

IESNA LM-79: 2008

Measurement and Test Report

for

Green Creative Ltd.

Room 1206-7, New Victory House, 93-103 Wing Lok Street, Central, HONG KONG

Apr 03, 2013

Product Name:	MR16
Model No:	01-715-D/840-38D
Test Engineer:	David Zhang 
Report No.:	BTR66.181.13.501.01
Sample Received Date:	Apr 01, 2013
Test Performed Date:	Apr 01, 2013
Reviewed By:	Steven Hsu 
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Applicant	:	Green Creative Ltd.
Product Name	:	MR16
Model No	:	01-715-D/840-38D
Brand	:	GREEN CREATIVE
SKU	:	T.B.D
12 NC Code	:	T.B.D
Nominal Operation Voltage	:	AC 12V/60Hz
Nominal Power	:	6.5W
Nominal CCT	:	4000K
Nominal CRI	:	82
Nominal Lumen Output	:	365 Lumens
Nominal Life Time	:	30000 Hours
Number of hours operated prior to measurement for new sample	:	0 Hours
Stabilization Time	:	1.0 hours
Total operating time for measurement include stabilization time	:	1.0 hours
		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Non Standard
Nominal Shape of Bulb(Designation)	:	<input type="checkbox"/> Omnidirectional A, BT, P, PS, S, T <input type="checkbox"/> Decorative B, BA, C, CA, DC, F, G <input checked="" type="checkbox"/> Directional R, BR, ER, PAR, MR, K
Date of Receiving Sample	:	Apr 01, 2013
Measurement quantities measured	:	1 pcs
Orientation During Testing	:	Base Up
Test Requested	:	Electrical and Photometric Test (Note: We only test the integral sphere parameter as to the IESNA LM-79-08 upon the request of the client.)

1.2 Objective

The following test report is prepared on behalf of Green Creative Ltd. in accordance with IESNA LM-79-08, used the following American National Standards or illumination Engineering Society of North America test guides:

- ANSI C78.377-2008: Specifications for the Chromaticity of Solid State Lighting Products;
- ANSI C79.1- 2002: American National Standard for Electric Lamps – Nomenclature for Glass Bulbs Intended for Use with Electric Lamps;
- ANSI C78.20 – 2003: American National Standard for Electric Lamps – A, G, PS, and Similar Shapes with E26 Medium Screw Bases;
- ANSI C78.21 – 2003: American National Standard for Electric Lamps – PAR and R Shapes;
- ANSI C78.24 – 2001: American National Standard for Electric Lamps – Two-inch (51 mm); Integral-reflector Lamps with Front Covers and GU5.3 or GX 5.3 Bases;
- ANSI/IEC C81.61-2003: American National Standard for Electric Lamp Bases;
- ANSI/IEEE C62.41 – 1991 (01-May-1991): Surge Voltages in Low-Voltage AC Power Circuits, Recommended Practice for;
- CIE Publication No. 13.3 – 1995: Method of Measuring and Specifying Color Rendering of Light Sources;
- CIE Publication No. 18.2 – 1983: The Basis of Physical Photometry;
- IESNA LM-16-1993: Practical Guide to Colorimetry of Light Sources;
- IESNA LM-28-89 – 1989: Guide for the Selection, Care, and Use of Electrical Instruments in the Photometric Laboratory;
- IESNA LM-79-08 Electrical and Photometric Measurement of Solid State Lighting Products
- UL 1993 – 1999: Standard for Self-Ballasted Lamps and Lamp Adapters;
- UL 8750 – 2009: Light Emitting Diode (LED) Equipment for Use in Lighting Products.

1.3 Test Facility Description

The Energy Efficiency Lab used by BEST to collect energy efficiency measurement data is located in 1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyao, Baoan, Shenzhen, China. BEST Test Service Shenzhen Co., Ltd is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200770-0). BEST Test Service Shenzhen Co., Ltd is also an ELI accredited lab for lighting products (ELI Certificate No. ELI-L04-2010) and UL accredited lab for lighting products

1.4 Test Equipment List

Device	Manufacture	Model No	Serial No	Cal. Date	Cal Due Date
Integral Sphere	Everfine	1.5M SPEKTRON	608040T	Oct 20, 2012	Oct 20, 2013
Integral Sphere	Everfine	1.5M SPEKTRON	906025	Oct 20, 2012	Oct 20, 2013
Integral Sphere	Labsphere	LMS-650	6101002416	Mar 10, 2013	Mar 09, 2014
Spectro Meter Assy	Labsphere	CDS 2100	217101416	Mar 10, 2013	Mar 09, 2014
Plus UV-VIS-Near IR Spectrophotometer Colorimeter	Everfine	PMS-80-V1 (380nm-800nm)	608033	Oct 20, 2012	Oct 20, 2013
Plus UV-VIS-Near IR Spectrophotometer Colorimeter	Everfine	PMS-700 (200nm-800nm)	908001	Oct 20, 2012	Oct 20, 2013
Goniophotometer	Everfine	GOR-5000	1009001	Nov 20, 2012	Nov 19, 2013
6 ^{1/2} Digital Multimeter	Agilent	34401A	MY4702386	Oct 18, 2012	Oct 17, 2013
AC Power Source	California Instrument	1501I	S13093	N/A	N/A
AC Power Source	California Instrument	1501L	L03572	N/A	N/A
Standard Light Source	OSRAM	24V/50W	NO.1	Sep 17, 2012	Sep 16, 2013
Standard Light Source	OSRAM	24V/50W	NO.2	Sep 17, 2012	Sep 16, 2013
Multi-Function AC standard Meter	Everfine	PF2010S	605010	Oct 18, 2012	Oct 17, 2013
Digital Power Meter	Everfine	PF9811	902029	Oct 18, 2012	Oct 17, 2013
Digital Power Meter	YOKOGAWA	WT210	91K310009	Oct 18, 2012	Oct 17, 2013
Digital Power Meter	YOKOGAWA	WT210	91K310017	Oct 18, 2012	Oct 17, 2013
Digital Power Meter	YOKOGAWA	WT210	91K310016	Oct 18, 2012	Oct 17, 2013
Ballast Parameter Analyzer	Everfine	PF9821	905050	Oct 18, 2012	Oct 17, 2013
Second Meter	TIANFU	PC 396	N/A	Oct 18, 2012	Oct 17, 2013
Digital Storage Oscilloscope	Tektronix	TDS2012B	C051911	Oct 18, 2012	Oct 17, 2013

Statement of Traceability: BEST Test Service Shenzhen Co., Ltd. certifies that all calibration has been performed using suitable standards traceable to the NIM China.

2 - Test Method

2.1 Photometric and Electrical Measurement (Integrated Sphere Method)

Total light output (luminous flux) for the $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ambient temperature conditions is measured using an Everfine integrating sphere. Temperature is measured at a position inside the sphere. Spectral radiant flux measurements are made using PMS-700 to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation. Each lamp should be stable before measurements are made. The determining method of stable is as follows:

Step 1 Take 3 measurements of the lamp light output at 15 minute interval (total time=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 350 to 1050 nm. The calibration of the sphere photometer-spectrometer system is traceable to the NIST USA. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the YOKOGAWA WT210 digital power Meter.

The total uncertainty of the light output measurements is estimated, at the 95% confidence level, not to exceed $\pm 1.12\%$ over the wavelength range 350-1050 nm.

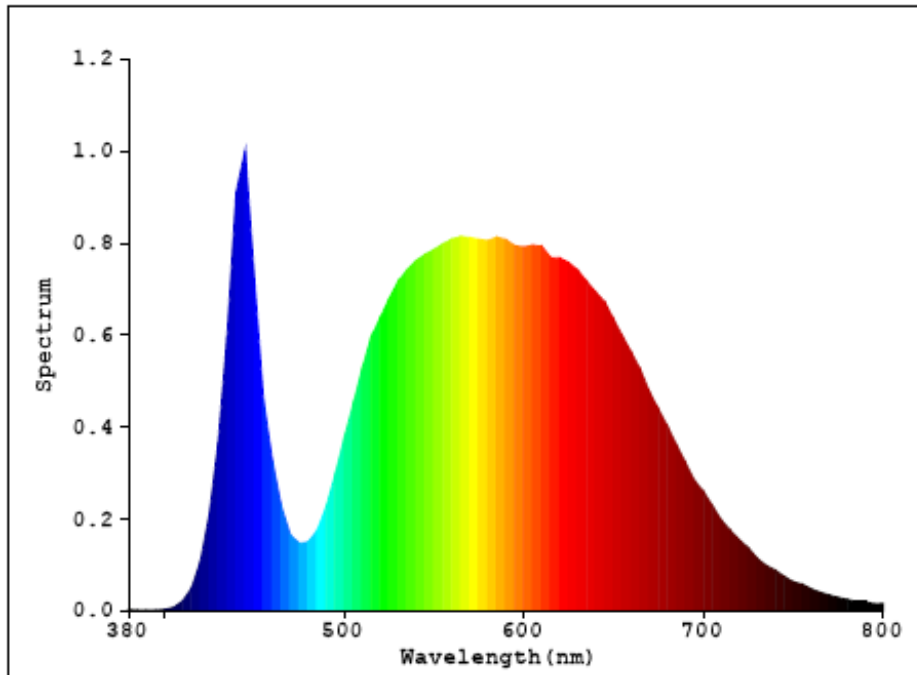
2.2 Deviation from standard operating procedure

None

3 – Summary of Test Result

	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	377.86		NVLAP/EPA
	Luminous Efficacy (lm/w)	62.45		NVLAP/EPA
	Correlated Color Temperature (CCT)	4005		NVLAP/EPA
	Color Rendering Index– CRI	81.9		NVLAP/EPA
	Input Power (W)	6.050		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	12		NVLAP/EPA
	Input Current (A)	0.5491		NVLAP/EPA
	Power Factor	0.9182		NVLAP/EPA
	x(CIE 1931)	0.3816		NVLAP/EPA
	y(CIE 1931)	0.3817		NVLAP/EPA
	u' (CIE 1976)	0.2239		NVLAP/EPA
	v' (CIE 1976)	0.5039		NVLAP/EPA
	Duv(CIE 1976)	0.002		NVLAP/EPA
	R9	39		NVLAP/EPA

4 – Spectral Flux Plots



5 – EUT Photos

