

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):
DLS0176(SUMO-R-9)

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

**Type of
Luminaire:** Downlights

Report Date: 2023-07-27

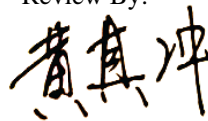
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	18.0 W
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	2023-07-27	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0176(SUMO-R-9)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202307270003	120.0	60	0.158	17.50	0.922

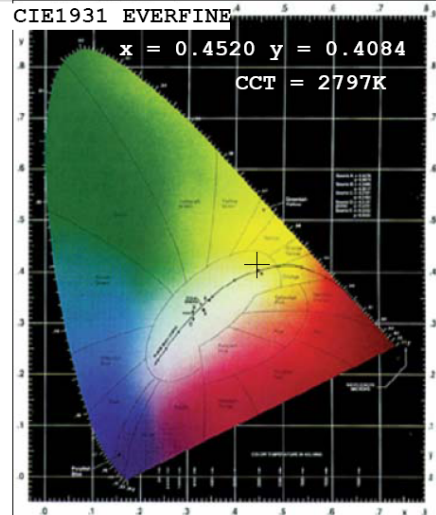
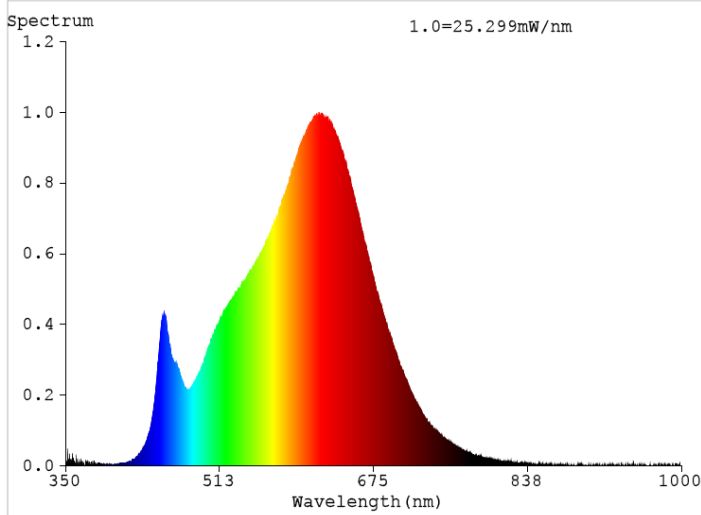
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	54
Frequency (Hz)	60	R2	97	R10	93
CCT (K)	2797	R3	98	R11	93
Duv	-0.0001	R4	92	R12	83
Chromaticity (x, y)	x=0.4520 y=0.4084	R5	93	R13	94
Chromaticity (u', v')	u'=0.2584 v'=0.5253	R6	97	R14	100
Color Rendering Index (CRI)	92.2	R7	90	R15	87
R9	54	R8	78	--	--

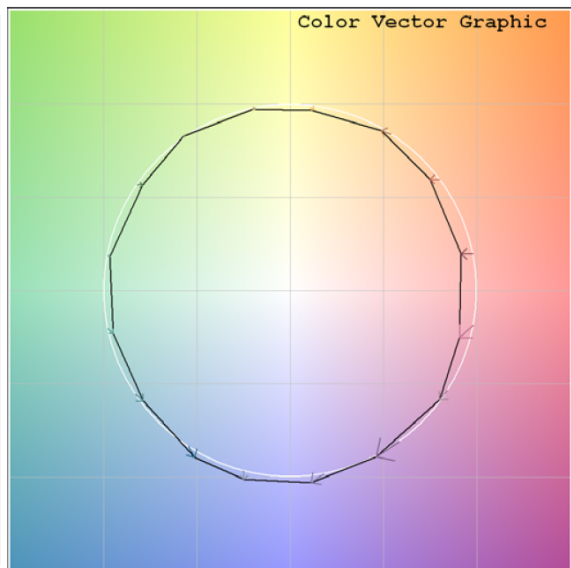
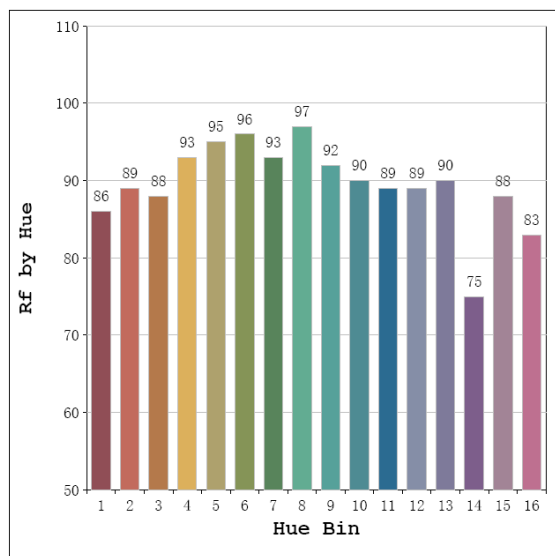
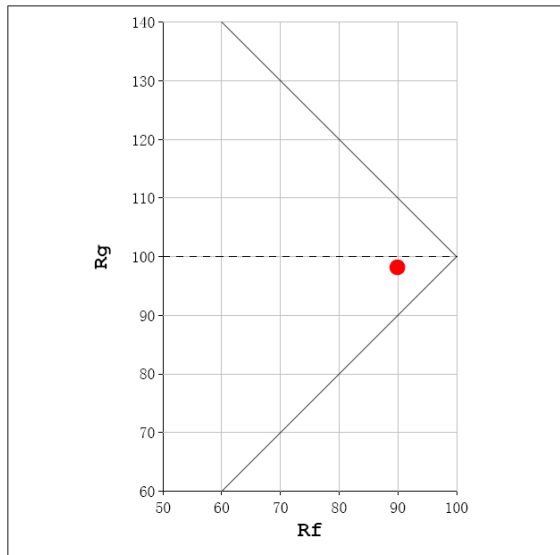
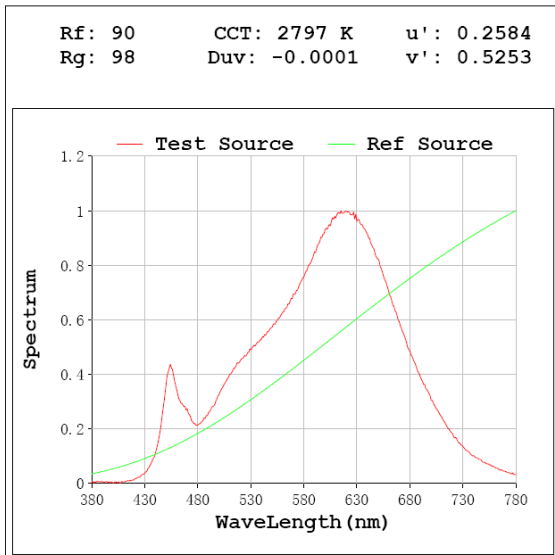
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1181.7
Luminous Efficacy (lm/W)	67.52
Beam Angle (°)	112.3
Center Beam Candle Power (cd)	412.1

Spectral Power Distribution & Chromaticity Diagram



TM30

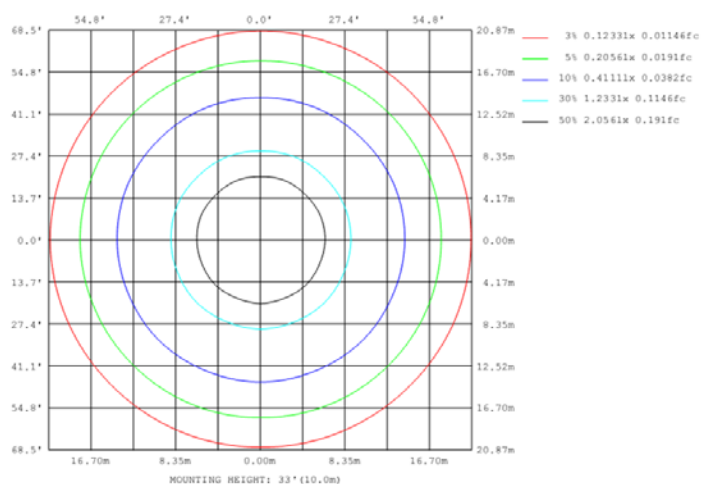
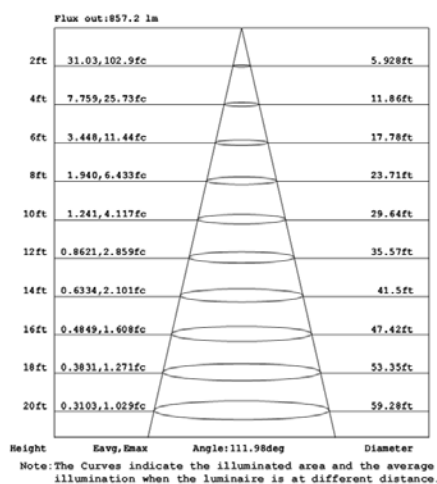
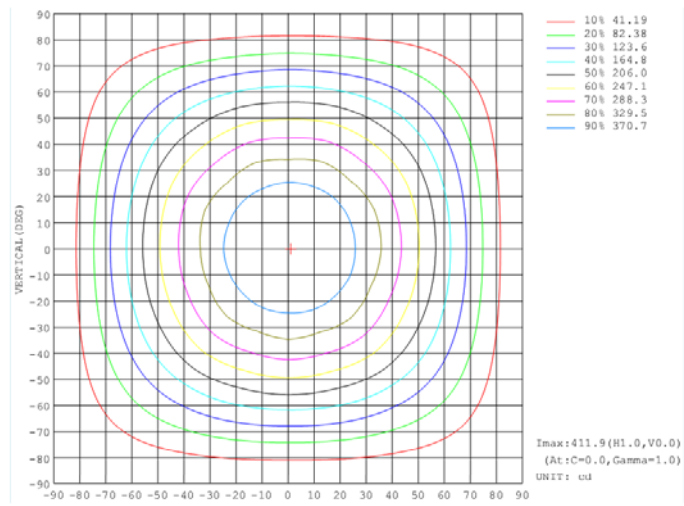
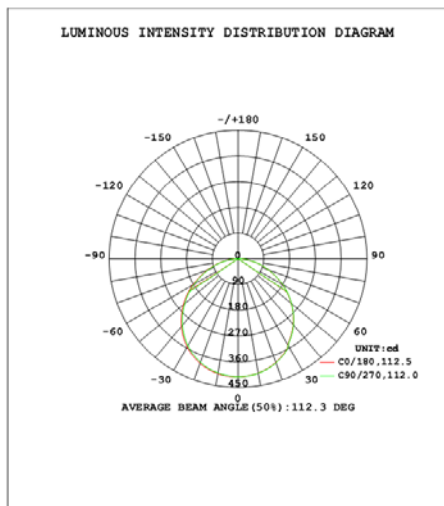


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	322.1	27.3%
0-40	527.0	44.6%
0-60	929.1	78.6%
60-90	252.6	21.4%
70-100	108.8	9.2%
90-120	0.0	0.0%
0-90	1181.7	100.0%
90-180	0.0	0.0%
0-180	1181.7	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	39.0	3.3%	90-100	0.0	0.0%
10-20	112.2	9.5%	100-110	0.0	0.0%
20-30	170.9	14.5%	110-120	0.0	0.0%
30-40	204.9	17.3%	120-130	0.0	0.0%
40-50	211.8	17.9%	130-140	0.0	0.0%
50-60	190.3	16.1%	140-150	0.0	0.0%
60-70	143.8	12.2%	150-160	0.0	0.0%
70-80	84.3	7.1%	160-170	0.0	0.0%
80-90	24.5	2.1%	170-180	0.0	0.0%

Photometric Data



Test date	2023-07-27	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0176(SUMO-R-9)	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202307270003	120.0	60	0.158	17.50	0.922

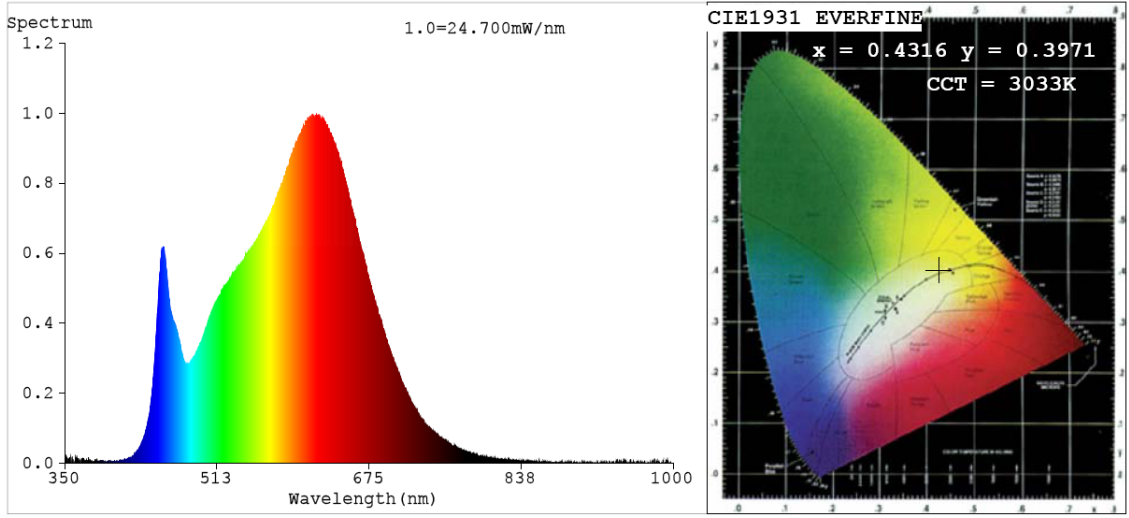
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	61
Frequency (Hz)	60	R2	99	R10	97
CCT (K)	3033	R3	97	R11	94
Duv	-0.0021	R4	93	R12	81
Chromaticity (x, y)	x=0.4316 y=0.3971	R5	94	R13	96
Chromaticity (u', v')	u'=0.2502 v'=0.5178	R6	96	R14	99
Color Rendering Index (CRI)	93.2	R7	90	R15	91
R9	61	R8	81	--	--

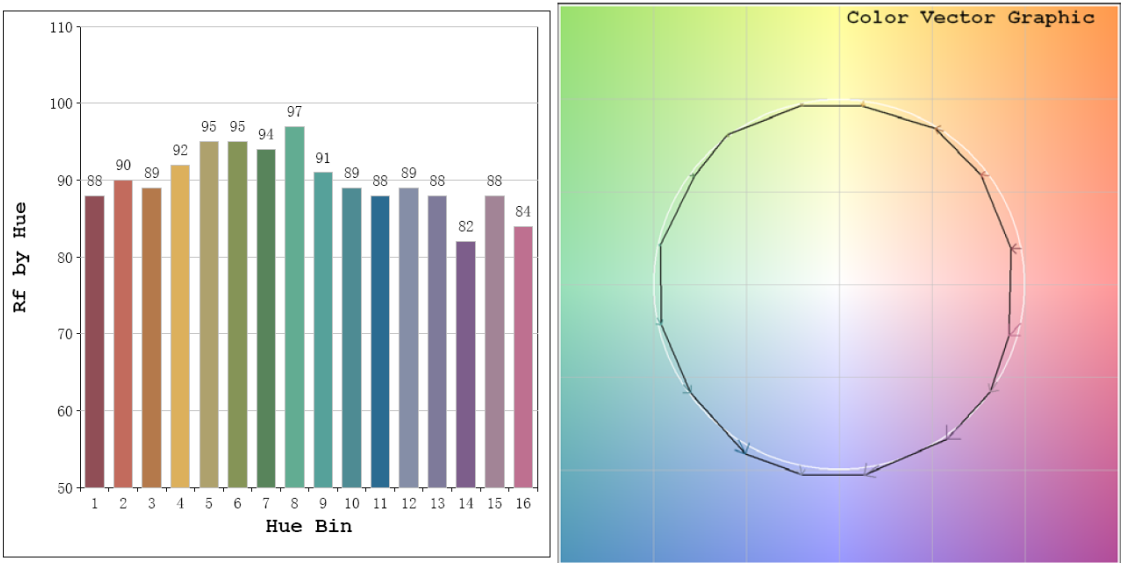
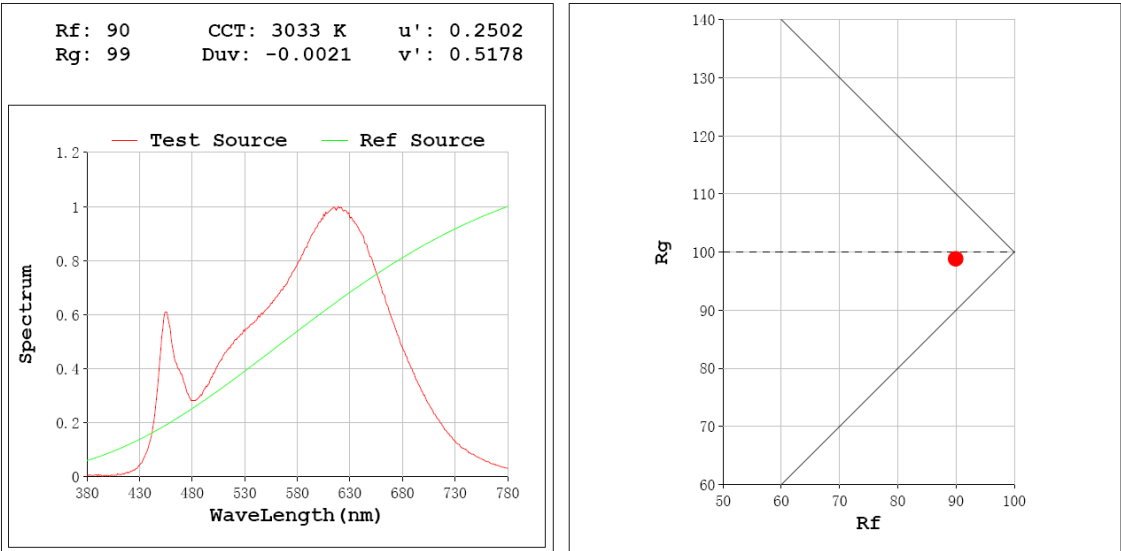
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1221.3
Luminous Efficacy (lm/W)	69.79
Beam Angle (°)	112.2
Center Beam Candle Power (cd)	425.4

Spectral Power Distribution & Chromaticity Diagram



TM30

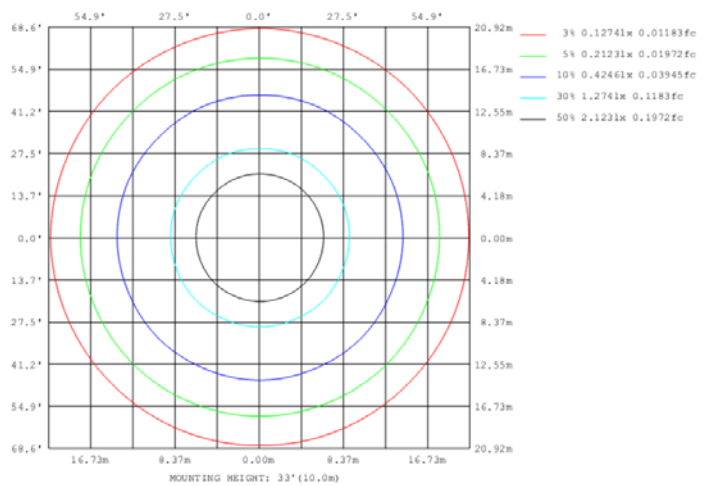
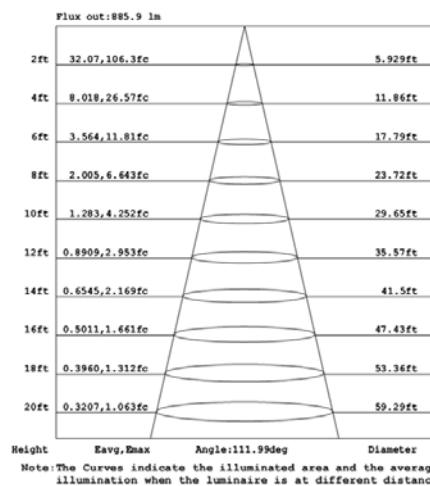
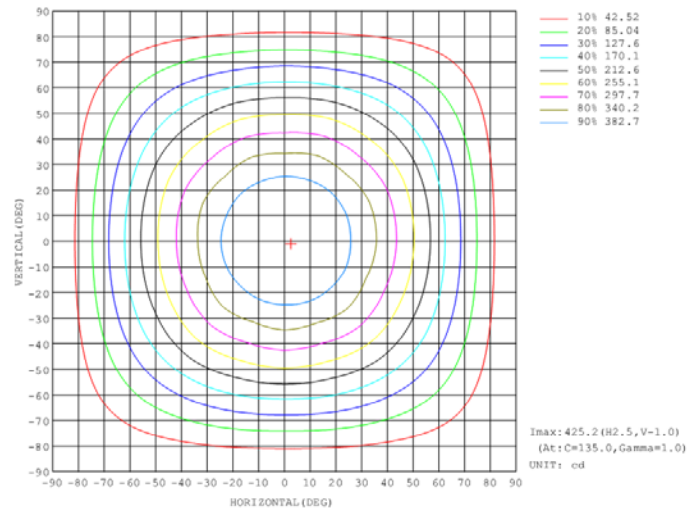
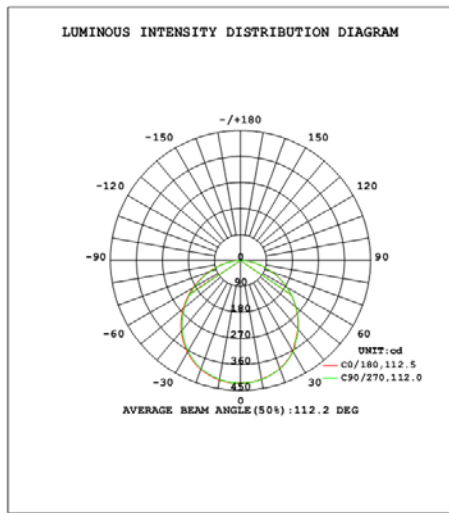


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	332.7	27.2%
0-40	544.7	44.6%
0-60	960.1	78.6%
60-90	261.2	21.4%
70-100	112.5	9.2%
90-120	0.0	0.0%
0-90	1221.3	100.0%
90-180	0.0	0.0%
0-180	1221.3	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	40.3	3.3%	90-100	0.0	0.0%
10-20	115.9	9.5%	100-110	0.0	0.0%
20-30	176.6	14.5%	110-120	0.0	0.0%
30-40	212.0	17.4%	120-130	0.0	0.0%
40-50	218.8	17.9%	130-140	0.0	0.0%
50-60	196.7	16.1%	140-150	0.0	0.0%
60-70	148.7	12.2%	150-160	0.0	0.0%
70-80	87.2	7.1%	160-170	0.0	0.0%
80-90	25.3	2.1%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-07-27	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0176(SUMO-R-9)	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202307270003	120.0	60	0.156	17.40	0.926

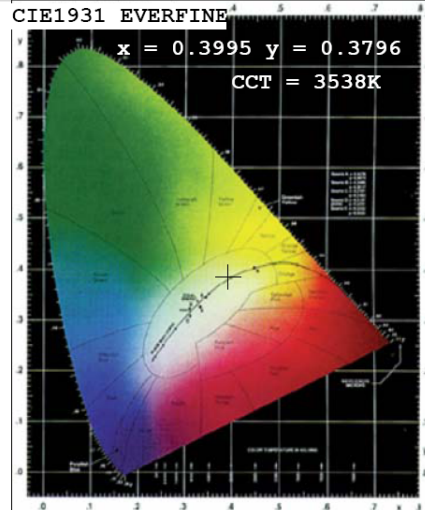
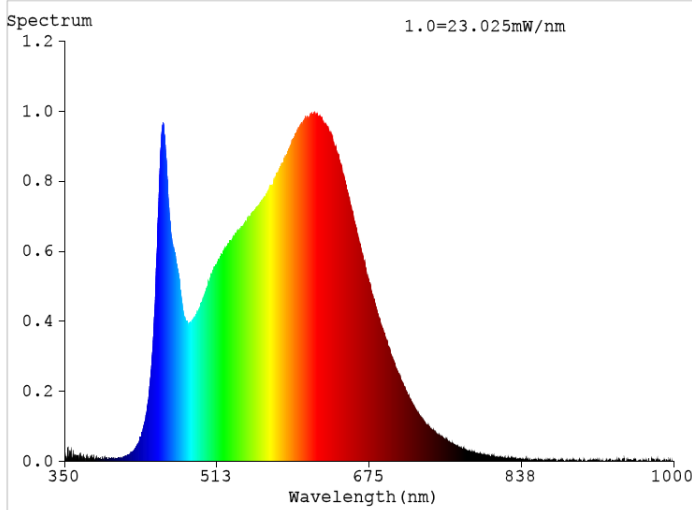
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	70
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3538	R3	97	R11	95
Duv	-0.0037	R4	93	R12	77
Chromaticity (x, y)	x=0.3995 y=0.3796	R5	95	R13	99
Chromaticity (u', v')	u'=0.2365 v'=0.5057	R6	95	R14	99
Color Rendering Index (CRI)	93.9	R7	91	R15	94
R9	70	R8	85	--	--

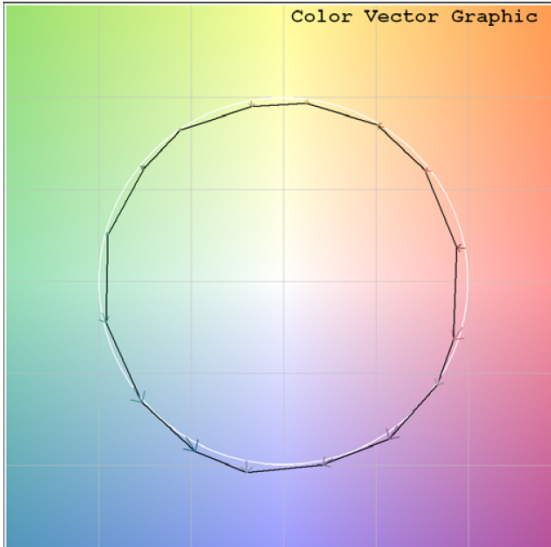
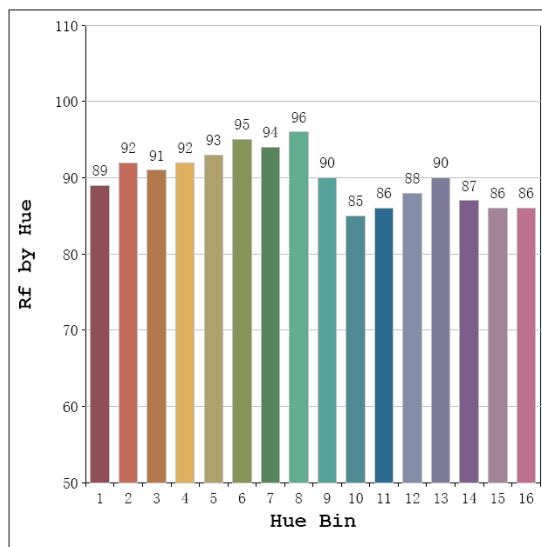
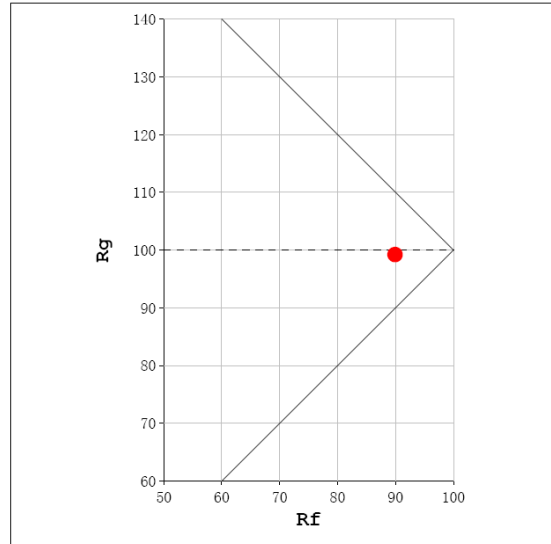
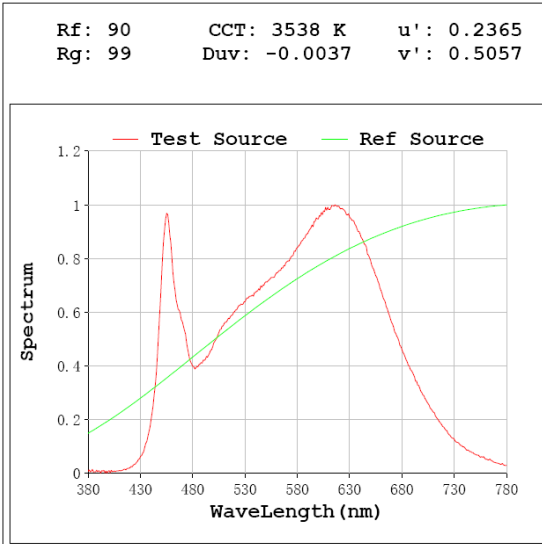
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1278.2
Luminous Efficacy (lm/W)	73.46
Beam Angle (°)	112.2
Center Beam Candle Power (cd)	445.3

Spectral Power Distribution & Chromaticity Diagram



TM30

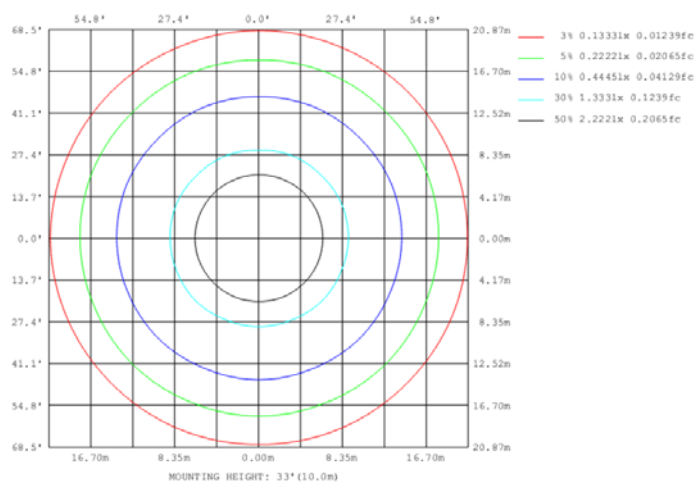
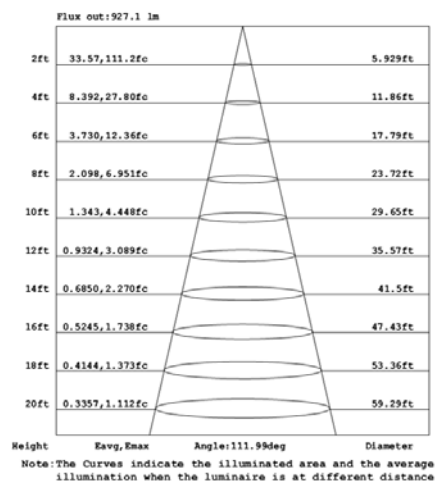
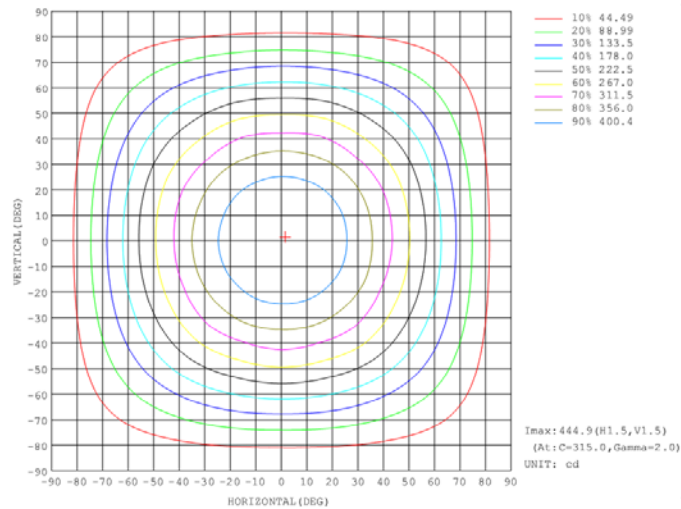
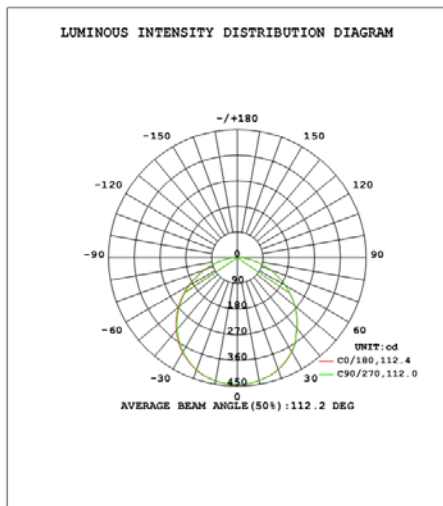


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	348.0	27.2%
0-40	570.4	44.6%
0-60	1004.8	78.6%
60-90	273.4	21.4%
70-100	117.6	9.2%
90-120	0.0	0.0%
0-90	1278.2	100.0%
90-180	0.0	0.0%
0-180	1278.2	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	42.1	3.3%	90-100	0.0	0.0%
10-20	121.2	9.5%	100-110	0.0	0.0%
20-30	184.7	14.4%	110-120	0.0	0.0%
30-40	222.4	17.4%	120-130	0.0	0.0%
40-50	228.8	17.9%	130-140	0.0	0.0%
50-60	205.7	16.1%	140-150	0.0	0.0%
60-70	155.7	12.2%	150-160	0.0	0.0%
70-80	91.2	7.1%	160-170	0.0	0.0%
80-90	26.5	2.1%	170-180	0.0	0.0%

Photometric Data



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-07-27	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0176(SUMO-R-9)	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202307270003	120.0	60	0.156	17.40	0.926

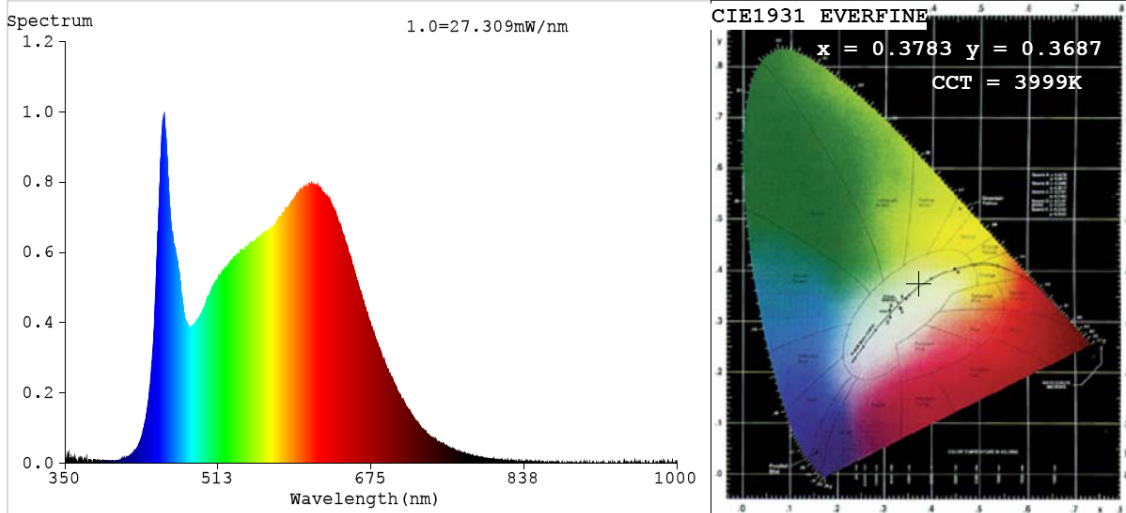
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	73
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3999	R3	97	R11	94
Duv	-0.0032	R4	93	R12	73
Chromaticity (x, y)	x=0.3783 y=0.3683	R5	95	R13	99
Chromaticity (u', v')	u'=0.2270 v'=0.4976	R6	95	R14	99
Color Rendering Index (CRI)	94.0	R7	91	R15	94
R9	73	R8	87	--	--

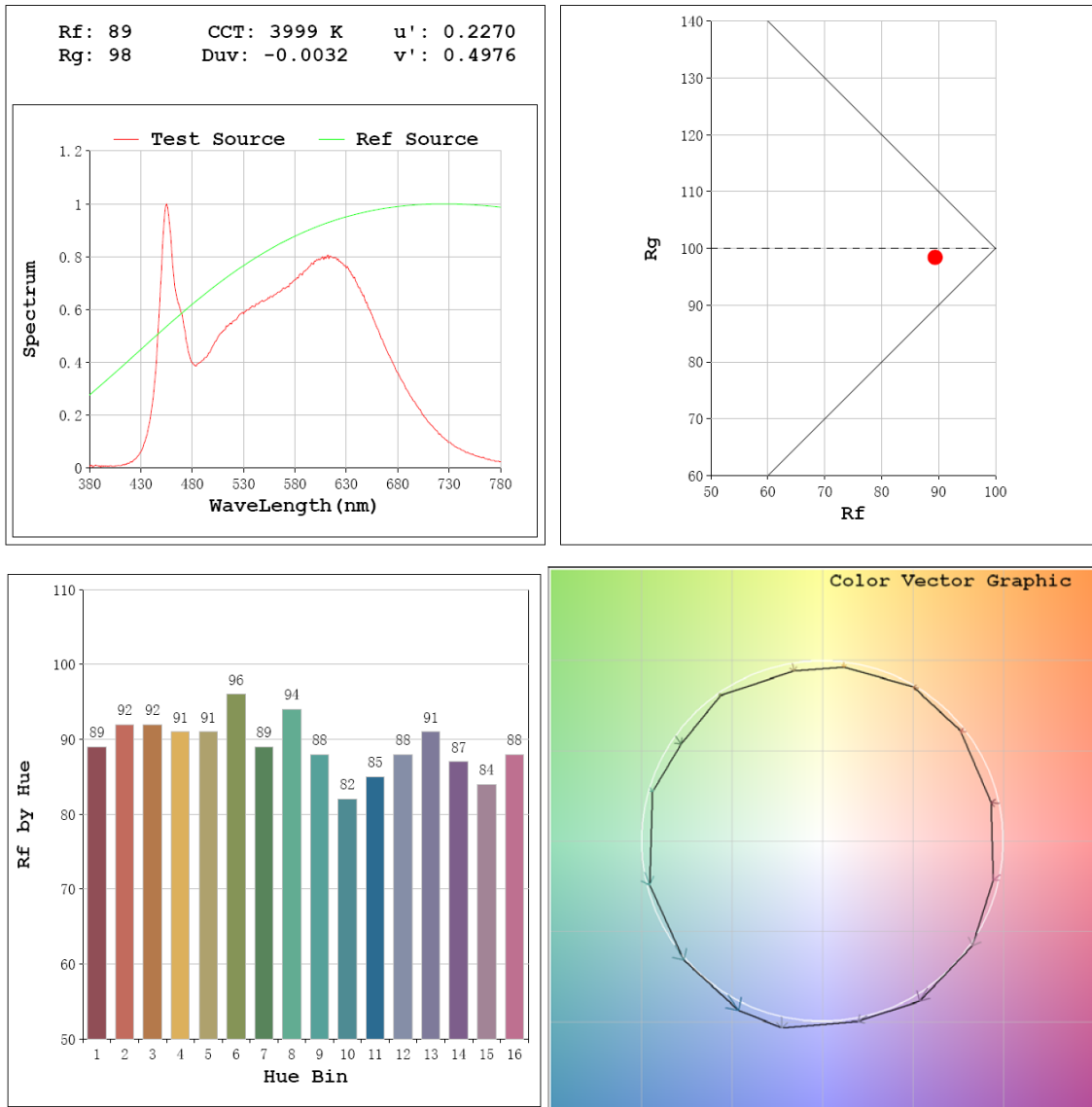
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1304.5
Luminous Efficacy (lm/W)	74.97
Beam Angle (°)	112.2
Center Beam Candle Power (cd)	454.5

Spectral Power Distribution & Chromaticity Diagram



TM30

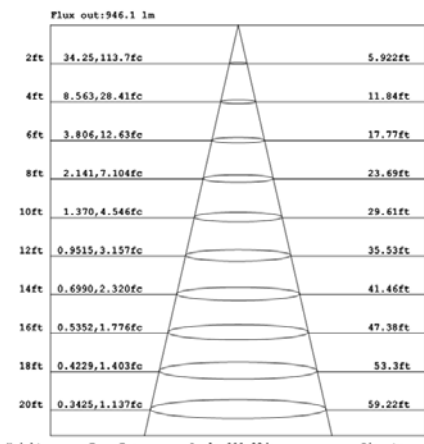
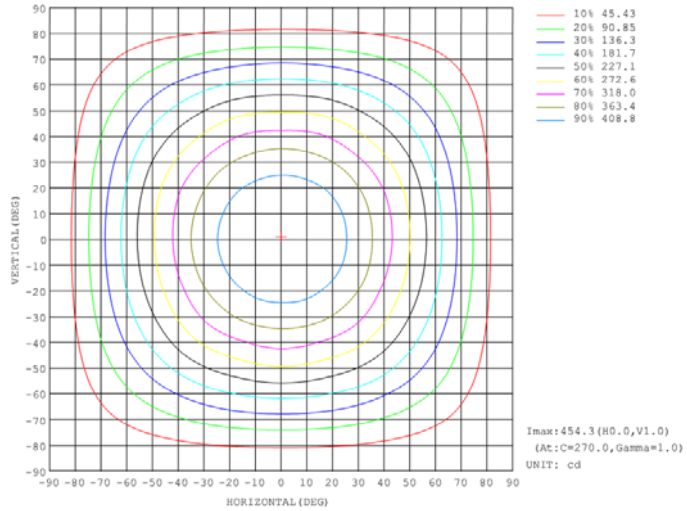
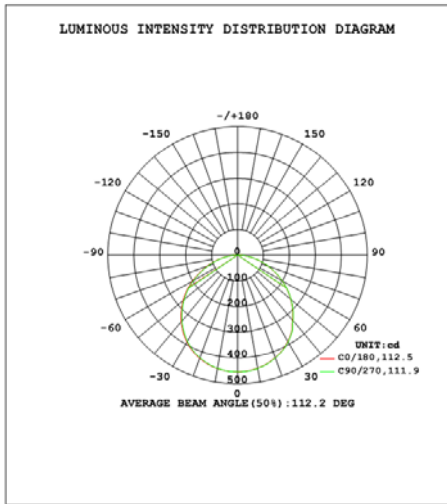


Zonal Lumen Tabulation

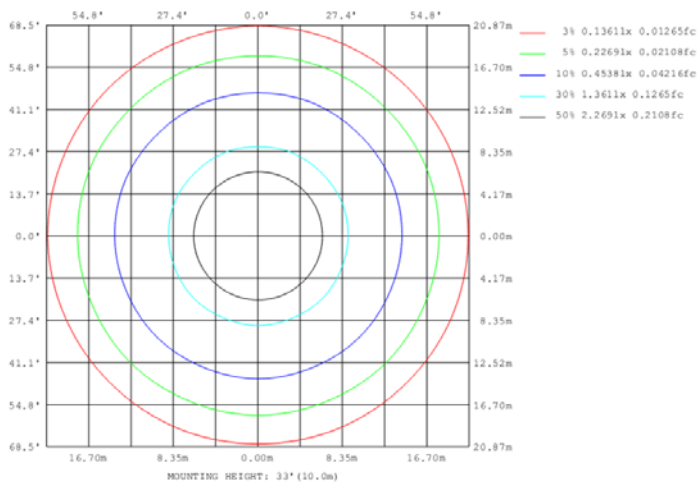
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	355.0	27.2%
0-40	582.1	44.6%
0-60	1025.3	78.6%
60-90	279.2	21.4%
70-100	120.2	9.2%
90-120	0.0	0.0%
0-90	1304.5	100.0%
90-180	0.0	0.0%
0-180	1304.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	43.0	3.3%	90-100	0.0	0.0%
10-20	123.7	9.5%	100-110	0.0	0.0%
20-30	188.4	14.4%	110-120	0.0	0.0%
30-40	227.1	17.4%	120-130	0.0	0.0%
40-50	233.4	17.9%	130-140	0.0	0.0%
50-60	209.9	16.1%	140-150	0.0	0.0%
60-70	159.0	12.2%	150-160	0.0	0.0%
70-80	93.1	7.1%	160-170	0.0	0.0%
80-90	27.1	2.1%	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.



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-07-27	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLS0176(SUMO-R-9)	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202307270003	120.0	60	0.158	17.50	0.922

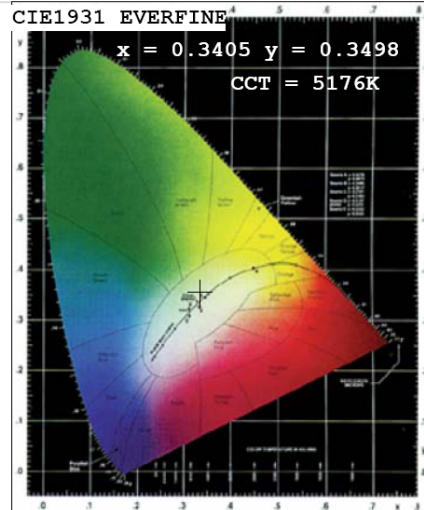
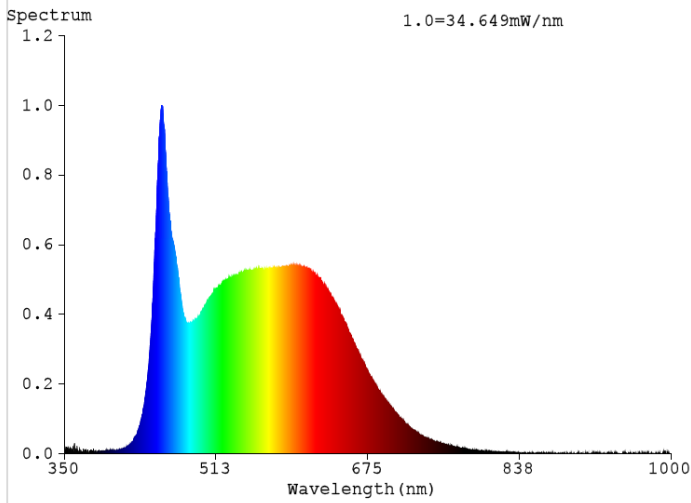
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	94	R9	64
Frequency (Hz)	60	R2	99	R10	95
CCT (K)	5176	R3	97	R11	92
Duv	0.0010	R4	91	R12	71
Chromaticity (x, y)	x=0.3405 y=0.3498	R5	93	R13	96
Chromaticity (u', v')	u'=0.2090 v'=0.4831	R6	94	R14	99
Color Rendering Index (CRI)	92.9	R7	91	R15	92
R9	64	R8	84	--	--

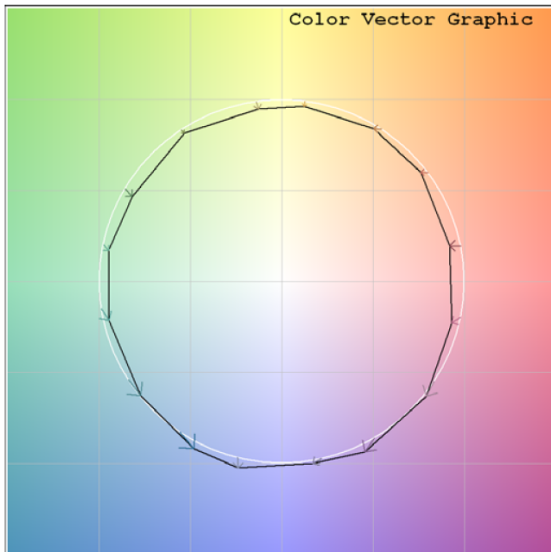
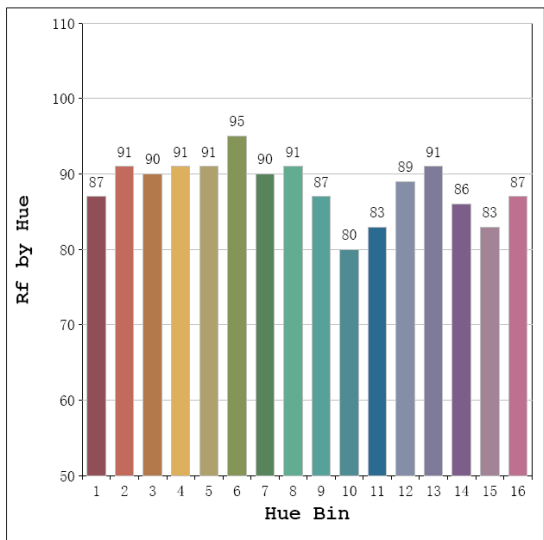
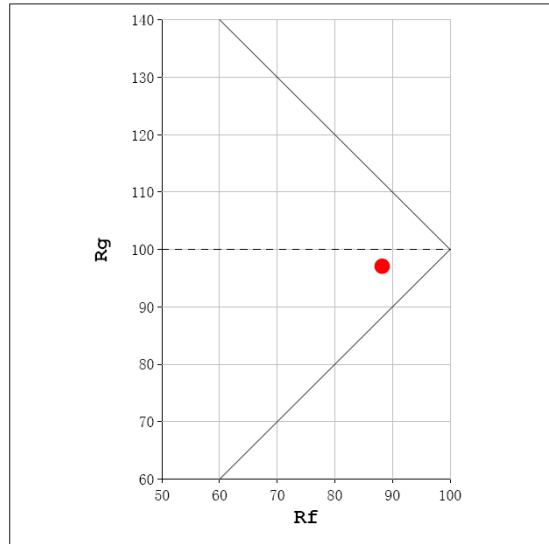
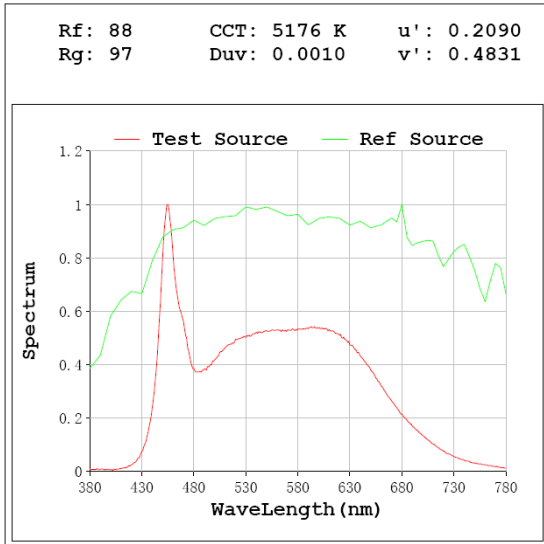
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1298.6
Luminous Efficacy (lm/W)	74.21
Beam Angle (°)	112.2
Center Beam Candle Power (cd)	452.4

Spectral Power Distribution & Chromaticity Diagram



TM30

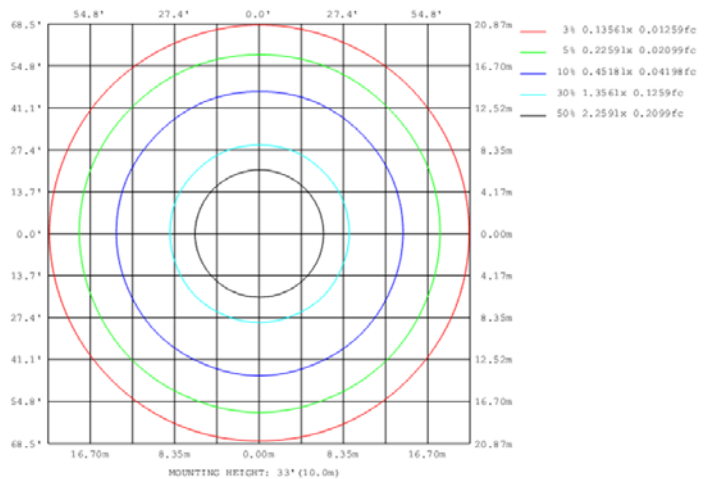
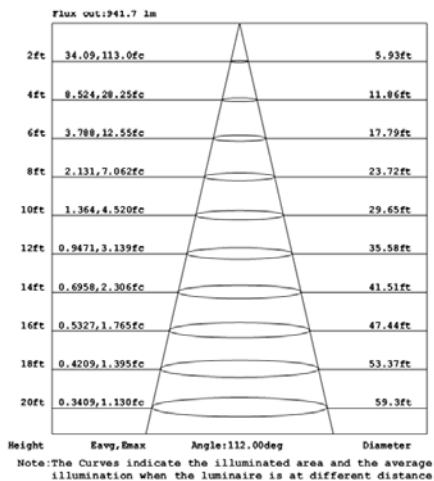
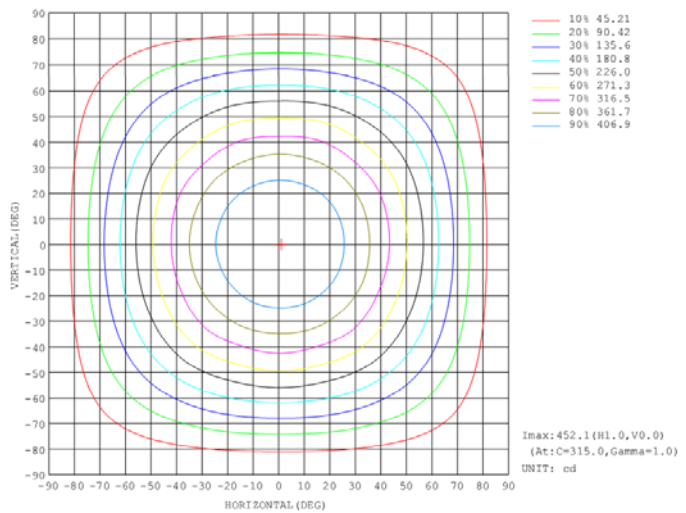
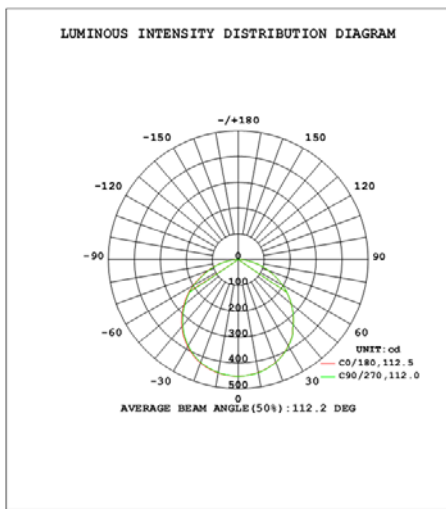


Zonal Lumen Tabulation

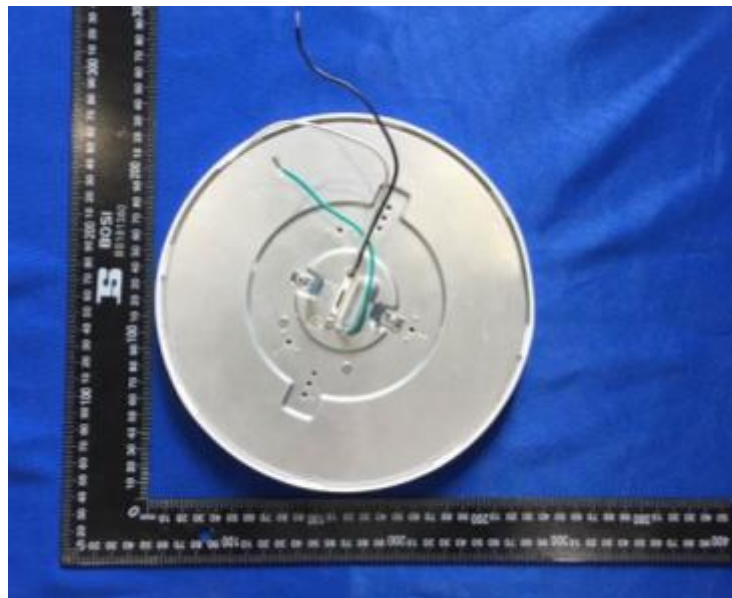
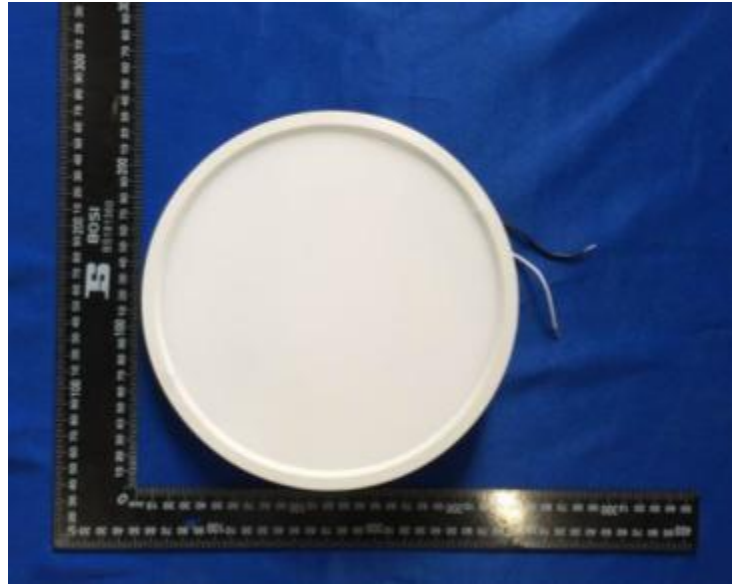
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	353.5	27.2%
0-40	579.4	44.6%
0-60	1020.6	78.6%
60-90	278.0	21.4%
70-100	119.7	9.2%
90-120	0.0	0.0%
0-90	1298.6	100.0%
90-180	0.0	0.0%
0-180	1298.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	42.8	3.3%	90-100	0.0	0.0%
10-20	123.1	9.5%	100-110	0.0	0.0%
20-30	187.6	14.4%	110-120	0.0	0.0%
30-40	225.9	17.4%	120-130	0.0	0.0%
40-50	232.3	17.9%	130-140	0.0	0.0%
50-60	208.9	16.1%	140-150	0.0	0.0%
60-70	158.3	12.2%	150-160	0.0	0.0%
70-80	92.7	7.1%	160-170	0.0	0.0%
80-90	26.9	2.1%	170-180	0.0	0.0%

Photometric Data



3. Product Photo



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