

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):
WFR4/RGB

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

**Type of
Luminaire:** Downlights

Report Date: 2024-01-10

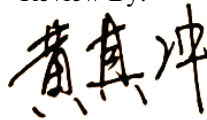
Prepared By:

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

1.1 Rated Values:	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	8.0 W
Rated Initial Lamp Lumen	550 lm
Declared CCT	2700K/3000K/3500K/4000K/5000K/6500K

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	2024-01-08	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFR4/RGB	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030035	120.0	60	0.071	7.81	0.913

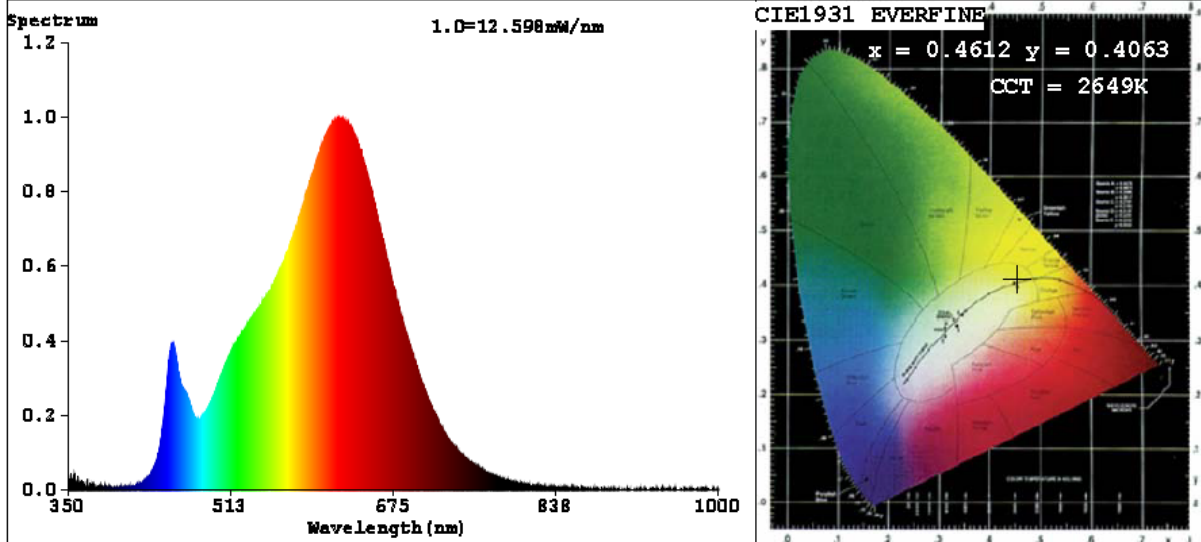
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	94	R9	56
Frequency (Hz)	60	R2	98	R10	95
CCT (K)	2649	R3	97	R11	94
Duv	-0.0017	R4	92	R12	85
Chromaticity (x, y)	x=0.4612 y=0.4063	R5	94	R13	95
Chromaticity (u', v')	u'=0.2653 v'=0.5259	R6	97	R14	100
Color Rendering Index (CRI)	92.5	R7	89	R15	89
R9	56	R8	79	--	--

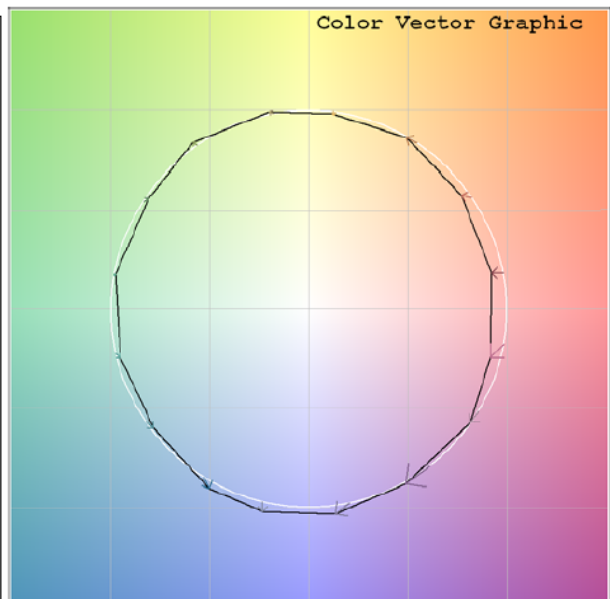
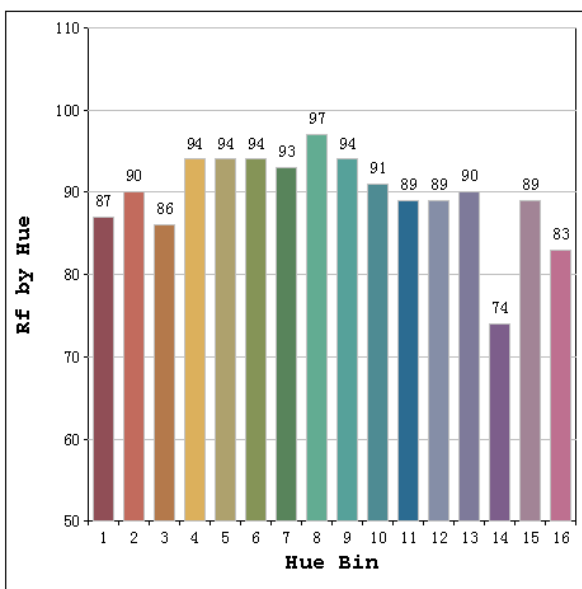
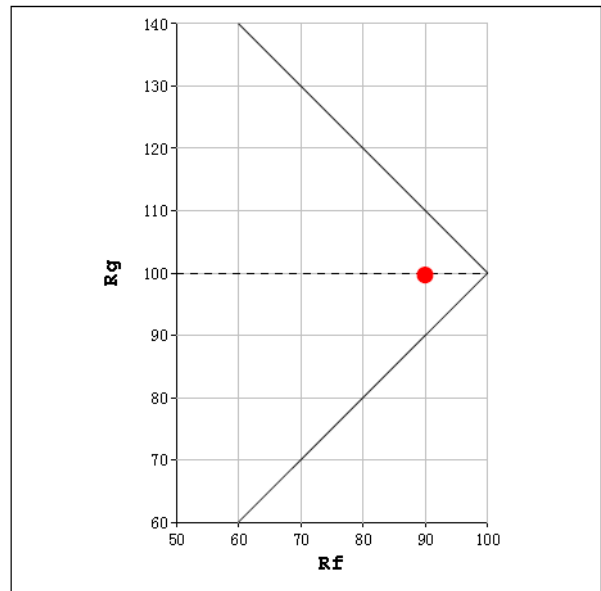
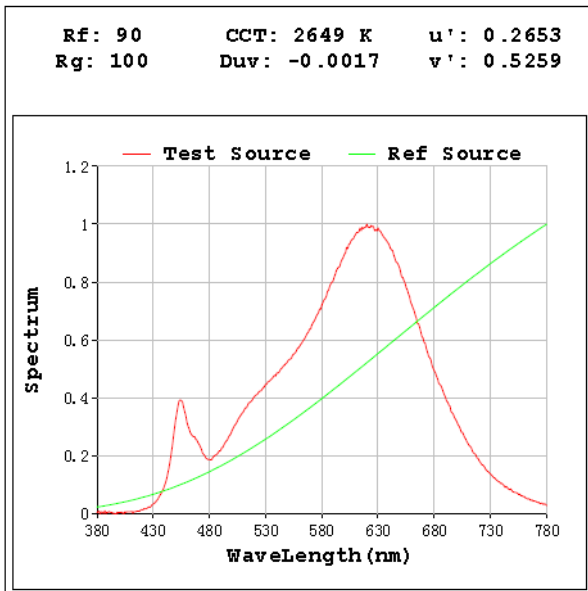
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	560.3
Luminous Efficacy (lm/W)	71.74
Beam Angle (°)	111.7
Center Beam Candle Power (cd)	196.8

Spectral Power Distribution & Chromaticity Diagram



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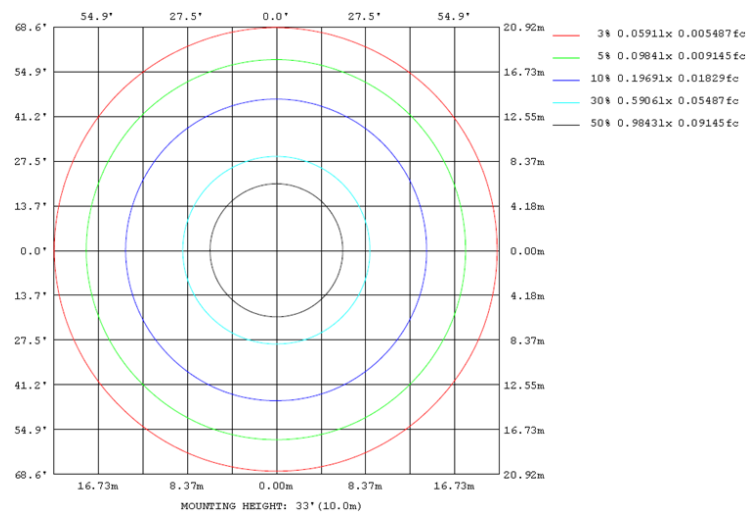
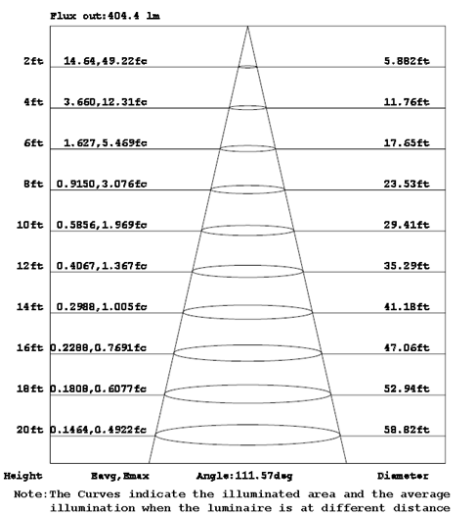
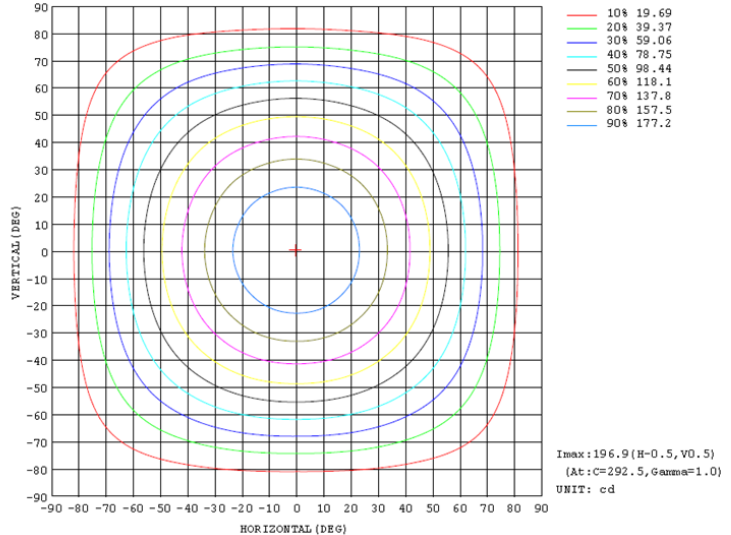
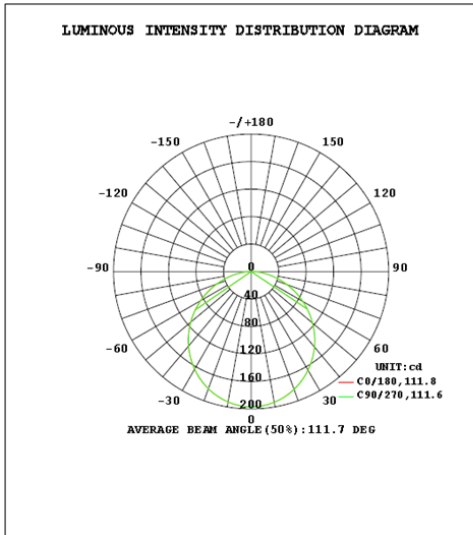


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	152.0	27.1%
0-40	248.5	44.3%
0-60	438.5	78.3%
60-90	121.8	21.7%
70-100	52.5	9.4%
90-120	0.0	0.0%
0-90	560.3	100.0%
90-180	0.0	0.0%
0-180	560.3	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.6	3.3%	90-100	0.0	0.0%
10-20	53.1	9.5%	100-110	0.0	0.0%
20-30	80.3	14.3%	110-120	0.0	0.0%
30-40	96.5	17.2%	120-130	0.0	0.0%
40-50	99.9	17.8%	130-140	0.0	0.0%
50-60	90.2	16.1%	140-150	0.0	0.0%
60-70	69.3	12.4%	150-160	0.0	0.0%
70-80	40.9	7.3%	160-170	0.0	0.0%
80-90	11.6	2.1%	170-180	0.0	0.0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-01-08	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFR4/RGB	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030035	120.0	60	0.071	7.83	0.913

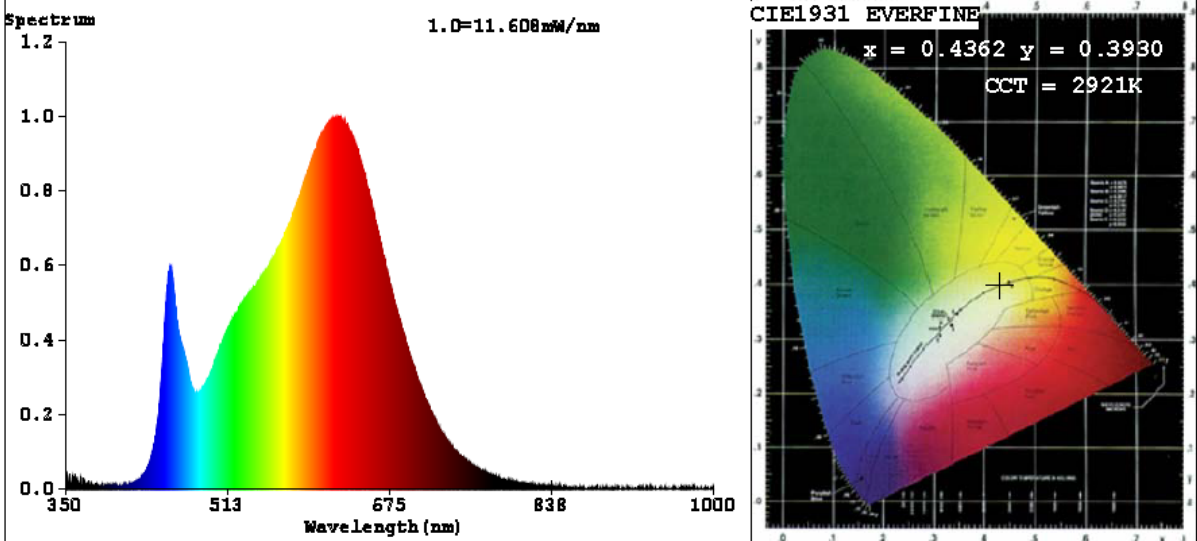
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	67
Frequency (Hz)	60	R2	99	R10	98
CCT (K)	2921	R3	97	R11	96
Duv	-0.0044	R4	94	R12	83
Chromaticity (x, y)	x=0.4362 y=0.3930	R5	96	R13	98
Chromaticity (u', v')	u'=0.2549 v'=0.5168	R6	95	R14	99
Color Rendering Index (CRI)	93.8	R7	90	R15	93
R9	67	R8	83	--	--

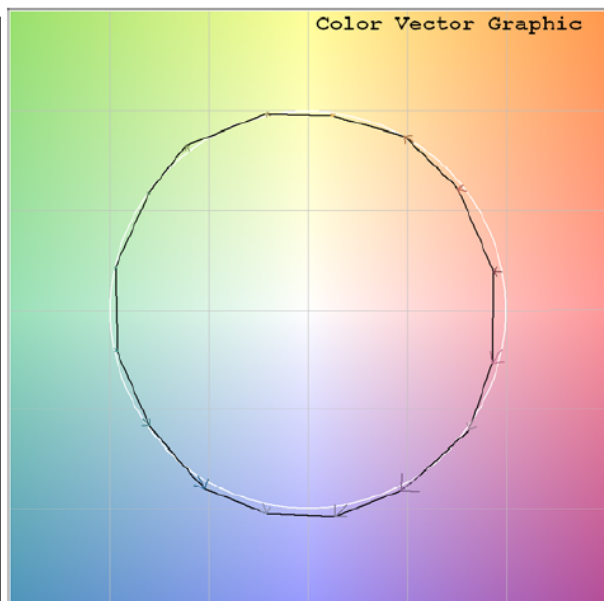
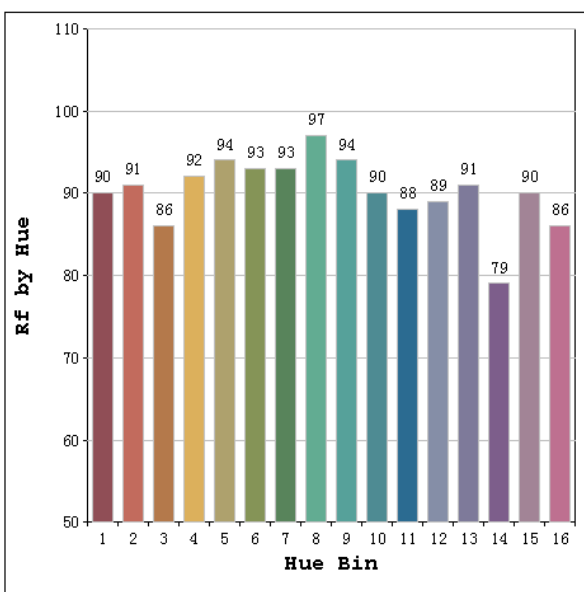
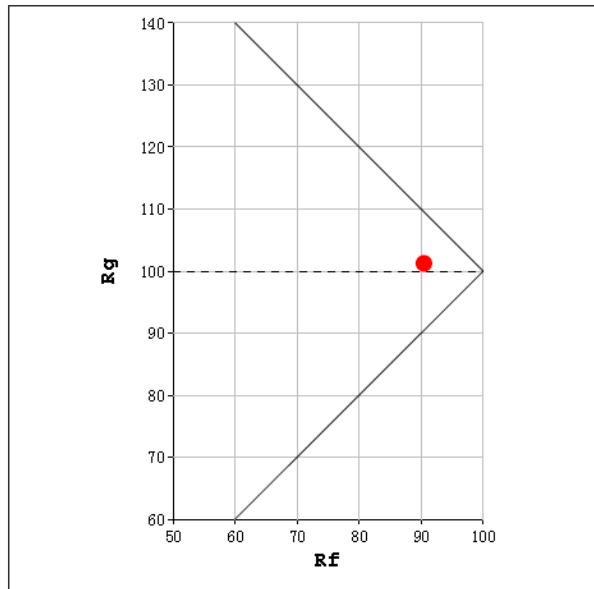
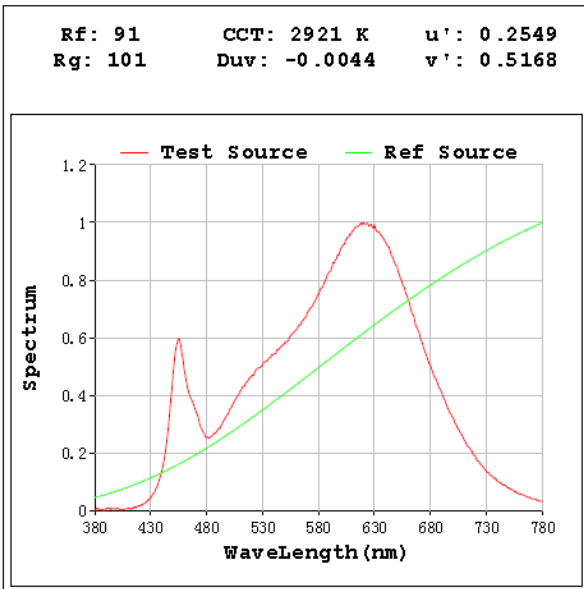
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	564.0
Luminous Efficacy (lm/W)	72.03
Beam Angle (°)	111.7
Center Beam Candle Power (cd)	198.1

Spectral Power Distribution & Chromaticity Diagram



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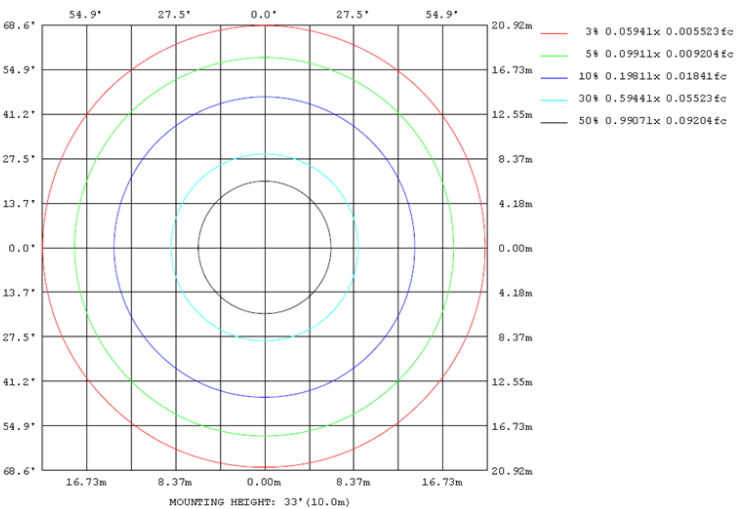
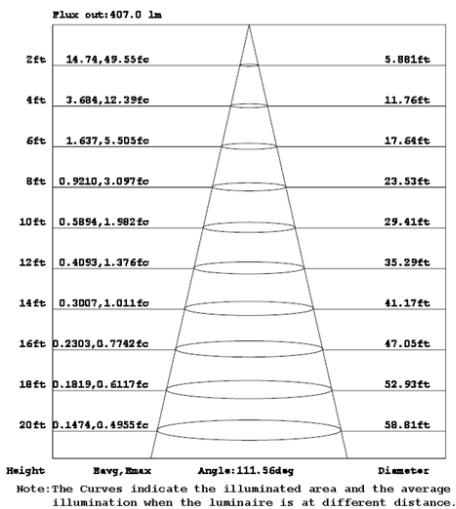
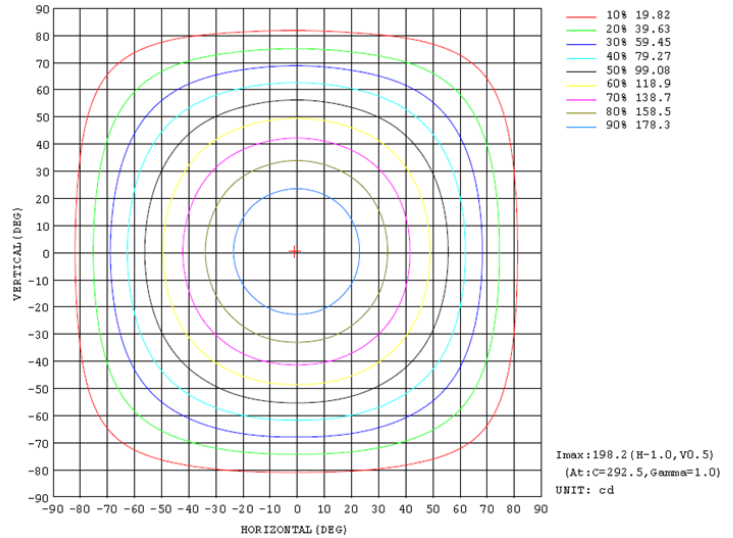
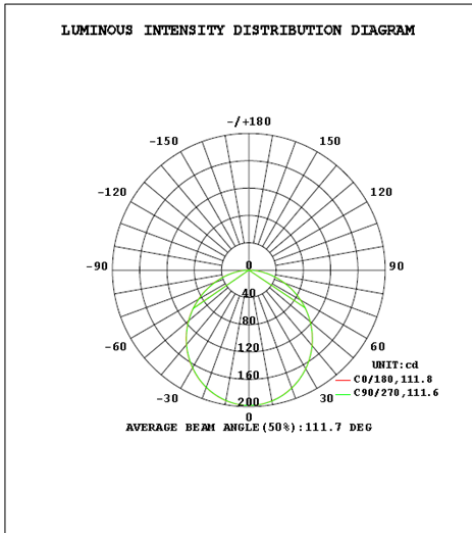


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	153.1	27.6%
0-40	250.5	45.2%
0-60	443.1	79.9%
60-90	111.6	20.1%
70-100	43.3	7.8%
90-120	0.0	0.0%
0-90	554.7	100.0%
90-180	0.0	0.0%
0-180	554.7	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.7	3.4%	90-100	0.0	0.0%
10-20	53.5	9.6%	100-110	0.0	0.0%
20-30	80.9	14.6%	110-120	0.0	0.0%
30-40	97.4	17.6%	120-130	0.0	0.0%
40-50	101.2	18.2%	130-140	0.0	0.0%
50-60	91.3	16.5%	140-150	0.0	0.0%
60-70	68.3	12.3%	150-160	0.0	0.0%
70-80	36.6	6.6%	160-170	0.0	0.0%
80-90	6.7	1.2%	170-180	0.0	0.0%

Photometric Data



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-01-08	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFR4/RGB	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030035	120.0	60	0.071	7.85	0.913

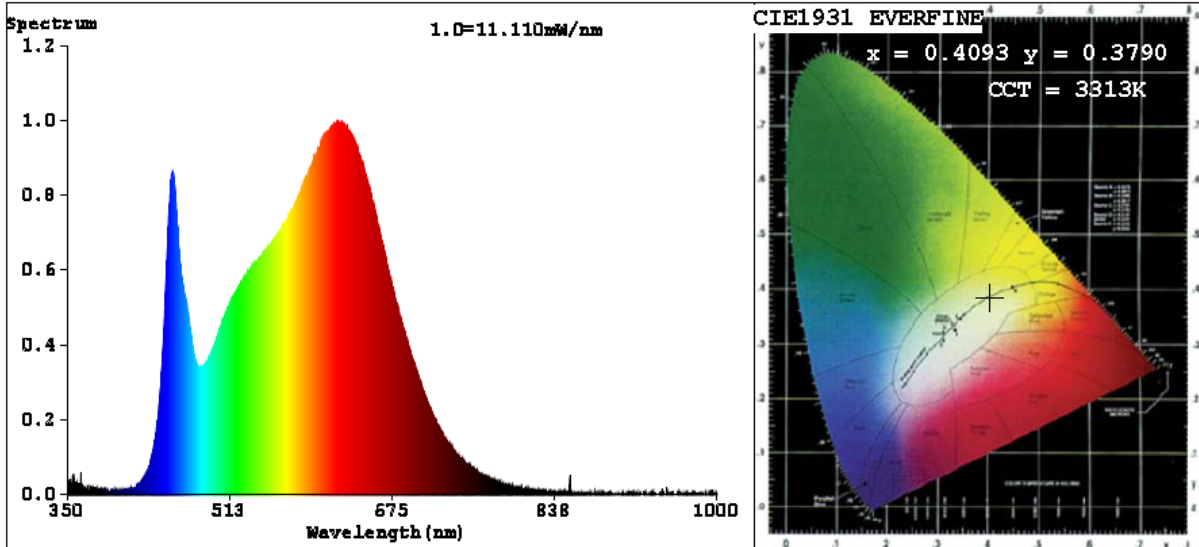
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	78
Frequency (Hz)	60	R2	97	R10	97
CCT (K)	3313	R3	97	R11	96
Duv	-0.0060	R4	96	R12	80
Chromaticity (x, y)	x=0.4093 y=0.3790	R5	97	R13	99
Chromaticity (u', v')	u'=0.2433 v'=0.5069	R6	94	R14	99
Color Rendering Index (CRI)	94.9	R7	92	R15	97
R9	78	R8	88	--	--

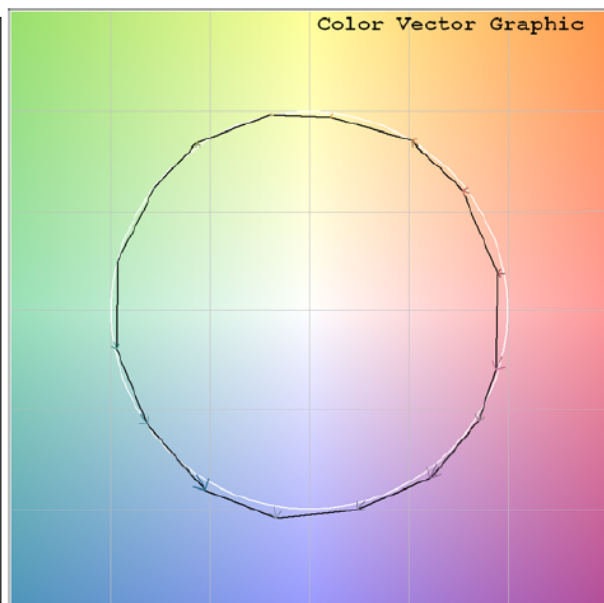
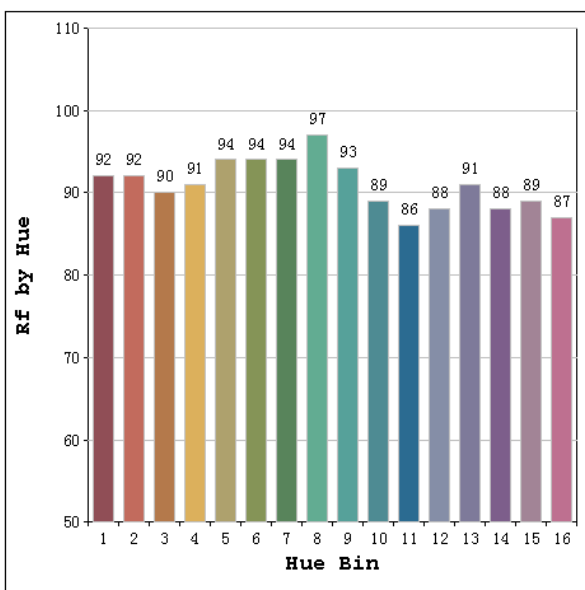
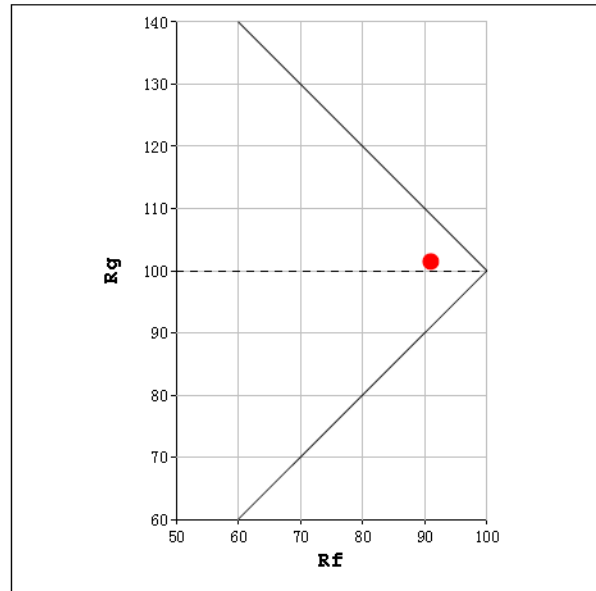
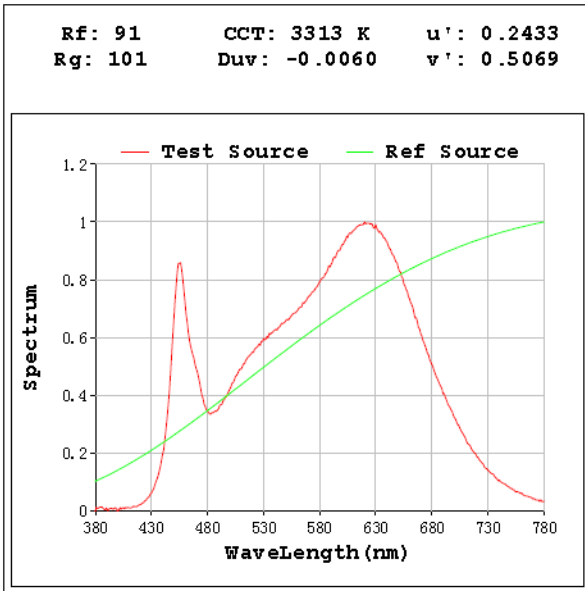
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	568.0
Luminous Efficacy (lm/W)	72.36
Beam Angle (°)	111.7
Center Beam Candle Power (cd)	199.5

Spectral Power Distribution & Chromaticity Diagram



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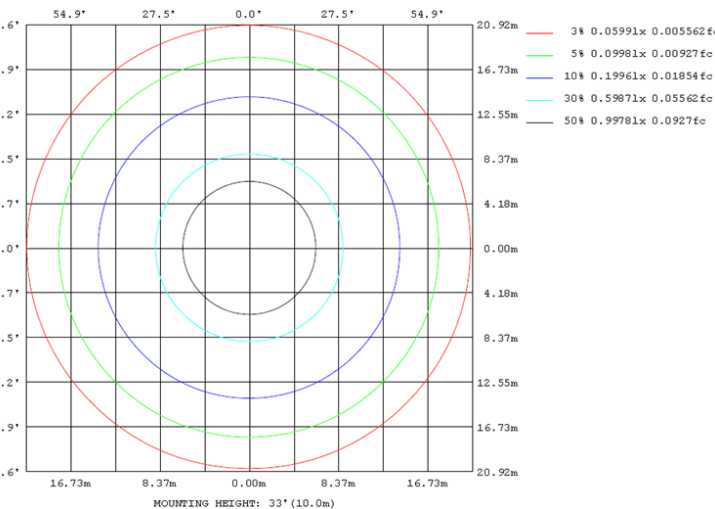
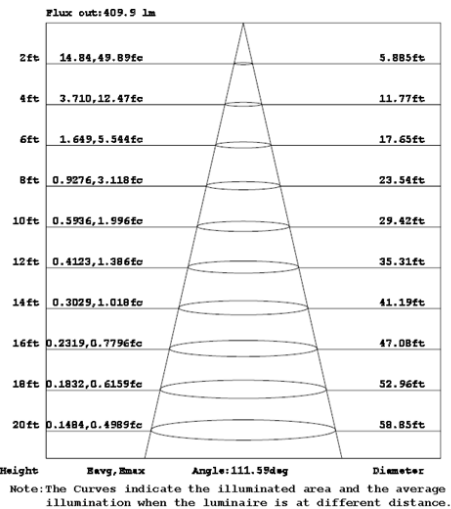
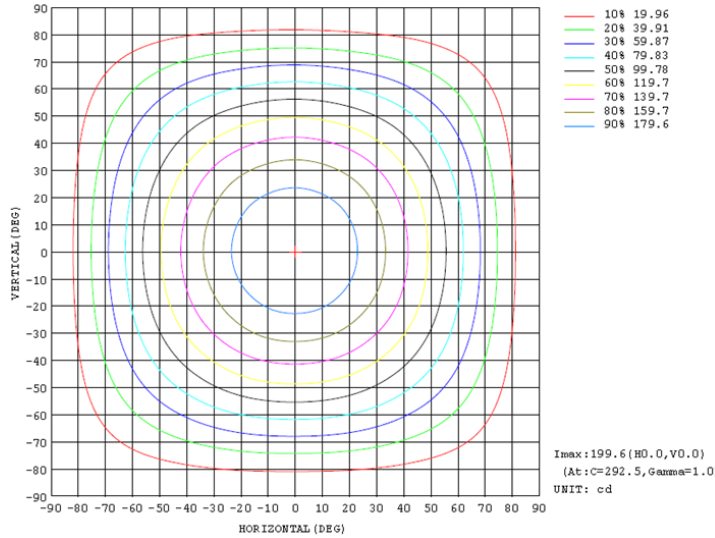
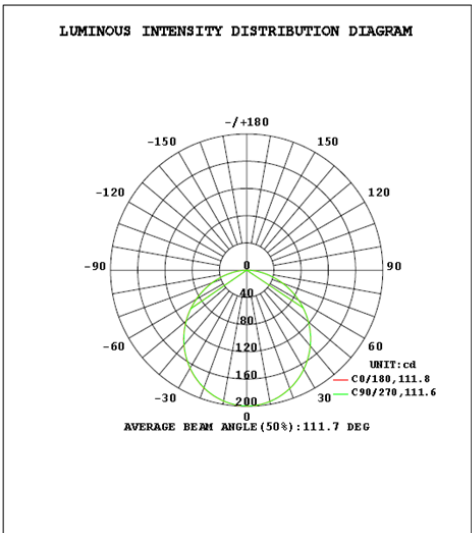


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	154.1	27.1%
0-40	251.8	44.3%
0-60	444.6	78.3%
60-90	123.4	21.7%
70-100	53.2	9.4%
90-120	0.0	0.0%
0-90	568.0	100.0%
90-180	0.0	0.0%
0-180	568.0	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.9	3.3%	90-100	0.0	0.0%
10-20	53.9	9.5%	100-110	0.0	0.0%
20-30	81.4	14.3%	110-120	0.0	0.0%
30-40	97.8	17.2%	120-130	0.0	0.0%
40-50	101.2	17.8%	130-140	0.0	0.0%
50-60	91.5	16.1%	140-150	0.0	0.0%
60-70	70.3	12.4%	150-160	0.0	0.0%
70-80	41.5	7.3%	160-170	0.0	0.0%
80-90	11.7	2.1%	170-180	0.0	0.0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-01-08	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFR4/RGB	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030035	120.0	60	0.071	7.86	0.913

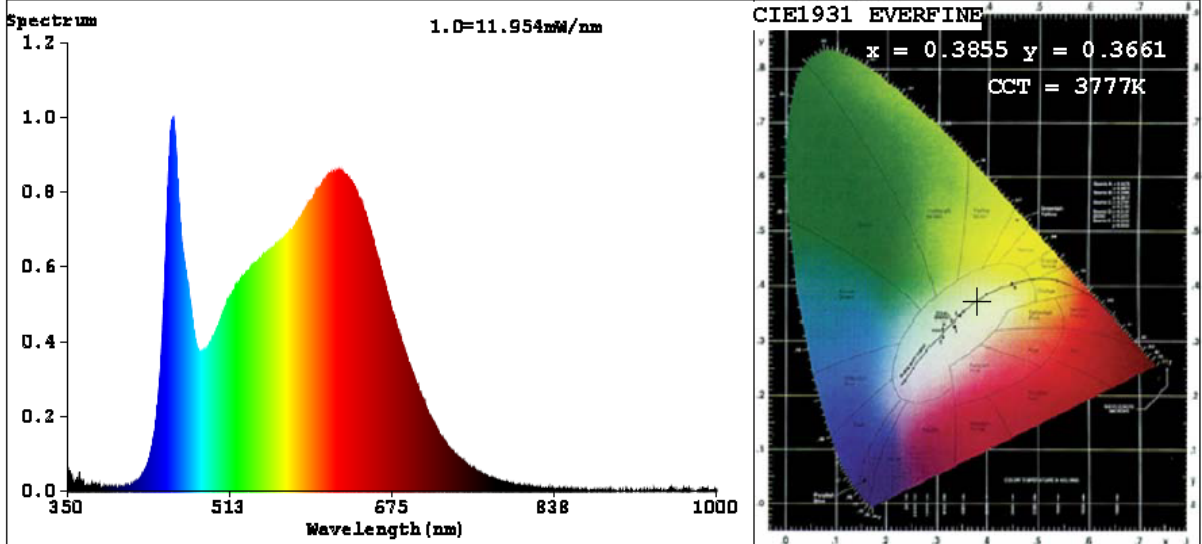
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	87
Frequency (Hz)	60	R2	97	R10	96
CCT (K)	3777	R3	97	R11	97
Duv	-0.0065	R4	96	R12	76
Chromaticity (x, y)	x=0.3855 y=0.3661	R5	96	R13	97
Chromaticity (u', v')	u'=0.2329 v'=0.4975	R6	93	R14	100
Color Rendering Index (CRI)	95.2	R7	93	R15	98
R9	87	R8	92	--	--

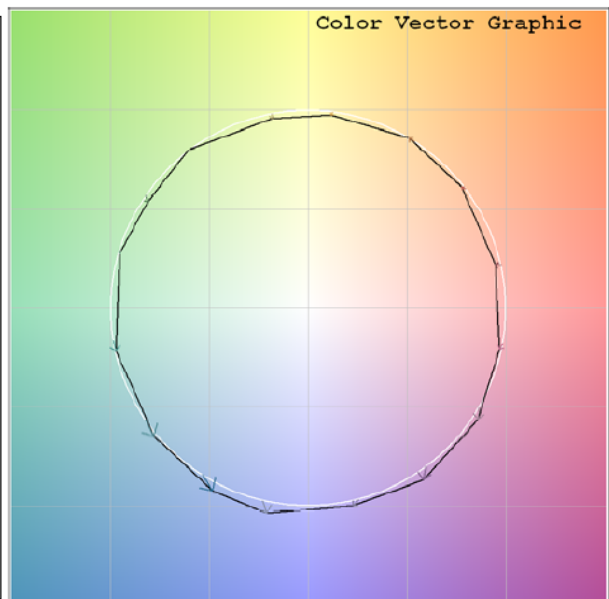
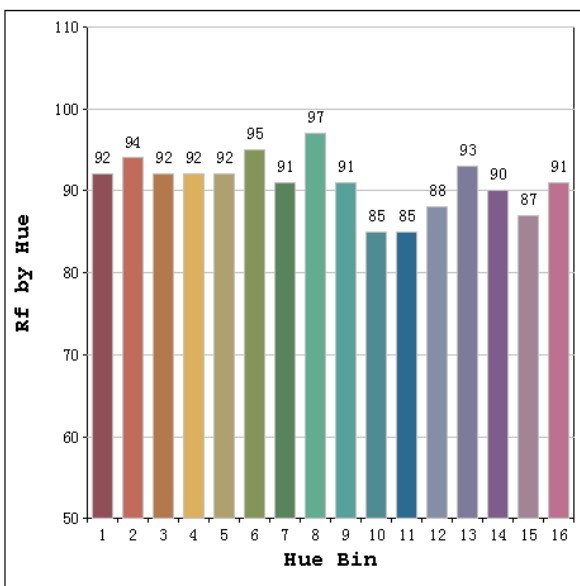
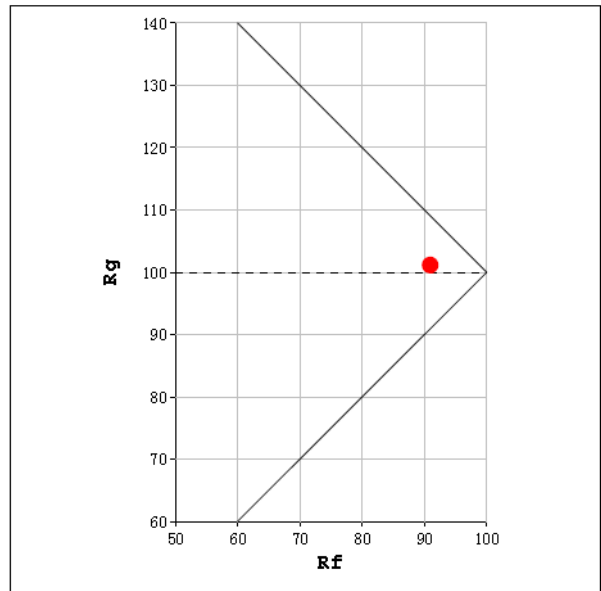
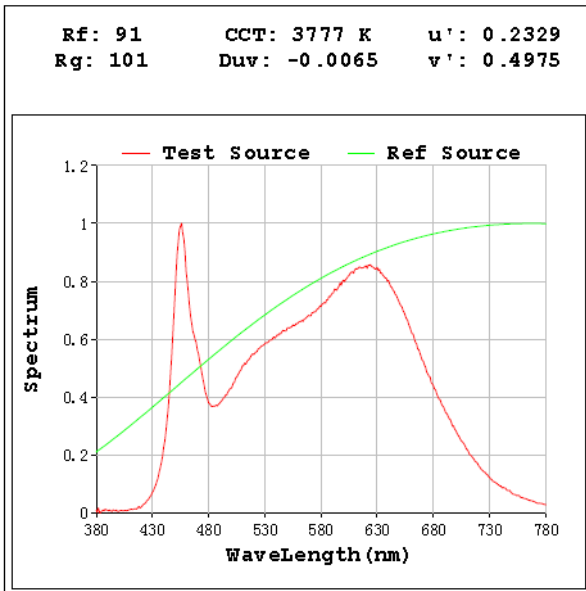
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	570.7
Luminous Efficacy (lm/W)	72.61
Beam Angle (°)	111.7
Center Beam Candle Power (cd)	200.4

Spectral Power Distribution & Chromaticity Diagram



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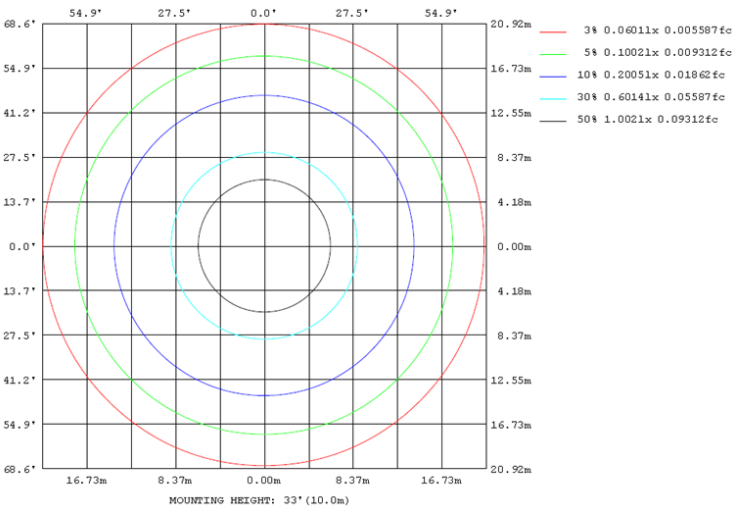
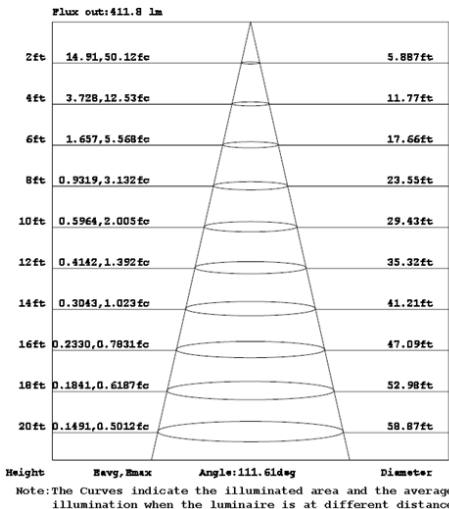
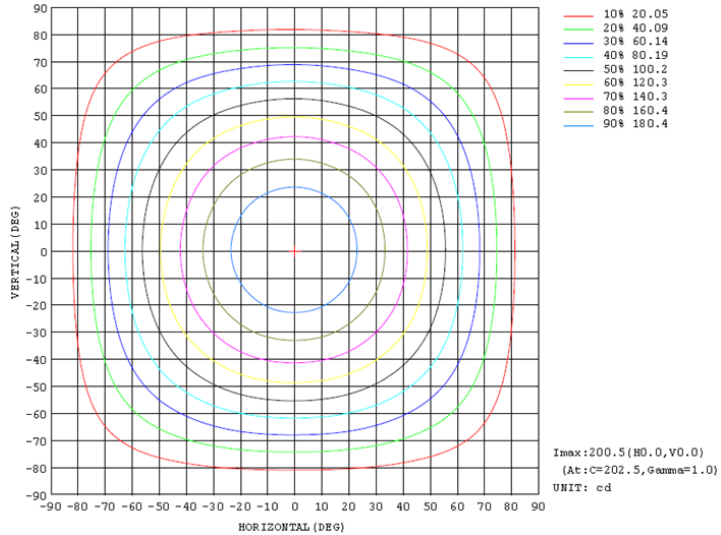
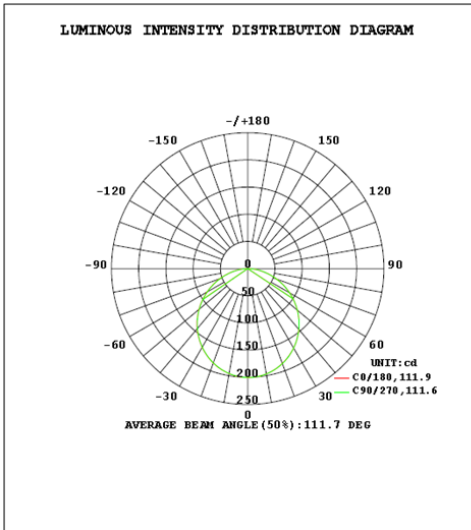


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	154.8	27.1%
0-40	253.0	44.3%
0-60	446.6	78.3%
60-90	124.1	21.7%
70-100	53.5	9.4%
90-120	0.0	0.0%
0-90	570.7	100.0%
90-180	0.0	0.0%
0-180	570.7	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.9	3.3%	90-100	0.0	0.0%
10-20	54.1	9.5%	100-110	0.0	0.0%
20-30	81.7	14.3%	110-120	0.0	0.0%
30-40	98.2	17.2%	120-130	0.0	0.0%
40-50	101.7	17.8%	130-140	0.0	0.0%
50-60	91.9	16.1%	140-150	0.0	0.0%
60-70	70.6	12.4%	150-160	0.0	0.0%
70-80	41.7	7.3%	160-170	0.0	0.0%
80-90	11.8	2.1%	170-180	0.0	0.0%

Photometric Data



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-01-08	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFR4/RGB	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030035	120.0	60	0.071	7.89	0.914

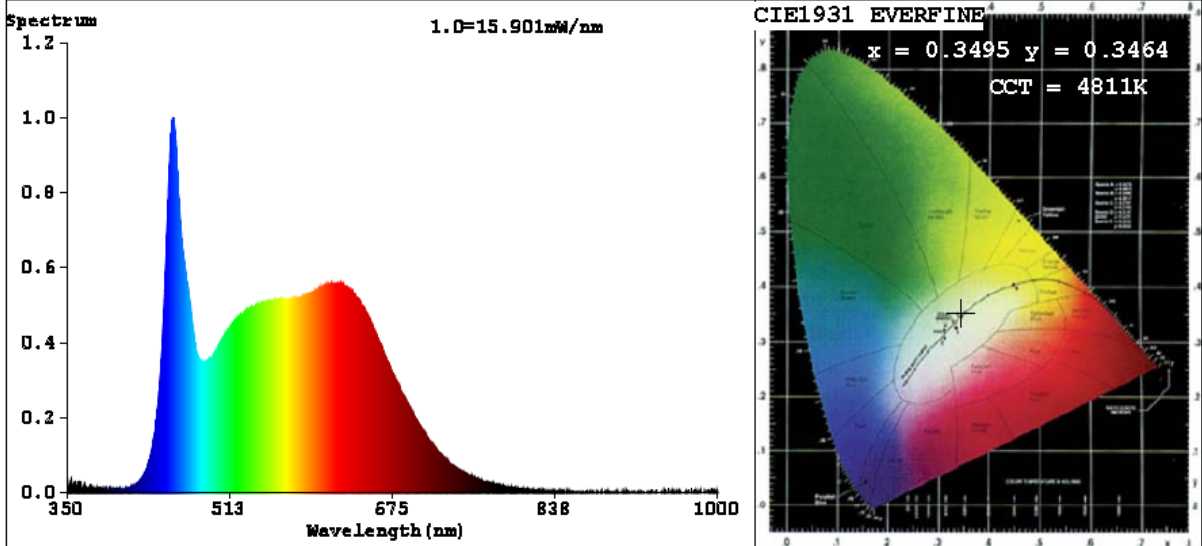
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	95
Frequency (Hz)	60	R2	97	R10	97
CCT (K)	4811	R3	98	R11	96
Duv	-0.0044	R4	93	R12	69
Chromaticity (x, y)	x=0.3495 y=0.3464	R5	94	R13	97
Chromaticity (u', v')	u'=0.2165 v'=0.4827	R6	93	R14	100
Color Rendering Index (CRI)	94.8	R7	93	R15	95
R9	95	R8	93	--	--

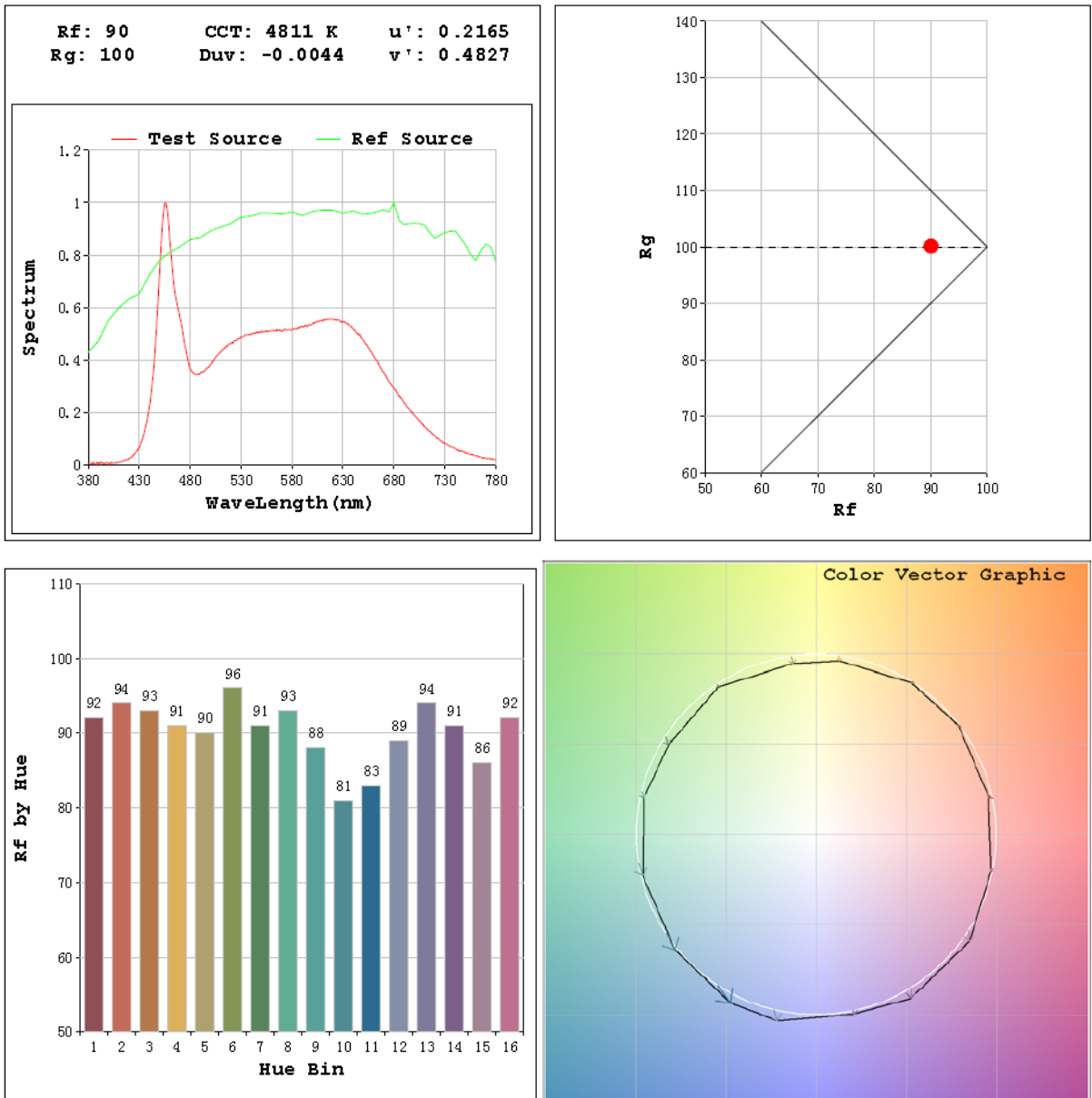
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	574.9
Luminous Efficacy (lm/W)	72.86
Beam Angle (°)	111.8
Center Beam Candle Power (cd)	201.8

Spectral Power Distribution & Chromaticity Diagram



TM30

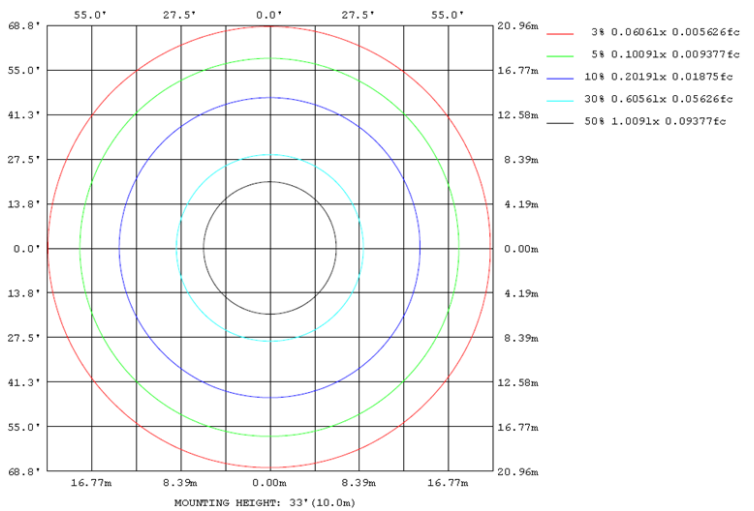
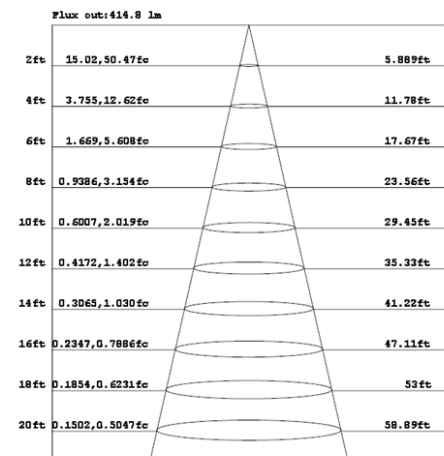
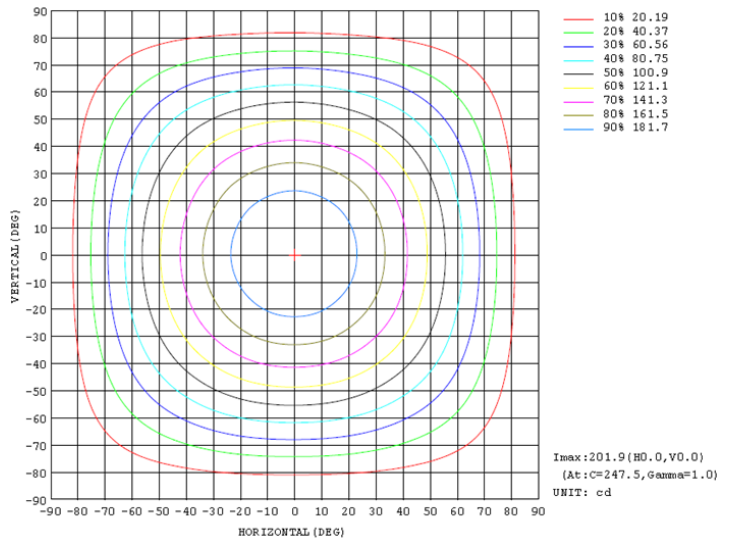
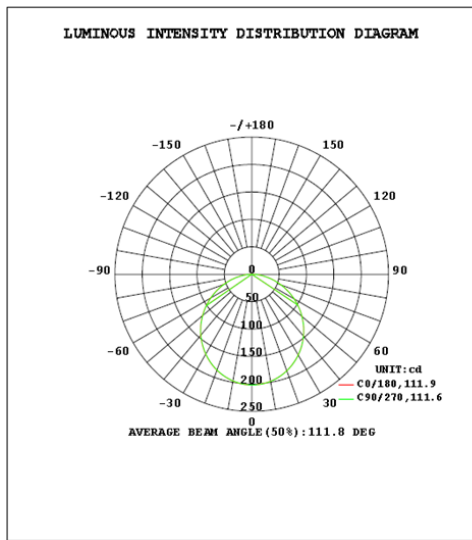


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	155.9	27.1%
0-40	254.8	44.3%
0-60	449.9	78.3%
60-90	125.0	21.7%
70-100	53.9	9.4%
90-120	0.0	0.0%
0-90	574.9	100.0%
90-180	0.0	0.0%
0-180	574.9	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	19.1	3.3%	90-100	0.0	0.0%
10-20	54.5	9.5%	100-110	0.0	0.0%
20-30	82.3	14.3%	110-120	0.0	0.0%
30-40	99.0	17.2%	120-130	0.0	0.0%
40-50	102.5	17.8%	130-140	0.0	0.0%
50-60	92.6	16.1%	140-150	0.0	0.0%
60-70	71.1	12.4%	150-160	0.0	0.0%
70-80	42.0	7.3%	160-170	0.0	0.0%
80-90	11.9	2.1%	170-180	0.0	0.0%

Photometric Data



2.1.6 Electrical, Photometric and Chromaticity Measurements

Test date	2024-01-08	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WFR4/RGB	6500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030035	120.0	60	0.072	7.90	0.914

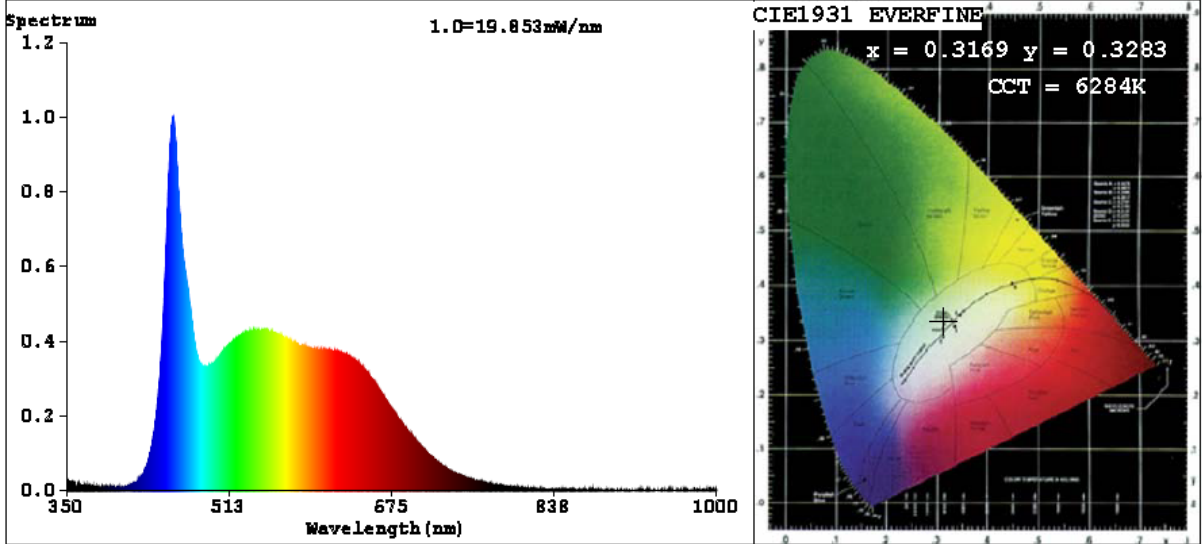
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	92
Frequency (Hz)	60	R2	98	R10	99
CCT (K)	6284	R3	98	R11	93
Duv	0.0007	R4	91	R12	67
Chromaticity (x, y)	x=0.3169 y=0.3283	R5	93	R13	99
Chromaticity (u', v')	u'=0.2010 v'=0.4685	R6	94	R14	100
Color Rendering Index (CRI)	94.3	R7	92	R15	94
R9	92	R8	92	--	--

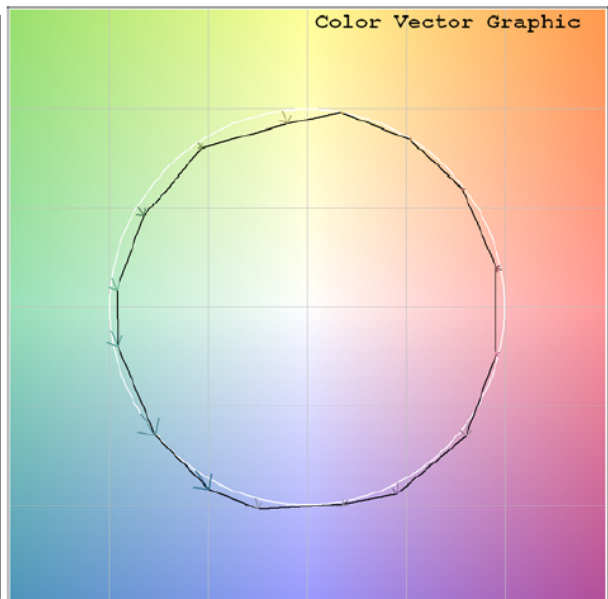
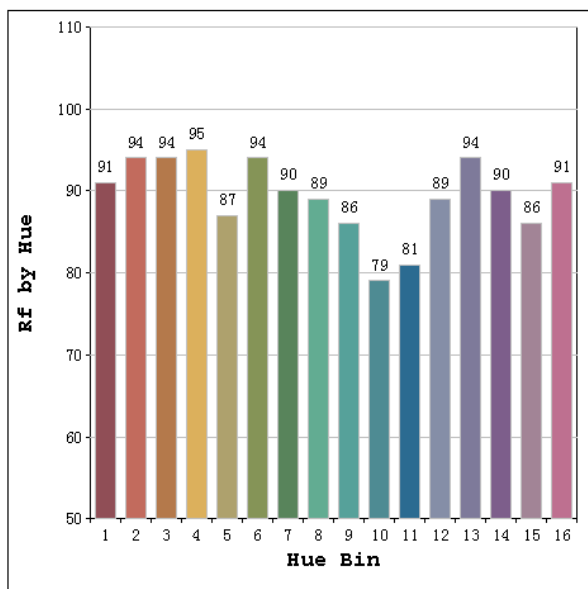
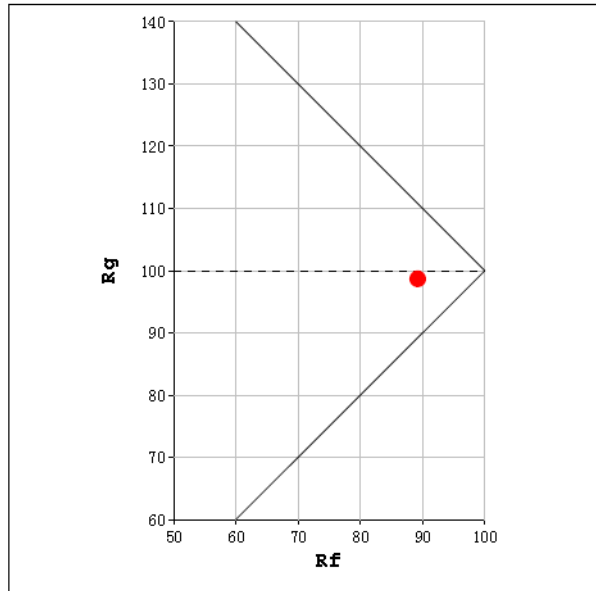
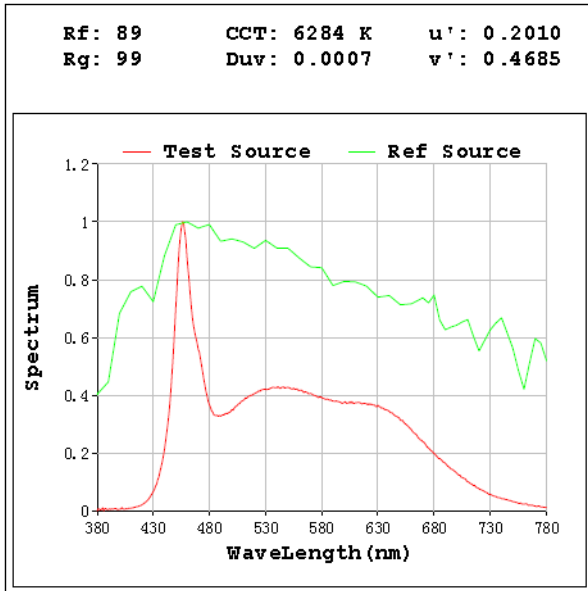
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	574.1
Luminous Efficacy (lm/W)	72.66
Beam Angle (°)	111.8
Center Beam Candle Power (cd)	201.5

Spectral Power Distribution & Chromaticity Diagram



TM30



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	155.6	27.1%
0-40	254.4	44.3%
0-60	449.2	78.2%
60-90	124.9	21.8%
70-100	53.8	9.4%
90-120	0.0	0.0%
0-90	574.1	100.0%
90-180	0.0	0.0%
0-180	574.1	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	19.0	3.3%	90-100	0.0	0.0%
10-20	54.4	9.5%	100-110	0.0	0.0%
20-30	82.2	14.3%	110-120	0.0	0.0%
30-40	98.8	17.2%	120-130	0.0	0.0%
40-50	102.3	17.8%	130-140	0.0	0.0%
50-60	92.5	16.1%	140-150	0.0	0.0%
60-70	71.0	12.4%	150-160	0.0	0.0%
70-80	42.0	7.3%	160-170	0.0	0.0%
80-90	11.9	2.1%	170-180	0.0	0.0%

Photometric Data

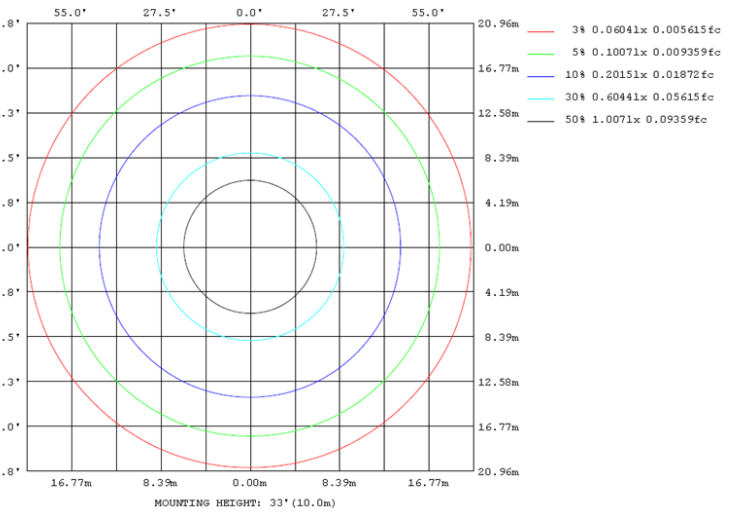
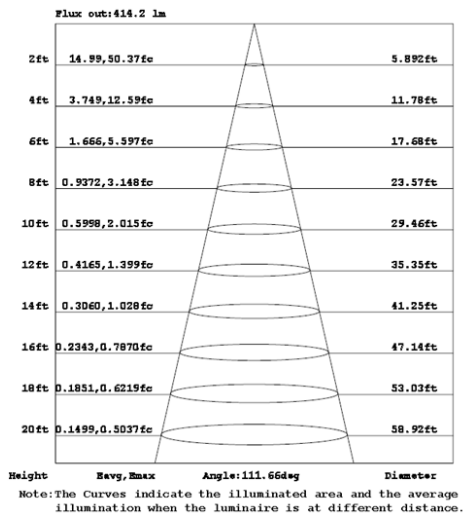
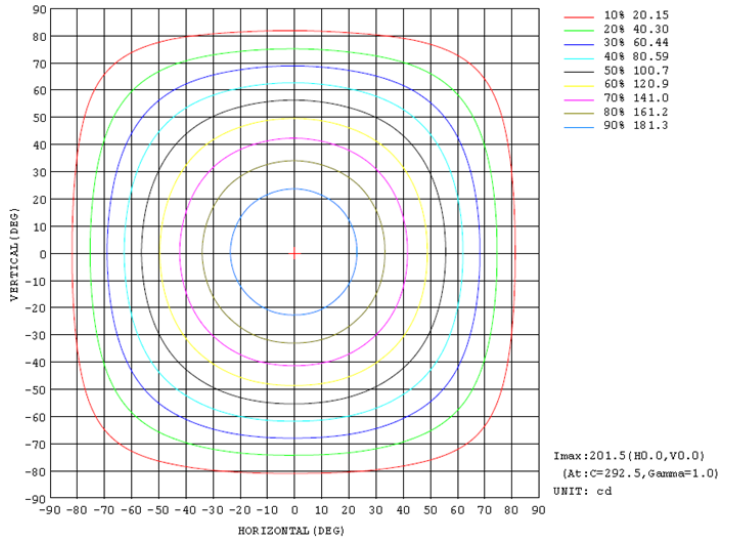
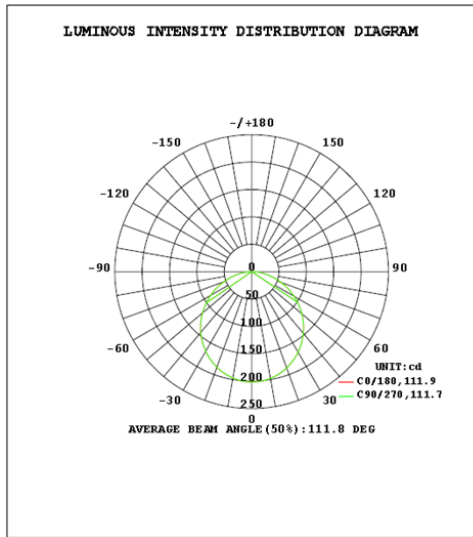


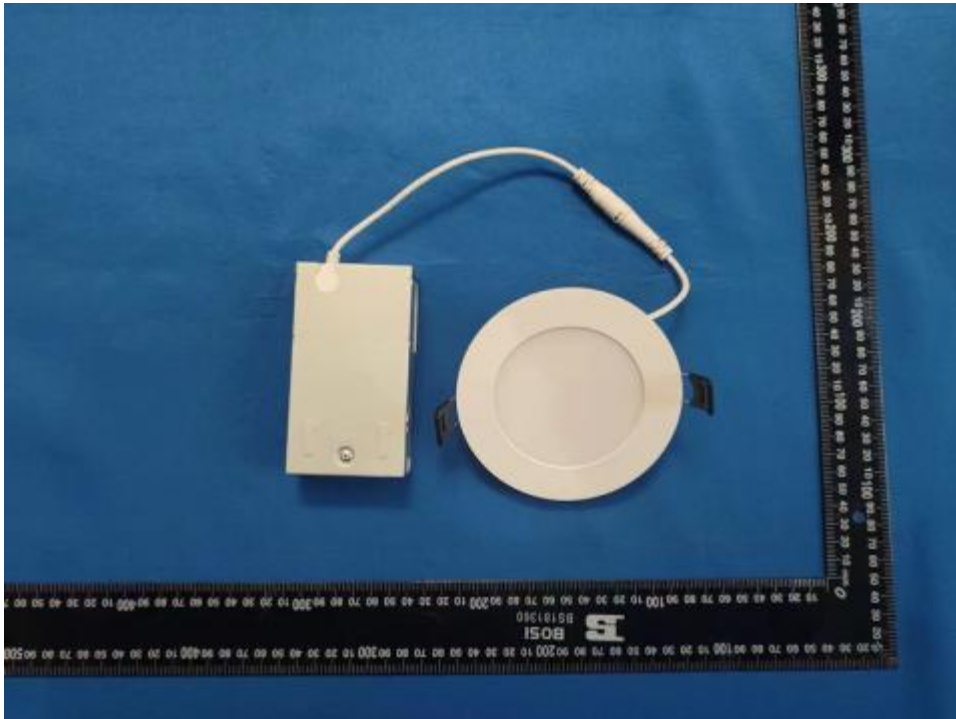
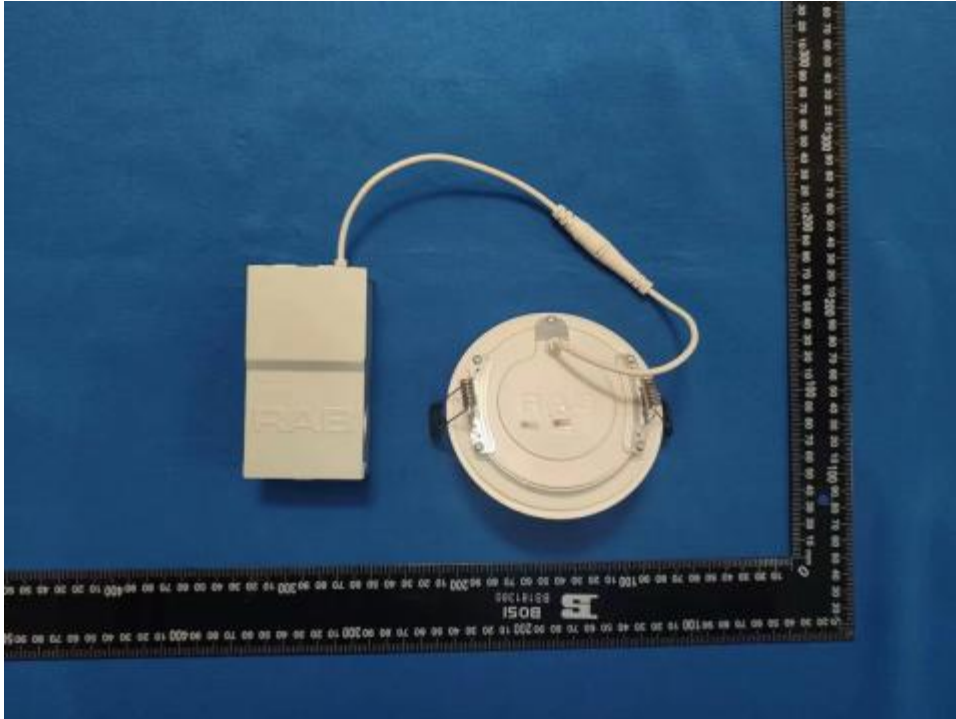
Table--1

UNIT: cd

C (DEG) \ T (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	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201			
5	200	200	200	200	200	200	200	200	201	201	201	201	201	201	201	200			
10	197	197	197	197	197	197	197	197	198	198	198	198	198	198	198	198			
15	192	192	192	192	192	192	192	193	193	193	193	193	193	193	193	193			
20	186	186	186	186	186	186	186	186	187	187	187	187	187	187	187	186			
25	178	178	177	178	177	178	178	178	179	179	179	179	179	179	179	178			
30	168	168	168	168	168	168	168	169	170	170	170	170	170	169	169	169			
35	157	157	157	157	157	157	157	158	159	159	159	159	159	158	158	158			
40	145	145	145	145	145	145	145	146	147	147	147	147	147	146	146	146			
45	132	132	131	131	131	132	132	133	134	134	134	134	134	133	133	132			
50	118	118	117	117	117	118	118	119	120	120	120	120	120	119	119	118			
55	102	103	102	102	102	103	103	104	105	105	105	105	105	104	104	103			
60	86.8	86.9	86.2	86.5	86.2	86.9	87.1	88.2	89.3	89.2	89.7	89.1	89.2	88.4	88.4	87.7			
65	70.7	70.9	70.2	70.4	70.1	70.9	71.1	72.2	73.3	73.2	73.7	73.1	73.1	72.3	72.3	71.6			
70	54.6	54.7	54.0	54.3	53.9	54.7	54.9	56.0	57.1	57.1	57.6	56.8	56.9	56.1	56.1	55.4			
75	38.8	38.9	38.2	38.4	38.0	38.7	38.9	40.0	41.1	41.1	41.5	40.9	40.8	40.1	40.1	39.5			
80	23.5	23.7	23.0	23.2	22.7	23.5	23.7	24.8	25.8	25.8	26.2	25.6	25.5	24.8	24.8	24.2			
85	9.62	9.62	9.12	9.21	8.98	9.51	9.75	10.6	11.6	11.6	12.0	11.5	11.4	10.8	10.8	10.2			
90	0.28	0.27	0.27	0.27	0.27	0.27	0.26	0.27	0.31	0.35	0.36	0.36	0.33	0.32	0.28	0.27			

Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
WFR4/RGB	2700K setting	120.0	560.3	7.81	71.74
	3000K setting	120.0	564.0	7.83	72.03
	3500K setting	120.0	568.0	7.85	72.36
	4000K setting	120.0	570.7	7.86	72.61
	5000K setting	120.0	574.9	7.89	72.86
	6500K setting	120.0	574.1	7.90	72.66

3. Product Photo



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