

LM-79-08 Test Report

For

ESPEN TECHNOLOGY INC.**(Brand Name: ESPEN)**

12257 Florence Ave. Santa Fe Springs, CA 90670

Dual Mode Internal Driver (UL Type A or B)

Model name(s): L96T8(aa)/8XX/24G-AB

Remark: The XXK represent for different

CCTs,30=3000K,35=3500K,40=4000K,41=4100K,45=4500K,50=5000K

This is multiple listed report, the Project Number of the original report is
STD200839NB-A-R.

Representative (Tested) Model:

L96T8(aa)/830/24G-AB

L96T8(aa)/850/24G-AB

L96T8(aa)/430/12G-AB (1.2m)

Model Difference: All construction and rating are the same, except CCT

Test & Report By:

Ferrum Li

Engineer: Ferrum Li

Date: Feb.07,2021

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:

Organization Name	ESPEN TECHNOLOGY INC.	
Brand Name	ESPEN	
Model Number	L96T8(aa)/8XX/24G-AB	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Dual Mode Internal Driver (UL Type A or B)	
Rated Voltage / Frequency	120-277 Vac, 50/60 Hz	
Nominal Power	24W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500,4000K,4100K,4500K,5000K	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-AA80RA35000Q1	
Test Ballast	ESPEN VE259MVHIP OSRAM SYLVANIA QTP 2x32T8/UNV ISN-SC	
Sample Number	STD200839NB-A1,A2(3000K),A3(5000K),A4,A5(1.2m,3000K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s
Photo		
		
		
		

1.2 Test Specifications:

Date of Receipt	Aug.26, 2020
Date of Test	Aug.28, 2020
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-79-2008 Electrical and Photometric 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 Color 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

1.3 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-28	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	L96T8(aa)/830/24G-AB with ballast ESPEN VE259MVHIP		

Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD200839	120.0	60	0.2428	28.65	0.9833	9.03
NB-A1	277.0	60	0.1062	28.45	0.9672	8.25
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

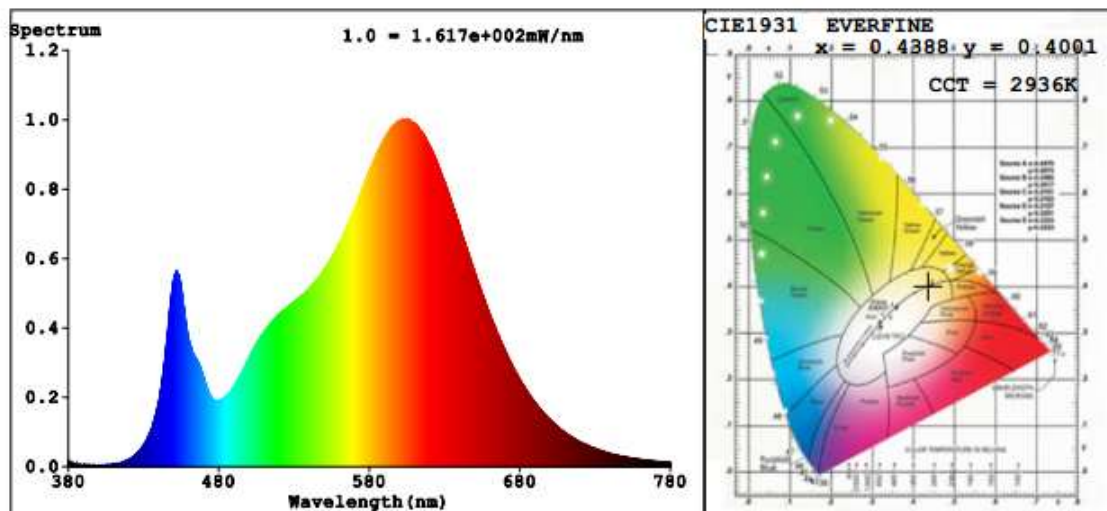
Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2936
Duv	-0.0018
Chromaticity (x, y)	x=0.4388 y=0.4001
Chromaticity (u', v')	u'=0.2535 v'=0.5201
Color Rendering Index (CRI)	82.5
R9	5

Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:

Photometric Measurement for Bare Lamp Sphere Spectroradiometer Method:			
Parameter	Result		DLC V5.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3823	3812	Bare Lamp: >= 3200(-10%)
Luminous Efficacy (lm/W)	133.44	133.99	Bare lamp: >= 120(-3%)
Most worst Luminous/Highest Watts	133.05		

Spectral Power Distribution & Chromaticity Diagram



Chromaticity Coordinate: x=0.4388 y=0.4001/u'=0.2535 v'=0.5201 Du, Dv: 0.0006, -0.0017

CCT=2936K (Duv=-0.0018) Dominant WL: Ld = 583.8nm Purity=51.8%

Peak WL: Lp=604.7nm FWHM=117.6nm

Render Index: Ra=82.5 Render Index: AvgR = 77.3

R1 = 82 R2 = 93 R3 = 94 R4 = 80 R5 = 82 R6 = 91 R7 = 81

R8 = 57 R9 = 5 R10 = 83 R11 = 80 R12 = 75 R13 = 84 R14 = 98 R15 = 74

2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-28	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	L96T8(aa)/830/24G-AB , Connected to line voltage		

Electrical Measurement for Bare-lamp:

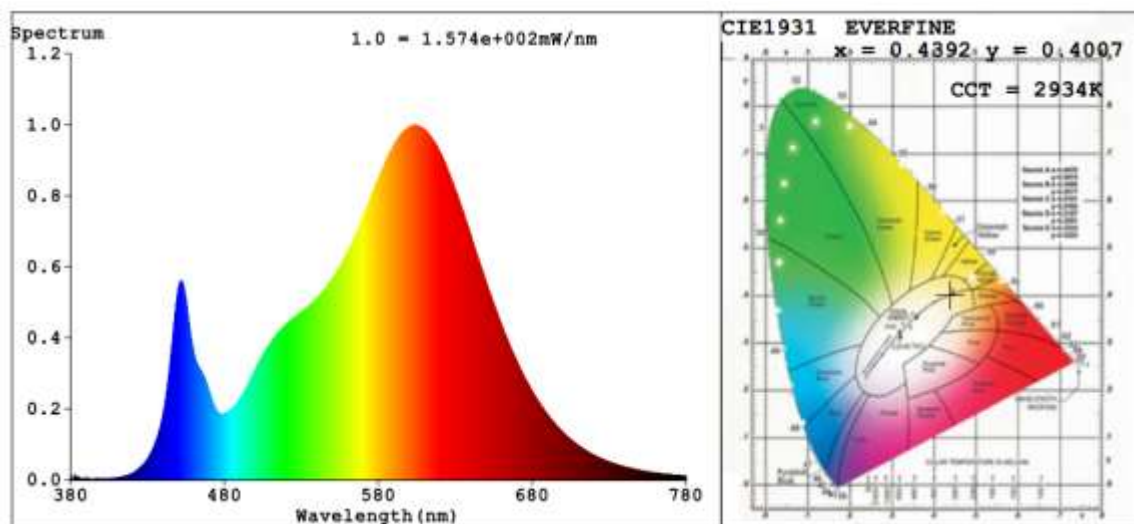
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD200839	120.0	60	0.2058	24.27	0.9826	8.12
NB-A1	277.0	60	0.0901	24.16	0.9685	7.35
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2934
Duv	-0.0016
Chromaticity (x, y)	x=0.4392 y=0.4007
Chromaticity (u', v')	u'=0.2535 v'=0.5204
Color Rendering Index (CRI)	82.5
R9	5

Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3713	3695	Bare Lamp: >= 3200(-10%)
Luminous Efficacy (lm/W)	152.99	152.94	Bare lamp: >= 120(-3%)
Most worst Luminous/Highest Watts	152.25		

Spectral Power Distribution & Chromaticity Diagram

Chromaticity Coordinate: $x=0.4392$ $y=0.4007$ / $u'=0.2535$ $v'=0.5204$ $Du, Dv: 0.0006, -0.0015$
CCT=2934K (Duv=-0.0016) Dominant WL: $\lambda_d = 583.7\text{nm}$ Purity=52.1%

Peak WL: $\lambda_p = 603.6\text{nm}$ FWHM=117.4nm

Render Index: $R_a = 82.5$ Render Index: AvgR = 77.2

R1 = 82 R2 = 92 R3 = 94 R4 = 80 R5 = 82 R6 = 91 R7 = 81

R8 = 57 R9 = 5 R10 = 83 R11 = 80 R12 = 75 R13 = 84 R14 = 98 R15 = 74

Summary

Sample No.	Test Method	Voltage (Vac)	Frequency (Hz)	Lumen Output(lm)	Lumen Efficacy(lm/w)	Power (W)
STD200839NB-A1	With Ballast	120.0	60	3823	133.44	28.65
STD200839NB-A1	Connected to line voltage	120.0	60	3713	152.99	24.27

The measured lumen efficacy of test condition “with ballast” was less than test condition “Connect to line voltage”. So the following test will be “with ballast”.

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-28	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	L96T8(aa)/430/12G-AB (1.2m), with ballast OSRAM SYLVANIA QTP 2x32T8/UNV ISN-SC		

Electrical Measurement for 2-lamp in Lithonia C 2 32 MV:

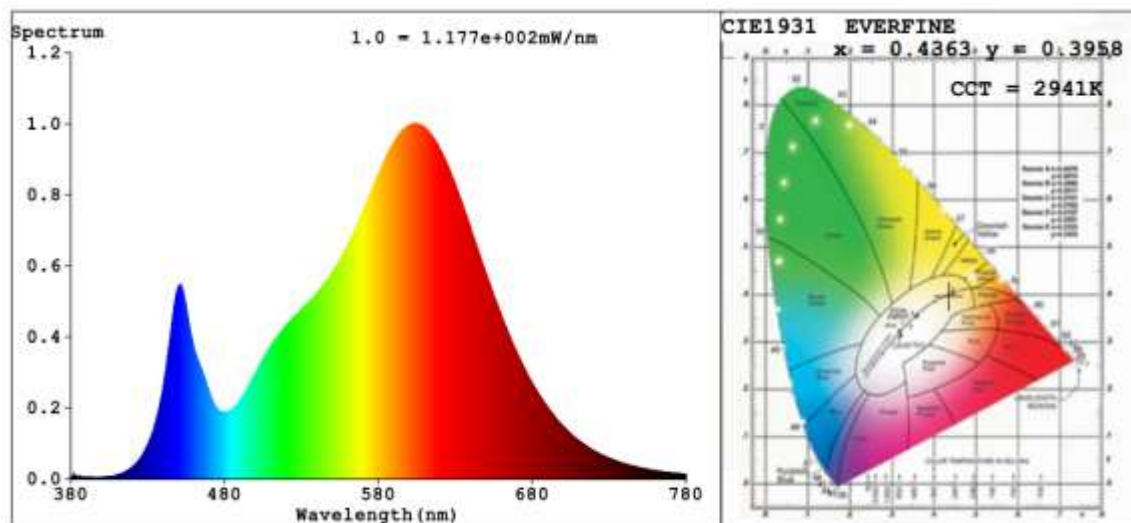
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD200839N	120.0	60	0.2473	29.15	0.9823	8.05
B-A4,A5	277.0	60	0.1063	28.56	0.9699	7.22
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement for 2-lamp in Lithonia C 2 32 MV - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2941
Duv	-0.0033
Chromaticity (x, y)	x=0.4363 y=0.3958
Chromaticity (u', v')	u'=0.2538 v'=0.5180
Color Rendering Index (CRI)	82.4
R9	7
Total Luminous (lm)	3497
Luminous Efficacy (lm/W)	119.97

Photometric Measurement 2-lamp in Lithonia C 2 32 MV – Goniophotometer Method:

Parameter	Result		DLC V5.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3566.4	3487.7	In luminaire (2 lamps): >= 3000(-10%)
Luminous Efficacy (lm/W)	122.35	122.12	In luminaire: >= 110(-3%)
Most worst Luminous/Highest Watts	119.65		
Zonal lumens in the 0-60 °zone (%)	60.5	--	>= 40(-3)

Spectral Power Distribution & Chromaticity Diagram

Chromaticity Coordinate: $x=0.4363$ $y=0.3958$ $u'=0.2538$ $v'=0.5180$ $Du, Dv: 0.0011, -0.0031$

CCT=2941K (Duv=-0.0033) Dominant WL: $L_d = 584.3\text{nm}$ Purity=49.7%

Peak WL: $L_p = 603.6\text{nm}$ FWHM=121.4nm

Render Index: $R_a = 82.4$ Render Index: AvgR =77.3

R1 =81 R2 =92 R3 =95 R4 =80 R5 =82 R6 =90 R7 =81

R8 =58 R9 =7 R10=82 R11=79 R12=75 R13=84 R14=98 R15=74

2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-28	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	L96T8(aa)/830/24G-AB with ballast ESPEN VE259MVHIP		

Electrical Measurement for 2-lamp in Lithonia C 2 96T8 MVOLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD200839N	120.0	60	0.4868	57.33	0.9815	8.19
B-A1,A2	277.0	60	0.2132	56.99	0.9652	7.85
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement for 2-lamp in Lithonia C 2 96T8 MVOLT GEB10IS - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2949
Duv	-0.0034
Chromaticity (x, y)	x=0.4355 y=0.3951
Chromaticity (u', v')	u'=0.2536 v'=0.5176
Color Rendering Index (CRI)	82.3
R9	7

Parameter	Result	
Test Voltage (V)	120.0	277.0
Total Luminous (lm)	7150	7145
Luminous Efficacy (lm/W)	124.72	125.37

Photometric Measurement 2-lamp in Lithonia C 2 96T8 MVOLT GEB10IS – Goniophotometer Method:

Parameter	Result		DLC V5.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	7292**	7286**	In luminaire (2 lamps): ≥ 6000(-10%)
Luminous Efficacy (lm/W)	127.19	127.85	In luminaire: ≥ 110(-3%)
Beam Angle (°)	131.1	--	--
Center Beam Candle Power (cd)	1763	--	--

**The calculation method is on page 15.

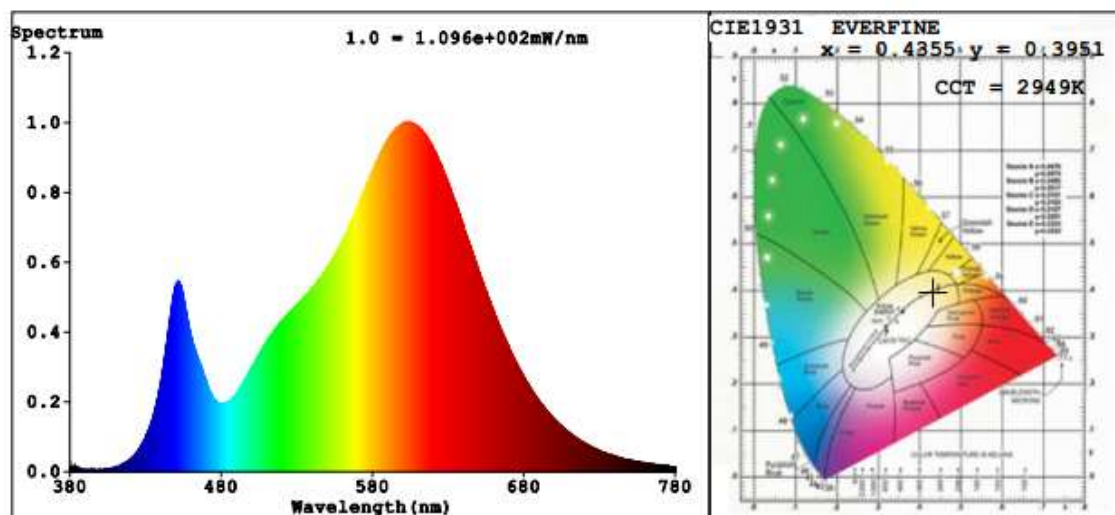
Laboratory: Standard-Tech Co., Ltd Testing Center

Report Format Number STD-QP019-409-B/0

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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Spectral Power Distribution & Chromaticity Diagram



Chromaticity Coordinate: x=0.4355 y=0.3951/u'=0.2536 v'=0.5176 Du, Dv: 0.0012, -0.0032
CCT=2949K (Duv=-0.0034) Dominant WL: Ld = 584.3nm Purity=49.3%

Peak WL: Lp=602.7nm FWHM=121.2nm

Render Index: Ra=82.3 Render Index: AvgR = 77.2

R1 =81 R2 =92 R3 =95 R4 =80 R5 =82 R6 =90 R7 =81
R8 =58 R9 =7 R10=82 R11=79 R12=75 R13=84 R14=98 R15=74

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,401.0	19.2%
0-40	2,338.4	32.1%
0-60	4,410.6	60.5%
60-90	2,139.0	29.3%
70-100	1,454.8	20%
90-120	610.9	8.4%
0-90	6,549.7	89.8%
90-180	741.7	10.2%
0-180	7,291.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	167.3	2.3%	90-100	265.4	3.6%
10-20	484.3	6.6%	100-110	205.3	2.8%
20-30	749.4	10.3%	110-120	140.2	1.9%
30-40	937.4	12.9%	120-130	80.6	1.1%
40-50	1,035.0	14.2%	130-140	36.2	0.5%
50-60	1,037.2	14.2%	140-150	9.3	0.1%
60-70	949.6	13.0%	150-160	2.4	0%
70-80	748.0	10.3%	160-170	1.6	0%
80-90	441.5	6.1%	170-180	0.6	0%

Photometric Data

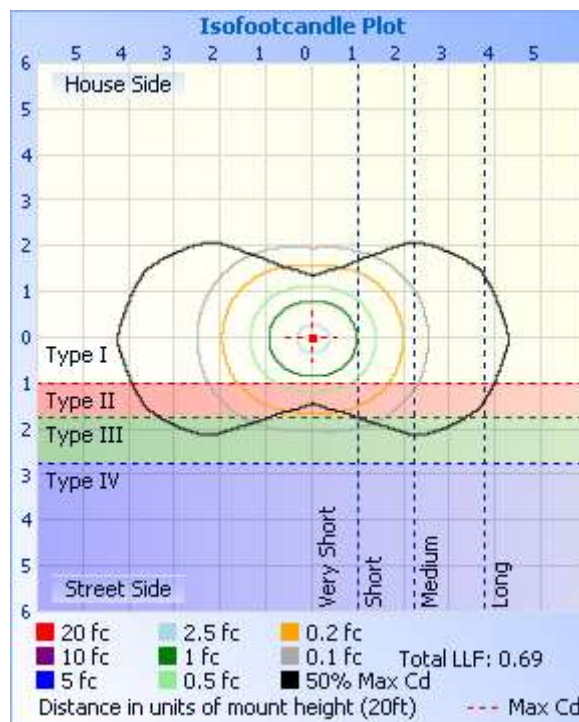
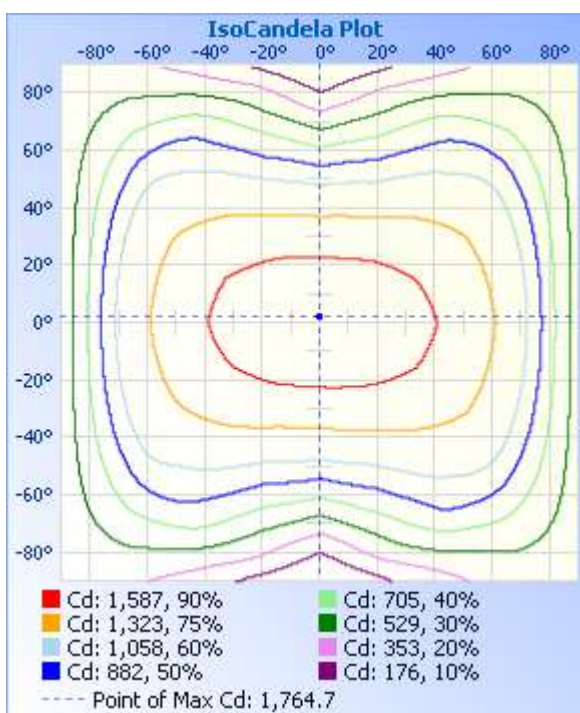
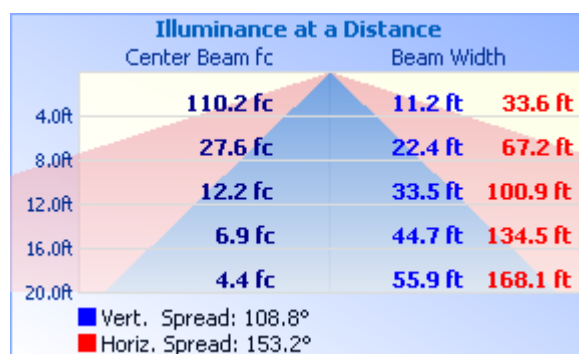
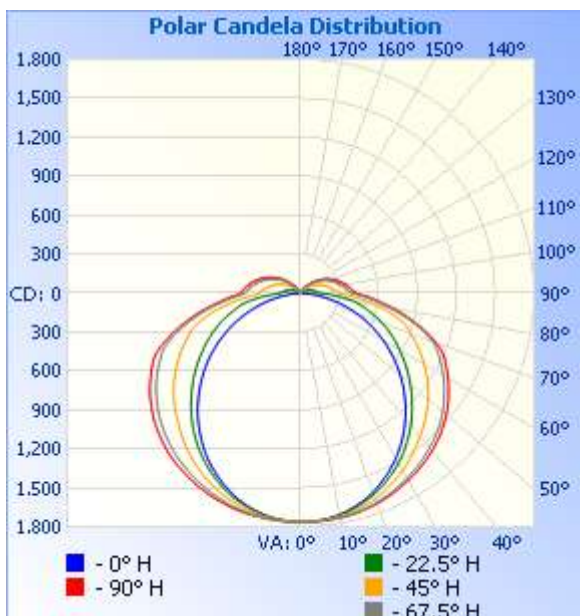


Table--1

UNIT: cd

C (DEG) Y (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	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	1763	
5	1760	1762	1760	1755	1757	1756	1760	1762	1760	1759	1754	1754	1753	1752	1756	1761	
10	1752	1753	1745	1733	1732	1735	1746	1754	1756	1749	1740	1727	1724	1729	1741	1749	
15	1745	1739	1721	1694	1690	1699	1720	1740	1743	1731	1710	1685	1680	1688	1711	1734	
20	1724	1713	1683	1640	1631	1650	1684	1715	1723	1703	1668	1630	1615	1635	1673	1709	
25	1702	1680	1632	1573	1555	1584	1633	1683	1696	1667	1616	1557	1538	1567	1624	1678	
30	1669	1641	1573	1491	1468	1509	1574	1643	1662	1623	1552	1474	1449	1488	1567	1641	
35	1636	1597	1505	1402	1368	1420	1506	1599	1624	1578	1485	1383	1346	1398	1501	1598	
40	1594	1547	1432	1305	1257	1323	1435	1550	1579	1523	1411	1282	1233	1301	1427	1550	
45	1541	1489	1353	1200	1137	1215	1360	1494	1528	1468	1328	1176	1113	1195	1351	1494	
50	1483	1424	1272	1089	1010	1106	1282	1429	1465	1396	1244	1062	985	1087	1275	1432	
55	1416	1351	1185	975	879	995	1196	1353	1393	1322	1156	945	854	979	1191	1360	
60	1338	1269	1092	858	743	884	1101	1271	1313	1238	1063	833	717	869	1101	1280	
65	1257	1183	994	748	603	777	1003	1183	1230	1151	964	723	577	763	1006	1194	
70	1125	1075	893	641	460	668	904	1078	1109	1052	865	616	436	655	911	1079	
75	951	911	784	526	321	553	795	911	933	889	758	504	299	543	784	910	
80	768	732	621	418	188	448	626	721	751	708	594	399	168	439	615	731	
85	597	560	450	286	74.3	301	448	545	578	536	424	264	60.1	285	442	558	
90	466	427	310	147	8.20	154	297	398	429	388	279	132	5.54	161	318	432	
95	433	391	279	121	2.91	124	260	356	388	351	250	108	2.30	134	288	397	
100	399	360	251	97.5	2.73	103	234	326	358	322	224	87.7	2.66	110	259	366	
105	366	327	221	73.8	3.15	82.5	207	296	324	292	197	67.7	3.44	86.1	228	331	
110	327	289	188	51.2	3.43	62.5	178	263	291	258	169	49.7	4.00	62.2	195	294	
115	284	250	154	29.4	3.63	43.4	150	230	255	225	141	31.6	4.44	38.8	161	253	
120	240	207	120	9.62	3.87	25.1	121	194	217	190	113	15.4	4.56	17.2	128	212	
125	196	166	87.6	5.69	3.92	11.6	93.8	158	180	155	86.5	6.54	4.67	4.63	94.2	170	
130	153	126	56.3	5.60	3.89	6.10	66.4	123	142	121	60.1	5.12	4.55	4.84	62.1	130	
135	110	85.8	26.3	5.59	3.94	5.36	40.3	90.1	107	88.1	35.3	5.22	4.41	5.07	31.6	89.2	
140	69.4	49.5	5.82	5.57	3.99	5.21	18.0	57.8	73.0	57.3	15.6	5.39	4.37	5.34	5.09	51.0	
145	31.4	14.8	5.24	5.61	4.03	5.28	7.35	27.5	40.2	29.1	6.43	5.42	4.49	5.57	4.36	14.9	
150	4.04	4.24	5.19	5.67	4.21	5.34	5.23	9.81	14.0	10.9	4.77	5.39	5.05	5.63	4.71	4.53	
155	3.92	4.30	5.13	5.74	4.45	5.41	5.07	5.59	5.53	4.30	4.92	5.55	5.34	5.70	5.24	4.40	
160	3.89	4.67	5.86	6.19	4.90	5.83	5.48	4.68	3.82	4.24	5.07	5.76	5.54	5.81	5.56	4.61	
165	4.46	5.67	6.60	6.89	5.68	6.60	5.91	5.25	4.74	5.02	5.55	6.68	6.94	5.83	7.03	5.88	
170	4.81	5.94	7.10	7.54	6.03	7.37	6.51	5.67	5.31	5.30	6.25	7.20	7.71	3.92	7.80	6.59	
175	5.52	6.15	7.29	7.75	6.44	7.72	6.63	5.86	5.57	5.51	6.33	7.28	7.81	6.46	7.86	6.88	
180	5.59	6.15	7.38	7.79	6.52	7.65	6.68	5.89	5.59	5.58	6.11	7.31	7.85	6.53	7.66	6.81	

2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2020-08-28	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	L96T8(aa)/850/24G-AB with ballast ESPEN VE259MVHIP		

Electrical Measurement for Bare-lamp:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD200839	120.0	60	0.2415	28.49	0.9832	9.12
NB-A3	277.0	60	0.1062	28.32	0.9631	8.35
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

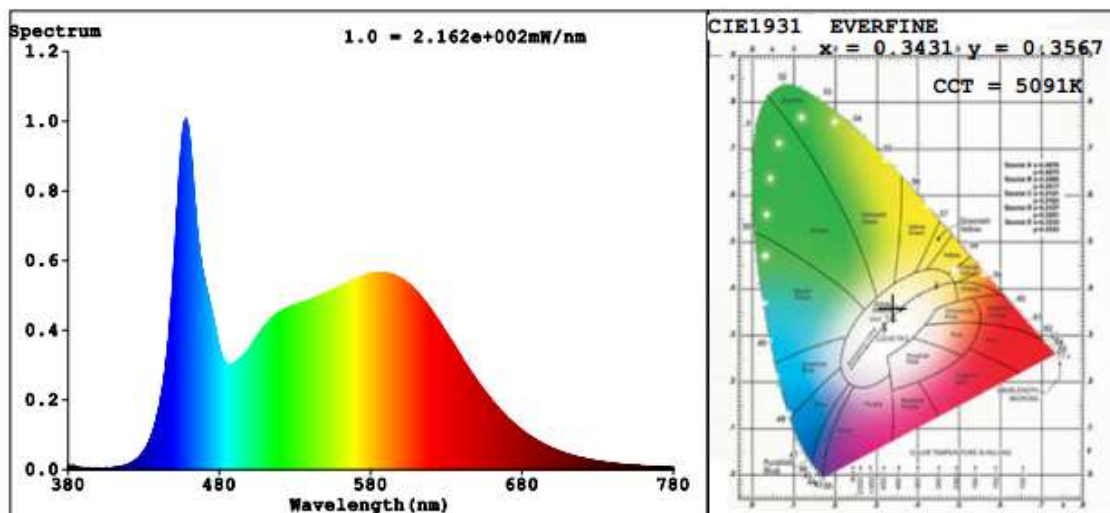
Chromaticity Measurement for Bare-lamp - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5091
Duv	0.0034
Chromaticity (x, y)	x=0.3431 y=0.3567
Chromaticity (u', v')	u'=0.2081 v'=0.4868
Color Rendering Index (CRI)	84.5
R9	13

Photometric Measurement for Bare-lamp –Sphere-Spectroradiometer Method:

Photometric Measurement for Bare Lamp Sphere Speed of Radiometer Method:			
Parameter	Result		DLC V5.0 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	3832	3825	Bare Lamp: >= 3200(-10%)
Luminous Efficacy (lm/W)	134.50	135.06	Bare lamp: >= 110(-3%)
Most worst Luminous/Highest Watts	134.26		

Spectral Power Distribution & Chromaticity Diagram



Chromaticity Coordinate: x=0.3431 y=0.3567/u'=0.2081 v'=-0.4868 Du,Dv:-0.0024,0.0023

CCT=5091K(Duv=0.0034) Dominant WL:Ld =568.2nm Purity=10.0%

Peak WL:Lp=457.8nm FWHM=23.6nm

Render Index:Ra=84.5 Render Index:AvgR =78.8

R1 =84 R2 =95 R3 =94 R4 =80 R5 =84 R6 =90 R7 =84

R8 =66 R9 =13 R10=86 R11=80 R12=63 R13=88 R14=97 R15=78

2.4 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
L96T8(aa)/830/24G-AB	3000K	3823	28.65	133.44
L96T8(aa)/835/24G-AB	3500K	3825 ^{*1}	28.57 ^{*2}	133.88 ^{*3}
L96T8(aa)/840/24G-AB	4000K	3828 ^{*1}	28.57 ^{*2}	133.99 ^{*3}
L96T8(aa)/841/24G-AB	4100K	3828 ^{*1}	28.57 ^{*2}	133.99 ^{*3}
L96T8(aa)/845/24G-AB	4500K	3830 ^{*1}	28.57 ^{*2}	134.06 ^{*3}
L96T8(aa)/850/24G-AB	5000K	3832	28.49	134.50

*1: This value is calculated and the calculation formula is as below:

$$3825 = (3832 - 3823) / 4 * 1 + 3823$$

$$3828 = (3832 - 3823) / 4 * 2 + 3823$$

$$3830 = (3832 - 3823) / 4 * 3 + 3823$$

*2: This value is calculated and the calculation formula is as below:

$$28.57 = (28.65 + 28.49) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$133.88 = 3825 / 28.57$$

$$133.99 = 3828 / 28.57$$

$$134.06 = 3830 / 28.57$$

Summary

Model	L96T8(aa)/430/12G-AB (1.2m)	L96T8(aa)/830/24G-AB
Overall Appearance	Picture 1	
Cross Section	Picture 2	
LED Spacing (mm)	9.62	9.62
Materials	Glass	Glass
Calculation Method	Please refer to below "Calculation method"	
LED Working Current (mA)	48	48

Picture 1



Picture 2



Calculation method

Model number	L96T8(aa)/430/12G-AB (1.2m)	L96T8(aa)/830/24G-AB	
Strip fixture model	Lithonia C 2 32 MV	Lithonia C 2 96T8 MVOLT GEB10IS	
Test Voltage (V)	120	120	277
Frequency (Hz)	60	60	60
Total Luminous of integrating sphere (lm)	3497	7150	7145
Total Luminous of goniophotometer (lm)	3566.4	7292**	7286**

Laboratory: Standard-Tech Co., Ltd Testing Center

Report Format Number STD-QP019-409-B/0

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Scale factor= $\frac{\text{goniophotometer (lm)}}{\text{integrating sphere (lm)}}$	1.0198	--
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** This value is calculated and the calculation formula is as below:

$$7292=7150*1.0198$$

$$7286=7145*1.0198$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-423	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-418	3 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-327	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
ST-R-332	Standard Lamp	2020-07-08	2021-07-07
ST-R-333	Power Meter for Integrating Sphere	2020-06-26	2021-06-26
ST-R-405	Temperature Probe for Integrating Sphere	2020-01-23	2021-01-22
ST-R-355	Goniophotometer system	Verified by D908S standard lamp	
ST-R-359	Standard Lamp	2020-07-08	2021-07-07
ST-R-358	Power Meter for Goniophotometer	2020-06-26	2021-06-25
ST-R-354	hygrothermograph for Goniophotometer	2020-06-27	2021-06-26
Expand Uncertainty: Photometric Measurement (Sphere):3.06%, k=2 Chromaticity Measurement(Sphere):43.46K, k=2 Photometric Measurement(Goniophotometer):3.38%, k=2			

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