

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN, LLC**(Brand Name: Light Efficient Design)**

188 S.Northwest Highway, Cary, IL60013, USA

LED SOX Lamp Retrofit

Model name(s): LED-8101-22K

Representative (Tested) Model: LED-8101-22K

Model Different: N/A.

Test & Report By:

Only Zhang

Engineer: Only Zhang

Date: Aug.03,2018

Review By:

John Li

Manager: John Li

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

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

Laboratory: Standard-Tech Co., Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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

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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	Light Efficient Design	
Model Number	LED-8101-22K	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED SOX Lamp Retrofit	
Rated Voltage / Frequency	100-277Vac, 50/60Hz	
Nominal Power	35W	
Rated Initial Lamp Lumen	--	
Declared CCT	2200K	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-B1(2200K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


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1.2 Test Specifications:

Date of Receipt	Aug.01,2018
Date of Test	Aug.03,2018
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-79-2008 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 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

1.3 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 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2018-08-03	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8101-22K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.2973	35.24	0.9879	7.15
B1	277.0	60	0.1395	34.92	0.9040	15.15

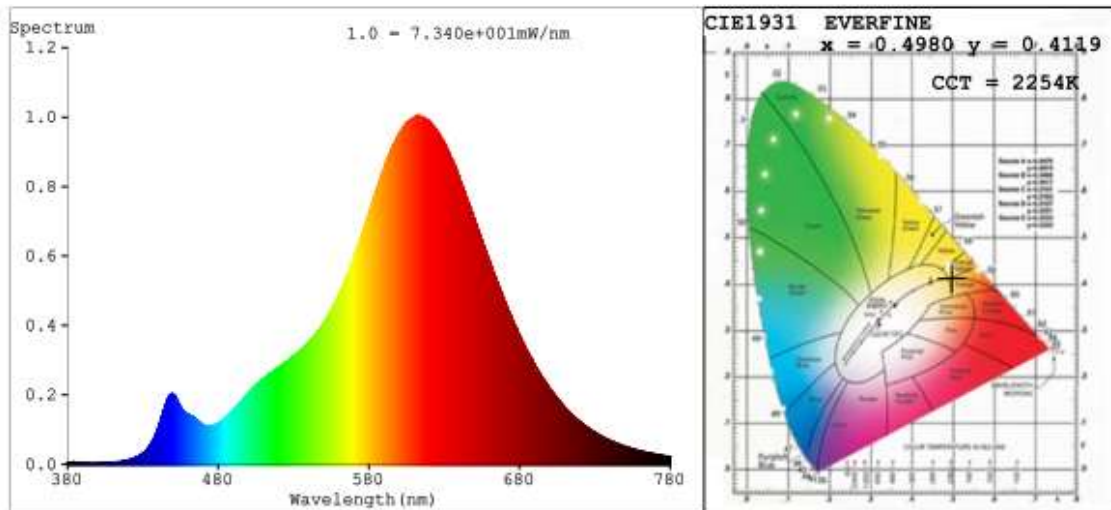
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	11
Frequency (Hz)	60	R2	94	R10	88
CCT (K)	2254	R3	91	R11	81
Duv	-0.0011	R4	80	R12	88
Chromaticity (x, y)	x=0.4980 y=0.4119	R5	93	R13	85
Chromaticity (u', v')	u'=0.2867 v'=0.5336	R6	96	R14	96
Color Rendering Index (CRI)	82.3	R7	79	R15	73
R9	11	R8	55	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	3232.1	3223.1
Luminous Efficacy (lm/W)	91.72	92.30
Most Worst Luminous/Highest Watts	91.46	
Beam Angle (°)	115.8	--
Center Beam Candle Power (cd)	1098	--

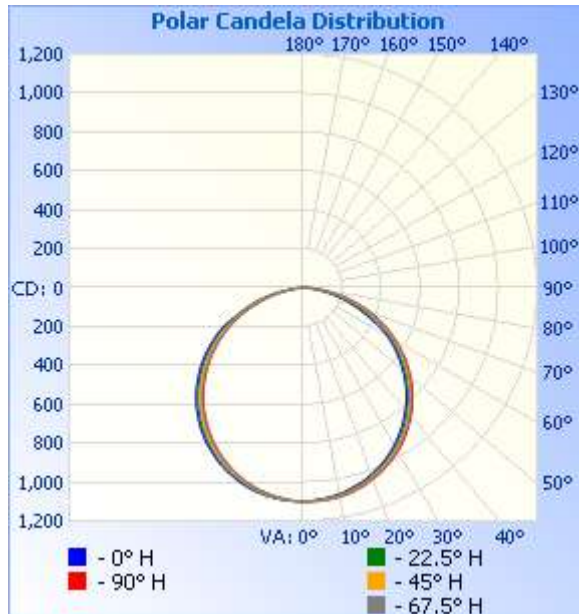
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	860.3	26.6%
0-40	1,417.6	43.9%
0-60	2,540.3	78.6%
60-90	689.9	21.3%
70-100	280.7	8.7%
90-120	1.4	0%
0-90	3,230.1	99.9%
90-180	1.7	0.1%
0-180	3,231.8	100%

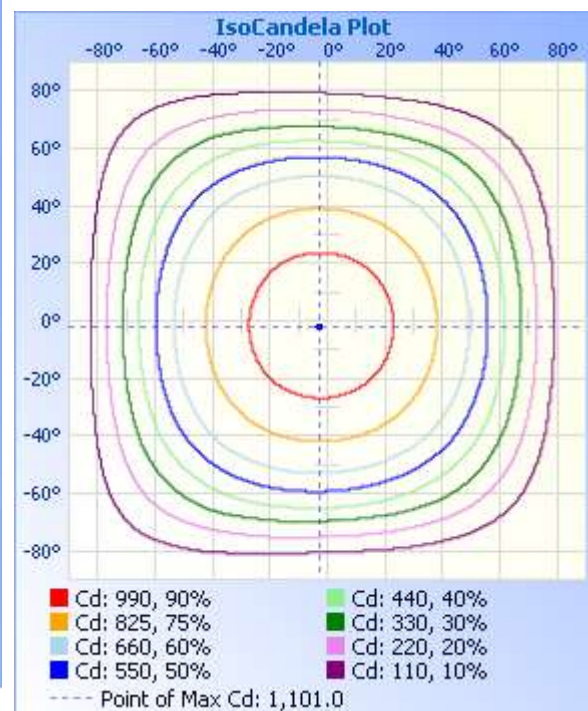
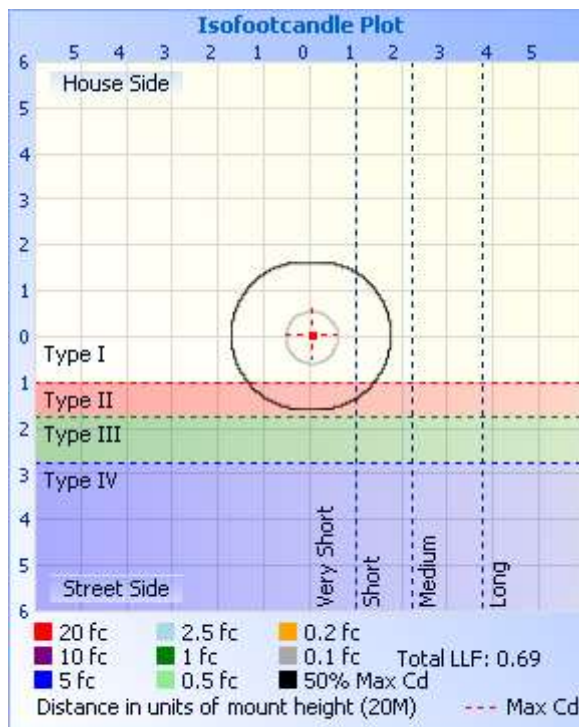
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	104.0	3.2%	90-100	1.2	0%
10-20	299.2	9.3%	100-110	0.1	0%
20-30	457.1	14.1%	110-120	0.1	0%
30-40	557.2	17.2%	120-130	0.1	0%
40-50	585.9	18.1%	130-140	0.1	0%
50-60	536.8	16.6%	140-150	0.0	0%
60-70	410.4	12.7%	150-160	0.0	0%
70-80	226.2	7.0%	160-170	0.0	0%
80-90	53.3	1.7%	170-180	0.0	0%

Photometric Data


Illuminance at a Distance

Center Beam fc	Beam Width		
3.33M	9.18 fc	10.72 M	10.58 M
6.67M	2.30 fc	21.43 M	21.14 M
10.00M	1.02 fc	32.15 M	31.72 M
13.33M	0.57 fc	42.87 M	42.28 M
16.67M	0.37 fc	53.59 M	52.86 M
20.00M	0.26 fc	64.31 M	63.44 M

■ Vert. Spread: 116.2°
 ■ Horiz. Spread: 115.5°



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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	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	1098	
5	1089	1089	1090	1090	1092	1094	1095	1097	1099	1099	1099	1097	1095	1095	1093	1091	
10	1072	1070	1072	1073	1077	1080	1085	1087	1091	1092	1091	1088	1086	1082	1078	1075	
15	1046	1045	1047	1048	1053	1059	1065	1068	1073	1074	1075	1070	1066	1060	1055	1049	
20	1012	1010	1012	1015	1023	1030	1037	1041	1047	1050	1050	1043	1038	1030	1023	1016	
25	969	966	970	974	982	991	1000	1007	1014	1015	1014	1009	1002	993	983	974	
30	918	917	919	926	935	946	955	963	970	974	973	966	957	946	935	924	
35	861	859	862	869	880	891	903	911	920	922	921	914	904	892	879	867	
40	794	792	797	805	817	831	843	851	860	864	864	855	844	830	815	802	
45	722	722	725	734	748	762	775	786	793	798	797	788	776	760	744	731	
50	644	639	647	658	671	687	702	712	721	725	723	714	700	683	667	652	
55	556	558	563	574	589	605	621	631	641	644	642	633	618	600	582	567	
60	467	462	471	484	501	518	533	544	554	557	556	545	529	510	491	476	
65	369	370	378	376	387	424	441	452	461	465	463	451	431	415	395	379	
70	273	272	269	275	292	311	344	357	364	367	364	337	315	302	295	280	
75	170	169	173	183	199	217	238	254	264	268	256	238	212	203	192	182	
80	84.2	85.9	85.7	90.5	103	121	143	160	165	168	158	136	110	105	99.1	90.3	
85	19.1	19.0	20.7	23.7	28.8	45.2	61.6	72.0	75.8	78.8	69.8	52.4	18.0	32.4	29.7	24.6	
90	0.68	0.95	1.41	2.46	0.58	5.63	8.94	13.0	16.7	18.0	14.2	5.77	0.02	1.02	1.14	0.90	
95	0.07	0.24	0.63	0.87	0.03	1.35	1.04	0.90	0.76	0.81	0.70	0.54	0.02	0.45	0.31	0.14	
100	0.06	0.19	0.37	0.28	0.03	0.50	0.47	0.20	0.07	0.14	0.26	0.19	0.02	0.21	0.21	0.11	
105	0.06	0.15	0.22	0.14	0.03	0.20	0.28	0.16	0.06	0.10	0.16	0.09	0.02	0.11	0.14	0.09	
110	0.06	0.13	0.16	0.09	0.04	0.11	0.18	0.13	0.06	0.08	0.10	0.06	0.03	0.07	0.10	0.07	
115	0.06	0.11	0.13	0.09	0.05	0.08	0.13	0.12	0.06	0.07	0.08	0.05	0.04	0.05	0.08	0.07	
120	0.06	0.10	0.11	0.09	0.05	0.07	0.11	0.10	0.06	0.06	0.07	0.05	0.04	0.05	0.07	0.06	
125	0.06	0.09	0.10	0.09	0.05	0.07	0.10	0.09	0.06	0.06	0.06	0.05	0.05	0.05	0.06	0.06	
130	0.06	0.09	0.10	0.08	0.05	0.07	0.09	0.09	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	
135	0.06	0.09	0.10	0.08	0.06	0.07	0.09	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	
140	0.06	0.08	0.10	0.07	0.06	0.08	0.09	0.08	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.06	
145	0.06	0.08	0.09	0.07	0.07	0.08	0.09	0.07	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	
150	0.06	0.08	0.09	0.07	0.07	0.07	0.09	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
155	0.06	0.08	0.10	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
160	0.06	0.07	0.08	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
165	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
170	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
175	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	
180	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2018-07-02	2019-07-01
ST-R-327	Spectral analysis system HAAS-2000	2018-07-02	2019-07-01
ST-R-332	Standard Lamp	2018-07-04	2019-07-03
ST-R-333	Power Meter for Integrating Sphere	2018-06-28	2019-06-27
ST-R-355	Goniophotometer system	2018-07-01	2019-06-30
ST-R-359	Standard Lamp	2018-07-04	2019-07-03
ST-R-358	Power Meter for Goniophotometer	2018-06-28	2019-06-27
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

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