

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-8100-22K

Representative (Tested) Model: LED-8100-22K

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-8100-22K	
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	20W	
Rated Initial Lamp Lumen	--	
Declared CCT	2200K,	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-A1(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-8100-22K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.1853	22.06	0.9920	13.32
A1	277.0	60	0.0849	22.15	0.9420	19.20

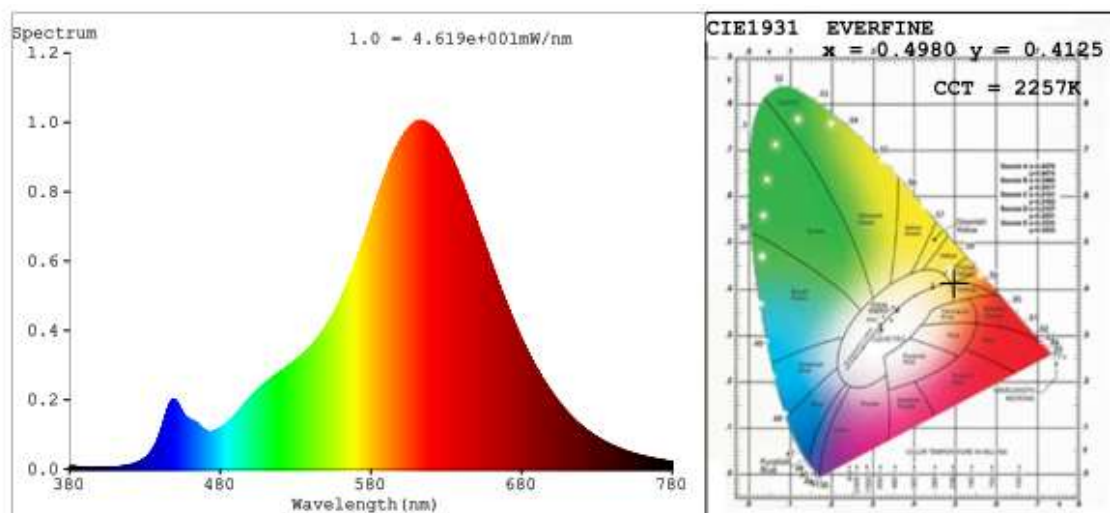
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	12
Frequency (Hz)	60	R2	94	R10	88
CCT (K)	2257	R3	92	R11	81
Duv	-0.0009	R4	80	R12	88
Chromaticity (x, y)	x=0.4980 y=0.4125	R5	83	R13	85
Chromaticity (u', v')	u'=0.2865 v'=0.5339	R6	95	R14	96
Color Rendering Index (CRI)	82.4	R7	79	R15	73
R9	12	R8	56	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	2030.9	2030.1
Luminous Efficacy (lm/W)	92.06	91.65
Most Worst Luminous/Highest Watts	91.65	
Beam Angle (°)	115.8	--
Center Beam Candle Power (cd)	694	--

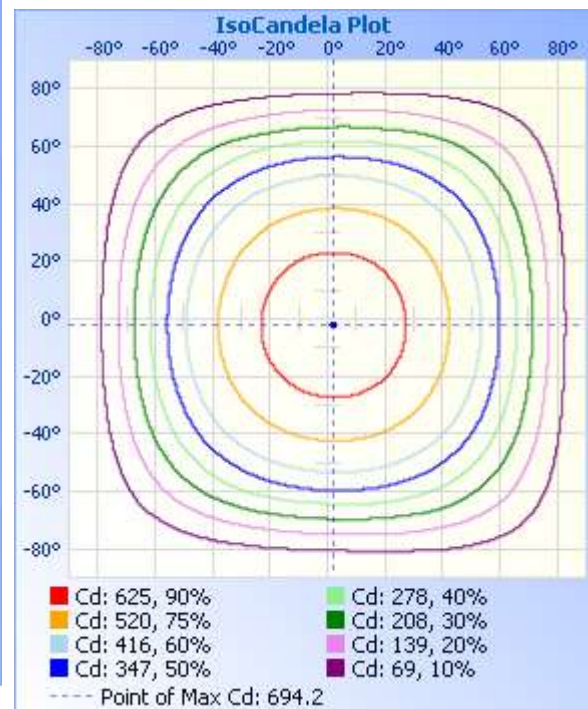
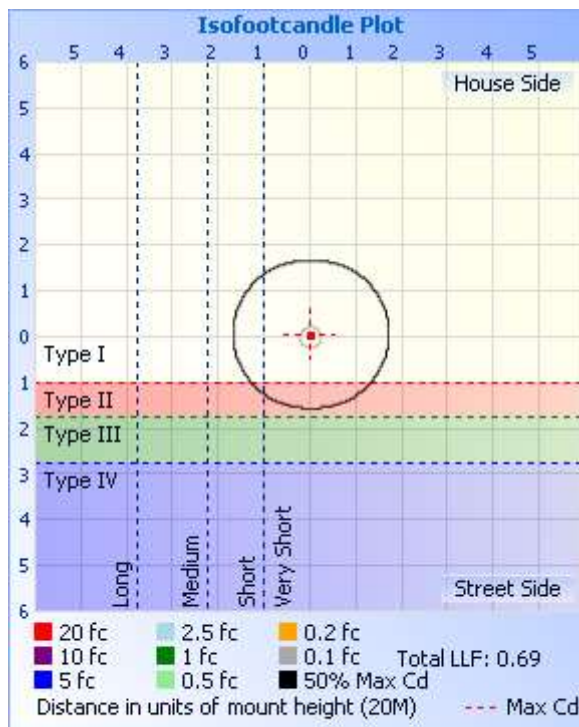
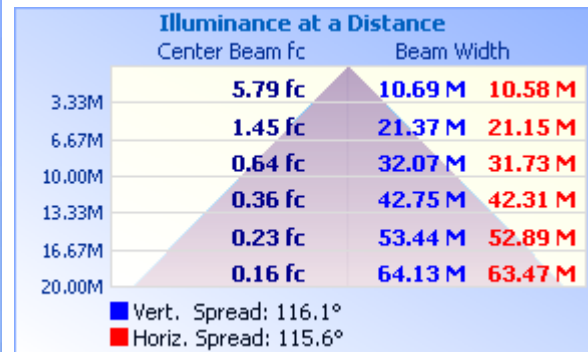
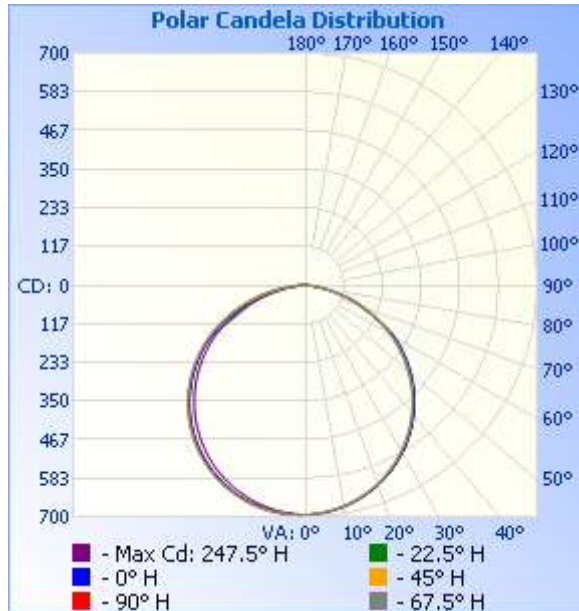
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	542.8	26.7%
0-40	894.2	44%
0-60	1,601.9	78.9%
60-90	427.8	21.1%
70-100	172.2	8.5%
90-120	0.9	0%
0-90	2,029.7	100%
90-180	1.0	0%
0-180	2,030.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	65.7	3.2%	90-100	0.7	0%
10-20	188.8	9.3%	100-110	0.1	0%
20-30	288.3	14.2%	110-120	0.1	0%
30-40	351.4	17.3%	120-130	0.0	0%
40-50	369.3	18.2%	130-140	0.0	0%
50-60	338.3	16.7%	140-150	0.0	0%
60-70	256.3	12.6%	150-160	0.0	0%
70-80	139.6	6.9%	160-170	0.0	0%
80-90	31.9	1.6%	170-180	0.0	0%

Photometric Data


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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	693	693	693	693	693	693	693	693	693	693	693	693	693	693	693	693	
5	693	691	690	689	688	688	688	688	689	689	690	692	692	693	694	693	
10	686	684	682	680	679	677	676	677	678	680	682	685	686	687	688	688	
15	674	671	668	665	663	661	660	660	663	665	668	672	675	676	677	677	
20	657	653	649	646	642	639	639	639	642	645	649	654	657	660	661	660	
25	635	630	625	621	617	613	612	612	615	619	625	630	634	638	639	638	
30	607	602	596	591	586	582	580	580	584	589	595	601	607	610	612	611	
35	575	569	563	556	550	546	544	545	548	553	560	568	574	578	580	579	
40	537	531	524	517	511	506	503	503	507	513	521	529	536	541	542	541	
45	495	488	481	473	466	461	457	458	462	468	476	485	493	498	500	500	
50	448	441	433	426	418	412	408	407	412	419	428	438	446	451	454	453	
55	397	390	382	374	366	359	355	354	359	366	375	385	394	400	403	402	
60	342	334	327	319	311	304	298	296	301	308	318	329	338	345	348	347	
65	284	277	269	247	233	233	239	236	240	248	258	254	257	279	289	288	
70	222	215	204	184	176	168	174	174	178	185	189	192	199	210	227	227	
75	159	153	137	127	111	111	109	112	116	123	126	123	128	148	157	164	
80	97.8	91.4	79.7	65.8	55.2	52.8	53.5	56.3	58.3	63.9	66.3	66.6	68.1	83.3	96.8	102	
85	42.9	38.0	29.7	20.7	13.6	14.3	13.3	13.8	15.8	19.0	22.1	22.2	13.2	32.7	41.5	45.9	
90	7.94	5.85	4.46	2.52	0.15	2.14	1.17	0.79	0.45	0.92	1.00	0.94	0.01	3.88	6.72	7.77	
95	0.41	0.53	0.68	0.94	0.02	0.95	0.54	0.18	0.04	0.13	0.28	0.38	0.01	0.44	0.47	0.45	
100	0.04	0.19	0.39	0.22	0.02	0.32	0.33	0.14	0.04	0.10	0.18	0.13	0.01	0.20	0.20	0.09	
105	0.04	0.14	0.19	0.09	0.02	0.13	0.19	0.10	0.04	0.08	0.11	0.07	0.01	0.10	0.13	0.07	
110	0.04	0.10	0.11	0.05	0.02	0.06	0.12	0.08	0.04	0.06	0.08	0.04	0.02	0.06	0.08	0.05	
115	0.04	0.08	0.08	0.04	0.03	0.04	0.09	0.07	0.04	0.05	0.05	0.03	0.02	0.04	0.06	0.05	
120	0.04	0.06	0.07	0.04	0.03	0.04	0.06	0.06	0.04	0.04	0.04	0.03	0.03	0.03	0.05	0.04	
125	0.04	0.06	0.06	0.04	0.03	0.04	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.04	
130	0.04	0.05	0.05	0.04	0.03	0.04	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.04	
135	0.04	0.05	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
140	0.04	0.04	0.05	0.04	0.04	0.04	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
145	0.04	0.04	0.05	0.04	0.04	0.04	0.06	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
150	0.04	0.04	0.06	0.04	0.04	0.05	0.06	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	
155	0.04	0.04	0.06	0.05	0.04	0.06	0.05	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.04	0.04	
160	0.04	0.04	0.05	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	
165	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
170	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
175	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	
180	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	

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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 *******