



LM-79-08 Test Report

for

GREEN CREATIVE LTD

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

LED HID

Model: 27HID/850/277V/E26

27HID/850/277V/EX39/R

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ16060024e

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

Review by:

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Jun. 29, 2016

Approved by:

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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: 27HID/850/277V/E26

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
121.8	3420.3	28.08	0.9748
CCT (K)	CRI	Stabilization Time (Light & Power)	
5003	85.5	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. 23, 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



27HID/850/277V/E26



27HID/850/277V/EX39/R

Overview of the sample

Equipment Under Test (EUT)

Name	: LED HID
Model	: 27HID/850/277V/E26
Electrical Ratings	: 120-277V, 60Hz, 27W
Product Description	: E26 base, 5000K, CRI80
Manufacturer	: GREEN CREATIVE LTD
Address	: 756 North Zhongshan Rd., Unit B301 Zhabei District, Shanghai

Note: Model 27HID/850/277V/E26 and model 27HID/850/277V/EX39/R are identical except their different screw base. Model 27HID/850/277V/E26 is E26 base. 27HID/850/277V/EX39/R is EX39 base. Model 27HID/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)	0.240	0.110
Power Factor	0.9748	0.9014
Test Power (W)	28.08	27.57
THD A%	21.18	17.86
Luminous Efficacy (lm/W)	121.8	
Total Luminous Flux (lm)	3420.3	
Color Rendering Index (CRI)	85.5	
R9	24	
Correlated Color Temperature (CCT) (K)	5003	
Chromaticity (Chroma x, Chroma y)	(0.3450, 0.3514)	
Chromaticity (Chroma u, Chroma v)	(0.2114, 0.3231)	
Chromaticity (Chroma u', Chroma v')	(0.2114, 0.4846)	
Duv	0	
Average Beam Angle (°)	310.9	
Center Beam Candle Power (cd)	148	
Spacing Criteria	2.60 (0°-180°)/ 2.58 (90°-270°)	
Zonal Lumens in the 0°-60°Zone	25.90%	
Zonal Lumens in the 60°-90°Zone	30.74%	
Zonal Lumens in the 90°-120°Zone	28.41%	
Zonal Lumens in the 120°-180°Zone	14.96%	

Special Color Rendering Indices	
R1	84
R2	89
R3	93
R4	86
R5	85
R6	85
R7	89
R8	73
R9	24
R10	75
R11	85
R12	66
R13	86
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

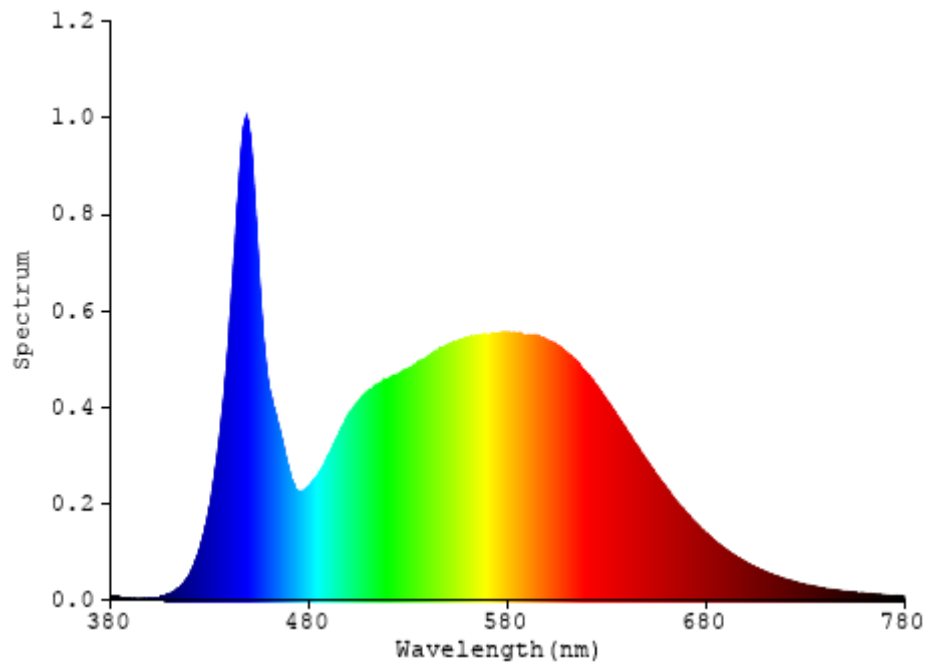


Chart 1: Spectral Power Distribution

Zonal Lumen Tabulation

$\gamma(^{\circ})$	Lumens	% Total
0- 10	14.579	0.43%
10- 20	50.962	1.49%
20- 30	104.315	3.05%
30- 40	172.898	5.06%
40- 50	242.642	7.09%
50- 60	300.367	8.78%
60- 70	337.105	9.86%
70- 80	353.178	10.33%
80- 90	361.099	10.56%
90-100	355.949	10.41%
100-110	330.228	9.66%
110-120	285.373	8.34%
120-130	224.941	6.58%
130-140	154.313	4.51%
140-150	85.596	2.50%
150-160	37.394	1.09%
160-170	8.835	0.26%
170-180	0.499	0.01%
Total	3420.3	100%

$\gamma(^{\circ})$	Lumens	% Total
0- 60	885.763	25.90%
60- 90	1051.382	30.74%
0-90	1937.145	56.64%
90- 180	1483.128	43.36%
0- 180	3420.3	100%

Table 3: Zonal Lumen Data

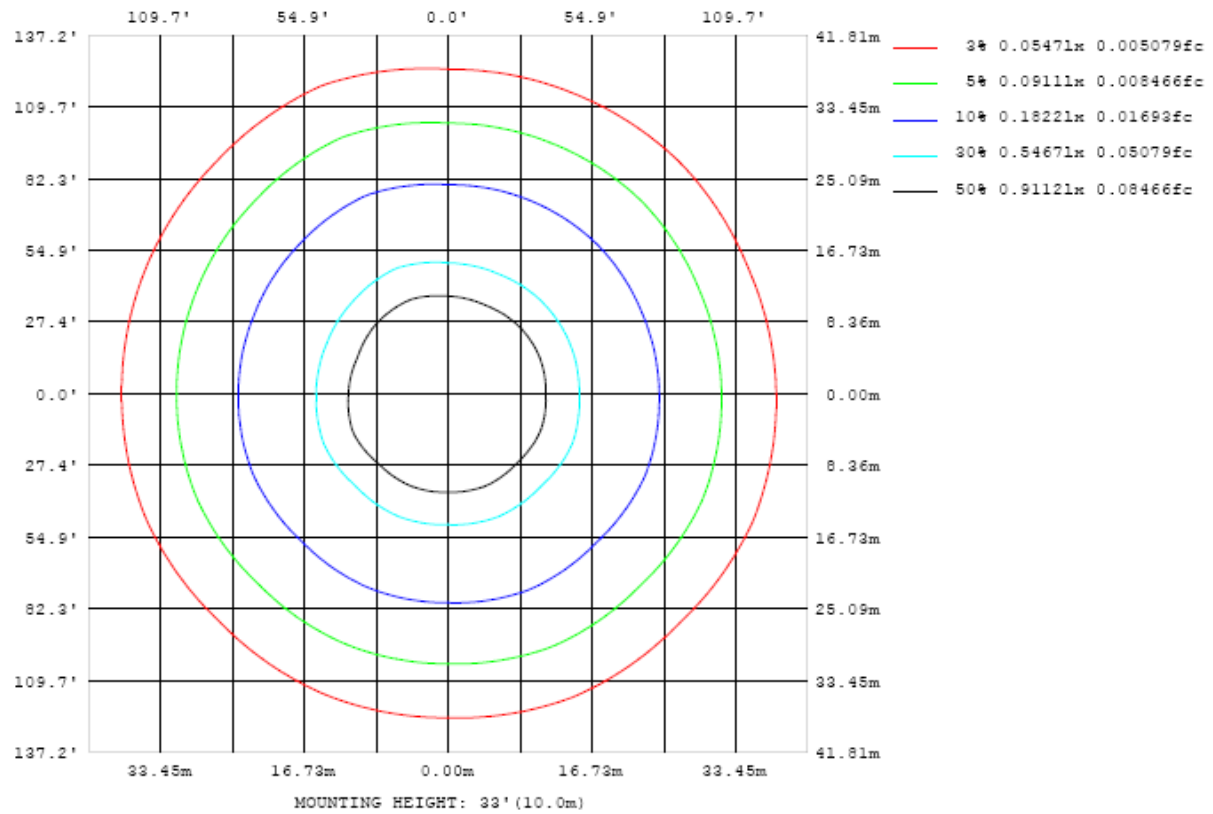


Chart 2: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots

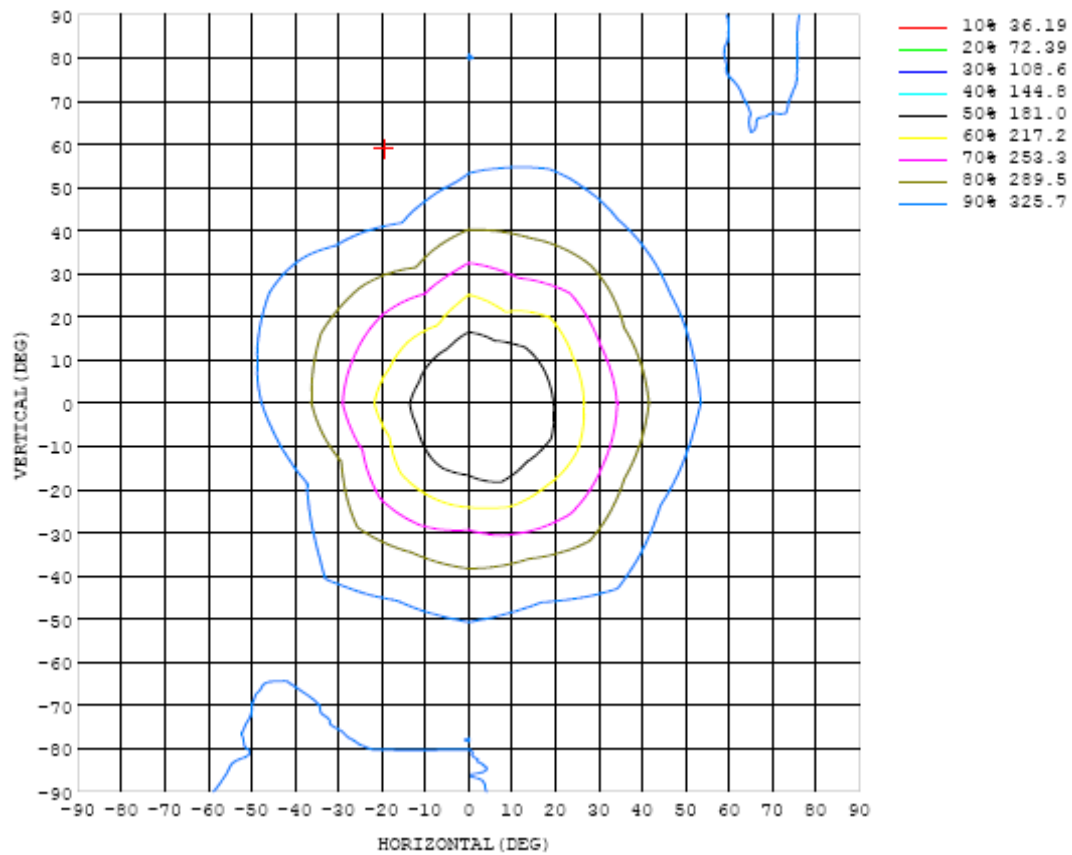


Chart 3: Isocandela Plot

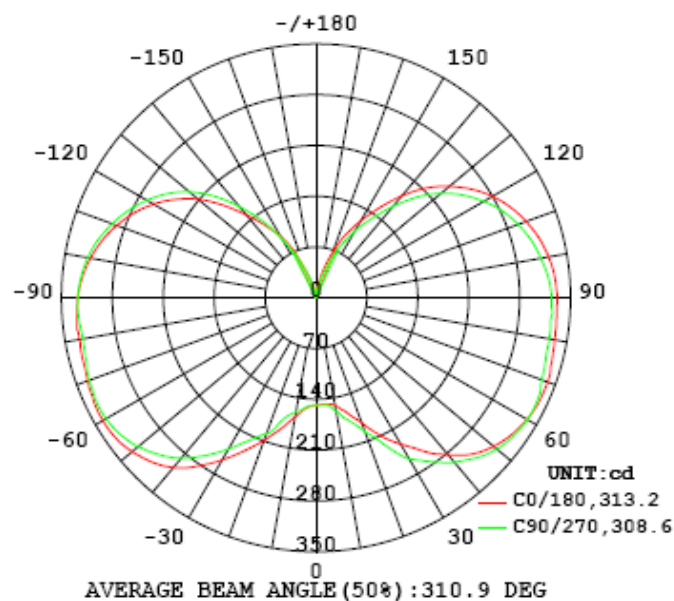


Chart 4: Polar Candela Distribution

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	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148	148			
5	147	147	148	148	148	150	152	151	152	155	153	151	151	149	148	148			
10	151	149	150	151	158	155	166	167	167	171	167	162	159	156	152	151			
15	164	157	167	165	175	175	184	192	187	196	195	190	173	178	167	165			
20	183	178	187	183	196	202	206	218	209	217	218	220	200	206	187	187			
25	209	206	213	214	224	225	230	244	233	238	237	243	217	226	208	212			
30	233	231	233	240	257	252	255	276	258	262	263	271	240	248	232	237			
35	258	262	258	271	276	281	277	304	283	282	285	296	266	272	258	268			
40	283	293	283	298	296	303	299	323	306	297	306	314	289	288	281	292			
45	305	314	304	316	312	318	315	337	320	308	322	328	306	301	305	310			
50	319	329	320	330	324	330	325	346	330	321	333	339	319	311	320	323			
55	328	342	329	340	331	338	331	349	337	334	340	353	329	322	330	333			
60	335	349	335	345	336	342	333	348	338	335	344	362	333	333	337	336			
65	338	350	337	346	335	340	332	344	337	334	343	360	334	336	340	336			
70	339	348	335	343	330	333	327	339	334	333	339	355	332	334	340	334			
75	336	344	330	338	327	330	323	334	332	335	337	353	327	330	335	328			
80	333	337	328	335	326	326	323	332	330	336	335	351	326	330	332	325			
85	332	333	327	334	324	325	323	331	330	338	336	353	328	331	331	323			
90	331	331	327	334	324	321	320	329	328	336	333	351	328	333	332	322			
95	329	327	324	334	320	316	317	325	323	332	328	345	325	331	330	320			
100	325	321	320	332	314	308	310	319	315	325	321	336	319	328	325	317			
105	318	312	313	328	306	298	301	310	305	315	312	325	310	321	317	310			
110	307	301	303	321	296	286	288	299	292	303	299	312	298	312	307	301			
115	295	289	291	308	283	267	273	286	277	288	283	298	285	299	294	290			
120	280	274	275	289	266	245	254	270	258	271	265	280	269	284	278	276			
125	261	251	257	266	247	224	233	250	237	250	243	260	250	266	259	260			
130	239	226	234	238	224	204	208	225	211	225	217	234	228	242	237	241			
135	214	204	209	208	197	181	178	197	181	194	184	204	198	211	209	218			
140	183	180	179	181	165	153	146	160	149	153	151	165	164	173	176	191			
145	151	148	147	151	133	126	117	130	122	116	120	126	130	134	140	154			
150	122	121	120	125	105	104	90.4	99.3	97.8	89.6	87.2	95.8	94.2	109	111	122			
155	95.3	97.3	95.6	100	77.5	80.1	63.6	70.2	69.2	63.0	52.7	69.8	61.2	86.7	85.3	102			
160	67.5	73.0	70.9	72.5	50.4	52.5	40.8	42.3	36.5	33.4	29.2	39.9	35.6	57.3	61.8	73.8			
165	41.3	43.4	40.1	39.1	28.3	29.4	19.8	19.3	17.3	14.0	10.8	18.1	17.6	32.8	31.2	38.6			
170	19.0	21.2	17.7	13.9	13.7	9.83	6.24	4.99	4.10	3.43	2.81	3.64	5.27	10.7	11.3	15.9			
175	5.45	7.21	5.50	3.97	4.27	2.86	1.74	1.03	0.33	0.38	0.19	0.44	1.01	2.01	3.83	4.57			
180	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60			

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 expanded uncertainty is 1.94% with a coverage factor $k=2$.

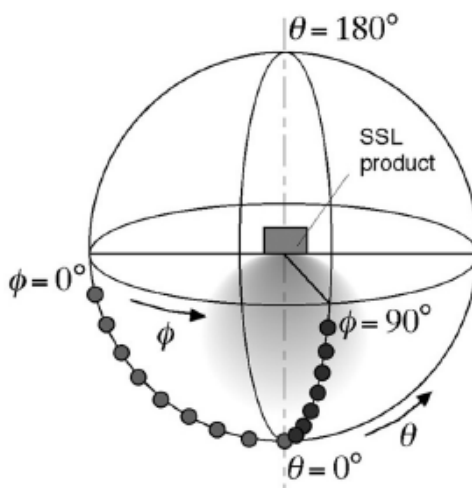
Color Characteristics Measurements

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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