

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):
DLW0099(FWAFER6B)

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

**Type of
Luminaire:** Downlights

Report Date: 2023-04-07

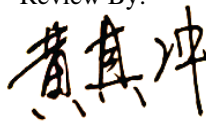
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	15.0 W
Rated Initial Lamp Lumen	1250 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	2023-04-07	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0099(FWAFER6B)	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202304070002	120.0	60	0.120	14.20	0.989

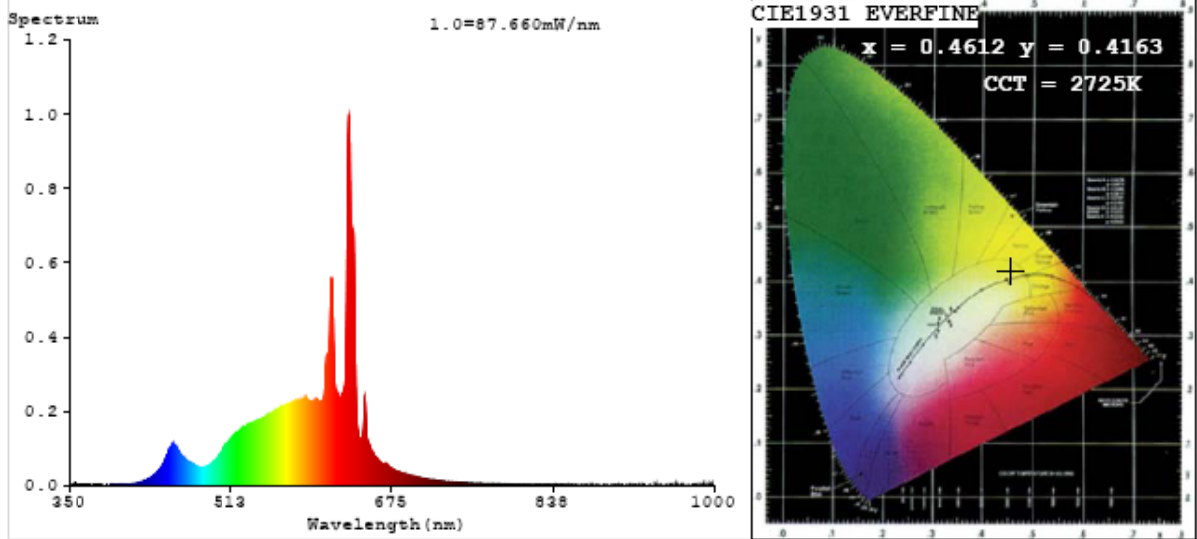
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	64
Frequency (Hz)	60	R2	95	R10	86
CCT (K)	2725	R3	93	R11	96
Duv	0.0020	R4	96	R12	79
Chromaticity (x, y)	x=0.4612 y=0.4163	R5	94	R13	95
Chromaticity (u', v')	u'=0.2608 v'=0.5297	R6	96	R14	94
Color Rendering Index (CRI)	93.6	R7	94	R15	91
R9	64	R8	86	--	--

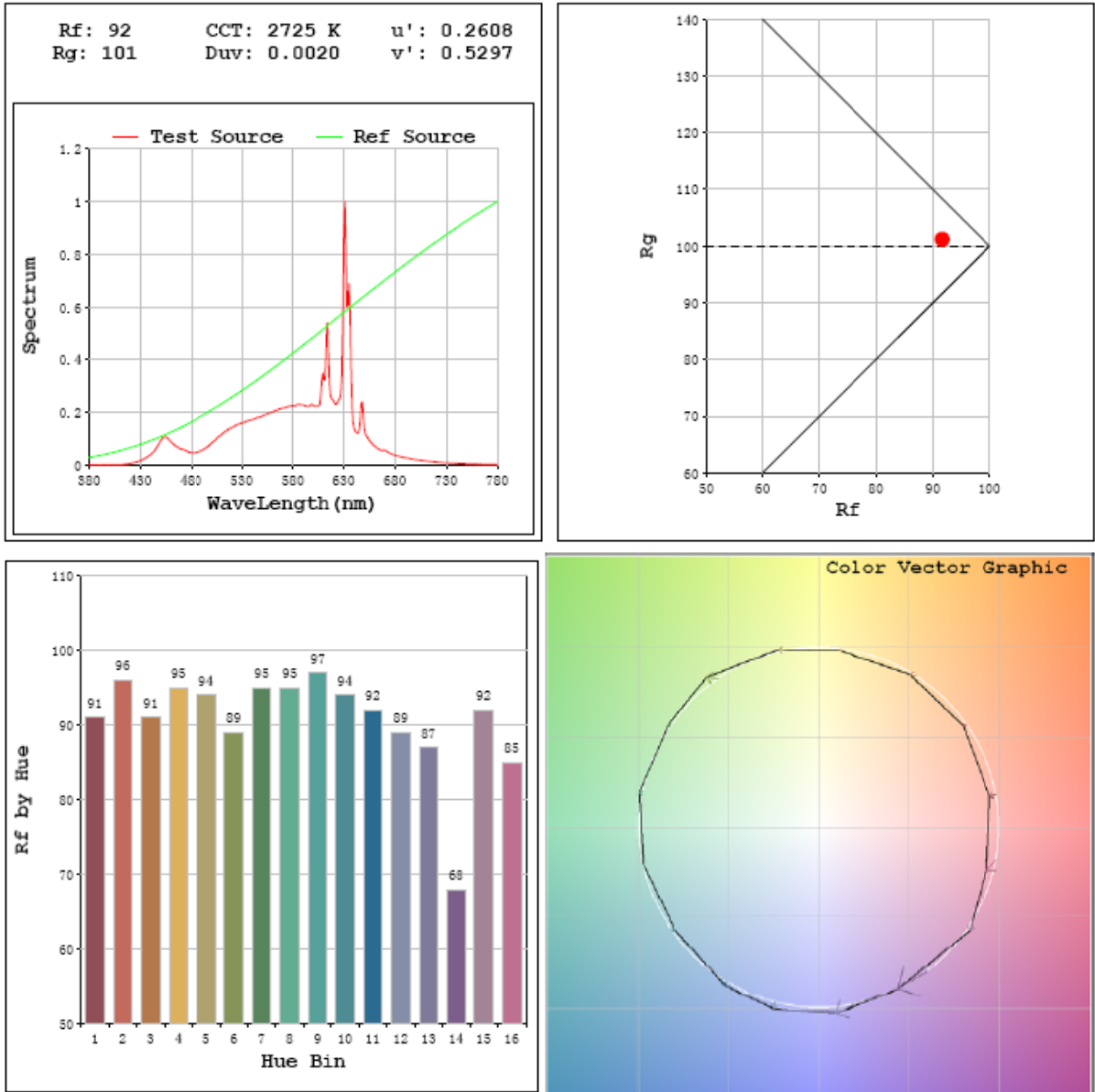
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1271.8
Luminous Efficacy (lm/W)	89.56
Beam Angle (°)	110.3
Center Beam Candle Power (cd)	460.3

Spectral Power Distribution & Chromaticity Diagram



TM30

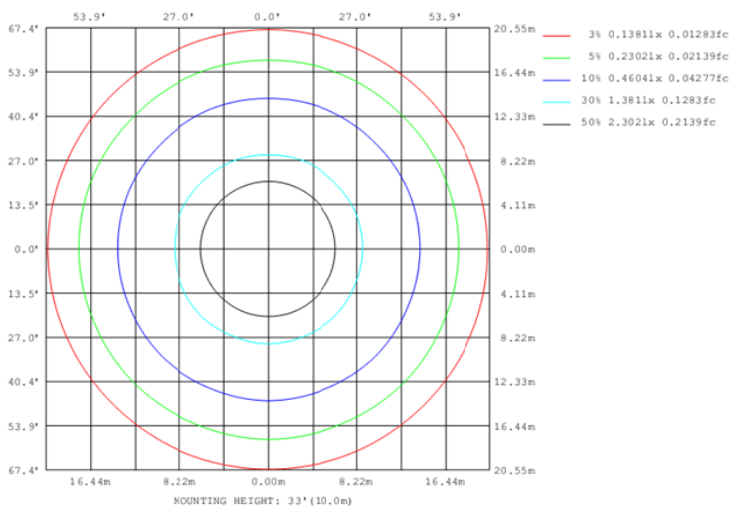
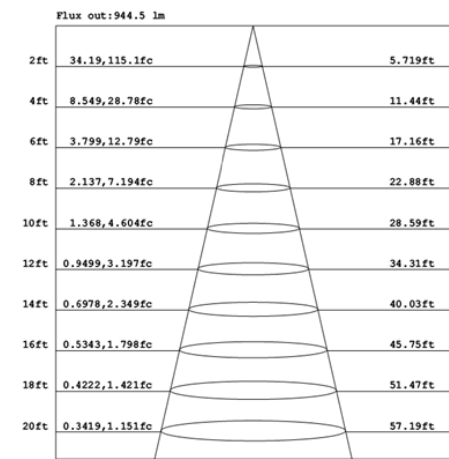
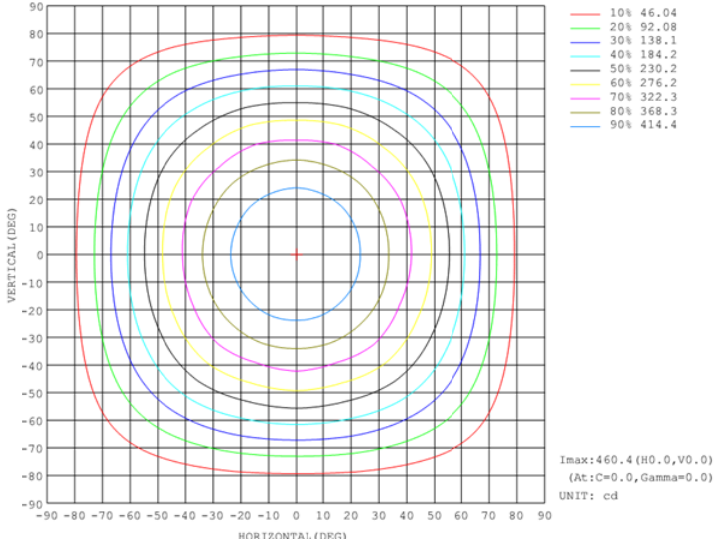
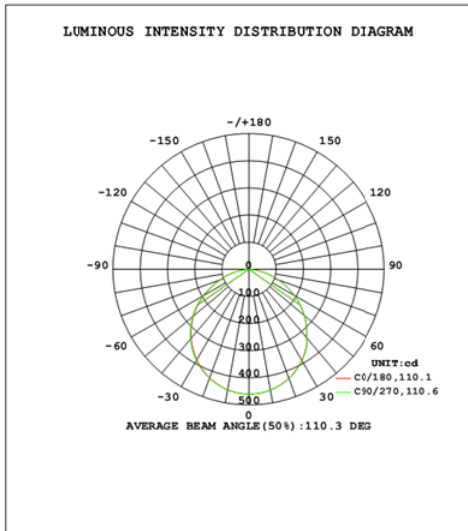


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	356.8	28.1%
0-40	583.4	45.9%
0-60	1022.1	80.4%
60-90	249.6	19.6%
70-100	97.8	7.7%
90-120	0.0	0.0%
0-90	1271.8	100.0%
90-180	0.0	0.0%
0-180	1271.8	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	43.5	3.4%	90-100	0.0	0.0%
10-20	124.6	9.8%	100-110	0.0	0.0%
20-30	188.6	14.8%	110-120	0.0	0.0%
30-40	226.6	17.8%	120-130	0.0	0.0%
40-50	232.0	18.2%	130-140	0.0	0.0%
50-60	206.8	16.3%	140-150	0.0	0.0%
60-70	151.9	11.9%	150-160	0.0	0.0%
70-80	81.1	6.4%	160-170	0.0	0.0%
80-90	16.6	1.3%	170-180	0.0	0.0%

Photometric Data



Test date	2023-04-07	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0099(FWAFER6B)	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202304070002	120.0	60	0.119	14.10	0.989

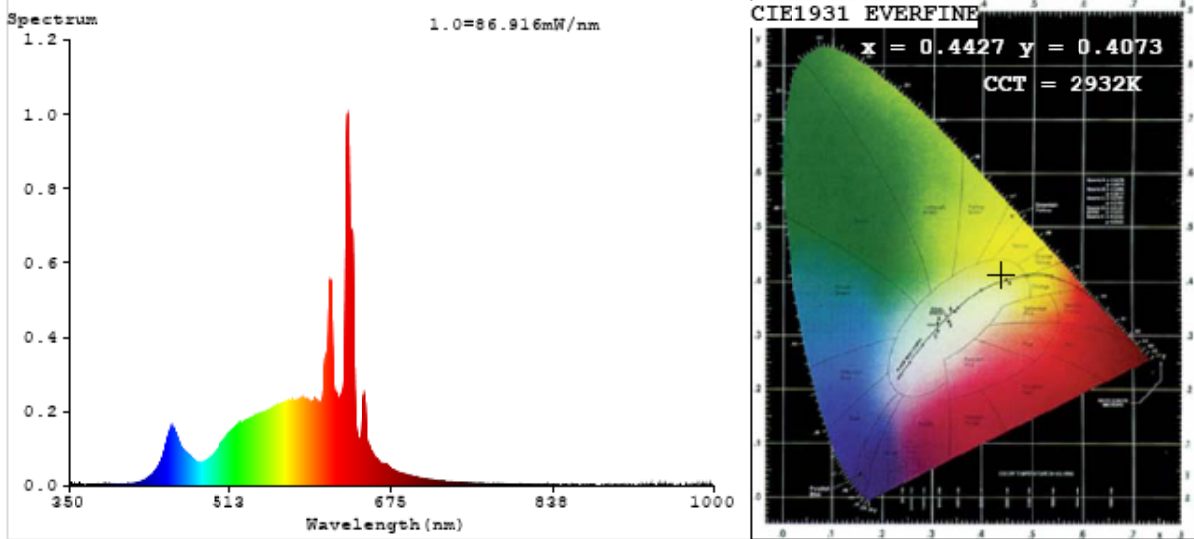
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	72
Frequency (Hz)	60	R2	97	R10	89
CCT (K)	2932	R3	93	R11	97
Duv	0.0005	R4	97	R12	80
Chromaticity (x, y)	x=0.4427 y=0.4073	R5	96	R13	97
Chromaticity (u', v')	u'=0.2529 v'=0.5235	R6	96	R14	94
Color Rendering Index (CRI)	95.3	R7	95	R15	94
R9	72	R8	89	--	--

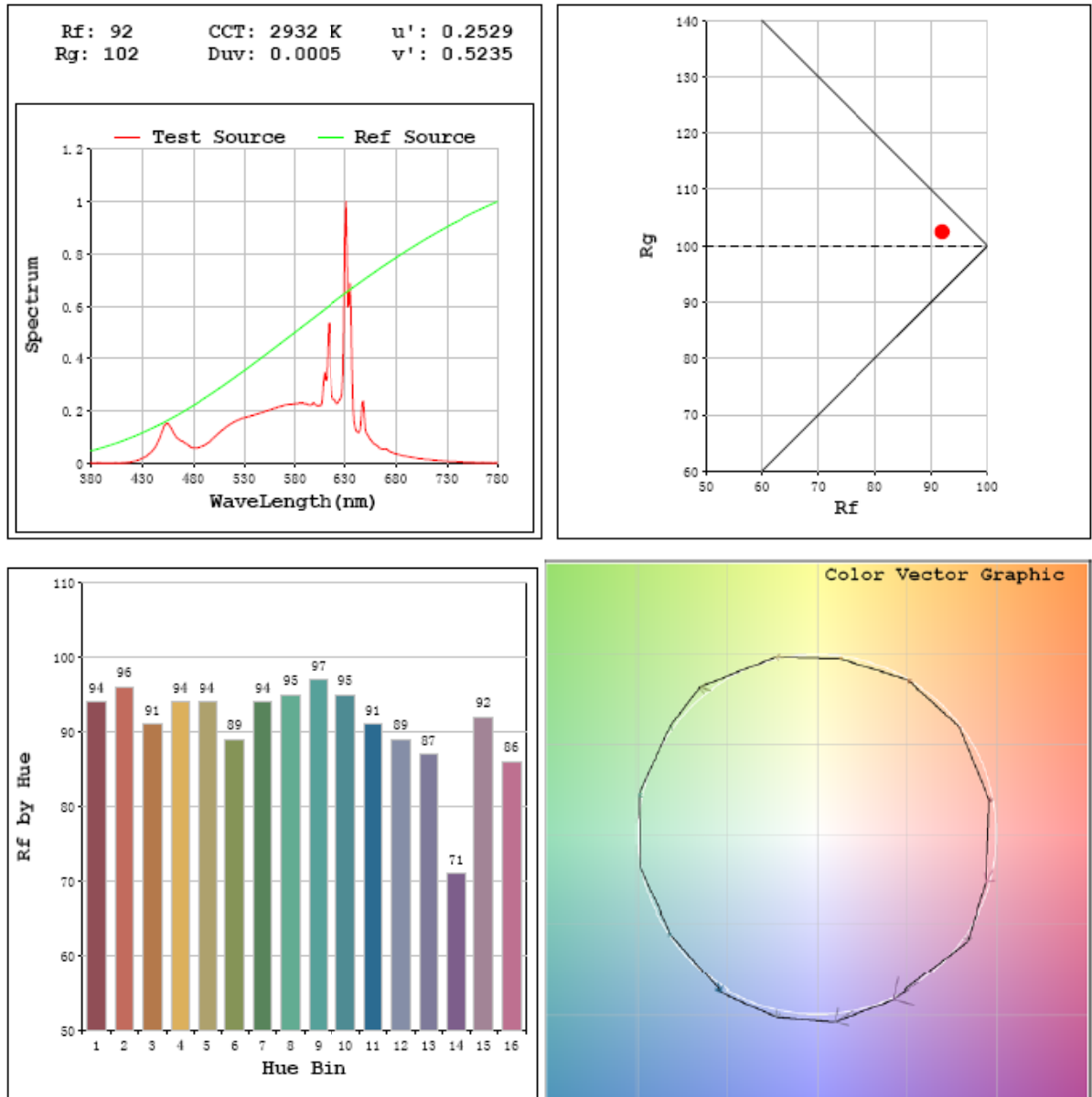
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1311.4
Luminous Efficacy (lm/W)	93.01
Beam Angle (°)	110.4
Center Beam Candle Power (cd)	474.6

Spectral Power Distribution & Chromaticity Diagram



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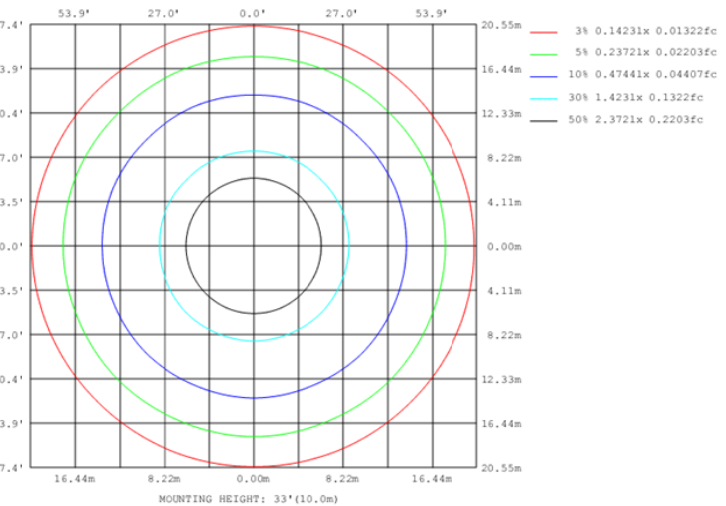
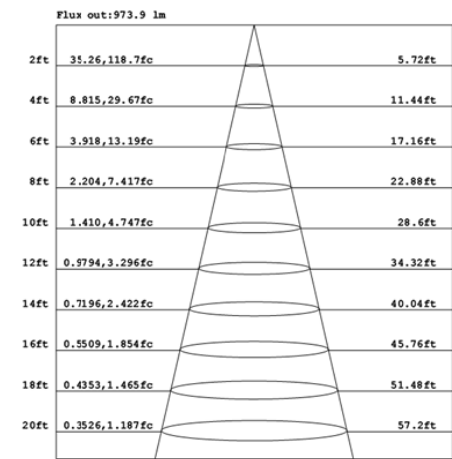
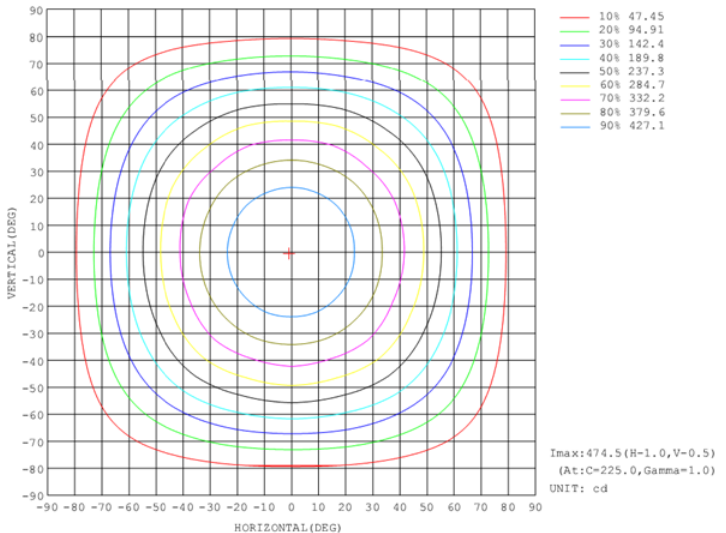
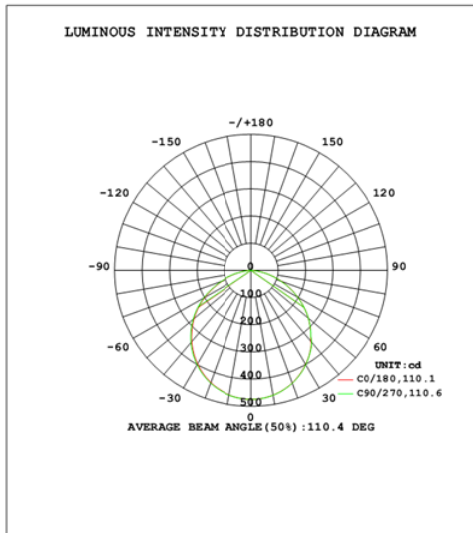


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	367.8	28.0%
0-40	601.5	45.9%
0-60	1053.9	80.4%
60-90	257.4	19.6%
70-100	100.8	7.7%
90-120	0.0	0.0%
0-90	1311.4	100.0%
90-180	0.0	0.0%
0-180	1311.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	44.9	3.4%	90-100	0.0	0.0%
10-20	128.5	9.8%	100-110	0.0	0.0%
20-30	194.4	14.8%	110-120	0.0	0.0%
30-40	233.7	17.8%	120-130	0.0	0.0%
40-50	239.3	18.2%	130-140	0.0	0.0%
50-60	213.2	16.3%	140-150	0.0	0.0%
60-70	156.6	11.9%	150-160	0.0	0.0%
70-80	83.6	6.4%	160-170	0.0	0.0%
80-90	17.2	1.3%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-04-07	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0099(FWAFER6B)	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202304070002	120.0	60	0.118	14.00	0.988

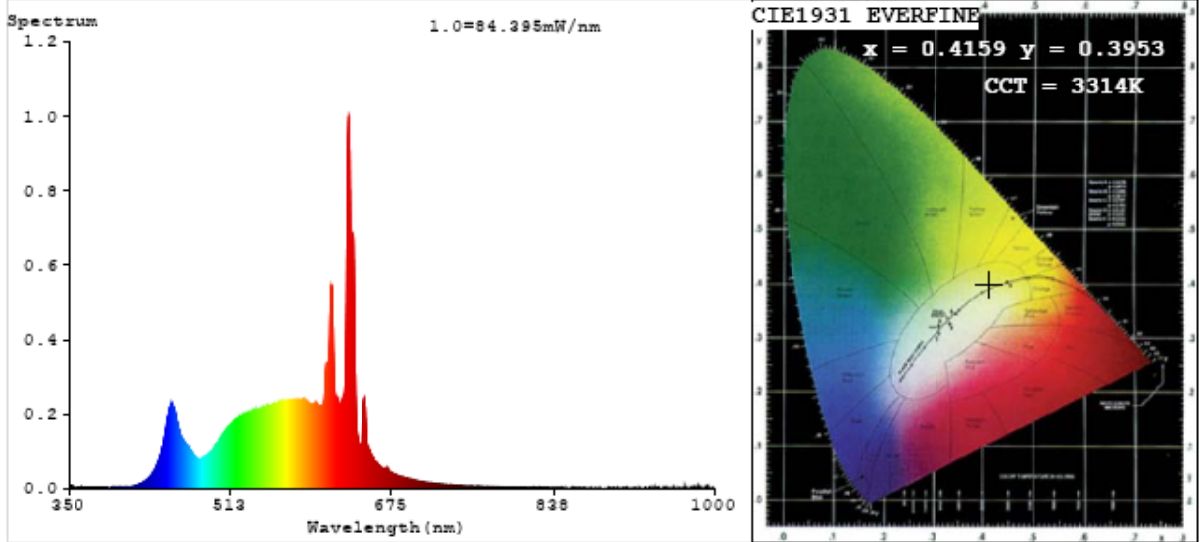
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	83
Frequency (Hz)	60	R2	98	R10	91
CCT (K)	3314	R3	93	R11	96
Duv	-0.0002	R4	98	R12	78
Chromaticity (x, y)	x=0.4159 y=0.3953	R5	98	R13	99
Chromaticity (u', v')	u'=0.2407 v'=0.5147	R6	96	R14	95
Color Rendering Index (CRI)	96.7	R7	97	R15	97
R9	83	R8	94	--	--

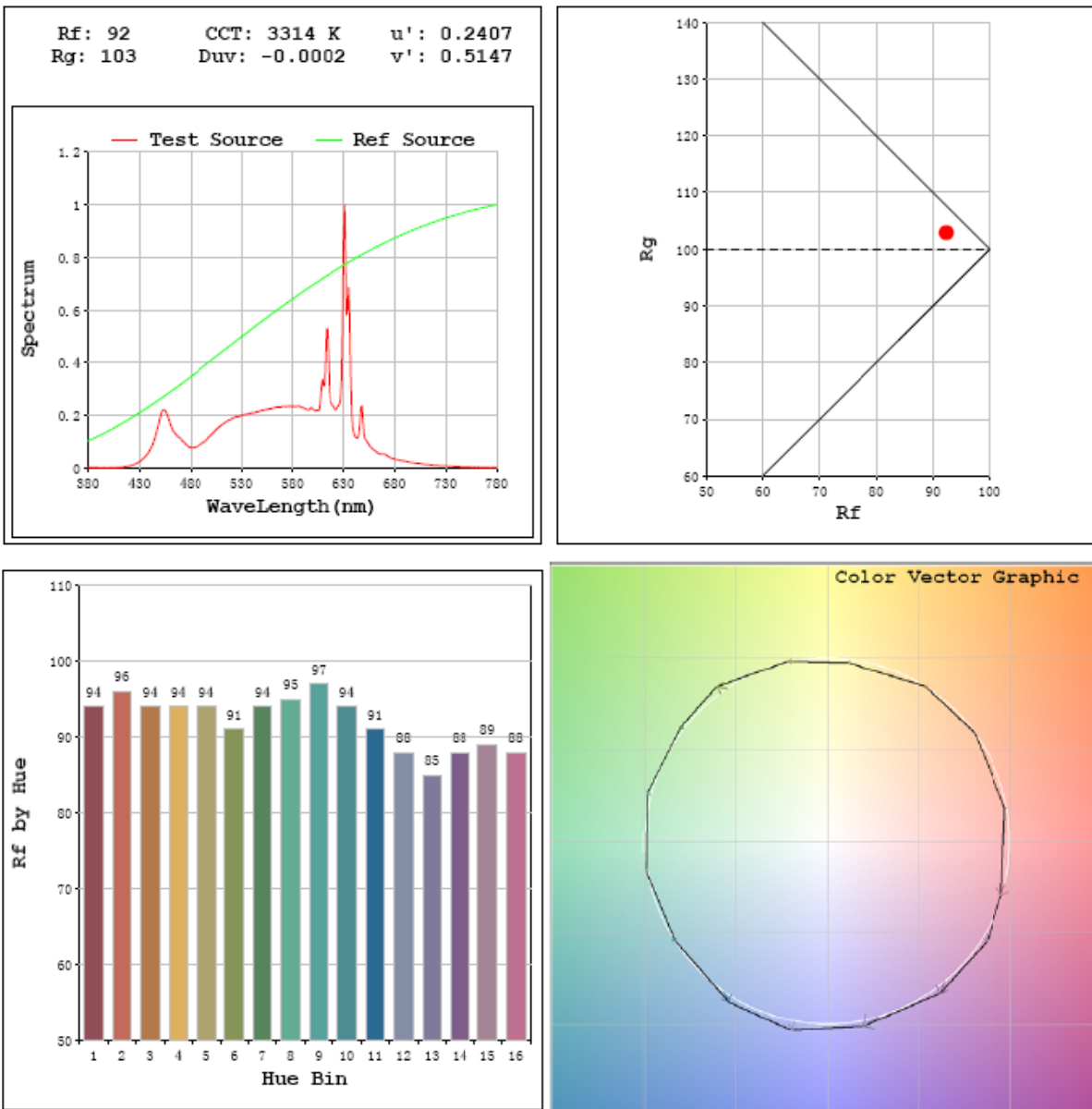
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1357.6
Luminous Efficacy (lm/W)	96.97
Beam Angle (°)	110.4
Center Beam Candle Power (cd)	491.0

Spectral Power Distribution & Chromaticity Diagram



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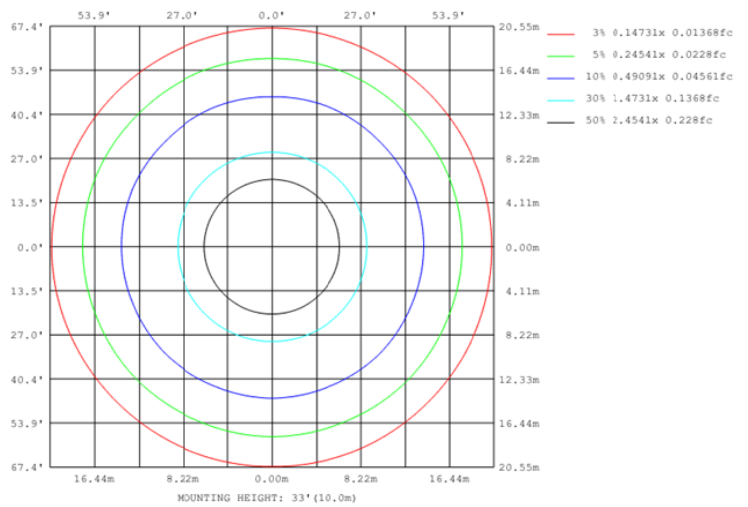
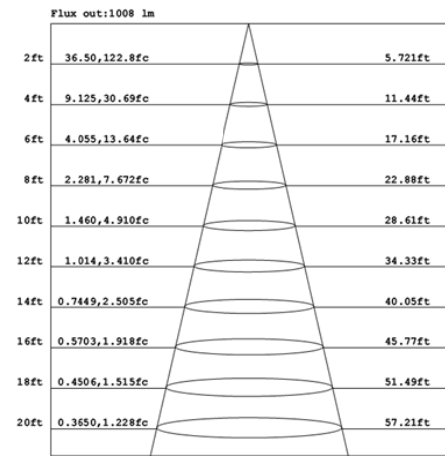
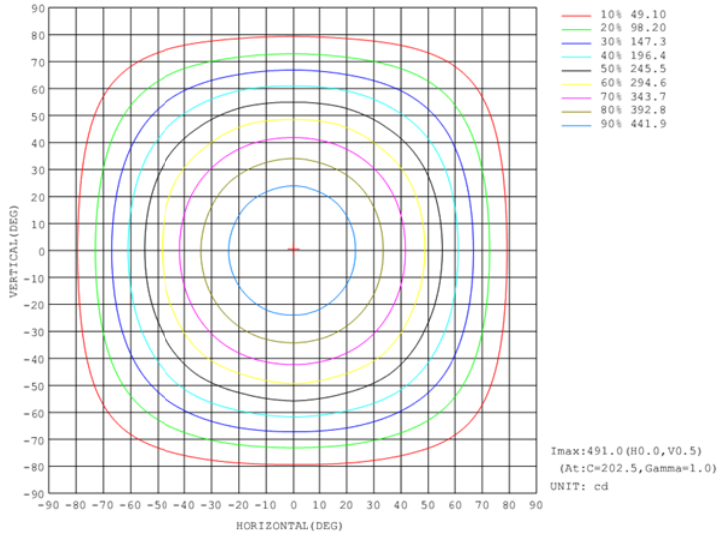
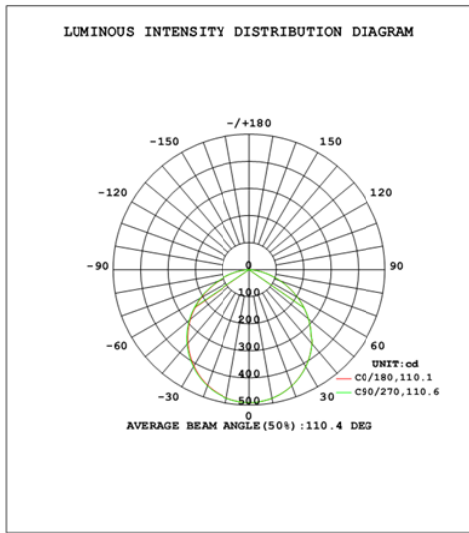


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	380.6	28.0%
0-40	622.4	45.8%
0-60	1091.0	80.4%
60-90	266.7	19.6%
70-100	104.4	7.7%
90-120	0.0	0.0%
0-90	1357.6	100.0%
90-180	0.0	0.0%
0-180	1357.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	46.4	3.4%	90-100	0.0	0.0%
10-20	132.9	9.8%	100-110	0.0	0.0%
20-30	201.2	14.8%	110-120	0.0	0.0%
30-40	241.8	17.8%	120-130	0.0	0.0%
40-50	248.0	18.3%	130-140	0.0	0.0%
50-60	220.6	16.2%	140-150	0.0	0.0%
60-70	162.3	12.0%	150-160	0.0	0.0%
70-80	86.6	6.4%	160-170	0.0	0.0%
80-90	17.8	1.3%	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.

2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-04-07	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0099(FWAFER6B)	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202304070002	120.0	60	0.118	14.00	0.988

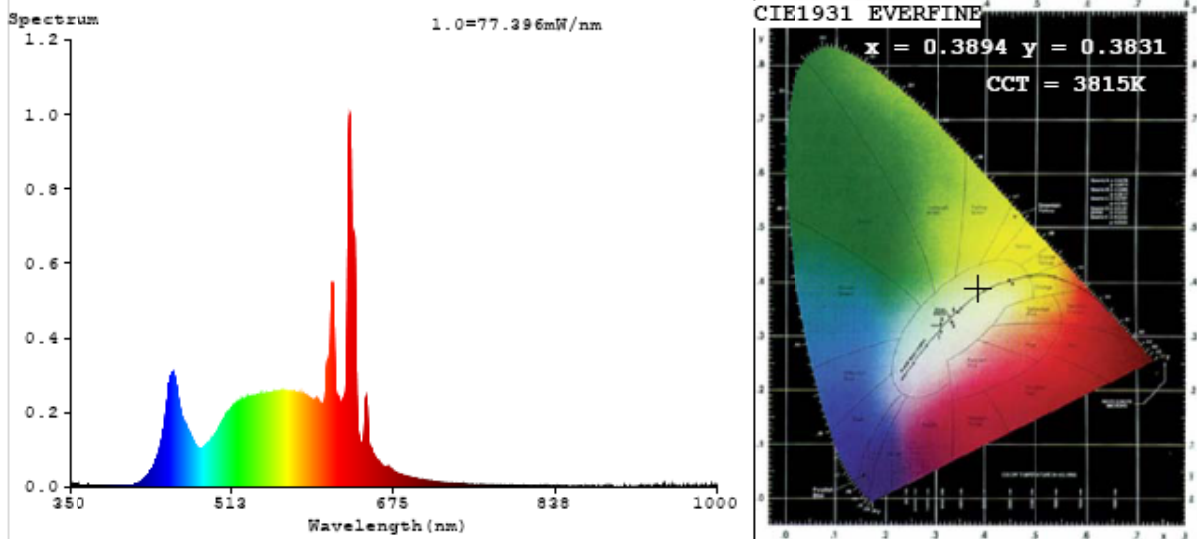
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	99	R9	89
Frequency (Hz)	60	R2	98	R10	91
CCT (K)	3815	R3	92	R11	96
Duv	0.0005	R4	98	R12	75
Chromaticity (x, y)	x=0.3894 y=0.3831	R5	98	R13	99
Chromaticity (u', v')	u'=0.2284 v'=0.5057	R6	96	R14	94
Color Rendering Index (CRI)	97.0	R7	99	R15	98
R9	89	R8	97	--	--

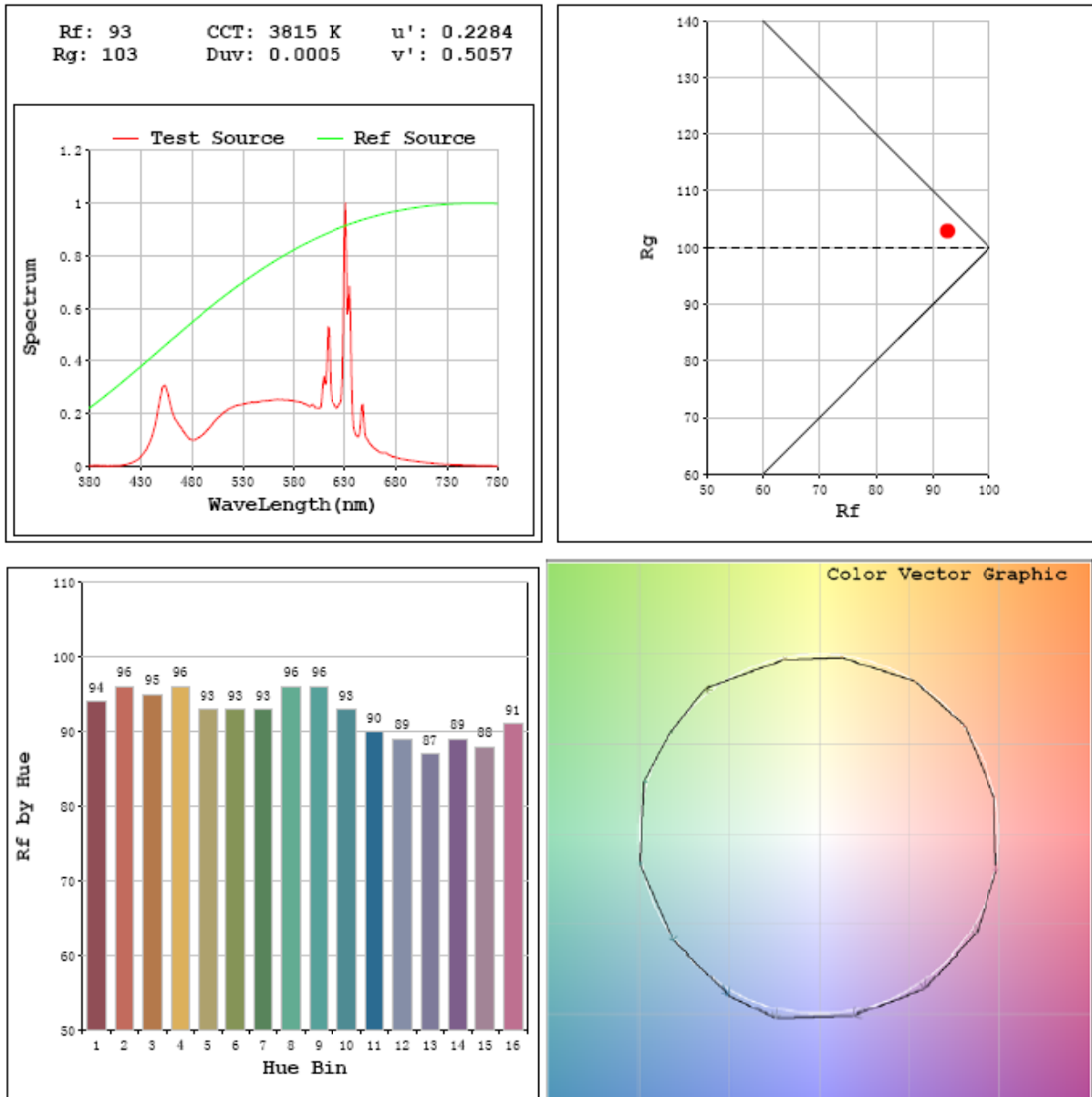
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1365.6
Luminous Efficacy (lm/W)	97.54
Beam Angle (°)	110.4
Center Beam Candle Power (cd)	493.8

Spectral Power Distribution & Chromaticity Diagram



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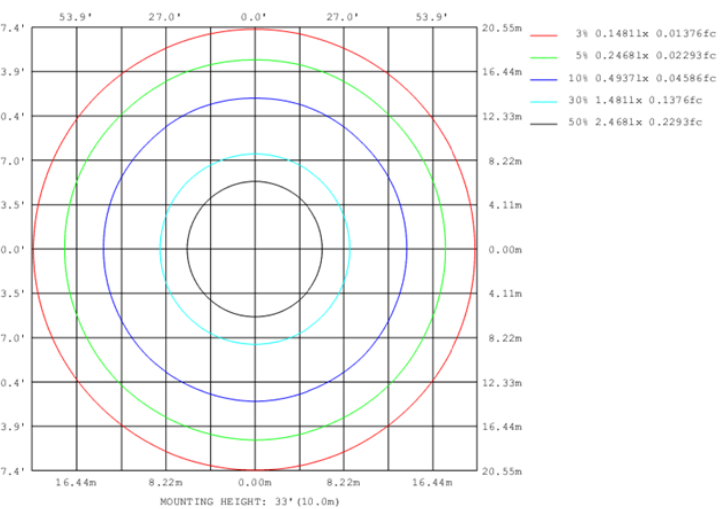
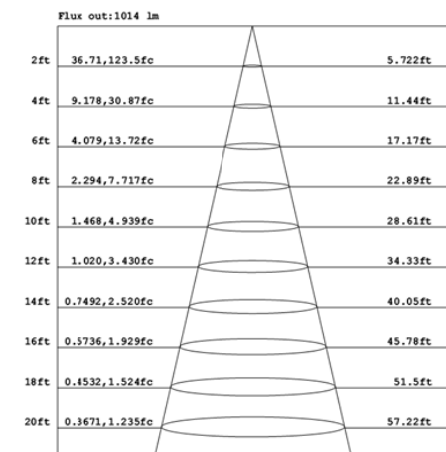
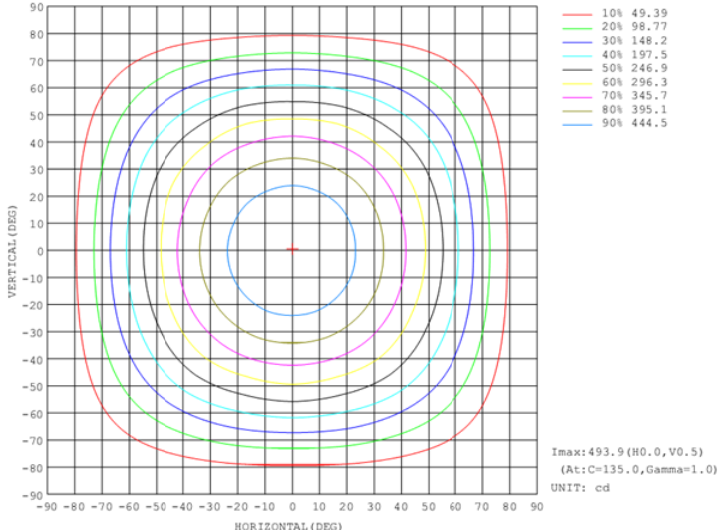
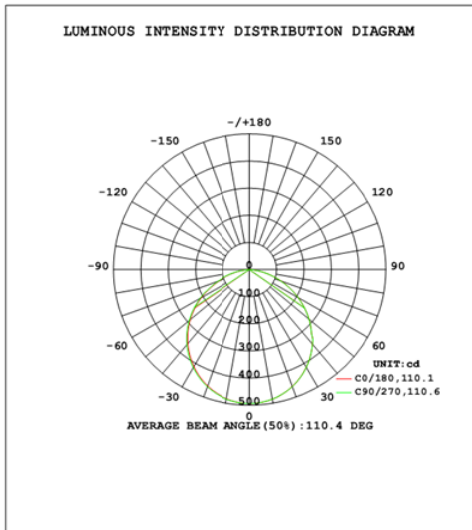


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	382.7	28.0%
0-40	625.9	45.8%
0-60	1097.3	80.4%
60-90	268.3	19.6%
70-100	105.0	7.7%
90-120	0.0	0.0%
0-90	1365.6	100.0%
90-180	0.0	0.0%
0-180	1365.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	46.7	3.4%	90-100	0.0	0.0%
10-20	133.7	9.8%	100-110	0.0	0.0%
20-30	202.3	14.8%	110-120	0.0	0.0%
30-40	243.2	17.8%	120-130	0.0	0.0%
40-50	249.5	18.3%	130-140	0.0	0.0%
50-60	221.9	16.2%	140-150	0.0	0.0%
60-70	163.2	12.0%	150-160	0.0	0.0%
70-80	87.1	6.4%	160-170	0.0	0.0%
80-90	17.9	1.3%	170-180	0.0	0.0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-04-07	Test Ambient:	25.3 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	DLW0099(FWAFER6B)	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202304070002	120.0	60	0.120	14.20	0.989

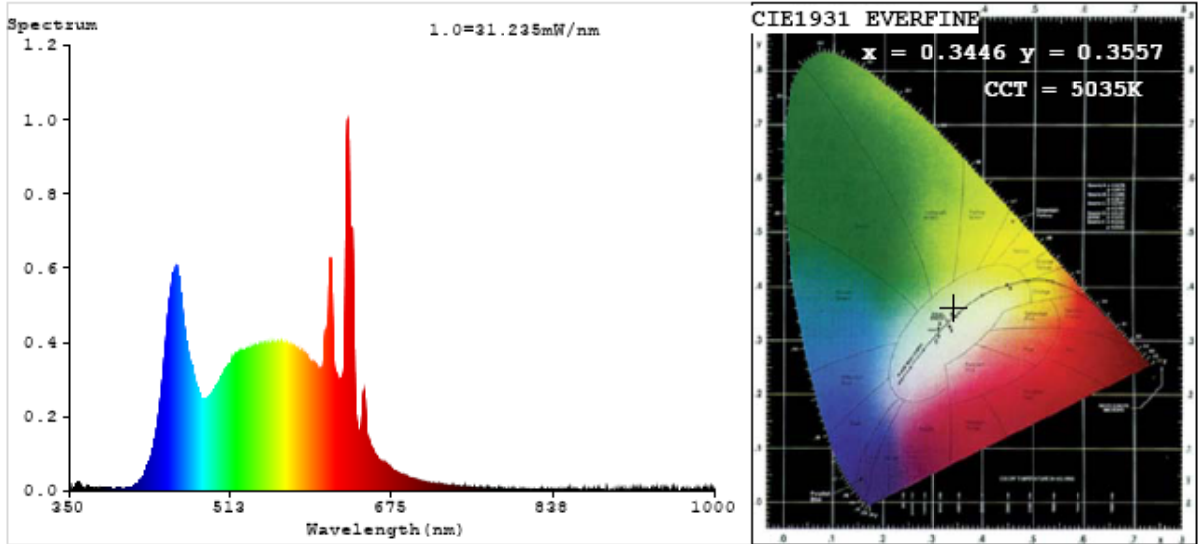
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	73
Frequency (Hz)	60	R2	98	R10	93
CCT (K)	5035	R3	97	R11	94
Duv	0.0023	R4	93	R12	73
Chromaticity (x, y)	x=0.3446 y=0.3557	R5	94	R13	97
Chromaticity (u', v')	u'=0.2095 v'=0.4866	R6	95	R14	98
Color Rendering Index (CRI)	94.3	R7	93	R15	94
R9	73	R8	89	--	--

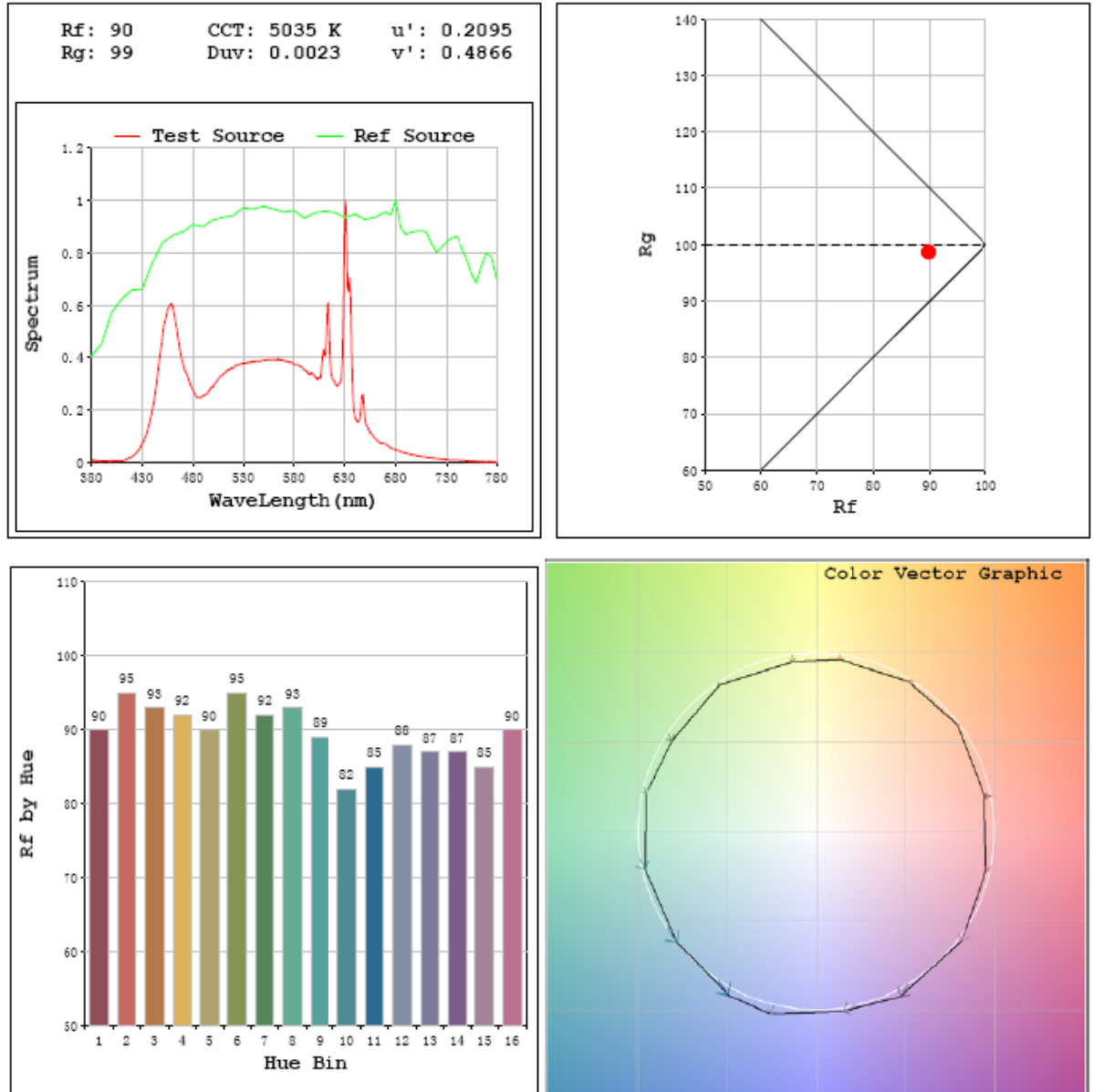
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1305.9
Luminous Efficacy (lm/W)	91.96
Beam Angle (°)	110.4
Center Beam Candle Power (cd)	472.4

Spectral Power Distribution & Chromaticity Diagram



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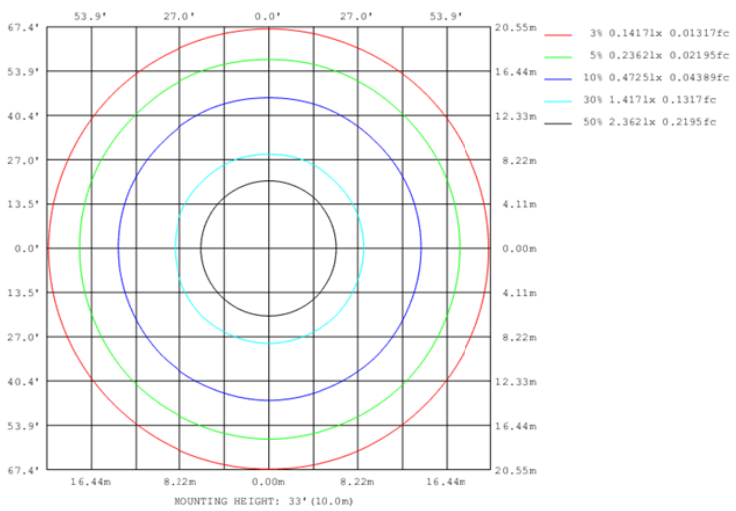
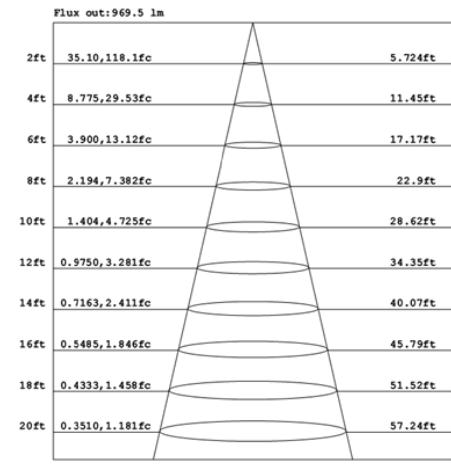
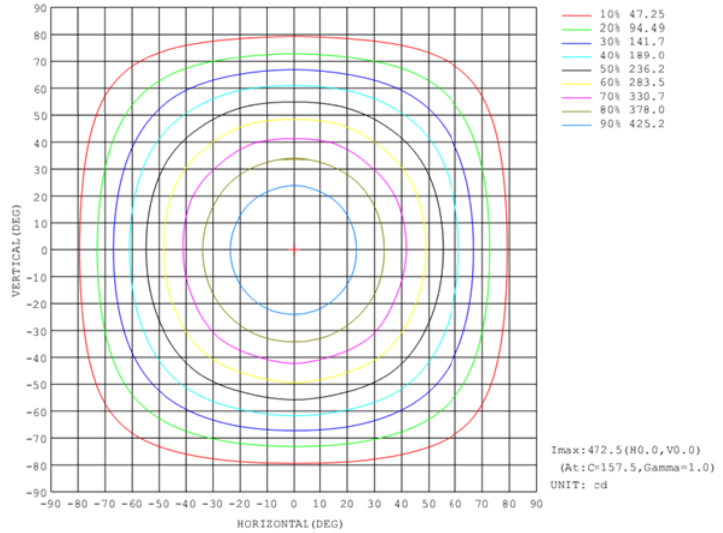
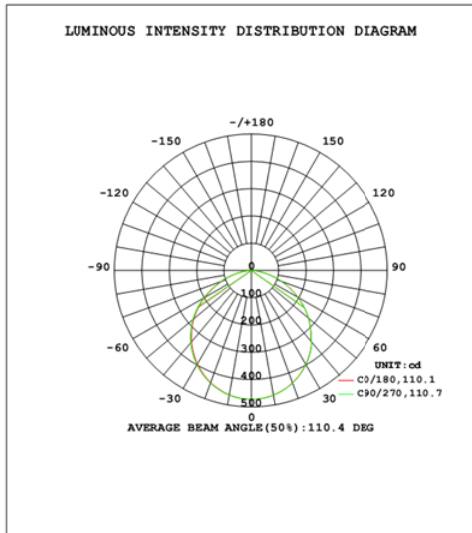


Zonal Lumen Tabulation

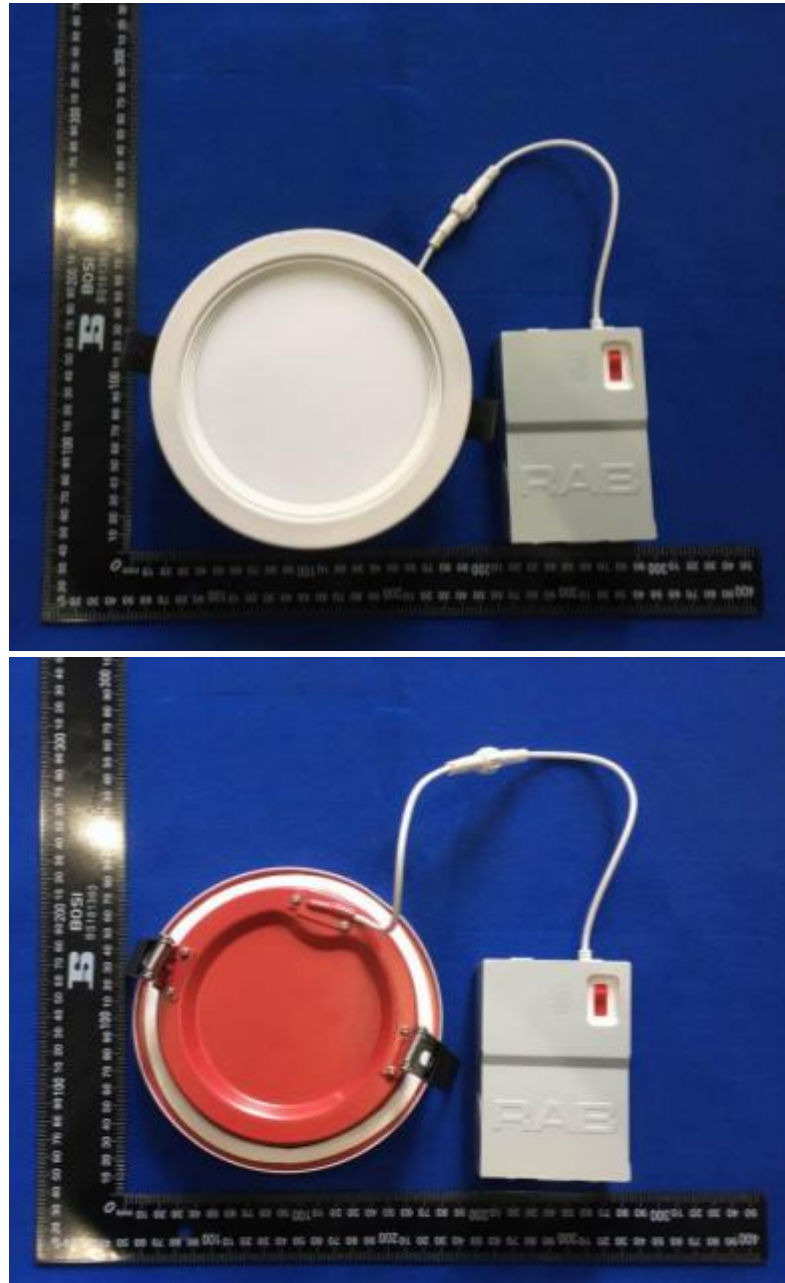
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	366.1	28.0%
0-40	598.7	45.8%
0-60	1049.3	80.3%
60-90	256.6	19.7%
70-100	100.5	7.7%
90-120	0.0	0.0%
0-90	1305.9	100.0%
90-180	0.0	0.0%
0-180	1305.9	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	44.7	3.4%	90-100	0.0	0.0%
10-20	127.9	9.8%	100-110	0.0	0.0%
20-30	193.5	14.8%	110-120	0.0	0.0%
30-40	232.6	17.8%	120-130	0.0	0.0%
40-50	238.2	18.2%	130-140	0.0	0.0%
50-60	212.3	16.3%	140-150	0.0	0.0%
60-70	156.1	12.0%	150-160	0.0	0.0%
70-80	83.4	6.4%	160-170	0.0	0.0%
80-90	17.2	1.3%	170-180	0.0	0.0%

Photometric Data



3. Product Photo



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