

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):
WFR4B/RGB

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

**Type of
Luminaire:** Downlights

Report Date: 2024-01-10

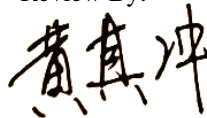
Prepared By:

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	WFR4B/RGB	2700K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030037	120.0	60	0.070	7.73	0.912

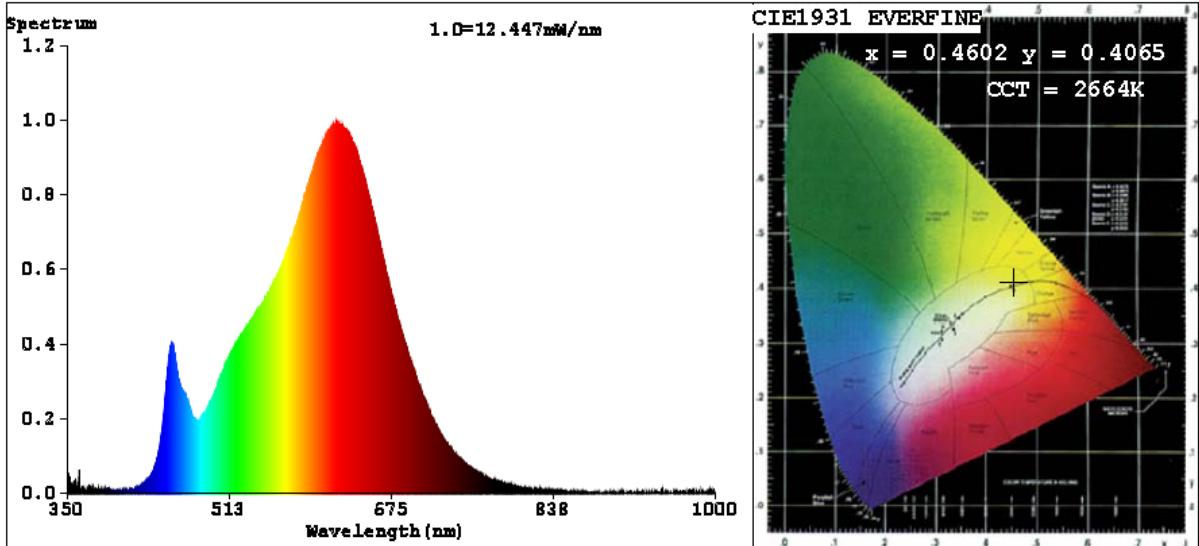
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	54
Frequency (Hz)	60	R2	98	R10	95
CCT (K)	2664	R3	97	R11	93
Duv	-0.0015	R4	92	R12	85
Chromaticity (x, y)	x=0.4602 y=0.4065	R5	93	R13	95
Chromaticity (u', v')	u'=0.2646 v'=0.5258	R6	97	R14	100
Color Rendering Index (CRI)	92.1	R7	89	R15	88
R9	54	R8	78	--	--

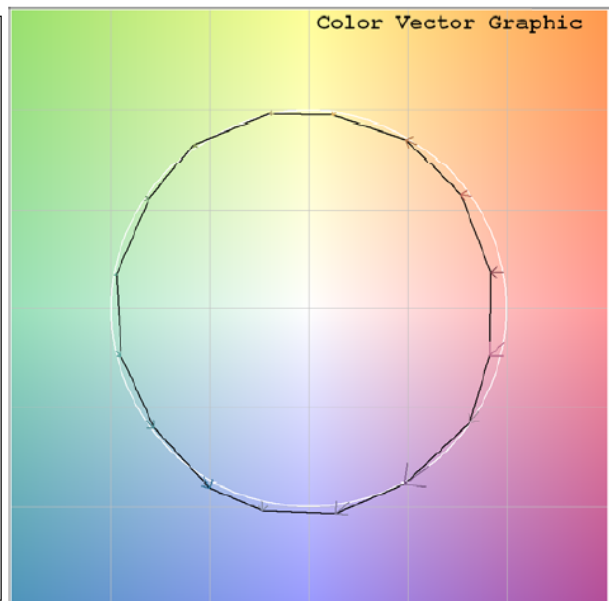
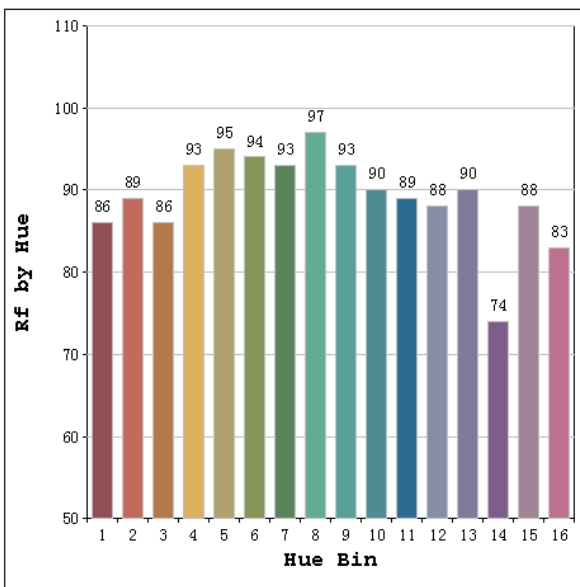
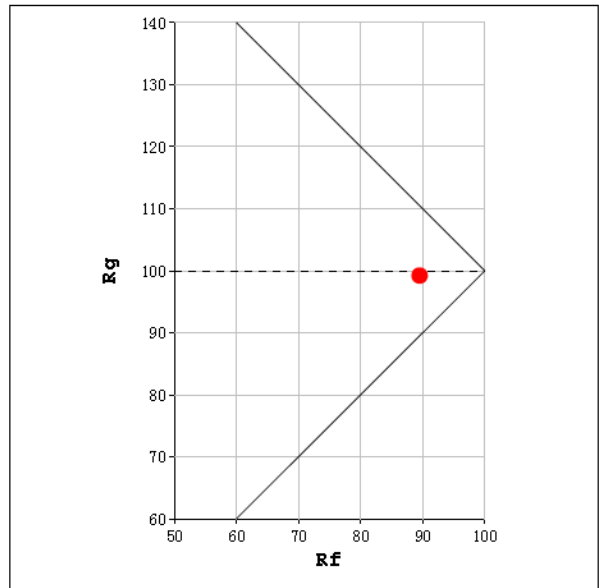
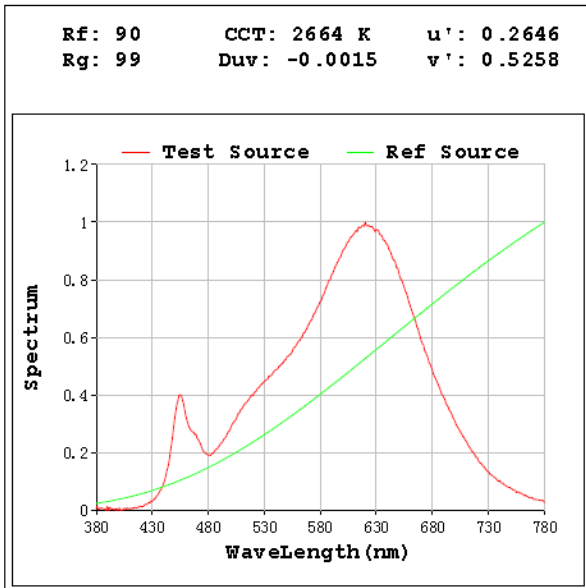
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	551.2
Luminous Efficacy (lm/W)	71.31
Beam Angle (°)	112.2
Center Beam Candle Power (cd)	196.3

Spectral Power Distribution & Chromaticity Diagram



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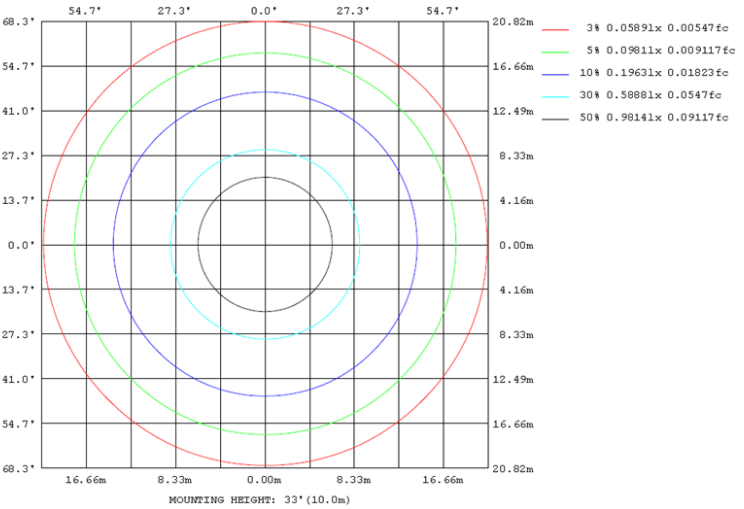
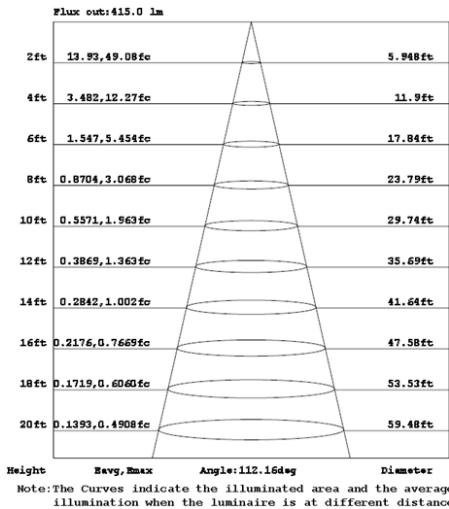
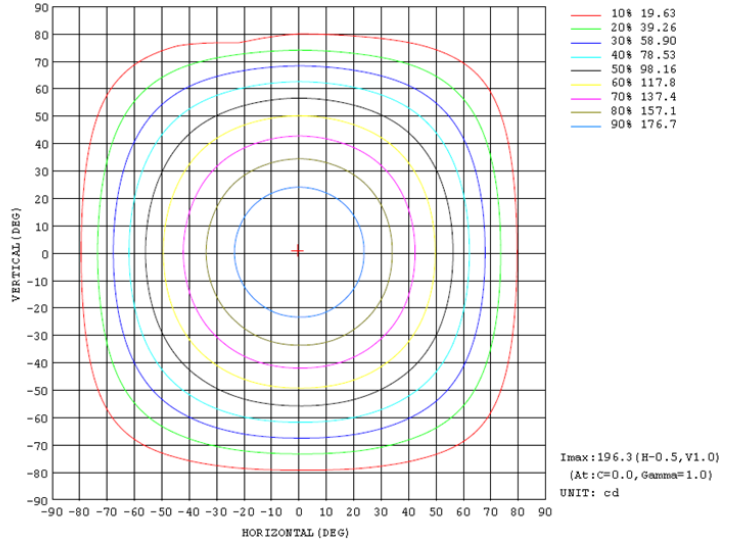
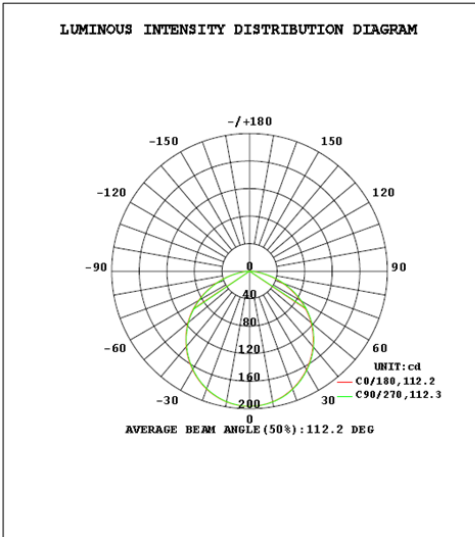


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	152.1	27.6%
0-40	249.0	45.2%
0-60	440.3	79.9%
60-90	110.9	20.1%
70-100	43.0	7.8%
90-120	0.0	0.0%
0-90	551.2	100.0%
90-180	0.0	0.0%
0-180	551.2	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.6	3.4%	90-100	0.0	0.0%
10-20	53.1	9.6%	100-110	0.0	0.0%
20-30	80.4	14.6%	110-120	0.0	0.0%
30-40	96.9	17.6%	120-130	0.0	0.0%
40-50	100.6	18.2%	130-140	0.0	0.0%
50-60	90.8	16.5%	140-150	0.0	0.0%
60-70	67.9	12.3%	150-160	0.0	0.0%
70-80	36.3	6.6%	160-170	0.0	0.0%
80-90	6.7	1.2%	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	WFR4B/RGB	3000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030037	120.0	60	0.070	7.75	0.912

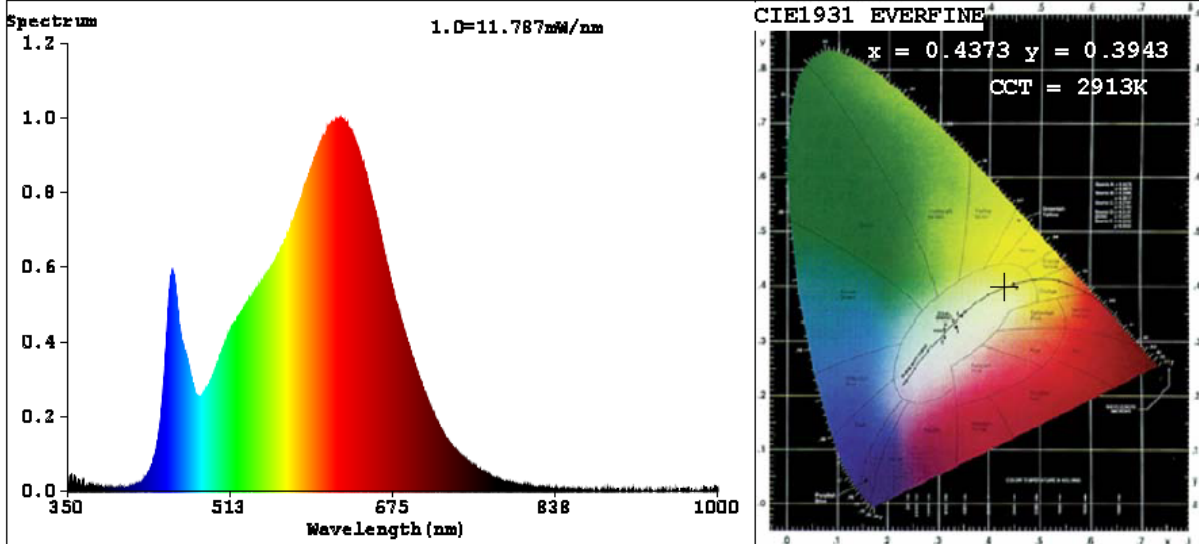
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	64
Frequency (Hz)	60	R2	99	R10	98
CCT (K)	2913	R3	96	R11	95
Duv	-0.0040	R4	93	R12	83
Chromaticity (x, y)	x=0.4373 y=0.3943	R5	96	R13	97
Chromaticity (u', v')	u'=0.2551 v'=0.5174	R6	95	R14	99
Color Rendering Index (CRI)	93.4	R7	90	R15	92
R9	64	R8	82	--	--

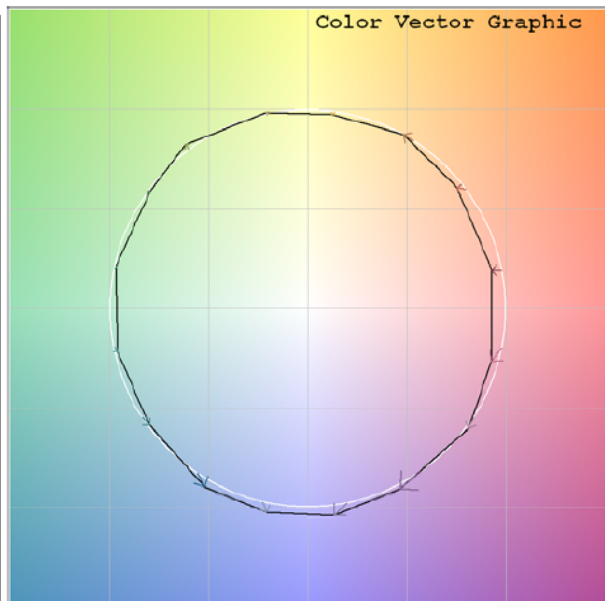
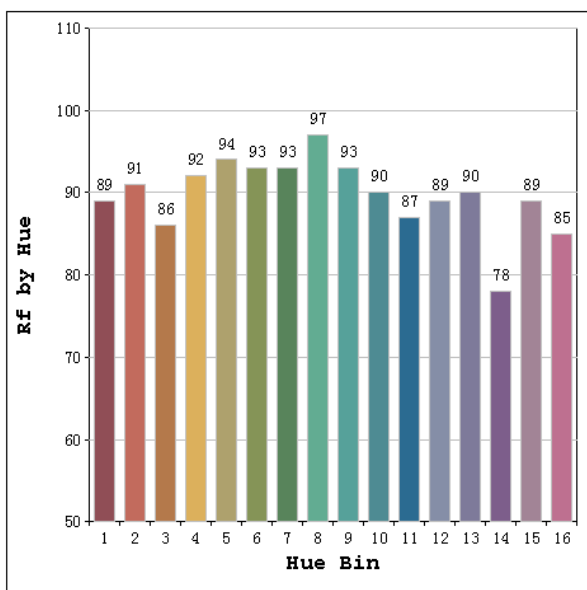
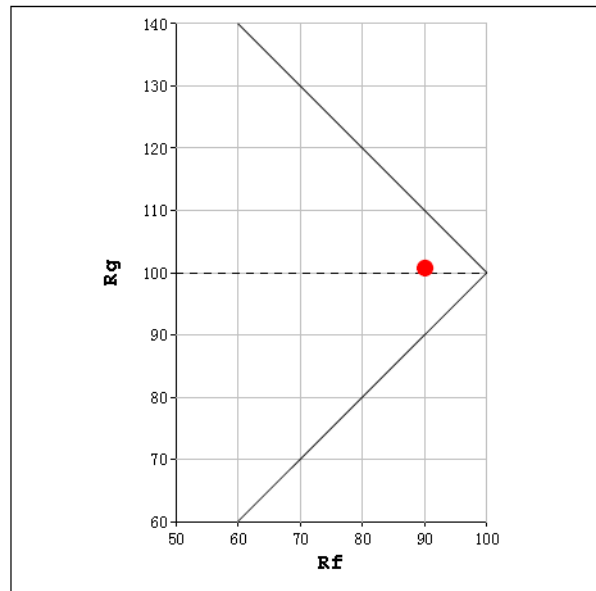
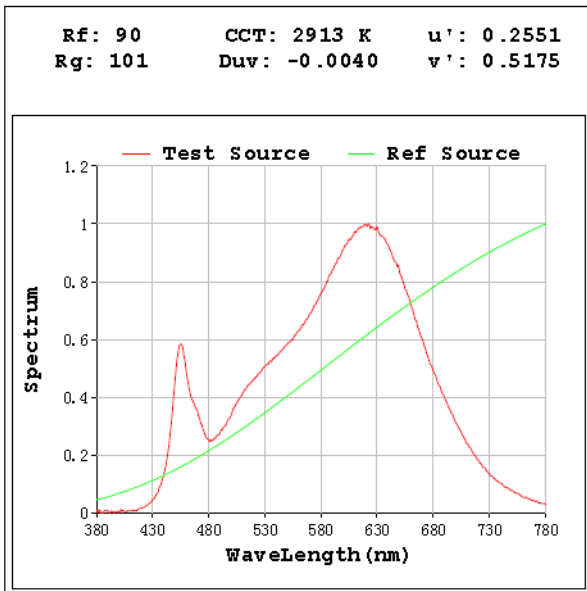
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	554.7
Luminous Efficacy (lm/W)	71.57
Beam Angle (°)	112.2
Center Beam Candle Power (cd)	197.5

Spectral Power Distribution & Chromaticity Diagram



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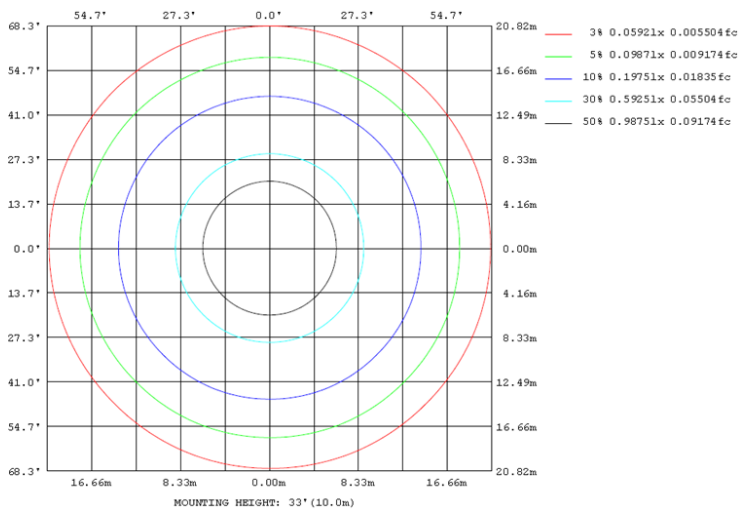
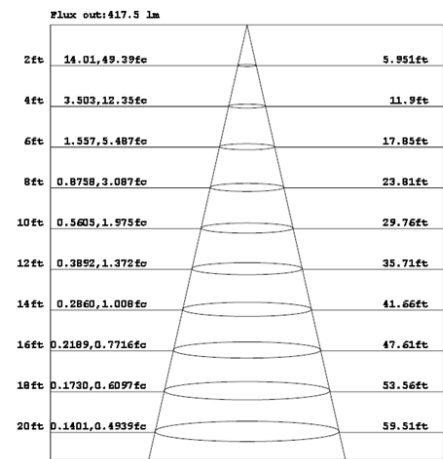
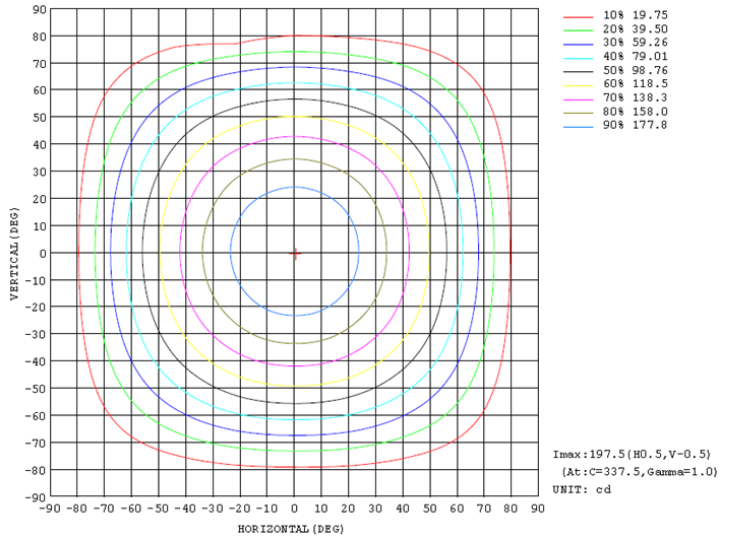
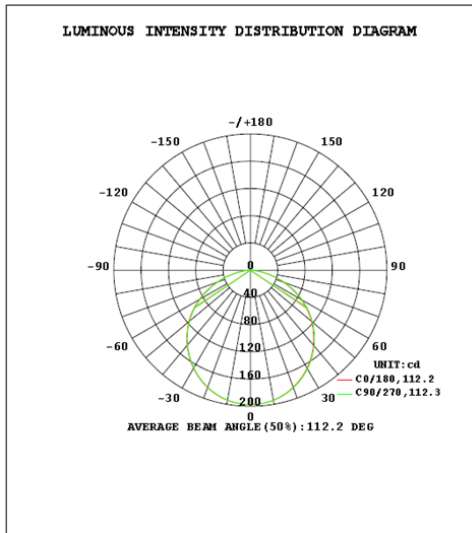


Zonal Lumen Tabulation

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	WFR4B/RGB	3500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030037	120.0	60	0.070	7.76	0.913

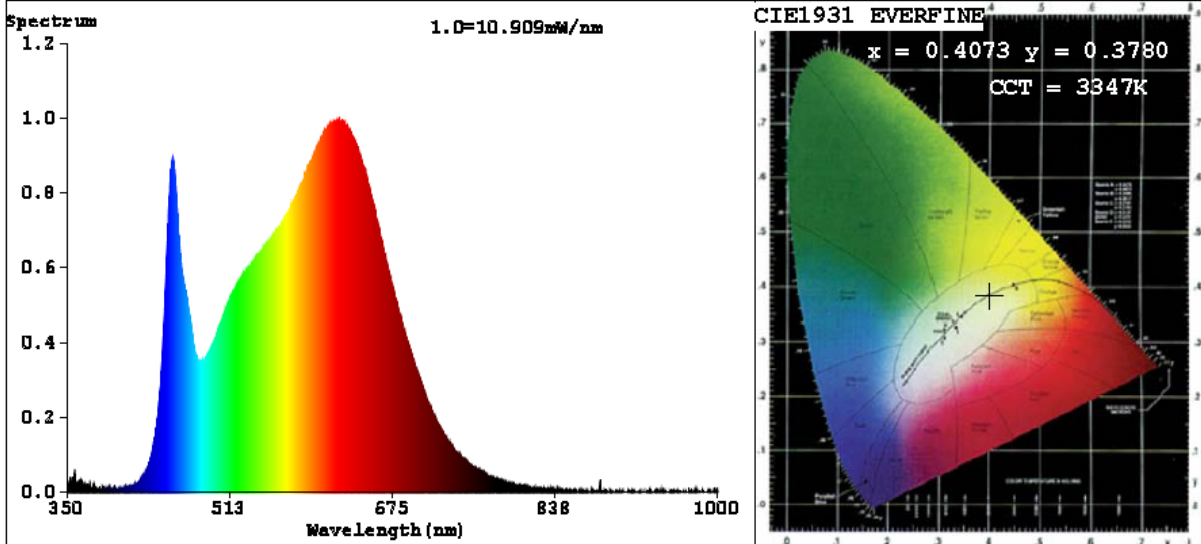
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	77
Frequency (Hz)	60	R2	97	R10	97
CCT (K)	3347	R3	97	R11	96
Duv	-0.0061	R4	95	R12	79
Chromaticity (x, y)	x=0.4073 y=0.3780	R5	97	R13	99
Chromaticity (u', v')	u'=0.2424 v'=0.5061	R6	94	R14	99
Color Rendering Index (CRI)	94.6	R7	91	R15	97
R9	77	R8	88	--	--

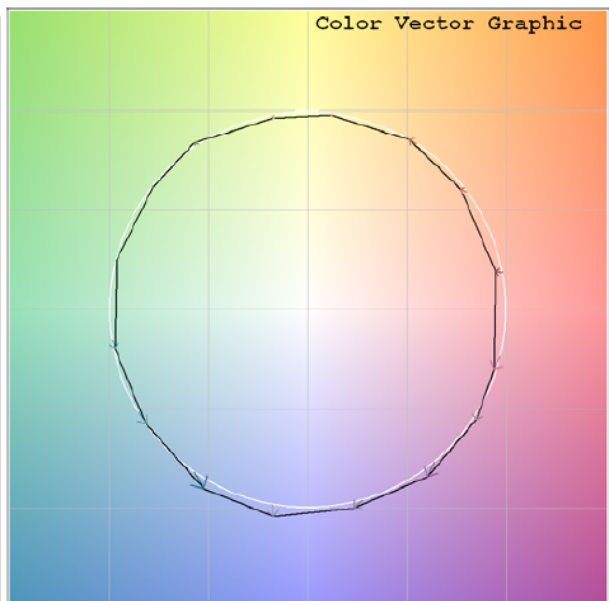
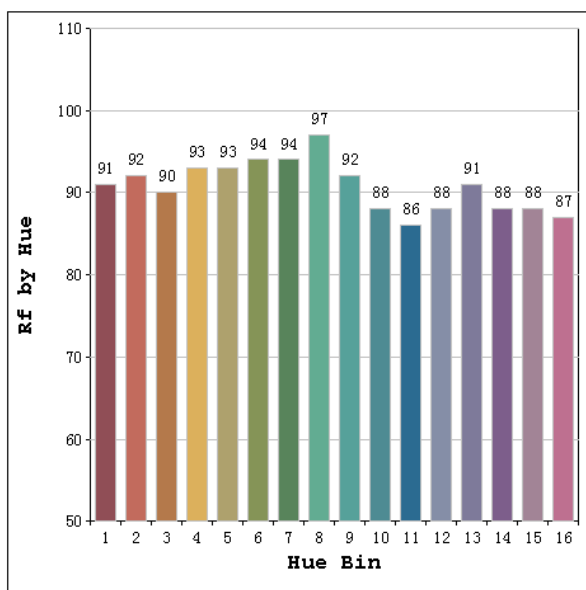
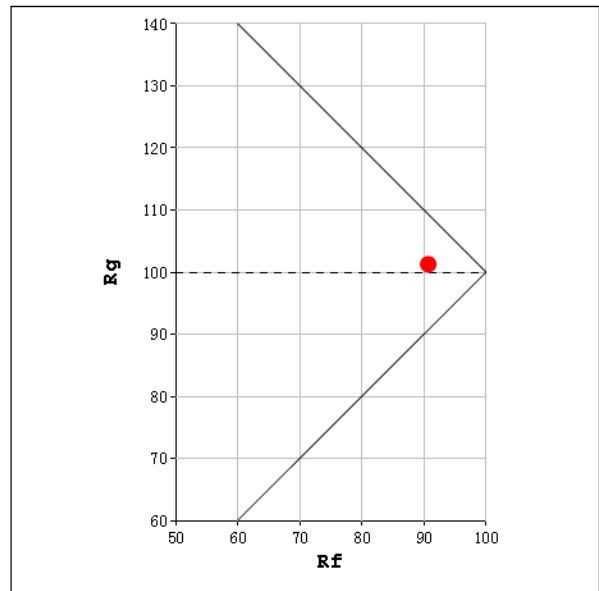
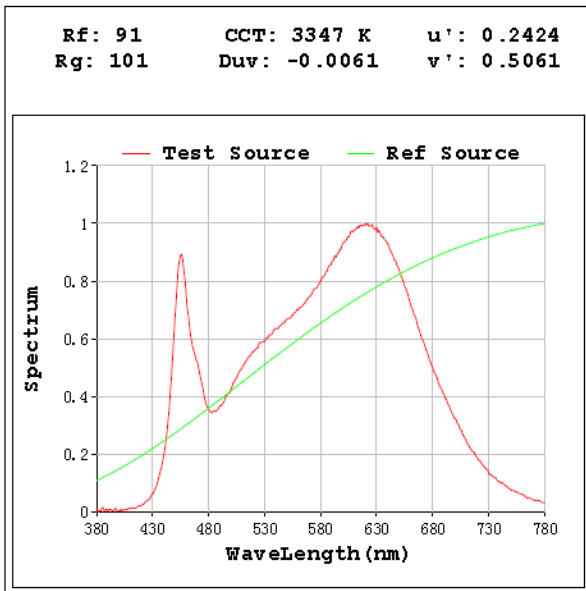
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	558.4
Luminous Efficacy (lm/W)	71.96
Beam Angle (°)	112.3
Center Beam Candle Power (cd)	198.8

Spectral Power Distribution & Chromaticity Diagram



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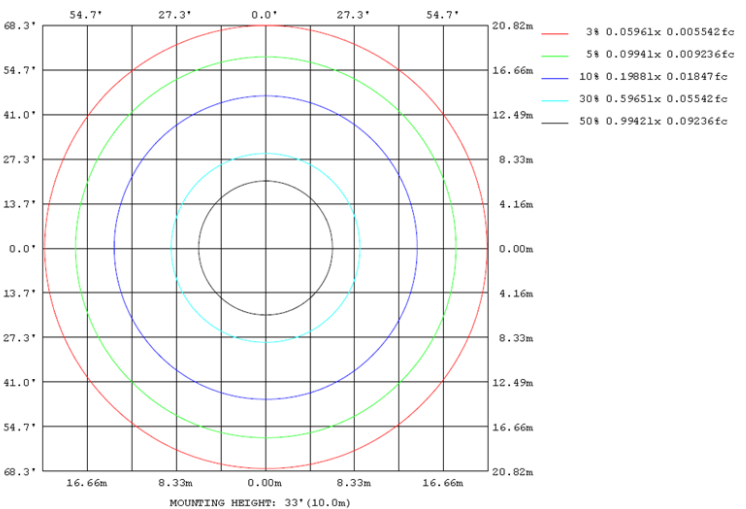
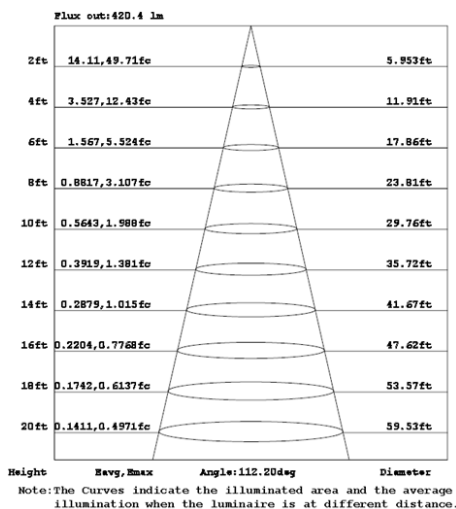
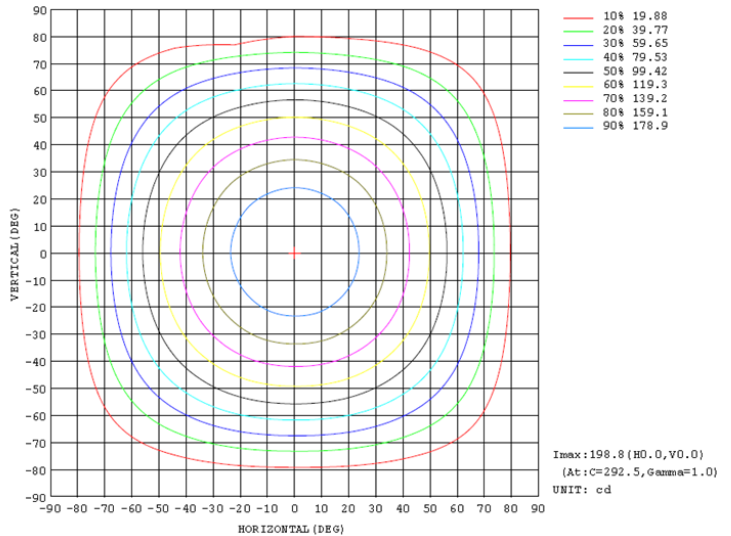
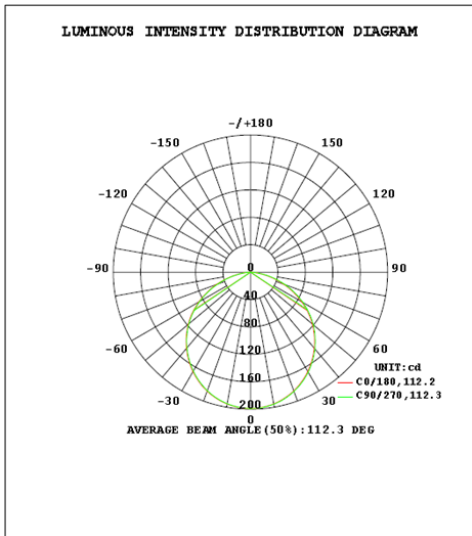


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	154.1	27.6%
0-40	252.2	45.2%
0-60	446.1	79.9%
60-90	112.4	20.1%
70-100	43.6	7.8%
90-120	0.0	0.0%
0-90	558.4	100.0%
90-180	0.0	0.0%
0-180	558.4	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.8	3.4%	90-100	0.0	0.0%
10-20	53.8	9.6%	100-110	0.0	0.0%
20-30	81.5	14.6%	110-120	0.0	0.0%
30-40	98.1	17.6%	120-130	0.0	0.0%
40-50	101.9	18.2%	130-140	0.0	0.0%
50-60	92.0	16.5%	140-150	0.0	0.0%
60-70	68.8	12.3%	150-160	0.0	0.0%
70-80	36.8	6.6%	160-170	0.0	0.0%
80-90	6.8	1.2%	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	WFR4B/RGB	4000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030037	120.0	60	0.071	7.78	0.913

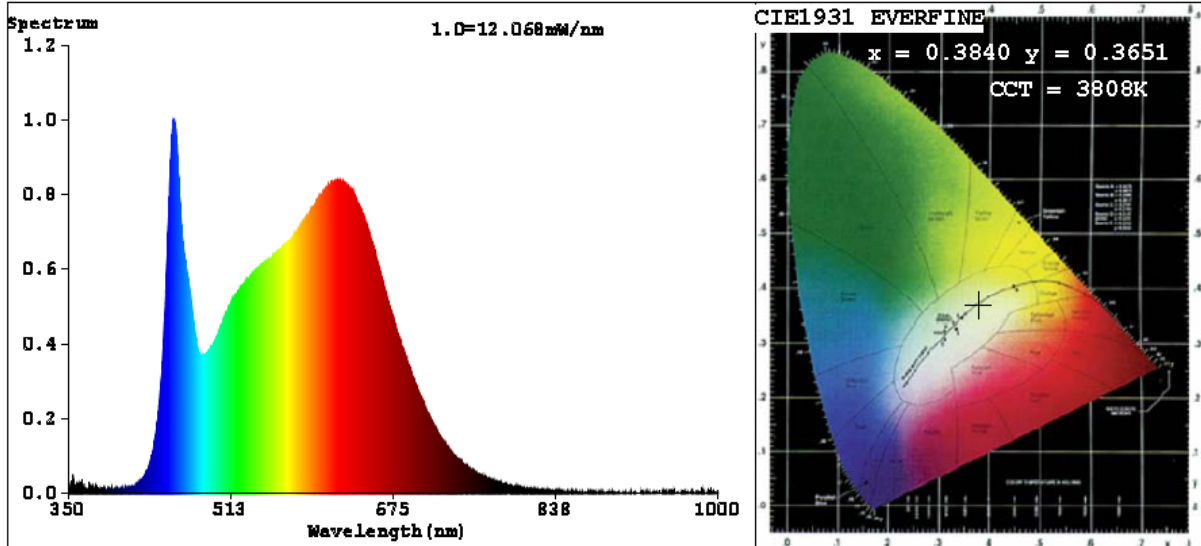
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	87
Frequency (Hz)	60	R2	96	R10	96
CCT (K)	3808	R3	97	R11	97
Duv	-0.0066	R4	96	R12	76
Chromaticity (x, y)	x=0.3840 y=0.3651	R5	96	R13	97
Chromaticity (u', v')	u'=0.2323 v'=0.4969	R6	93	R14	100
Color Rendering Index (CRI)	95.0	R7	93	R15	97
R9	87	R8	92	--	--

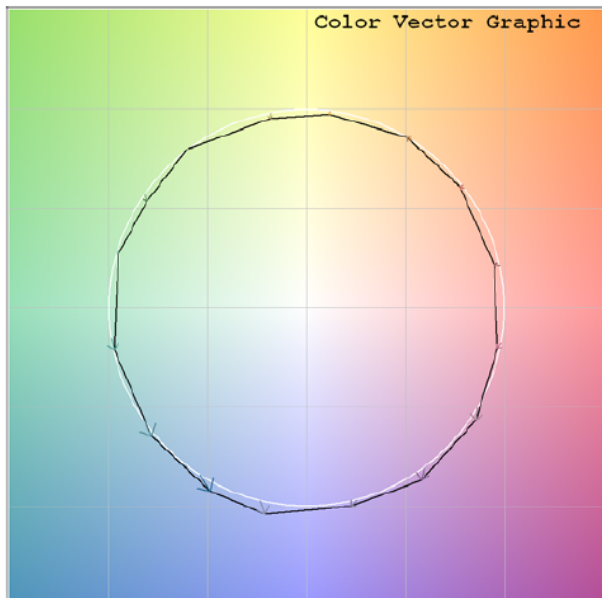
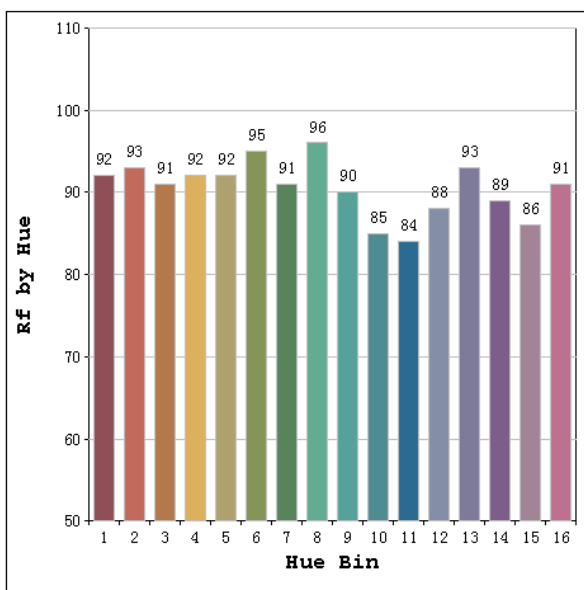
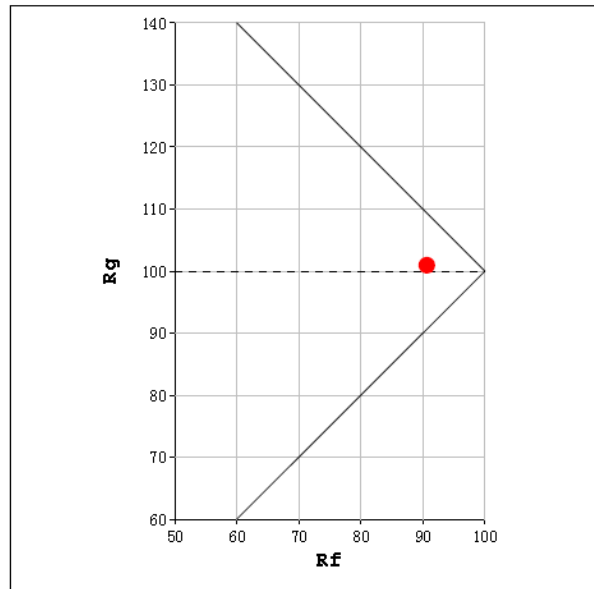
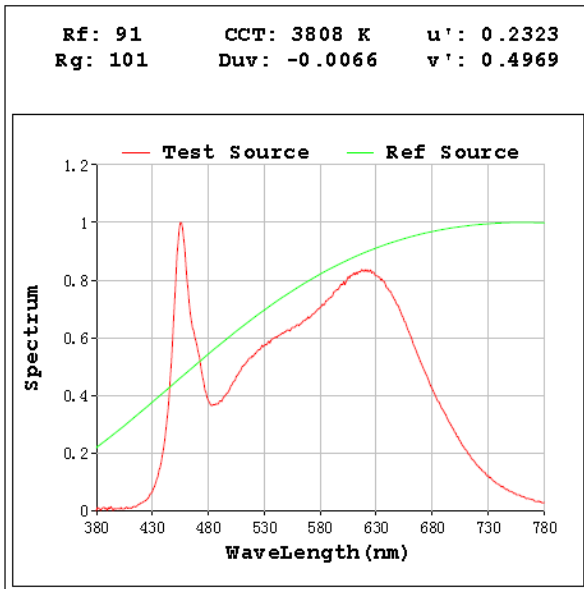
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	561.9
Luminous Efficacy (lm/W)	72.23
Beam Angle (°)	112.3
Center Beam Candle Power (cd)	200.0

Spectral Power Distribution & Chromaticity Diagram



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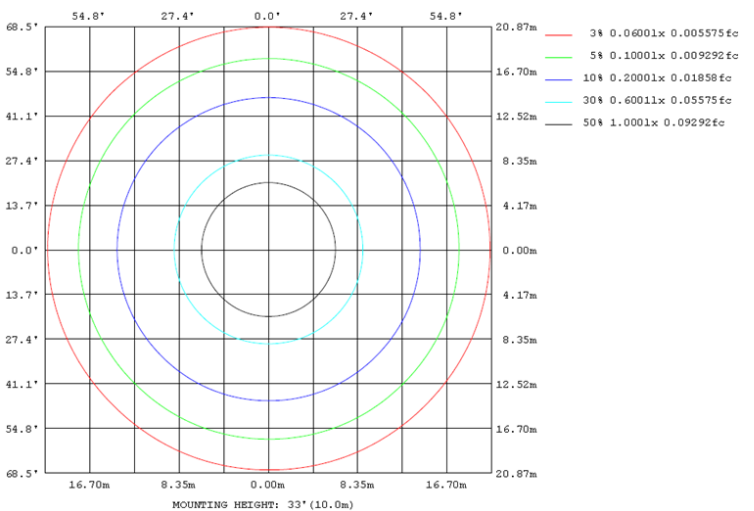
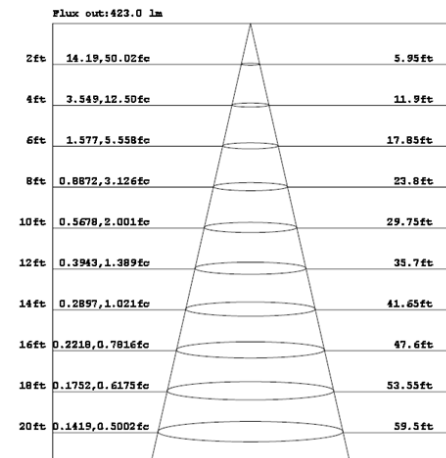
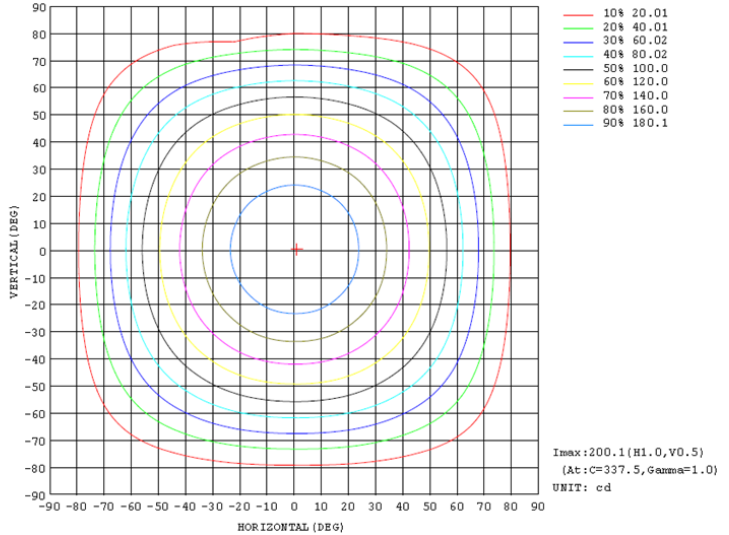
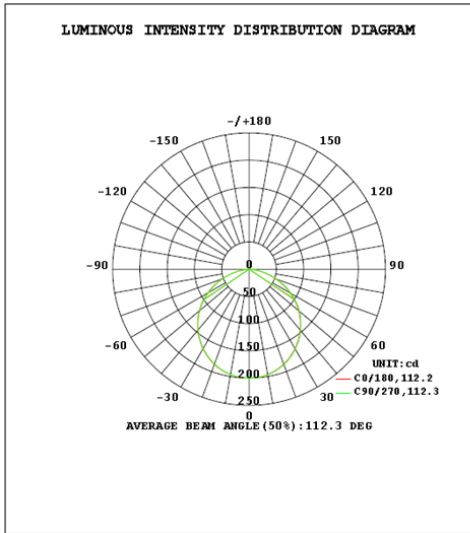


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	155.0	27.6%
0-40	253.7	45.2%
0-60	448.8	79.9%
60-90	113.1	20.1%
70-100	43.9	7.8%
90-120	0.0	0.0%
0-90	561.9	100.0%
90-180	0.0	0.0%
0-180	561.9	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.9	3.4%	90-100	0.0	0.0%
10-20	54.2	9.6%	100-110	0.0	0.0%
20-30	82.0	14.6%	110-120	0.0	0.0%
30-40	98.7	17.6%	120-130	0.0	0.0%
40-50	102.6	18.2%	130-140	0.0	0.0%
50-60	92.6	16.5%	140-150	0.0	0.0%
60-70	69.3	12.3%	150-160	0.0	0.0%
70-80	37.1	6.6%	160-170	0.0	0.0%
80-90	6.8	1.2%	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	WFR4B/RGB	5000K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030037	120.0	60	0.071	7.81	0.913

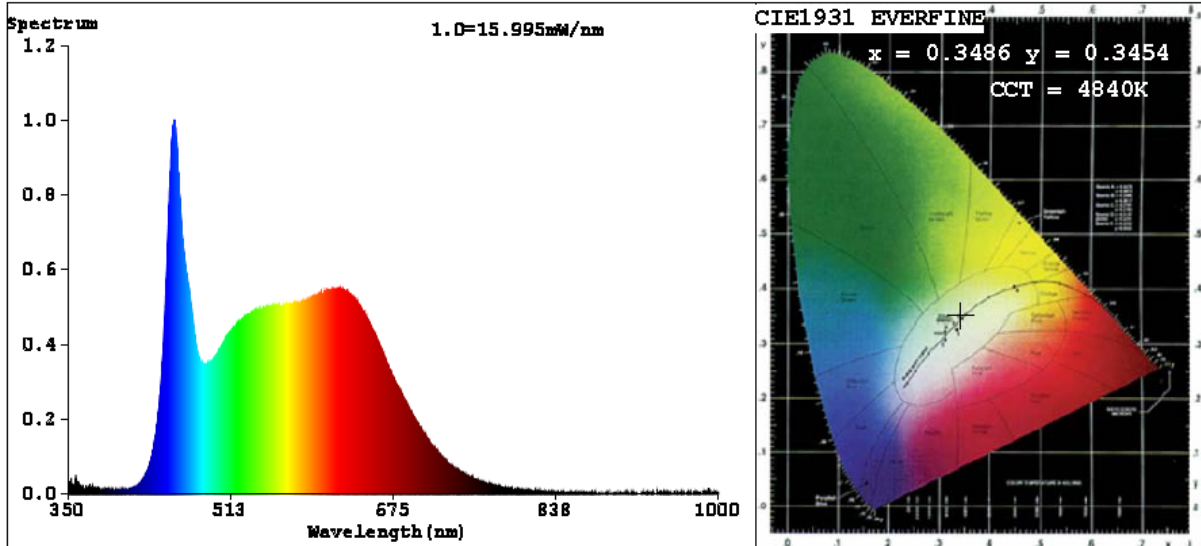
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	94
Frequency (Hz)	60	R2	97	R10	96
CCT (K)	4840	R3	98	R11	95
Duv	-0.0046	R4	93	R12	69
Chromaticity (x, y)	x=0.3486 y=0.3454	R5	94	R13	97
Chromaticity (u', v')	u'=0.2163 v'=0.4821	R6	93	R14	100
Color Rendering Index (CRI)	94.6	R7	93	R15	95
R9	94	R8	93	--	--

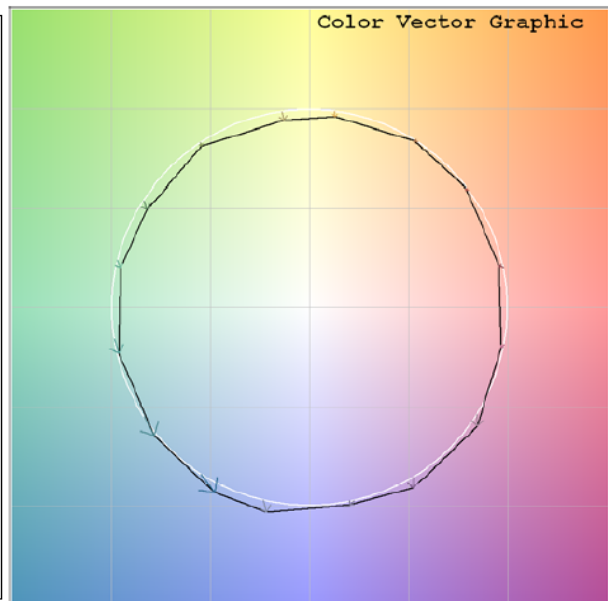
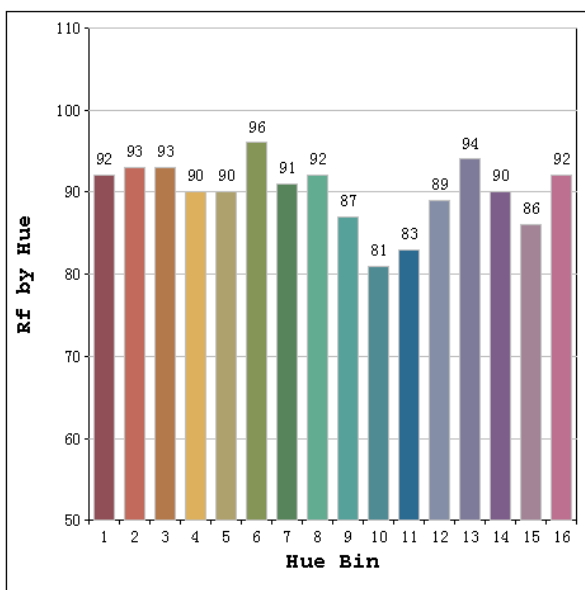
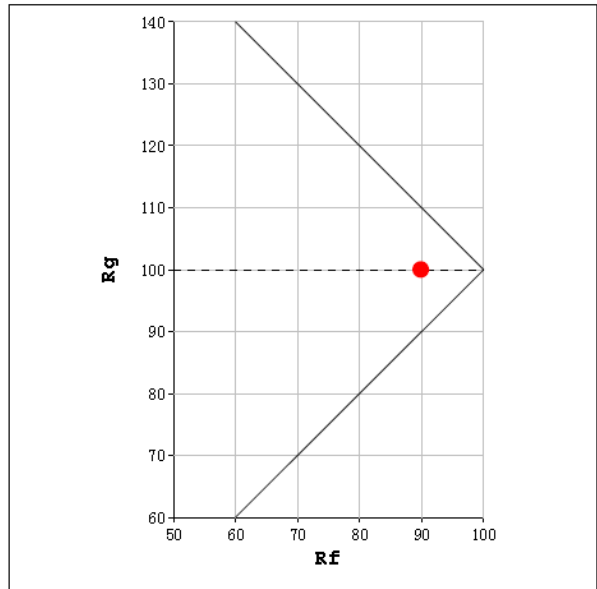
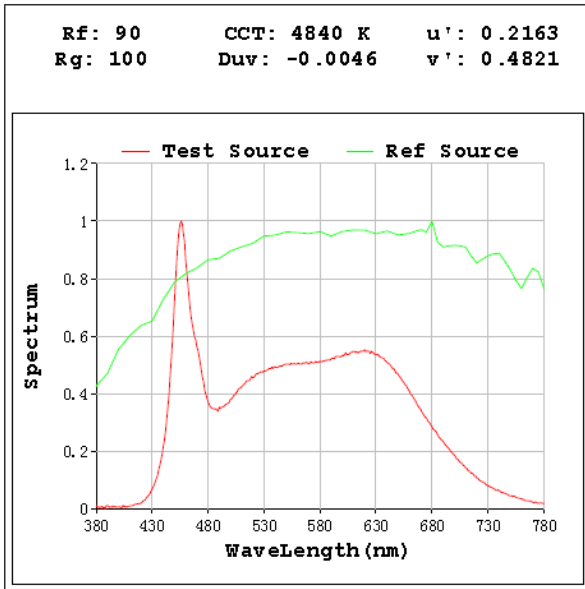
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	566.5
Luminous Efficacy (lm/W)	72.53
Beam Angle (°)	112.3
Center Beam Candle Power (cd)	201.6

Spectral Power Distribution & Chromaticity Diagram



TM30

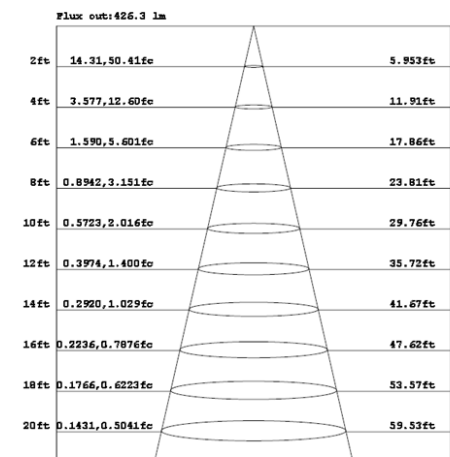
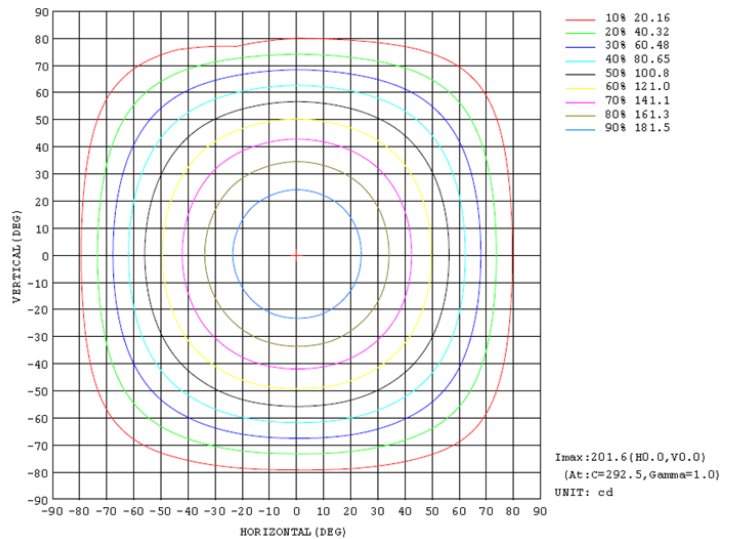
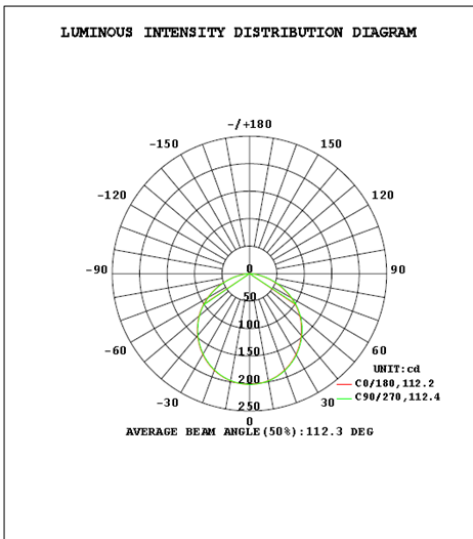


Zonal Lumen Tabulation

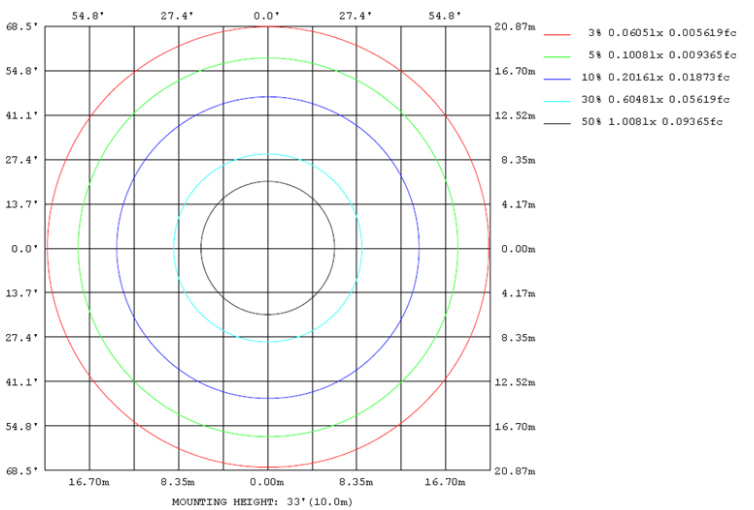
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	156.2	27.6%
0-40	255.7	45.1%
0-60	452.4	79.9%
60-90	114.1	20.1%
70-100	44.2	7.8%
90-120	0.0	0.0%
0-90	566.5	100.0%
90-180	0.0	0.0%
0-180	566.5	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	19.1	3.4%	90-100	0.0	0.0%
10-20	54.6	9.6%	100-110	0.0	0.0%
20-30	82.6	14.6%	110-120	0.0	0.0%
30-40	99.5	17.6%	120-130	0.0	0.0%
40-50	103.4	18.2%	130-140	0.0	0.0%
50-60	93.3	16.5%	140-150	0.0	0.0%
60-70	69.8	12.3%	150-160	0.0	0.0%
70-80	37.4	6.6%	160-170	0.0	0.0%
80-90	6.9	1.2%	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.



2.1.6 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	WFR4B/RGB	6500K	

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
202401030037	120.0	60	0.071	7.82	0.913

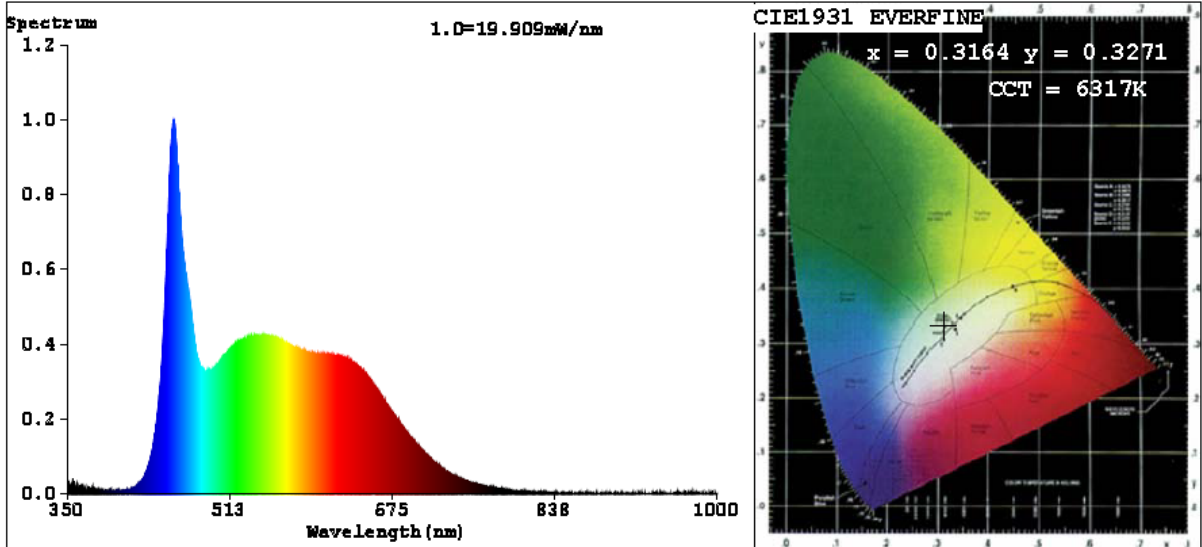
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	93
Frequency (Hz)	60	R2	98	R10	98
CCT (K)	6317	R3	98	R11	93
Duv	0.0003	R4	91	R12	68
Chromaticity (x, y)	x=0.3164 y=0.3271	R5	93	R13	99
Chromaticity (u', v')	u'=0.2011 v'=0.4678	R6	94	R14	100
Color Rendering Index (CRI)	94.2	R7	92	R15	94
R9	93	R8	92	--	--

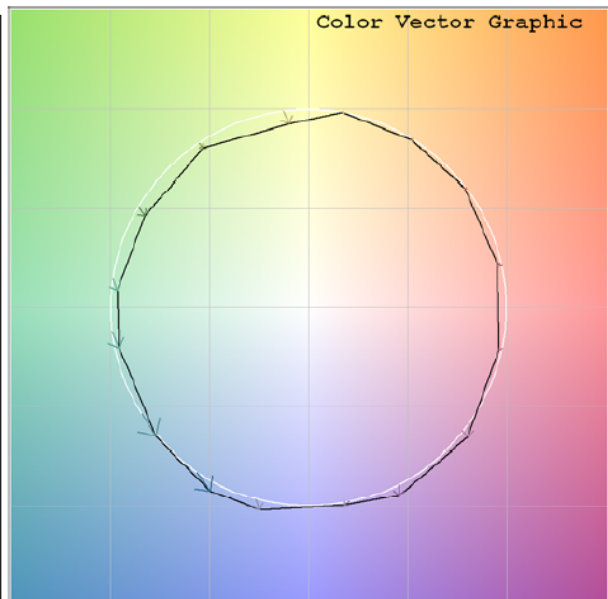
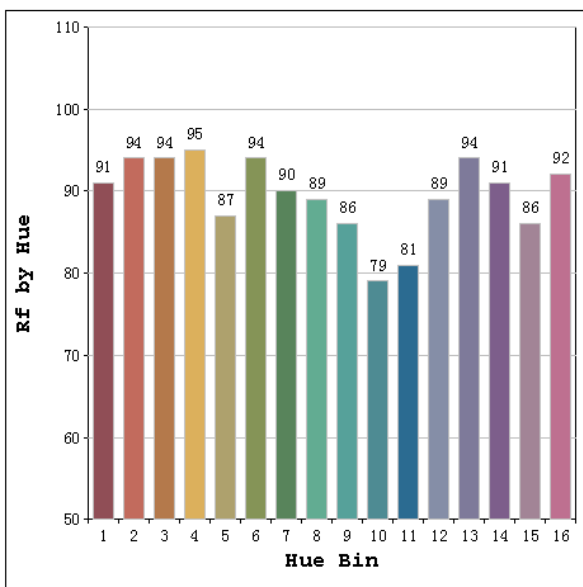
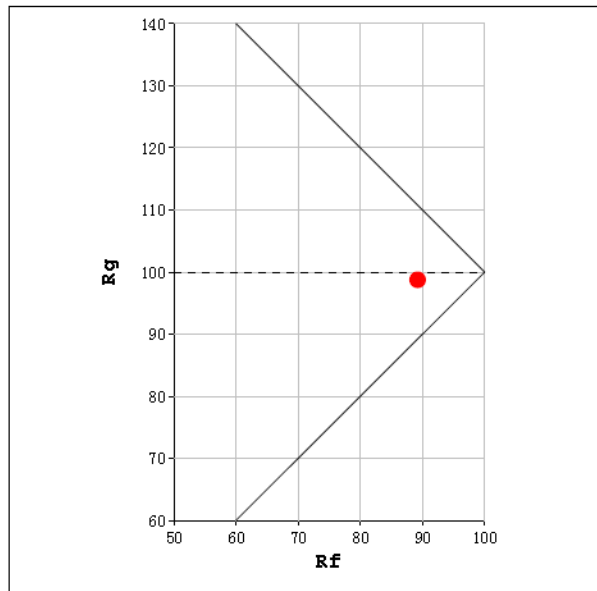
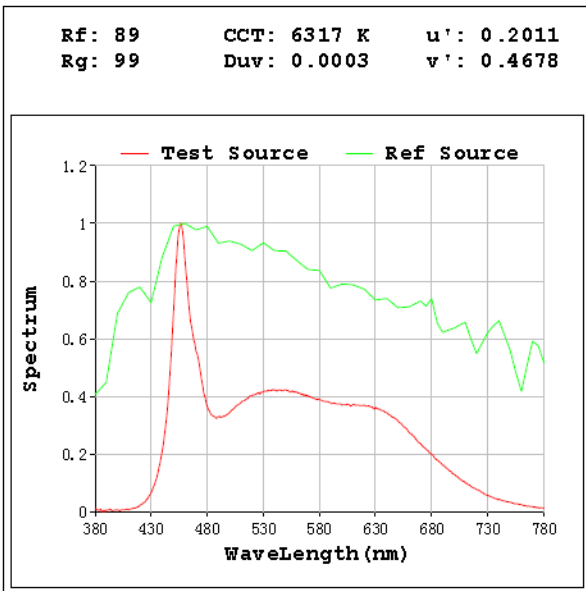
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	566.4
Luminous Efficacy (lm/W)	72.43
Beam Angle (°)	112.3
Center Beam Candle Power (cd)	201.5

Spectral Power Distribution & Chromaticity Diagram



TM30

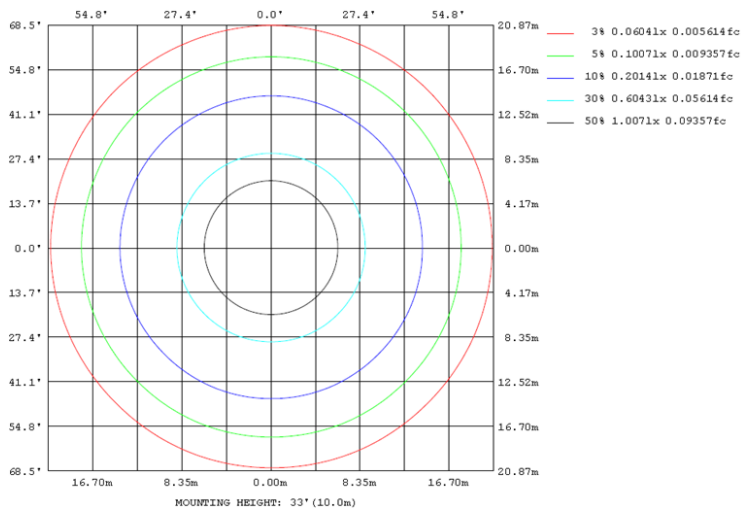
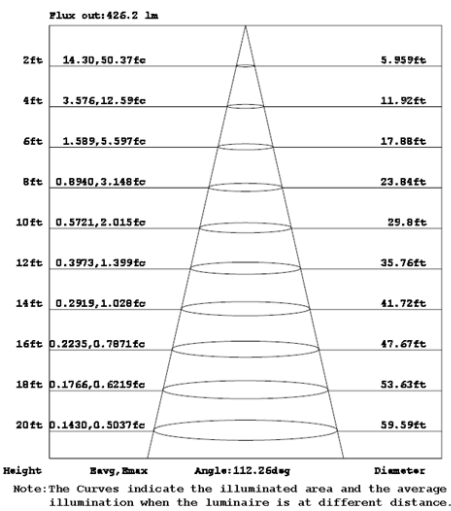
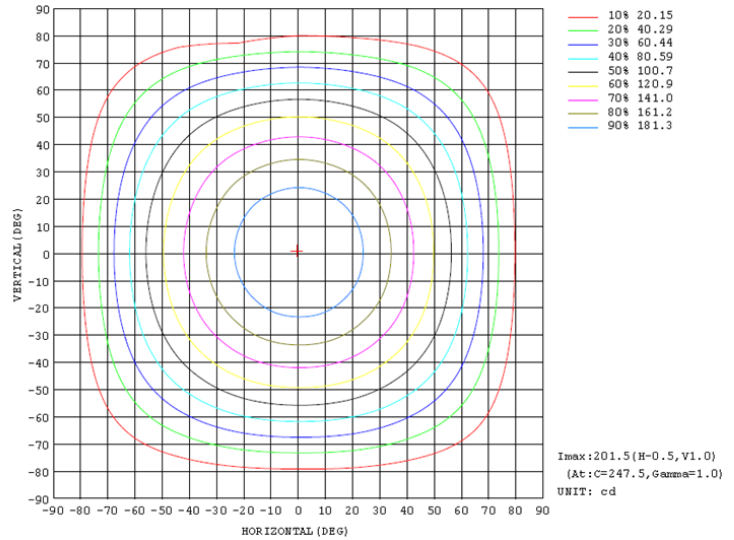
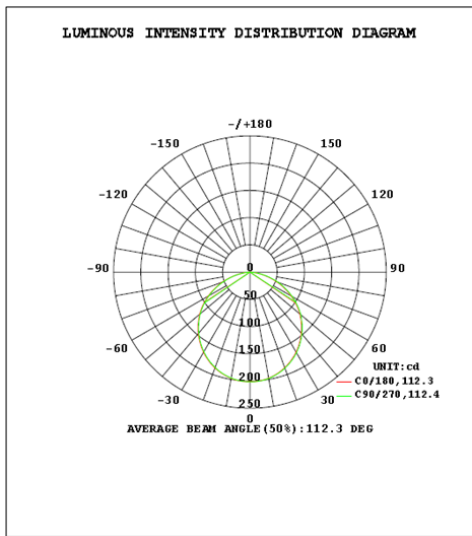


Zonal Lumen Tabulation

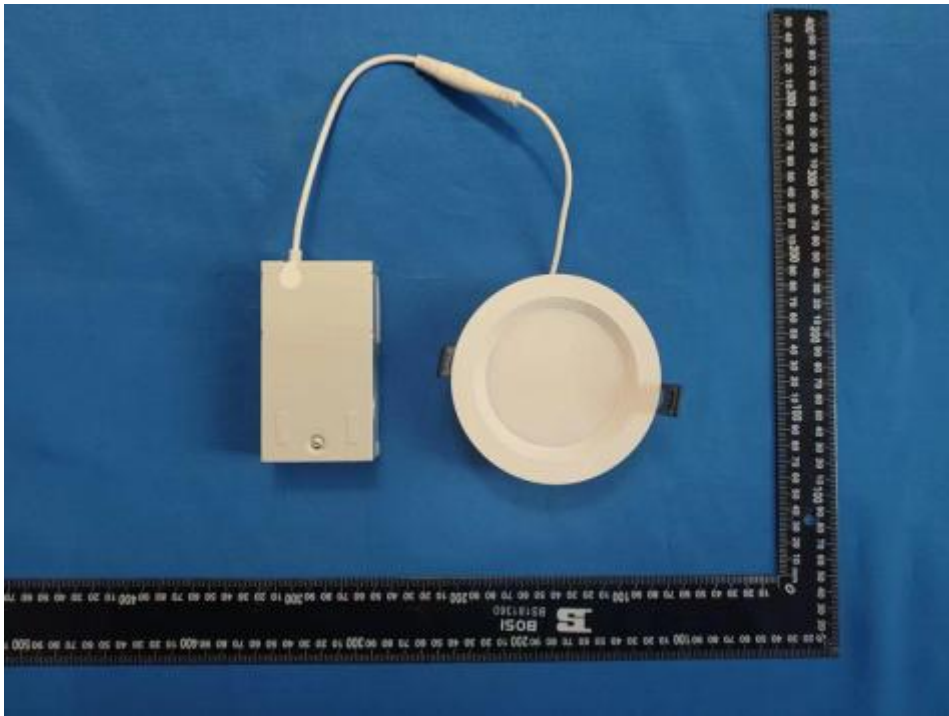
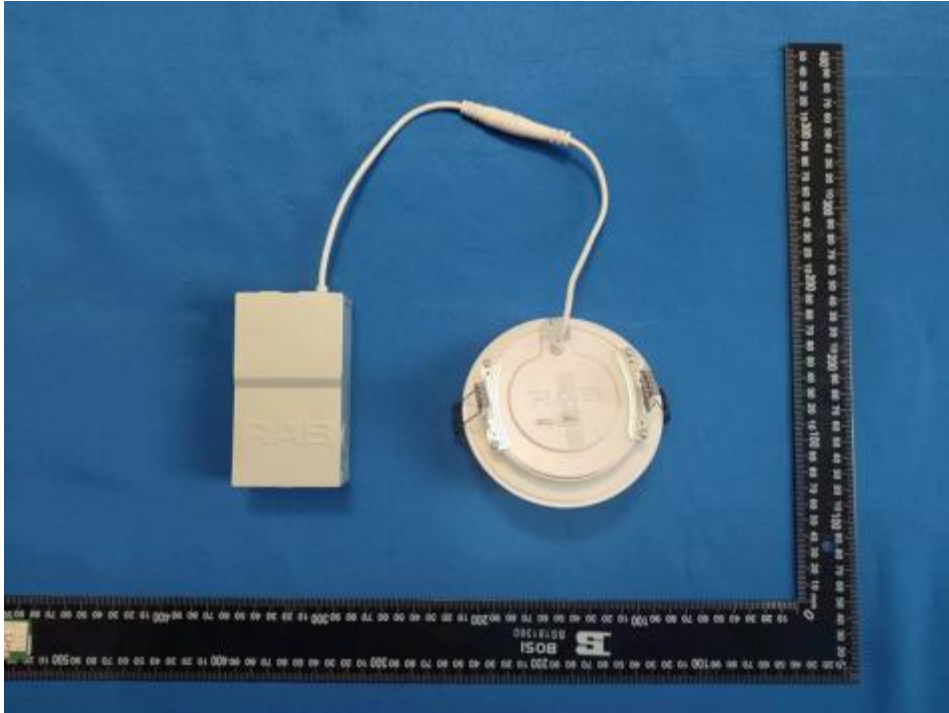
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Zone	Lumens	% Total	Zone	Lumens	% Total
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50-60	93.3	16.5%	140-150	0.0	0.0%
60-70	69.9	12.3%	150-160	0.0	0.0%
70-80	37.4	6.6%	160-170	0.0	0.0%
80-90	6.9	1.2%	170-180	0.0	0.0%

Photometric Data



3. Product Photo



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