

**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): ORB4**

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

**Type of  
Luminaire:** Downlights

**Report Date:** 2024-06-15

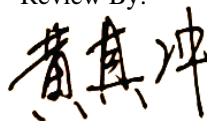
**Prepared By:**

Test & Report By:



Engineer: Sun Fangfang

Review By:



Manager: Huang Qichong

<b>1.1 Rated Values:</b>	
Rated Voltage / Frequency	120Vac, 60 Hz
Nominal Power	9.0W
Rated Initial Lamp Lumen	750lm (mode5000K)
Declared CCT	2700K/3000K/3500K/4000K/5000K

### 1.2 Test Specifications:

Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	QD25

### 1.3 Test Methods

<p><b>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</b> 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><b>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</b> 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><b>3) Electrical Measurements:</b> 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**

<b>Test date</b>	2024-06-12	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ORB4	5000K	

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202406110030	120.0	60	0.077	8.96	0.962

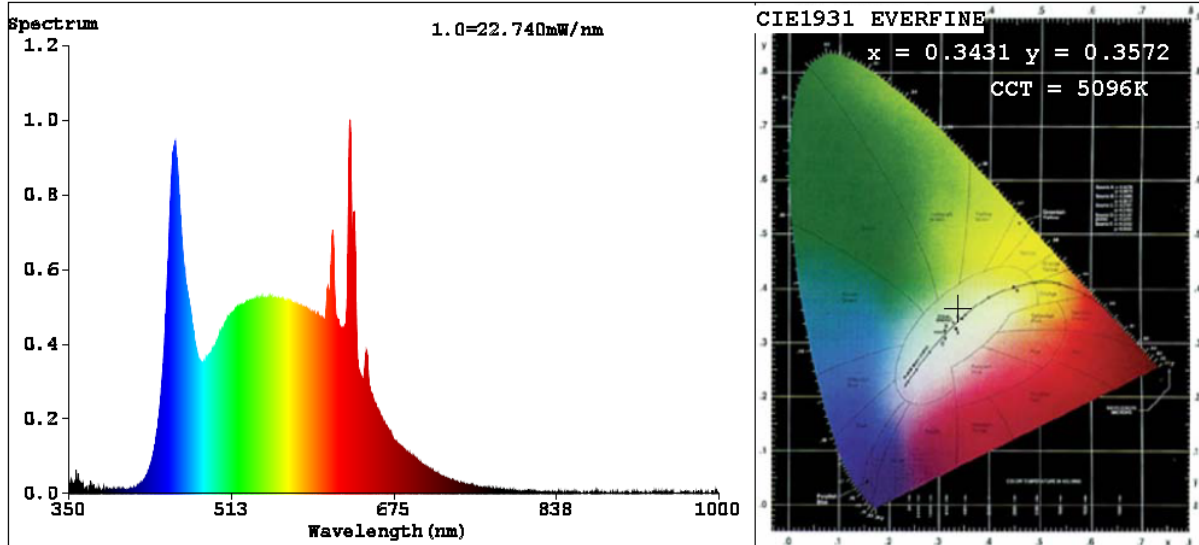
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	73
Frequency (Hz)	60	R2	99	R10	95
CCT (K)	5096	R3	98	R11	94
Duv	0.0036	R4	93	R12	71
Chromaticity (x, y)	x=0.3431 y=0.3572	R5	94	R13	97
Chromaticity (u', v')	u'=0.2079 v'=0.4871	R6	95	R14	99
Color Rendering Index (CRI)	94.4	R7	93	R15	93
R9	73	R8	88	--	--
Rg	98				
Rf	91				
Rcs,h1%	-5				

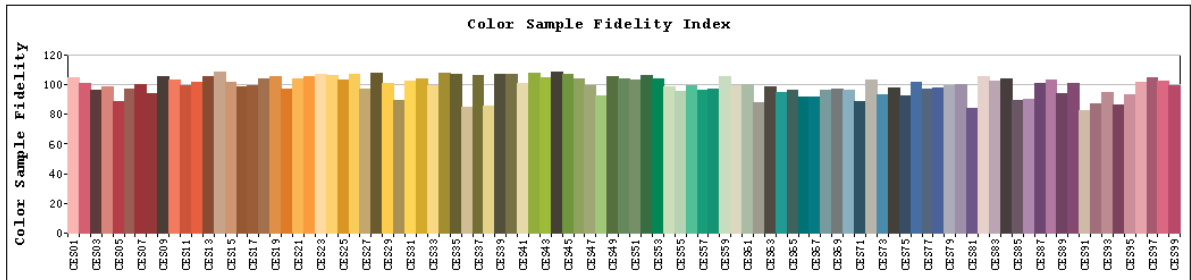
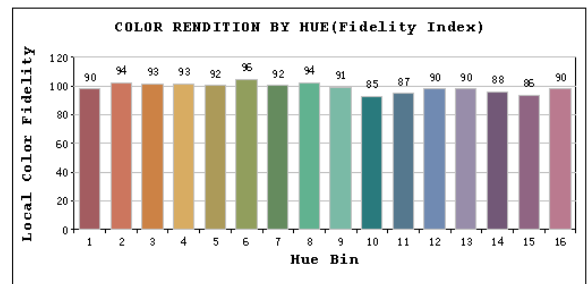
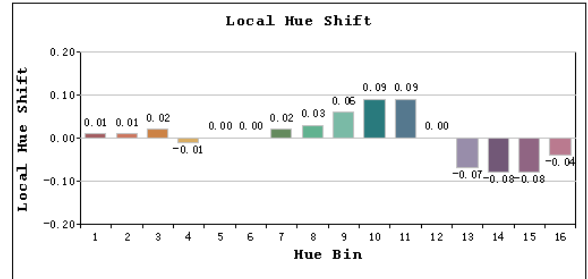
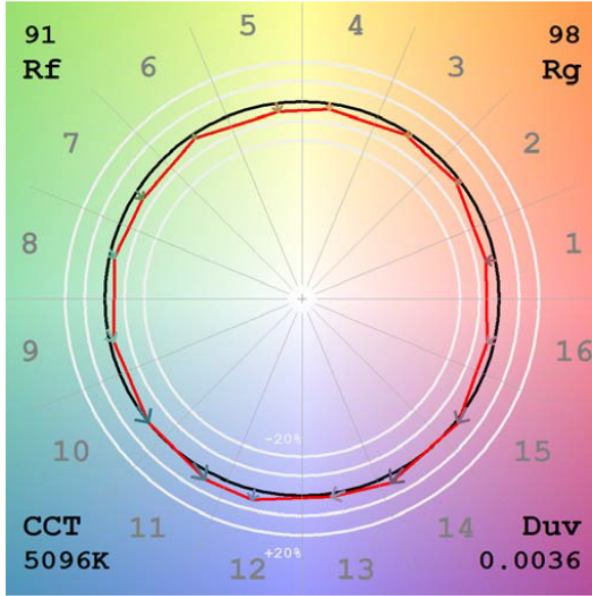
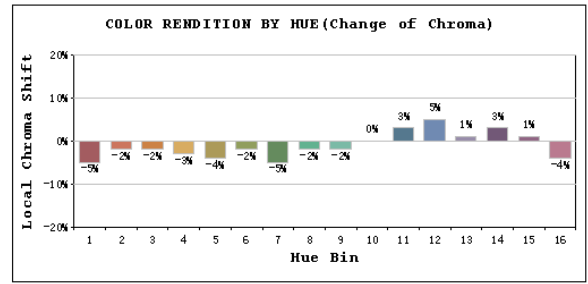
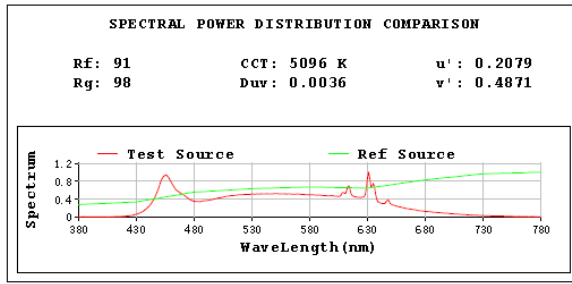
**Photometric Measurement – Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	815.8
Luminous Efficacy (lm/W)	91.05
Beam Angle (°)	121.7
Center Beam Candle Power (cd)	235.6

# Spectral Power Distribution & Chromaticity Diagram



# TM30



# Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	184.5	22.6%
0-40	304.6	37.3%
0-60	554.6	68.0%
60-90	223.5	27.4%
70-100	140.5	17.2%
90-120	26.2	3.2%
0-90	778.1	95.4%
90-180	37.7	4.6%
0-180	815.8	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	22.3	2.7%	90-100	20.2	2.5%
10-20	64.2	7.9%	100-110	3.0	0.4%
20-30	98.1	12.0%	110-120	3.0	0.4%
30-40	120.0	14.7%	120-130	3.3	0.4%
40-50	128.1	15.7%	130-140	3.4	0.4%
50-60	122.0	15.0%	140-150	2.8	0.3%
60-70	103.1	12.6%	150-160	1.1	0.1%
70-80	75.6	9.3%	160-170	0.7	0.1%
80-90	44.7	5.5%	170-180	0.2	0.0%

## Photometric Data

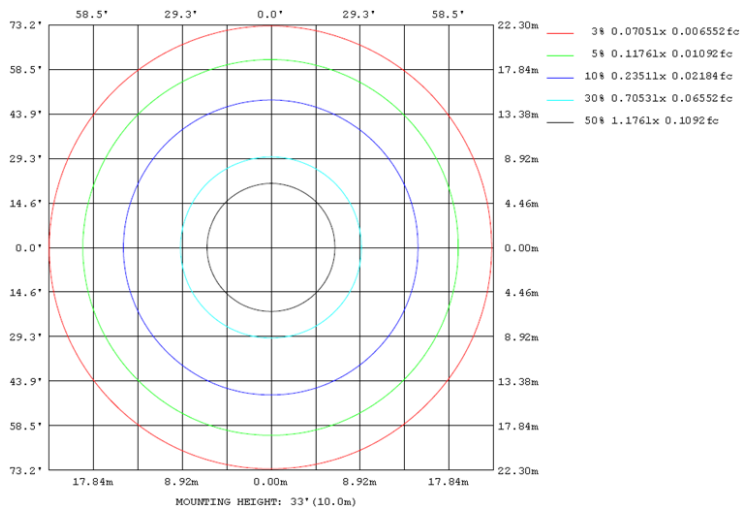
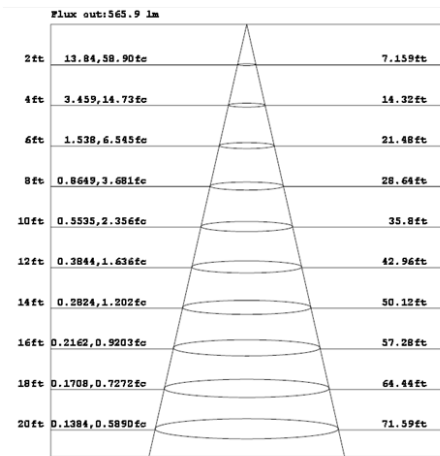
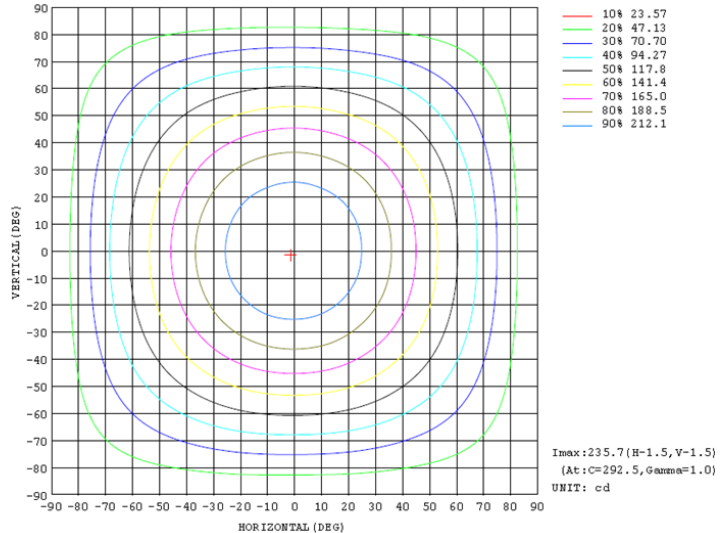
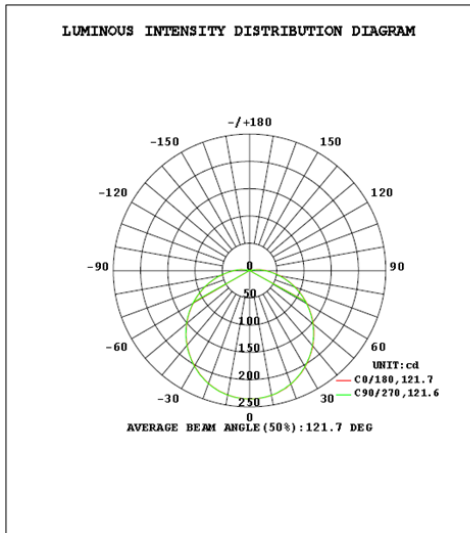


Table--1

UNIT: cd

γ (DEG)	C (DEG)																		
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235			
5	234	235	234	234	234	235	235	235	235	235	235	234	234	235	234	234			
10	232	232	231	232	231	232	232	232	232	232	232	232	232	232	232	231			
15	227	227	227	227	227	228	227	227	228	228	228	228	227	227	227	227			
20	220	221	220	221	221	221	221	221	222	221	222	221	221	221	221	220			
25	212	212	212	212	212	213	213	213	213	214	213	213	213	212	212	212			
30	202	202	202	203	203	203	203	203	204	204	204	203	203	203	203	203			
35	191	191	191	191	191	192	192	193	193	193	193	192	192	191	192	191			
40	178	179	178	179	179	180	180	180	181	180	180	180	180	179	179	179			
45	165	165	165	166	166	166	166	167	167	167	167	166	166	166	166	165			
50	150	151	151	151	151	152	152	153	153	152	152	152	152	151	151	151			
55	135	136	136	136	136	137	137	137	138	137	137	137	137	136	136	136			
60	119	120	120	120	120	121	121	122	122	121	121	121	121	120	120	120			
65	103	103	103	104	104	104	105	105	105	105	105	104	104	103	104	103			
70	86.5	87.1	86.9	87.7	87.4	88.1	88.2	88.7	89.0	88.5	88.5	87.7	87.8	86.9	87.2	86.9			
75	70.5	71.1	70.8	71.4	71.3	72.0	71.9	72.6	72.8	72.3	72.3	71.4	71.3	70.7	71.2	70.7			
80	54.7	55.3	55.2	55.9	55.5	56.4	56.2	56.6	57.1	56.7	56.8	55.8	55.3	54.9	55.6	55.3			
85	39.5	40.0	39.8	40.5	40.3	41.0	41.0	41.3	41.6	41.1	41.4	40.4	40.0	39.9	40.5	40.0			
90	27.9	28.1	28.0	28.3	28.1	28.4	28.5	28.7	28.8	28.5	28.6	27.9	27.0	27.9	28.3	28.1			
95	18.9	19.2	18.9	19.6	18.9	19.4	19.4	19.6	19.8	19.6	19.8	18.8	16.6	18.7	19.8	19.3			
100	6.65	6.80	6.50	7.16	6.49	6.94	6.79	6.83	7.33	7.10	7.46	6.92	6.35	6.60	7.56	7.04			
105	2.16	2.22	2.13	2.27	2.31	2.44	2.25	2.25	2.47	2.41	2.29	2.22	2.09	2.00	2.06	1.97			
110	2.54	2.61	2.51	2.70	2.79	2.93	2.71	2.78	2.93	2.90	2.72	2.58	2.51	2.45	2.48	2.35			
115	2.95	3.01	2.90	3.07	3.27	3.46	3.22	3.28	3.42	3.40	2.98	2.36	2.41	2.81	2.79	2.71			
120	3.35	3.41	3.27	3.49	3.65	3.89	3.69	3.75	3.93	3.91	3.40	2.22	2.08	3.05	3.04	3.10			
125	3.80	3.83	3.67	3.87	4.05	4.25	4.09	4.18	4.40	4.38	3.76	2.46	2.30	3.44	3.52	3.51			
130	4.19	4.22	4.02	4.24	4.46	4.63	4.42	4.58	4.86	4.83	4.12	2.70	2.70	3.80	3.99	3.81			
135	4.62	4.58	4.31	4.58	4.84	5.02	4.74	5.00	5.32	5.26	4.31	2.91	2.93	4.14	4.32	4.26			
140	4.88	4.71	4.37	4.71	5.07	5.26	4.96	5.25	5.66	5.51	4.57	3.01	3.05	4.35	4.59	4.39			
145	4.79	4.71	4.33	4.67	4.65	4.94	4.94	5.00	5.56	5.65	4.71	3.16	2.81	4.26	4.79	3.44			
150	3.87	3.67	3.35	3.24	3.50	3.83	3.75	3.98	4.35	4.39	4.10	2.33	2.32	3.91	3.56	3.88			
155	2.13	2.15	2.12	2.15	2.12	2.13	2.13	2.16	2.10	2.08	2.12	2.09	2.12	2.09	2.12	2.10			
160	2.21	2.24	2.20	2.24	2.21	2.23	2.21	2.23	2.19	2.18	2.21	2.18	2.22	2.17	2.21	2.17			
165	2.30	2.33	2.29	2.31	2.29	2.31	2.31	2.31	2.28	2.27	2.29	2.27	2.30	2.26	2.30	2.27			
170	2.36	2.39	2.36	2.38	2.37	2.38	2.37	2.39	2.36	2.35	2.37	2.36	2.40	2.35	2.38	2.36			
175	2.42	2.44	2.41	2.45	2.41	2.44	2.42	2.44	2.42	2.42	2.43	2.41	2.45	2.40	2.44	2.40			
180	2.44	2.45	2.44	2.45	2.46	2.45	2.45	2.45	2.44	2.46	2.45	2.44	2.45	2.45	2.45	2.45			

## 2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-06-12	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	ORB4	4000K	

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202406110030	120.0	60	0.076	8.81	0.961

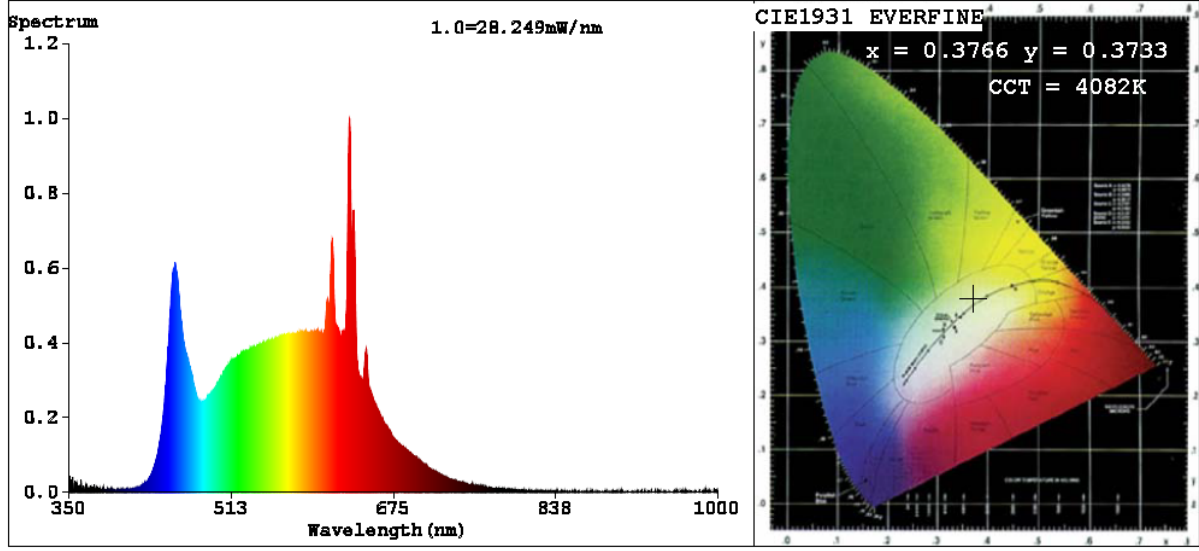
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	81
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	4082	R3	99	R11	97
Duv	-0.0005	R4	94	R12	72
Chromaticity (x, y)	x=0.3766 y=0.3733	R5	95	R13	99
Chromaticity (u', v')	u'=0.2239 v'=0.4995	R6	95	R14	99
Color Rendering Index (CRI)	95.5	R7	93	R15	95
R9	81	R8	90	--	--
Rg	98				
Rf	91				
Rcs,h1%	-4				

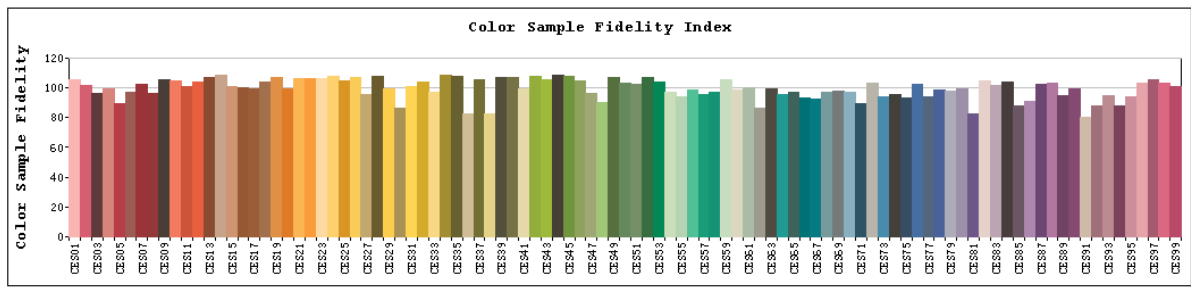
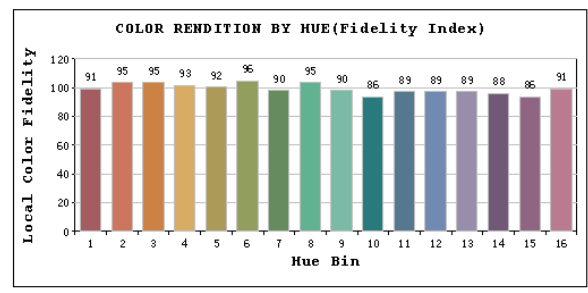
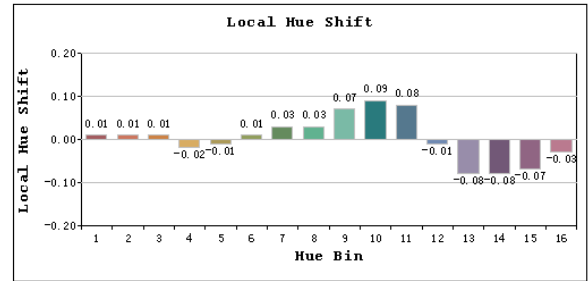
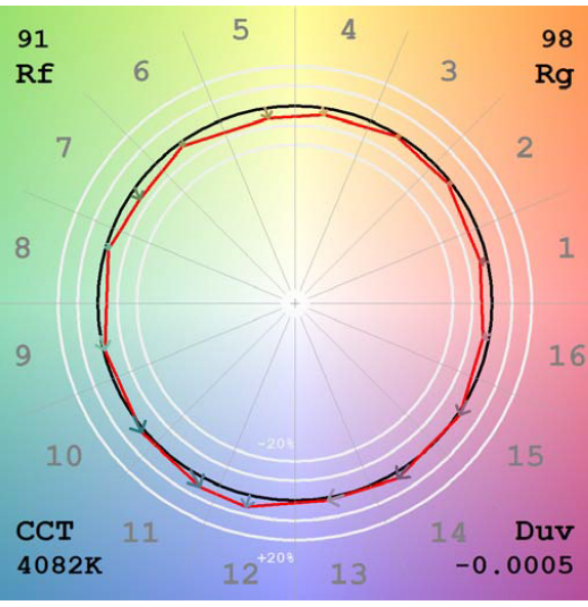
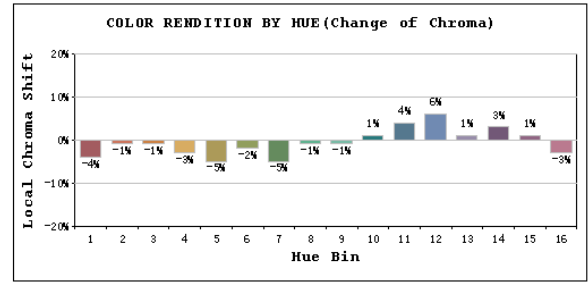
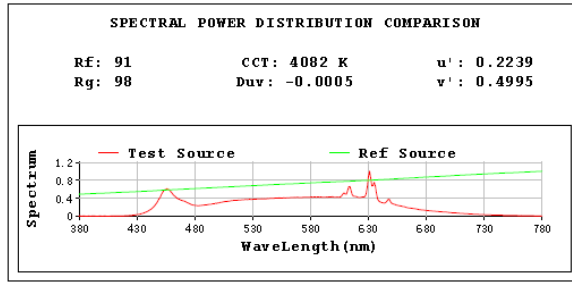
### Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	827.3
Luminous Efficacy (lm/W)	93.90

# Spectral Power Distribution & Chromaticity Diagram



# TM30



**2.1.3 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2024-06-12	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ORB4	3500K	

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202406110030	120.0	60	0.076	8.78	0.961

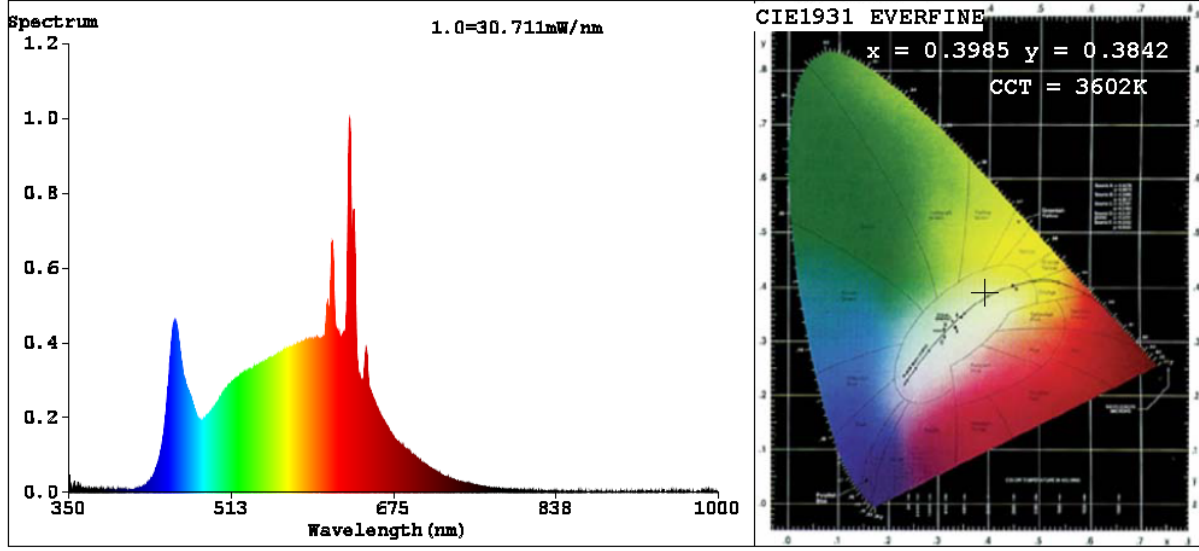
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	79
Frequency (Hz)	60	R2	99	R10	100
CCT (K)	3602	R3	99	R11	98
Duv	-0.0014	R4	95	R12	76
Chromaticity (x, y)	x=0.3985 y=0.3842	R5	96	R13	100
Chromaticity (u', v')	u'=0.2339 v'=0.5075	R6	95	R14	99
Color Rendering Index (CRI)	95.6	R7	93	R15	96
R9	72	R8	90	--	--
Rg	99				
Rf	91				
Rcs,h1%	-4				

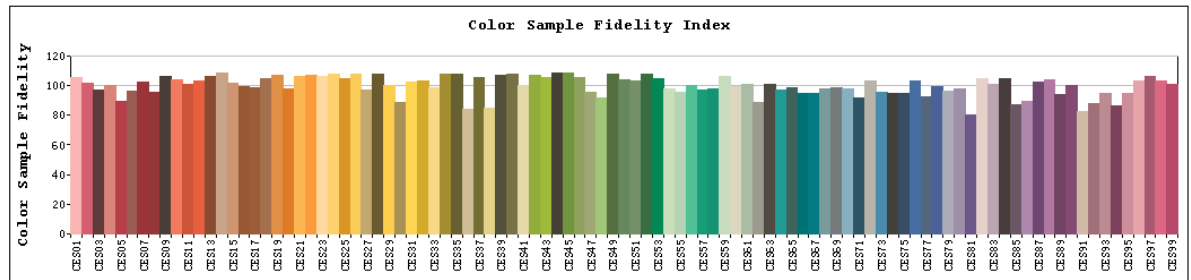
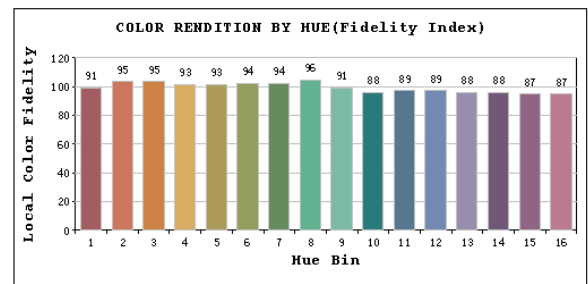
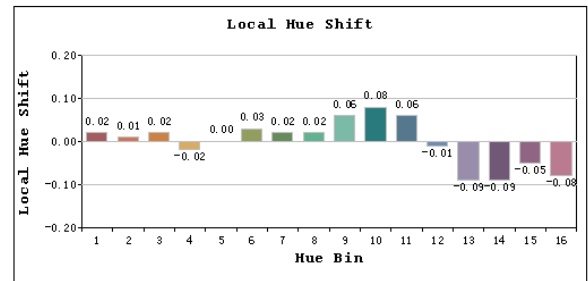
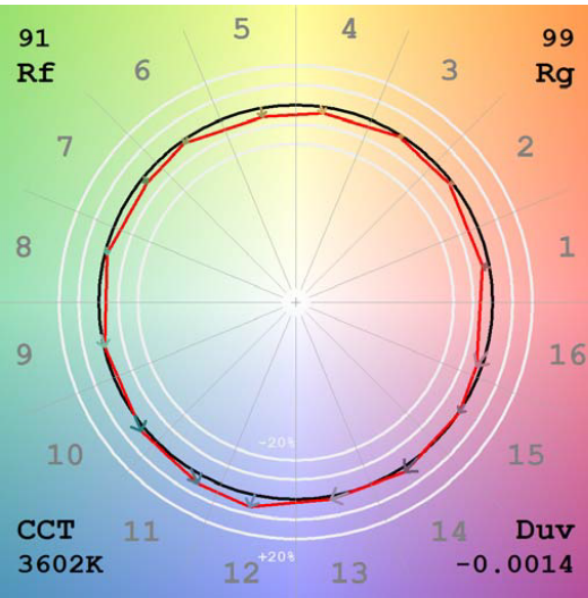
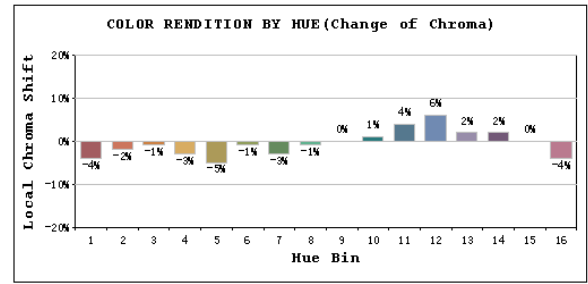
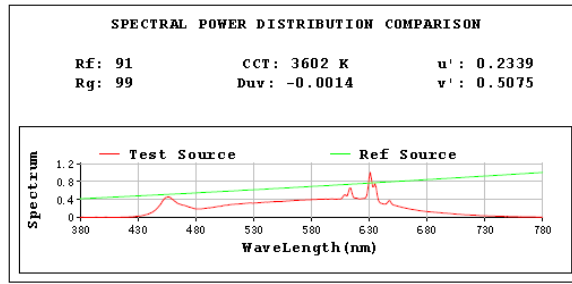
**Photometric Measurement – Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	815.8
Luminous Efficacy (lm/W)	92.92

# Spectral Power Distribution & Chromaticity Diagram



# TM30



**2.1.4 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2024-06-12	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ORB4	3000K	

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202406110030	120.0	60	0.077	8.90	0.962

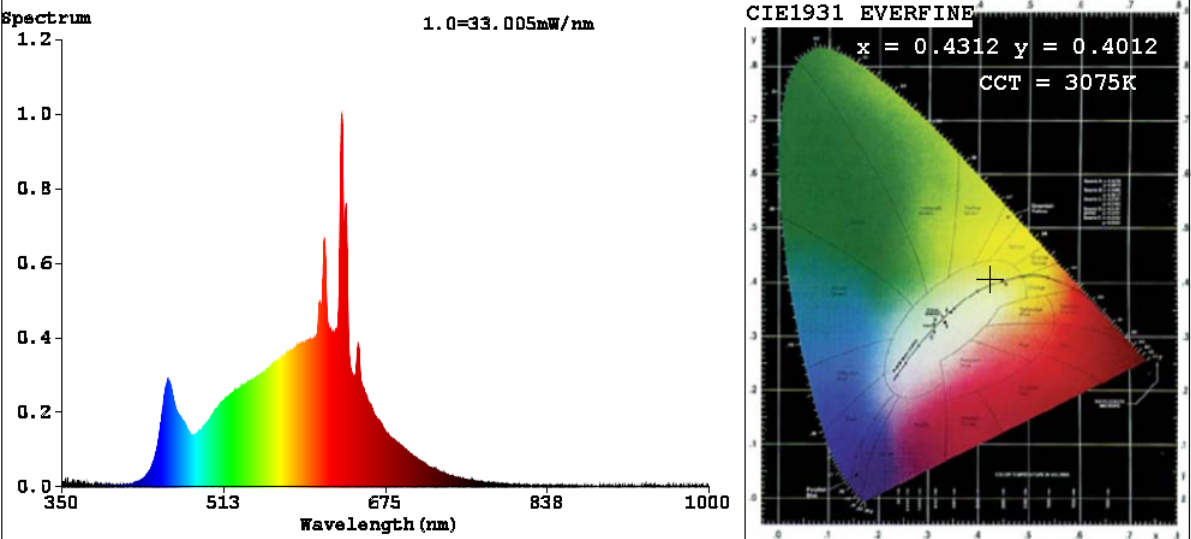
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

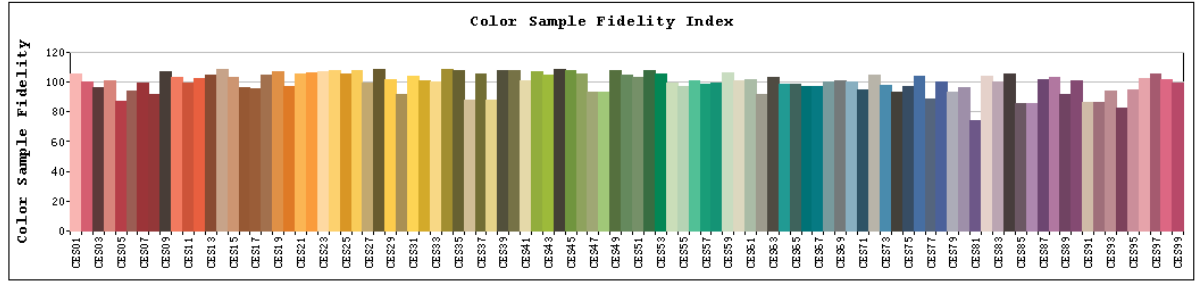
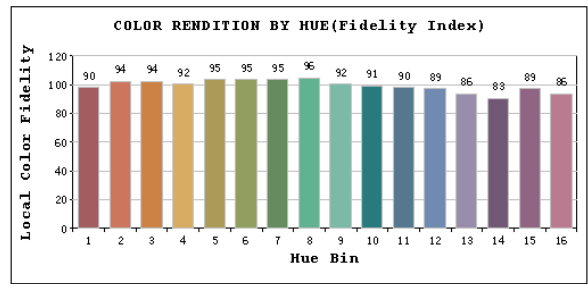
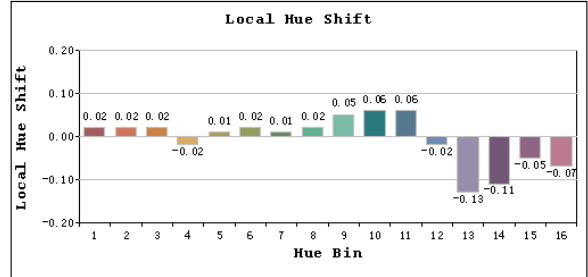
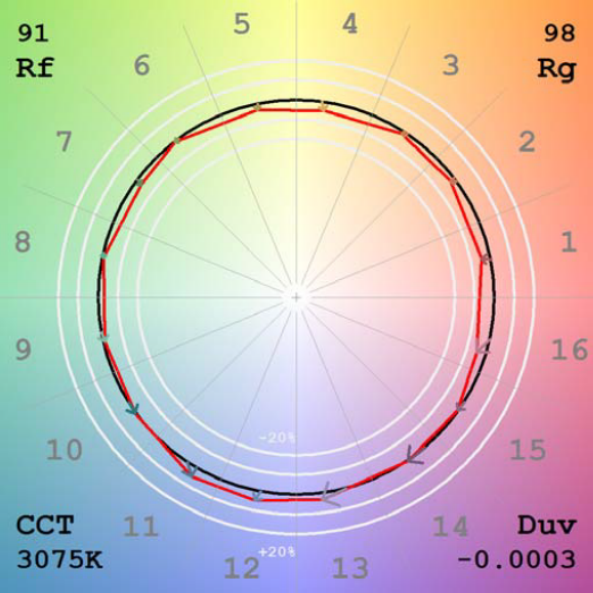
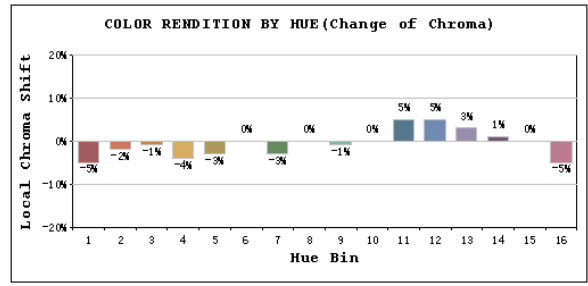
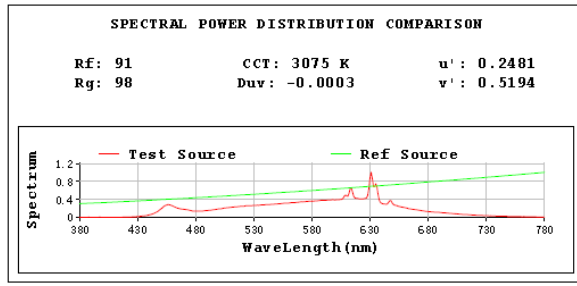
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	70
Frequency (Hz)	60	R2	100	R10	98
CCT (K)	3075	R3	99	R11	98
Duv	-0.0003	R4	96	R12	81
Chromaticity (x, y)	x=0.4312 y=0.4012	R5	96	R13	98
Chromaticity (u', v')	u'=0.2481 v'=0.5194	R6	96	R14	99
Color Rendering Index (CRI)	95.3	R7	92	R15	93
R9	70	R8	86	--	--
Rg	98				
Rf	91				
Rcs,h1%	-5				

**Photometric Measurement – Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	778.8
Luminous Efficacy (lm/W)	87.51

# Spectral Power Distribution & Chromaticity Diagram





**2.1.5 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2024-06-12	<b>Test Ambient:</b>	25.1 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ORB4	2700K	

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz )	Current (A)	Power (W)	Power Factor
202406110030	120.0	60	0.077	8.98	0.962

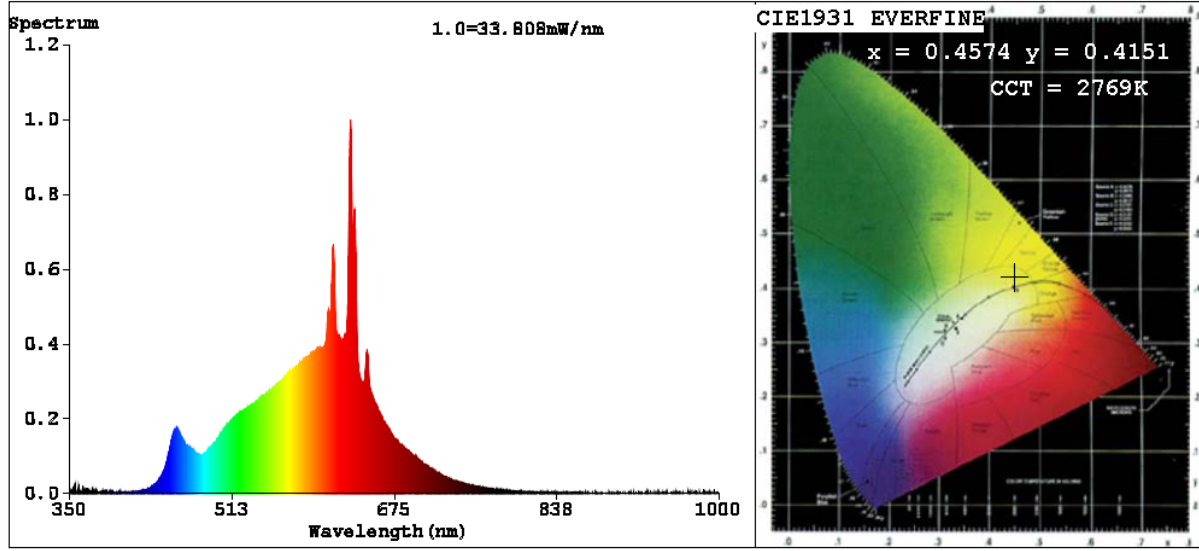
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	61
Frequency (Hz)	60	R2	98	R10	94
CCT (K)	2769	R3	100	R11	97
Duv	0.0019	R4	95	R12	83
Chromaticity (x, y)	x=0.4574 y=0.4151	R5	95	R13	96
Chromaticity (u', v')	u'=0.2589 v'=0.5287	R6	98	R14	98
Color Rendering Index (CRI)	94.3	R7	92	R15	90
R9	61	R8	83	--	--
Rg	97				
Rf	91				
Rcs,h1%	-6				

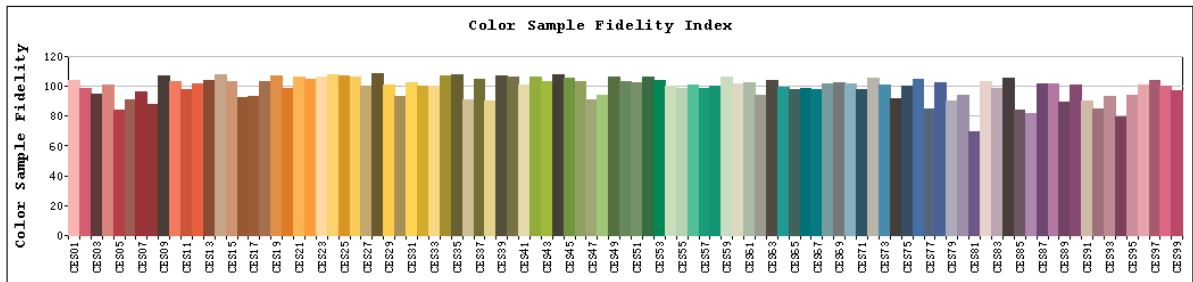
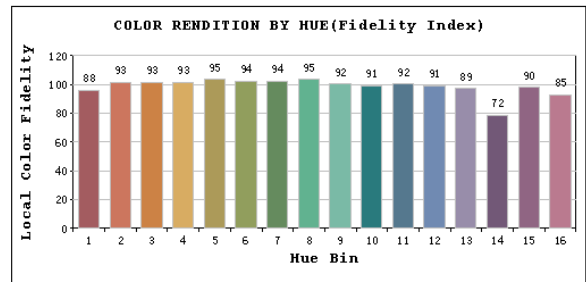
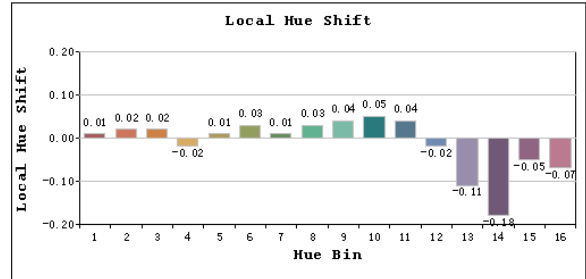
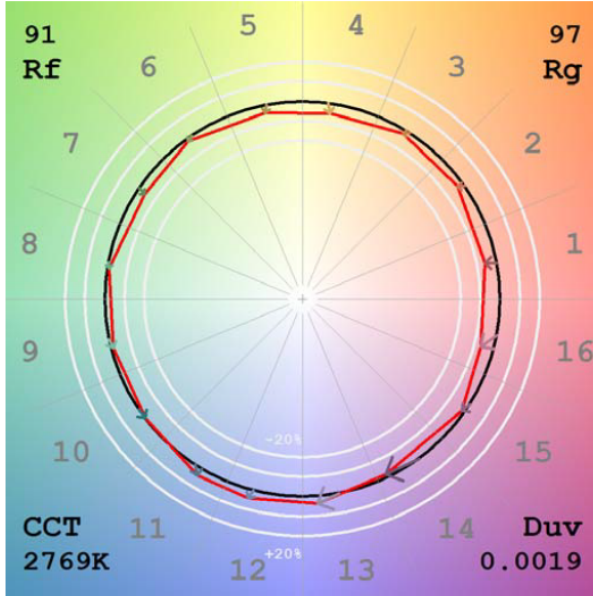
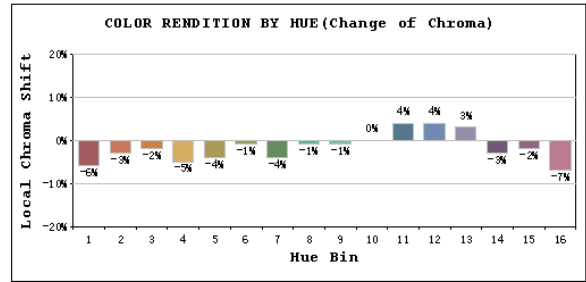
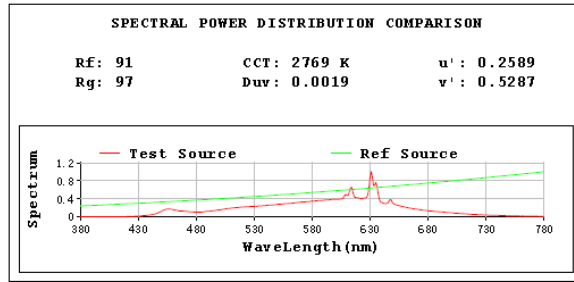
**Photometric Measurement – Goniophotometer Method:**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	744.4
Luminous Efficacy (lm/W)	82.90

# Spectral Power Distribution & Chromaticity Diagram



# TM30



Sample No.	Wattage and CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
ORB4	2700K setting	120	744.4	8.98	82.90
	3000K setting	120	778.8	8.90	87.51
	3500K setting	120	815.8	8.78	92.92
	4000K setting	120	827.3	8.81	93.90
	5000K setting	120	815.8	8.96	91.05

**3. Product Photo**



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