%
60-70	150.5	11.7%	150-160	6.3	0.5%
70-80	105.4	8.2%	160-170	3.3	0.3%
80-90	62.0	4.8%	170-180	1.0	0.1%

Photometric Data

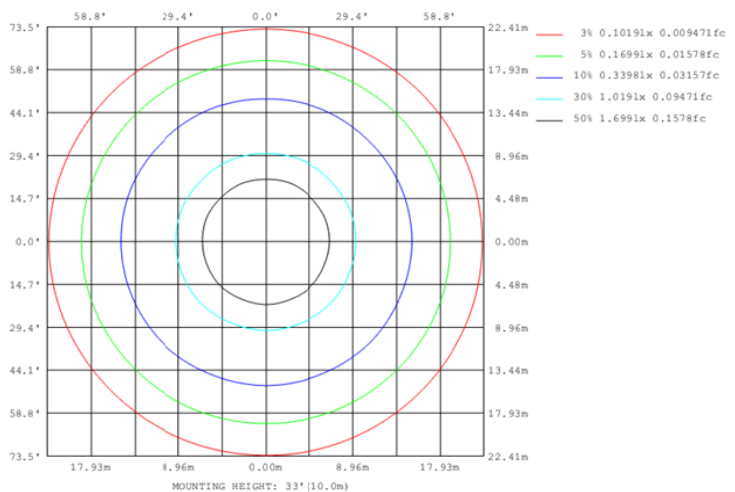
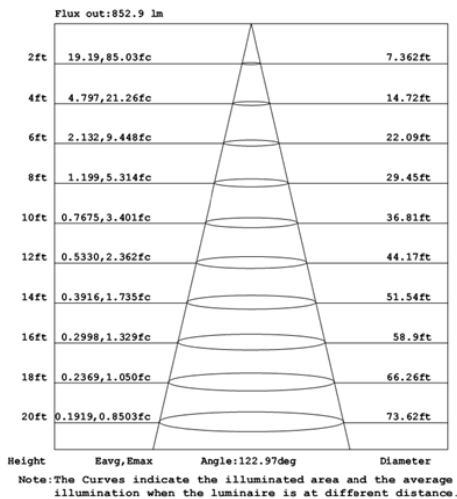
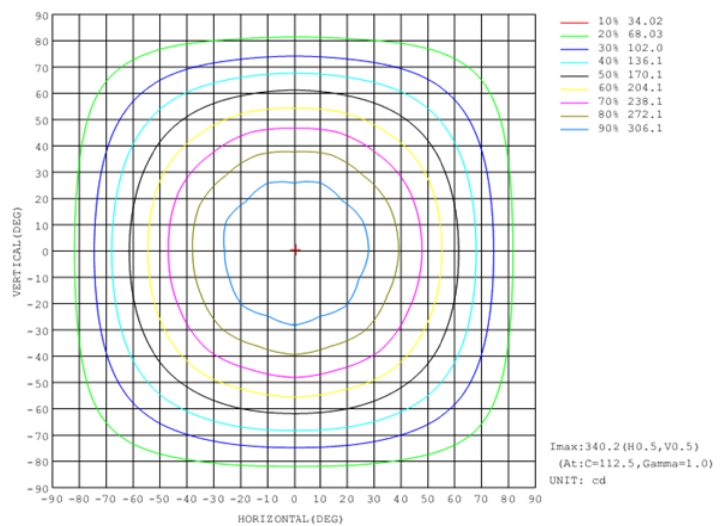
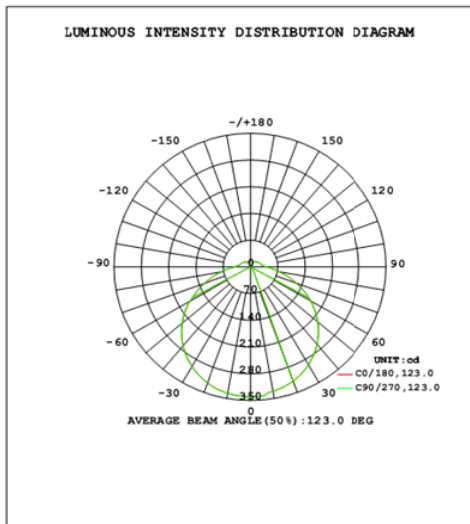


Table--1

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	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340	340				
5	339	339	339	339	339	339	339	339	339	339	339	339	339	339	339	339				
10	336	331	336	331	336	331	336	331	331	336	331	336	331	336	331	336				
15	331	326	331	326	331	326	331	326	326	330	326	330	326	331	326	331				
20	323	319	324	319	324	319	324	319	318	323	318	323	318	323	319	323				
25	313	309	314	310	314	309	313	309	309	313	308	313	308	313	309	313				
30	301	297	302	298	302	297	301	297	296	300	296	300	296	300	296	301				
35	286	283	287	283	287	283	286	282	282	285	281	285	281	285	282	286				
40	269	266	270	267	270	266	269	265	265	268	264	268	264	268	265	269				
45	250	247	251	248	251	247	250	246	246	249	245	248	245	248	246	249				
50	229	227	230	227	230	227	229	229	225	227	224	227	224	227	225	228				
55	206	204	207	205	207	204	206	203	202	204	201	203	201	204	202	205				
60	179	179	182	180	181	180	180	178	178	178	176	175	176	177	177	179				
65	152	154	154	155	154	154	153	152	152	150	151	150	150	150	151	152				
70	126	127	127	128	127	128	126	126	126	124	124	123	124	124	125	125				
75	99.5	101	101	102	101	101	100.0	99.8	99.5	98.0	98.1	97.0	97.7	97.5	99.0	99.3				
80	75.2	76.6	76.4	77.2	76.5	76.9	75.7	75.6	75.5	74.2	74.3	73.3	73.9	73.8	75.0	75.2				
85	55.7	56.7	56.6	57.2	56.6	56.9	56.1	56.2	56.3	55.2	55.3	54.5	55.0	54.8	55.7	55.7				
90	41.6	42.4	42.5	42.9	42.5	42.6	42.1	42.1	42.4	41.7	41.6	41.1	41.4	41.3	41.8	41.8				
95	33.1	33.6	33.5	33.9	33.7	33.8	33.5	33.5	33.8	33.4	33.4	33.1	33.2	33.1	33.4	33.4				
100	29.1	29.3	29.4	29.5	29.5	29.5	29.4	29.4	30.0	29.8	29.8	29.7	29.7	29.7	29.7	29.6				
105	27.3	27.5	27.6	27.6	27.6	27.7	27.6	27.6	28.3	28.2	28.2	28.1	28.1	28.0	28.0	28.0				
110	25.6	25.8	25.9	26.0	26.0	26.0	25.9	25.9	26.7	26.6	26.6	26.5	26.5	26.5	26.5	26.4				
115	24.0	24.2	24.3	24.4	24.4	24.4	24.3	24.3	25.2	25.1	25.1	25.0	24.9	24.9	24.9	24.9				
120	22.4	22.7	22.7	22.8	22.8	22.8	22.8	22.8	23.6	23.5	23.5	23.4	23.4	23.4	23.4	23.3				
125	20.9	21.2	21.2	21.3	21.3	21.3	21.3	21.3	22.1	22.0	22.0	21.9	21.9	21.8	21.8	21.8				
130	19.5	19.7	19.7	19.8	19.8	19.9	19.8	19.8	20.6	20.5	20.5	20.4	20.4	20.4	20.3	20.3				
135	18.0	18.3	18.3	18.4	18.4	18.4	18.4	18.4	19.2	19.0	19.0	19.0	18.9	18.9	18.8	18.8				
140	16.7	16.9	16.9	17.0	17.0	17.1	17.0	17.0	17.7	17.6	17.6	17.5	17.5	17.4	17.4	17.4				
145	15.4	15.6	15.6	15.7	15.6	15.7	15.7	15.7	16.4	16.2	16.2	16.2	16.1	16.1	16.1	16.0				
150	14.2	14.3	14.4	14.5	14.4	14.5	14.5	14.5	15.1	15.0	14.9	14.9	14.9	14.8	14.8	14.8				
155	13.1	13.2	13.2	13.2	13.2	13.4	13.4	13.3	13.8	13.8	13.8	13.7	13.7	13.6	13.6	13.6				
160	12.1	12.2	12.2	12.2	12.2	12.4	12.3	12.3	12.7	12.7	12.7	12.6	12.5	12.5	12.5	12.5				
165	11.3	11.3	11.3	11.4	11.4	11.5	11.5	11.5	11.8	11.8	11.8	11.7	11.6	11.5	11.6	11.6				
170	10.9	10.8	10.8	10.8	10.9	10.9	10.9	11.0	11.3	11.2	11.1	11.1	10.9	10.9	11.0	11.0				
175	10.8	10.8	10.8	10.9	10.9	10.9	10.9	10.9	11.0	11.0	11.0	11.0	10.9	10.9	10.9	10.9				
180	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0				

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-12	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0099(CRVFAS-11R-16-9CCT-UNV-W/MVS)		3000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202110120040	120.0	60	0.136	16.19	0.994

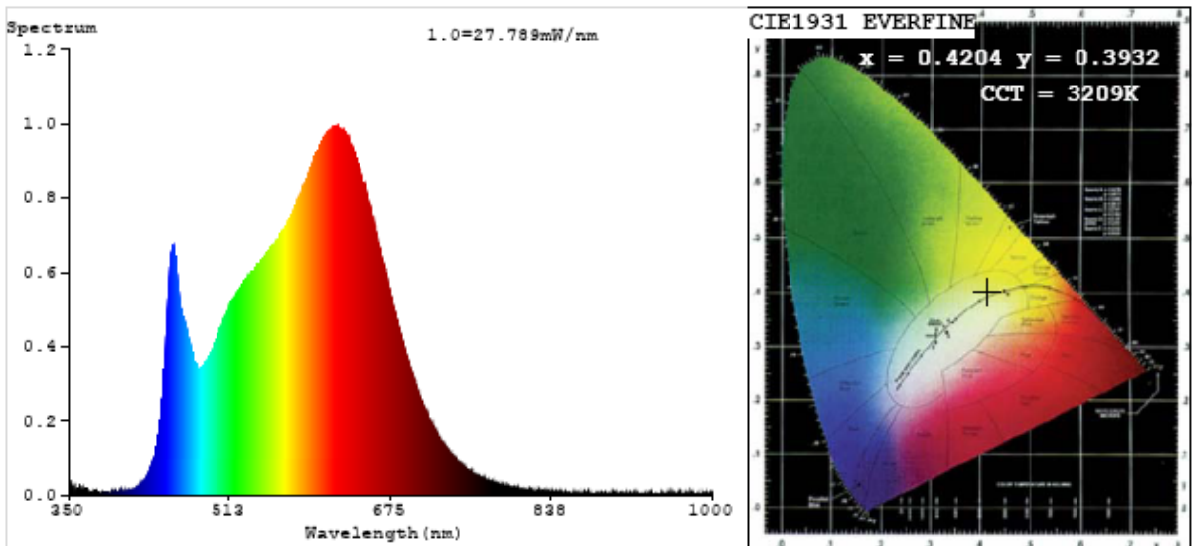
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3209
Duv	0.0019
Chromaticity (x, y)	x=0.4204 y=0.3932
Chromaticity (u', v')	u'=0.2445 v'=0.5145
Color Rendering Index (CRI)	94.7
R9	72
Total Luminous (lm)	1412.0
Luminous Efficacy (lm/W)	87.24

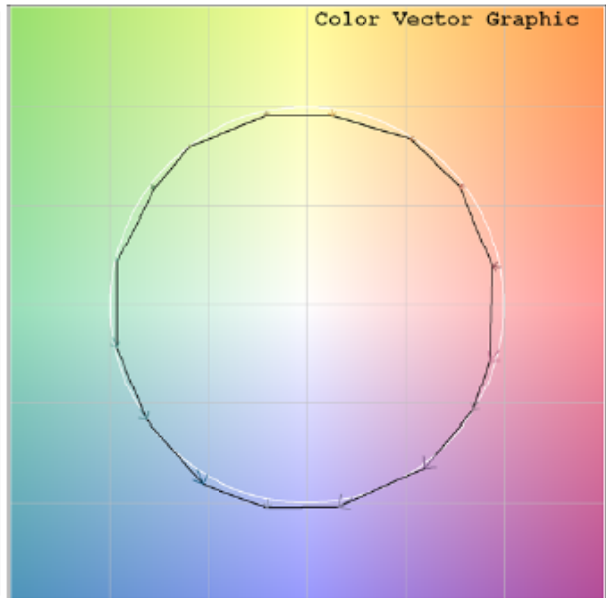
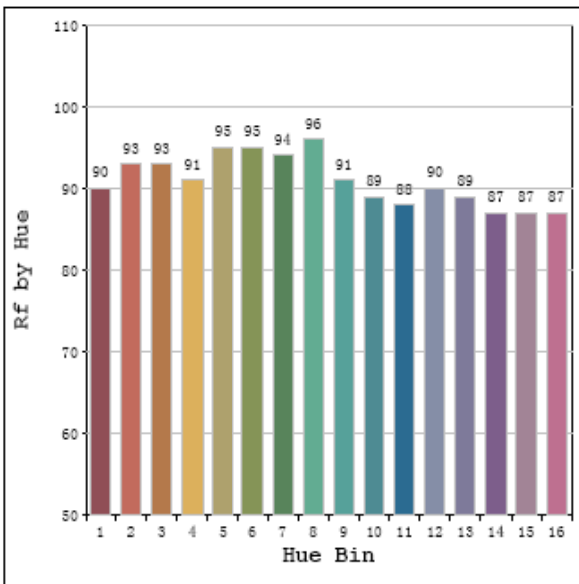
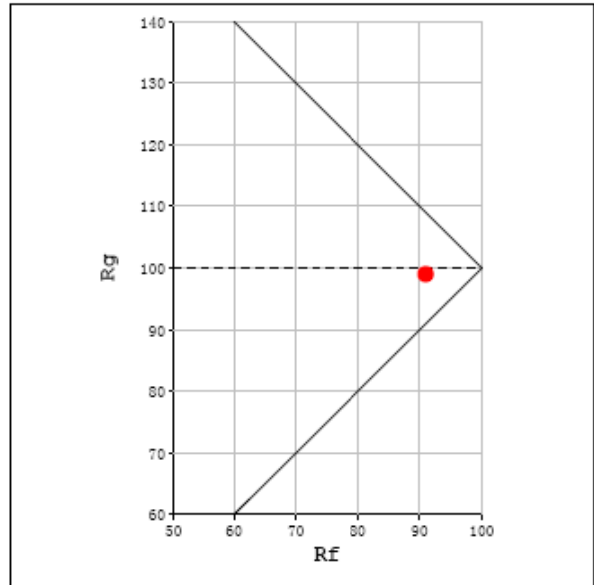
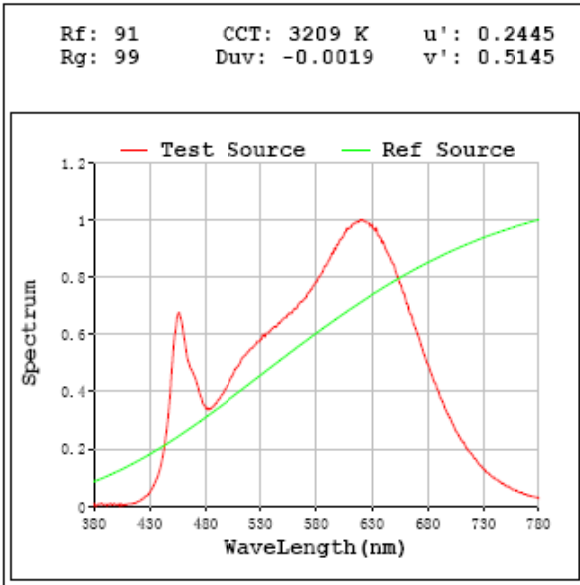
Special Color Rendering Indices			
R1	97	R9	72
R2	99	R10	99
R3	97	R11	97
R4	95	R12	81
R5	96	R13	99
R6	95	R14	99
R7	92	R15	94
R8	86	--	--

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1407.0
Luminous Efficacy (lm/W)	85.84

Spectral Power Distribution & Chromaticity Diagram



TM30



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-12	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0099(CRVFAS-11R-16-9CCT-UNV-W/MVS)		3500K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202110120040	120.0	60	0.133	15.82	0.994

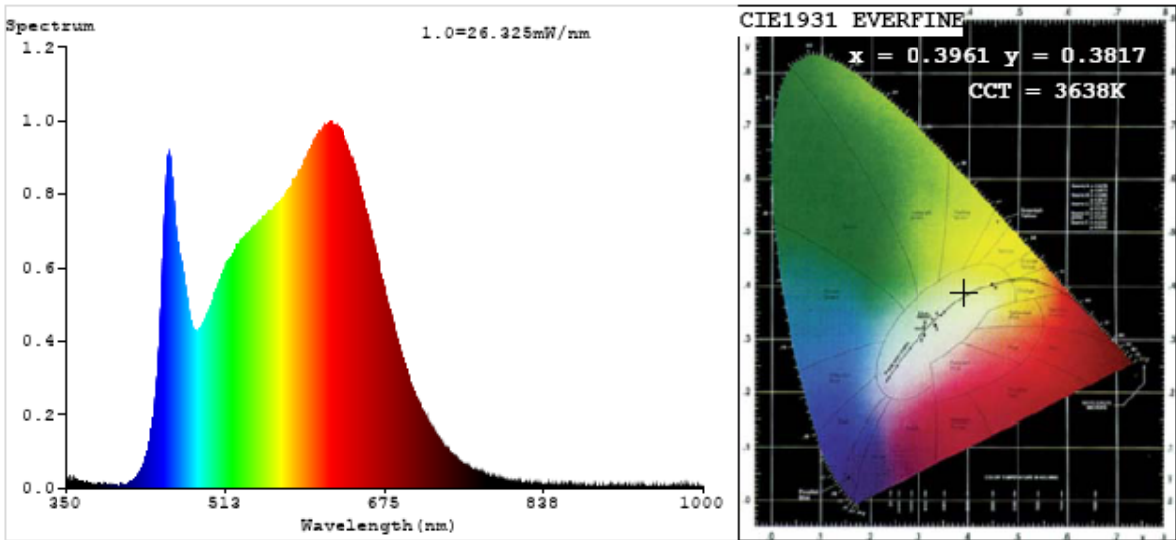
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3638
Duv	0.0019
Chromaticity (x, y)	x=0.3961 y=0.3817
Chromaticity (u', v')	u'=0.2334 v'=0.5060
Color Rendering Index (CRI)	95.4
R9	79
Total Luminous (lm)	1458.0
Luminous Efficacy (lm/W)	92.13

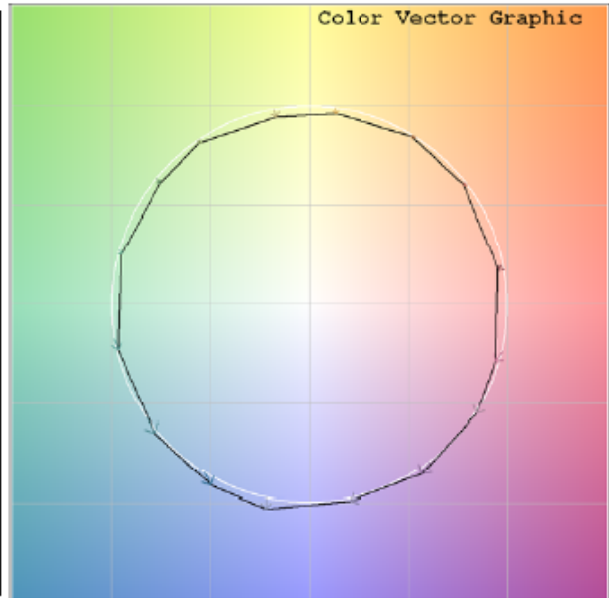
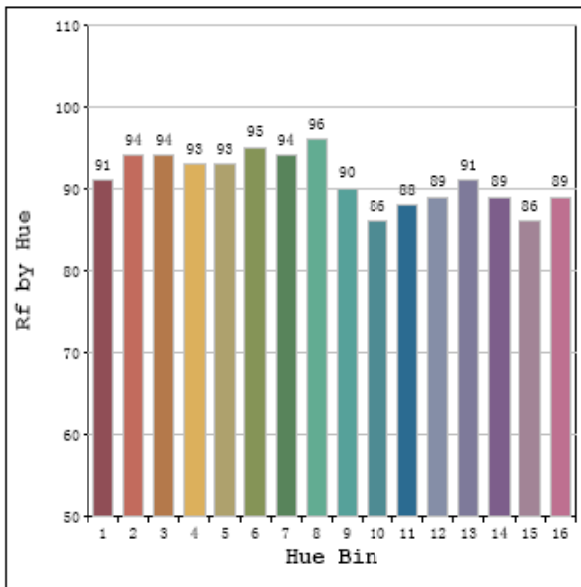
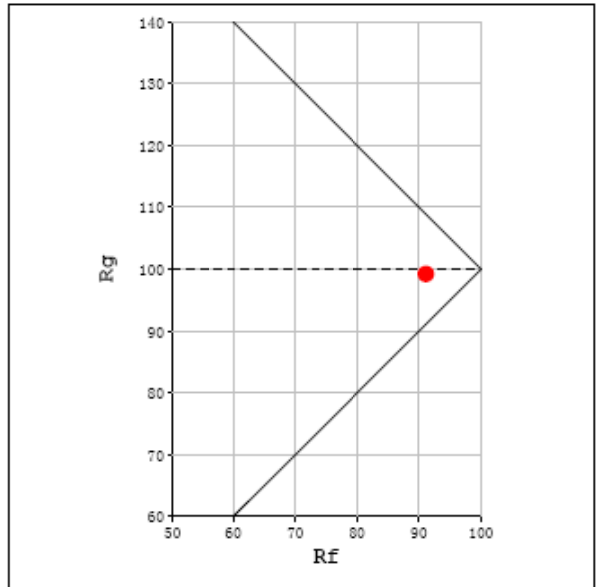
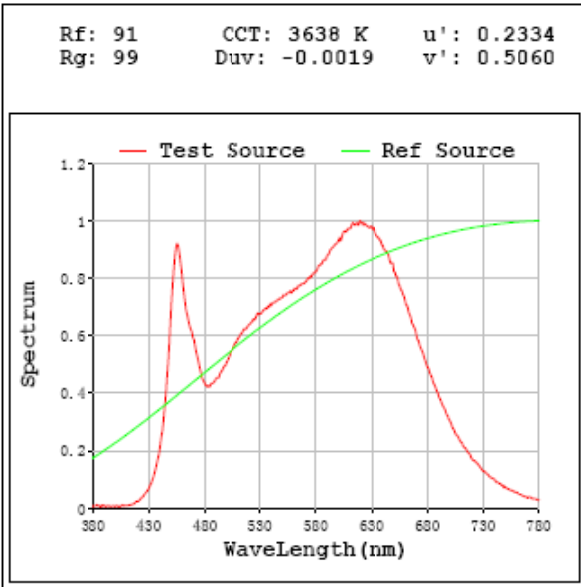
Special Color Rendering Indices			
R1	98	R9	79
R2	99	R10	99
R3	98	R11	97
R4	95	R12	77
R5	96	R13	100
R6	95	R14	100
R7	93	R15	96
R8	89	--	--

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1452.0
Luminous Efficacy (lm/W)	90.53

Spectral Power Distribution & Chromaticity Diagram



TM30



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-12	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0099(CRVFAS-11R-16-9CCT-UNV-W/MVS)		4000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202110120040	120.0	60	0.134	16.01	0.994

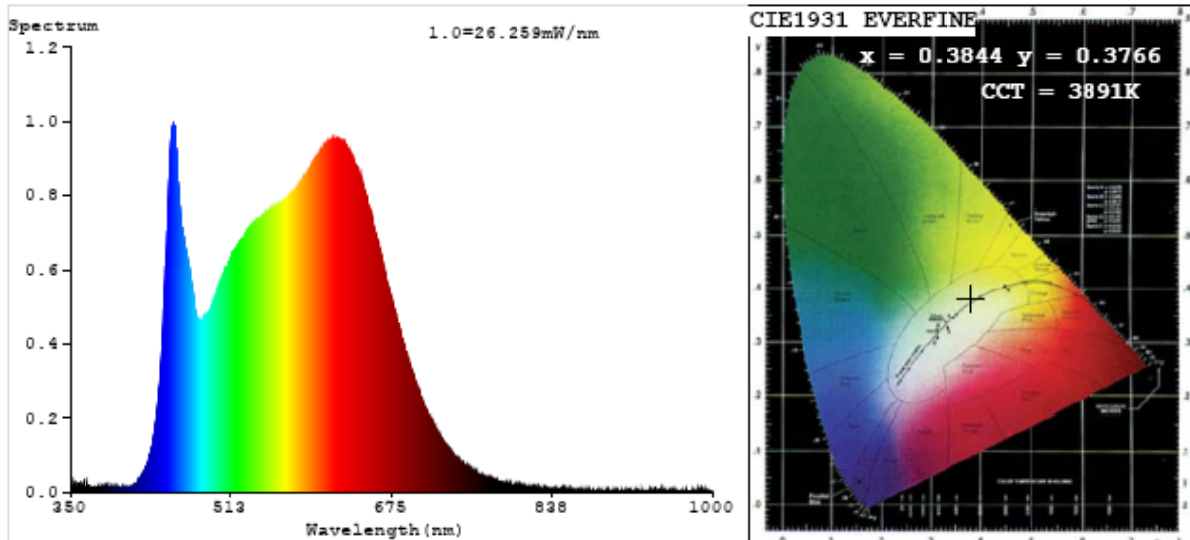
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3891
Duv	0.0012
Chromaticity (x, y)	x=0.3844 y=0.3766
Chromaticity (u', v')	u'=0.2278 v'=0.5021
Color Rendering Index (CRI)	95.6
R9	81
Total Luminous (lm)	1459.0
Luminous Efficacy (lm/W)	91.16

Special Color Rendering Indices			
R1	98	R9	81
R2	99	R10	99
R3	99	R11	97
R4	95	R12	75
R5	96	R13	100
R6	96	R14	100
R7	93	R15	95
R8	90	--	--

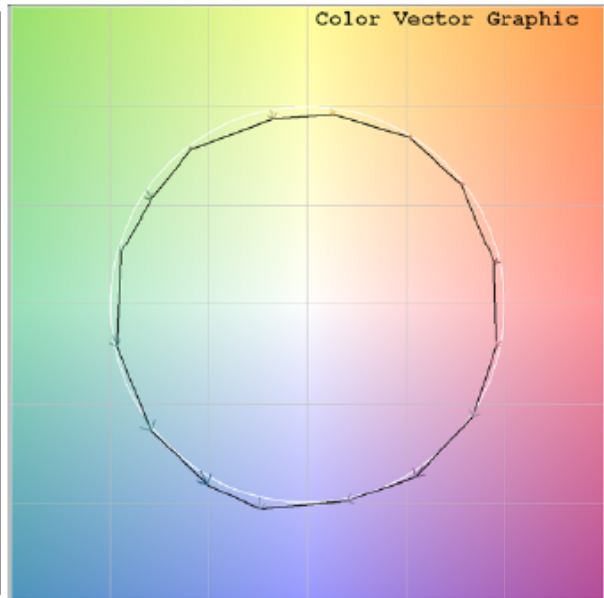
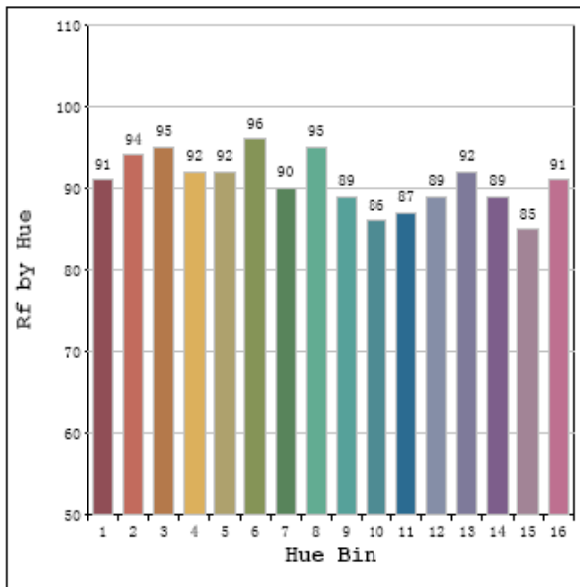
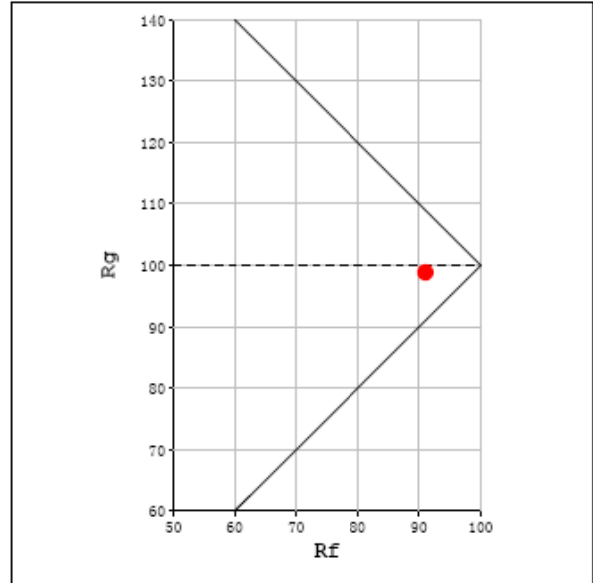
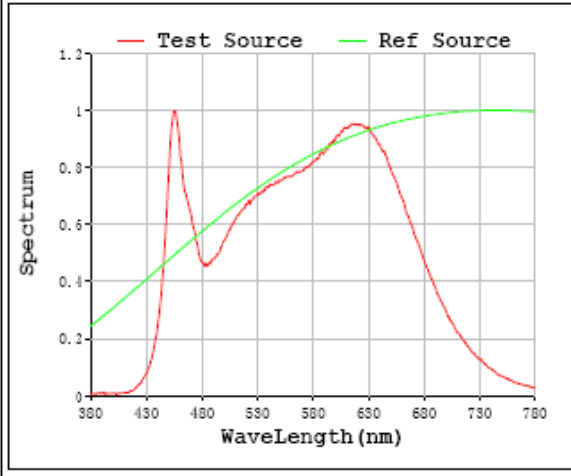
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1453.0
Luminous Efficacy (lm/W)	89.66

Spectral Power Distribution & Chromaticity Diagram



TM30

Rf: 91 CCT: 3891 K u': 0.2278
 Rg: 99 Duv: -0.0012 v': 0.5021



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2021-10-12	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0099(CRVFAS-11R-16-9CCT-UNV-W/MVS)		5000K

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202110120040	120.0	60	0.137	16.33	0.994

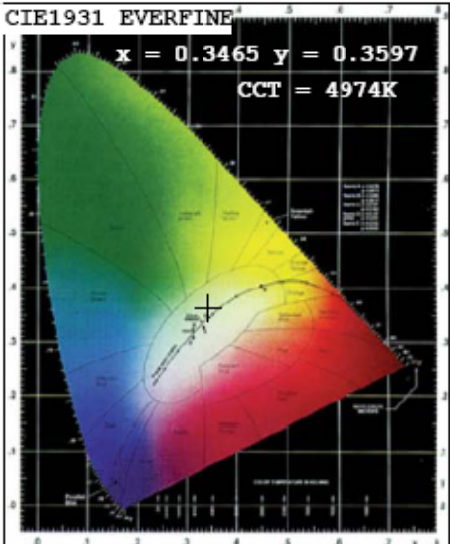
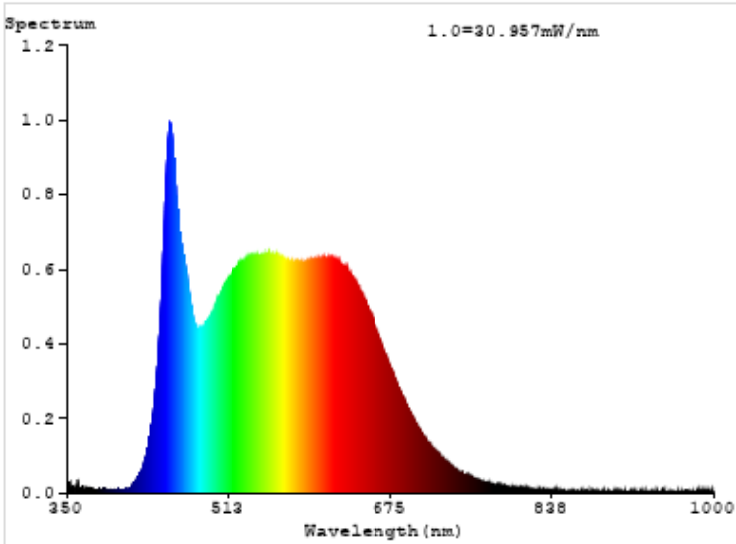
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4974
Duv	0.0034
Chromaticity (x, y)	x=0.3465 y=0.3597
Chromaticity (u', v')	u'=0.2093 v'=0.4888
Color Rendering Index (CRI)	93.8
R9	74
Total Luminous (lm)	1365.0
Luminous Efficacy (lm/W)	83.57

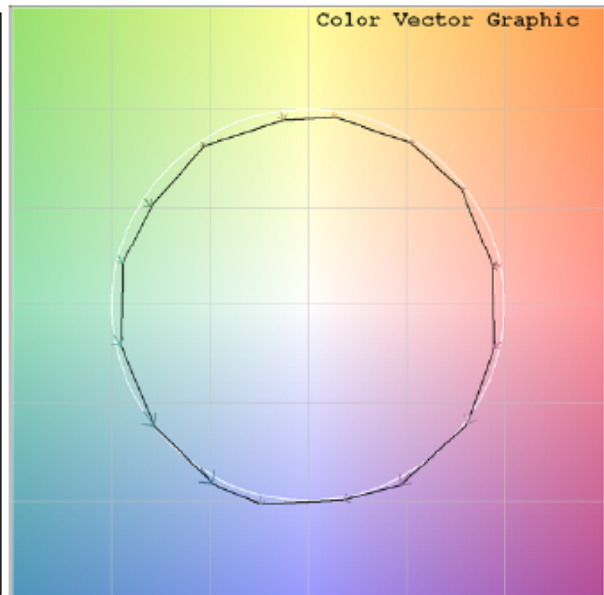
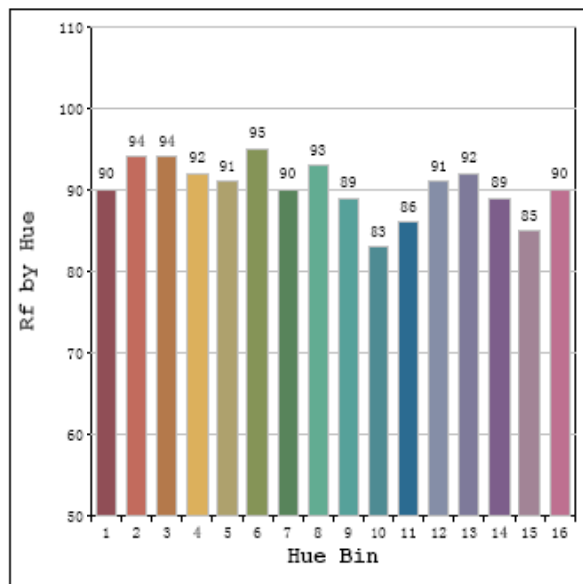
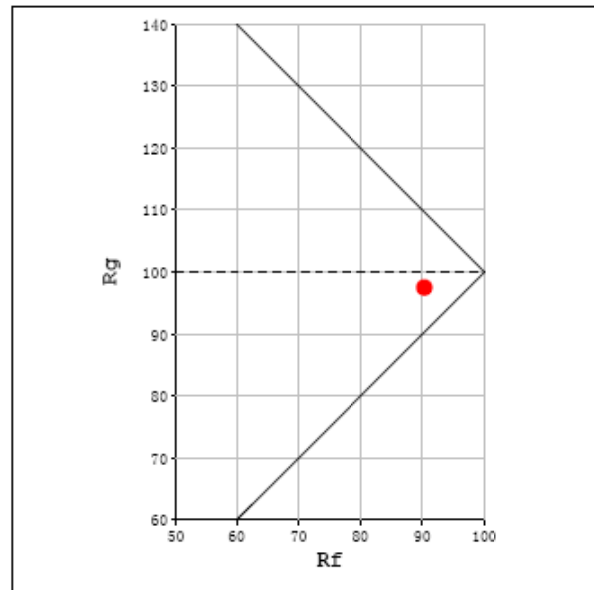
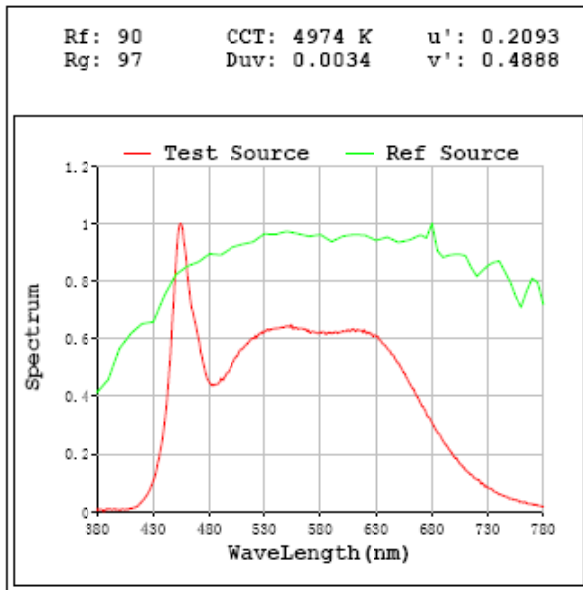
Special Color Rendering Indices			
R1	95	R9	74
R2	98	R10	93
R3	99	R11	92
R4	90	R12	68
R5	92	R13	96
R6	95	R14	99
R7	93	R15	91
R8	89	--	--

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	1363.0
Luminous Efficacy (lm/W)	82.34

Spectral Power Distribution & Chromaticity Diagram

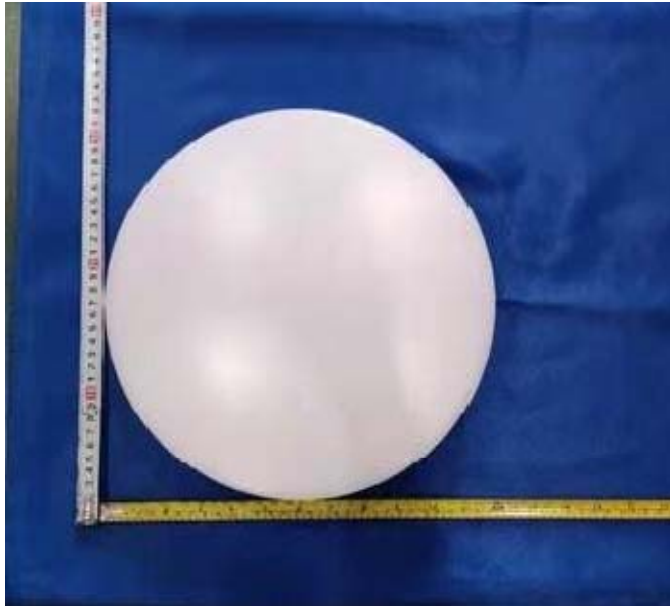


TM30



Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
DLS0099(CRVFAS-11R-16-9CCT-UNV-W/MVS)	2700K setting	120.0	1283.5	16.40	78.26
		277.0	1280.0	16.61	77.06
	3000K setting	120.0	1412.0	16.19	87.24
		277.0	1407.0	16.39	85.84
	3500K setting	120.0	1458.0	15.82	92.13
		277.0	1452.0	16.04	90.53
	4000K setting	120.0	1459.0	16.01	91.16
		277.0	1453.0	16.20	89.66
	5000K setting	120.0	1365.0	16.33	83.57
		277.0	1363.0	16.55	82.34

3. Product Photo



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