



LM-79-08 Test Report

for

GREEN CREATIVE LTD

756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

LED HID

Model: 45HID/850/277V/E26

45HID/850/277V/EX39/R

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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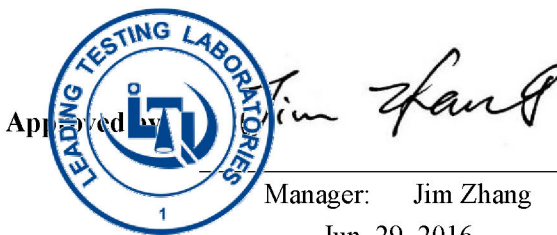
Report No.: HZ16060024d

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by:

April Zou

Engineer: April Zou
Jun. 29, 2016



Approved by

Manager: Jim Zhang
Jun. 29, 2016

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

Test Summary

Sample Tested: 45HID/850/277V/E26

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
127.5	5684.1	44.59	0.9655
CCT (K)	CRI	Stabilization Time (Light & Power)	
5008	85.2	60	

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt	: Jun. 16, 2016
Date of Test	: Jun. 22, 2016
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

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Sample Photos



45HID/850/277V/E26



45HID/850/277V/EX39/R

Overview of the sample

Equipment Under Test (EUT)

Name	: LED HID
Model	: 45HID/850/277V/E26
Electrical Ratings	: 120-277V, 60Hz, 45W
Product Description	: E26 base, 5000K, CRI80
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

Note: Model 45HID/850/277V/E26 and model 45HID/850/277V/EX39/R are identical except their different screw base. Model 45HID/850/277V/E26 is E26 base. 45HID/850/277V/EX39/R is EX39 base. Model 45HID/850/277V/E26 was chosen to be representative model in this report.

TEST RESULTS

Test ambient temperature was 24.5°C.

Base orientation was Light down. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 60 minutes, and the total operating time including stabilization was 95 minutes.

The photometric distance of Goniophotometer is 2.47 m.

Luminous data was taken at 0.5° vertical intervals and 10.0° horizontal intervals.

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.385	0.179
Power Factor	0.9655	0.8945
Test Power (W)	44.59	44.35
THD A%	24.73	20.61
Luminous Efficacy (lm/W)	127.5	
Total Luminous Flux (lm)	5684.1	
Color Rendering Index (CRI)	85.2	
R9	22	
Correlated Color Temperature (CCT) (K)	5008	
Chromaticity (Chroma x, Chroma y)	(0.3449, 0.3514)	
Chromaticity (Chroma u, Chroma v)	(0.2113, 0.3230)	
Chromaticity (Chroma u', Chroma v')	(0.2113, 0.4845)	
Duv	0	
Average Beam Angle (°)	313.9	
Center Beam Candle Power (cd)	247	
Spacing Criteria	2.56 (0°-180°)/ 2.58 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	26.36%	
Zonal Lumens in the 60°-90°Zone	30.43%	
Zonal Lumens in the 90°-120°Zone	28.03%	
Zonal Lumens in the 120°-180°Zone	15.19%	

Special Color Rendering Indices	
R1	84
R2	89
R3	92
R4	86
R5	85
R6	85
R7	88
R8	72
R9	22
R10	74
R11	86
R12	68
R13	85
R14	96

Table 2: Test data per Goniophotometer Method

Note: According to CIE 1976 (u',v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Spectral Power Distribution

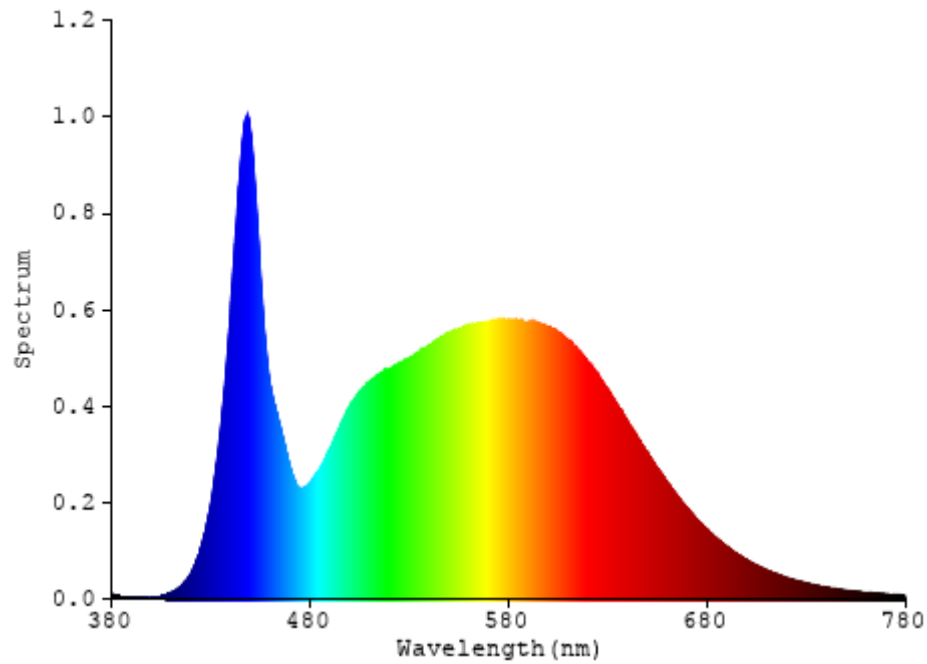


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	24.586	0.43%
10- 20	86.733	1.53%
20- 30	179.498	3.16%
30- 40	295.494	5.20%
40- 50	410.276	7.22%
50- 60	501.554	8.82%
60- 70	556.81	9.80%
70- 80	580.793	10.22%
80- 90	592.072	10.42%
90-100	583.13	10.26%
100-110	541.365	9.52%
110-120	468.595	8.24%
120-130	370.573	6.52%
130-140	259.202	4.56%
140-150	148.964	2.62%
150-160	67.083	1.18%
160-170	16.357	0.29%
170-180	1.039	0.02%
Total	5684.1	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	1498.141	26.36%
60- 90	1729.675	30.43%
0-90	3227.816	56.79%
90- 180	2456.308	43.21%
0- 180	5684.1	100%

Table 3: Zonal Lumen Data

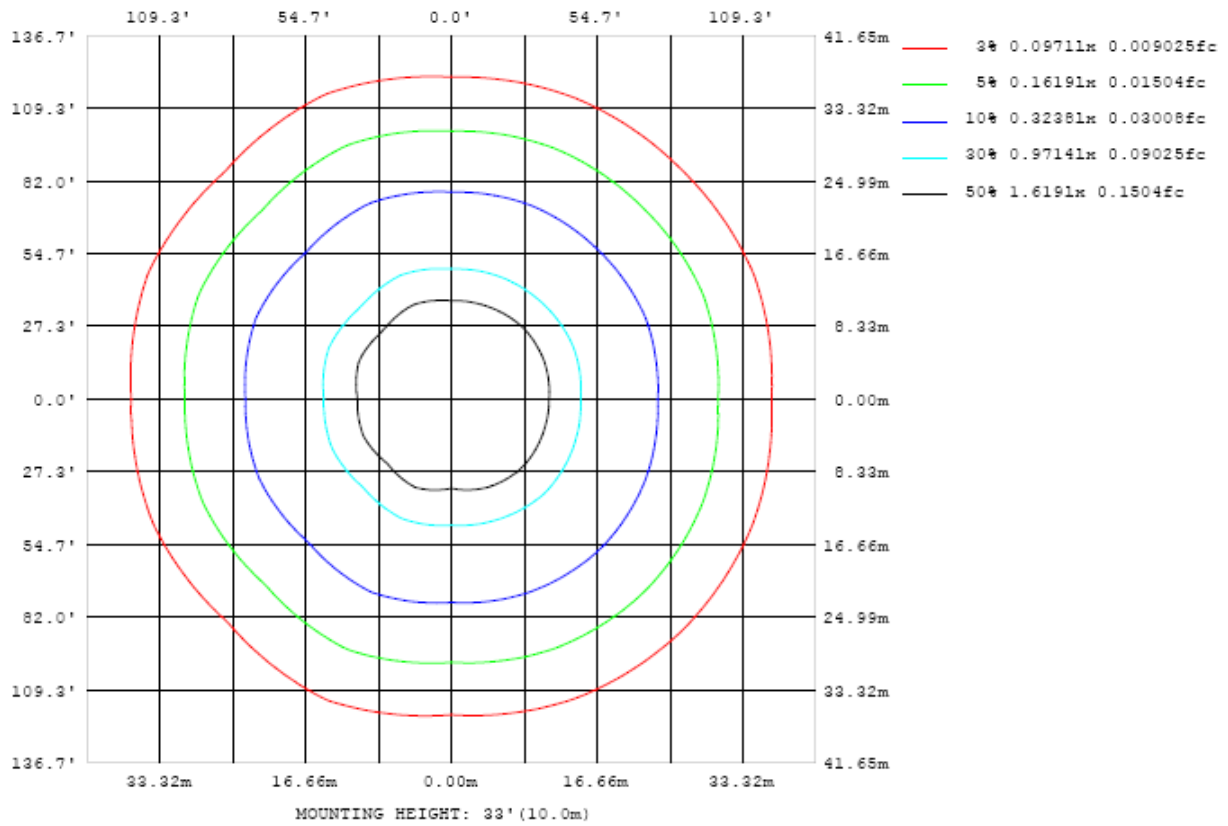


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

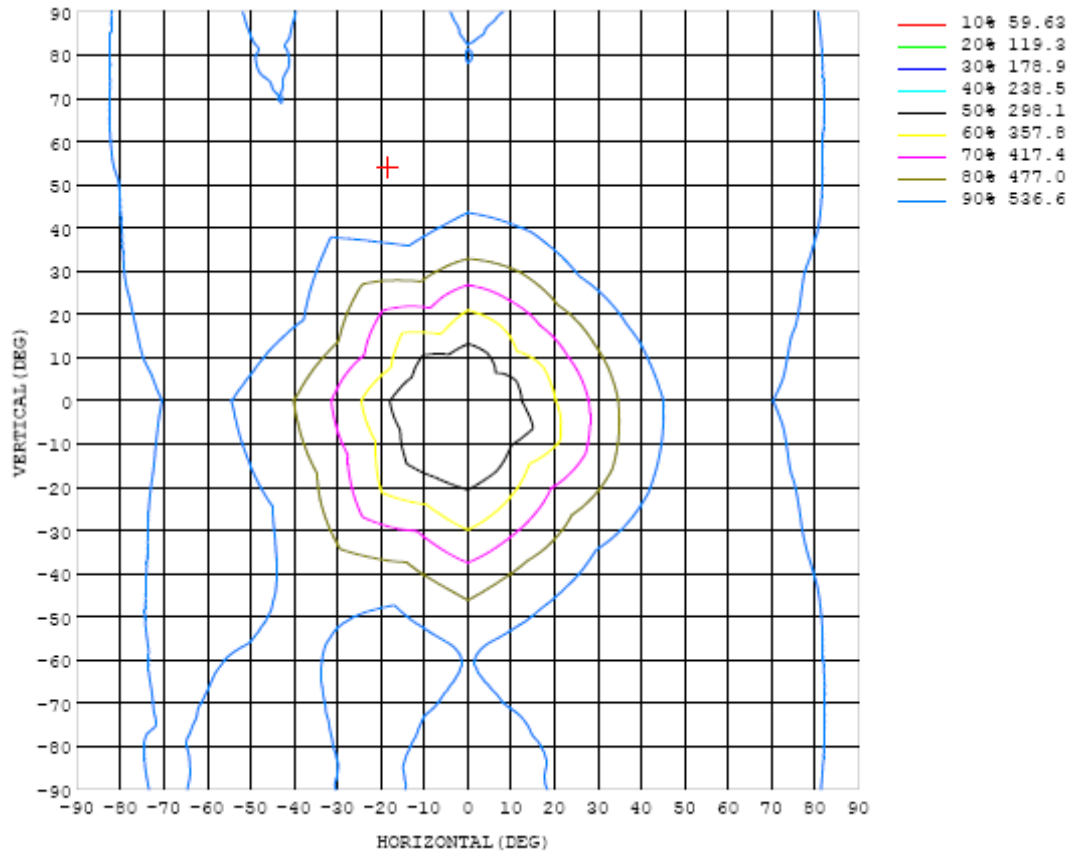


Chart 3: Isocandela Plot

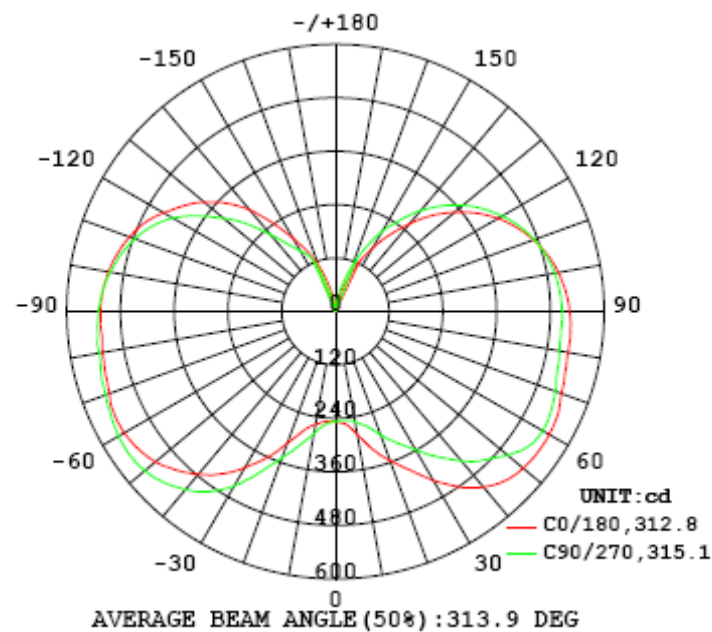


Chart 4: Polar Candela Distribution

Luminous Intensity Data

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	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247			
5	253	253	250	247	246	245	245	247	248	250	253	258	254	257	266	261			
10	280	267	261	260	251	249	251	255	258	270	269	286	277	284	304	282			
15	320	289	305	277	266	265	268	284	277	307	301	337	311	321	350	322			
20	356	330	355	319	294	307	297	326	315	366	344	392	350	367	387	368			
25	392	374	397	360	326	352	331	375	361	409	387	435	397	417	427	416			
30	438	421	438	401	359	397	368	416	405	453	432	482	451	462	477	463			
35	480	465	477	444	398	442	412	458	445	497	472	518	493	500	517	504			
40	514	505	509	485	438	480	451	488	476	528	502	549	522	531	549	536			
45	536	533	540	515	471	515	482	516	503	555	526	574	542	552	571	558			
50	547	552	561	536	501	538	504	537	525	573	543	588	555	566	579	573			
55	551	566	579	552	526	554	517	551	537	584	553	596	561	574	580	581			
60	551	572	587	561	535	564	522	559	544	589	555	596	560	574	576	582			
65	548	572	584	562	531	567	522	559	545	587	551	591	553	569	568	577			
70	537	567	576	559	523	565	518	555	537	578	543	585	547	563	561	570			
75	531	560	564	551	513	561	514	547	532	572	536	580	541	558	554	564			
80	527	558	557	546	509	556	510	544	528	566	532	574	536	555	551	561			
85	527	560	557	544	505	552	505	540	525	564	531	573	533	554	550	560			
90	523	559	557	544	506	554	506	541	524	560	526	570	529	549	546	556			
95	516	553	552	539	503	550	503	538	522	554	520	562	522	541	538	548			
100	506	543	546	531	497	543	496	530	515	544	510	551	511	528	526	536			
105	491	527	534	519	487	532	486	518	504	530	494	535	496	511	510	521			
110	471	509	519	501	473	518	472	502	490	512	476	515	477	490	491	500			
115	447	487	499	480	454	499	454	482	471	490	454	489	453	463	466	475			
120	419	460	474	454	430	475	432	456	443	462	426	459	420	431	437	446			
125	385	428	446	424	402	446	406	426	414	430	395	423	375	394	403	412			
130	347	390	413	389	371	413	375	392	382	393	360	382	326	350	367	372			
135	306	347	373	348	336	376	335	352	344	349	325	333	278	301	326	327			
140	257	298	327	301	296	331	291	305	298	295	270	278	226	246	271	276			
145	210	246	273	250	251	281	240	254	242	238	223	221	184	192	216	224			
150	163	197	224	202	207	234	190	206	191	179	198	165	157	148	176	167			
155	119	152	173	156	157	186	148	155	150	130	163	115	137	113	131	104			
160	72.4	104	116	110	110	135	110	104	110	90.6	98.1	75.3	83.1	55.1	69.8	56.7			
165	36.4	58.0	60.6	65.9	67.9	78.5	70.8	59.1	66.6	61.4	46.1	46.4	31.0	29.0	25.5	24.4			
170	14.7	24.7	19.9	26.3	33.7	38.0	38.6	24.9	30.0	32.1	17.6	17.2	8.57	8.54	5.90	7.79			
175	2.65	4.34	5.95	8.17	8.81	10.0	13.2	9.89	6.83	6.22	4.90	2.99	1.65	0.73	0.52	1.10			
180	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35			

Table 4: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Jul. 17, 2015	Jul. 16, 2016
Digital Power Meter	PF2010A	HZTE028-01	Jul. 17, 2015	Jul. 16, 2016
AC Power Supply	PCR 500L	HZTE001-08	Jul. 17, 2015	Jul. 16, 2016
DC Power Supply	WY12010	HZTE004-03	Jul. 17, 2015	Jul. 16, 2016
Temperature Meter	TES1310	HZTE017-01	Jul. 17, 2015	Jul. 16, 2016
Standard source	D908	HZTE012-01	Jul. 23, 2015	Jul. 22, 2016
Standard source	SCL-1400	HZTE012-02	Oct. 21, 2015	Oct. 20, 2016

Table 5: Test Equipment List

TEST METHODS

Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning. Therefore, no seasoning was performed.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.

Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated 2x2' Troffer Retrofit Kit) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.

Some graphics were created with Photometric Plus software.

The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.

The uncertainty of goniophotometer system reported in this document is expended uncertainty is 1.94% with a coverage factor k=2.

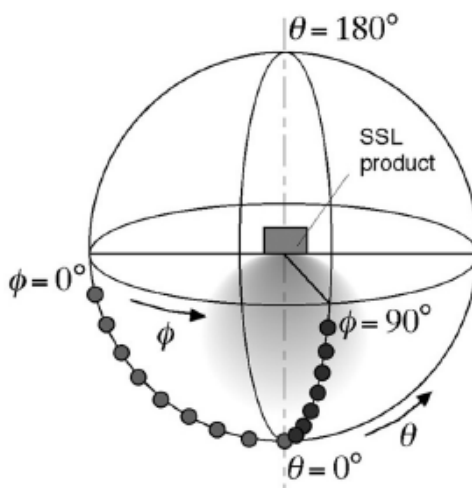
Color Characteristics Measurements

The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

Color Spatial Uniformity

The characteristics of SSL products may be spatially non-uniform, the chromaticity coordinate shall be measured at two vertical planes ($C=0^\circ/180^\circ$ and $C=90^\circ/270^\circ$) and at 10° or less intervals for vertical angle until the light output dropped to below 10% of the peak intensity. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates. The spatial non-uniformity of chromaticity, $\Delta u'v'$, is determined as the maximum deviation (distance on the CIE (u' , v') diagram) among all measured points from the spatially averaged chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***

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