

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN**(Brand Name: REMPHOS OR LIGHT EFFICIENT DESIGN)**

188 S. Northwest Highway Cary, IL 60013, USA

Direct Linear Ambient Luminaires

Model name(s):

RP-LBI-G1-3F-15W-XXK-[WC,W,C]-[Blank,OCN]-[BAA,Blank]

Remark: [WC,W,C] represents product function, WC represents power adjustable and color turnable, W represents power adjustable, C represents color turnable. [Blank,OCN] represent sensor option, OCN represents occupancy sensor and N can be a number 1 to 4 for sensor number, Blank represents without sensor. [BAA,Blank] where Blank represent NON-BAA, BAA represents BAA Section 1605 Compliant.

Representative (Tested) Model:

RP-LBI-G1-3F-15W-XXK-WC(0%,3500K)

Model Difference: All construction and rating are the same, except product function and sensor option.

Test & Report By:

Xeon Ren

Engineer: Xeon Ren

Date: Nov.20,2018

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	
Brand Name	REMPHOS OR LIGHT EFFICIENT DESIGN	
Model Number	RP-LBI-G1-3F-15W-XXK-[WC,W,C]-[Blank,OCN] -[BAA,Blank]	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Direct Linear Ambient Luminaires	
Rated Voltage / Frequency	100-277 Vac, 50/60 Hz	
Nominal Power	15W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K,5000K	
LED Manufacturer	Hongli Zhihui Group Co., Ltd.	
LED Model	PU2835DW-S1-08-PCT-HR3	
Sample Number	JDE181007-H1	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s
Photo		
		

1.2 Test Specifications:

Date of Receipt	Oct.25,2018
Date of Test	Oct.25,2018
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	2018-10-25	Test Ambient:	25.0 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	RP-LBI-G1-3F-15W-XXK-WC (0%,3500K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JDE181007-H1	120.0	60	0.1269	15.09	0.9912	6.31
	277.0	60	0.0617	15.33	0.8966	10.32
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

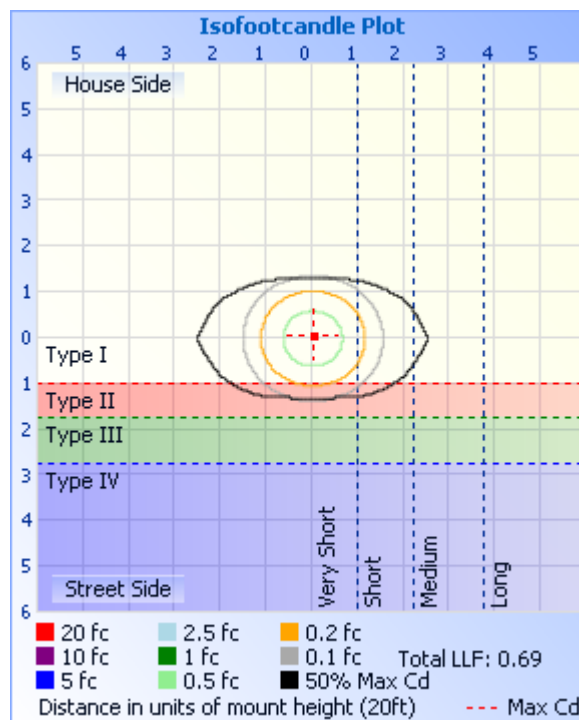
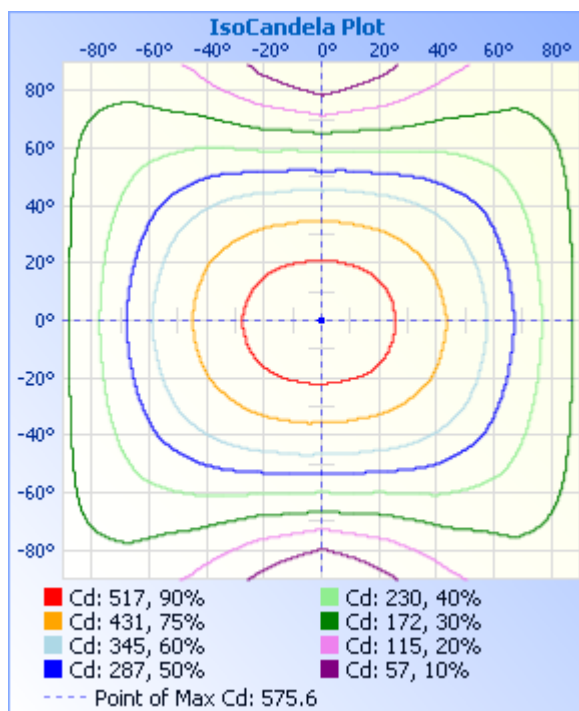
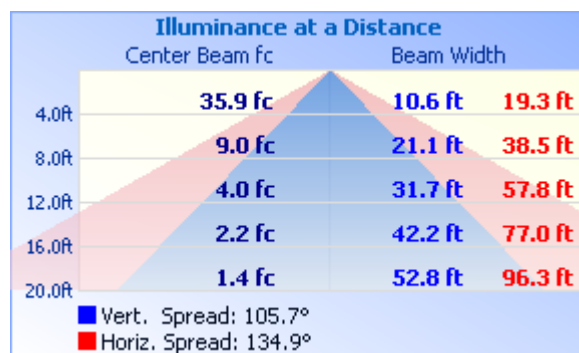
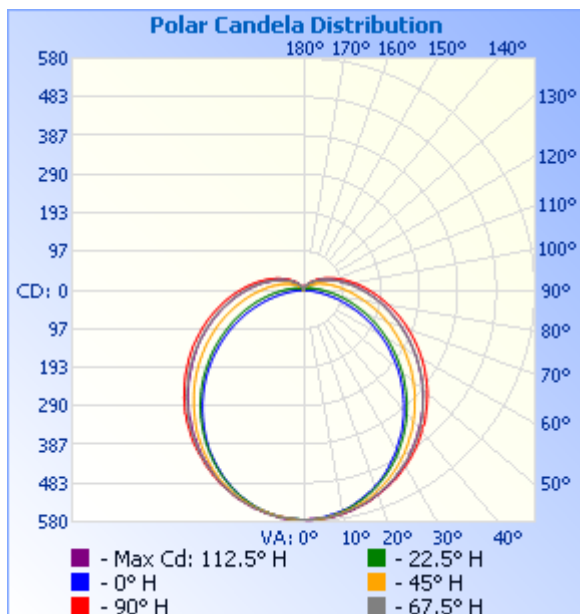
Photometric Measurement –Goniophotometer Method:

Parameter	Result		DLC V4.4 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	2099.3	2098.3	>=375 lm/ft(-10%)	
Luminous Efficacy (lm/W)	139.12	136.88	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Most Worst Luminous/Highest Watts	136.88			
Zonal lumens in the 0-60 °zone (%)	62.7	--	>= 40%(-3%)	
Beam Angle (°)	120.2	--	--	
Center Beam Candle Power (cd)	575	--	--	

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	445.6	21.2%
0-40	731.0	34.8%
0-60	1,316.5	62.7%
60-90	556.9	26.5%
70-100	401.2	19.1%
90-120	181.0	8.6%
0-90	1,873.3	89.2%
90-180	226.1	10.8%
0-180	2,099.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	54.3	2.6%	90-100	86.8	4.1%
10-20	155.5	7.4%	100-110	57.6	2.7%
20-30	235.7	11.2%	110-120	36.6	1.7%
30-40	285.4	13.6%	120-130	22.2	1.1%
40-50	301.1	14.3%	130-140	12.6	0.6%
50-60	284.4	13.5%	140-150	6.4	0.3%
60-70	242.4	11.5%	150-160	2.8	0.1%
70-80	185.7	8.8%	160-170	0.9	0%
80-90	128.8	6.1%	170-180	0.2	0%

Photometric Data


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Table--1

UNIT: cd

C (DEG) γ (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	575	575	575	575	575	575	575	575	575	575	575	575	575	575	575	575	
5	570	573	572	571	570	572	574	573	572	574	574	571	572	571	572	572	
10	564	565	564	561	561	562	565	566	569	568	566	562	562	563	562	564	
15	552	554	550	545	544	546	553	557	558	557	553	548	546	546	550	552	
20	537	537	532	525	522	526	536	543	544	543	537	528	525	526	534	538	
25	519	516	510	498	496	501	514	525	529	526	515	504	498	500	512	518	
30	499	493	483	467	464	471	489	503	509	504	490	474	468	471	485	496	
35	475	467	452	435	430	438	459	480	487	478	460	441	432	437	456	470	
40	449	438	419	398	391	402	428	452	461	451	428	406	394	402	424	443	
45	421	409	385	359	350	363	394	423	433	422	394	368	355	364	390	412	
50	391	377	349	319	309	323	359	391	405	390	359	327	312	323	355	381	
55	361	344	314	279	265	281	324	358	373	356	325	286	269	283	320	350	
60	330	313	279	238	221	240	288	324	342	324	288	244	224	241	285	317	
65	298	282	244	198	176	200	253	290	309	291	252	204	180	201	250	284	
70	268	250	212	159	131	161	219	257	277	259	219	165	135	163	217	252	
75	238	220	180	124	88.4	125	186	227	246	228	187	129	92.1	128	184	224	
80	210	193	151	92.6	48.7	93.8	155	199	216	200	156	96.4	51.7	95.4	155	194	
85	183	167	126	66.1	17.0	66.7	128	172	189	173	130	70.0	19.7	68.9	129	169	
90	159	143	103	45.8	3.06	47.1	106	147	164	148	107	48.8	4.60	48.3	106	145	
95	137	122	83.2	32.4	2.85	33.8	87.7	126	141	127	87.5	34.9	4.09	34.4	87.2	123	
100	117	103	68.6	23.9	2.85	24.7	71.8	106	121	107	72.1	25.4	3.93	24.9	71.0	105	
105	99.0	86.1	56.1	17.8	2.80	18.8	58.9	89.2	102	90.0	58.6	18.7	3.21	18.1	57.6	87.6	
110	83.1	72.1	45.8	14.2	2.80	15.0	47.9	74.7	85.4	75.2	47.4	14.3	2.43	13.9	46.5	72.9	
115	69.4	59.8	37.0	11.6	1.97	12.6	38.9	62.1	71.3	61.8	38.3	11.3	1.81	10.7	37.0	60.1	
120	57.0	49.2	29.6	9.85	1.81	10.7	31.8	51.1	58.8	51.3	30.6	9.07	1.76	8.61	29.6	49.2	
125	46.2	39.9	23.8	8.76	1.81	9.40	25.8	42.0	47.8	41.6	24.8	7.61	1.92	7.31	23.4	39.5	
130	36.9	31.8	19.2	7.52	1.81	8.56	21.0	33.9	38.6	33.5	19.8	6.63	1.97	6.12	18.5	31.5	
135	29.1	25.2	15.6	6.64	1.81	7.58	17.3	27.2	30.8	26.7	16.1	5.91	1.97	5.08	14.6	24.5	
140	22.6	19.9	12.6	5.29	1.81	6.70	14.2	21.7	24.4	21.2	13.2	5.49	2.02	4.09	11.5	18.9	
145	17.3	15.4	10.2	3.69	1.91	4.68	11.8	17.2	18.8	16.9	11.1	4.25	2.02	2.33	8.72	14.2	
150	13.1	11.8	8.07	2.60	1.86	3.69	9.49	13.5	14.5	13.4	9.42	3.63	2.02	1.97	5.97	10.5	
155	9.70	8.72	5.45	2.44	1.97	2.65	7.73	10.6	10.9	10.3	7.90	3.20	2.02	2.18	2.96	7.07	
160	6.68	6.30	2.72	2.23	1.92	2.39	4.34	7.93	7.99	7.75	6.11	2.33	2.07	2.34	2.07	3.45	
165	3.34	2.52	2.15	2.18	2.43	2.39	2.65	4.41	4.12	4.08	3.18	1.97	2.28	2.85	2.44	1.94	
170	1.64	1.78	2.09	2.28	2.59	2.49	2.22	2.00	1.75	1.78	1.73	1.97	2.28	2.85	2.65	2.10	
175	1.59	1.73	1.99	2.23	2.74	2.54	2.22	1.94	1.80	1.73	1.73	1.97	2.23	2.85	2.59	2.15	
180	1.64	1.73	1.99	2.23	2.80	2.54	2.22	1.94	1.80	1.63	1.73	1.97	2.23	2.85	2.59	2.20	

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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	2019-06-01
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 *******