



## 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-24SBN**

**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.



<b>1.1 Product Information:</b>		
Model Number	ALR-24SBN	
Remark	N/A	
Representative (Tested) Model	ALR-24SBN(mode:2700K) ALR-24SBN(mode:3000K) ALR-24SBN(mode:3500K) ALR-24SBN(mode:4000K) ALR-24SBN(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-F1	
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

<b>1.2 Rated Values:</b>	
Rated Voltage / Frequency	120Vac, 60Hz
Nominal Power	24W
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"> <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-79-2019 Optical and Electrical Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 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>

### 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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**

<b>Test date</b>	2024-11-22	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	ALR-24SBN(mode:2700K)	<b>Total Operating Time(min)</b>	75

**Electrical Measurement:**

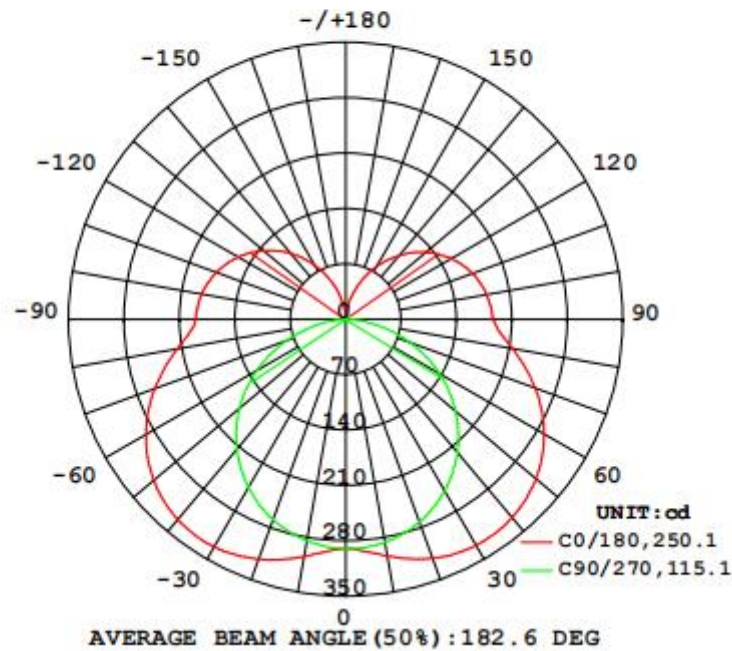
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-F1	120.0	60.01	0.2206	24.37	0.9206	42.21

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

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1836.8
Luminous Efficacy (lm/W)	75.37
Beam Angle (°)	182.6
Center Beam Candle Power (cd)	290

**Zonal Lumen Tabulation**

**LUMINOUS INTENSITY DISTRIBUTION DIAGRAM**



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	250.4	13.6%
0-40	432.2	23.5%
0-60	860.4	46.8%
60-90	516.0	28.1%
70-100	427.7	23.3%
90-120	303.9	16.5%
0-90	1,376.4	74.9%
90-180	460.2	25.1%
0-180	1,836.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	28.0	1.5%	90-100	117.2	6.4%
10-20	84.5	4.6%	100-110	102.5	5.6%
20-30	138.0	7.5%	110-120	84.2	4.6%
30-40	181.7	9.9%	120-130	65.1	3.5%
40-50	209.9	11.4%	130-140	45.3	2.5%
50-60	218.3	11.9%	140-150	27.3	1.5%
60-70	205.5	11.2%	150-160	13.7	0.7%
70-80	174.1	9.5%	160-170	4.4	0.2%
80-90	136.5	7.4%	170-180	0.5	0%

**Photometric Data**

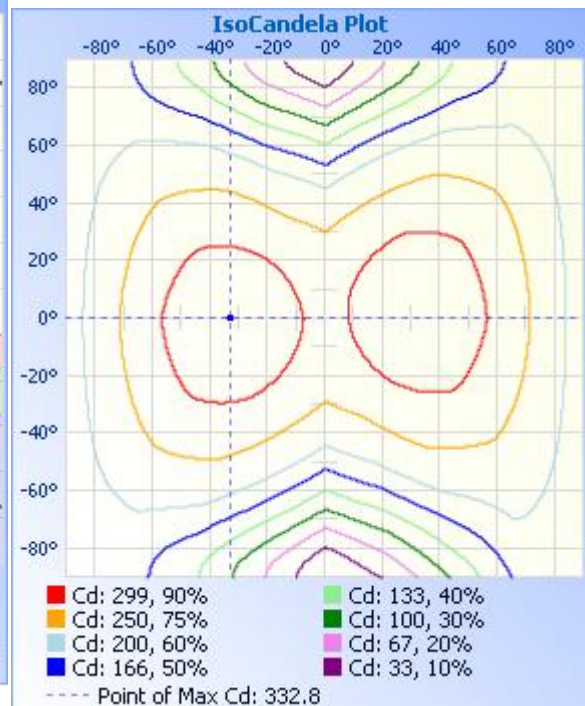
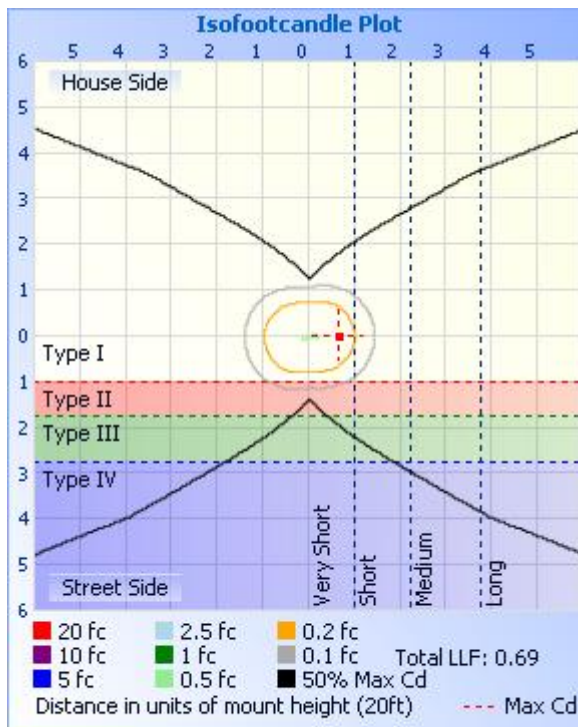
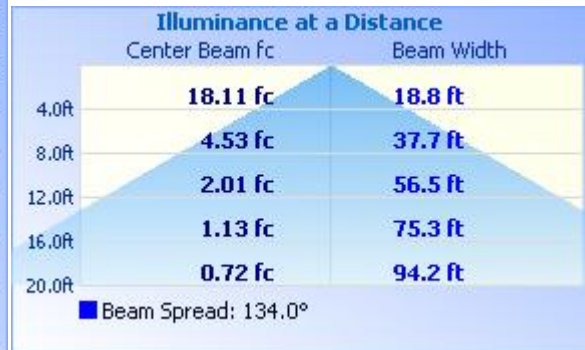
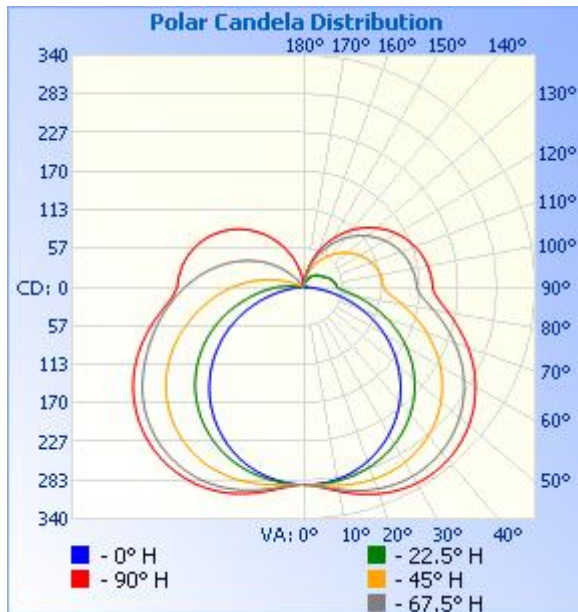




Table--1 UNIT: °C

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	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290			
5	294	294	293	290	289	290	292	294	295	294	292	289	288	289	291	293			
10	304	303	298	291	286	289	295	301	304	302	296	288	284	287	294	301			
15	313	311	303	290	281	286	298	309	314	311	300	286	278	283	297	308			
20	321	318	306	287	273	281	300	315	322	318	303	283	269	278	299	315			
25	327	323	308	283	262	275	300	319	328	323	305	278	259	271	298	319			
30	330	325	307	277	250	266	297	320	332	325	303	271	246	263	296	321			
35	330	325	304	268	236	256	292	319	333	324	299	262	231	252	291	319			
40	327	321	298	257	220	244	285	315	330	321	293	251	214	239	284	316			
45	322	315	289	245	201	229	275	308	325	315	285	238	196	224	274	309			
50	314	306	278	230	181	213	263	299	317	306	273	223	175	208	262	300			
55	303	295	264	213	160	194	249	287	305	294	260	206	153	189	247	288			
60	289	281	248	194	137	174	232	272	292	280	244	187	130	169	230	273			
65	273	264	230	173	112	152	212	255	275	263	225	166	105	148	211	257			
70	255	245	209	150	86.7	128	192	236	257	244	205	143	79.9	125	190	240			
75	234	224	188	127	60.9	104	170	215	237	223	183	120	54.3	101	169	224			
80	214	204	166	104	36.4	80.5	147	194	216	202	162	97.4	30.0	77.8	147	207			
85	196	185	146	83.6	15.4	60.1	128	176	198	185	144	78.9	10.2	57.6	126	191			
90	186	175	135	72.2	3.90	49.1	118	166	190	177	136	71.2	2.37	37.8	104	174			
95	184	173	133	70.9	2.67	47.5	116	165	188	175	135	70.2	1.33	18.0	82.9	158			
100	181	170	131	69.1	1.10	45.5	114	162	185	172	132	68.1	0.26	0.00	61.4	142			
105	176	165	128	64.3	1.04	42.4	111	158	180	168	128	64.9	0.00	0.00	39.9	125			
110	170	160	122	58.8	1.17	38.7	106	152	174	162	123	60.6	0.00	0.00	18.4	109			
115	163	153	116	54.9	1.57	34.9	101	145	166	155	117	55.5	0.00	0.00	0.00	92.1			
120	154	144	109	51.4	1.73	31.3	94.1	137	157	146	109	50.4	0.00	0.00	0.00	75.6			
125	144	135	101	46.6	1.97	29.1	86.7	128	147	136	101	45.3	0.00	0.00	0.00	59.1			
130	132	124	92.6	41.8	2.05	27.1	78.6	117	135	125	92.2	40.2	0.00	0.00	0.00	42.6			
135	119	112	83.1	37.3	2.05	24.6	70.0	106	123	113	82.8	35.0	0.00	0.00	0.00	26.1			
140	106	99.2	72.3	32.6	2.16	21.6	60.9	93.6	109	101	73.6	29.9	0.00	0.00	0.00	9.65			
145	91.3	85.6	61.4	27.4	2.19	18.4	52.5	80.6	94.5	88.2	64.3	24.8	0.00	0.00	0.00	0.00			
150	76.2	71.0	50.5	22.2	2.19	15.0	43.8	67.2	79.2	75.2	55.1	19.7	0.00	0.00	0.00	0.00			
155	61.1	57.1	40.0	18.7	2.19	11.6	34.6	54.0	64.1	61.8	45.9	14.5	0.00	0.00	0.00	0.00			
160	45.9	42.5	29.1	14.0	2.08	8.33	25.3	40.5	48.7	47.9	36.6	9.42	0.00	0.00	0.00	0.00			
165	31.0	28.5	18.8	8.34	1.92	5.64	16.4	27.1	33.0	33.7	27.4	4.29	0.00	0.00	0.00	0.00			
170	17.0	15.6	8.47	4.35	1.87	2.77	8.38	14.7	18.3	19.6	18.1	0.00	0.00	0.00	0.00	0.00			
175	5.84	4.24	3.24	2.58	1.89	1.94	2.86	4.85	6.15	5.44	8.90	0.00	0.00	0.00	0.00	0.00			
180	1.18	1.24	1.59	1.91	2.03	1.86	1.65	1.20	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00			



**2.2 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2024-11-22	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	ALR-24SBN(mode:2700K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-F1	120.0	60.01	0.2217	24.41	0.9176	42.43

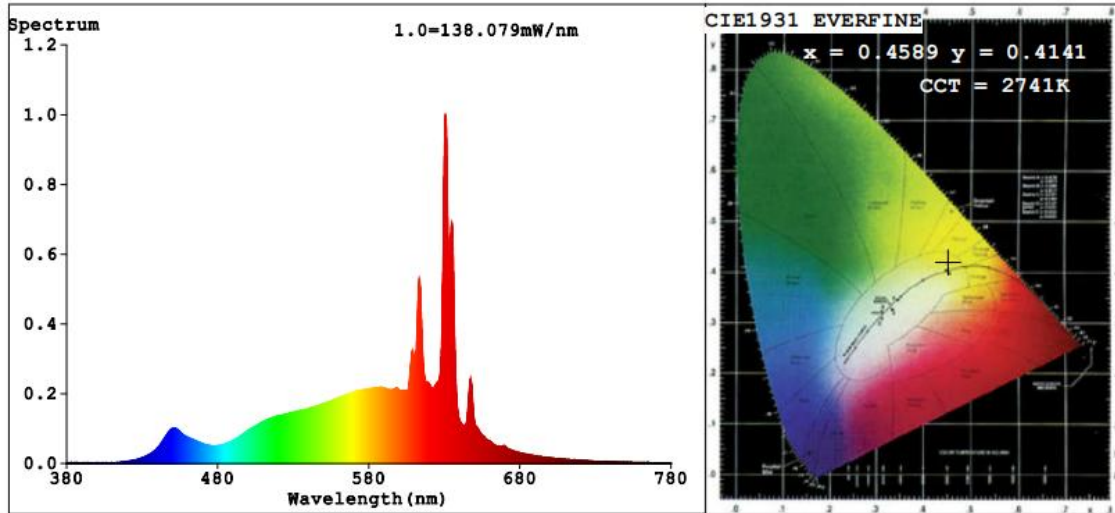
**Chromaticity Measurement - Sphere-Spectroradiometer  
 Method(Self-absorption:1.0817)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2741
Duv	0.0014
Chromaticity (x, y)	x=0.4589 y=0.4141
Chromaticity (u', v')	u'=0.2603 v'=0.5286
Color Rendering Index (CRI)	95.3
R9	68
Rg	100
Rf	92
Rcs,h1	-5

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1861
Luminous Efficacy (lm/W)	76.24

**Spectral Power Distribution & Chromaticity Diagram**



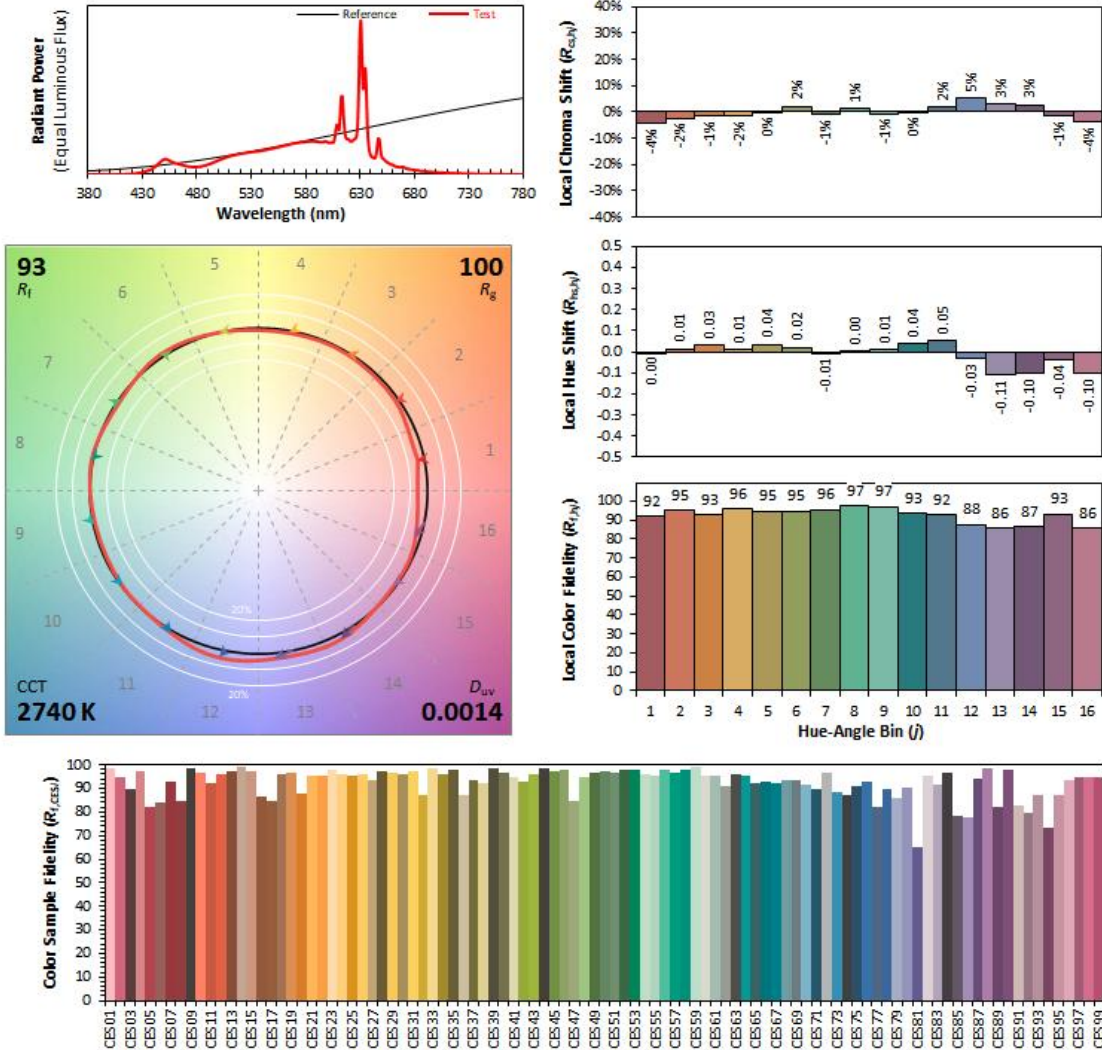
R1 =97	R2 =97	R3 =96	R4 =98	R5 =96	R6 =98	R7 =94	
R8 =87	R9 =68	R10=91	R11=98	R12=86	R13=97	R14=96	R15=92



**TM30**

**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-xx90RC35xxxxx      Manufacturer: RAB Lighting INC.  
 Date: 2024-11-22      Model: ALR-24SBN (mode:2700K)



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

$x$	<b>0.4589</b>	CIE 13.3-1995 (CRI)  $R_a$ 95 $R_g$ 69
$y$	<b>0.4141</b>	
$u'$	<b>0.2604</b>	
$v'$	<b>0.5285</b>	

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**

<b>Test date</b>	2024-11-22	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	ALR-24SBN(mode:3000K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-F1	120.0	60.01	0.2209	24.36	0.9188	42.29

**Chromaticity Measurement - Sphere-Spectroradiometer**

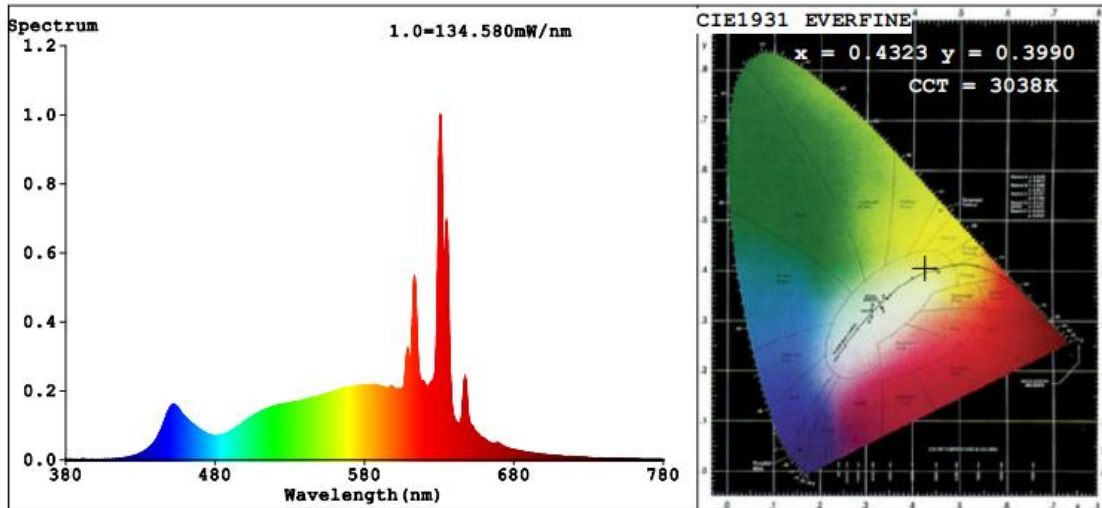
**Method(Self-absorption:1.0815)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3038
Duv	-0.0014
Chromaticity (x, y)	x=0.4323 y=0.3990
Chromaticity (u', v')	u'=0.2498 v'=0.5187
Color Rendering Index (CRI)	97.0
R9	82
Rg	101
Rf	93
Rcs,h1	-3

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1911
Luminous Efficacy (lm/W)	78.45

**Spectral Power Distribution & Chromaticity Diagram**



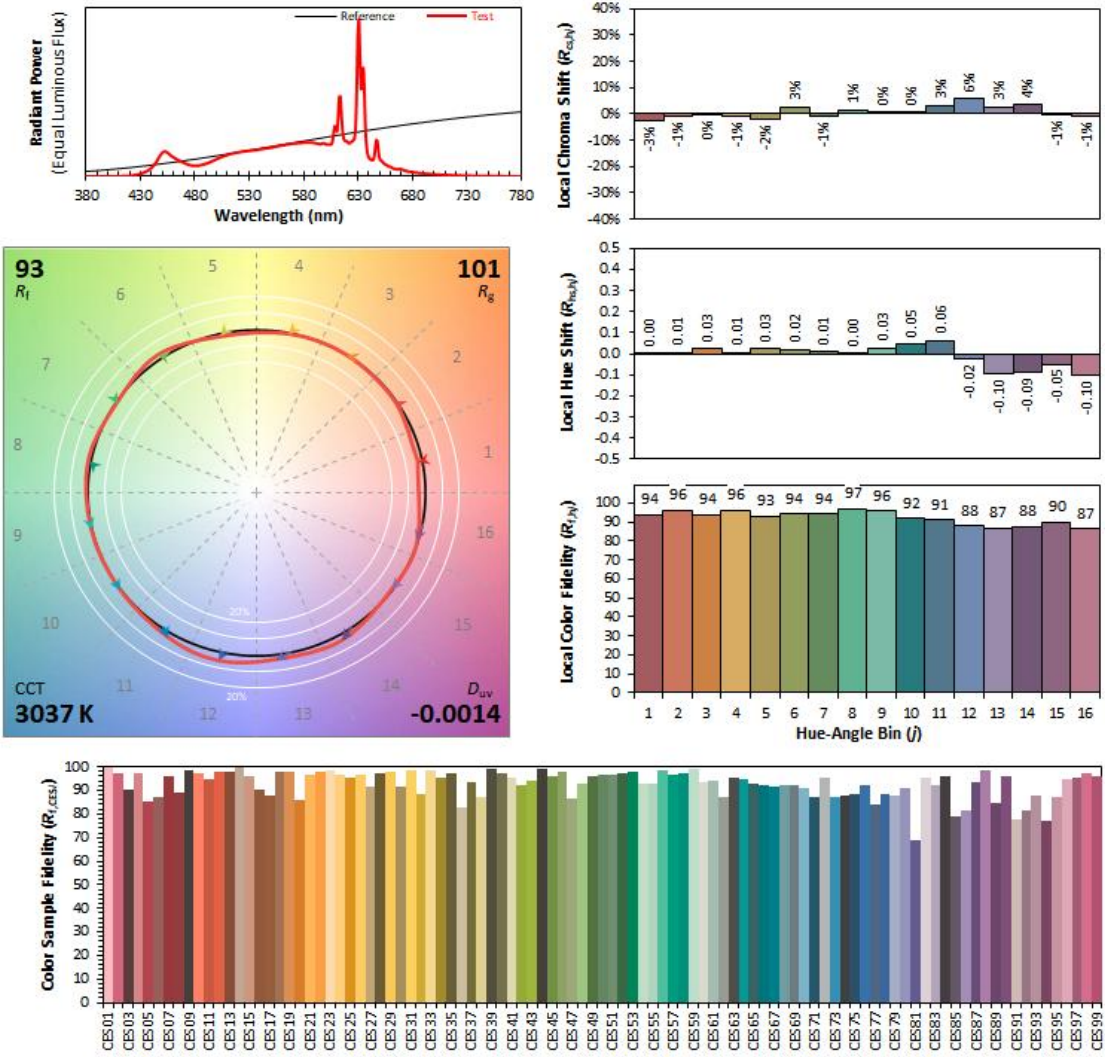
R1 =99	R2 =99	R3 =96	R4 =98	R5 =99	R6 =96	R7 =95	
R8 =93	R9 =82	R10=96	R11=96	R12=85	R13=100	R14=96	R15=97



**TM30**

**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-xx90RC35xxxxx      Manufacturer: RAB Lighting INC.  
 Date: 2024-11-22      Model: ALR-24SBN (mode: 3000K)



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

$x$	<b>0.4323</b>	CIE 13.3-1995 (CRI)  $R_a$ 97 $R_g$ 82
$y$	<b>0.3989</b>	
$u'$	<b>0.2498</b>	
$v'$	<b>0.5187</b>	

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**

<b>Test date</b>	2024-11-22	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	ALR-24SBN(mode:3500K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-F1	120.0	60.01	0.2197	24.29	0.9212	42.17

**Chromaticity Measurement - Sphere-Spectroradiometer**

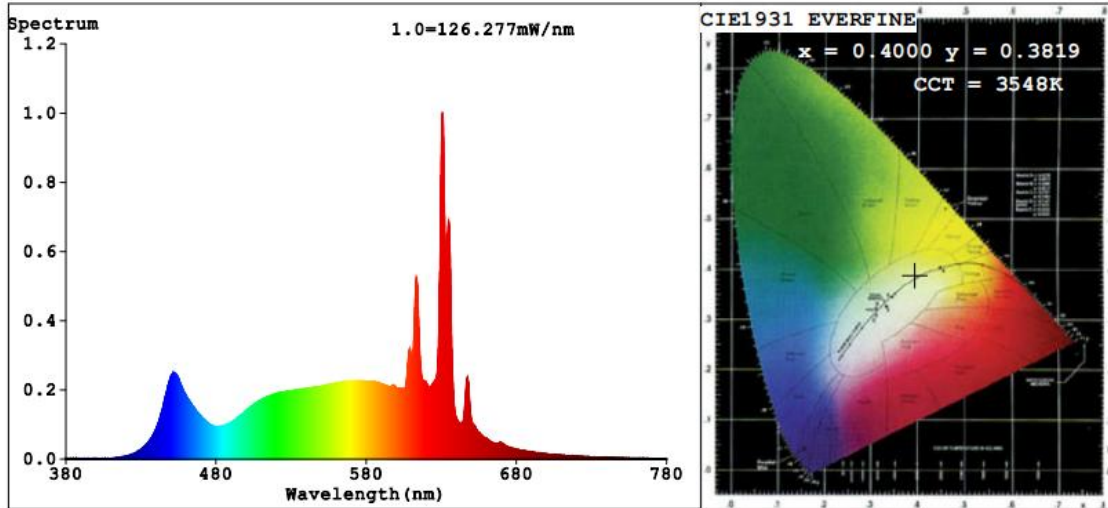
**Method(Self-absorption:1.0818)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3548
Duv	-0.0027
Chromaticity (x, y)	x=0.4000 y=0.3819
Chromaticity (u', v')	u'=0.2359 v'=0.5067
Color Rendering Index (CRI)	97.2
R9	95
Rg	103
Rf	93
Rcs,h1	-2

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1952
Luminous Efficacy (lm/W)	80.36

**Spectral Power Distribution & Chromaticity Diagram**



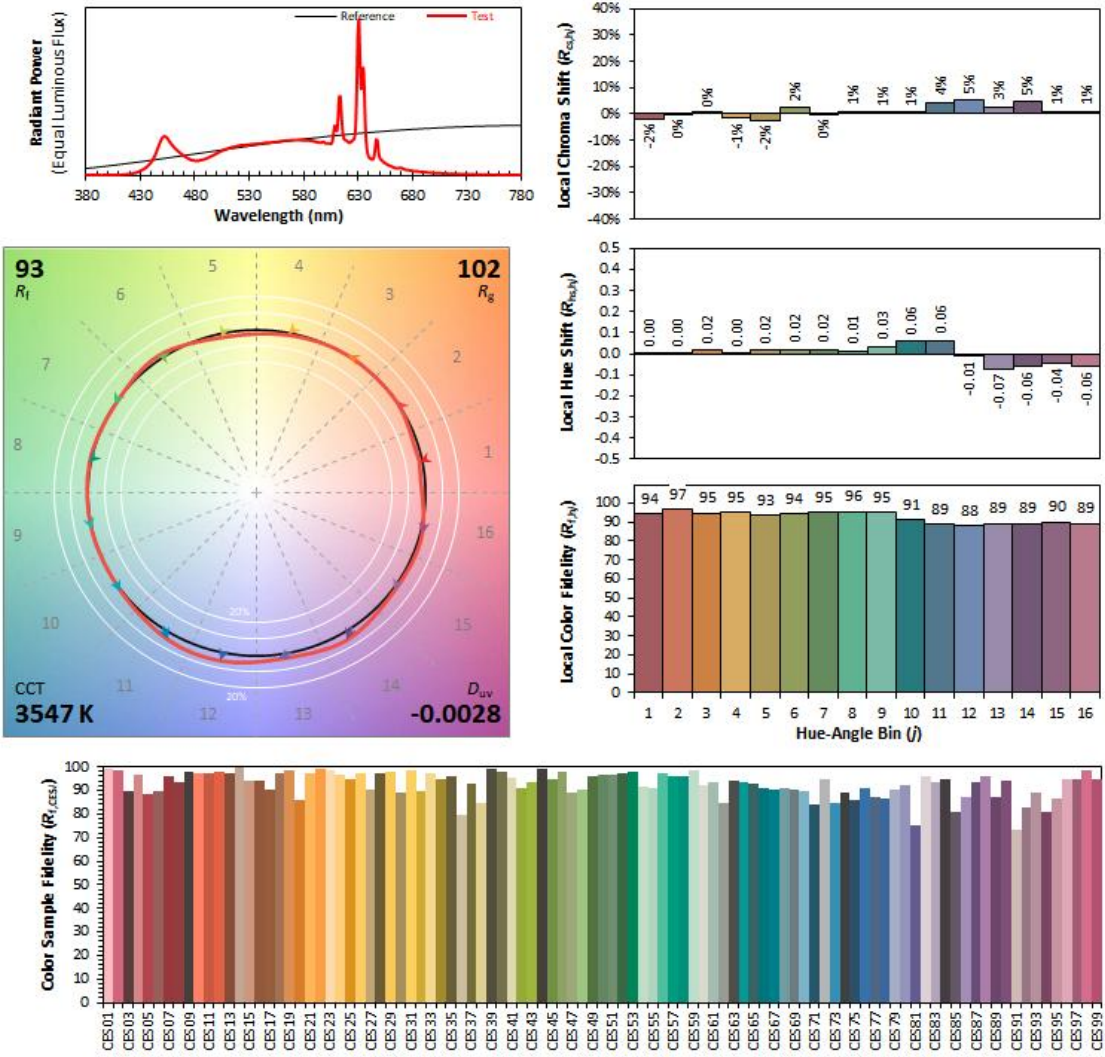
R1 =97	R2 =99	R3 =95	R4 =97	R5 =98	R6 =95	R7 =98		
R8 =99	R9 =95	R10=97	R11=94	R12=81	R13=98	R14=96	R15=98	



**TM30**

**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-xx90RC35xxxxx      Manufacturer: RAB Lighting INC.  
 Date: 2024-11-22      Model: ALR-24SBN (mode: 3500K)



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

$x$	0.4000	CIE 13.3-1995 (CRI)
$y$	0.3818	
$u'$	0.2359	
$v'$	0.5067	
		$R_a$ 97
		$R_g$ 95

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



**2.5 Electrical, Photometric and Chromaticity Measurements**

<b>Test date</b>	2024-11-22	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	ALR-24SBN(mode:4000K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-F1	120.0	60.01	0.2206	24.34	0.9194	42.19

**Chromaticity Measurement - Sphere-Spectroradiometer**

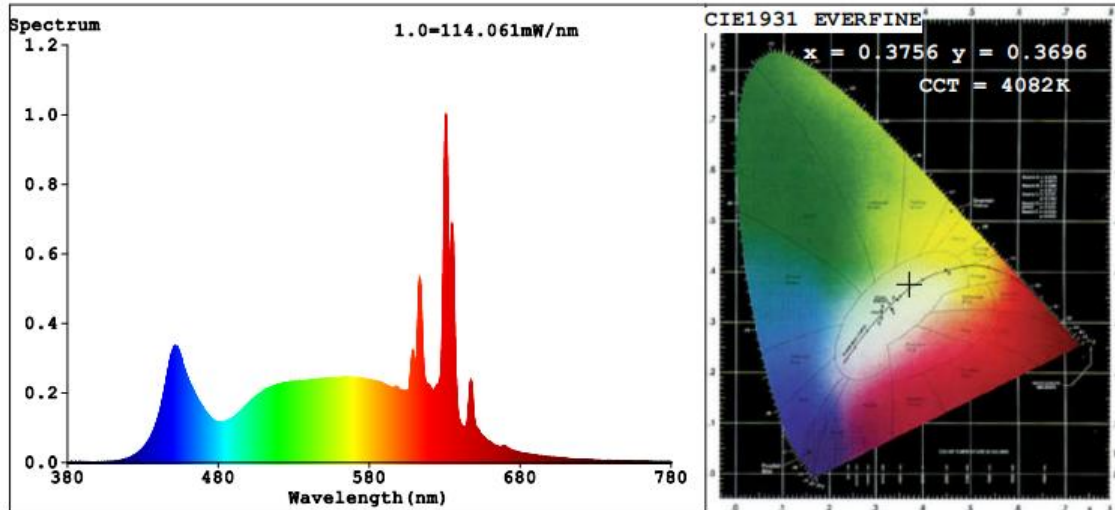
**Method(Self-absorption:1.0820)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4082
Duv	-0.0020
Chromaticity (x, y)	x=0.3756 y=0.3696
Chromaticity (u', v')	u'=0.2248 v'=0.4976
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)	1935
Luminous Efficacy (lm/W)	79.50

**Spectral Power Distribution & Chromaticity Diagram**



R1 =97	R2 =99	R3 =93	R4 =97	R5 =98	R6 =96	R7 =99		
R8 =98	R9 =97	R10=95	R11=94	R12=77	R13=98	R14=95	R15=97	

TM30

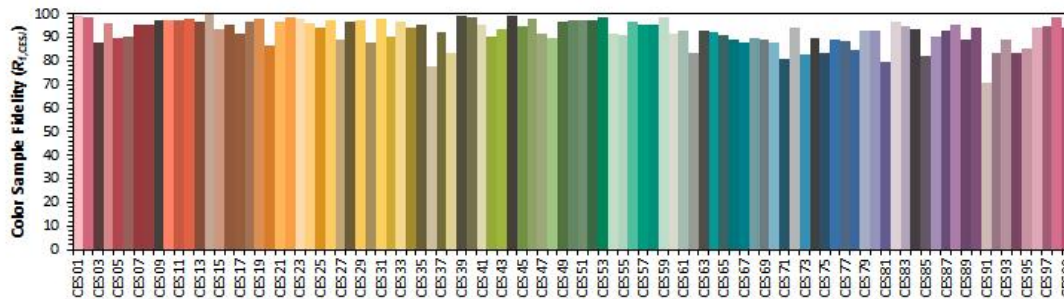
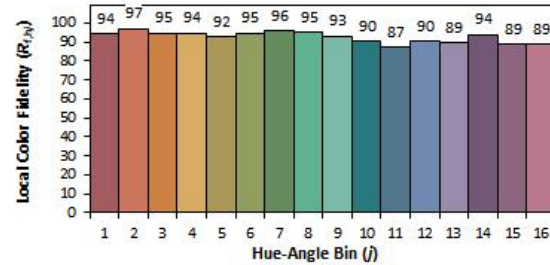
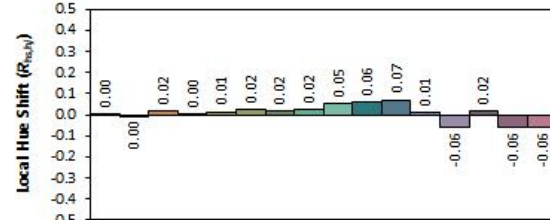
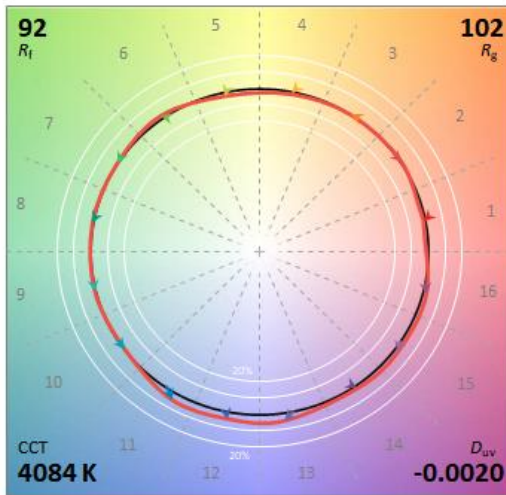
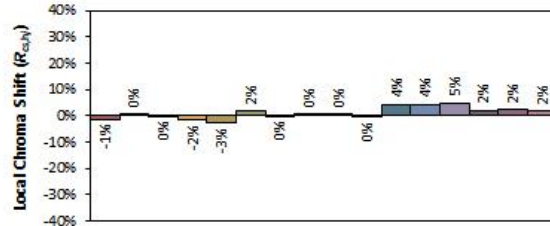
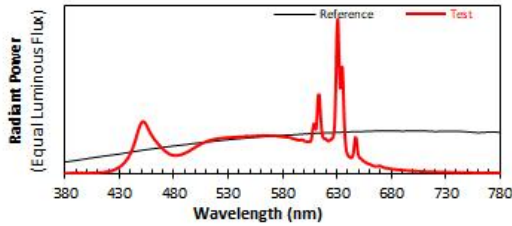
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-xx90RC35xxxxx

Manufacturer: RAB Lighting INC.

Date: 2024-11-22

Model: ALR-24SBN (mode: 4000K)



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

x 0.3755  
y 0.3694  
u' 0.2248  
v' 0.4976

CIE 13.3-1995 (CRI)

R<sub>a</sub> 97  
R<sub>g</sub> 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**

<b>Test date</b>	2024-11-22	<b>Test Ambient:</b>	25 ± 1 ° C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	60
<b>Model Number</b>	ALR-24SBN(mode:5000K)	<b>Total Operating Time(min)</b>	61

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD241047 NB-F1	120.0	60.01	0.2213	24.36	0.9171	42.18

**Chromaticity Measurement - Sphere-Spectroradiometer**

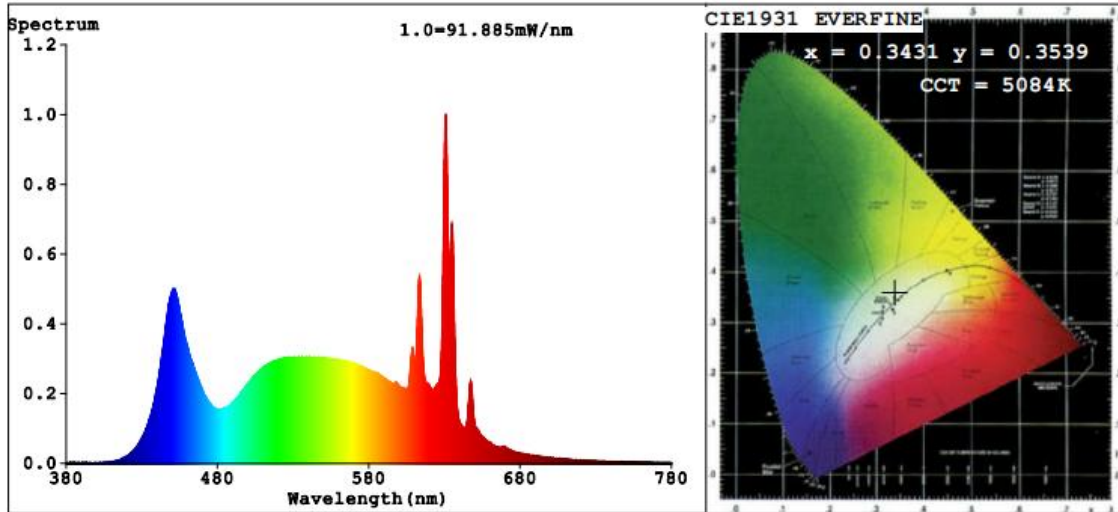
**Method(Self-absorption:1.0819)(4π geometry):**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5084
Duv	0.0019
Chromaticity (x, y)	x=0.3431 y=0.3539
Chromaticity (u', v')	u'=0.2092 v'=0.4855
Color Rendering Index (CRI)	96.0
R9	95
Rg	102
Rf	93
Rcs,h1	-2

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	1849
Luminous Efficacy (lm/W)	75.90

**Spectral Power Distribution & Chromaticity Diagram**



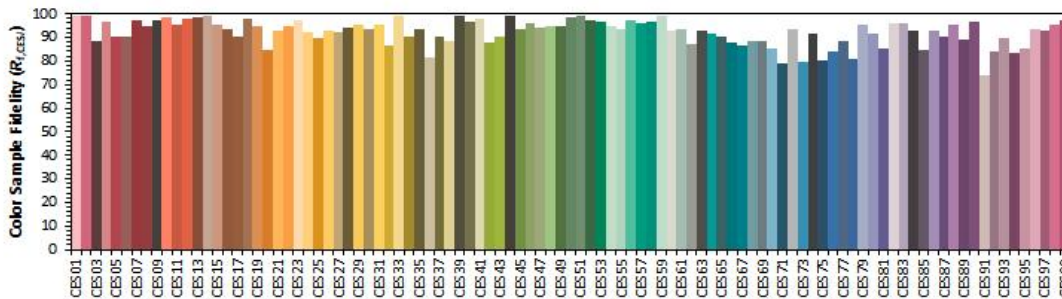
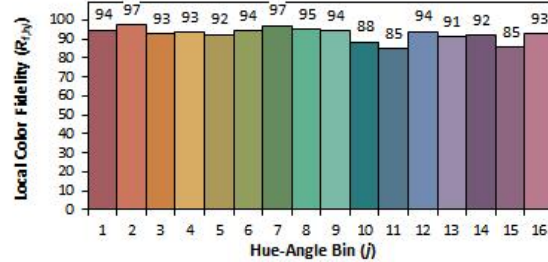
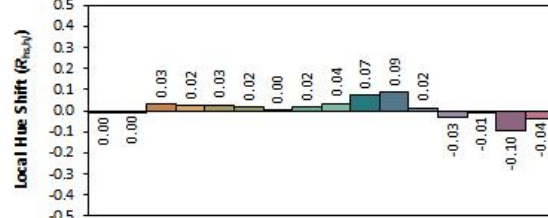
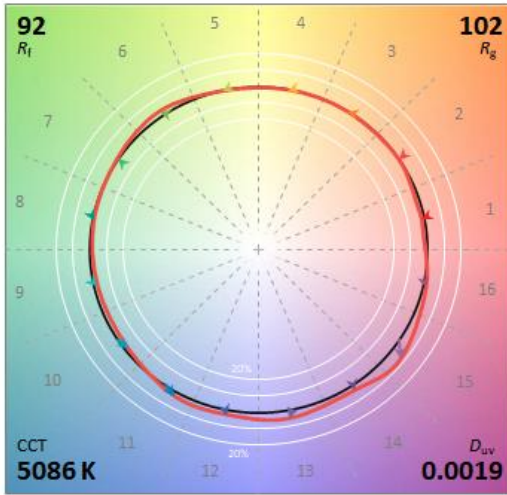
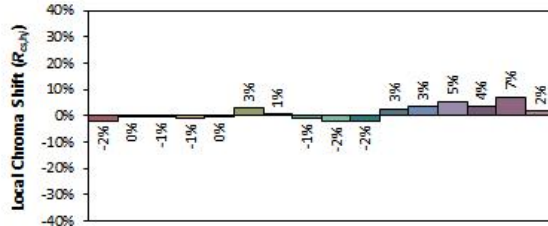
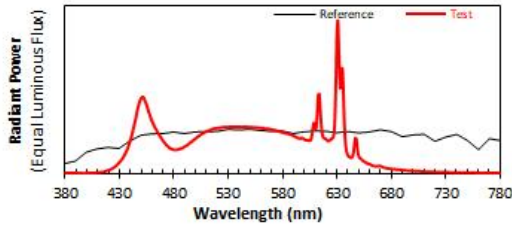
R1 =99	R2 =96	R3 =90	R4 =96	R5 =98	R6 =94	R7 =97		
R8 =99	R9 =95	R10=88	R11=94	R12=75	R13=98	R14=94	R15=99	



**TM30**

**ANSI/IES TM-30-18 Color Rendition Report**

Source: L128-xx90RC35xxxxx      Manufacturer: RAB Lighting INC.  
 Date: 2024-11-22      Model: ALR-24SBN (mode:5000K)



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

x    **0.3430**  
 y    **0.3537**  
 u'   **0.2092**  
 v'   **0.4854**

CIE 13.3-1995  
 (CRI)  
 Ra    96  
 Rg    96

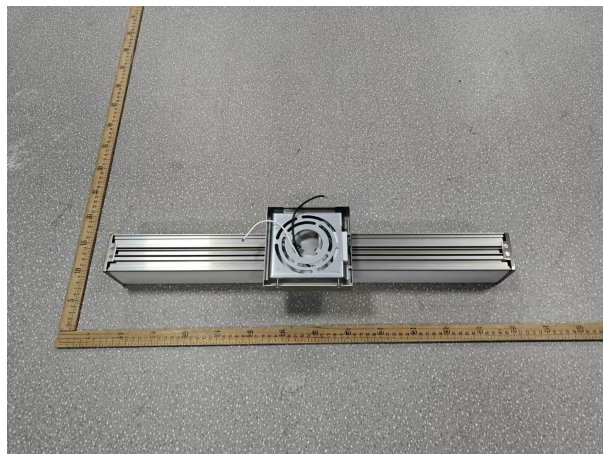
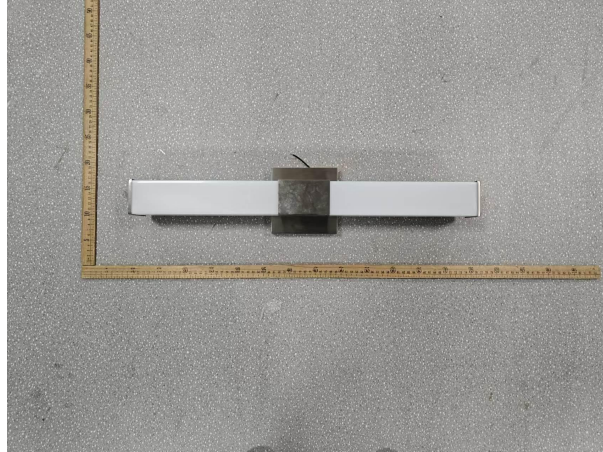
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



### 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 \*\*\*\*\*