

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-8102-40K

Representative (Tested) Model: LED-8102-40K

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-8102-40K	
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	60W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-G1(4000K)	
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-8102-40K		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.5104	57.22	0.9342	9.80
B1	277.0	60	0.2222	55.81	0.9066	18.00

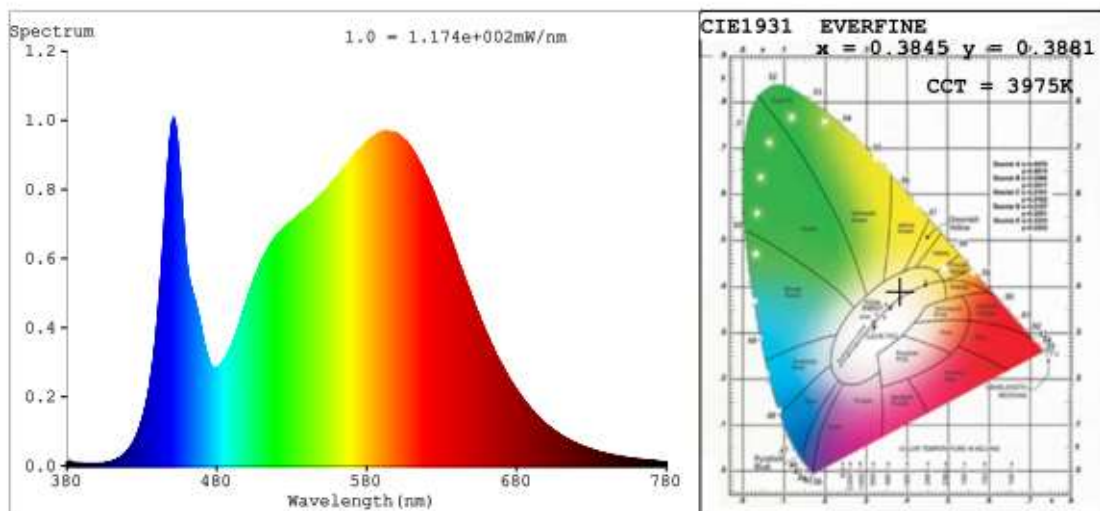
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	88	R10	73
CCT (K)	3975	R3	95	R11	80
Duv	0.0041	R4	81	R12	60
Chromaticity (x, y)	x=0.384 y=0.3881	R5	80	R13	82
Chromaticity (u', v')	u'=0.2233 v'=0.507	R6	84	R14	98
Color Rendering Index (CRI)	82.5	R7	87	R15	73
R9	4	R8	63	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	8198.7	8087.2
Luminous Efficacy (lm/W)	143.28	144.9
Most Worst Luminous/Highest Watts	141.34	
Beam Angle (°)	117.5	--
Center Beam Candle Power (cd)	2729	--

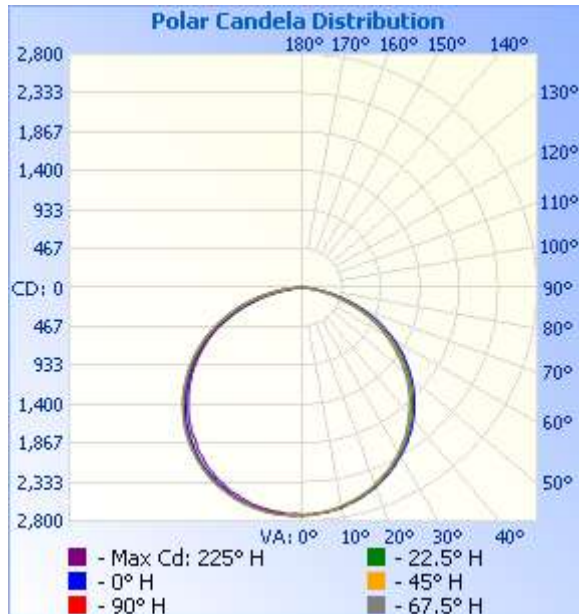
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	2,150.6	26.2%
0-40	3,555.0	43.4%
0-60	6,406.5	78.1%
60-90	1,759.5	21.5%
70-100	714.5	8.7%
90-120	10.8	0.1%
0-90	8,165.9	99.6%
90-180	31.9	0.4%
0-180	8,197.9	100%

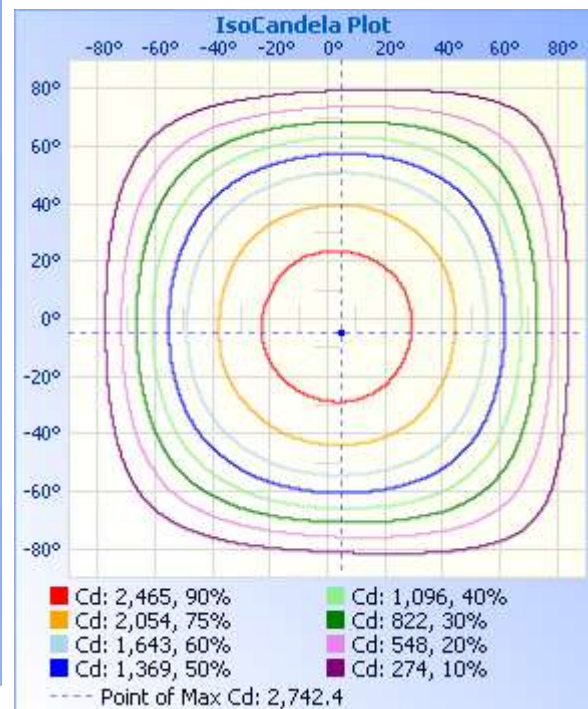
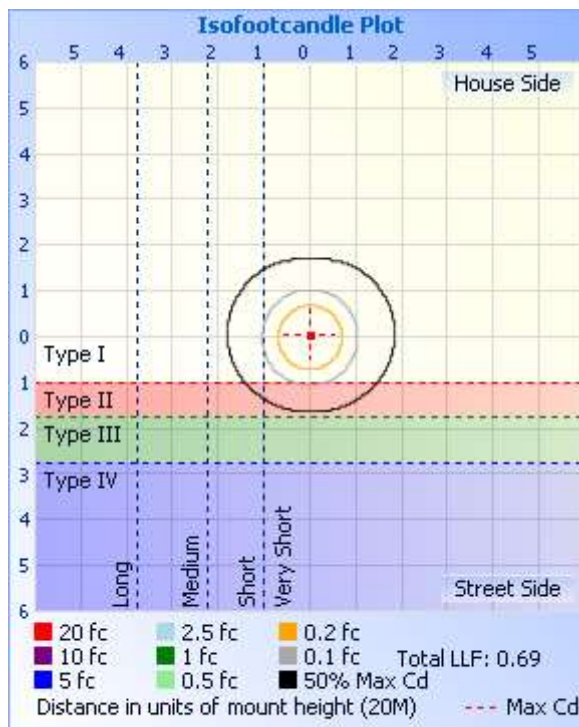
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	258.8	3.2%	90-100	4.1	0%
10-20	746.4	9.1%	100-110	2.8	0%
20-30	1,145.5	14.0%	110-120	4.0	0%
30-40	1,404.4	17.1%	120-130	4.7	0.1%
40-50	1,485.4	18.1%	130-140	4.7	0.1%
50-60	1,366.0	16.7%	140-150	4.3	0.1%
60-70	1,049.0	12.8%	150-160	3.6	0%
70-80	575.8	7.0%	160-170	2.6	0%
80-90	134.7	1.6%	170-180	1.0	0%

Photometric Data


Illuminance at a Distance

Center Beam fc	Beam Width	Beam Width	Beam Width
3.33M	22.8 fc	11.10 M	10.86 M
6.67M	5.71 fc	22.19 M	21.72 M
10.00M	2.53 fc	33.29 M	32.58 M
13.33M	1.43 fc	44.37 M	43.44 M
16.67M	0.91 fc	55.47 M	54.30 M
20.00M	0.63 fc	66.57 M	65.17 M

Vert. Spread: 118.0°
Horiz. Spread: 116.9°



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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	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	2729	
5	2731	2728	2718	2717	2711	2708	2710	2705	2710	2712	2728	2728	2728	2738	2733	2740	
10	2714	2689	2688	2677	2674	2660	2663	2663	2679	2683	2685	2704	2711	2722	2718	2716	
15	2678	2669	2642	2631	2615	2620	2597	2598	2608	2630	2624	2657	2671	2692	2685	2681	
20	2616	2605	2583	2545	2545	2535	2514	2516	2526	2543	2561	2591	2601	2632	2633	2620	
25	2538	2526	2492	2465	2449	2420	2425	2409	2423	2450	2469	2505	2514	2556	2558	2553	
30	2447	2424	2385	2360	2332	2312	2294	2279	2299	2332	2360	2398	2427	2453	2459	2444	
35	2320	2302	2242	2233	2197	2173	2153	2150	2157	2185	2223	2267	2303	2331	2338	2339	
40	2184	2159	2111	2078	2051	2013	1989	1978	1997	2040	2066	2119	2160	2197	2201	2195	
45	2024	2006	1943	1922	1880	1843	1815	1797	1822	1850	1891	1949	1992	2029	2038	2033	
50	1843	1823	1767	1731	1692	1645	1619	1595	1618	1658	1694	1762	1804	1839	1855	1857	
55	1641	1623	1566	1533	1486	1435	1402	1376	1396	1440	1479	1546	1603	1631	1659	1658	
60	1434	1407	1350	1312	1267	1207	1177	1147	1165	1204	1246	1317	1373	1409	1440	1443	
65	1202	1171	1121	1079	1024	967	930	902	916	950	1000	1067	1117	1163	1204	1208	
70	954	923	879	823	758	707	678	643	656	685	729	791	843	895	946	959	
75	699	667	623	562	502	450	419	388	401	427	467	514	567	629	683	700	
80	442	417	369	314	258	217	191	171	179	199	230	264	302	369	425	447	
85	213	190	153	110	71.7	52.0	37.2	29.4	30.4	38.8	54.2	76.2	90.6	148	188	215	
90	48.7	38.4	22.9	8.82	3.04	3.22	3.03	2.83	2.07	2.31	2.50	3.12	2.54	17.1	34.6	46.4	
95	2.30	2.69	2.82	2.71	1.82	2.53	2.23	2.08	1.81	1.84	1.93	1.98	1.72	1.95	1.96	1.92	
100	1.76	2.10	3.28	2.40	2.34	2.53	2.55	2.19	2.08	2.10	2.19	2.04	1.77	1.90	1.86	1.71	
105	1.70	2.15	2.56	2.76	3.17	3.27	3.23	2.93	2.72	2.63	2.56	2.45	2.35	2.22	2.23	1.92	
110	2.50	2.78	3.18	3.75	4.53	4.48	4.13	3.57	3.25	3.15	3.18	3.03	2.97	2.95	2.61	2.56	
115	3.19	3.47	4.02	4.90	5.62	5.43	5.04	4.42	3.89	3.73	3.71	3.71	3.75	3.59	3.40	3.04	
120	4.04	4.04	4.85	5.74	6.46	6.17	5.72	5.06	4.37	4.31	4.23	4.28	4.38	4.59	4.19	3.52	
125	4.58	4.83	5.37	6.62	7.34	6.96	6.31	5.70	4.68	4.62	4.64	4.75	4.85	5.27	4.72	4.00	
130	5.06	5.04	5.74	7.04	7.71	7.43	6.73	5.92	4.96	4.94	4.96	5.22	5.58	6.07	5.15	4.53	
135	5.27	5.46	6.31	7.72	8.02	7.79	7.00	6.24	5.38	5.41	5.33	5.58	5.83	6.75	5.89	4.96	
140	5.75	5.83	6.73	8.09	8.02	8.22	7.48	6.50	5.48	5.57	5.69	5.85	6.04	7.33	6.21	5.49	
145	6.01	6.20	7.04	8.35	8.28	8.48	7.74	6.77	6.02	5.89	6.00	6.21	6.57	7.75	6.85	5.87	
150	6.59	6.67	7.46	8.97	8.65	8.80	8.16	7.25	6.49	6.52	6.53	6.68	7.14	8.17	7.69	6.67	
155	6.92	7.41	8.19	9.23	9.01	9.01	8.54	7.78	7.03	6.78	6.94	7.15	7.24	8.39	8.43	7.46	
160	7.29	7.62	8.24	9.34	9.17	9.12	8.75	7.94	7.13	7.14	7.15	7.41	7.30	8.65	8.91	7.78	
165	8.25	8.56	9.39	10.2	10.2	10.7	10.3	9.17	8.52	8.47	8.67	9.03	9.28	10.6	11.0	9.77	
170	9.15	9.61	10.3	10.9	10.9	11.7	11.2	9.97	9.90	9.83	10.0	10.4	10.7	11.6	12.5	11.3	
175	10.2	10.6	10.9	11.3	11.5	12.5	12.2	10.9	10.5	10.5	10.4	10.8	10.9	11.6	12.6	12.0	
180	10.2	10.2	10.7	10.9	11.1	12.3	11.9	10.7	10.1	10.0	10.2	10.6	10.6	11.3	12.2	11.9	

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 *******