

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-8100-40K

Representative (Tested) Model: LED-8100-40K

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

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	Light Efficient Design	
Model Number	LED-8100-40K	
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	20W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,	
LED Manufacturer	N/A	
LED Model	N/A	
Sample Number	JBE180709-E1(4000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


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-8100-40K		

Electrical Measurement:

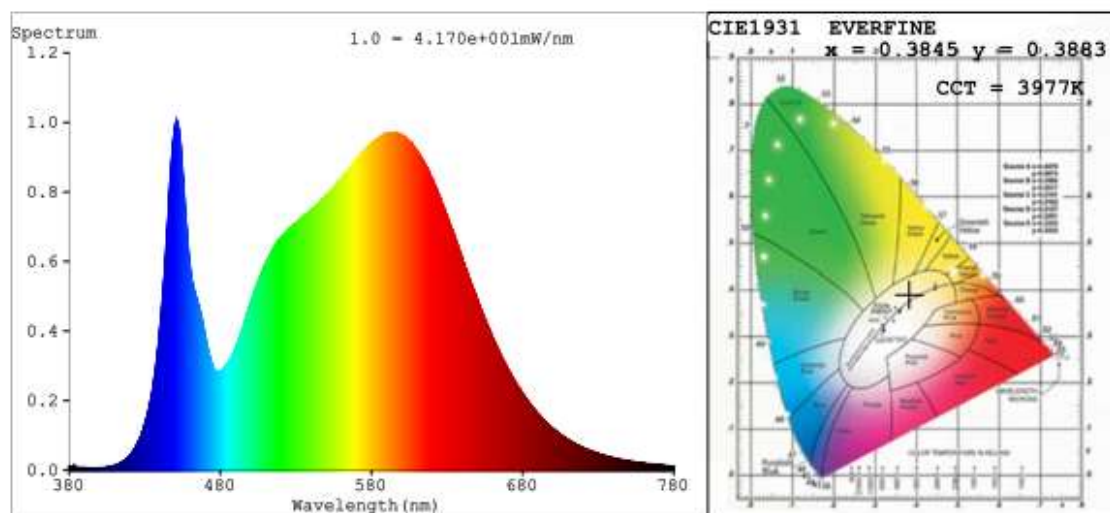
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180709-	120.0	60	0.1786	21.28	0.9930	12.53
B1	277.0	60	0.0823	21.35	0.9370	19.6

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)	3977	R3	95	R11	80
Duv	0.0042	R4	81	R12	6
Chromaticity (x, y)	x=0.3845 y=0.3883	R5	80	R13	82
Chromaticity (u', v')	u'=0.2232 v'=0.5072	R6	84	R14	98
Color Rendering Index (CRI)	82.4	R7	87	R15	73
R9	4	R8	63	--	--

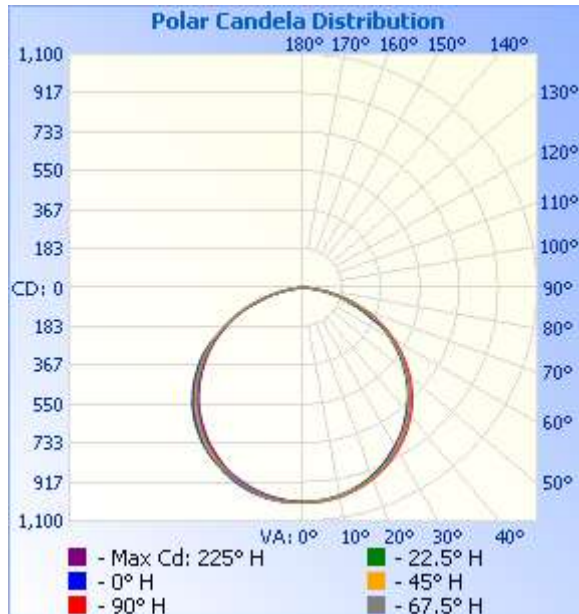
Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	3022.5	3015.7
Luminous Efficacy (lm/W)	142.03	141.25
Most Worst Luminous/Highest Watts	141.25	
Beam Angle (°)	117.1	--
Center Beam Candle Power (cd)	1012	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	797.1	26.4%
0-40	1,317.5	43.6%
0-60	2,374.5	78.6%
60-90	637.7	21.1%
70-100	254.4	8.4%
90-120	3.3	0.1%
0-90	3,012.1	99.7%
90-180	10.1	0.3%
0-180	3,022.2	100%

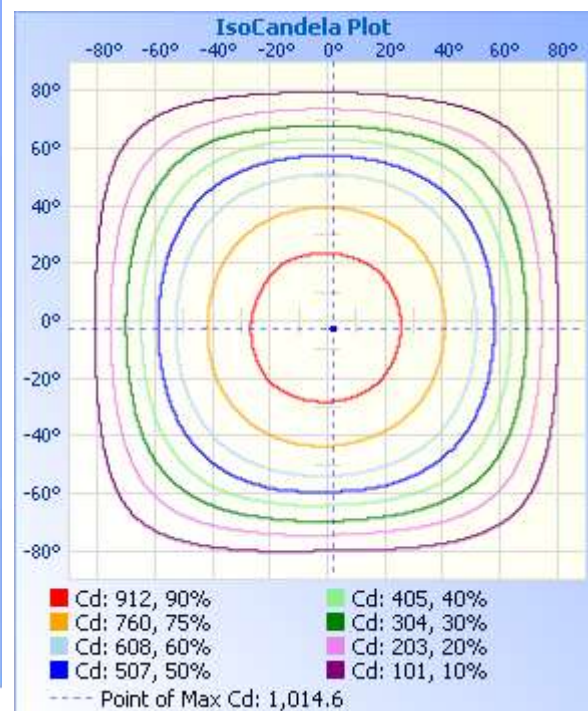
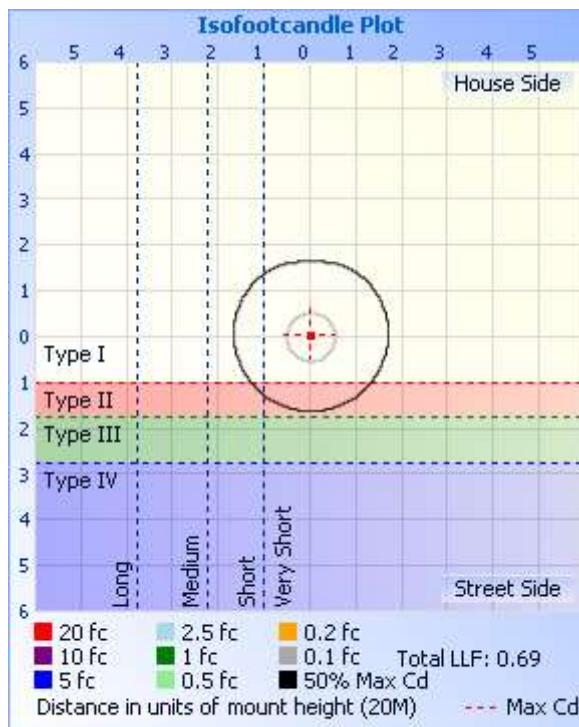
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	96.0	3.2%	90-100	1.2	0%
10-20	276.7	9.2%	100-110	0.9	0%
20-30	424.4	14.0%	110-120	1.2	0%
30-40	520.4	17.2%	120-130	1.5	0%
40-50	550.6	18.2%	130-140	1.5	0%
50-60	506.4	16.8%	140-150	1.4	0%
60-70	384.5	12.7%	150-160	1.2	0%
70-80	207.8	6.9%	160-170	0.9	0%
80-90	45.4	1.5%	170-180	0.3	0%

Photometric Data


Illuminance at a Distance

Center Beam fc	Beam Width	Beam Width	Beam Width
3.33M	8.45 fc	10.83 M	10.92 M
6.67M	2.11 fc	21.65 M	21.82 M
10.00M	0.94 fc	32.48 M	32.74 M
13.33M	0.53 fc	43.31 M	43.64 M
16.67M	0.34 fc	54.14 M	54.56 M
20.00M	0.23 fc	64.97 M	65.47 M

■ Vert. Spread: 116.8°
 ■ Horiz. Spread: 117.2°



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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	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	1012	
5	1009	1006	1004	1005	1005	1006	1008	1009	1011	1013	1012	1012	1013	1011	1012	1010	
10	996	992	991	991	993	994	995	999	1001	1005	1005	1005	1006	1001	1002	998	
15	976	970	970	969	973	973	978	980	984	991	992	989	989	984	981	979	
20	950	943	943	938	943	944	953	953	960	966	969	966	965	960	955	953	
25	914	908	907	902	906	909	919	918	927	936	939	937	931	929	924	918	
30	871	868	864	860	862	869	872	878	887	895	903	900	896	892	887	876	
35	821	820	814	812	814	821	824	832	841	847	851	854	849	845	835	827	
40	766	761	758	757	758	764	769	776	786	794	801	803	797	789	780	769	
45	702	698	694	695	698	700	706	713	725	735	740	740	734	726	716	707	
50	631	624	623	629	628	632	637	644	656	663	671	670	663	654	645	637	
55	552	546	548	550	554	557	563	568	580	588	594	593	587	578	569	559	
60	467	464	464	467	473	476	481	485	498	503	509	507	482	489	484	475	
65	377	373	376	377	370	389	394	397	410	416	418	398	382	381	391	386	
70	283	281	278	269	274	278	301	302	317	320	312	302	294	286	288	293	
75	188	187	179	183	189	192	196	207	221	223	215	198	186	186	194	197	
80	99.6	97.4	93.6	95.6	100	103	111	118	127	129	122	109	90.6	99.4	104	106	
85	29.9	28.4	27.2	28.2	31.4	34.4	38.3	42.5	47.7	49.2	47.4	36.6	18.9	31.1	33.4	32.4	
90	1.07	1.55	2.33	4.93	2.76	5.36	3.90	3.55	4.28	4.34	3.47	1.96	0.36	1.20	0.95	0.85	
95	0.64	0.80	1.37	2.31	0.42	2.89	1.64	0.80	0.53	0.64	0.68	0.68	0.36	0.63	0.69	0.53	
100	0.53	0.85	1.21	1.26	0.36	1.31	1.27	0.80	0.53	0.59	0.74	0.68	0.47	0.63	0.69	0.58	
105	0.80	0.85	1.16	0.94	0.52	1.10	1.16	0.80	0.80	0.64	0.84	0.69	0.68	0.79	0.90	0.90	
110	0.80	1.06	1.16	0.94	0.78	1.10	1.16	0.80	1.01	1.01	0.95	0.95	0.99	0.99	1.01	1.01	
115	1.17	1.22	1.37	1.25	1.10	1.10	1.16	1.01	1.28	1.33	1.21	1.15	1.20	1.15	1.27	1.33	
120	1.60	1.43	1.58	1.73	1.62	1.57	1.58	1.38	1.44	1.43	1.37	1.36	1.46	1.47	1.48	1.54	
125	1.65	1.65	1.79	1.73	1.77	1.68	1.64	1.65	1.60	1.59	1.53	1.52	1.56	1.62	1.64	1.59	
130	1.76	1.75	1.84	1.88	1.83	1.83	1.74	1.75	1.76	1.75	1.63	1.68	1.62	1.83	1.90	1.70	
135	1.97	1.81	1.95	2.20	2.03	1.99	1.90	1.81	1.92	1.96	1.84	1.88	1.82	1.99	2.06	1.81	
140	2.13	2.12	2.21	2.41	2.19	2.30	2.06	2.01	2.08	2.02	1.95	2.04	2.08	1.99	2.06	2.02	
145	2.35	2.18	2.42	2.41	2.50	2.46	2.33	2.02	2.29	2.07	2.16	2.20	2.14	2.20	2.12	2.28	
150	2.51	2.49	2.47	2.46	2.50	2.51	2.48	2.49	2.46	2.39	2.37	2.41	2.35	2.36	2.54	2.55	
155	2.56	2.55	2.47	2.67	2.50	2.57	2.48	2.50	2.62	2.50	2.47	2.56	2.50	2.41	2.70	2.60	
160	2.56	2.55	2.58	2.67	2.61	2.67	2.64	2.50	2.62	2.55	2.63	2.62	2.56	2.62	2.75	2.71	
165	2.88	2.97	3.05	3.03	2.97	3.19	3.22	2.97	3.26	3.13	3.26	3.20	3.08	3.25	3.49	3.19	
170	3.31	3.24	3.37	3.30	3.23	3.30	3.28	3.29	3.74	3.66	3.68	3.66	3.49	3.51	3.65	3.88	
175	3.57	3.66	3.68	3.51	3.44	3.61	3.70	3.66	3.74	3.66	3.63	3.66	3.49	3.51	3.65	3.88	
180	3.68	3.66	3.68	3.50	3.44	3.61	4.02	3.72	3.68	3.66	3.63	3.66	3.49	3.46	3.65	3.88	

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 *******