

# 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

Sep 29, 2013

<b>Product Name:</b>	LED PAR30SN
<b>Model No:</b>	14.5PAR30SNG3DIM/827FL40
<b>Test Engineer:</b>	David Zhang 
<b>Report No.:</b>	BTR66.181.13.1427.01
<b>Sample Received Date:</b>	Sep 26, 2013
<b>Test Performed Date:</b>	Sep 26, 2013 to Sep 29, 2013
<b>Reviewed By:</b>	Steven Hsu 
<b>Prepared By:</b>	<b>BEST Test Service Shenzhen Co., Ltd.</b> 1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China TEL: +86-755-28236006 FAX: +86-755-23467087-811 Email: certification@bestcert.cn



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## 1 - GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

Applicant	:	Green Creative Ltd.
Product Name	:	LED PAR30SN
Model No	:	14.5PAR30SNG3DIM/827FL40
Brand	:	GREEN CREATIVE
SKU	:	T.B.D
12 NC Code	:	T.B.D
Nominal Operation Voltage	:	AC 120V/60Hz
Nominal Power	:	14.5W
Nominal CCT	:	2700K
Nominal CRI	:	82
Nominal Lumen Output	:	800Lumens
Nominal Life Time	:	40000Hours
Number of hours operated prior to measurement for new sample	:	0 Hours
Stabilization Time	:	1.5 hours
Total operating time for measurement include stabilization time	:	3.5 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	:	Sep 26, 2013
Measurement quantities measured	:	1 pcs
Orientation During Testing	:	Base Up
Test Requested	:	Electrical and Photometric Test Luminous Intensity Distribution Test

### 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 – 2011: 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

Apparatus List	Device	Cal. Date	Cal Due Date
1	Integral Sphere+ Spectrophotometer System	Mar 10, 2013	Mar 09, 2014
2	Digital Power Meter	Oct 18, 2012	Oct 17, 2013
3	Goniophotometer+ Spectrophotometer System	Nov 20, 2012	Nov 19, 2013
4	Standard Light Source	Sep 17, 2013	Sep 16, 2014
5	Standard Light Source	Sep 17, 2013	Sep 16, 2014
6	Digital Storage Oscilloscope	Oct 18, 2012	Oct 17, 2013
7	Ultra Compact Simulator	Oct 20, 2012	Oct 20, 2013
8	Temperature Chamber	Oct 20, 2012	Oct 20, 2013
9	Digital Caliper	Nov 20, 2012	Nov 19, 2013
10	Digital CC&CV DC Power Supply(30V 5A)	N/A	N/A
11	5 1/2 Digital Multimeter	Oct 18, 2012	Oct 17, 2013
12	Digital CC&CV DC Power Supply(120V 10A)	N/A	N/A
13	6 1/2 Digital Multimeter	Oct 18, 2012	Oct 17, 2013
14	Digital Multimeter	Oct 18, 2012	Oct 17, 2013
15	Temperature Recorder+Thermocouple	Nov 20, 2012	Nov 19, 2013
16	Timer Controller	Nov 20, 2012	Nov 19, 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 a 1.6m 4Π geometry integrating sphere. Temperature is measured at a position inside the sphere. Spectral radiant flux measurements are made using Lab sphere 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 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 Photometric and Electrical Measurement (GoniPhotometer Method)

A Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample; the photometric distance is 24m. Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to be stable before measurement was made. Electrical measurements including voltage, current, power and power factor were measured using the Power Analyzer

Before each measurement, the method below should be used to determine the lamp is stable or not.

Step 1 Take 3 measurements of the lamp intensity 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.

Some graphics were created with Photometric Plus software.

### 2.3 Deviation from standard operating procedure

None.

### 3 – Summary of Test Result

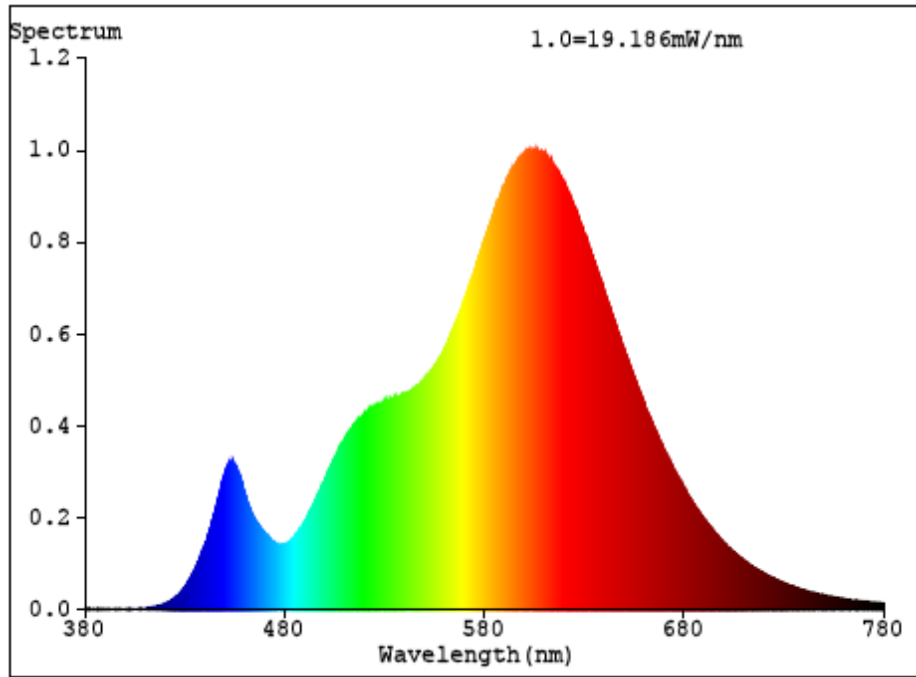
	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	857.08		NVLAP/EPA
	Luminous Efficacy (lm/w)	56.91		NVLAP/EPA
	Correlated Color Temperature (CCT)	2722		NVLAP/EPA
	Color Rendering Index– CRI	82.8		NVLAP/EPA
	Input Power (W)	15.06		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.1320		NVLAP/EPA
	Power Factor	0.9502		NVLAP/EPA
	x(CIE 1931)	0.4620		NVLAP/EPA
	y(CIE 1931)	0.4173		NVLAP/EPA
	u' (CIE 1976)	0.2609		NVLAP/EPA
	v' (CIE 1976)	0.5302		NVLAP/EPA
	Duv(CIE 1976)	0.0023		NVLAP/EPA
	Beam Angle: (Degree)	37.8		NVLAP/EPA
	Center beam candlepower: (cd)	1294		NVLAP/EPA
	Zonal lumen density (0-60°):	92.7%		NVLAP/EPA
	Zonal lumen density (60-90°):	7.3%		NVLAP/EPA
	Zonal lumen density (90-120°):	0%		NVLAP/EPA
Zonal lumen density (120-180°):	0%		NVLAP/EPA	

	CRI (R1)	82	NVLAP/EPA
	CRI (R2)	92	NVLAP/EPA
	CRI (R3)	95	NVLAP/EPA
	CRI (R4)	82	NVLAP/EPA
	CRI (R5)	82	NVLAP/EPA
	CRI (R6)	93	NVLAP/EPA
	CRI (R7)	81	NVLAP/EPA
	CRI (R8)	55	NVLAP/EPA
	CRI (R9)	2	NVLAP/EPA
	CRI (R10)	83	NVLAP/EPA
	CRI (R11)	84	NVLAP/EPA
	CRI (R12)	77	NVLAP/EPA
	CRI (R13)	84	NVLAP/EPA
	CRI (R14)	98	NVLAP/EPA

**Lumen summary:**

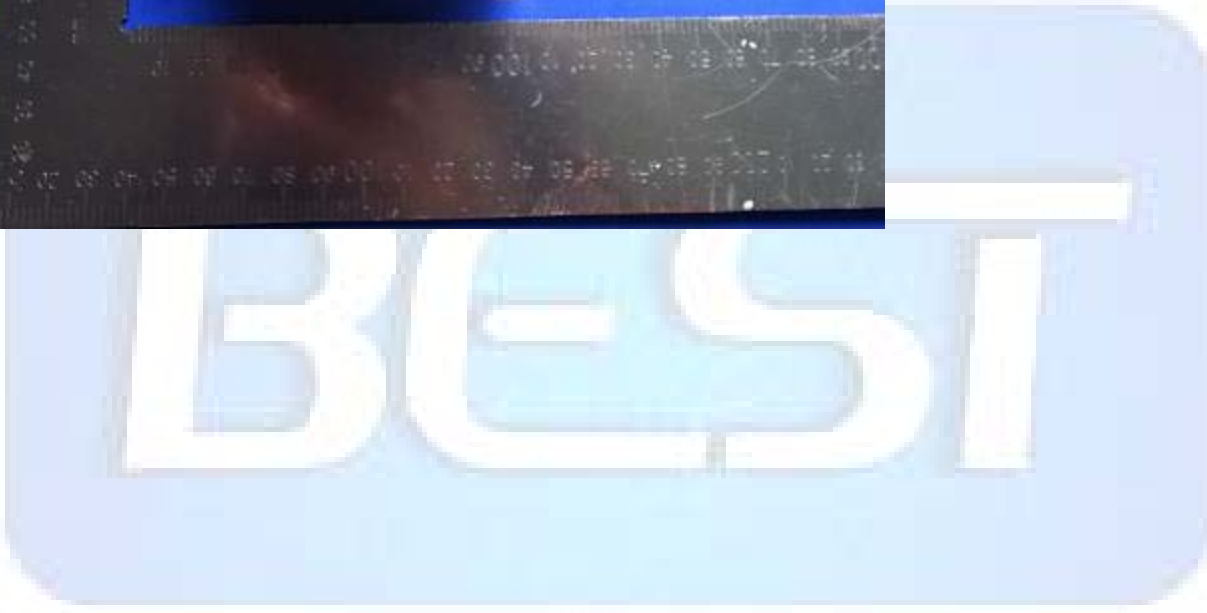
[OTHER]	Gamma(deg)	Fz(lm)	Ft(lm)	%Lum	%Lamp
[OTHER]	0- 10	111.13	111.13	12.97	12.97
[OTHER]	10- 20	226.25	337.39	39.36	39.36
[OTHER]	20- 30	198.97	536.36	62.58	62.58
[OTHER]	30- 40	131.44	667.80	77.92	77.92
[OTHER]	40- 50	78.31	746.11	87.05	87.05
[OTHER]	50- 60	48.79	794.90	92.74	92.74
[OTHER]	60- 70	34.14	829.04	96.73	96.73
[OTHER]	70- 80	21.38	850.42	99.22	99.22
[OTHER]	80- 90	6.64	857.06	100.00	100.00
[OTHER]	90-100	0.02	857.08	100.00	100.00
[OTHER]	100-110	0.00	857.08	100.00	100.00
[OTHER]	110-120	0.00	857.08	100.00	100.00
[OTHER]	120-130	0.00	857.08	100.00	100.00
[OTHER]	130-140	0.00	857.08	100.00	100.00
[OTHER]	140-150	0.00	857.08	100.00	100.00
[OTHER]	150-160	0.00	857.08	100.00	100.00
[OTHER]	160-170	0.00	857.08	100.00	100.00
[OTHER]	170-180	0.00	857.08	100.00	100.00

## 4 – Spectral Flux Plots





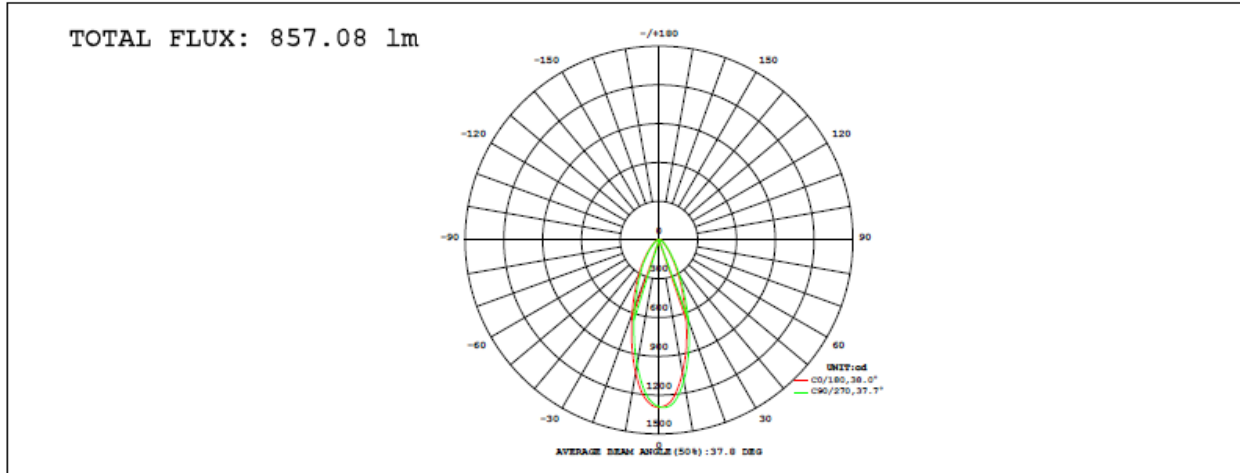
## 5 – EUT Photos



## 6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

### LAMP PHOTOMETRIC REPORT

Electrical: Voltage:120.0V Current:0.1320A Power:15.06W Factor:0.9502		
MODEL: 14.5PAR30SNG3DIM/827FL40		
POWER: 14.5W	VOLTAGE: 120V	WORKING VOLTAGE: 120.0V
MANUFACTURER: Green Creative		Eff.: 56.91 lm/W



γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%
10	1044	985.8	977.5	1007	1044	1070	1105	1108	0- 10	111.1	111.1	13
20	612.2	561.7	551.3	572.8	600.2	625.0	660.1	673.1	10- 20	226.3	337.4	39.4
30	317.6	297.8	281.1	276.6	283.3	294.9	315.9	331.7	20- 30	199.0	536.4	62.6
40	158.7	152.5	139.5	129.2	127.4	130.3	142.3	156.8	30- 40	131.4	667.8	77.9
50	80.14	77.81	70.40	64.42	64.07	65.40	70.02	77.30	40- 50	78.31	746.1	87.1
60	46.16	45.09	42.55	39.94	39.04	39.75	41.79	45.04	50- 60	48.79	794.9	92.7
70	29.80	28.68	27.25	25.65	25.06	25.55	26.94	28.89	60- 70	34.14	829.0	96.7
80	15.17	13.94	12.48	11.15	11.16	12.05	13.39	14.70	70- 80	21.38	850.4	99.2
90	0.9503	0.2557	0.0062	0	0	0	0.3581	1.094	80- 90	6.639	857.1	100
100	0	0	0	0	0	0	0	0	90-100	0.0218	857.1	100
110	0	0	0	0	0	0	0	0	100-110	0	857.1	100
120	0	0	0	0	0	0	0	0	110-120	0	857.1	100
130	0	0	0	0	0	0	0	0	120-130	0	857.1	100
140	0	0	0	0	0	0	0	0	130-140	0	857.1	100
150	0	0	0	0	0	0	0	0	140-150	0	857.1	100
160	0	0	0	0	0	0.0000	0	0.0000	150-160	0.0000	857.1	100
170	0.0060	0.0074	0.0070	0.0076	0.0074	0.0070	0.0063	0.0052	160-170	0.0008	857.1	100
180	0	0	0	0	0	0	0	0	170-180	0.0005	857.1	100
DEG	LUMINOUS INTENSITY:cd								UNIT:lm			

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:25.2DEG  
 Operators:David

γ Range: 0 - 180DEG  
 γ Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.265  
 Humidity:62.7%  
 Test Distance:2.456m [K=1.0000]

LUMINOUS DISTRIBUTION INTENSITY DATA

Electrical: Voltage:120.0V Current:0.1320A Power:15.06W Factor:0.9502		
MODEL: 14.5PAR30SNG3DIM/827FL40		
POWER: 14.5W	VOLTAGE: 120V	WORKING VOLTAGE: 120.0V
MANUFACTURER: Green Creative		Eff.: 56.91 lm/W

Table--1

UNIT: cd

C (DEG) y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1294	1293	1293	1292	1290	1290	1289	1289	1294	1293	1293	1292	1290	1290	1289	1289			
5	1231	1213	1201	1193	1192	1195	1203	1211	1231	1240	1250	1260	1266	1267	1261	1248			
10	1044	1010	986	975	978	991	1007	1020	1044	1056	1070	1088	1105	1114	1108	1084			
15	820	783	757	747	751	767	785	798	820	832	848	867	888	902	895	866			
20	612	583	562	550	551	560	573	581	600	610	625	642	660	675	673	651			
25	445	426	412	401	397	399	403	407	419	426	437	451	465	479	480	469			
30	318	308	298	288	281	278	277	277	283	287	295	305	316	327	332	329			
35	229	224	217	208	200	194	191	189	192	194	198	205	214	223	230	233			
40	159	157	152	146	139	133	129	126	127	128	130	135	142	150	157	160			
45	113	112	109	104	99.0	93.7	90.3	88.1	88.9	89.0	90.4	93.3	98.1	104	109	113			
50	80.1	79.9	77.8	74.5	70.4	66.7	64.4	63.6	64.1	64.4	65.4	67.2	70.0	73.8	77.3	80.0			
55	59.2	59.1	57.8	55.5	53.1	50.9	49.5	48.5	48.9	49.3	49.9	51.2	52.9	55.1	57.3	58.7			
60	46.2	46.0	45.1	44.1	42.5	41.0	39.9	38.9	39.0	39.2	39.7	40.7	41.8	43.3	45.0	46.1			
65	37.4	37.1	36.3	35.7	34.5	33.4	32.5	31.5	31.7	31.8	32.2	33.0	33.8	34.9	36.4	37.3			
70	29.8	29.5	28.7	28.2	27.3	26.3	25.6	24.8	25.1	25.3	25.6	26.2	26.9	27.8	28.9	29.7			
75	22.6	22.2	21.5	20.9	20.1	19.2	18.7	18.1	18.4	18.8	19.2	19.8	20.4	21.2	22.0	22.6			
80	15.2	14.7	13.9	13.3	12.5	11.7	11.2	10.8	11.2	11.6	12.0	12.7	13.4	14.1	14.7	15.2			
85	7.57	7.16	6.56	5.94	5.30	4.67	4.21	4.02	4.49	4.87	5.28	5.88	6.48	7.02	7.40	7.74			
90	0.95	0.70	0.26	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.36	0.80	1.09	1.25			
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
170	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:25.2DEG  
 Operators:David

y Range: 0 - 180DEG  
 y Interval: 1.0DEG  
 Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.265  
 Humidity:62.7%  
 Test Distance:2.456m [K=1.0000]