



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-SBN

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,
Ningbo, Zhejiang

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-SBN	
Remark	N/A	
Representative (Tested) Model	ALR-SBN(mode:2700K) ALR-SBN(mode:3000K) ALR-SBN(mode:3500K) ALR-SBN(mode:4000K) ALR-SBN(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-C1	
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:

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	ALR-SBN(mode:2700K)	Total Operating Time(min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-C1	120.0	60.01	0.1448	15.88	0.9169	47.21

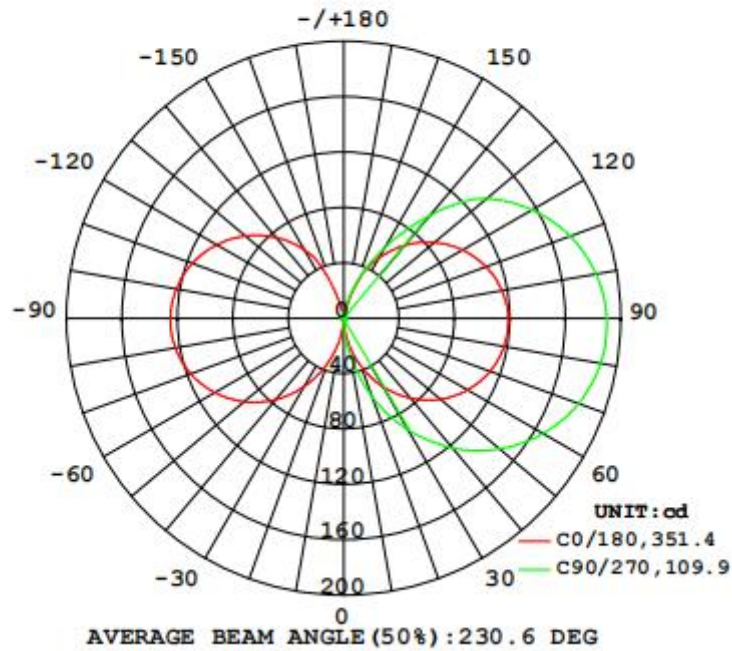
Photometric Measurement – Goniophotometer Method(Test Distance: 26.00m):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1214.4
Luminous Efficacy (lm/W)	76.45
Beam Angle (°)	230.6
Center Beam Candle Power (cd)	2



Zonal Lumen Tabulation

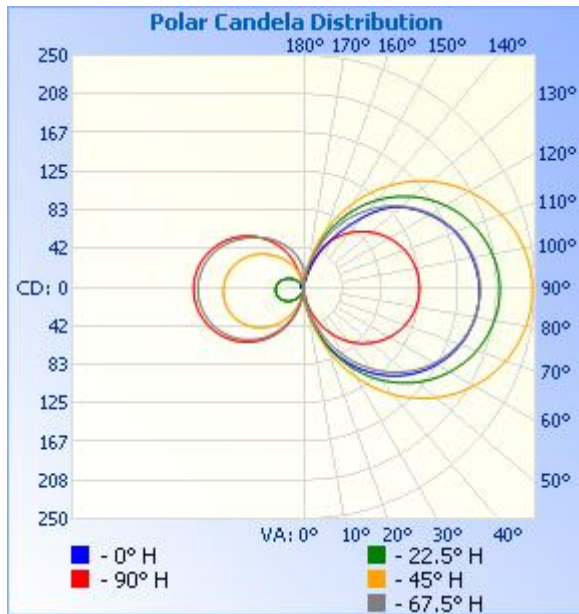
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	31.2	2.5%
0-40	75.4	6.2%
0-60	239.0	19.5%
60-90	389.1	31.8%
70-100	411.9	33.7%
90-120	379.6	31%
0-90	628.1	51.3%
90-180	595.5	48.7%
0-180	1,223.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.9	0.1%	90-100	139.2	11.4%
10-20	7.6	0.6%	100-110	129.1	10.5%
20-30	22.7	1.9%	110-120	111.4	9.1%
30-40	44.2	3.6%	120-130	88.4	7.2%
40-50	69.2	5.7%	130-140	63.2	5.2%
50-60	94.4	7.7%	140-150	38.9	3.2%
60-70	116.4	9.5%	150-160	19.2	1.6%
70-80	132.4	10.8%	160-170	5.6	0.5%
80-90	140.3	11.5%	170-180	0.5	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
4.0ft	0.09 fc	24.3 ft	17.7 ft
8.0ft	0.02 fc	48.6 ft	35.3 ft
12.0ft	0.01 fc	72.9 ft	53.0 ft
16.0ft	0.01 fc	97.1 ft	70.7 ft
20.0ft	0.00 fc	121.4 ft	88.3 ft

■ Vert. Spread: 143.5°
■ Horiz. Spread: 131.3°

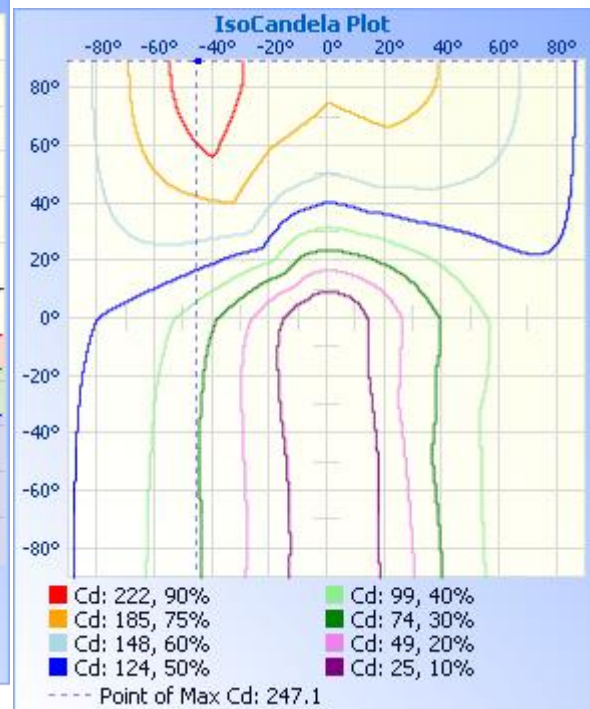
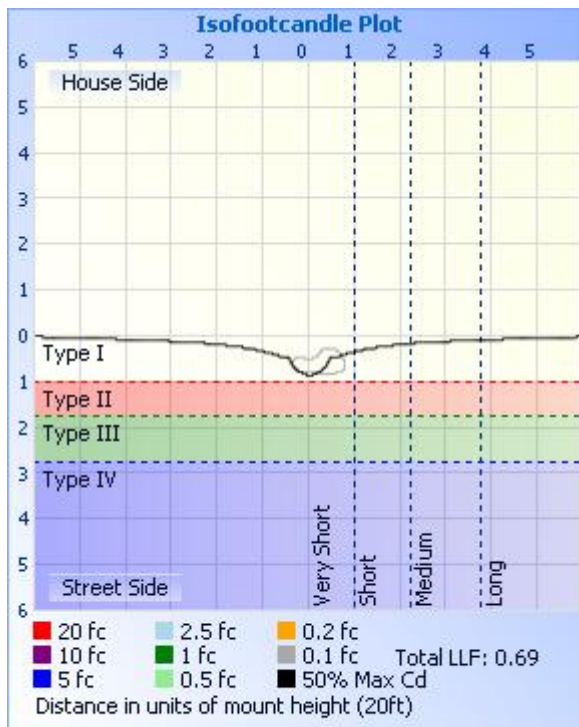




Table--1 UNIT: °C

C(°C) T(°C)	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	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51	1.51			
5	7.02	8.51	9.79	11.1	11.5	10.6	10.06	6.60	4.22	2.48	1.51	0.60	0.38	1.66	4.00	5.27			
10	16.1	19.4	22.5	25.5	26.2	25.3	26.0	18.7	12.9	9.45	6.09	2.49	0.51	3.77	10.21	13.9			
15	26.4	31.6	37.6	42.3	43.1	42.8	46.0	33.8	23.7	18.4	12.2	5.21	0.51	6.08	17.6	23.9			
20	36.9	44.5	53.5	59.8	60.2	61.1	67.7	50.4	34.7	27.3	18.4	8.05	0.41	8.32	25.2	34.1			
25	47.4	57.5	69.5	77.3	77.0	79.6	89.7	67.5	45.8	36.5	25.0	11.3	0.41	10.8	33.1	44.3			
30	57.3	70.1	85.0	94.2	92.9	97.5	111	84.1	56.6	45.6	31.7	15.0	0.43	13.5	40.8	54.2			
35	66.7	82.2	99.9	110	108	115	132	100	67.0	54.3	38.3	18.7	0.57	16.2	48.3	63.6			
40	75.5	93.5	114	125	122	131	151	115	76.8	62.5	44.5	22.3	0.73	18.8	55.2	72.2			
45	83.7	104	127	139	135	146	169	129	85.6	70.0	50.2	25.8	0.87	21.3	61.7	80.2			
50	91.1	113	138	152	147	159	185	142	93.8	76.9	55.4	29.0	1.08	23.6	67.4	87.4			
55	97.6	122	149	163	157	172	200	153	101	83.1	60.2	32.0	1.32	25.5	72.6	93.9			
60	103	129	157	173	166	183	213	163	107	88.7	64.2	34.5	1.54	27.2	77.0	99.5			
65	108	136	165	181	174	192	224	172	113	93.5	67.7	36.7	1.78	28.6	80.8	104			
70	112	140	171	188	180	199	232	179	117	97.3	70.5	38.3	1.94	29.7	83.6	108			
75	115	144	175	193	185	205	239	184	121	100	72.7	39.5	2.11	30.4	85.6	111			
80	117	147	179	196	188	209	244	188	123	103	74.4	40.1	2.27	30.5	86.9	113			
85	119	148	180	198	190	212	247	190	125	104	75.3	40.3	2.27	30.2	87.1	114			
90	119	148	180	198	190	212	247	191	125	105	75.4	39.9	2.27	29.9	86.7	114			
95	118	146	178	196	188	210	245	189	125	104	74.7	38.9	2.24	29.0	85.3	113			
100	116	143	175	193	185	207	242	186	123	103	73.5	37.4	2.19	27.7	83.2	111			
105	113	139	170	188	180	202	236	182	120	101	71.6	35.4	2.13	25.9	80.3	109			
110	109	133	164	181	174	195	228	175	116	97.9	69.0	33.1	2.03	23.5	76.7	105			
115	105	127	156	173	166	187	218	167	112	94.2	65.8	30.4	1.94	21.0	72.3	100			
120	98.9	119	147	163	157	176	206	158	106	89.6	62.1	27.5	1.73	18.4	67.2	94.8			
125	92.5	110	137	152	146	165	193	148	99.8	84.4	57.9	24.3	1.73	15.8	61.5	88.6			
130	85.3	100	125	139	134	152	178	136	92.7	78.5	53.1	21.0	1.30	12.9	55.4	82.3			
135	77.5	89.9	113	126	118	138	161	123	84.8	71.9	48.1	17.5	1.30	9.70	49.0	76.0			
140	68.8	78.7	99.0	111	97.2	122	143	109	76.2	65.0	43.2	14.4	1.32	6.19	42.6	69.7			
145	59.7	67.1	84.5	95.0	76.8	106	123	93.6	67.1	57.9	38.8	12.4	1.46	2.68	36.3	63.4			
150	50.0	54.8	69.2	78.4	58.5	87.8	102	77.8	57.4	50.5	34.9	11.9	1.60	0.00	29.9	57.1			
155	39.7	42.5	53.5	61.2	42.2	69.6	81.0	61.5	46.0	42.2	30.7	11.6	1.73	0.00	23.6	50.8			
160	25.3	30.0	38.0	43.9	27.9	50.6	59.5	45.4	26.8	26.9	25.5	11.4	1.87	0.00	17.2	44.4			
165	9.63	16.8	22.9	27.2	15.8	29.2	38.5	29.6	8.95	9.30	19.0	11.1	2.01	0.00	10.83	38.1			
170	3.93	5.49	9.71	12.0	6.43	10.6	18.6	15.1	5.01	4.79	12.6	10.9	2.15	0.00	4.47	31.8			
175	0.59	0.56	1.12	1.39	0.93	1.85	3.71	3.29	1.67	1.01	6.08	10.6	2.28	0.00	0.00	25.5			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.4	2.42	0.00	0.00	19.2			



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

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-C1	120.0	60.01	0.1448	15.90	0.9153	47.32

Chromaticity Measurement - Sphere-Spectroradiometer

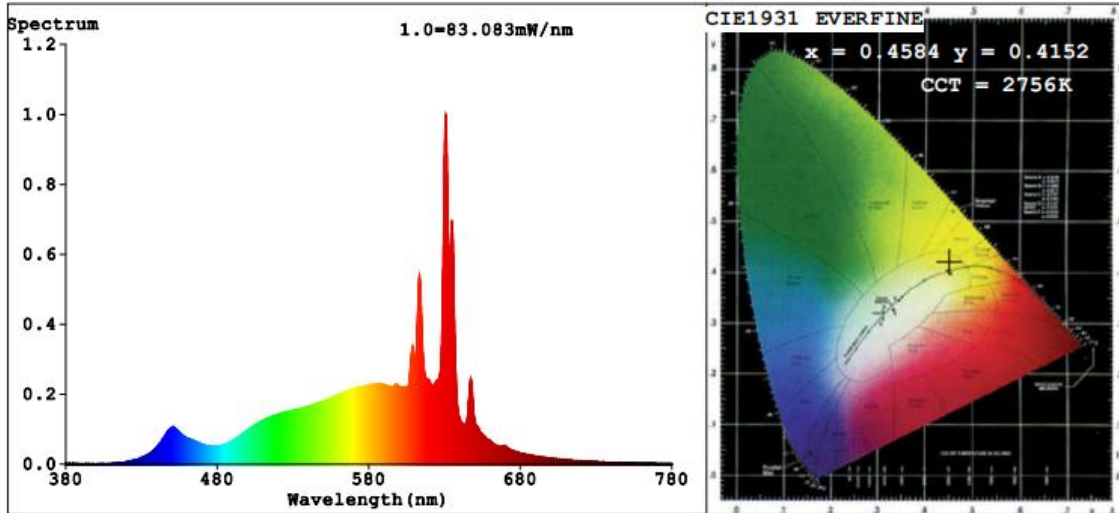
Method(Self-absorption:1.0686)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2756
Duv	0.0018
Chromaticity (x, y)	x=0.4584 y=0.4152
Chromaticity (u', v')	u'=0.2595 v'=0.5289
Color Rendering Index (CRI)	94.4
R9	64
Rg	99
Rf	92
Rcs,h1	-6

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1237
Luminous Efficacy (lm/W)	77.80

Spectral Power Distribution & Chromaticity Diagram



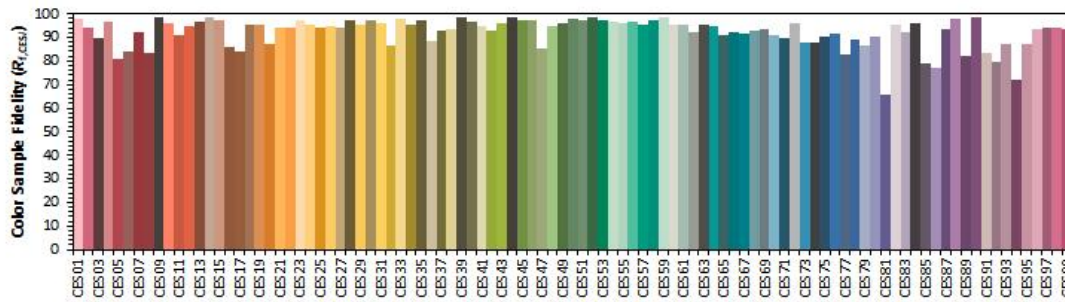
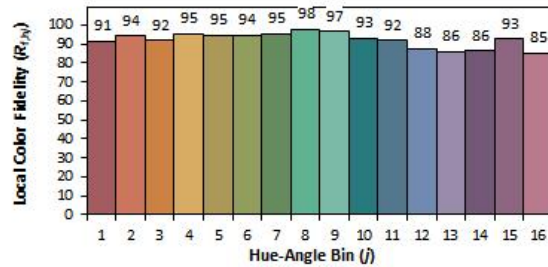
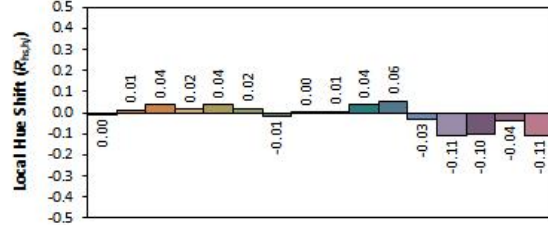
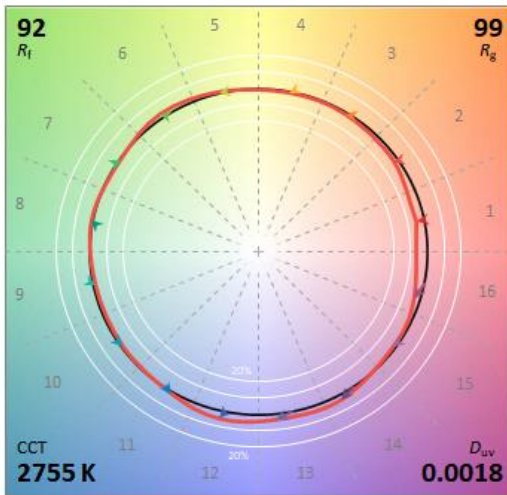
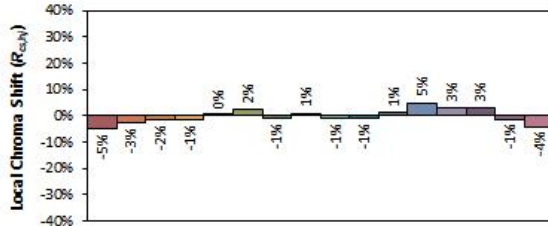
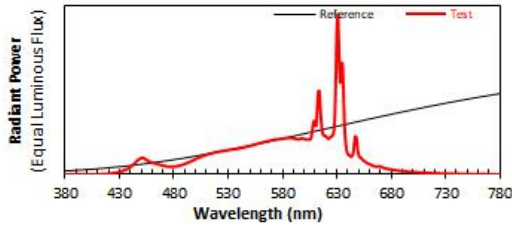
R1 =96	R2 =96	R3 =95	R4 =97	R5 =95	R6 =97	R7 =94	
R8 =85	R9 =64	R10=89	R11=98	R12=85	R13=95	R14=96	R15=91



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx Manufacturer: RAB Lighting INC.
 Date: 2024-11-22 Model: ALR-SBN (mode:2700K)



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

x	0.4585	CIE 13.3-1995 (CRI) R_a 94 R_g 65
y	0.4151	
u'	0.2596	
v'	0.5288	

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

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-C1	120.0	60.01	0.1442	15.86	0.9165	47.23

Chromaticity Measurement - Sphere-Spectroradiometer

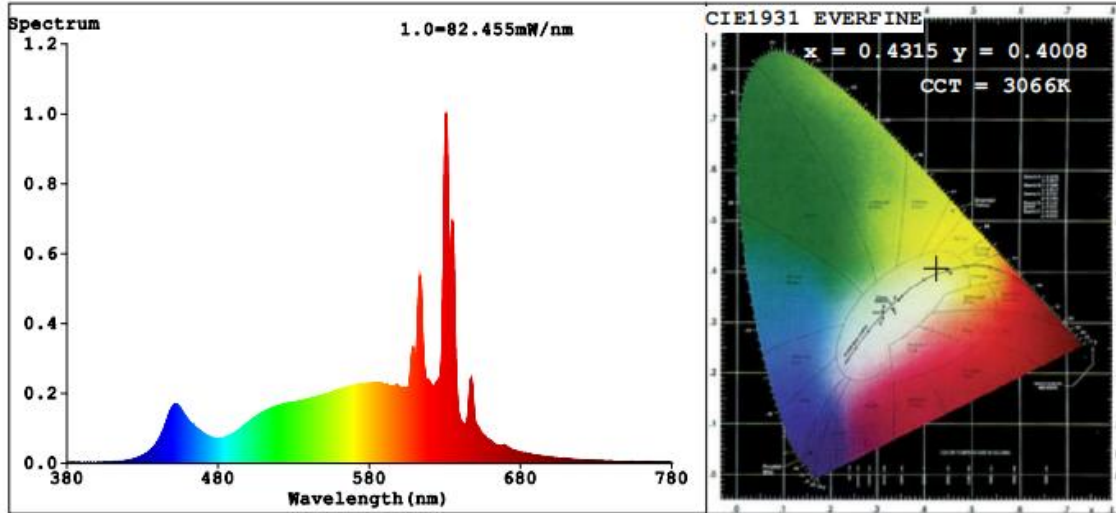
Method(Self-absorption:1.0684)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3066
Duv	-0.0006
Chromaticity (x, y)	x=0.4315 y=0.4008
Chromaticity (u', v')	u'=0.2485 v'=0.5193
Color Rendering Index (CRI)	96.5
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)	1291
Luminous Efficacy (lm/W)	81.40

Spectral Power Distribution & Chromaticity Diagram



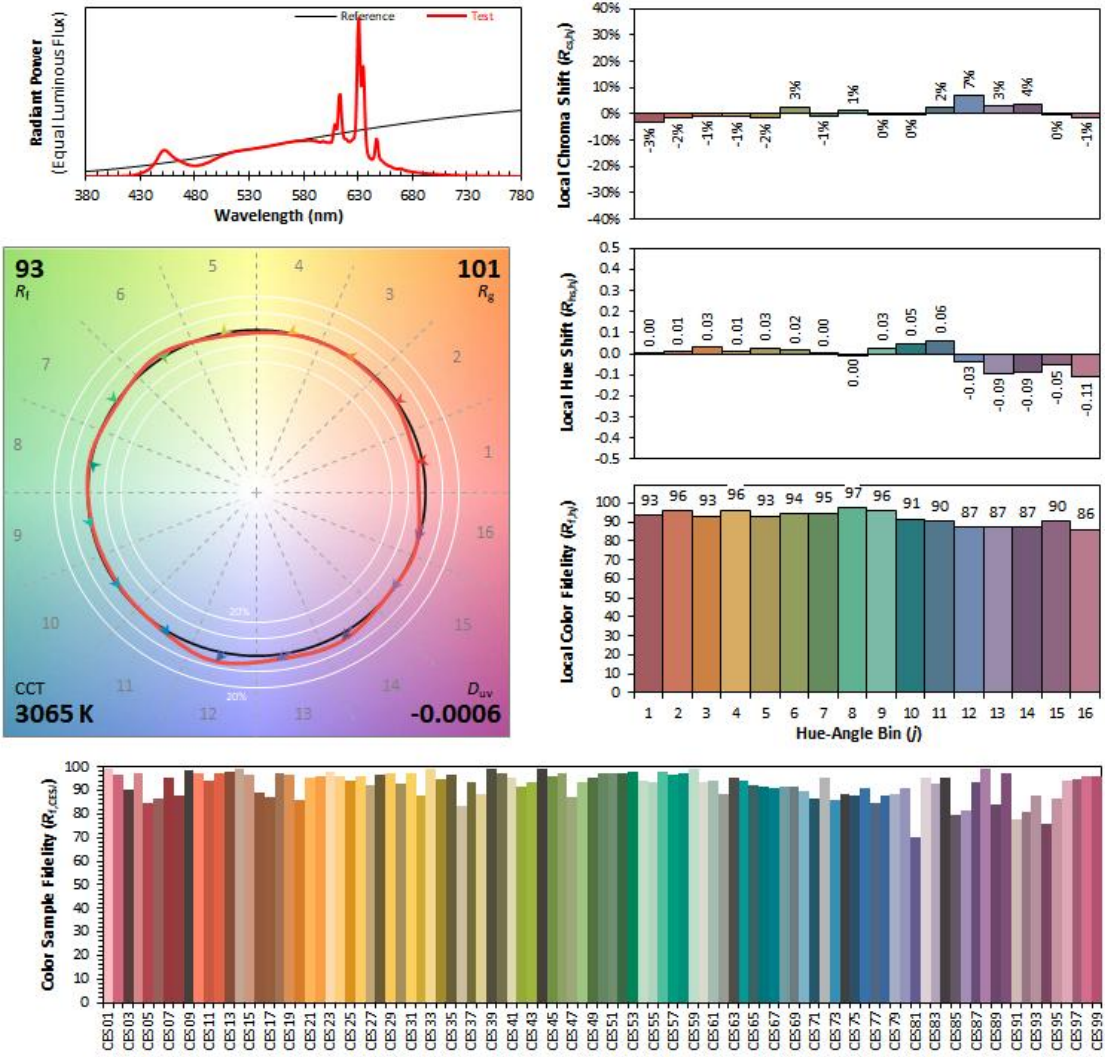
R1 =99	R2 =98	R3 =96	R4 =98	R5 =98	R6 =97	R7 =95	
R8 =91	R9 =78	R10=94	R11=97	R12=83	R13=99	R14=96	R15=96



TM30

ANSI/IES TM-30-18 Color Rendition Report

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



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

x	0.4315	CIE 13.3-1995 (CRI)
y	0.4007	
u'	0.2485	
v'	0.5192	
		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-SBN(mode:3500K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-C1	120.0	60.01	0.1438	15.83	0.9176	47.17

Chromaticity Measurement - Sphere-Spectroradiometer

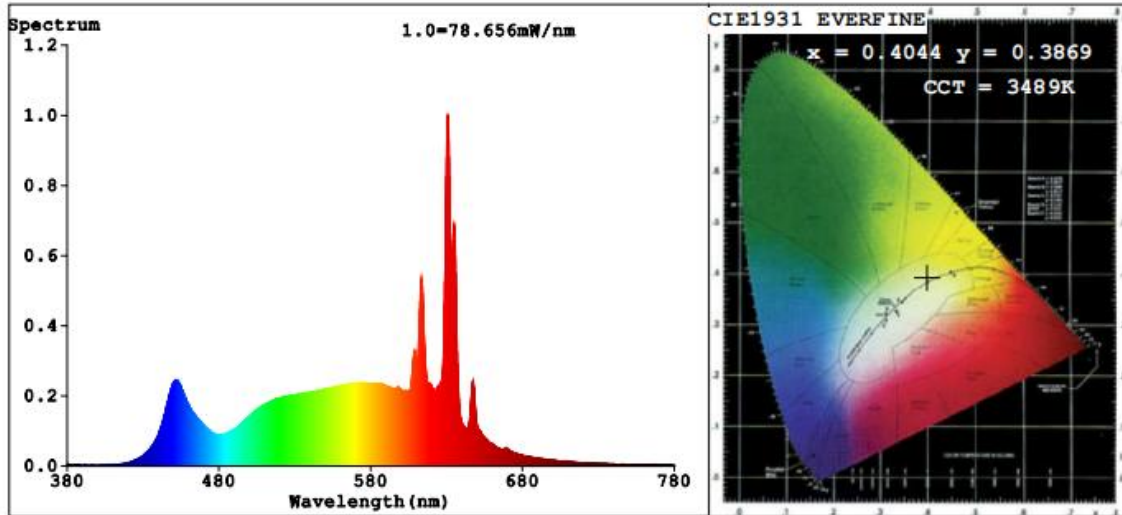
Method(Self-absorption:1.0689)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3489
Duv	-0.0015
Chromaticity (x, y)	x=0.4044 y=0.3869
Chromaticity (u', v')	u'=0.2367 v'=0.5095
Color Rendering Index (CRI)	97.3
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)	1325
Luminous Efficacy (lm/W)	83.70

Spectral Power Distribution & Chromaticity Diagram



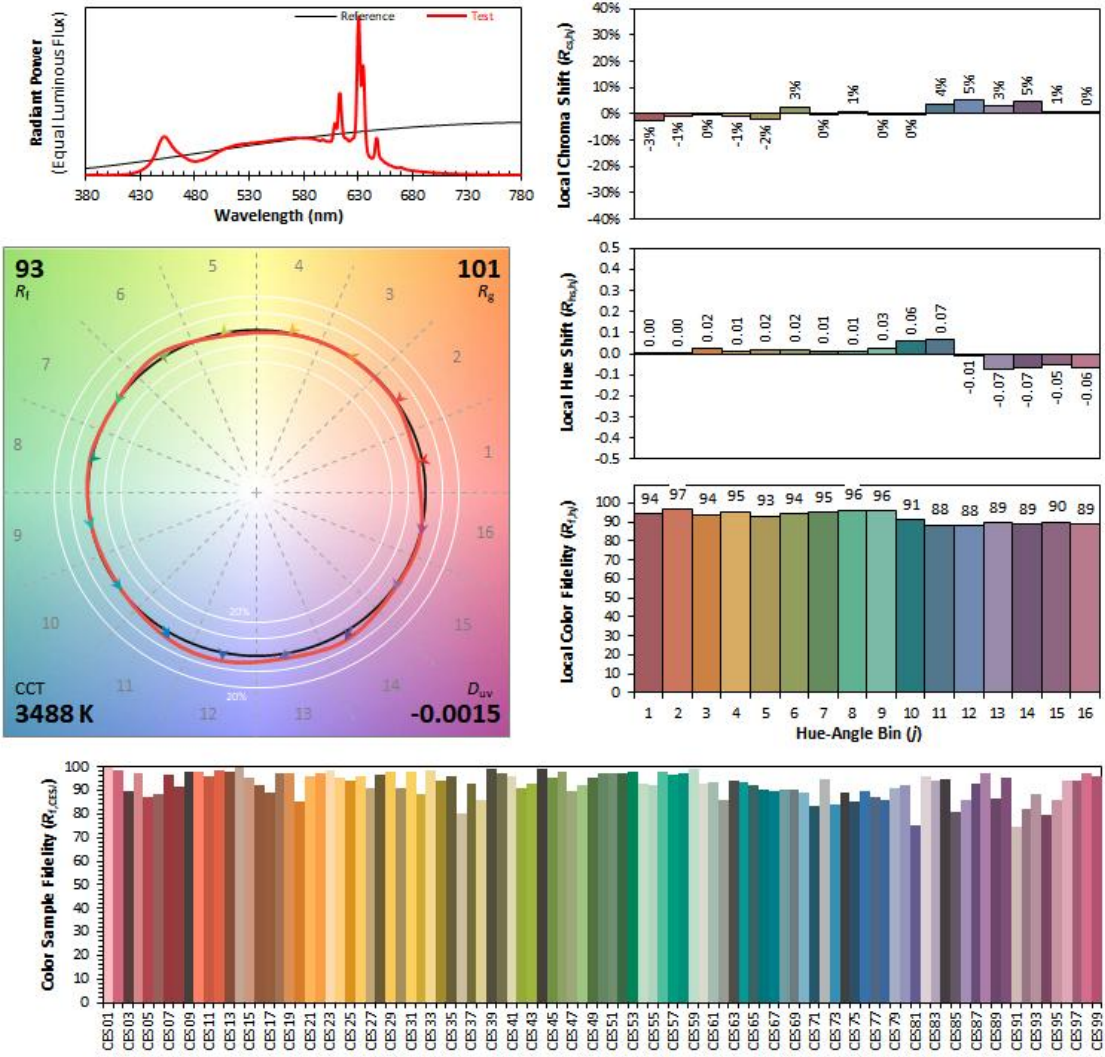
R1 =99	R2 =99	R3 =94	R4 =98	R5 =99	R6 =96	R7 =97	
R8 =96	R9 =88	R10=94	R11=95	R12=80	R13=100	R14=95	R15=99



TM30

ANSI/IES TM-30-18 Color Rendition Report

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



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

x	0.4043	CIE 13.3-1995 (CRI)
y	0.3867	
u'	0.2367	
v'	0.5095	
		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-SBN(mode:4000K)	Total Operating Time(min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-C1	120.0	60.01	0.1436	15.83	0.9184	47.09

Chromaticity Measurement - Sphere-Spectroradiometer

Method(Self-absorption:1.0685)(4π geometry):

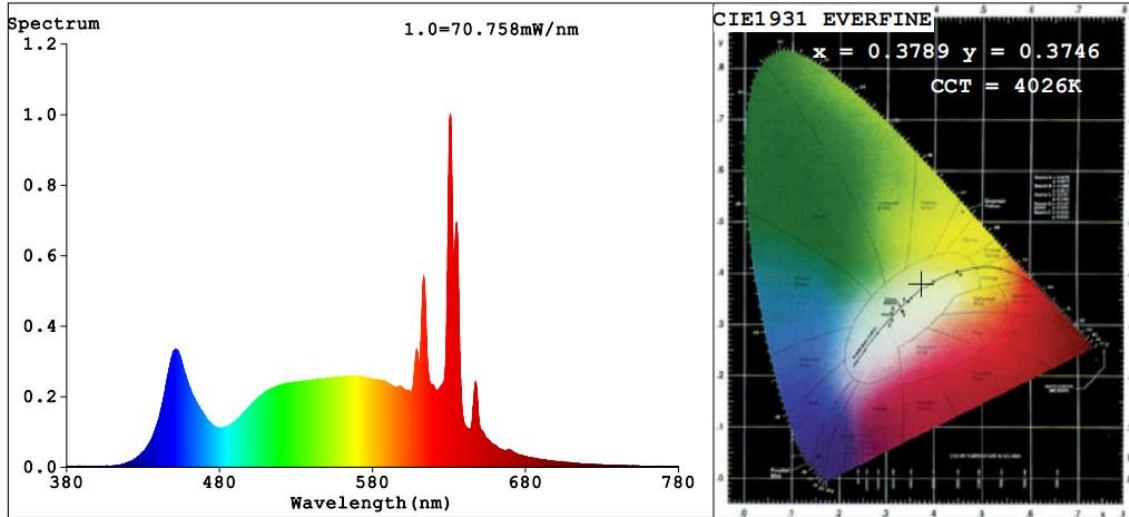
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4026
Duv	-0.0006
Chromaticity (x, y)	x=0.3789 y=0.3746
Chromaticity (u', v')	u'=0.2250 v'=0.5004
Color Rendering Index (CRI)	97.3
R9	93
Rg	102
Rf	93
Rcs,h1	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1320
Luminous Efficacy (lm/W)	83.39



Spectral Power Distribution & Chromaticity Diagram



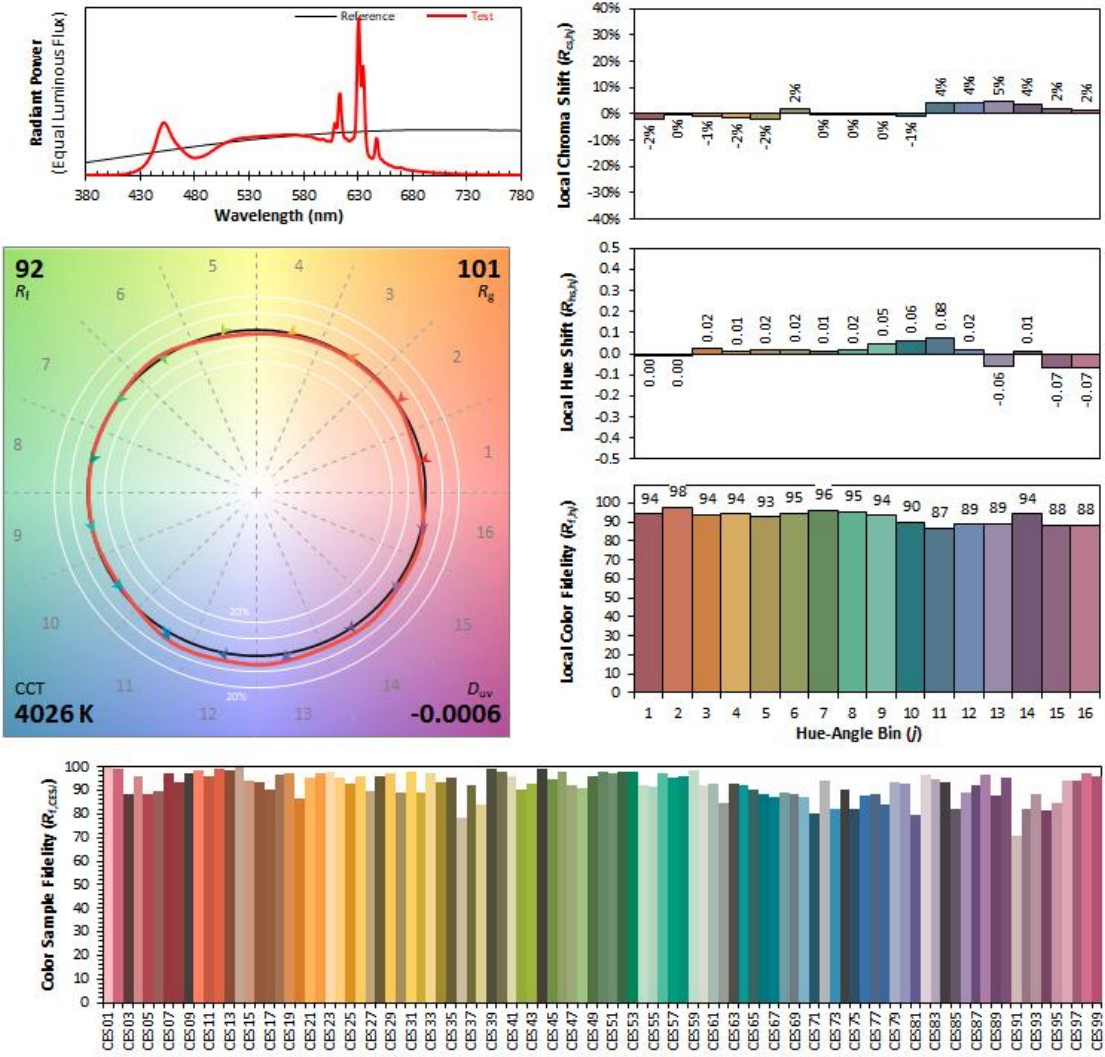
R1 =99	R2 =98	R3 =93	R4 =98	R5 =98	R6 =95	R7 =99		
R8 =99	R9 =93	R10=92	R11=95	R12=75	R13=100	R14=95	R15=98	



TM30

ANSI/IES TM-30-18 Color Rendition Report

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



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

x	0.3789	CIE 13.3-1995 (CRI)	
y	0.3744		
u'	0.2250		
v'	0.5003		
		R_a	97
		R_g	93

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

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-C1	120.0	60.01	0.1447	15.87	0.9140	47.39

Chromaticity Measurement - Sphere-Spectroradiometer

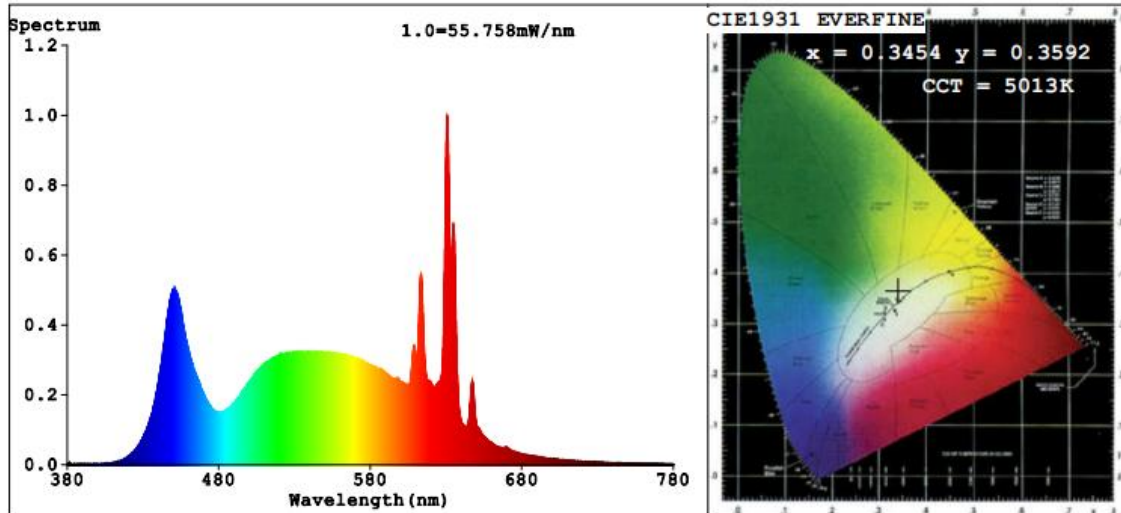
Method(Self-absorption:1.0686)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5013
Duv	0.0036
Chromaticity (x, y)	x=0.3454 y=0.3592
Chromaticity (u', v')	u'=0.2087 v'=0.4884
Color Rendering Index (CRI)	94.2
R9	85
Rg	101
Rf	92
Rcs,h1	-3

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1252
Luminous Efficacy (lm/W)	78.92

Spectral Power Distribution & Chromaticity Diagram



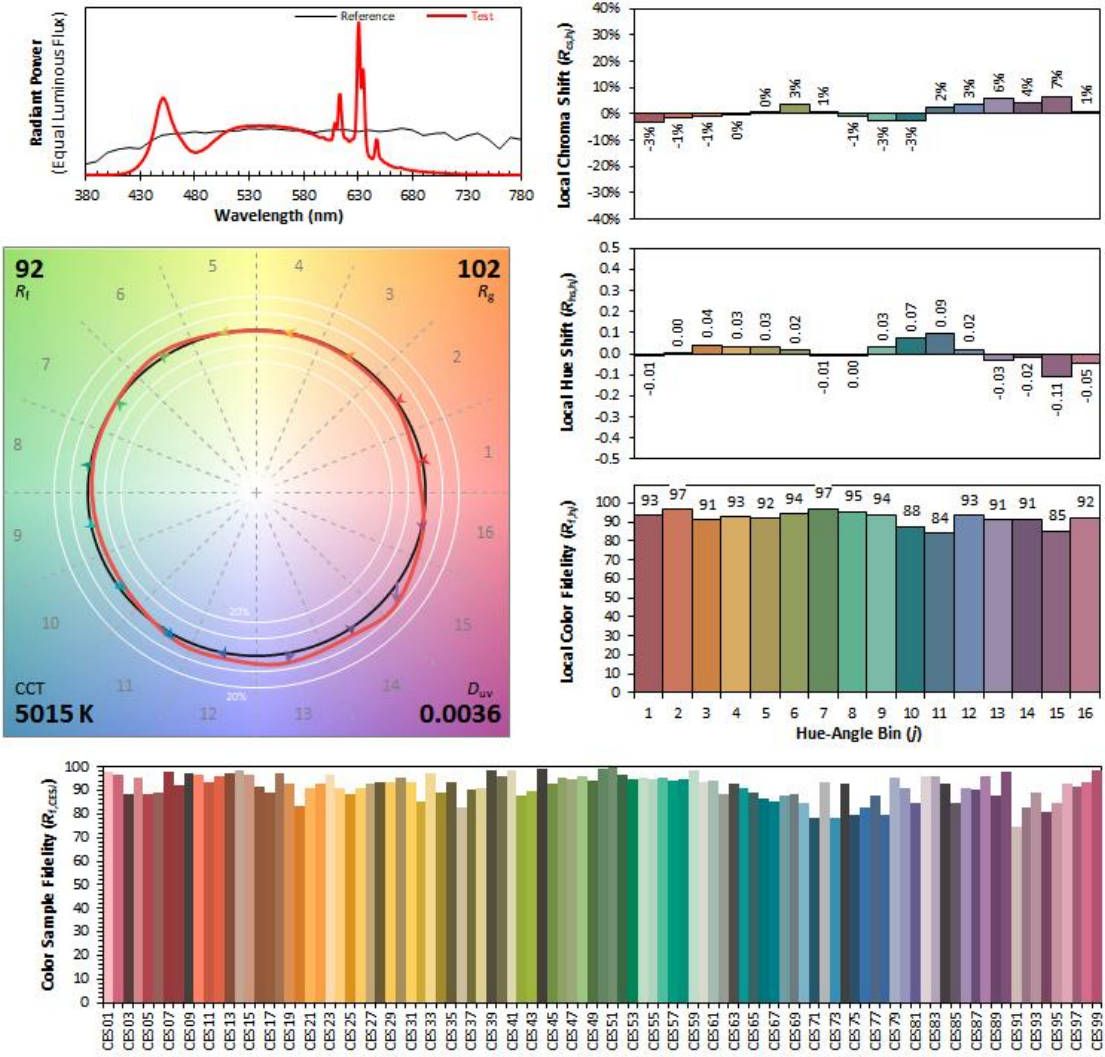
R1 =96	R2 =94	R3 =90	R4 =95	R5 =95	R6 =92	R7 =96	
R8 =96	R9 =85	R10=84	R11=94	R12=73	R13=95	R14=94	R15=96



TM30

ANSI/IES TM-30-18 Color Rendition Report

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



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

x	0.3454	CIE 13.3-1995 (CRI) R_a 94 R_g 85
y	0.3590	
u'	0.2088	
v'	0.4883	

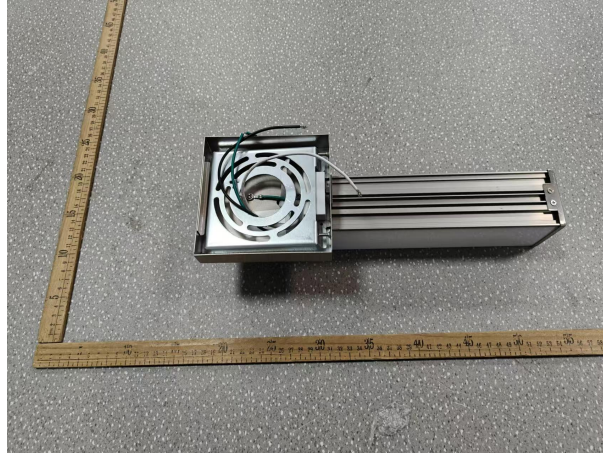
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



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 *****