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): DLC0036(C3R5.5/7/8.59FAUNVW)

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Downlights
Report Date:	2020-09-10

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	5.5 W /7.0 W /8.5W
Rated Initial Lamp Lumen	430 lm /550 lm /650 lm
Declared CCT	3000K/3500K/4000K/5000K

1.2 Test Specifications:

Test item	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	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 25ºC ±1ºC. 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 25ºC ±1ºC. 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	2020-09-10	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0036(C3R5.5/7/8.59FAUNVW)	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009090002	120.0	60	0.068	8.21	0.998

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2907
Duv	0.0006
Chromaticity (x, y)	x=0.4427 y=0.4044
Chromaticity (u', v')	u'=0.2542 v'=0.5224
Color Rendering Index (CRI)	92.1
R9	54

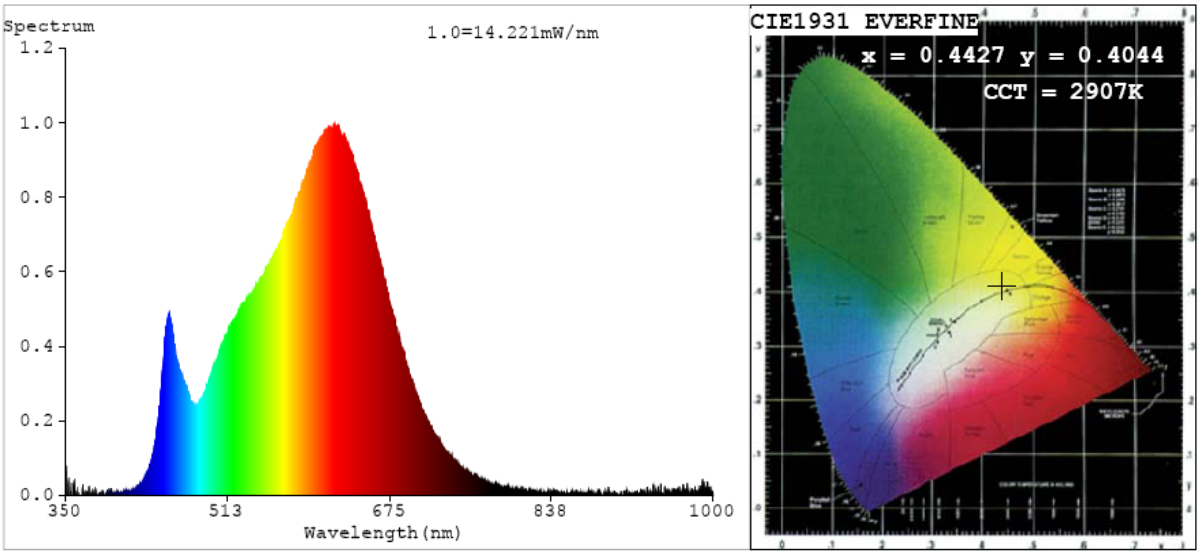
Special Color Rendering Indices			
R1	93	R9	54
R2	97	R10	93
R3	99	R11	93
R4	91	R12	82
R5	92	R13	94
R6	96	R14	100
R7	90	R15	88
R8	79	--	--

Photometric Measurement – Goniophotometer Method:

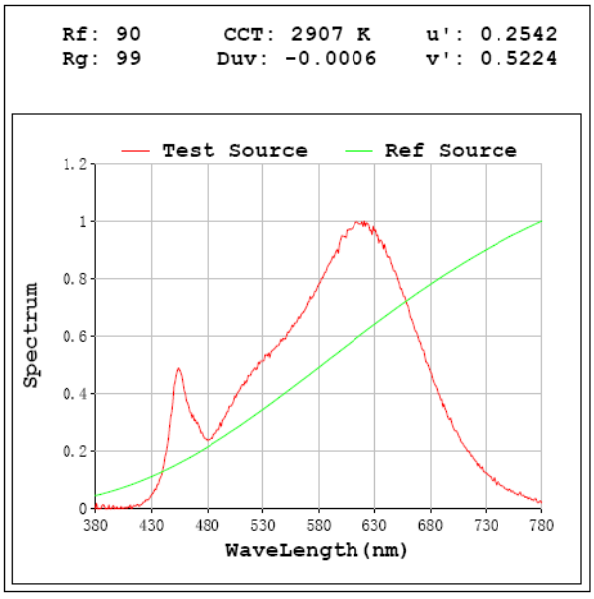
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	684.05
Luminous Efficacy (lm/W)	83.32
Beam Angle (°)	66.5
Center Beam Candle Power (cd)	478.3

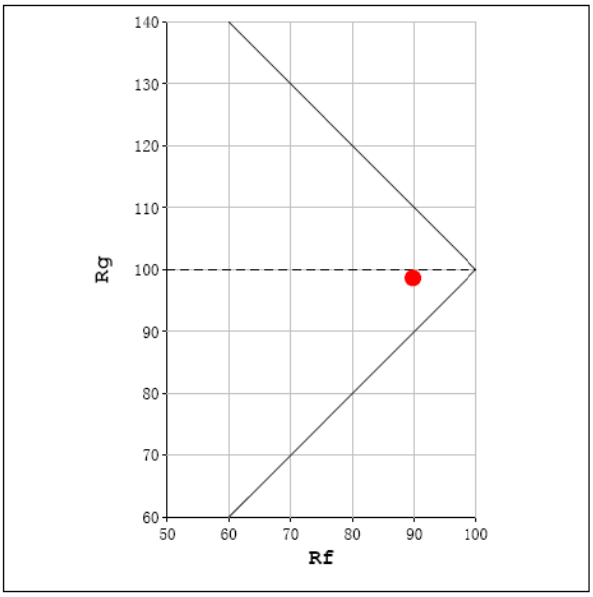
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	680.4
Luminous Efficacy (lm/W)	80.14

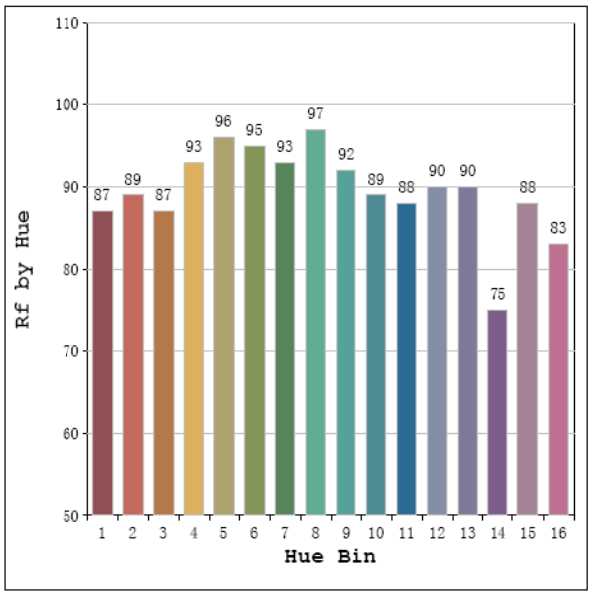
Spectral Power Distribution & Chromaticity Diagram

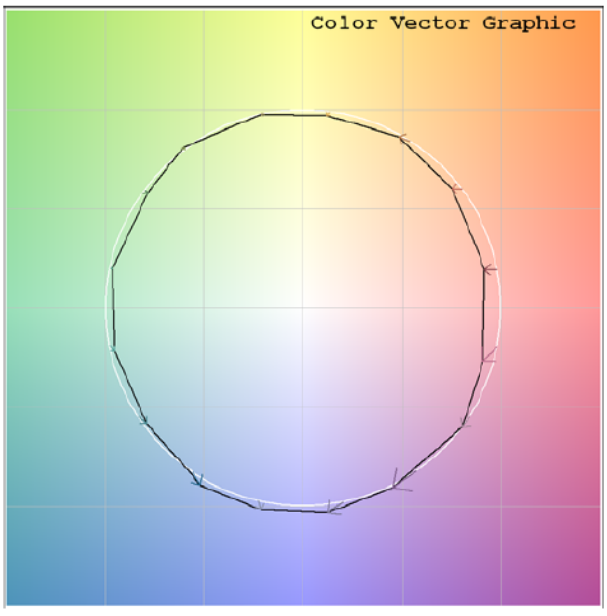


T30







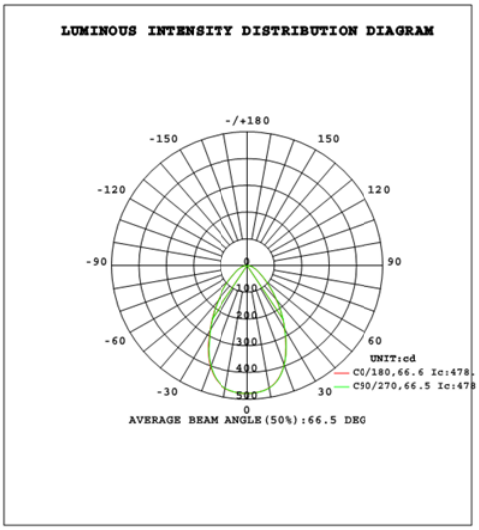


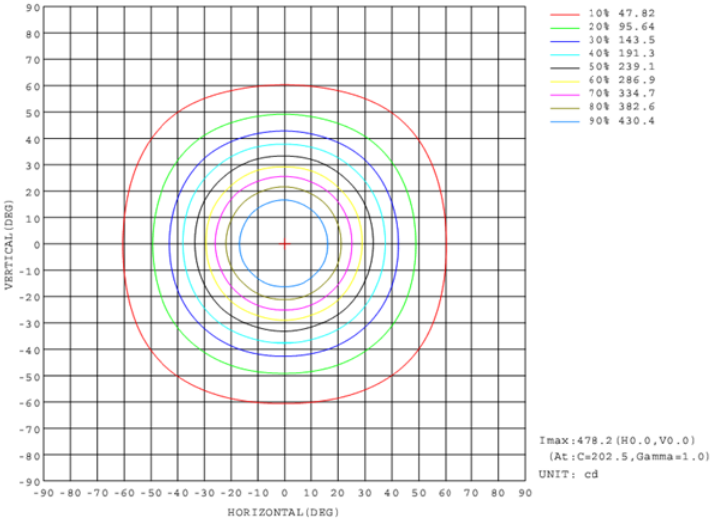
Zonal Lumen Tabulation

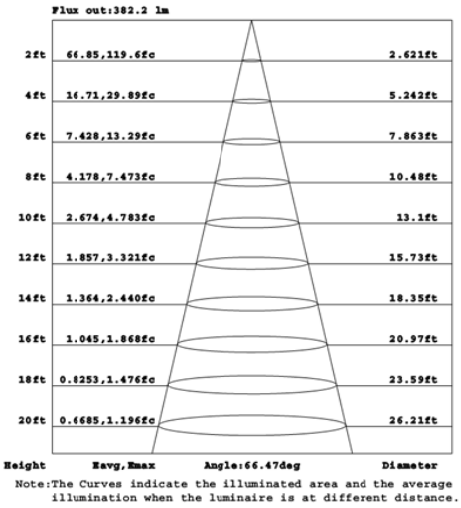
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	323.3	47.3%
0-40	460.9	67.4%
0-60	617.5	90.3%
60-90	66.6	9.7%
70-100	29.3	4.3%
90-120	0.0	0.0%
0-90	684.1	100.0%
90-180	0.0	0.0%
0-180	684.1	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	45.1	6.6%	90-100	0.0	0.0%
10-20	123.1	18.0%	100-110	0.0	0.0%
20-30	155.1	22.7%	110-120	0.0	0.0%
30-40	137.6	20.1%	120-130	0.0	0.0%
40-50	97.1	14.2%	130-140	0.0	0.0%
50-60	59.5	8.7%	140-150	0.0	0.0%
60-70	37.3	5.4%	150-160	0.0	0.0%
70-80	20.9	3.1%	160-170	0.0	0.0%
80-90	8.4	1.2%	170-180	0.0	0.0%

Photometric Data







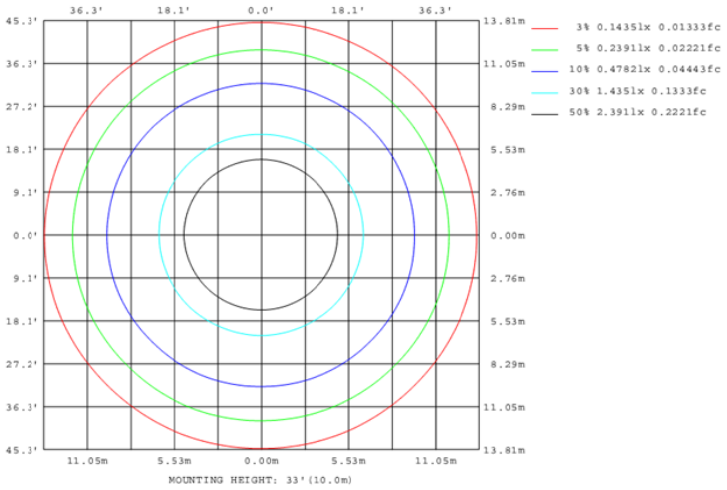


Table--1

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	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478	478			
5	475	475	475	475	475	476	476	476	476	476	476	476	476	475	475	475			
10	464	465	464	465	465	466	466	467	467	466	467	466	466	465	465	464			
15	439	440	440	441	440	442	442	444	444	443	443	442	442	440	440	439			
20	395	396	394	397	396	398	397	402	404	402	401	400	400	397	397	395			
25	336	338	335	338	337	340	340	344	347	346	346	342	343	339	340	338			
30	274	272	274	272	276	275	279	278	280	283	280	281	277	278	274	276			
35	218	216	218	217	220	219	222	222	223	226	223	224	220	221	218	219			
40	165	166	165	168	169	169	171	171	172	172	171	170	169	168	167	165			
45	122	124	123	125	125	126	126	127	127	126	127	125	125	123	124	122			
50	88.8	89.8	89.8	91.3	91.0	92.2	91.5	92.4	91.9	90.9	91.2	90.2	90.2	88.9	89.4	88.6			
55	64.1	65.0	65.0	66.1	65.9	66.6	66.2	66.7	66.1	65.2	65.4	64.7	64.9	64.0	64.5	63.9			
60	48.3	48.9	49.0	49.5	49.4	49.9	49.6	49.7	49.1	48.6	48.8	48.3	48.5	48.3	48.5	48.0			
65	36.8	37.3	37.3	37.8	37.7	38.1	37.8	38.0	37.7	37.2	37.4	36.9	37.2	36.9	37.1	36.7			
70	27.0	27.5	27.4	27.9	27.8	28.1	27.9	28.1	28.1	27.7	27.7	27.4	27.6	27.3	27.4	27.2			
75	19.1	19.3	19.3	19.6	19.6	19.9	19.8	19.9	20.1	19.8	19.8	19.5	19.6	19.4	19.5	19.3			
80	12.4	12.7	12.6	12.9	12.8	13.1	13.0	13.1	13.5	13.2	13.3	13.0	13.1	12.9	13.0	12.8			
85	6.99	7.15	7.14	7.30	7.29	7.49	7.44	7.55	8.06	7.87	7.85	7.66	7.70	7.54	7.62	7.55			
90	3.48	3.47	3.49	3.48	3.49	3.50	3.51	3.50	4.05	4.05	4.04	4.04	4.04	4.04	4.04	4.04			

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2020-09-10	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0036(C3R5.5/7/8.59FAUNVW)	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009090002	120.0	60	0.066	7.92	0.997

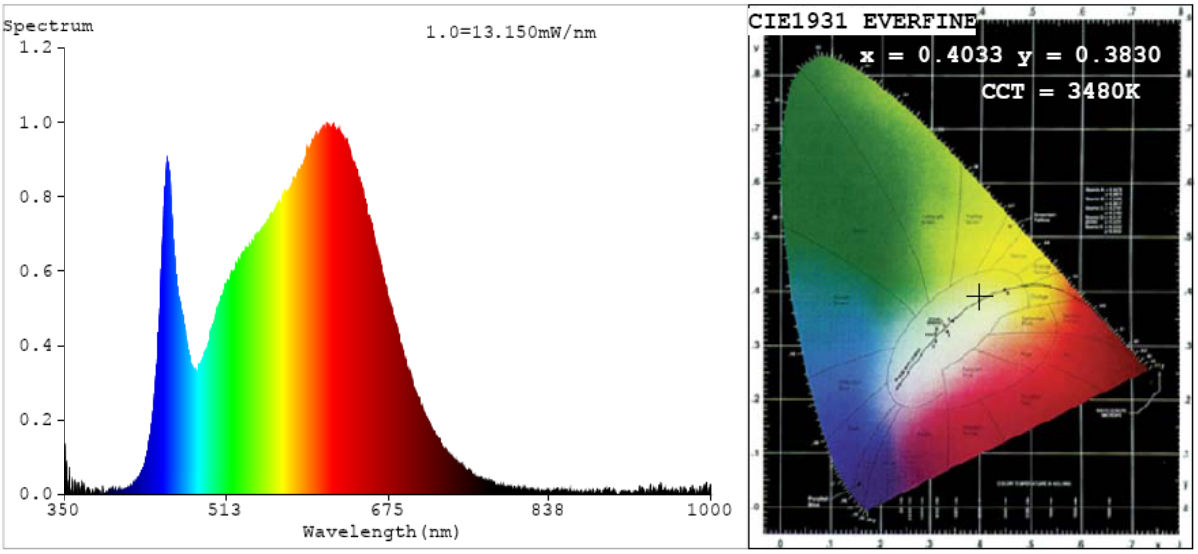
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3480
Duv	0.0030
Chromaticity (x, y)	x=0.4033 y=0.3830
Chromaticity (u', v')	u'=0.2376 v'=0.5077
Color Rendering Index (CRI)	94.1
R9	68
Total Luminous (lm)	713.3
Luminous Efficacy (lm/W)	90.09

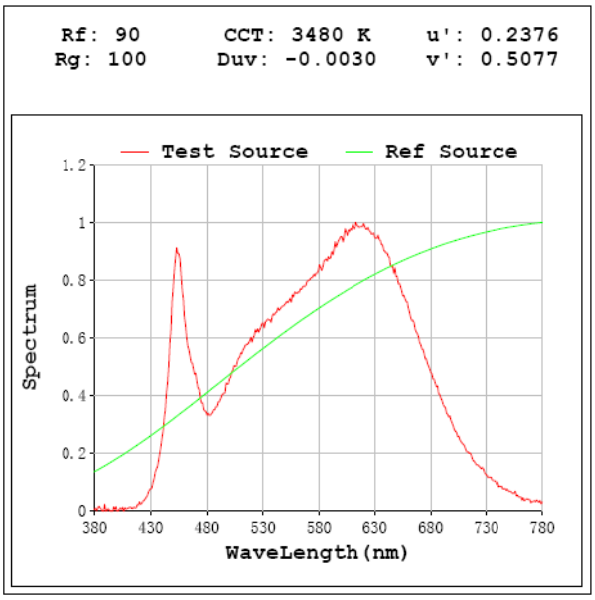
Special Color Rendering Indices			
R1	95	R9	68
R2	98	R10	94
R3	98	R11	94
R4	94	R12	77
R5	95	R13	97
R6	95	R14	99
R7	92	R15	93
R8	85	--	--

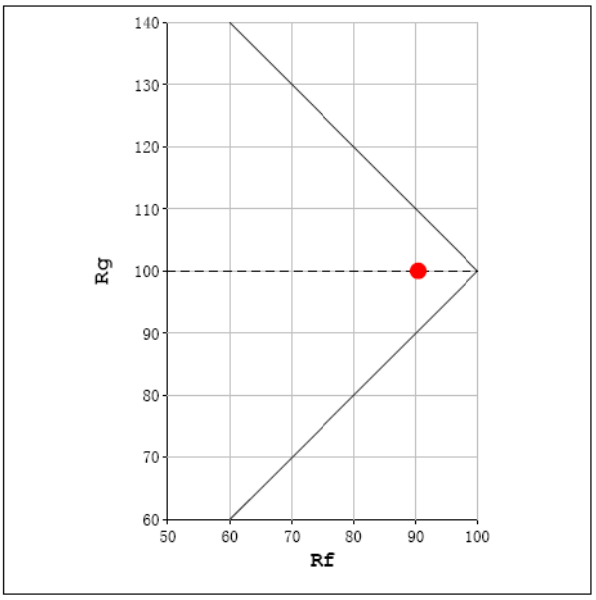
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	714.2
Luminous Efficacy (lm/W)	87.00

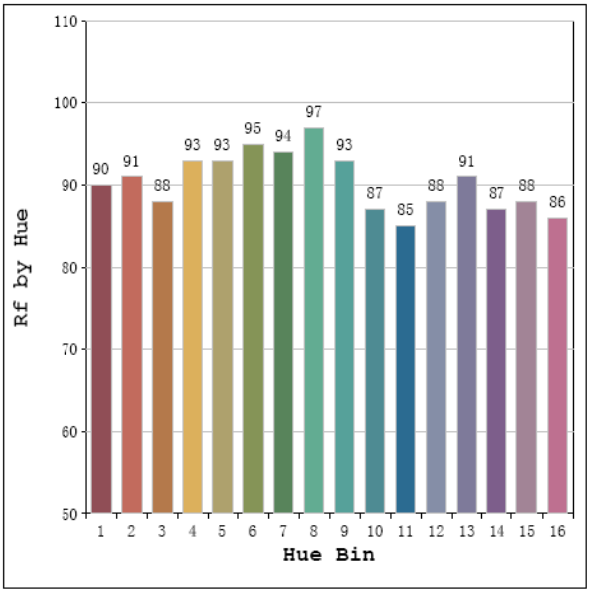
Spectral Power Distribution & Chromaticity Diagram

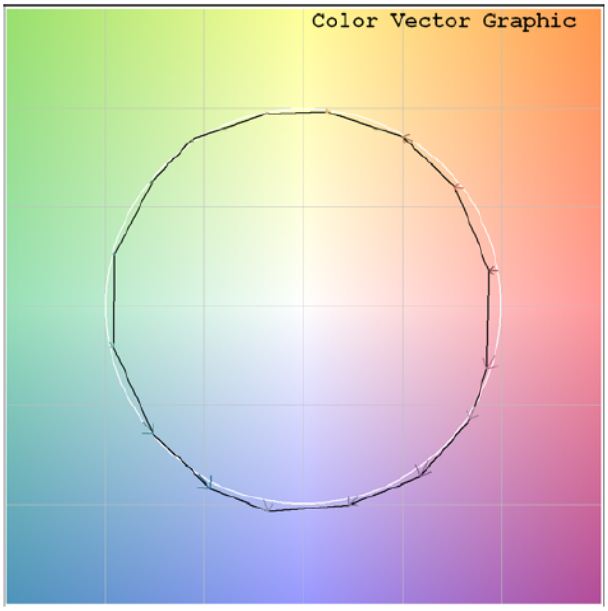


T30


Rf: 90
Rg: 100
CCT: 3480 K
Duv: -0.0030
u': 0.2376
v': 0.5077
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
Hue Bin
90 91 88 93 93 95 94 97 93 87 85 88 91 87 88 86


Color Vector Graphic

2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2020-09-10	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0036(C3R5.5/7/8.59FAUNVW)	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009090002	120.0	60	0.066	7.93	0.997

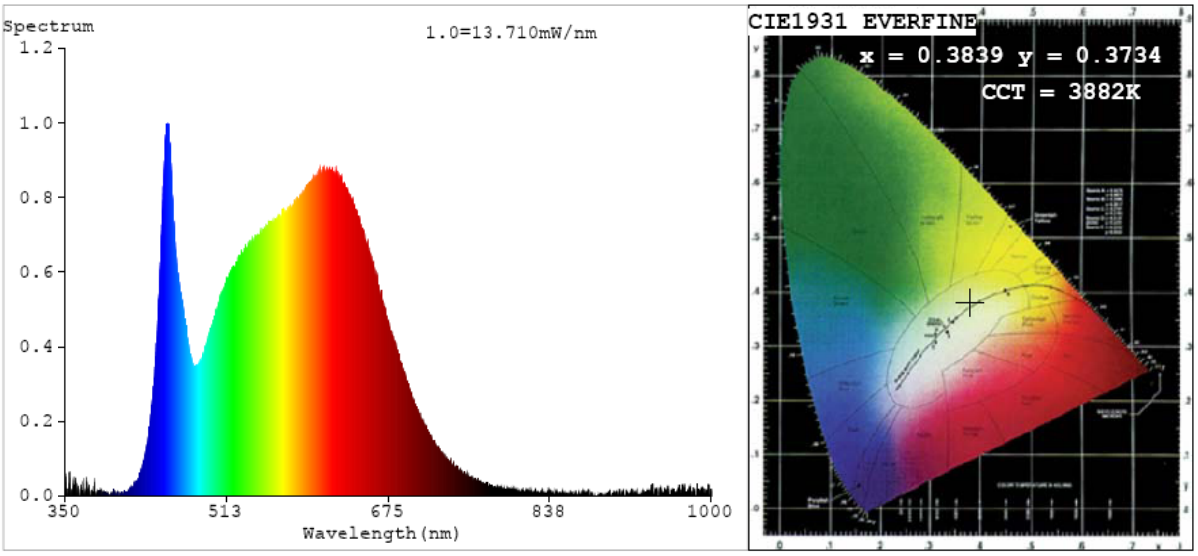
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3882
Duv	0.0025
Chromaticity (x, y)	x=0.3839 y=0.3734
Chromaticity (u', v')	u'=0.2287 v'=0.5006
Color Rendering Index (CRI)	94.1
R9	70
Total Luminous (lm)	711.8
Luminous Efficacy (lm/W)	89.78

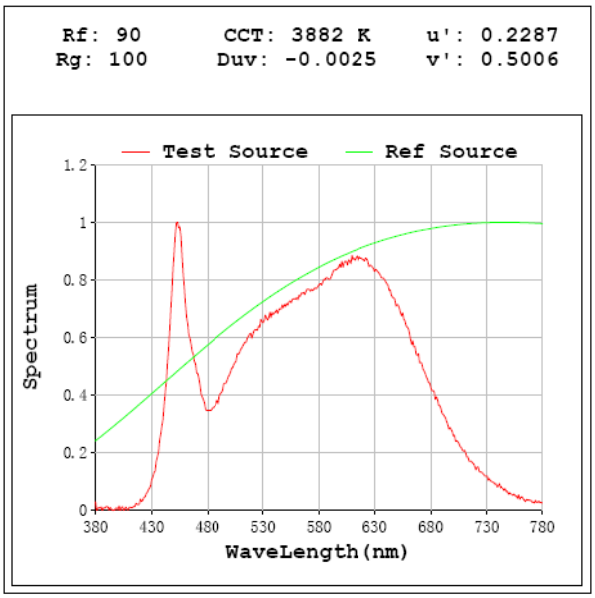
Special Color Rendering Indices			
R1	95	R9	70
R2	97	R10	92
R3	97	R11	94
R4	94	R12	74
R5	94	R13	96
R6	94	R14	98
R7	94	R15	93
R8	88	--	--

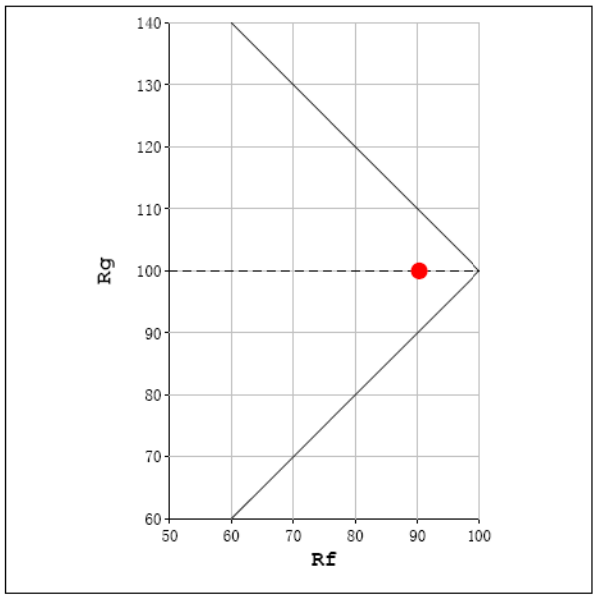
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	711.8
Luminous Efficacy (lm/W)	86.43

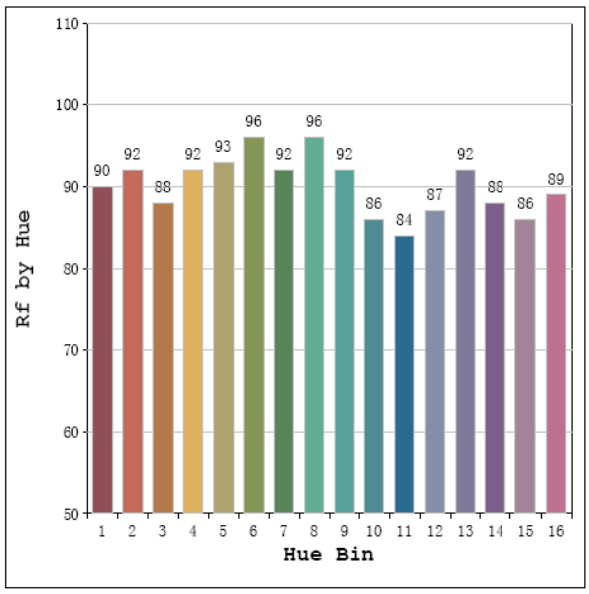
Spectral Power Distribution & Chromaticity Diagram

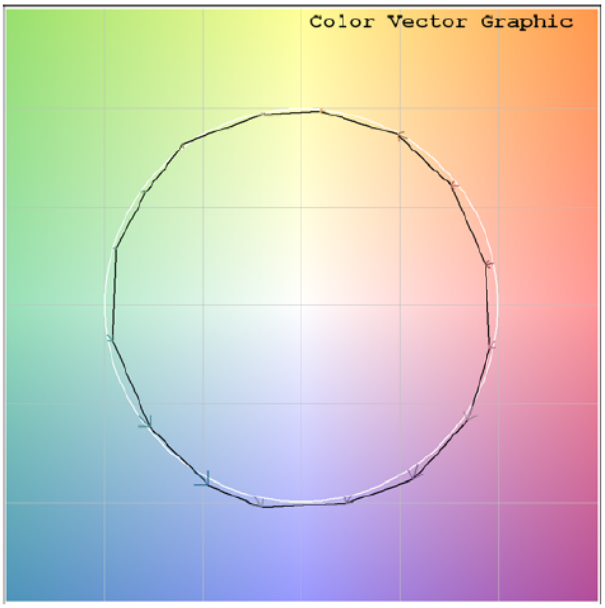


T30


Rf: 90
CCT: 3882 K
u': 0.2287
Rg: 100
Duv: -0.0025
v': 0.5006
Test Source
Ref Source
Spectrum
WaveLength(nm)


Rg
Rf


Rf by Hue
Hue Bin
90
92
88
92
93
96
92
96
92
86
84
87
92
88
86
89


Color Vector Graphic

2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2020-09-10	Test Ambient:	25.3 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLC0036(C3R5.5/7/8.59FAUNVW)	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202009090002	120.0	60	0.068	8.20	0.998

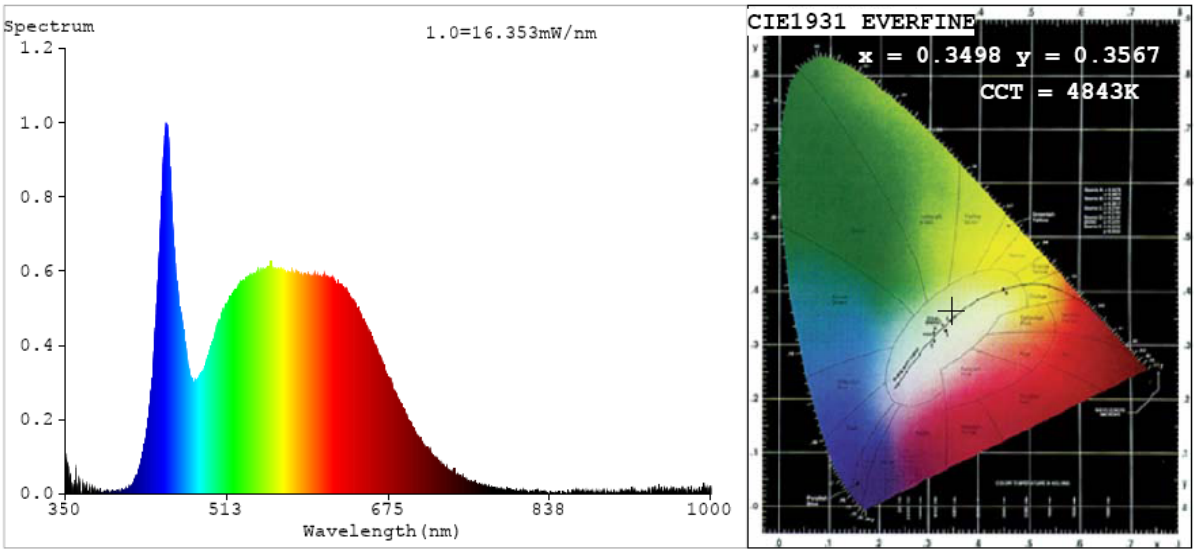
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4843
Duv	0.0007
Chromaticity (x, y)	x=0.3498 y=0.3567
Chromaticity (u', v')	u'=0.2126 v'=0.4878
Color Rendering Index (CRI)	91.7
R9	66
Total Luminous (lm)	672.1
Luminous Efficacy (lm/W)	81.98

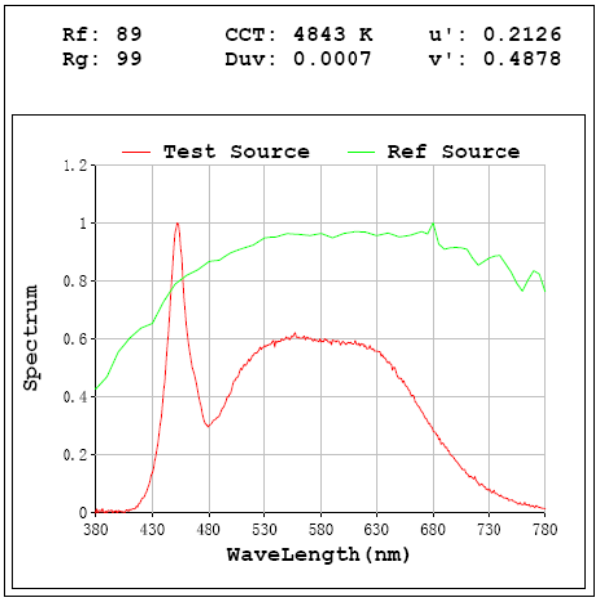
Special Color Rendering Indices			
R1	92	R9	66
R2	94	R10	84
R3	93	R11	91
R4	91	R12	66
R5	90	R13	92
R6	89	R14	96
R7	95	R15	90
R8	88	--	--

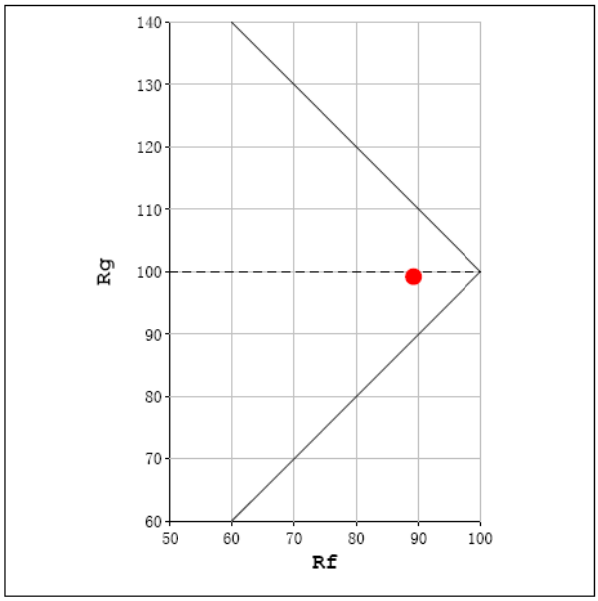
Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	673.2
Luminous Efficacy (lm/W)	79.67

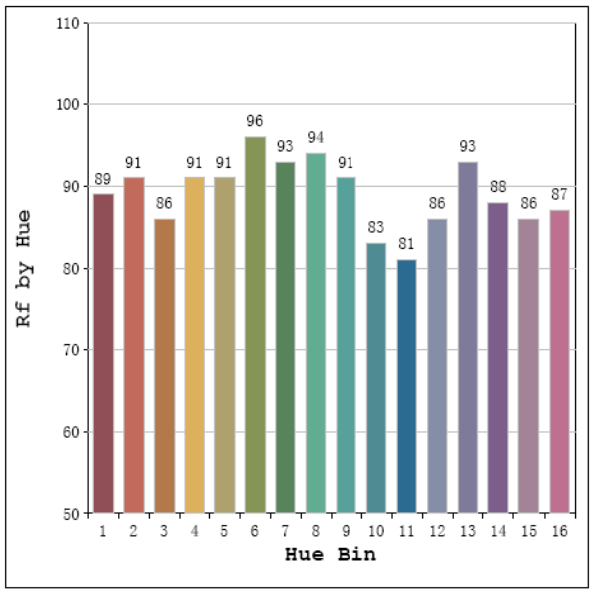
Spectral Power Distribution & Chromaticity Diagram

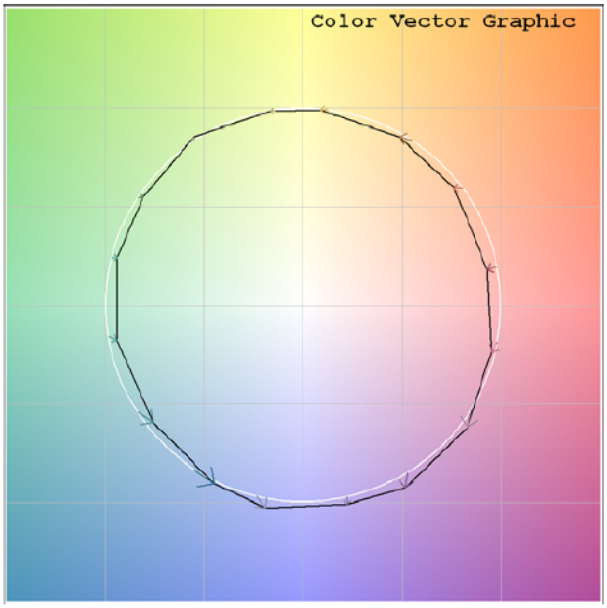


T30



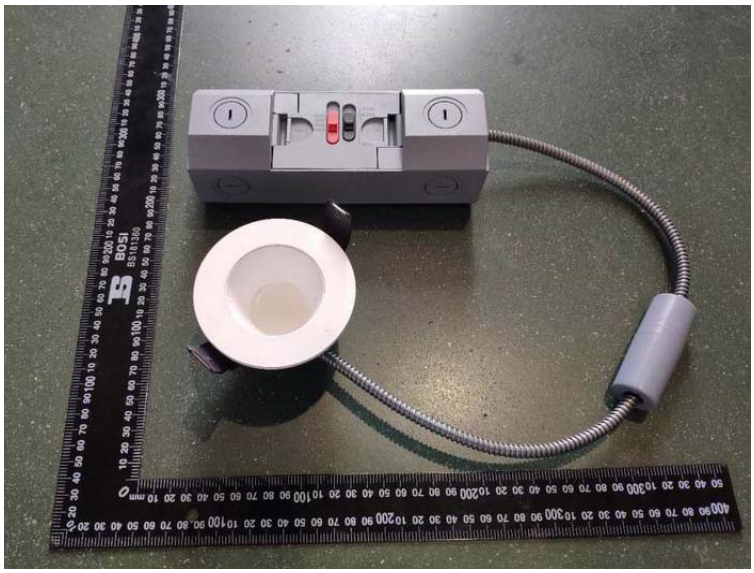


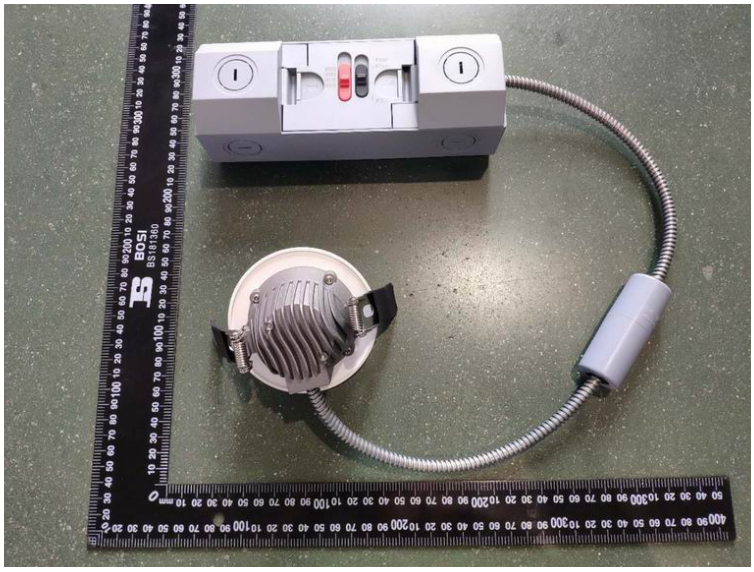




Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
DLC0036(C3R5.5/7/8.59FAUNVW)	5.5W 3000K setting	120.0	442.4	5.23	84.62
		277.0	441.7	5.44	81.17
	7.0W 3000K setting	120.0	567.7	6.75	84.11
		277.0	569.8	6.89	82.70
	8.5W 3000K setting	120.0	680.2	8.21	82.87
		277.0	680.4	8.49	80.14
	8.5W 3500K setting	120.0	713.3	7.92	90.09
		277.0	714.2	8.21	87.00
	8.5W 4000K setting	120.0	711.8	7.93	89.78
		277.0	711.8	8.24	86.43
	8.5W 5000K setting	120.0	672.1	8.20	81.98
		277.0	673.2	8.45	79.67

3. Product Photo





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