



LM-79-19 Test Report

For

RAB Lighting Inc.

(Brand Name: RAB Lighting)

Room 609, Building C, MixC, No. 1799 Wuzhong Road Minhang District, Shanghai,
China Xiao Xiang, 15921313292, gary.xiao@rablighting.com

Model name(s):

RLB-2F[blank, /MVS, /LCBS/MVS][blank, /E]

Report Type: Testing and Report According to IES LM-79-2019
Type of Luminaire: Retrofit Kits for Direct Linear Ambient Luminaires
Report Date: 2024-11-15

Test & Report By:

Ferrum Li

Engineer: Ferrum Li

Review By:

Garman Mo

Manager: Garman Mo

Note: 1.The results contained in this report pertain only to the tested samples.
2.This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.



1.1 Product Information:		
Model Number	RLB-2F[blank, /MVS, /LCBS/MVS][blank, /E]	
Remark	The suffix “[blank, /MVS, /LCBS/MVS]” can be “/MVS” =with motion sensor, “/LCBS/MVS” =motion sensor with Bluetooth and smart controller or Blank=no sensor and smart controller provided. The suffix “[blank, /E]” can be “/E” =with emergency backup driver or Blank=no emergency backup driver provided.	
Representative (Tested) Model	RLB-2F(0%,3000K) RLB-2F(50%,4000K) RLB-2F(100%,6500K)	
Model Difference	N/A	
SKU (if available)	--	
Type of Luminaire (for integral lamps, list base type and lamp type)	Retrofit Kits for Direct Linear Ambient Luminaires	
LED Manufacturer	Bridgelux Inc.	
LED Model	BXEN-30E-13H-9C1 BXEN-65E-13H-9C1	
Integral Controls Availability	Yes	
Dimming	Continuous	
Sample Number	JDE241105-B1	
Date of Receipt	2024-11-09	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaire Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120-277Vac, 50/60Hz
Nominal Power	10W/15W/20W(Power Adjustable)
Rated Initial Lamp Lumen	--
Declared CCT	3000K,3500K,4000K,5000K,6500K (Color Tunable)

1.3 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-79-2019 Optical and Electrical 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

1.4 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 $25\text{ }^{\circ}\text{C} \pm 1.2\text{ }^{\circ}\text{C}$, measured at a point not more than 1.5 m from the sample and at the same height as the sample. The humidity should be maintained between 10% and 65%. 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 $25\text{ }^{\circ}\text{C} \pm 1.2\text{ }^{\circ}\text{C}$. The humidity should be maintained between 10% and 65%. 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 $25\text{ }^{\circ}\text{C} \pm 1.2\text{ }^{\circ}\text{C}$. 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 Summary of Test Result

Criteria Item	Measured Value		Compliance	Requirement (DLC V5.1)
Minimum Total Luminous	2590.1		Pass	≥ 375 lm/ft (-10%)
Minimum Luminous Efficacy	132.02		Pass	Standard: ≥ 115 (-3%) Premium: ≥ 130 (-3%)
Minimum Power Factor	0.9367		Pass	≥ 0.9 (-3%)
Maximum THD %	12.14		Pass	≤ 20 (+5)
Minimum CRI	83.9		Pass	≥ 80 (-1)
Minimum R9	12		Pass	≥ 0 (-1)
Minimum Rg	94		Pass	≥ 89 (-1)
Minimum Rf	84		Pass	≥ 70 (-1)
Rcs, h1(%)	-12		Pass	-12%-23%(-1%)
CCT (K)	3000K	3031	Pass	≤ 6500 K
	4000K	4095		
	6500K	6639		
Zonal Lumen Requirement	0-60 °	66.2	Pass	≥ 40 (-3)



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-12	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RLB-2F(0%,3000 K)	Total Operating Time (min)	75

Electrical Measurement in Lithonia C2 25 MVOLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE241105-B1	120.0	60	0.1645	19.64	0.9945	8.33
	277.2	60	0.0756	19.62	0.9367	12.14

**Photometric Measurement in Lithonia C2 25 MVOLT GEB10IS–
Goniophotometer Method(Test Distance:26.000m):**

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	2632.9	2590.1
Luminous Efficacy (lm/W)	134.07	132.02
Zonal lumens in the 0-60 °	66.2	--
Beam Angle (°)	119.2	--
Center Beam Candle Power (cd)	762	--

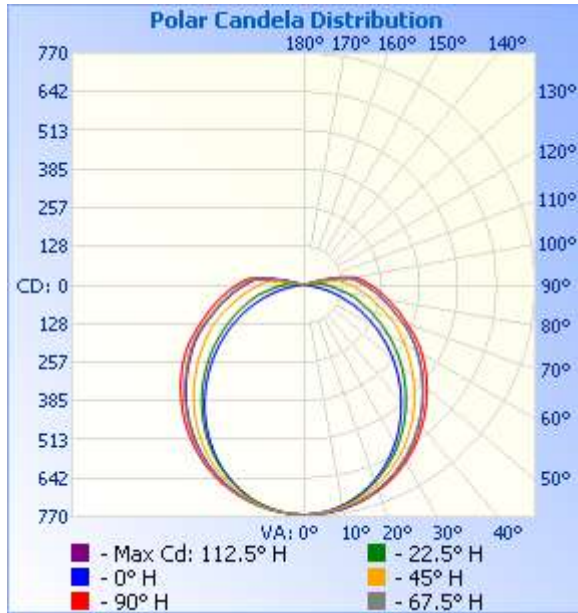


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	591.2	22.5%
0-40	969.2	36.8%
0-60	1,743.8	66.2%
60-90	749.2	28.5%
70-100	539.0	20.5%
90-120	138.7	5.3%
0-90	2,493.0	94.7%
90-180	139.7	5.3%
0-180	2,632.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	72.1	2.7%	90-100	113.3	4.3%
10-20	206.4	7.8%	100-110	25.2	1%
20-30	312.7	11.9%	110-120	0.2	0%
30-40	378.1	14.4%	120-130	0.1	0%
40-50	397.9	15.1%	130-140	0.1	0%
50-60	376.6	14.3%	140-150	0.2	0%
60-70	323.6	12.3%	150-160	0.2	0%
70-80	249.3	9.5%	160-170	0.3	0%
80-90	176.4	6.7%	170-180	0.1	0%

Photometric Data



Illuminance at a Distance

Center Beam fc	Beam Width	
47.6 fc	10.1 ft	19.8 ft
11.9 fc	20.2 ft	39.7 ft
5.3 fc	30.3 ft	59.5 ft
3.0 fc	40.3 ft	79.3 ft
1.9 fc	50.4 ft	99.1 ft
1.3 fc	60.5 ft	119.0 ft
1.0 fc	70.6 ft	138.8 ft
0.7 fc	80.7 ft	158.6 ft

■ Vert. Spread: 103.2°
■ Horiz. Spread: 136.1°

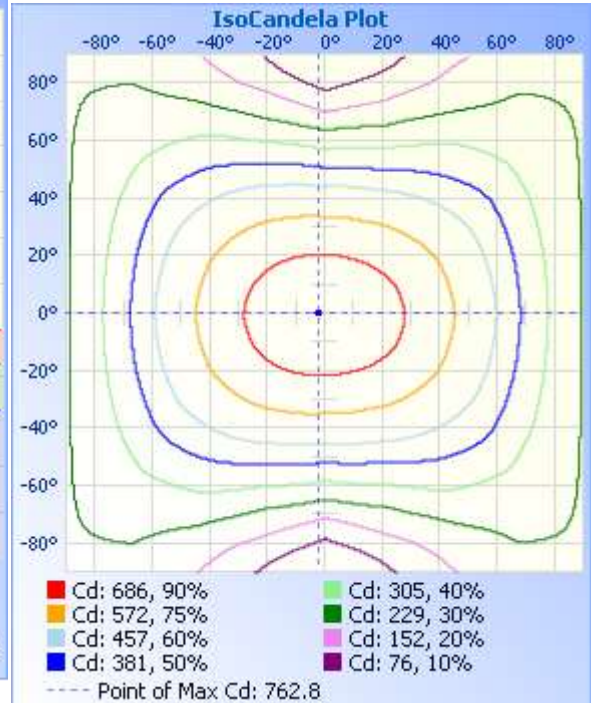
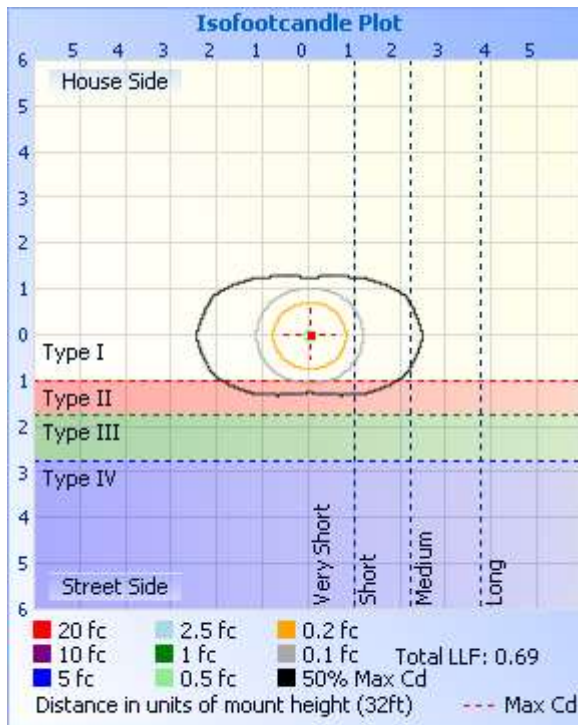




Table--1

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	762	762	762	762	762	762	762	762	762	762	762	762	762	762	762	762
5	758	758	757	756	757	758	758	760	761	761	760	759	759	758	758	759
10	751	749	745	742	743	745	748	752	755	754	751	748	745	745	749	752
15	738	735	728	721	720	724	732	740	743	742	735	728	724	725	732	738
20	721	716	703	691	689	696	709	721	727	723	712	701	694	697	708	719
25	700	692	672	655	651	661	680	697	705	699	683	666	657	662	679	696
30	673	662	637	614	608	621	647	668	679	670	649	626	614	621	644	667
35	643	629	596	566	559	577	608	634	648	637	611	582	565	576	606	634
40	609	592	553	516	505	529	565	596	612	599	569	533	513	527	563	596
45	572	552	507	463	449	478	522	557	574	559	524	482	457	475	518	557
50	534	511	460	409	392	428	476	515	535	519	477	429	399	422	472	517
55	495	468	413	355	333	375	431	474	495	477	432	376	340	368	426	475
60	454	428	368	301	274	322	387	433	454	436	386	323	281	315	381	436
65	409	385	325	250	216	272	345	391	411	393	343	271	222	264	339	393
70	363	338	283	202	158	225	302	344	364	345	301	223	164	216	295	345
75	324	297	236	159	104	185	254	303	325	305	254	180	109	175	247	303
80	288	261	198	121	54.6	141	219	267	288	268	216	138	59.2	132	211	266
85	254	228	167	82.1	16.5	104	186	236	254	235	182	97.1	19.0	94.7	177	234
90	223	197	138	56.8	0.00	77.9	158	206	224	205	153	69.4	0.00	69.5	150	205
95	195	170	113	20.4	0.00	42.9	132	178	195	176	126	34.7	0.00	32.8	123	177
100	138	113	44.7	0.00	0.00	0.00	71.1	133	156	131	66.4	0.00	0.00	0.00	55.9	117
105	58.1	33.0	0.60	0.00	0.00	0.00	0.89	52.3	75.7	49.8	0.00	0.00	0.00	0.00	0.02	37.9
110	0.82	0.70	0.59	0.00	0.00	0.00	0.50	0.70	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.50	0.50	0.40	0.00	0.00	0.00	0.50	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.40	0.50	0.40	0.00	0.00	0.00	0.50	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.40	0.50	0.40	0.10	0.00	0.00	0.50	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.40	0.50	0.40	0.20	0.00	0.00	0.50	0.20	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00
135	0.40	0.50	0.40	0.30	0.00	0.10	0.50	0.20	0.00	0.00	0.00	0.20	0.10	0.00	0.00	0.00
140	0.40	0.50	0.40	0.50	0.00	0.30	0.50	0.20	0.00	0.00	0.00	0.30	0.10	0.10	0.00	0.00
145	0.40	0.50	0.40	1.09	0.00	0.40	0.50	0.20	0.00	0.00	0.10	0.40	0.10	0.50	0.00	0.00
150	0.40	0.50	0.40	1.39	0.00	0.60	0.70	0.20	0.00	0.00	0.10	0.40	0.20	0.70	0.00	0.00
155	0.40	0.50	0.70	1.49	0.00	0.99	1.20	0.20	0.00	0.00	0.10	0.40	0.50	0.70	0.20	0.00
160	0.40	0.50	1.29	1.49	0.50	1.39	1.60	0.40	0.00	0.00	0.10	0.50	0.99	0.70	0.30	0.10
165	0.40	0.70	1.30	1.69	0.50	1.39	1.70	1.10	0.71	0.60	0.89	1.49	1.79	0.99	1.40	1.40
170	0.60	1.10	1.39	1.69	0.90	1.39	1.70	1.30	0.60	0.90	1.29	1.39	1.79	0.99	1.40	1.70
175	0.81	1.30	1.39	1.79	0.90	1.39	1.70	1.40	0.60	1.00	1.29	1.39	1.79	0.90	1.40	1.70
180	0.91	1.30	1.39	1.79	0.90	1.39	1.70	1.40	0.50	0.90	1.29	1.39	1.79	0.90	1.40	1.70



2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-12	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RLB-2F(0%,3000 K)	Total Operating Time (min)	61

Electrical Measurement in Lithonia C2 25 MVOLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE241105-B1	120.0	60	0.1653	19.77	0.9965	8.27
	277.0	60	0.0760	19.75	0.9386	12.08

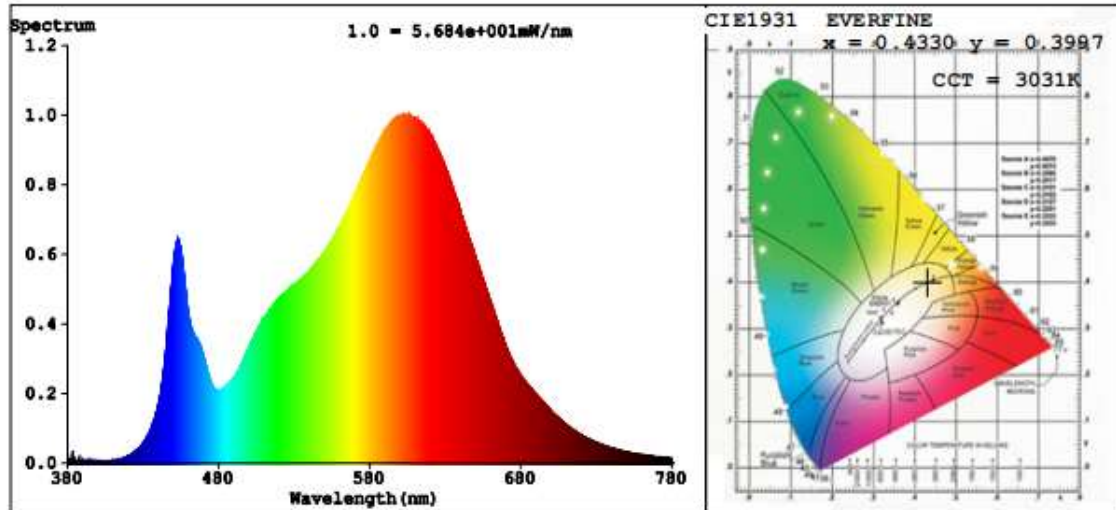
Chromaticity Measurement in Lithonia C2 25 MVOLT GEB10IS- Sphere-Spectroradiometer Method(Self-absorption:1.1293) (4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	83.9
Frequency (Hz)	60	R9	12
CCT (K)	3031	Rg	96
Duv	-0.0012	Rf	85
Chromaticity (x, y)	x=0.4330 y=0.3997	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.2499 v'=0.5190		

Photometric Measurement in Lithonia C2 25 MVOLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	2659	2616
Luminous Efficacy (lm/W)	134.50	132.46

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =83	R2 =93	R3 =95	R4 =82	R5 =83	R6 =91	R7 =83	
R8 =61	R9 =12	R10=84	R11=81	R12=73	R13=86	R14=98	R15=76

TM30

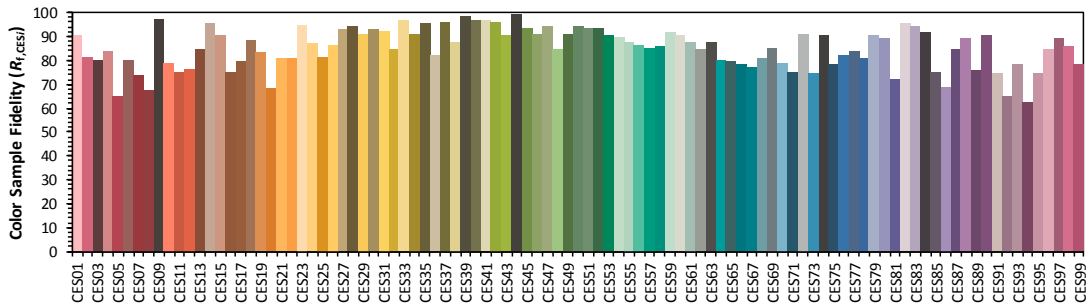
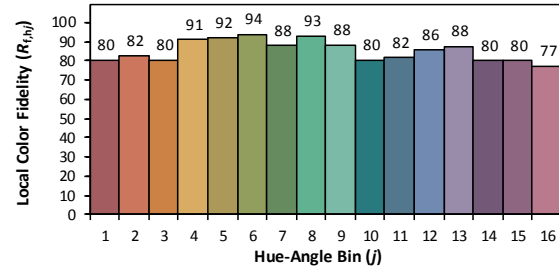
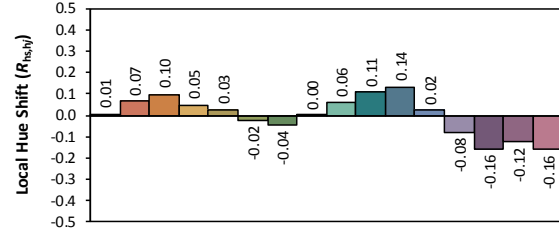
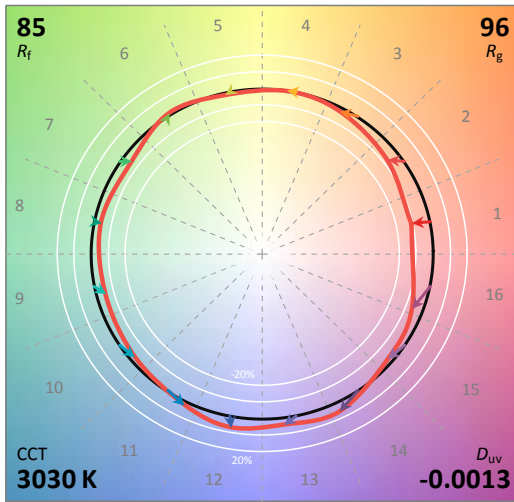
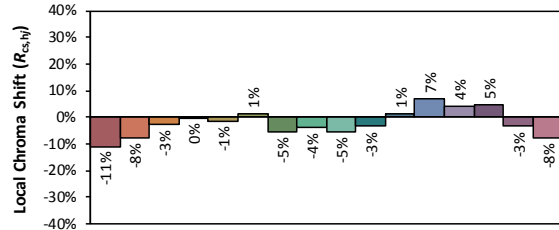
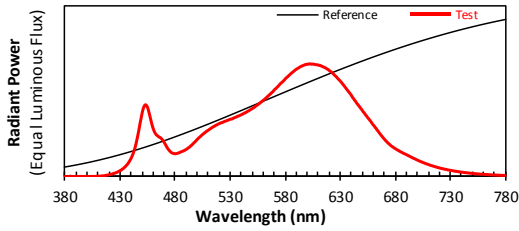
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-30E-13H-9C1

Manufacturer: RAB Lighting Inc.

Date: 2024-11-12

Model: RLB-2F (0%, 3000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4330
 y 0.3995
 u' 0.2500
 v' 0.5190

CIE 13.3-1995 (CRI)

R_a 84
R_g 12

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0



2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-12	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RLB-2F(50%,400 0K)	Total Operating Time (min)	61

Electrical Measurement in Lithonia C2 25 MVOLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE241105-B1	120.0	60	0.1608	19.23	0.9963	8.29
	277.0	60	0.0739	19.21	0.9384	12.10

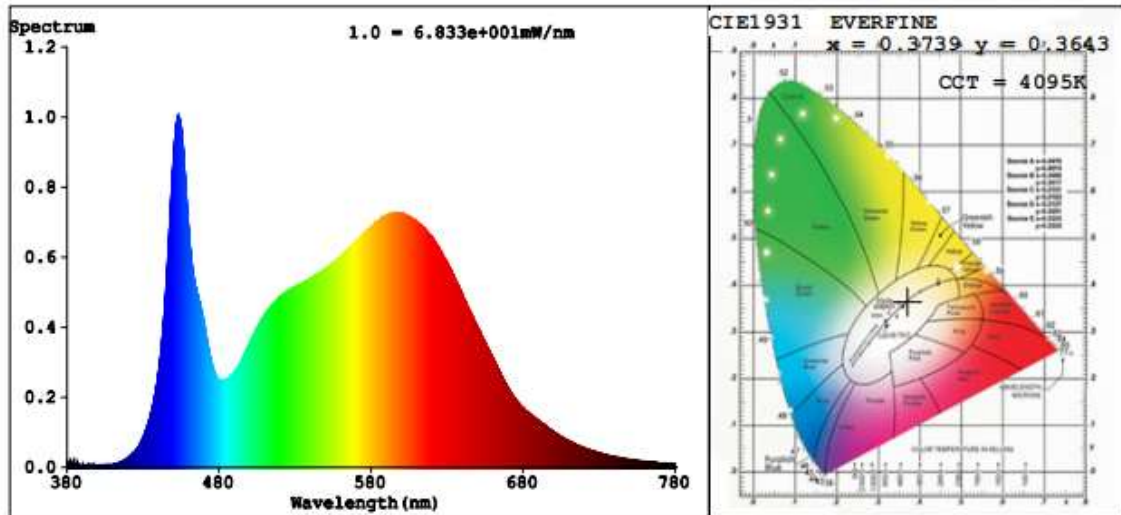
Chromaticity Measurement in Lithonia C2 25 MVOLT GEB10IS- Sphere-Spectroradiometer Method(Self-absorption:1.1295) (4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	87.0
Frequency (Hz)	60	R9	28
CCT (K)	4095	Rg	97
Duv	-0.0040	Rf	85
Chromaticity (x, y)	x=0.3739 y=0.3643	Rcs,h1(%)	-11
Chromaticity (u', v')	u'=0.2258 v'=0.4950		

Photometric Measurement in Lithonia C2 25 MVOLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	2772	2727
Luminous Efficacy (lm/W)	144.15	141.96

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

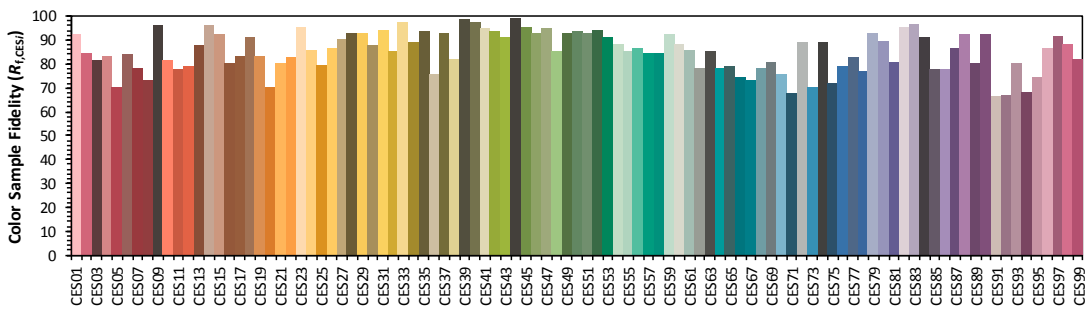
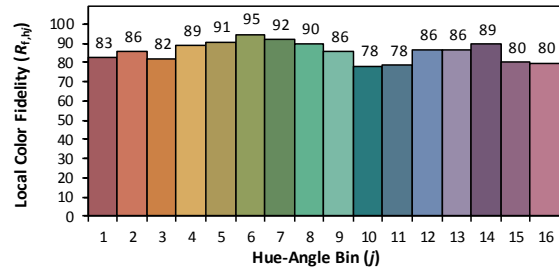
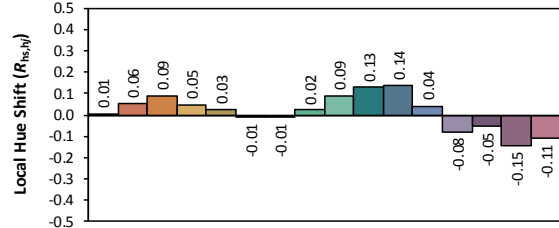
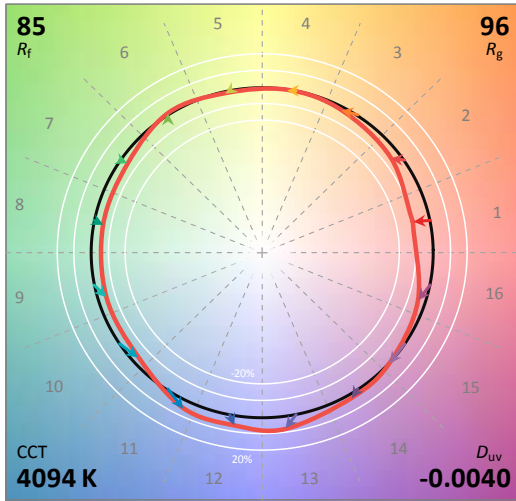
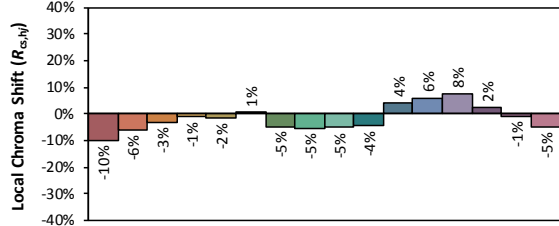
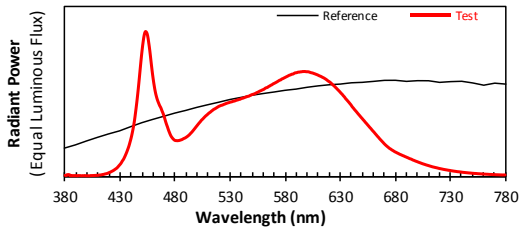
R1 =87	R2 =94	R3 =96	R4 =85	R5 =87	R6 =90	R7 =87		
R8 =71	R9 =28	R10=84	R11=85	R12=65	R13=90	R14=98	R15=83	



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-30E-13H-9C1
 BXEN-65E-13H-9C1
 Date: 2024-11-12
 Manufacturer: RAB Lighting Inc.
 Model: RLB-2F (50%, 4000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3739
 y 0.3642
 u' 0.2258
 v' 0.4949

CIE 13.3-1995 (CRI)
 R_a 87
 R_g 28

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0



2.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-12	Test Ambient:	25 ± 1 °C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	RLB-2F(100%,65 00K)	Total Operating Time (min)	61

Electrical Measurement in Lithonia C2 25 MVOLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE241105-B1	120.0	60	0.1630	19.49	0.9962	8.30
	277.0	60	0.0749	19.47	0.9383	12.11

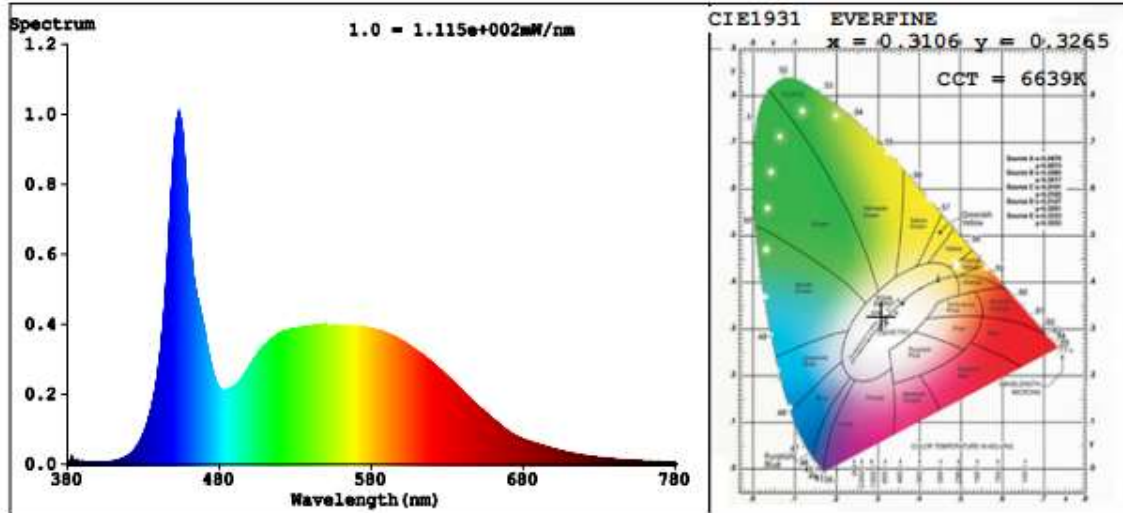
Chromaticity Measurement in Lithonia C2 25 MVOLT GEB10IS- Sphere-Spectroradiometer Method(Self-absorption:1.1292) (4π geometry):

Parameter	Result	Parameter	Result
Test Voltage (V)	120	Color Rendering Index (CRI)	85.2
Frequency (Hz)	60	R9	20
CCT (K)	6639	Rg	94
Duv	0.0030	Rf	84
Chromaticity (x, y)	x=0.3106 y=0.3265	Rcs,h1(%)	-12
Chromaticity (u', v')	u'=0.1973 v'=0.4667		

Photometric Measurement in Lithonia C2 25 MVOLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	2718	2674
Luminous Efficacy (lm/W)	139.46	137.34

Spectral Power Distribution & Chromaticity Diagram



Special Color Rendering Indices

R1 =84	R2 =91	R3 =92	R4 =84	R5 =84	R6 =85	R7 =89	
R8 =73	R9 =20	R10=76	R11=83	R12=56	R13=87	R14=96	R15=80

TM30

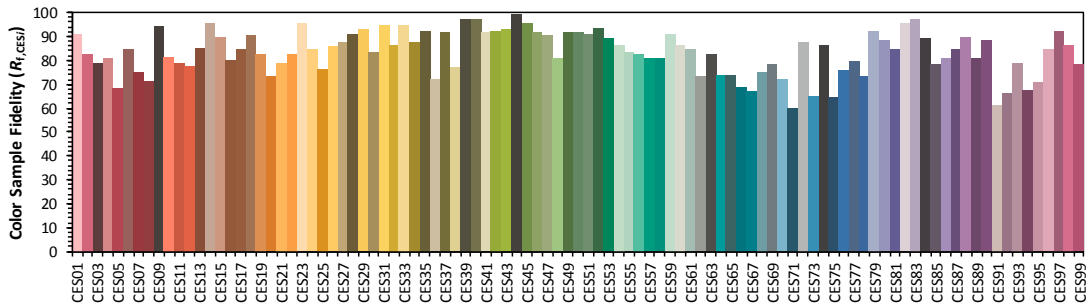
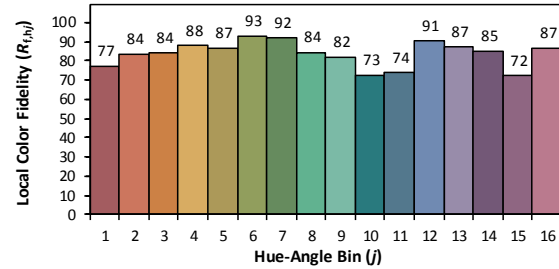
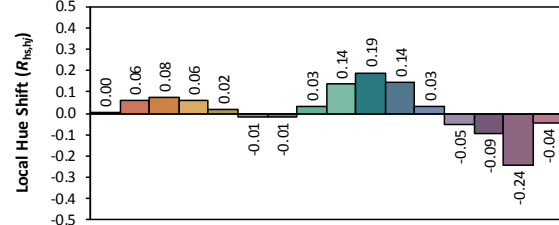
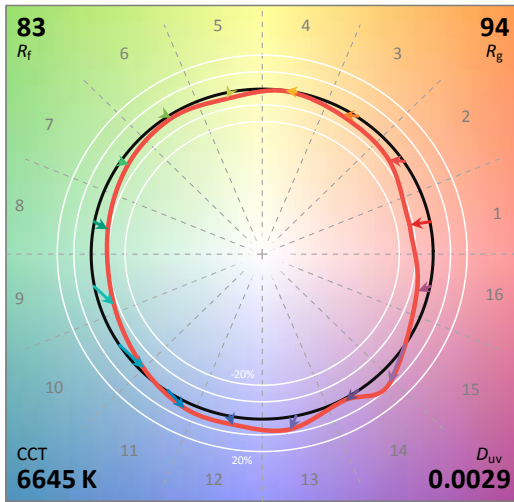
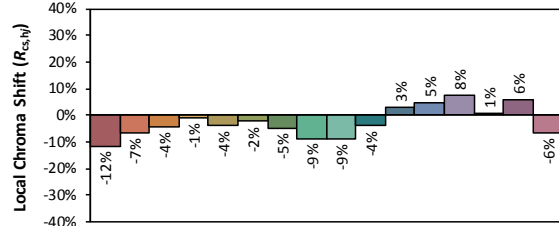
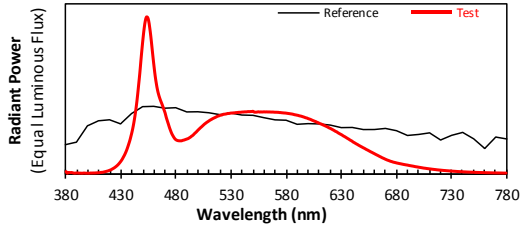
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-65E-13H-9C1

Manufacturer: RAB Lighting Inc.

Date: 2024-11-12

Model: RLB-2F (100%, 6500K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3106
 y 0.3263
 u' 0.1973
 v' 0.4666

CIE 13.3-1995
(CRI)

R_a 85
 R_g 20

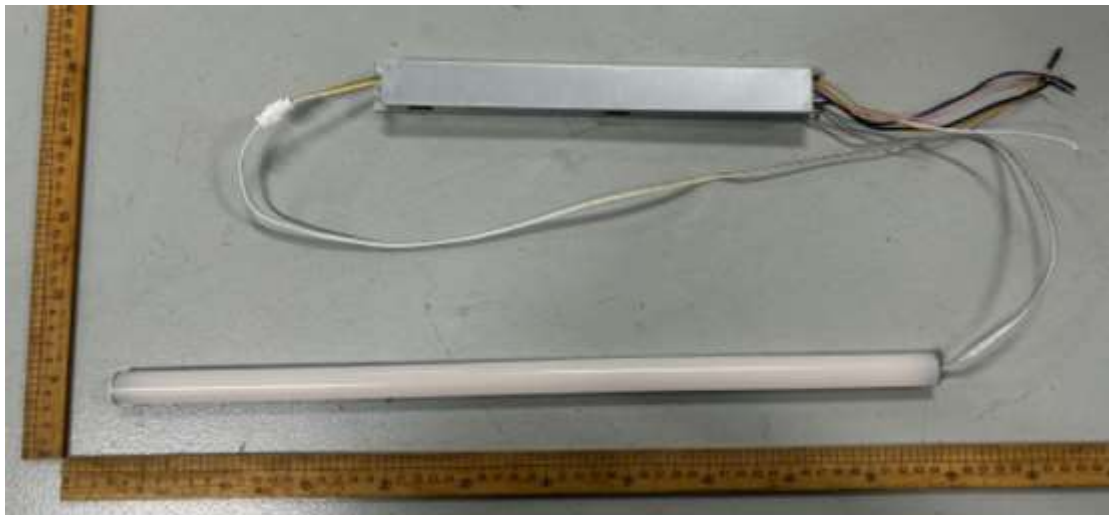
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0



3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-S-451	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-S-455	Spectral analysis system HASS-2000	Verified by D204 standard lamp	
ST-R-S-452	Standard Lamp D204	2023-06-26	2026-06-25
ST-R-S-453	Power Meter for Integrating Sphere	2024-05-29	2025-05-28
ST-R-S-467	Hygrothermograph	2024-06-06	2025-06-05
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp D908S	2022-07-19	2025-07-18
ST-R-357	AC Power Source	2024-01-29	2025-01-28
ST-R-S-422	Power Meter for Goniophotometer	2024-05-29	2025-05-28
ST-R-S-354	hygrothermograph for Goniophotometer	2024-05-29	2025-05-28
Uncertainty: Photometric Measurement (Sphere):2.94%, k=2 Chromaticity Measurement(Sphere):52.28K, k=2 Photometric Measurement(Goniophotometer): 2.94%, k=2			

4. Product Photo



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