



LM-79-19 Test Report

For

RAB Lighting INC.

(Brand Name:RAB)

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

**Model name(s):
ALR-RBN**

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,
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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	ALR-RBN	
Remark	N/A	
Representative (Tested) Model	ALR-RBN(mode:2700K) ALR-RBN(mode:3000K) ALR-RBN(mode:3500K) ALR-RBN(mode:4000K) ALR-RBN(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-B1	
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	16W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,5000K (Color Tunable)



1.3 Test Specifications:

<p>Test item</p>	<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
<p>Reference Standard</p>	<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	ALR-RBN(mode:2700K)	Total Operating Time(min)	75

Electrical Measurement:

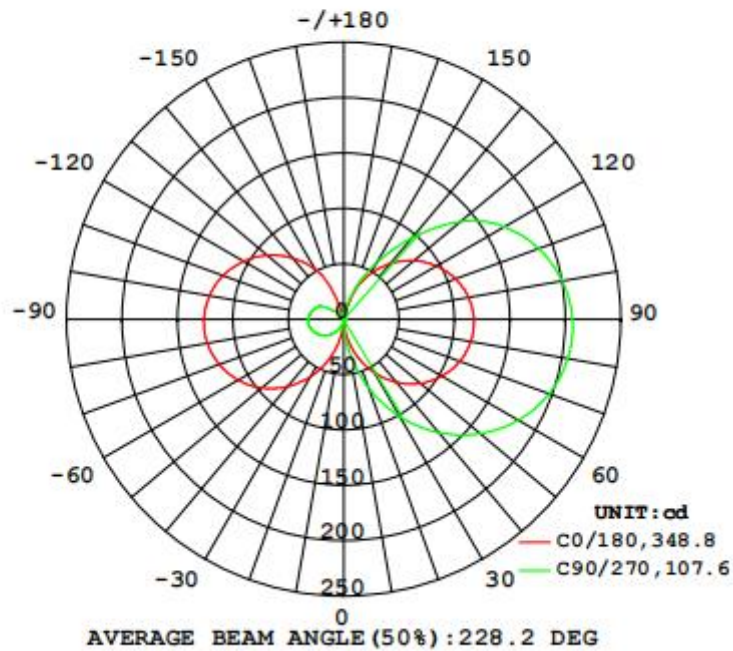
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-B1	120.0	60.01	0.1451	15.95	0.9161	45.32

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

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1220.2
Luminous Efficacy (lm/W)	76.48
Beam Angle (°)	228.2
Center Beam Candle Power (cd)	3

Zonal Lumen Tabulation

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	32.9	2.7%
0-40	78.6	6.4%
0-60	246.0	20%
60-90	394.3	32.1%
70-100	416.1	33.9%
90-120	380.9	31%
0-90	640.2	52.1%
90-180	588.5	47.9%
0-180	1,228.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	1.0	0.1%	90-100	140.2	11.4%
10-20	8.2	0.7%	100-110	129.5	10.5%
20-30	23.7	1.9%	110-120	111.2	9.1%
30-40	45.7	3.7%	120-130	87.5	7.1%
40-50	71.0	5.8%	130-140	61.3	5%
50-60	96.3	7.8%	140-150	36.8	3%
60-70	118.3	9.6%	150-160	17.2	1.4%
70-80	134.2	10.9%	160-170	4.5	0.4%
80-90	141.8	11.5%	170-180	0.3	0%

Photometric Data

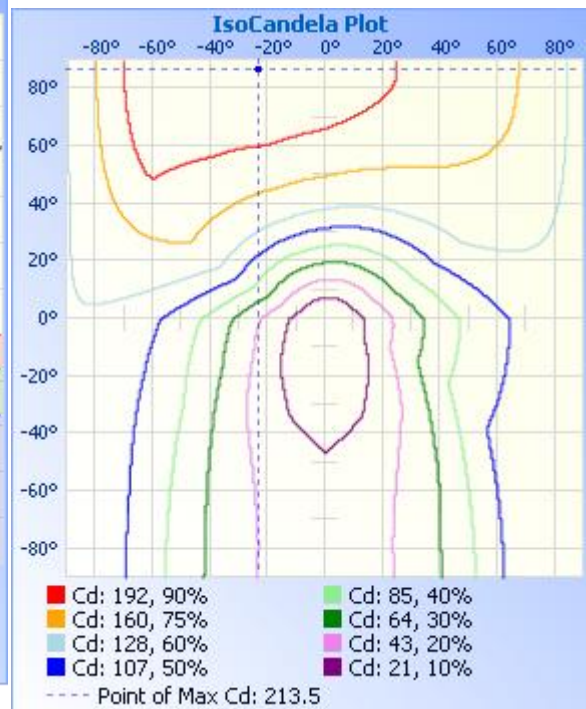
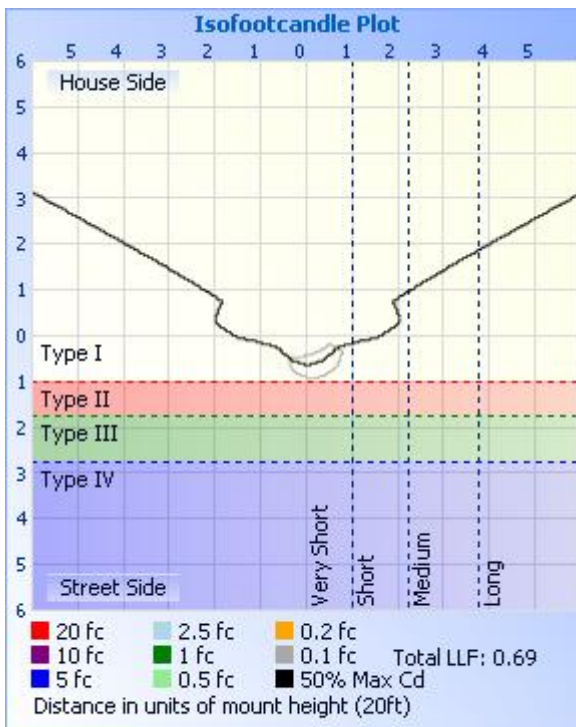
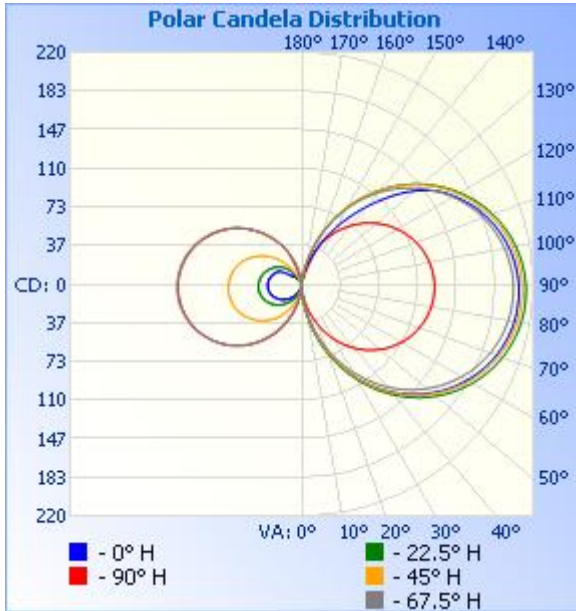




Table--1

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	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60			
5	6.57	9.78	11.7	13.1	14.0	14.1	13.0	11.23	6.41	4.58	2.42	1.04	0.51	0.91	2.39	4.99			
10	15.1	21.6	25.0	27.7	29.8	30.2	28.4	25.7	15.6	11.9	7.04	3.55	2.12	3.17	6.89	13.0			
15	25.0	35.1	40.4	44.3	47.5	48.4	46.2	42.5	26.4	20.8	12.9	6.98	4.51	6.40	12.9	23.0			
20	35.4	49.1	56.2	61.5	65.9	67.4	64.9	60.4	37.3	29.7	18.6	10.2	6.80	9.72	19.1	33.4			
25	45.8	63.3	72.0	78.5	84.1	86.2	83.5	78.3	48.4	38.8	24.5	13.7	9.39	13.3	25.4	44.1			
30	55.9	76.9	87.1	94.7	101	104	101	95.5	59.4	48.0	30.5	17.4	12.2	17.0	31.8	54.5			
35	65.4	90.0	101	110	118	121	118	112	69.7	56.7	36.4	21.1	15.1	20.7	37.9	64.3			
40	74.4	102	115	125	134	137	134	127	79.4	64.8	41.8	24.6	17.9	24.2	43.5	73.5			
45	82.7	113	128	138	148	152	149	142	88.4	72.3	46.9	27.8	20.5	27.5	48.8	82.1			
50	90.2	123	139	150	161	165	162	154	96.4	79.1	51.4	30.8	23.0	30.5	53.6	89.8			
55	96.7	132	149	161	172	177	174	166	104	85.2	55.6	33.4	25.2	33.2	57.7	96.7			
60	102	140	157	170	182	188	184	176	110	90.5	59.0	35.7	27.1	35.5	61.5	103			
65	107	147	165	178	191	196	193	184	115	95.0	61.9	37.7	28.8	37.5	64.5	108			
70	111	152	171	184	197	203	199	191	120	98.5	64.1	39.2	30.2	39.1	66.9	112			
75	114	156	175	189	202	208	205	196	123	101	65.8	40.3	31.3	40.2	68.5	115			
80	116	159	178	192	205	212	208	199	125	103	67.0	41.1	32.1	41.0	69.6	117			
85	117	160	179	194	207	213	210	201	126	104	67.4	41.1	32.3	41.1	69.7	118			
90	117	160	179	193	206	213	210	201	126	104	67.2	40.9	32.2	41.0	69.3	118			
95	116	158	177	191	204	211	208	199	125	104	66.2	40.0	31.7	40.3	68.2	117			
100	114	155	174	187	200	207	204	196	123	102	64.5	38.7	30.9	39.2	66.5	115			
105	111	151	169	182	194	201	198	191	120	99.3	62.3	37.0	29.7	37.9	64.2	112			
110	107	146	163	175	187	193	191	184	116	95.8	59.4	34.9	28.2	35.8	60.8	108			
115	102	139	155	167	178	184	182	176	111	91.5	56.0	32.4	26.5	33.6	56.7	103			
120	96.5	131	146	157	167	174	172	166	105	86.3	52.0	29.7	24.4	31.1	52.0	97.2			
125	89.9	122	136	146	154	161	160	154	97.8	80.5	47.7	26.7	17.6	28.2	46.7	90.5			
130	82.4	111	125	134	137	148	147	142	90.1	74.0	43.0	23.5	11.6	25.0	41.0	83.1			
135	74.4	101	112	120	117	133	132	128	81.5	67.1	37.9	20.1	10.6	21.1	34.5	74.4			
140	65.6	88.5	98.8	106	95.9	117	117	113	72.3	59.9	33.0	16.7	8.34	16.3	27.1	65.1			
145	56.5	75.9	84.6	90.1	76.3	99.7	100	97.5	62.4	53.2	29.0	13.3	6.76	11.5	19.1	55.9			
150	46.8	62.8	69.6	73.7	58.4	81.4	82.6	80.7	52.1	46.4	25.5	9.82	5.74	6.77	11.1	46.6			
155	36.7	49.0	54.2	57.1	42.3	63.0	64.5	63.5	40.0	39.1	22.0	6.54	4.80	2.04	3.16	37.3			
160	22.9	34.8	38.7	40.4	28.1	44.6	46.4	46.0	20.4	26.3	17.9	3.26	3.87	0.00	0.00	28.1			
165	10.0	19.9	23.8	24.5	15.6	25.6	28.5	29.0	5.82	10.9	13.7	0.00	2.93	0.00	0.00	18.8			
170	4.26	5.88	10.2	10.1	6.01	8.63	12.4	13.4	3.28	4.04	9.56	0.00	2.00	0.00	0.00	9.55			
175	1.07	0.42	1.07	1.25	0.52	0.58	1.94	1.75	0.99	0.00	5.39	0.00	1.06	0.00	0.00	0.28			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21	0.00	0.13	0.00	0.00	0.00			



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	ALR-RBN(mode:2700K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-B1	120.0	60.01	0.1455	15.98	0.9152	45.37

Chromaticity Measurement - Sphere-Spectroradiometer

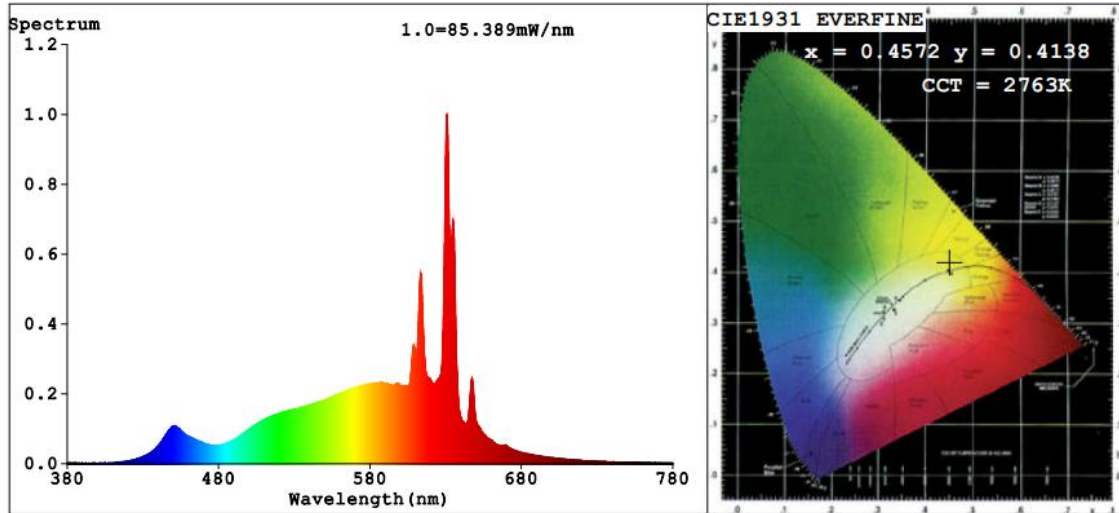
Method(Self-absorption:1.0569)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2763
Duv	0.0014
Chromaticity (x, y)	x=0.4572 y=0.4138
Chromaticity (u', v')	u'=0.2593 v'=0.5282
Color Rendering Index (CRI)	94.5
R9	65
Rg	100
Rf	92
Rcs,h1	-6

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1231
Luminous Efficacy (lm/W)	77.03

Spectral Power Distribution & Chromaticity Diagram



R1 =96	R2 =96	R3 =95	R4 =97	R5 =95	R6 =97	R7 =94	
R8 =86	R9 =65	R10=90	R11=98	R12=85	R13=96	R14=96	R15=91

TM30

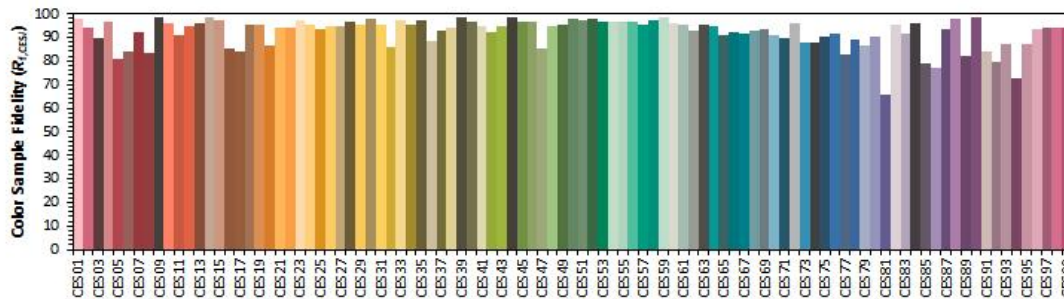
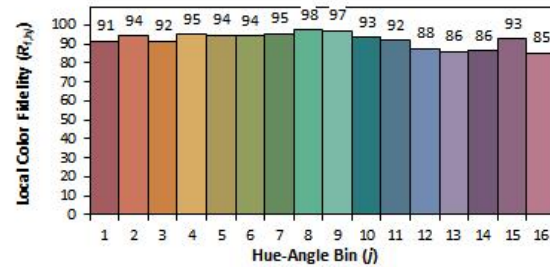
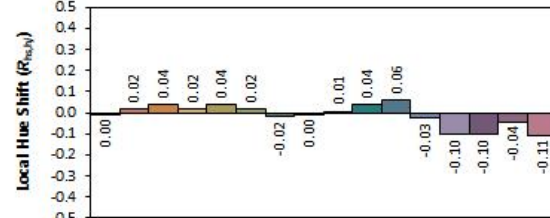
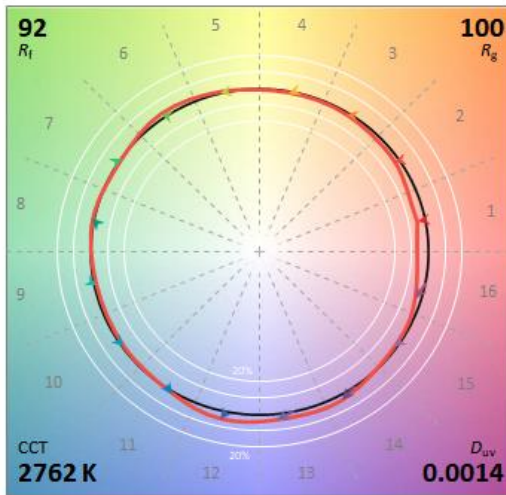
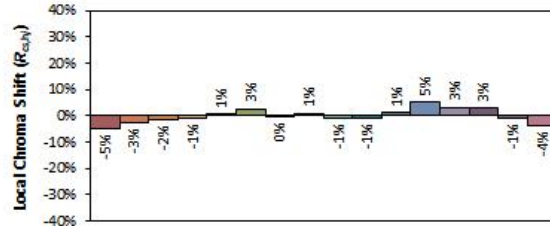
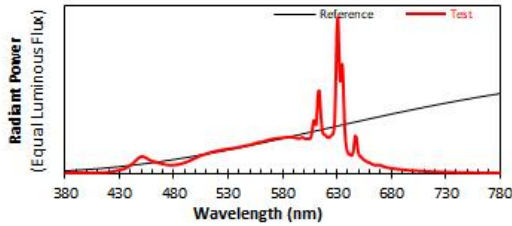
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx

Manufacturer: RAB Lighting INC.

Date: 2024-11-22

Model: ALR-RBN (mode:2700K)



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

x 0.4572
y 0.4137
u' 0.2594
v' 0.5281

CIE 13.3-1995 (CRI)

R_a 95
R_g 65

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	ALR-RBN(mode:3000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-B1	120.0	60.01	0.1449	15.94	0.9168	45.29

Chromaticity Measurement - Sphere-Spectroradiometer

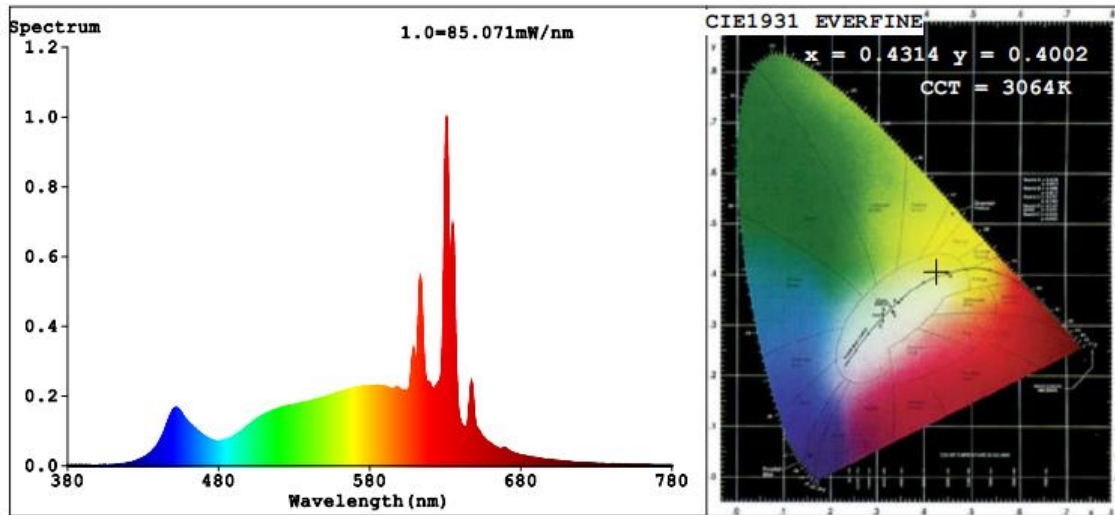
Method(Self-absorption:1.0571)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3064
Duv	-0.0008
Chromaticity (x, y)	x=0.4314 y=0.4002
Chromaticity (u', v')	u'=0.2487 v'=0.5190
Color Rendering Index (CRI)	96.6
R9	78
Rg	101
Rf	93
Rcs,h1	-4

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1283
Luminous Efficacy (lm/W)	80.49

Spectral Power Distribution & Chromaticity Diagram



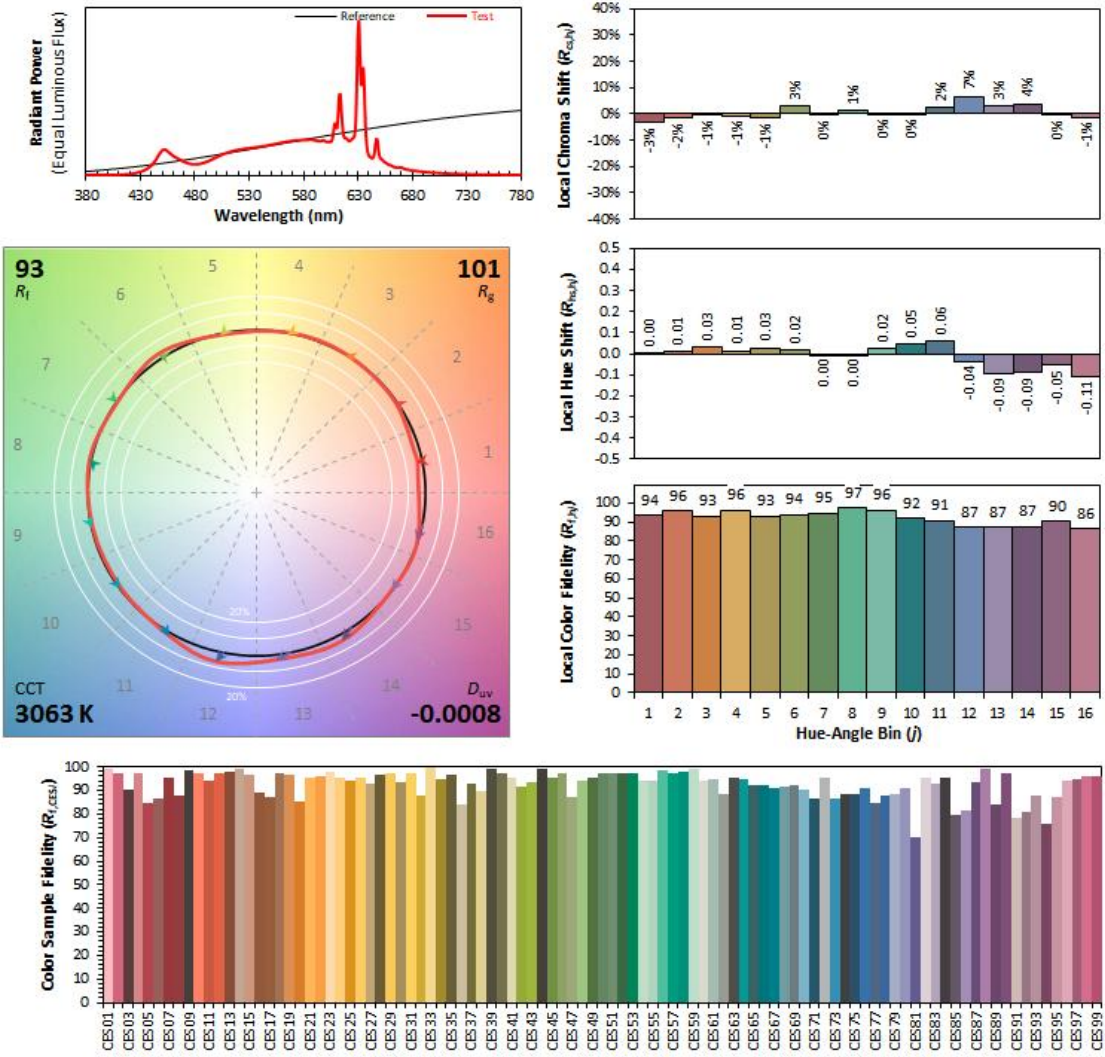
R1 =99	R2 =98	R3 =95	R4 =98	R5 =98	R6 =96	R7 =95		
R8 =91	R9 =78	R10=94	R11=96	R12=84	R13=99	R14=96	R15=96	



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx Manufacturer: RAB Lighting INC.
 Date: 2024-11-22 Model: ALR-RBN (mode:3000K)



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

x	0.4314	CIE 13.3-1995 (CRI)
y	0.4001	
u'	0.2487	
v'	0.5190	
		R_a 97
		R_g 78

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	ALR-RBN(mode:3500K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-B1	120.0	60.01	0.1444	15.90	0.9174	45.21

Chromaticity Measurement - Sphere-Spectroradiometer

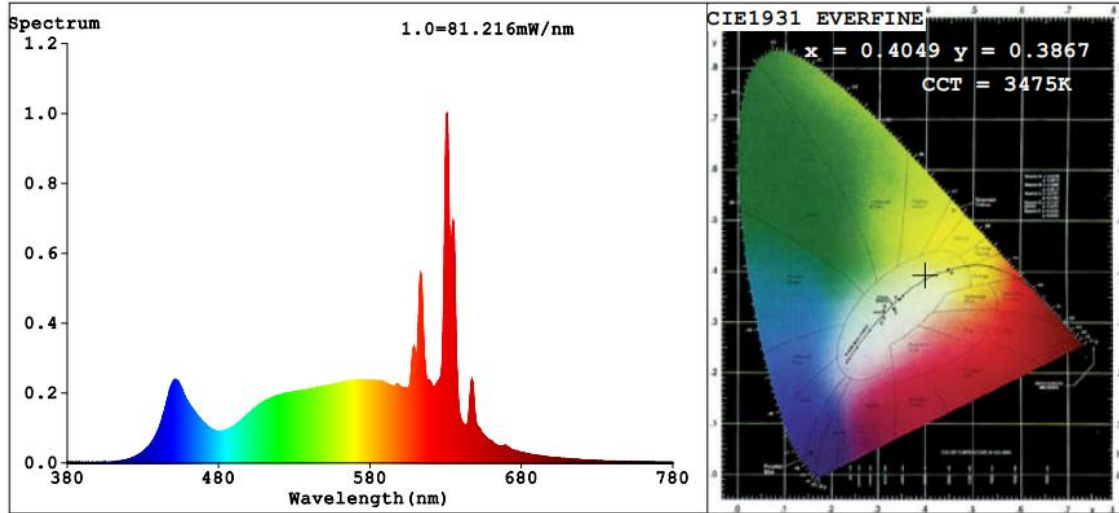
Method(Self-absorption:1.0566)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3475
Duv	-0.0017
Chromaticity (x, y)	x=0.4049 y=0.3867
Chromaticity (u', v')	u'=0.2371 v'=0.5095
Color Rendering Index (CRI)	97.3
R9	89
Rg	102
Rf	93
Rcs,h1	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1315
Luminous Efficacy (lm/W)	82.70

Spectral Power Distribution & Chromaticity Diagram



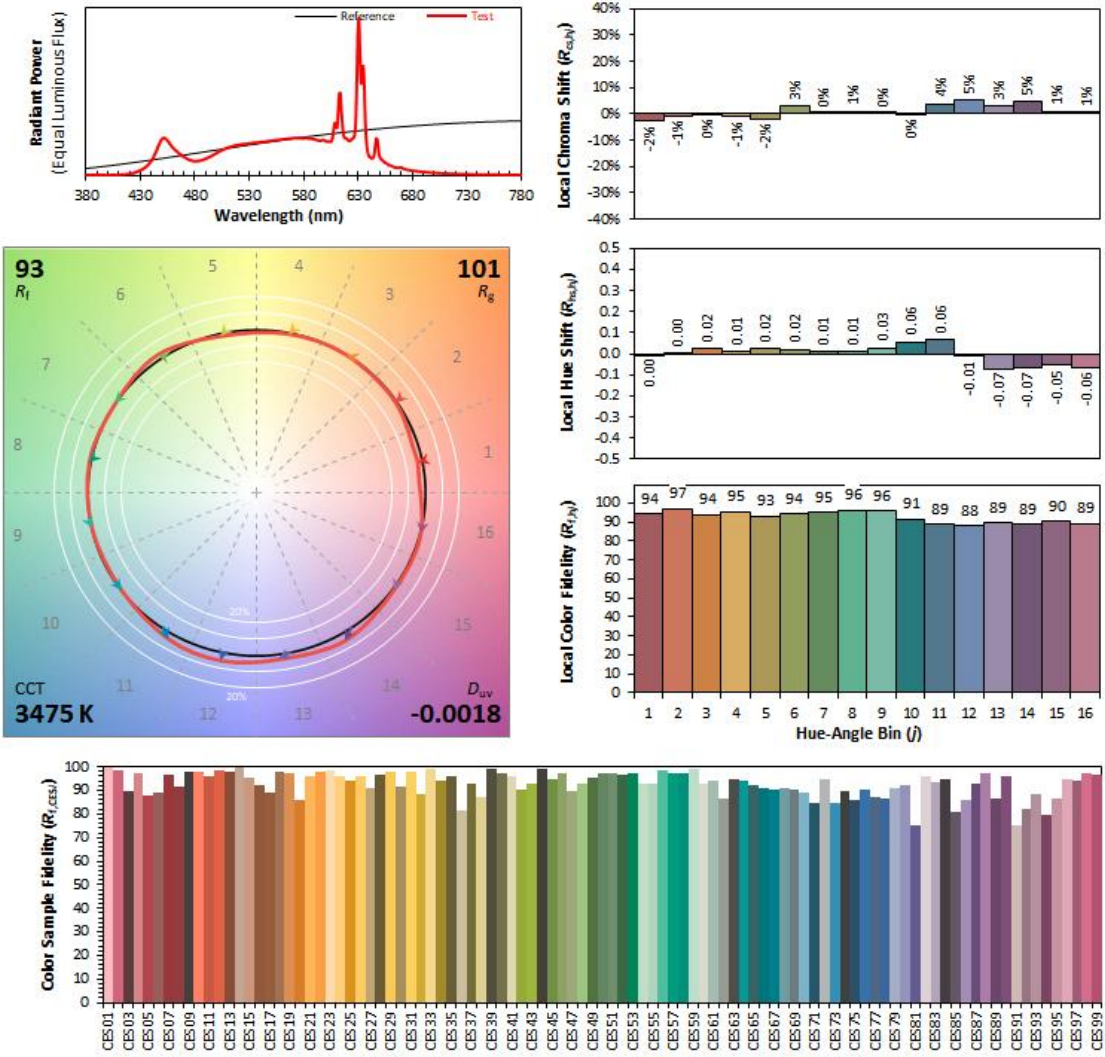
R1 =98	R2 =99	R3 =94	R4 =97	R5 =99	R6 =96	R7 =97	
R8 =96	R9 =89	R10=95	R11=95	R12=81	R13=99	R14=95	R15=99



TM30

ANSI/IES TM-30-18 Color Rendition Report

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



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

x	0.4049	CIE 13.3-1995 (CRI)
y	0.3865	
u'	0.2372	
v'	0.5094	
		R_a 97
		R_g 89

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	ALR-RBN(mode:4000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-B1	120.0	60.01	0.1445	15.92	0.9181	45.17

Chromaticity Measurement - Sphere-Spectroradiometer

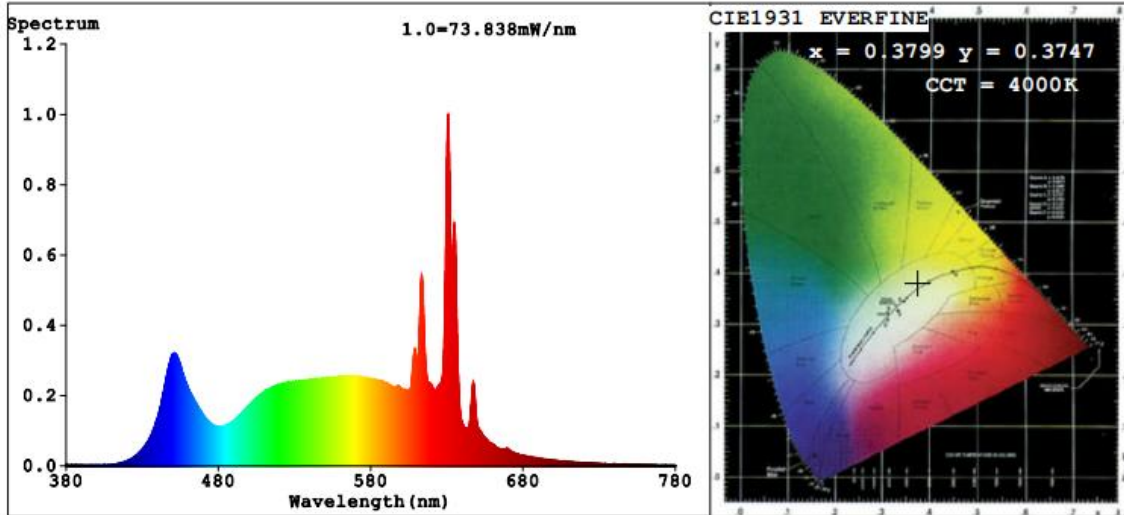
Method(Self-absorption:1.0568)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4000
Duv	-0.0008
Chromaticity (x, y)	x=0.3799 y=0.3747
Chromaticity (u', v')	u'=0.2256 v'=0.5006
Color Rendering Index (CRI)	97.3
R9	94
Rg	102
Rf	93
Rcs,h1	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1310
Luminous Efficacy (lm/W)	82.29

Spectral Power Distribution & Chromaticity Diagram



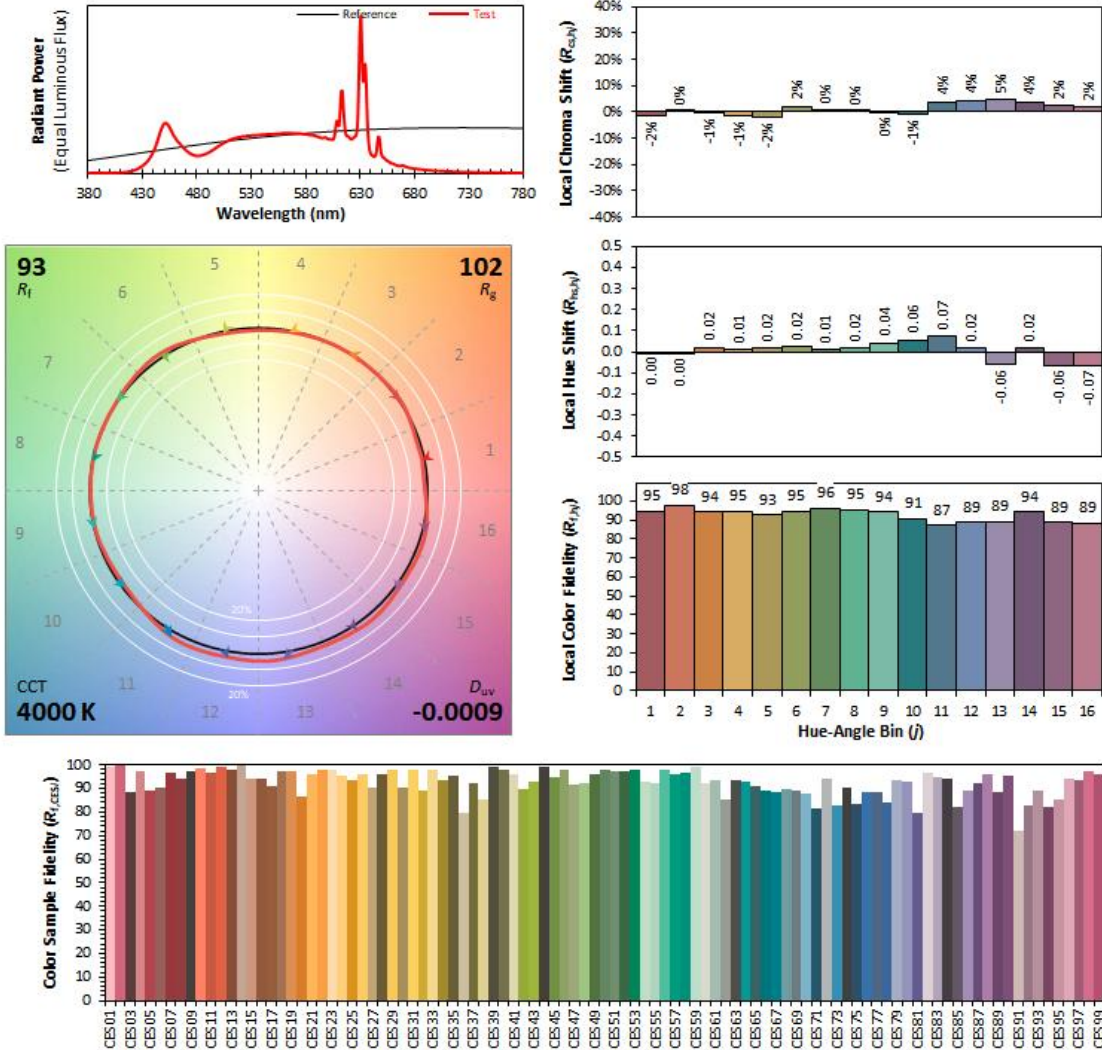
R1 =99	R2 =98	R3 =92	R4 =97	R5 =99	R6 =96	R7 =99		
R8 =99	R9 =94	R10=92	R11=94	R12=77	R13=100	R14=94	R15=98	



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ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx Manufacturer: RAB Lighting INC.
 Date: 2024-11-22 Model: ALR-RBN (mode:4000K)



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

x	0.3799	CIE 13.3-1995 (CRI)
y	0.3745	
u'	0.2256	
v'	0.5005	
		R_a 97
		R_g 95

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	ALR-RBN(mode:5000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-B1	120.0	60.01	0.1451	15.92	0.9142	45.41

Chromaticity Measurement - Sphere-Spectroradiometer

Method(Self-absorption:1.0572)(4π geometry):

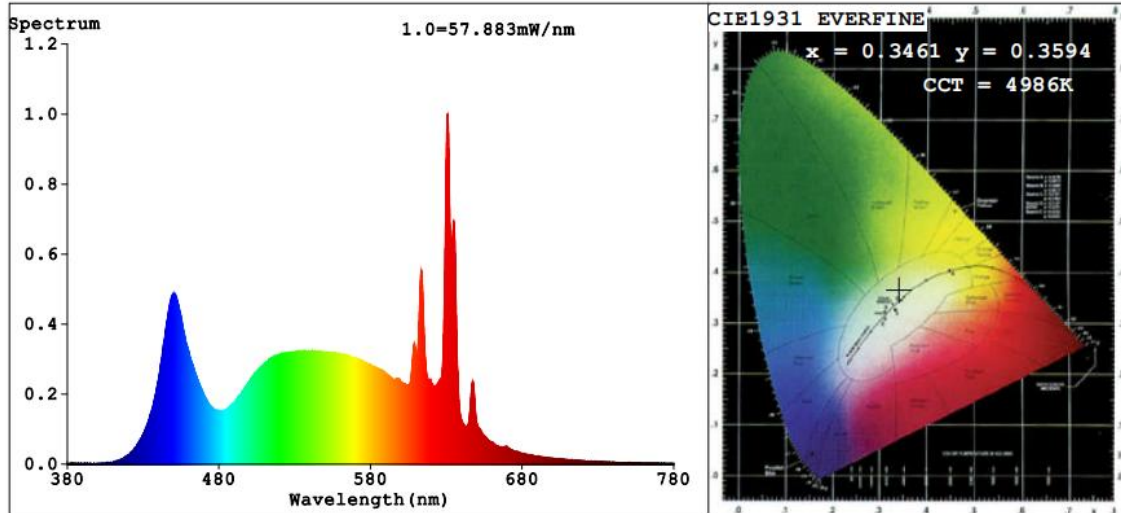
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4986
Duv	0.0034
Chromaticity (x, y)	x=0.3461 y=0.3594
Chromaticity (u', v')	u'=0.2091 v'=0.4886
Color Rendering Index (CRI)	94.8
R9	88
Rg	102
Rf	93
Rcs,h1	-3

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1234
Luminous Efficacy (lm/W)	77.53



Spectral Power Distribution & Chromaticity Diagram



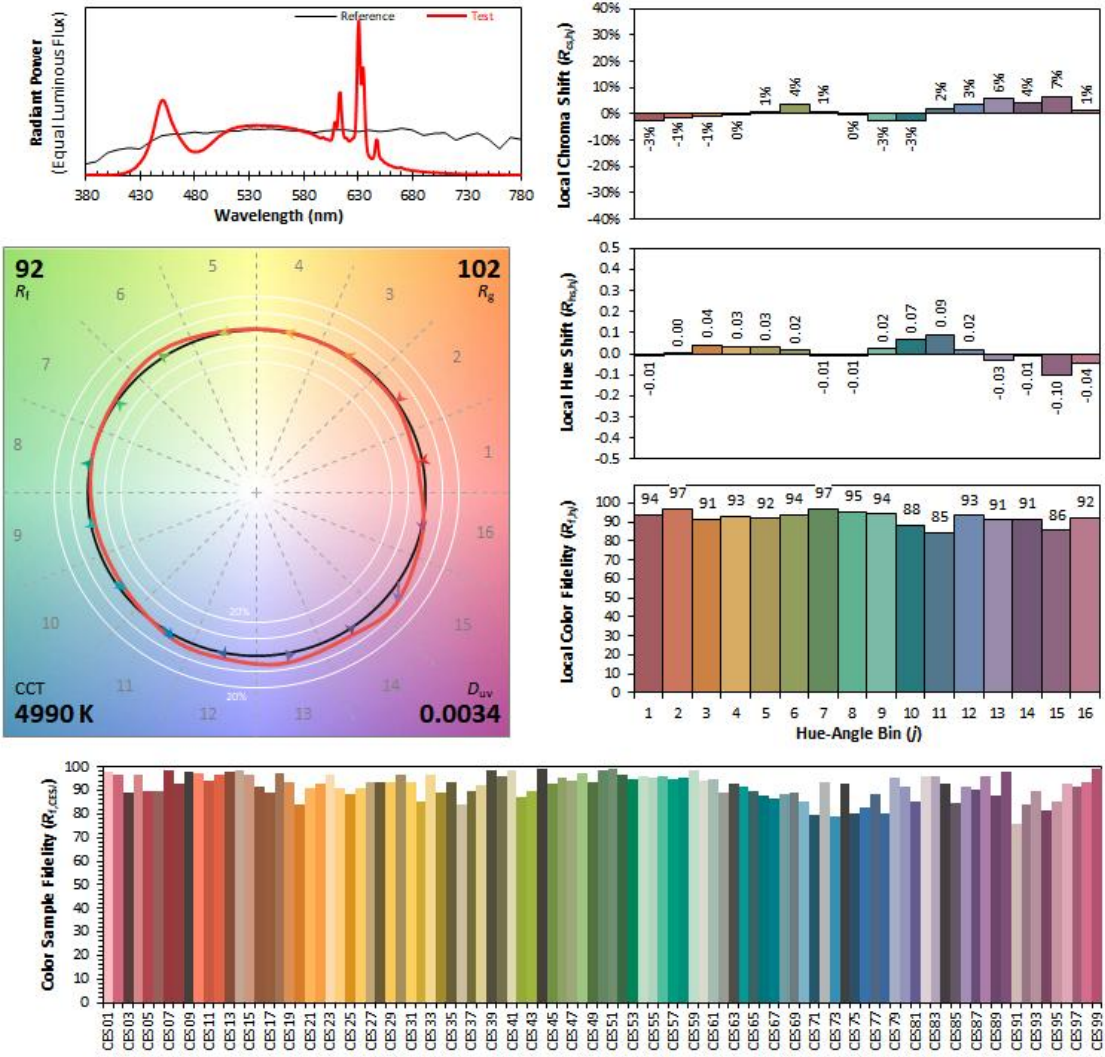
R1 =97	R2 =94	R3 =90	R4 =96	R5 =95	R6 =92	R7 =98	
R8 =98	R9 =88	R10=84	R11=94	R12=68	R13=95	R14=94	R15=96



TM30

ANSI/IES TM-30-18 Color Rendition Report

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



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

x	0.3461	CIE 13.3-1995 (CRI)
y	0.3592	
u'	0.2092	
v'	0.4885	
		R_a 95
		R_g 89

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



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 *****