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Certificate #4703.03

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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-36SB

Report Type:	Testing and Report According to IES LM-79-2019
Type of Luminaire:	LED luminaire
Report Date:	2024-08-30

Test & Report By:

Ferrum Li

Engineer: Ferrum Li

Review By:

Garman Mo

Manager: Garman Mo

Note: 1.The results contained in this report pertain only to the tested samples.

2.This report does not imply product certification, approval, or endorsement by A2LA or any agency of the Federal Government.

1.1 Product Information:		
Model Number	ALR-36SB	
Remark	N/A	
Representative (Tested) Model	ALR-36SB(mode: 2700K) ALR-36SB(mode: 3000K) ALR-36SB(mode: 3500K) ALR-36SB(mode: 4000K) ALR-36SB(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	
Sample Number	STD240728NB-I1	
Date of Receipt	2024-08-14	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaire Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac, 60Hz
Nominal Power	30W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,5000K (Color Tunable)

1.3 Test Specifications:

Test item	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	1. IES LM-79-2019 Optical and Electrical Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.4 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method: Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1.2° 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 25º C ± 1.2º 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 25º C ± 1.2º 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	2024-08-16	Test Ambient:	25±1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ALR-36SB(mode: 2700K)	Total Operating Time (min)	75

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD240728 NB-I1	120.0	60	0.2673	29.58	0.9223	40.92

Photometric Measurement – Goniophotometer Method(Test Distance:26.000m):

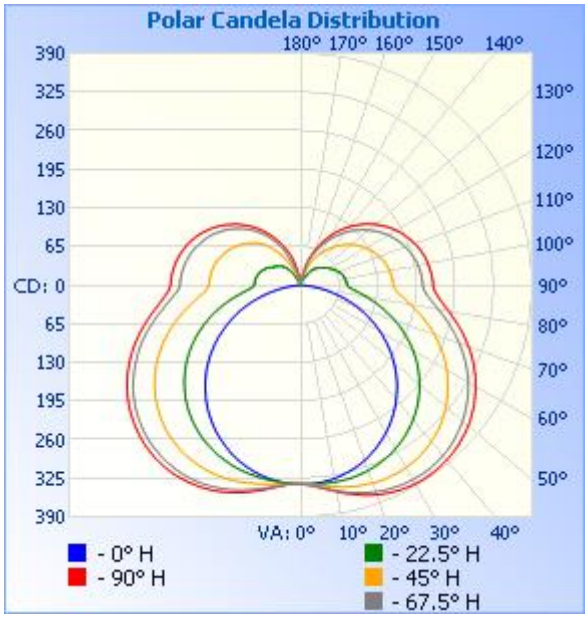
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	2205.3
Luminous Efficacy (lm/W)	74.56
Beam Angle (°)	173.0
Center Beam Candle Power (cd)	335

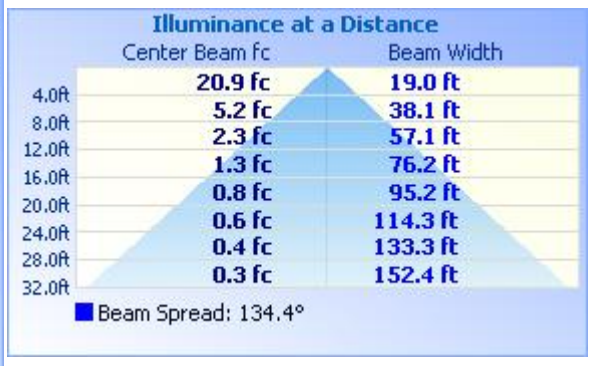
Zonal Lumen Tabulation

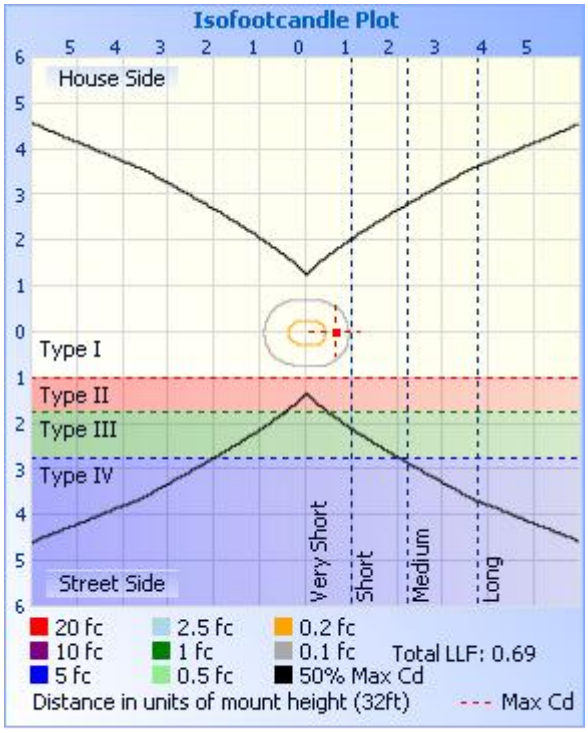
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	289.5	13.1%
0-40	499.9	22.7%
0-60	996.8	45.2%
60-90	599.8	27.2%
70-100	504.1	22.9%
90-120	390.0	17.7%
0-90	1,596.6	72.4%
90-180	608.3	27.6%
0-180	2,204.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	32.3	1.5%	90-100	143.2	6.5%
10-20	97.6	4.4%	100-110	132.7	6%
20-30	159.6	7.2%	110-120	114.1	5.2%
30-40	210.5	9.5%	120-130	90.2	4.1%
40-50	243.4	11.0%	130-140	64.6	2.9%
50-60	253.5	11.5%	140-150	39.5	1.8%
60-70	238.9	10.8%	150-160	18.4	0.8%
70-80	202.1	9.2%	160-170	5.2	0.2%
80-90	158.8	7.2%	170-180	0.4	0%

Photometric Data







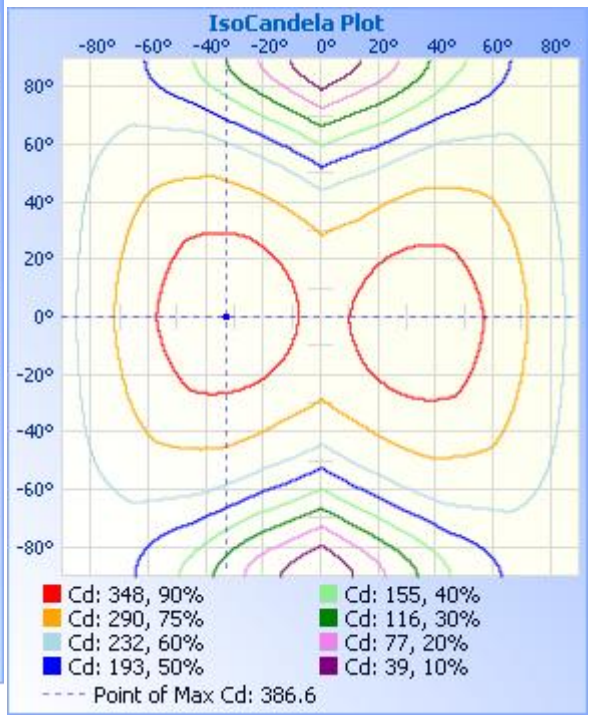


Table--1 UNIT: cd

C(DEG) / (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	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335			
5	339	337	334	334	334	336	338	341	341	340	338	335	333	334	336	338			
10	349	346	338	331	330	336	345	351	353	350	343	334	329	332	340	347			
15	361	355	341	328	323	335	350	362	365	359	347	331	322	329	344	356			
20	371	362	344	322	314	332	354	370	375	367	349	326	312	325	348	365			
25	378	368	344	315	302	326	356	375	382	372	349	319	299	319	350	371			
30	382	370	342	305	287	318	355	378	386	374	346	309	285	311	348	375			
35	383	370	337	293	270	308	351	378	386	373	340	298	267	301	345	374			
40	380	366	330	279	251	295	343	374	384	368	332	284	248	288	338	371			
45	375	358	319	263	229	280	333	367	378	361	321	267	227	273	329	364			
50	365	348	305	244	206	262	319	356	369	350	307	247	204	256	316	355			
55	353	335	289	224	181	241	303	343	356	336	290	226	178	236	301	342			
60	338	318	270	202	154	218	285	326	341	320	271	202	151	214	282	326			
65	320	299	249	177	126	193	263	307	322	300	249	177	123	190	261	307			
70	299	277	225	150	95.7	167	239	284	301	278	225	150	92.8	164	238	285			
75	275	254	200	123	65.5	139	214	260	278	254	200	122	62.5	137	213	261			
80	252	230	175	96.5	36.5	113	188	236	254	230	174	94.5	33.8	111	188	237			
85	231	209	153	73.9	12.5	89.5	167	216	233	210	153	71.8	10.4	88.7	166	216			
90	219	197	142	62.3	0.70	78.5	156	206	223	200	143	61.0	0.10	78.4	155	204			
95	218	195	140	61.5	0.20	77.2	154	204	221	198	141	59.2	0.10	77.3	153	202			
100	214	193	139	60.3	0.00	75.2	151	200	217	195	138	56.9	0.20	75.8	151	199			
105	209	188	135	58.1	0.00	71.8	147	195	212	190	134	53.7	0.59	73.2	147	194			
110	202	182	131	55.0	0.00	67.3	141	188	205	183	129	49.9	0.59	69.7	142	188			
115	194	175	125	51.0	0.00	62.1	134	179	196	175	122	45.1	0.59	65.7	136	180			
120	183	166	118	46.2	0.00	56.3	126	169	185	165	115	40.7	0.59	59.3	129	171			
125	172	155	110	42.2	0.00	50.8	117	157	173	154	106	37.4	0.59	53.8	120	160			
130	158	143	101	39.3	0.00	45.6	106	144	159	141	95.8	33.8	0.59	49.6	110	147			
135	144	130	89.4	36.0	0.00	40.7	94.8	131	144	128	85.6	30.3	0.49	44.8	99.3	134			
140	129	116	76.5	31.7	0.00	35.4	83.0	116	128	113	75.6	27.2	0.49	38.4	86.6	119			
145	112	101	66.4	24.7	0.00	28.9	70.6	99.4	111	99.0	66.9	23.7	0.49	28.4	67.7	102			
150	94.3	84.7	52.1	14.2	0.00	18.5	58.1	82.8	92.7	84.2	58.7	20.0	0.49	12.8	50.6	83.7			
155	76.6	66.1	37.1	10.6	0.00	13.5	44.2	65.9	73.8	69.1	49.0	16.8	0.79	8.06	32.2	61.5			
160	57.9	46.3	26.3	9.42	0.39	9.35	28.8	48.6	54.5	52.8	38.0	14.0	2.17	3.64	16.8	36.9			
165	38.6	27.3	14.1	7.27	0.49	5.82	15.4	26.9	34.1	33.8	21.5	10.2	2.07	1.97	10.8	18.9			
170	16.1	8.99	9.44	5.50	1.08	3.45	7.51	11.6	13.8	14.2	9.85	5.00	2.07	1.38	6.03	9.95			
175	5.70	3.87	4.73	3.63	1.38	2.07	2.38	3.35	3.27	3.43	2.05	1.48	2.07	1.38	3.25	4.26			
180	0.00	0.88	1.27	2.05	1.38	1.77	1.28	0.39	0.10	0.10	0.98	1.47	2.27	1.38	1.78	1.28			

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-08-16	Test Ambient:	25±1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ALR-36SB(mode: 2700K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD240728 NB-I1	120.0	60	0.2688	29.73	0.9218	40.97

Chromaticity Measurement - Sphere-Spectroradiometer Method(Self-absorption:1.1775) (4π geometry):

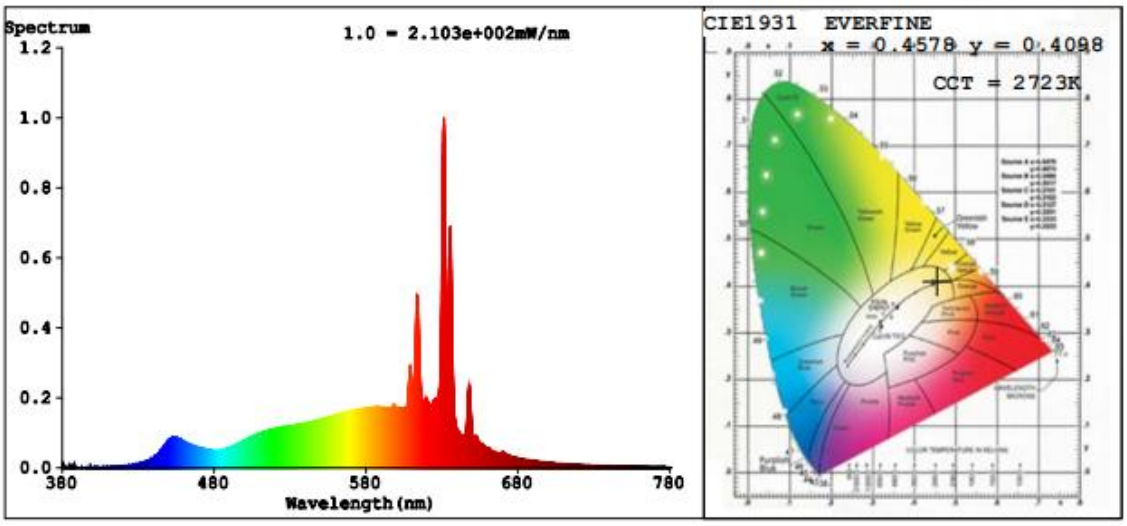
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2723
Duv	-0.0001
Chromaticity (x, y)	x=0.4578 y=0.4098
Chromaticity (u', v')	u'=0.2615 v'=0.5267

Parameter	Result
Color Rendering Index (CRI)	96.9
R9	78
Rg	100
Rf	93
Rcs,h1(%)	-4

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	2227
Luminous Efficacy (lm/W)	74.91

Spectral Power Distribution & Chromaticity Diagram



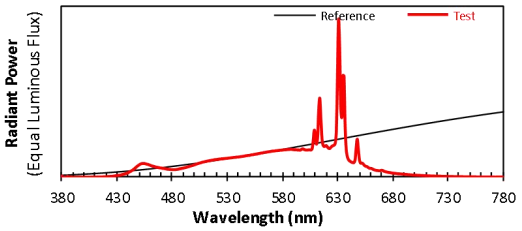
Special Color Rendering Indices

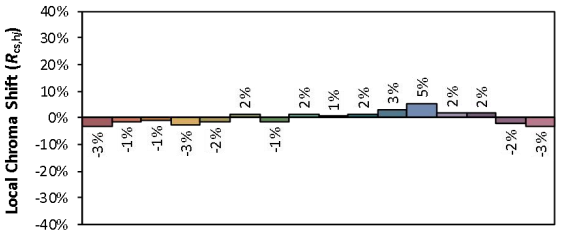
R1 =99	R2 =100	R3 =97	R4 =99	R5 =99	R6 =95	R7 =94	
R8 =91	R9 =78	R10=97	R11=96	R12=88	R13=100	R14=96	R15=96

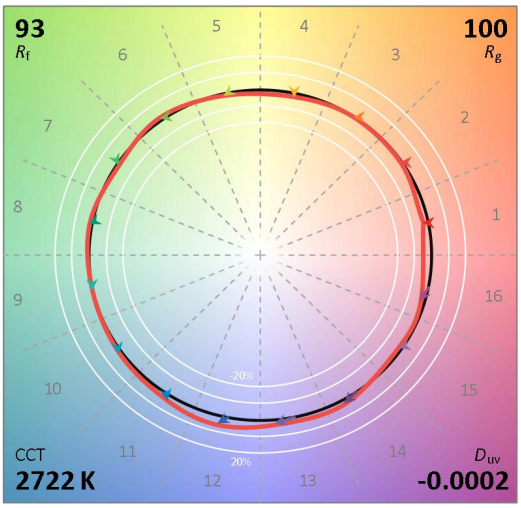
TM30

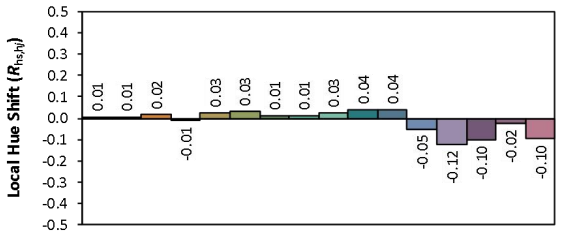
ANSI/IES TM-30-18 Color Rendition Report

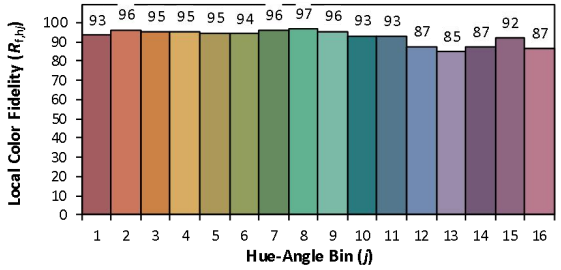
Source:	L128-xx90RC35xxxxx	**Manufacturer:**	RAB Lighting INC.
Date:	2024-08-16	**Model:**	ALR-36SB(mode: 2700K)

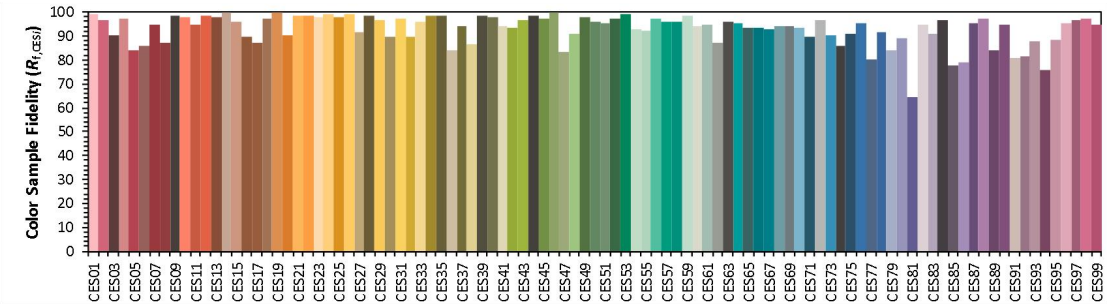












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4578
y	0.4097
u'	0.2616
v'	0.5267

CIE 13.3-1995 (CRI)	
R_a	97
R_9	79

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2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-08-16	Test Ambient:	25±1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ALR-36SB(mode: 3000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD240728 NB-I1	120.0	60	0.2680	29.65	0.9220	40.95

Chromaticity Measurement - Sphere-Spectroradiometer Method(Self-absorption:1.1779) (4π geometry):

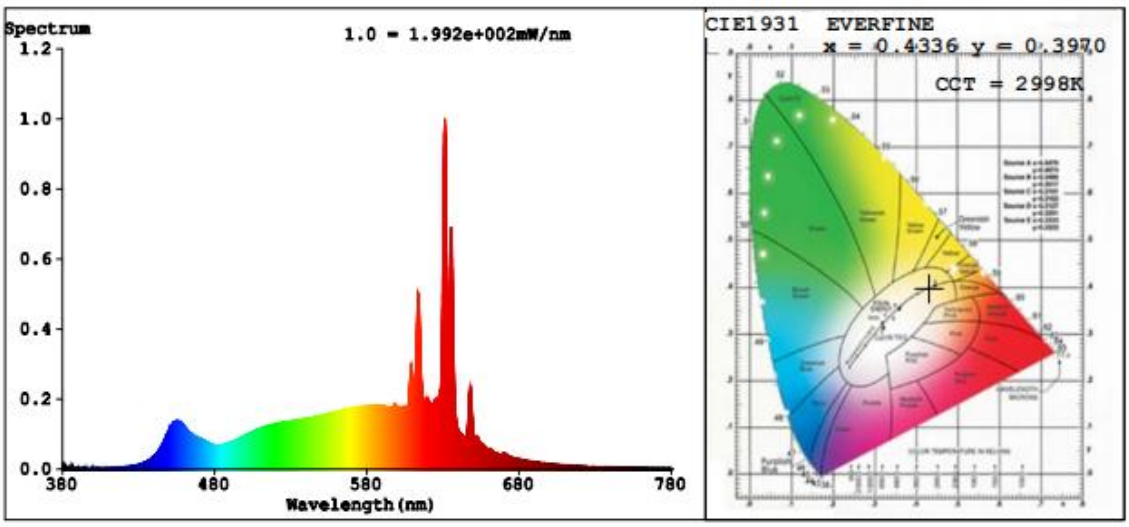
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	2998
Duv	-0.0024
Chromaticity (x, y)	x=0.4336 y=0.3970
Chromaticity (u', v')	u'=0.2515 v'=0.5181

Parameter	Result
Color Rendering Index (CRI)	96.2
R9	88
Rg	101
Rf	93
Rcs,h1(%)	-3

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	2290
Luminous Efficacy (lm/W)	77.23

Spectral Power Distribution & Chromaticity Diagram



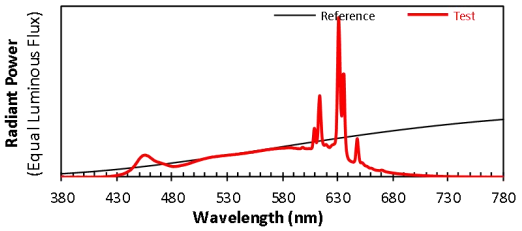
Special Color Rendering Indices

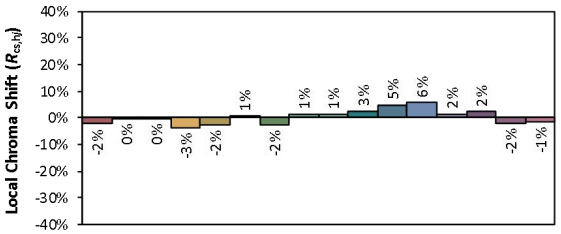
R1 =97	R2 =98	R3 =99	R4 =98	R5 =97	R6 =93	R7 =95	
R8 =94	R9 =88	R10=98	R11=95	R12=84	R13=97	R14=97	R15=99

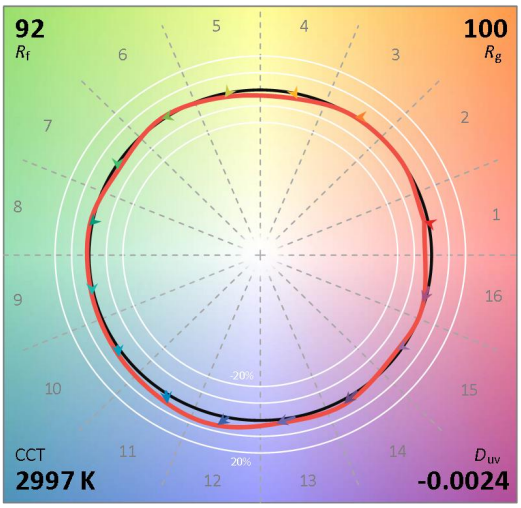
TM30

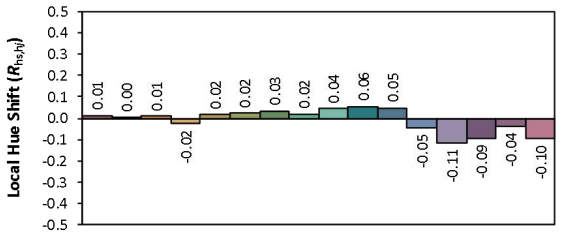
ANSI/IES TM-30-18 Color Rendition Report

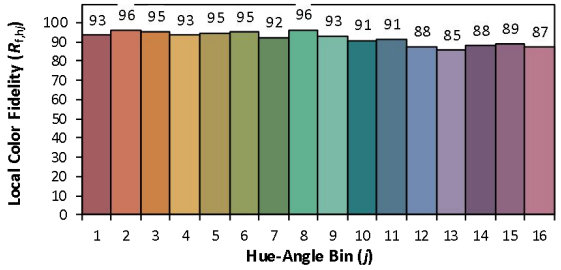
Source:	L128-xx90RC35xxxxx	**Manufacturer:**	RAB Lighting INC.
Date:	2024-08-16	**Model:**	ALR-36SB(mode: 3000K)

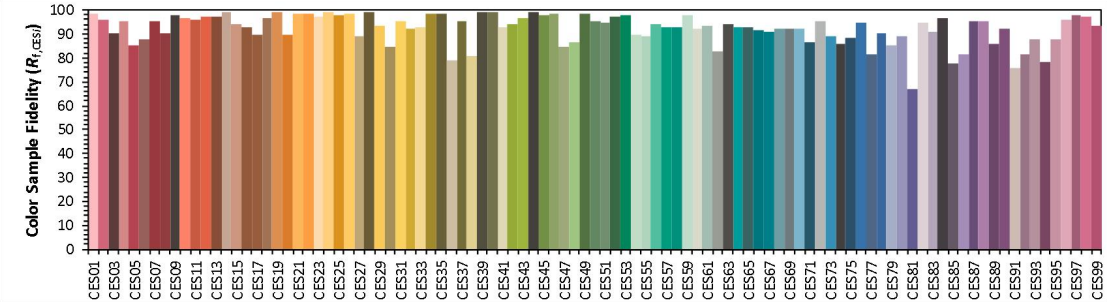












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4336
y	0.3969
u'	0.2515
v'	0.5180

CIE 13.3-1995 (CRI)	
R_a	96
R_9	88

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2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-08-16	Test Ambient:	25±1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ALR-36SB(mode: 3500K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD240728 NB-I1	120.0	60	0.2640	29.21	0.9219	40.96

Chromaticity Measurement - Sphere-Spectroradiometer Method(Self-absorption:1.1773) (4π geometry):

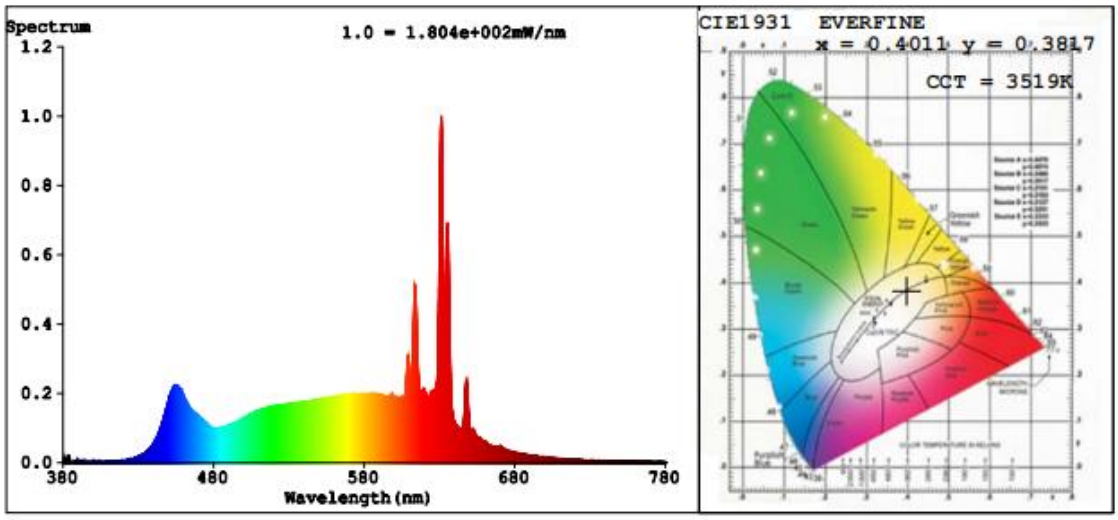
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3519
Duv	-0.0031
Chromaticity (x, y)	x=0.4011 y=0.3817
Chromaticity (u', v')	u'=0.2367 v'=0.5068

Parameter	Result
Color Rendering Index (CRI)	96.1
R9	96
Rg	101
Rf	92
Rcs,h1(%)	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	2378
Luminous Efficacy (lm/W)	81.41

Spectral Power Distribution & Chromaticity Diagram



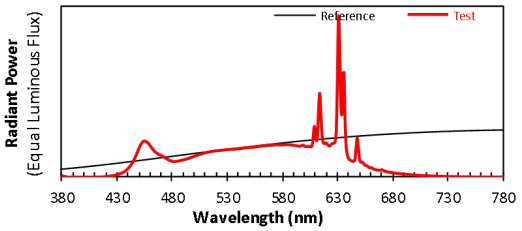
Special Color Rendering Indices

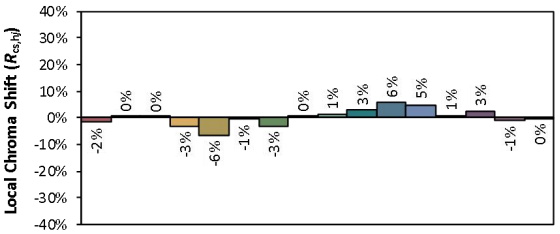
R1 =95	R2 =97	R3 =99	R4 =98	R5 =96	R6 =92	R7 =95	
R8 =97	R9 =96	R10=96	R11=95	R12=80	R13=96	R14=98	R15=96

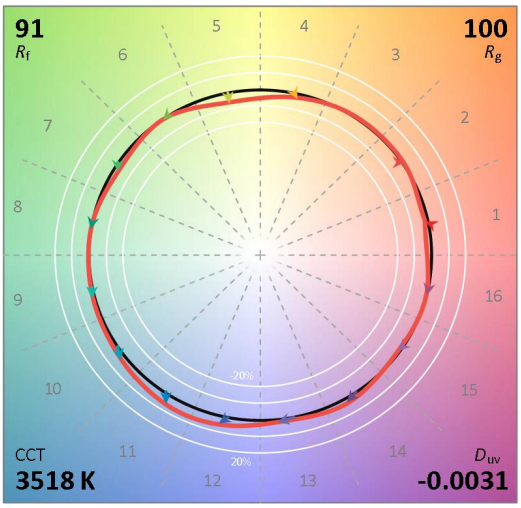
TM30

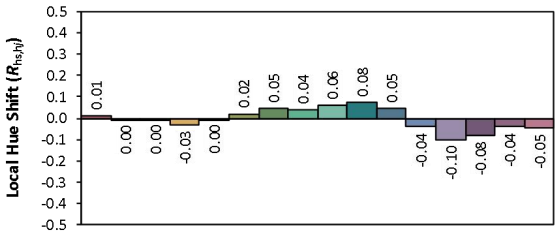
ANSI/IES TM-30-18 Color Rendition Report

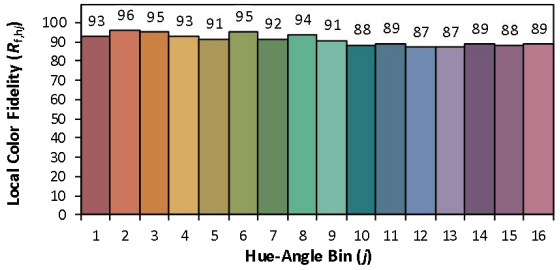
Source:	L128-xx90RC35xxxxx	**Manufacturer:**	RAB Lighting INC.
Date:	2024-08-16	**Model:**	ALR-36SB(mode: 3500K)

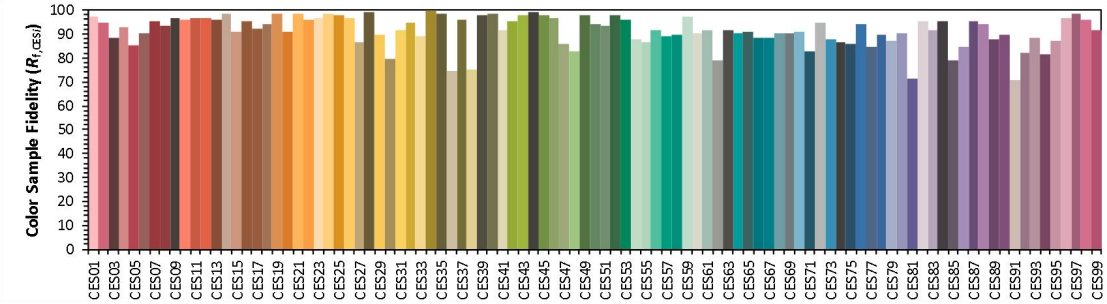












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4011
y	0.3816
u'	0.2368
v'	0.5068

CIE 13.3-1995 (CRI)	
R_a	96
R_9	96

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2.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-08-16	Test Ambient:	25±1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ALR-36SB(mode: 4000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD240728 NB-I1	120.0	60	0.2625	29.05	0.9222	40.93

Chromaticity Measurement - Sphere-Spectroradiometer Method(Self-absorption:1.1777) (4π geometry):

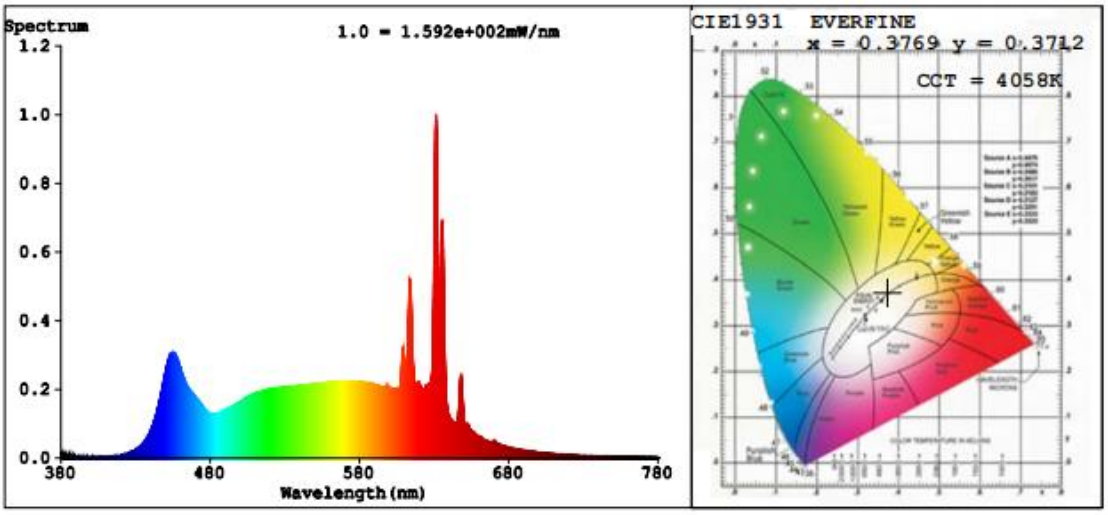
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4058
Duv	-0.0016
Chromaticity (x, y)	x=0.3769 y=0.3712
Chromaticity (u', v')	u'=0.2250 v'=0.4986

Parameter	Result
Color Rendering Index (CRI)	96.4
R9	96
Rg	100
Rf	92
Rcs,h1(%)	-2

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	2401
Luminous Efficacy (lm/W)	82.65

Spectral Power Distribution & Chromaticity Diagram



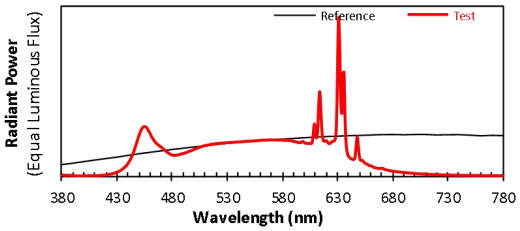
Special Color Rendering Indices

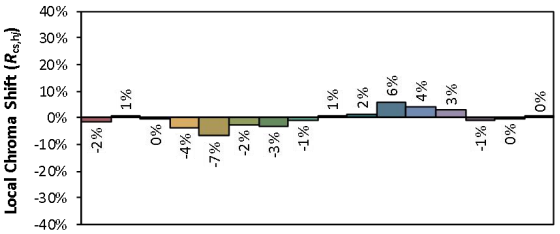
R1 =96	R2 =98	R3 =99	R4 =97	R5 =96	R6 =94	R7 =95	
R8 =96	R9 =96	R10=98	R11=97	R12=76	R13=96	R14=98	R15=96

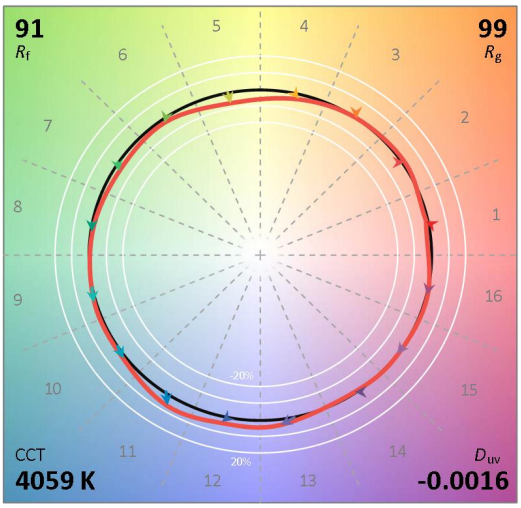
TM30

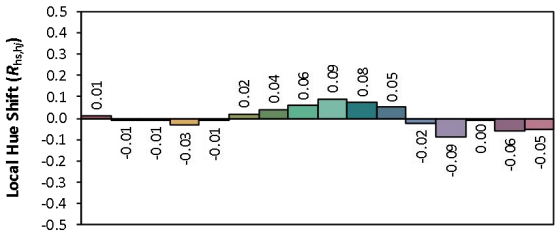
ANSI/IES TM-30-18 Color Rendition Report

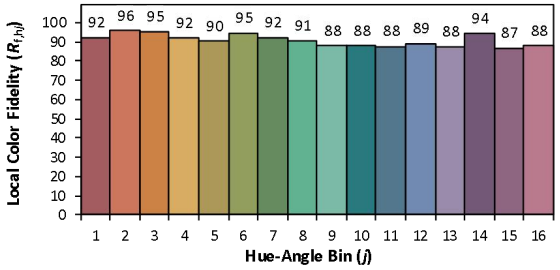
Source:	L128-xx90RC35xxxxx	**Manufacturer:**	RAB Lighting INC.
Date:	2024-08-16	**Model:**	ALR-36SB(mode: 4000K)

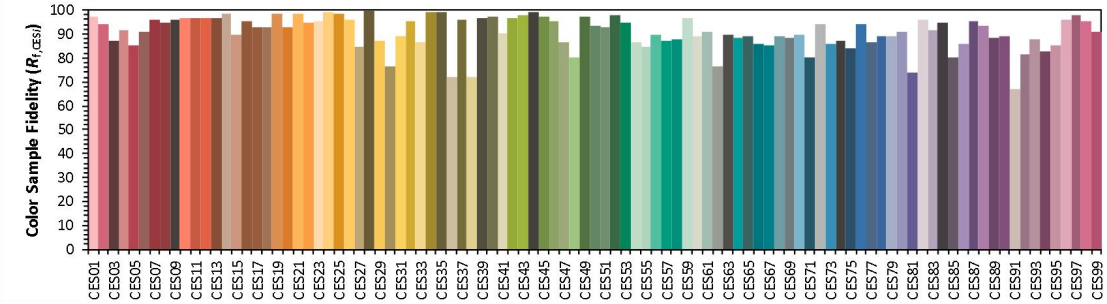












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3769
y	0.3711
u'	0.2250
v'	0.4985

CIE 13.3-1995 (CRI)

R_a	96
R_9	97

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2.6 Electrical, Photometric and Chromaticity Measurements

Test date	2024-08-16	Test Ambient:	25±1° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	ALR-36SB(mode: 5000K)	Total Operating Time (min)	61

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD240728 NB-I1	120.0	60	0.2663	29.45	0.9217	40.98

Chromaticity Measurement - Sphere-Spectroradiometer Method(Self-absorption:1.1774) (4π geometry):

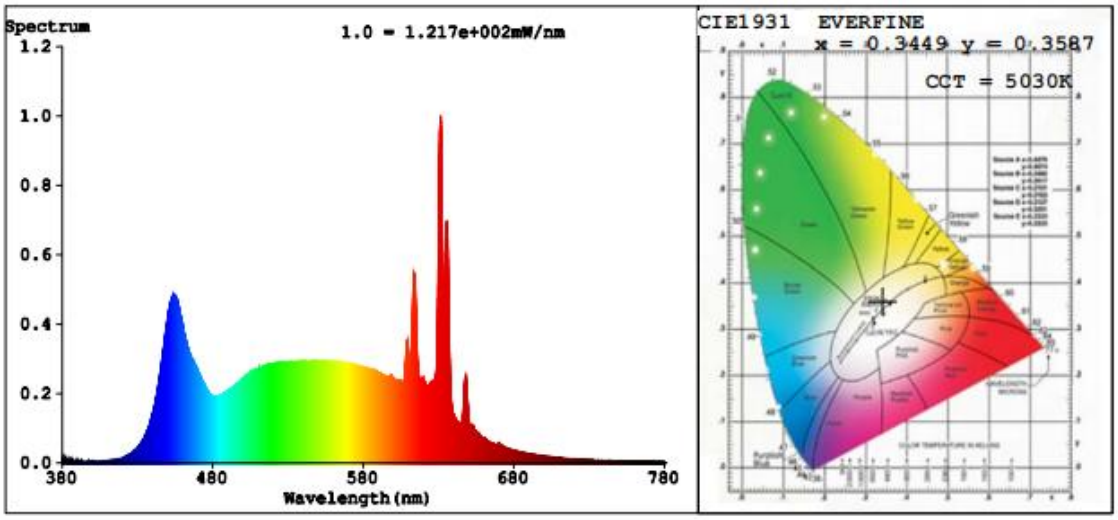
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5030
Duv	0.0036
Chromaticity (x, y)	x=0.3449 y=0.3587
Chromaticity (u', v')	u'=0.2085 v'=0.4881

Parameter	Result
Color Rendering Index (CRI)	96.2
R9	84
Rg	99
Rf	92
Rcs,h1(%)	-4

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	2372
Luminous Efficacy (lm/W)	80.54

Spectral Power Distribution & Chromaticity Diagram



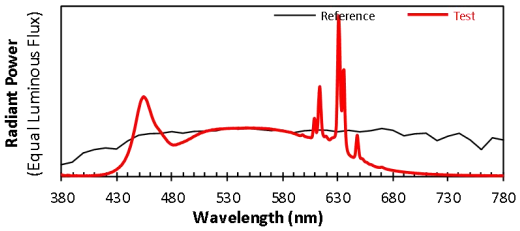
Special Color Rendering Indices

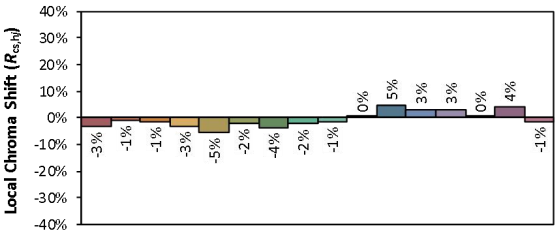
R1 =97	R2 =99	R3 =98	R4 =96	R5 =96	R6 =96	R7 =95	
R8 =93	R9 =84	R10=95	R11=97	R12=74	R13=98	R14=98	R15=95

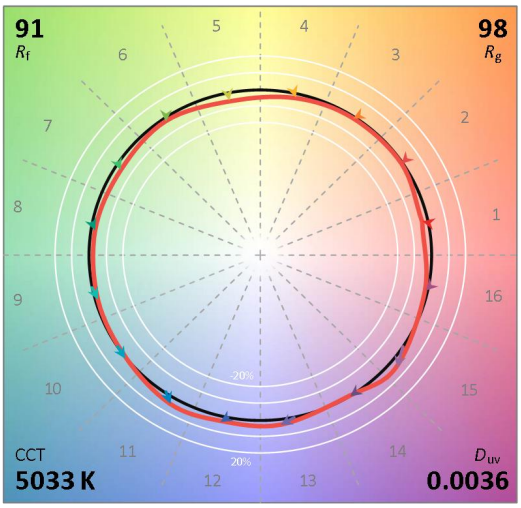
TM30

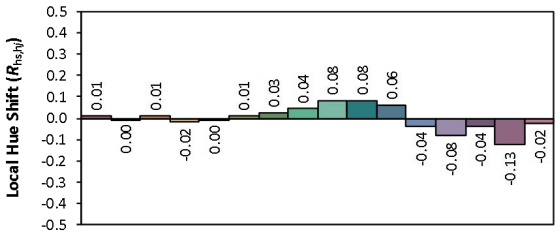
ANSI/IES TM-30-18 Color Rendition Report

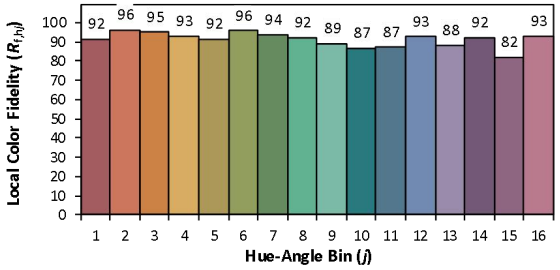
Source:	L128-xx90RC35xxxxx	**Manufacturer:**	RAB Lighting INC.
Date:	2024-08-16	**Model:**	ALR-36SB(mode: 5000K)

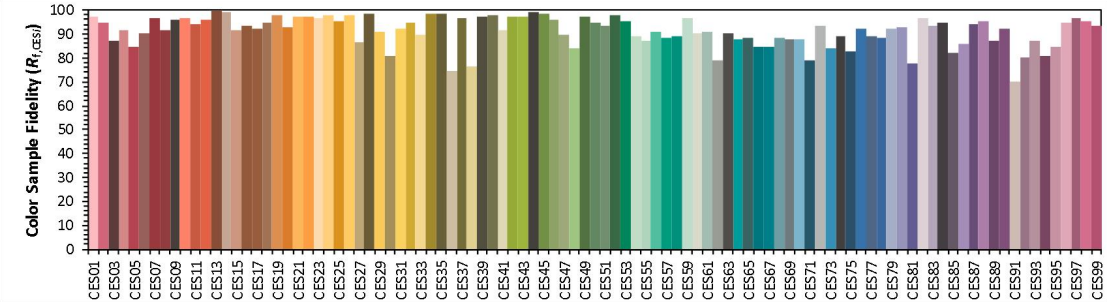












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3448
y	0.3586
u'	0.2086
v'	0.4880

CIE 13.3-1995 (CRI)	
R_a	96
R_9	84

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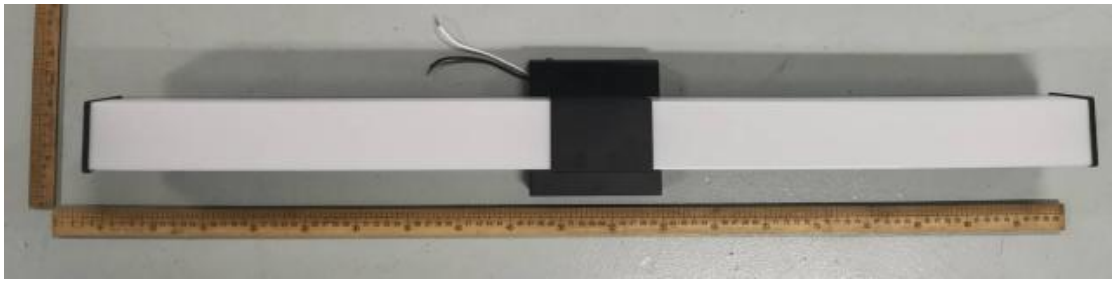
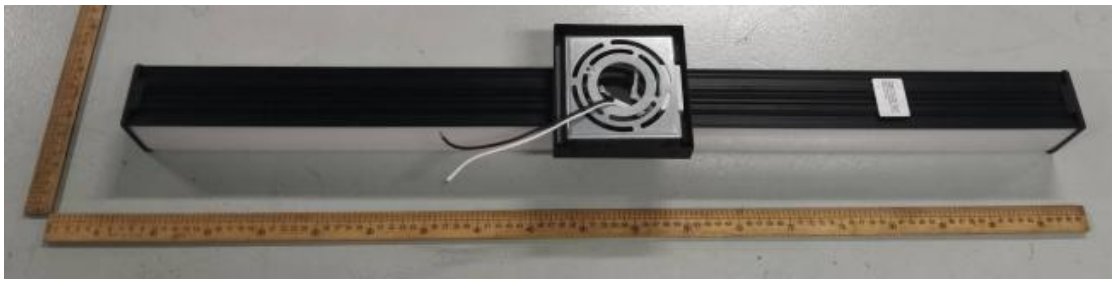
3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-S-451	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-S-455	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-S-452	Standard Lamp D204	2023-06-26	2026-06-25
ST-R-S-453	Power Meter for Integrating Sphere	2024-05-29	2025-05-28
ST-R-S-467	Hygrothermograph	2024-06-06	2025-06-05
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp D908S	2022-07-19	2025-07-18
ST-R-357	AC Power Source	2024-01-29	2025-01-28
ST-R-S-422	Power Meter for Goniophotometer	2024-05-29	2025-05-28
ST-R-S-354	hygrothermograph for Goniophotometer	2024-05-29	2025-05-28
Uncertainty: Photometric Measurement (Sphere):2.94%, k=2 Chromaticity Measurement(Sphere):52.28K, k=2 Photometric Measurement(Goniophotometer): 2.94%, k=2			

4. Product Photo





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