



LM-79-19 Test Report

For

RAB Lighting INC.

(Brand Name:RAB)

408 W 14th St, New York, NY 10014, USA

**Model name(s):
ENCT-48BN**

Report Type: Testing and Report According to IES LM-79-2019

**Type of
Luminaire:** LED luminaire

Report Date: 2024-11-27

Ningbo TengLi Testing Co., Ltd

Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
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Test & Report By:

Engineer: Holly Wang

Review By:

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	ENCT-48BN
Remark	N/A
Representative (Tested) Model	ENCT-48BN(mode:2700K) ENCT-48BN(mode:3000K) ENCT-48BN(mode:3500K) ENCT-48BN(mode:4000K) ENCT-48BN(mode:5000K)
Model Difference	N/A
SKU (if available)	-
Type of Luminaire (for integral lamps, list base type and lamp type)	LED luminaire
LED Manufacturer	Lumileds Holding B.V.
LED Model	L128-xx90RC35xxxxx
Dimming	Continuous
Integral Controls	N/A
Sample Number	STD241047NB-J1
Date of Receipt	Nov.18,2024
Luminaire Aperture (for downlights)	-- in.
Luminaire Length	-- mm
Luminaires Width	-- mm
Number of Units (modular products)	N/A s

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac, 60Hz
Nominal Power	50W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,5000K (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 C78.377-2008 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

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 $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$, 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 $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$. 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 $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$. 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 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-22	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ENCT-48BN(mode:2700K)	Total Operating Time(min)	75

Electrical Measurement:

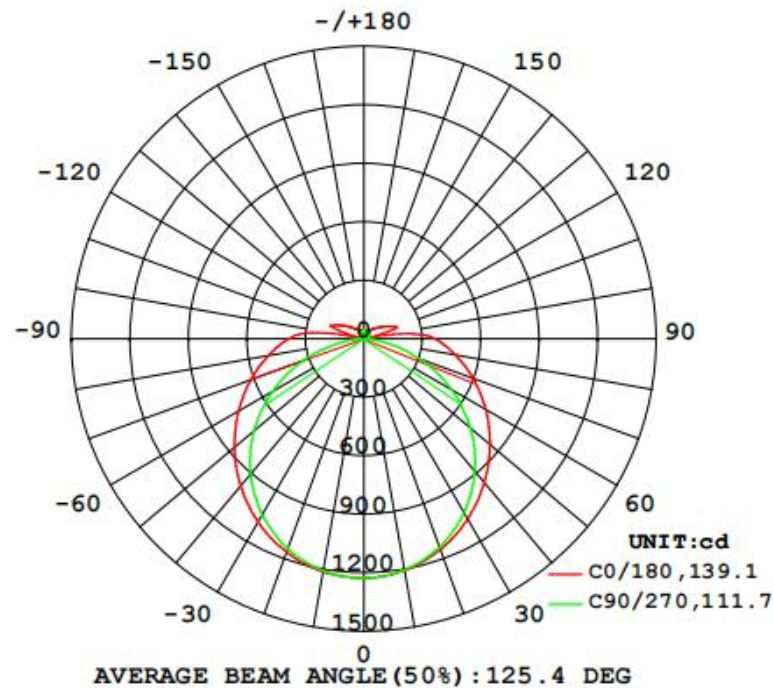
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-J1	120.0	60.01	0.4647	50.31	0.9021	47.41

Photometric Measurement – Goniophotometer Method(Test Distance: 26.00m):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	4680.9
Luminous Efficacy (lm/W)	93.04
Beam Angle (°)	125.4
Center Beam Candle Power (cd)	1227

Zonal Lumen Tabulation

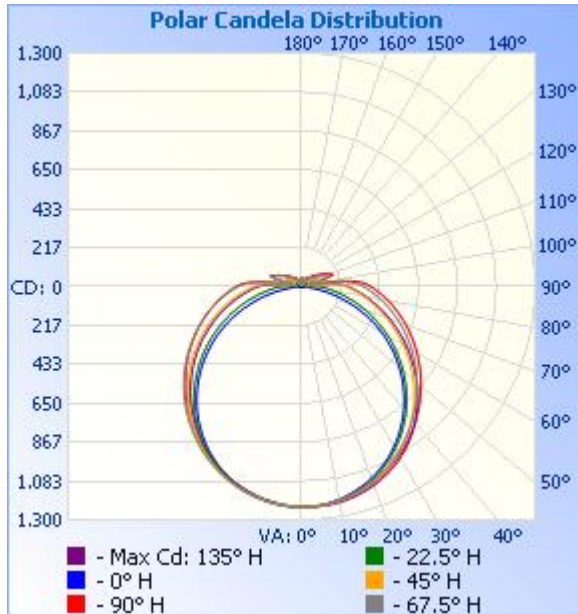
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	963.8	20.6%
0-40	1,594.2	34.1%
0-60	2,919.3	62.4%
60-90	1,300.7	27.8%
70-100	902.4	19.3%
90-120	314.3	6.7%
0-90	4,220.0	90.2%
90-180	460.6	9.8%
0-180	4,680.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	116.2	2.5%	90-100	163.1	3.5%
10-20	334.7	7.2%	100-110	68.3	1.5%
20-30	512.9	11.0%	110-120	82.9	1.8%
30-40	630.4	13.5%	120-130	57.4	1.2%
40-50	675.9	14.4%	130-140	36.9	0.8%
50-60	649.1	13.9%	140-150	25.3	0.5%
60-70	561.4	12.0%	150-160	14.0	0.3%
70-80	435.1	9.3%	160-170	9.1	0.2%
80-90	304.1	6.5%	170-180	3.6	0.1%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
4.0ft	76.7 fc	11.9 ft	21.3 ft
8.0ft	19.2 fc	23.7 ft	42.7 ft
12.0ft	8.5 fc	35.6 ft	64.0 ft
16.0ft	4.8 fc	47.5 ft	85.3 ft
20.0ft	3.1 fc	59.3 ft	106.7 ft

■ Vert. Spread: 112.0°
■ Horiz. Spread: 138.9°

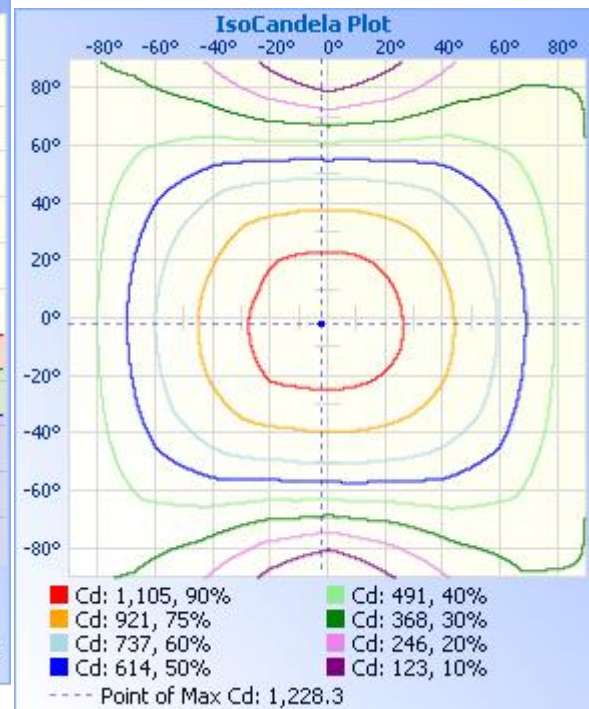
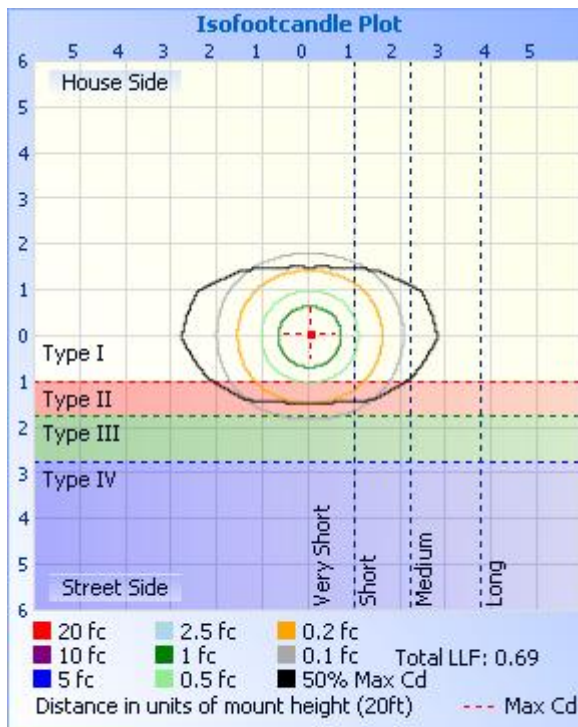




Table--1 UNIT: cd

C(DEG) γ (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	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227	1227			
5	1221	1219	1218	1219	1221	1222	1224	1222	1224	1226	1227	1224	1223	1222	1222	1222			
10	1206	1204	1201	1202	1204	1207	1211	1208	1213	1215	1219	1213	1207	1207	1208	1209			
15	1182	1179	1176	1176	1175	1182	1190	1185	1193	1197	1202	1189	1181	1183	1186	1188			
20	1150	1146	1143	1140	1136	1145	1160	1154	1164	1169	1177	1154	1145	1150	1156	1159			
25	1111	1106	1102	1095	1087	1098	1121	1115	1128	1135	1143	1109	1098	1107	1117	1122			
30	1066	1060	1055	1041	1029	1042	1074	1070	1086	1094	1099	1055	1043	1055	1072	1079			
35	1016	1008	1000	977	962	977	1018	1018	1038	1045	1045	991	978	994	1019	1030			
40	962	952	940	905	887	905	956	962	985	991	983	919	905	924	960	976			
45	905	892	874	825	804	825	887	902	927	931	914	841	824	847	894	918			
50	845	829	804	741	714	740	813	839	867	869	838	757	737	764	825	857			
55	784	765	732	651	619	651	735	774	805	804	759	667	642	676	752	794			
60	722	699	656	559	518	558	655	709	742	737	678	575	543	585	677	729			
65	659	633	580	466	413	466	577	644	680	670	598	482	439	494	601	664			
70	597	568	504	374	306	374	501	580	618	604	520	390	332	403	527	599			
75	536	505	431	287	200	290	430	517	557	539	447	302	226	317	455	535			
80	477	444	363	210	104	215	365	457	498	477	378	223	126	239	386	473			
85	420	387	301	147	28.9	153	306	400	441	417	316	158	44.4	172	324	414			
90	366	332	246	99.7	0.54	107	254	346	387	360	260	107	2.10	120	267	358			
95	282	244	144	26.0	1.26	26.3	168	270	314	283	178	30.0	0.95	33.3	173	268			
100	110	66.1	40.0	28.8	4.64	31.4	25.5	108	163	119	27.7	30.2	3.67	35.2	35.6	82.8			
105	75.4	96.2	101	25.2	8.81	28.4	102	60.8	45.3	60.4	106	27.5	7.91	31.5	114	93.3			
110	179	153	90.6	24.7	12.5	26.1	94.8	160	167	168	95.0	24.0	11.5	28.3	98.5	169			
115	152	129	79.2	25.3	15.7	25.4	84.1	139	165	143	82.7	23.3	14.4	27.4	83.8	142			
120	127	109	68.4	26.1	20.2	25.1	73.1	118	139	120	71.2	23.6	18.2	27.5	72.1	119			
125	107	92.1	59.3	27.9	23.9	27.6	63.6	99.3	117	100	61.9	26.2	22.2	28.1	63.2	99.8			
130	89.5	77.9	52.5	13.5	28.4	30.3	55.6	83.6	97.2	83.8	54.0	29.3	26.5	24.9	55.9	84.0			
135	75.4	66.7	47.5	8.45	31.3	17.5	49.4	70.7	81.0	70.7	48.0	14.4	30.3	9.31	50.1	71.4			
140	64.3	57.9	44.1	26.2	32.5	12.0	46.8	60.2	67.9	60.0	45.7	12.6	32.4	21.6	45.9	61.5			
145	55.6	51.2	40.2	30.6	32.2	24.2	46.0	52.4	57.3	52.1	44.9	14.5	33.2	25.5	38.1	53.9			
150	49.5	47.2	6.12	25.1	32.7	30.2	38.2	49.7	52.0	49.7	44.8	25.8	34.9	27.4	7.40	49.3			
155	26.1	7.97	22.8	26.1	34.4	25.9	12.6	47.7	49.1	47.7	20.0	37.5	34.5	34.1	35.1	7.08			
160	8.26	21.3	29.9	37.1	36.8	25.7	34.5	12.8	16.9	13.9	12.7	28.2	37.6	36.5	27.6	40.6			
165	35.9	34.0	28.2	38.6	40.0	40.8	28.8	40.7	22.8	22.8	37.2	25.7	38.7	39.1	39.9	27.9			
170	37.4	37.4	40.0	40.3	42.1	44.6	31.9	27.1	27.4	26.8	24.5	27.6	40.6	41.4	42.4	37.7			
175	34.4	36.2	38.9	40.8	43.0	45.4	43.9	40.0	33.9	32.8	37.1	38.1	42.6	43.9	45.5	43.0			
180	37.0	37.5	38.8	41.8	44.4	44.5	43.8	39.6	37.1	33.8	35.8	39.1	42.1	46.5	48.3	48.3			



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-22	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ENCT-48BN(mode:2700K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-J1	120.0	60.01	0.4665	50.36	0.8997	47.49

Chromaticity Measurement - Sphere-Spectroradiometer

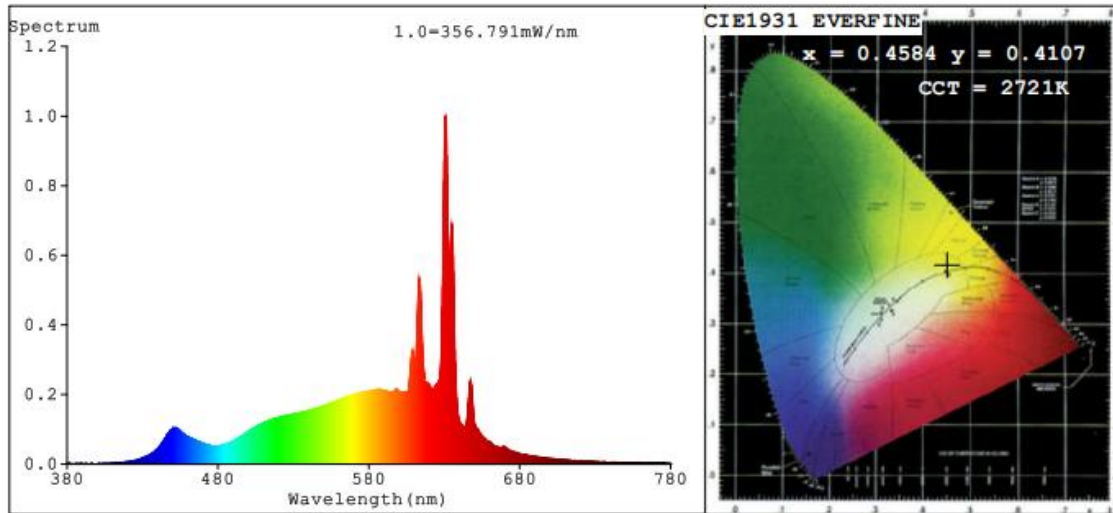
Method(Self-absorption:1.1194)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2721
Duv	0.0001
Chromaticity (x, y)	x=0.4584 y=0.4107
Chromaticity (u', v')	u'=0.2615 v'=0.5272
Color Rendering Index (CRI)	95.9
R9	71
Rg	101
Rf	92
Rcs,h1	-5

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	4746
Luminous Efficacy (lm/W)	94.24

Spectral Power Distribution & Chromaticity Diagram



R1 =98	R2 =98	R3 =96	R4 =98	R5 =98	R6 =97	R7 =94		
R8 =88	R9 =71	R10=94	R11=97	R12=88	R13=98	R14=96	R15=94	

TM30

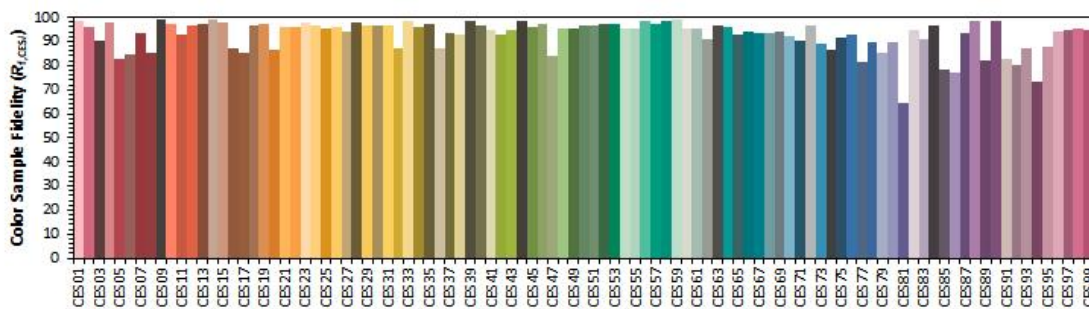
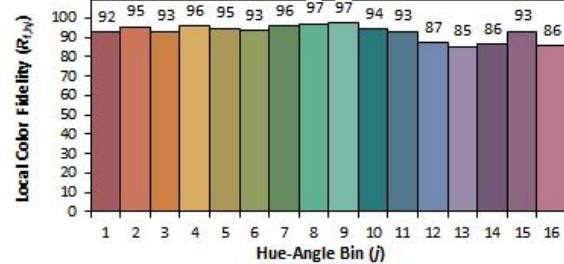
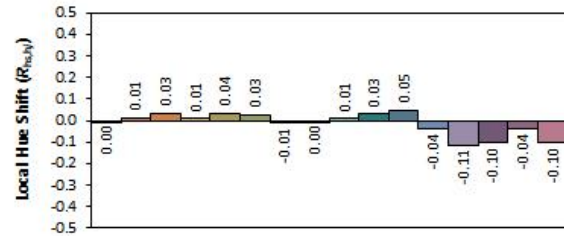
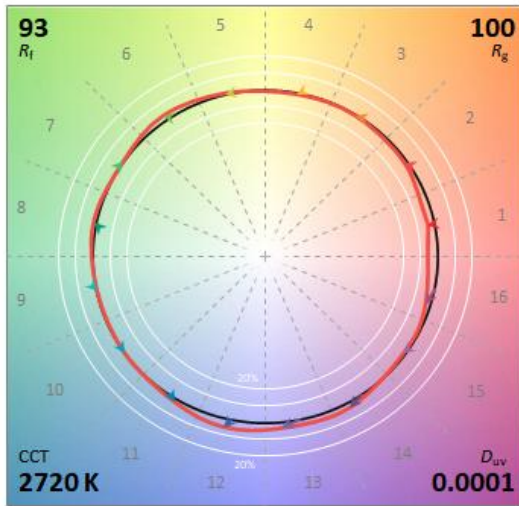
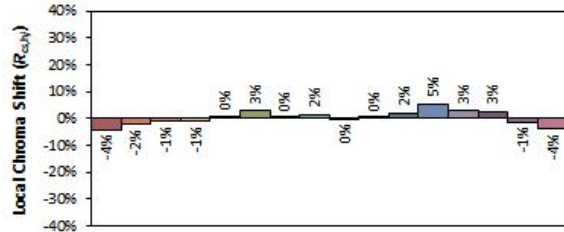
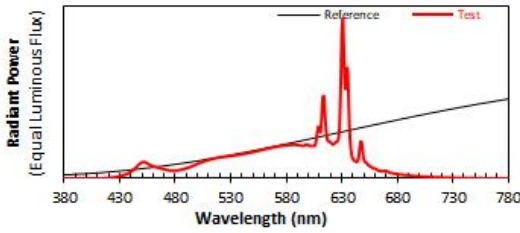
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx

Manufacturer: RAB Lighting INC.

Date: 2024-11-22

Model: ENCT-48BN (mode:2700K)



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

x 0.4584
y 0.4106
u' 0.2616
v' 0.5271

CIE 13.3-1995
(CRI)
R_a 96
R_g 71

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-22	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ENCT-48BN(mode:3000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-J1	120.0	60.01	0.4674	50.41	0.8988	47.48

Chromaticity Measurement - Sphere-Spectroradiometer

Method(Self-absorption:1.1193)(4π geometry):

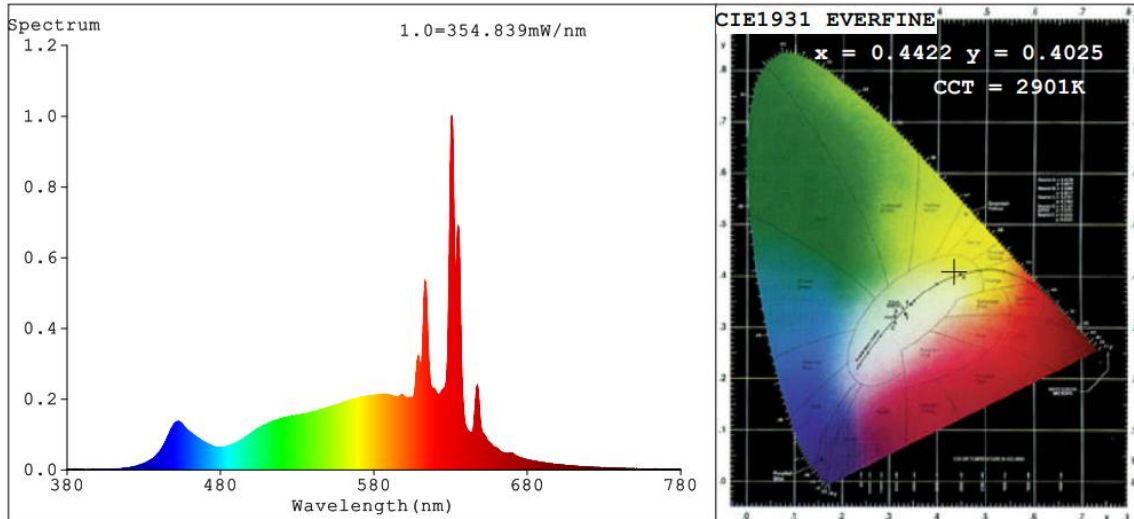
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2901
Duv	-0.0013
Chromaticity (x, y)	x=0.4422 y=0.4025
Chromaticity (u', v')	u'=0.2547 v'=0.5216
Color Rendering Index (CRI)	96.8
R9	78
Rg	102
Rf	93
Rcs,h1	-4

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	4879
Luminous Efficacy (lm/W)	96.79



Spectral Power Distribution & Chromaticity Diagram



R1 =99	R2 =99	R3 =97	R4 =98	R5 =99	R6 =95	R7 =94		
R8 =91	R9 =78	R10=96	R11=96	R12=87	R13=100	R14=96	R15=96	

TM30

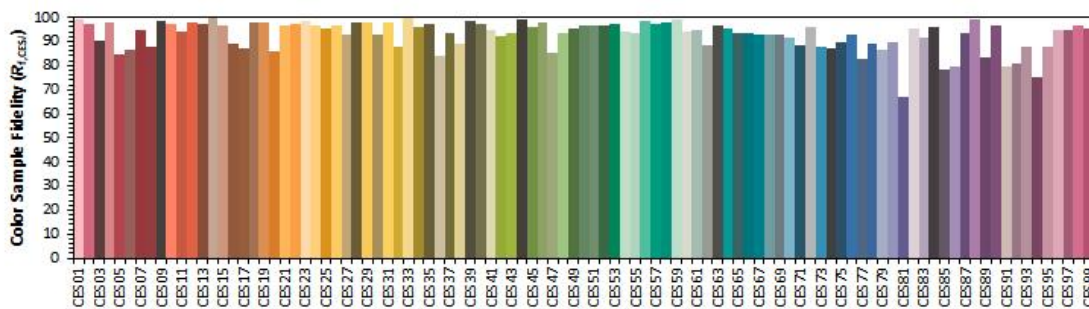
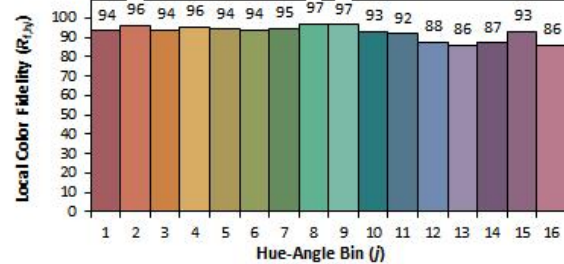
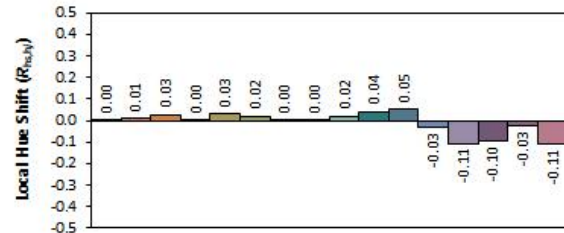
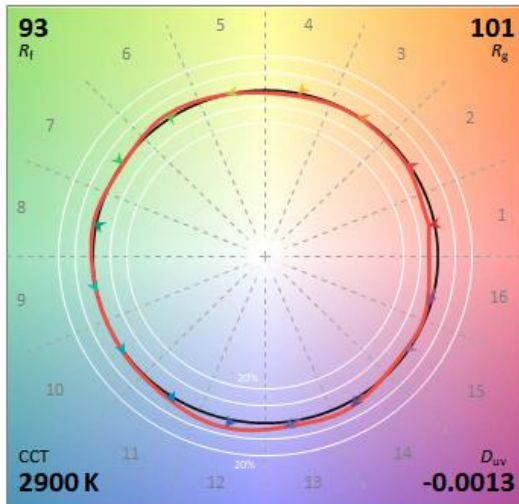
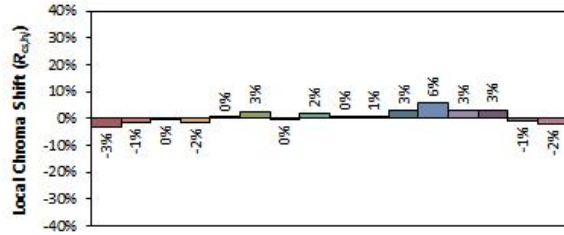
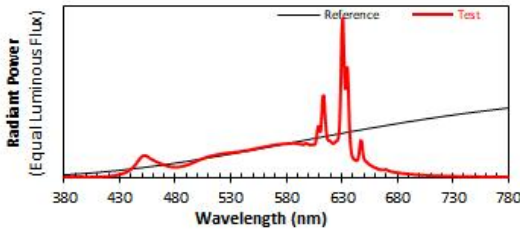
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx

Manufacturer: RAB Lighting INC.

Date: 2024-11-22

Model: ENCT-48BN (mode: 3000K)



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

x 0.4422
y 0.4024
u' 0.2547
v' 0.5215

CIE 13.3-1995 (CRI)
R_a 97
R_g 79

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-22	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ENCT-48BN(mode:3500K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-J1	120.0	60.01	0.4628	50.16	0.9032	47.36

Chromaticity Measurement - Sphere-Spectroradiometer

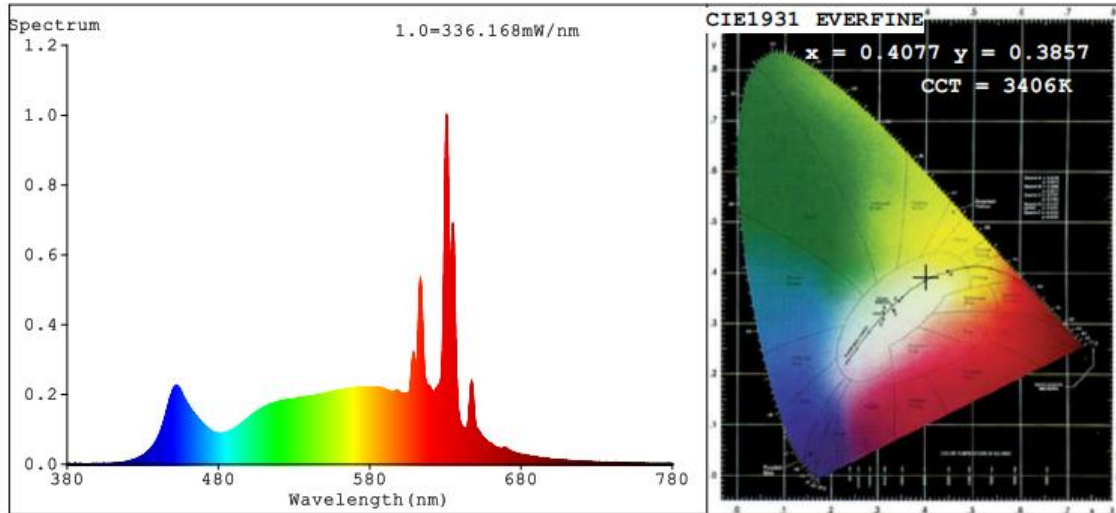
Method(Self-absorption:1.1196)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3406
Duv	-0.0027
Chromaticity (x, y)	x=0.4077 y=0.3857
Chromaticity (u', v')	u'=0.2394 v'=0.5095
Color Rendering Index (CRI)	97.0
R9	93
Rg	103
Rf	93
Rcs,h1	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	5067
Luminous Efficacy (lm/W)	101.02

Spectral Power Distribution & Chromaticity Diagram



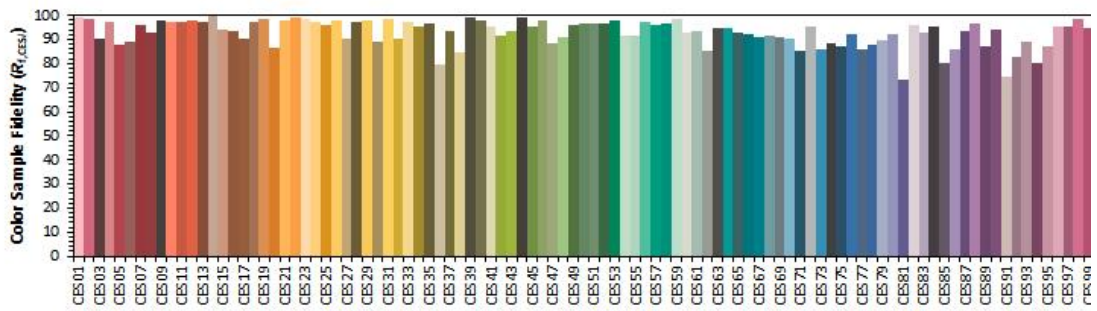
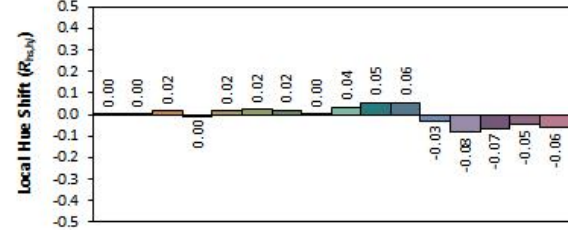
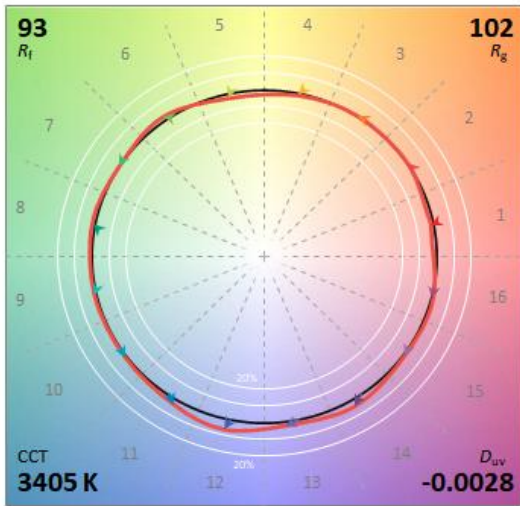
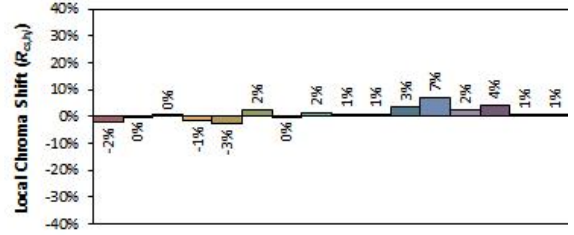
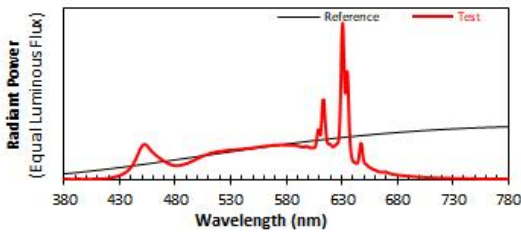
R1 =97	R2 =99	R3 =96	R4 =97	R5 =98	R6 =95	R7 =97	
R8 =98	R9 =93	R10=98	R11=94	R12=83	R13=97	R14=96	R15=98



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx Manufacturer: RAB Lighting INC.
 Date: 2024-11-22 Model: ENCT-48BN (mode: 3500K)



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

x	0.4077
y	0.3855
u'	0.2394
v'	0.5094

CIE 13.3-1995 (CRI)	
R_a	97
R_g	94

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-22	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ENCT-48BN(mode:4000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-J1	120.0	60.01	0.4615	50.04	0.9035	47.37

Chromaticity Measurement - Sphere-Spectroradiometer

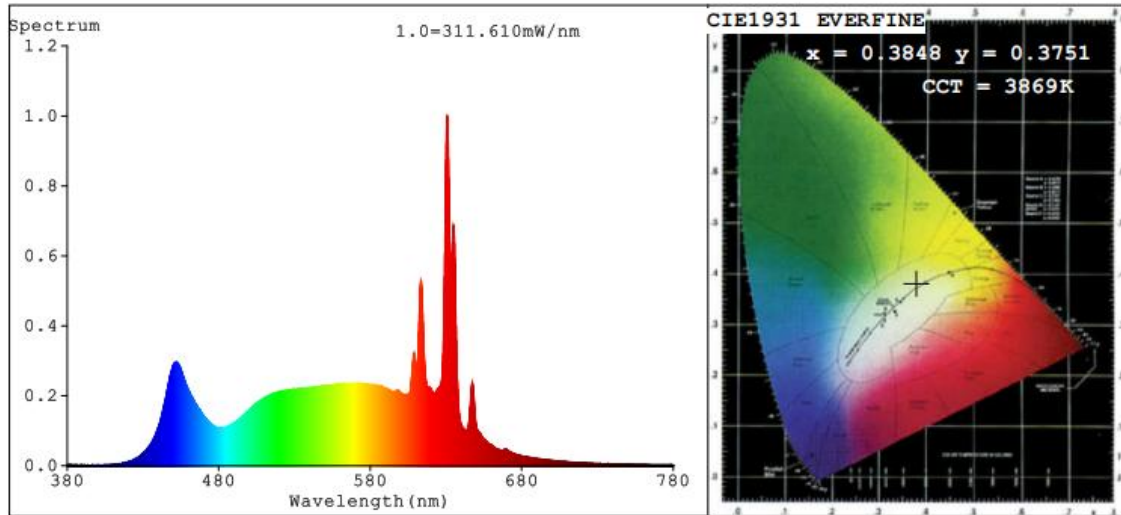
Method(Self-absorption:1.1195)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3869
Duv	-0.0020
Chromaticity (x, y)	x=0.3848 y=0.3751
Chromaticity (u', v')	u'=0.2287 v'=0.5015
Color Rendering Index (CRI)	97.3
R9	97
Rg	102
Rf	93
Rcs,h1	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	5105
Luminous Efficacy (lm/W)	102.02

Spectral Power Distribution & Chromaticity Diagram



R1 =97	R2 =99	R3 =94	R4 =97	R5 =98	R6 =96	R7 =99		
R8 =99	R9 =97	R10=97	R11=94	R12=79	R13=98	R14=95	R15=97	

TM30

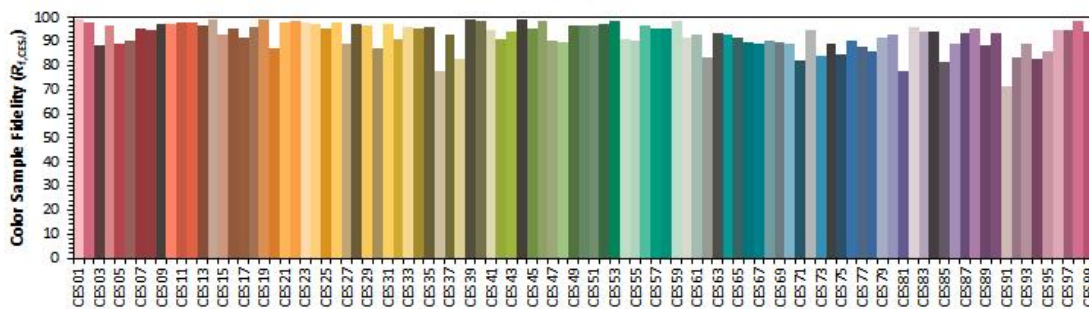
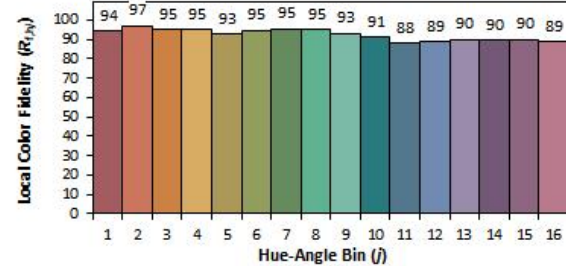
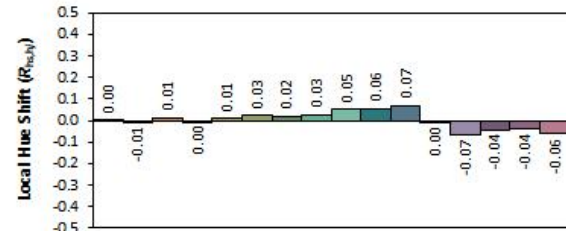
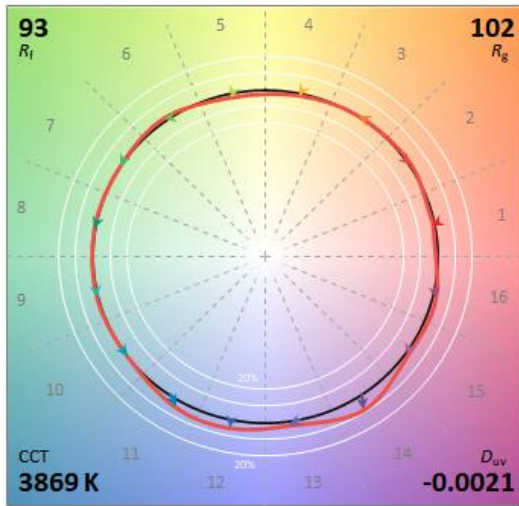
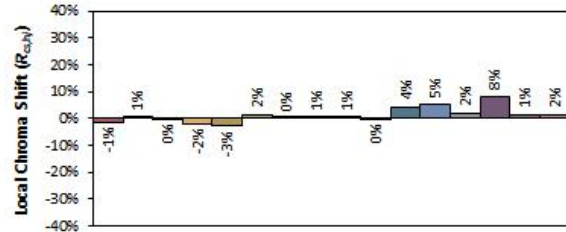
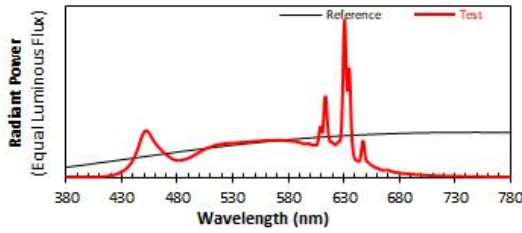
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx

Manufacturer: RAB Lighting INC.

Date: 2024-11-22

Model: ENCT-48BN (mode: 4000K)



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

x 0.3848
 y 0.3749
 u' 0.2287
 v' 0.5014

CIE 13.3-1995
(CRI)
 R_a 97
 R_g 97

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.6 Electrical, Photometric and Chromaticity Measurements

Test date	2024-11-22	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ENCT-48BN(mode:5000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-J1	120.0	60.01	0.4674	50.28	0.8965	47.53

Chromaticity Measurement - Sphere-Spectroradiometer

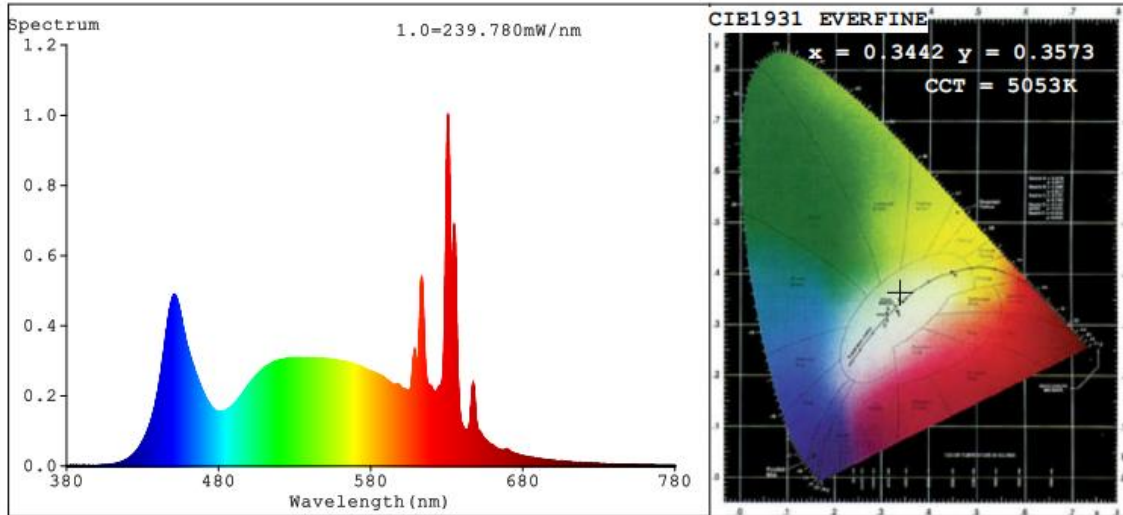
Method(Self-absorption:1.1198)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5053
Duv	0.0032
Chromaticity (x, y)	x=0.3442 y=0.3573
Chromaticity (u', v')	u'=0.2086 v'=0.4873
Color Rendering Index (CRI)	95.9
R9	92
Rg	102
Rf	93
Rcs,h1	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	4879
Luminous Efficacy (lm/W)	97.04

Spectral Power Distribution & Chromaticity Diagram



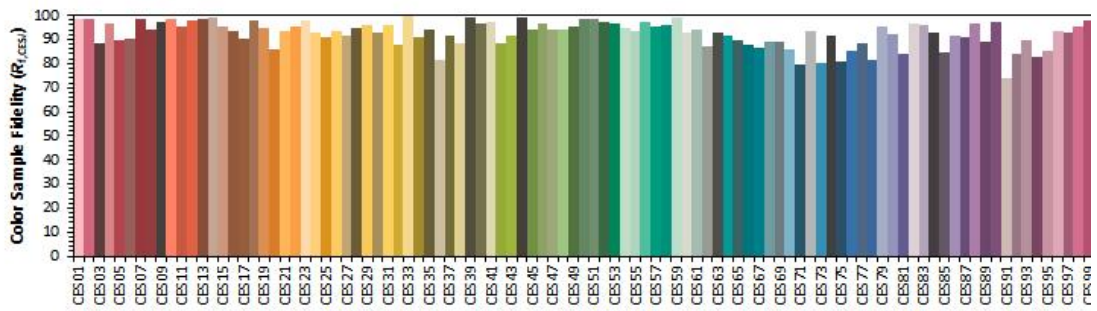
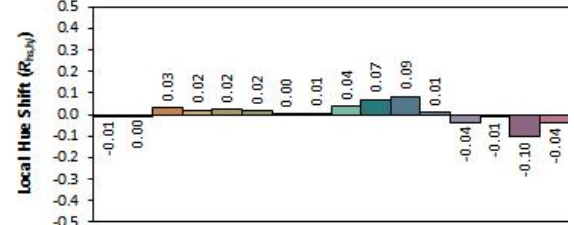
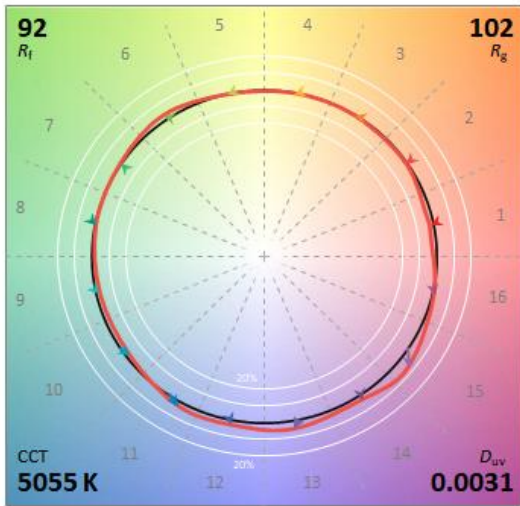
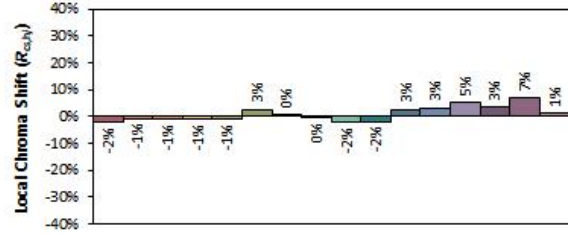
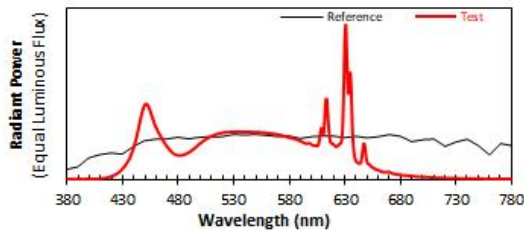
R1 =98	R2 =96	R3 =91	R4 =96	R5 =97	R6 =94	R7 =97		
R8 =98	R9 =92	R10=87	R11=94	R12=74	R13=97	R14=94	R15=98	



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx Manufacturer: RAB Lighting INC.
 Date: 2024-11-22 Model: ENCT-48BN (mode:5000K)



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

x	0.3441	CIE 13.3-1995 (CRI) R_a 96 R_g 93
y	0.3571	
u'	0.2087	
v'	0.4872	

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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-703	Standard Lamp D204	2023-12-26	2024-12-25
ST-R-704	Power Meter for Integrating Sphere	2023-12-26	2024-12-25
ST-R-707	Temperature Probe for Integrating Sphere	2023-12-26	2024-12-25
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2023-12-26	2024-12-25
ST-R-711	Power Meter for Goniophotometer	2023-12-26	2024-12-25
ST-R-709	Hygrothermograph for Goniophotometer	2023-12-26	2024-12-25
Uncertainty(K=2): Photometric Measurement (Sphere):3.40% Chromaticity Measurement(Sphere):44.8K Photometric Measurement(Goniophotometer):3.64%			

4. Product Photo



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