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

Feb 27, 2013

Product Name:	B11
Model No:	01-717-D/827;01-718-D/827
Test Engineer:	David Zhang
Report No.:	BTR66.181.13.269.01
Sample Received Date:	Feb 22, 2013
Test Performed Date:	Feb 22, 2013 to Feb 26, 2013
Reviewed By:	Steven Hsu
Prepared By:	**BEST Test Service Shenzhen Co., Ltd.** 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

NVLAP LAB CODE 200770-0

Efficient Lighting Initiative

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Applicant	:	Green Creative Ltd.
Product Name	:	B11
Model No	:	01-717-D/827;01-718-D/827
Brand	:	GREEN CREATIVE
SKU	:	T.B.D
12 NC Code	:	T.B.D
Nominal Operation Voltage	:	AC 120V/60Hz
Nominal Power	:	5W
Nominal CCT	:	2700K
Nominal CRI	:	83
Nominal Lumen Output	:	250 Lumens
Nominal Life Time	:	30000Hours
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	:	2.5 Hours
Nominal Shape of Bulb(Designation)	:	☒Standard ☐Non Standard ☐Omnidirectional A, BT, P, PS, S, T ☒ Decorative B, BA, C, CA, DC, F, G ☐ Directional PAR30
Date of Receiving Sample	:	Feb 22, 2013
Measurement quantities measured	:	1 pcs
Orientation During Testing	:	Base Up
Test Requested	:	Electrical and Photometric Test; Luminous Intensity Distribution Test

(Note: 01-717-D/827 and 01-718-D/827 are the same except exterior color. Here we select 01-717-D/827 as representative to be tested and 01-718-D/827 shares the performance data)

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, Shiyan, 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, 2012	Mar 09, 2013
Spectro Meter Assy	Labsphere	CDS 2100	217101416	Mar 10, 2012	Mar 09, 2013
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℃ ±1℃ 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 ±1.12% over the wavelength range 350-1050 nm.

2.2 Photometric and Electrical Measurement (GonioPhotometer Method)

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.

A Everfine GOR-5000 Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample; the photometric distance is 2.436m. 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 YOKOGAWA WT210 Power Analyzer.

Some graphics were created with Photometric Plus software.

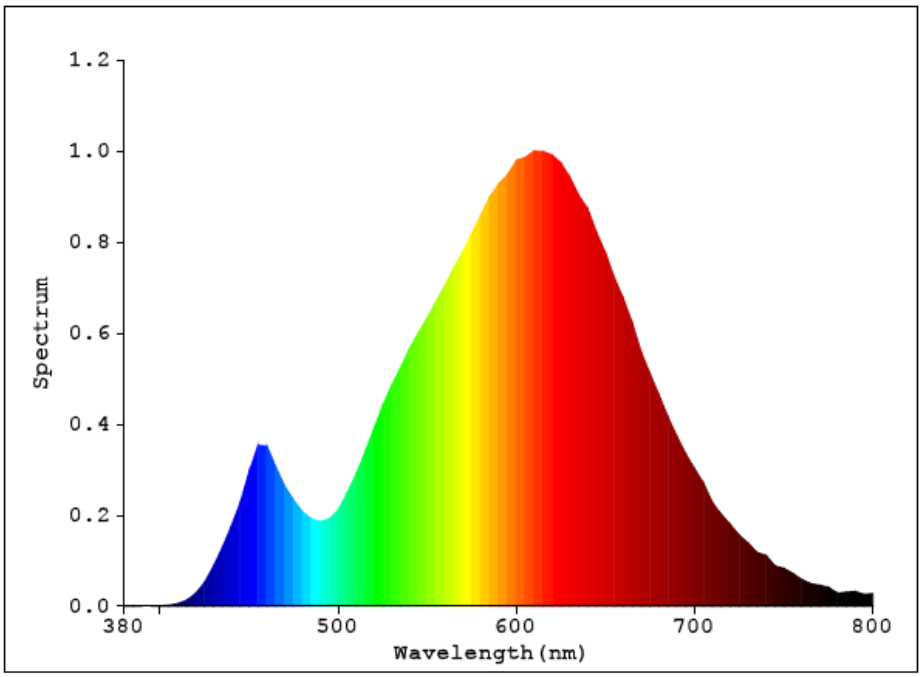
2.3 Deviation from standard operating procedure

None

3 – Summary of Test Result

	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	230.50		NVLAP/EPA
	Luminous Efficacy (lm/w)	47.64		NVLAP/EPA
	Correlated Color Temperature (CCT)	2746		NVLAP/EPA
	Color Rendering Index– CRI	83.5		NVLAP/EPA
	Input Power (W)	4.84		NVLAP/EPA
Optional Fields	Power Type	☒AC	☐DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.0546		NVLAP/EPA
	Power Factor	0.7378		NVLAP/EPA
	x(CIE 1931)	0.4562		NVLAP/EPA
	y(CIE 1931)	0.4099		NVLAP/EPA
	u' (CIE 1976)	0.2605		NVLAP/EPA
	v' (CIE 1976)	0.5265		NVLAP/EPA
	Duv(CIE 1976)	0.0001		NVLAP/EPA
	R9	26		NVLAP/EPA
	Beam Angle: (Degree)	273.8		NVLAP/EPA
	Center beam candlepower: (cd)	27.11		NVLAP/EPA
	Zonal lumen density (0-60°):	19.6%		NVLAP/EPA
	Zonal lumen density (60-90°):	33.1%		NVLAP/EPA
	Zonal lumen density (90-120°):	32.6%		NVLAP/EPA
	Zonal lumen density (120-180°):	14.7%		NVLAP/EPA

4 – Spectral Flux Plots



5 – EUT Photos

6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

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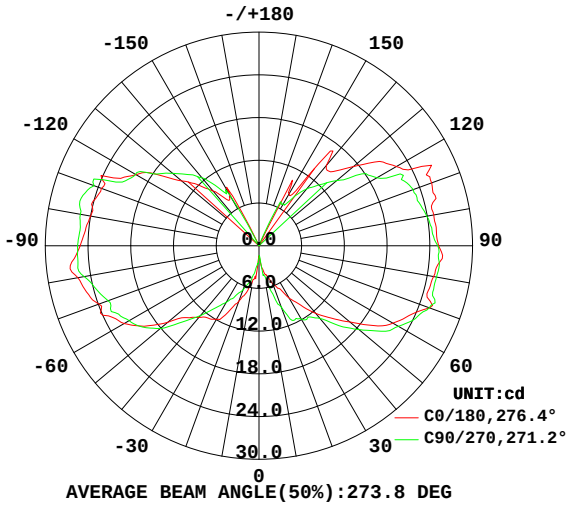
LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

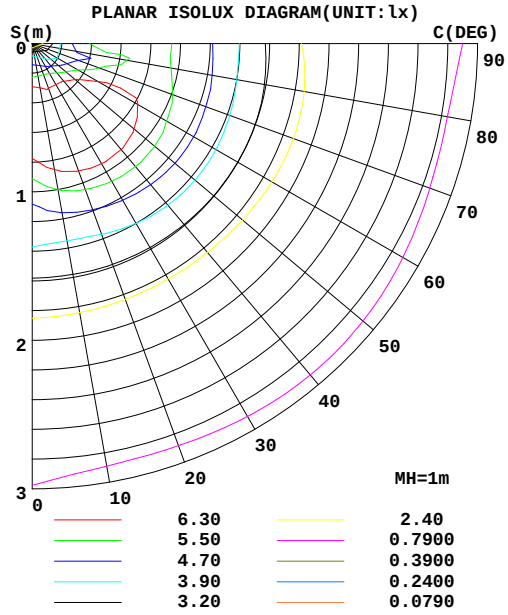
DATA OF LAMP		PHOTOMETRIC DATA		Eff: 47.64 lm/W	
MODEL	01-717-D/827	Imax(cd)	27.11	S/MH(C0/180)	5.67
NOMINAL POWER(W)	5	LOR(%)	100.0	S/MH(C90/270)	5.35
RATED VOLTAGE(V)	120	TOTAL FLUX(lm)	230.50	η UP,DN(C0-180)	23.4,25.4
NOMINAL FLUX(lm)	230.503	CIE CLASS	DIFFUSE	η UP,DN(C180-360)	23.9,27.3
LAMPS INSIDE	1	η up(%)	47.3	CIBSE SHR NOM	1.50
TEST VOLTAGE(V)	120.0	η down(%)	52.7	CIBSE SHR MAX	1.55

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):273.8 DEG

PLANAR ISOLUX DIAGRAM(UNIT:lx)



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

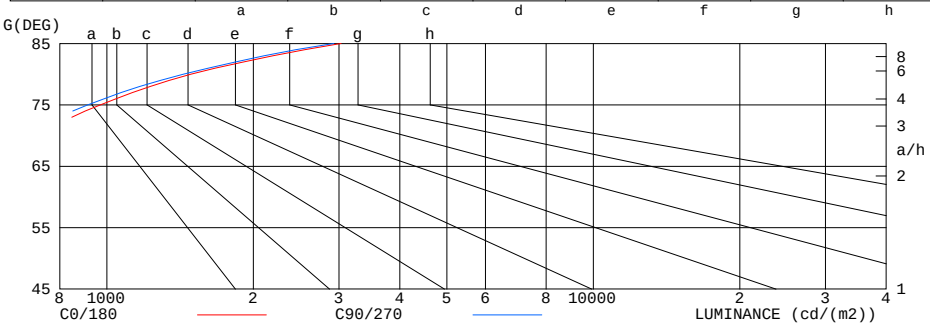
ZONAL FLUX DIAGRAM
AND LUMINANCE LIMITATION CURVES

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	4.811	5.095	4.041	4.043	3.575	4.807	4.266	4.772	0- 10	0.3169	0.3169	0.14,0.14
20	8.271	7.900	6.629	6.459	5.754	7.468	9.155	8.942	10- 20	1.698	2.015	0.87,0.87
30	11.94	11.46	9.149	11.11	8.534	11.53	11.86	13.53	20- 30	4.240	6.255	2.71,2.71
40	13.15	14.72	12.79	13.77	12.40	15.29	13.32	16.59	30- 40	7.893	14.15	6.14,6.14
50	16.73	18.71	18.10	16.98	16.67	18.67	18.32	19.35	40- 50	12.67	26.82	11.6,11.6
60	21.85	21.75	21.06	21.94	21.73	22.49	22.64	23.49	50- 60	18.40	45.22	19.6,19.6
70	23.92	22.97	22.55	23.58	25.51	25.90	25.46	25.80	60- 70	23.42	68.64	29.8,29.8
80	25.84	24.08	24.95	24.88	24.90	26.22	25.31	26.75	70- 80	25.75	94.39	41,41
90	25.11	24.77	25.50	25.62	25.22	26.44	25.11	27.07	80- 90	27.13	121.5	52.7,52.7
100	24.02	24.46	25.48	25.07	24.92	25.50	23.93	25.35	90-100	26.68	148.2	64.3,64.3
110	23.56	25.08	24.65	26.05	25.82	25.49	23.07	24.92	100-110	25.57	173.8	75.4,75.4
120	19.99	20.92	20.04	21.96	22.27	22.51	19.14	21.09	110-120	22.80	196.6	85.3,85.3
130	14.19	13.91	15.86	16.09	17.34	15.35	14.24	17.03	120-130	16.41	213.0	92.4,92.4
140	10.05	8.207	12.49	9.544	14.73	7.729	10.44	13.91	130-140	10.10	223.1	96.8,96.8
150	7.951	4.787	8.407	7.462	8.509	5.563	6.820	8.766	140-150	6.089	229.2	99.4,99.4
160	0.2627	0.3045	0.2809	0.3607	0.3823	0.4069	0.3749	0.3152	150-160	1.260	230.4	100,100
170	0.0135	0	0	0	0.1032	0.1565	0.1460	0.1599	160-170	0.0673	230.5	100,100
180	0	0	0	0	0	0	0	0	170-180	0.0015	230.5	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

LUMINANCE LIMITATION CURVES

GLARE	CLASS	ILLUMINANCE (lx)							
1.15	A	2000	1000	500	<=300				
1.50	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.20	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	3030	2928
80	1488	1437
75	969	913
70	699	659
65	552	527
60	437	421
55	344	347
50	260	282
45	202	214

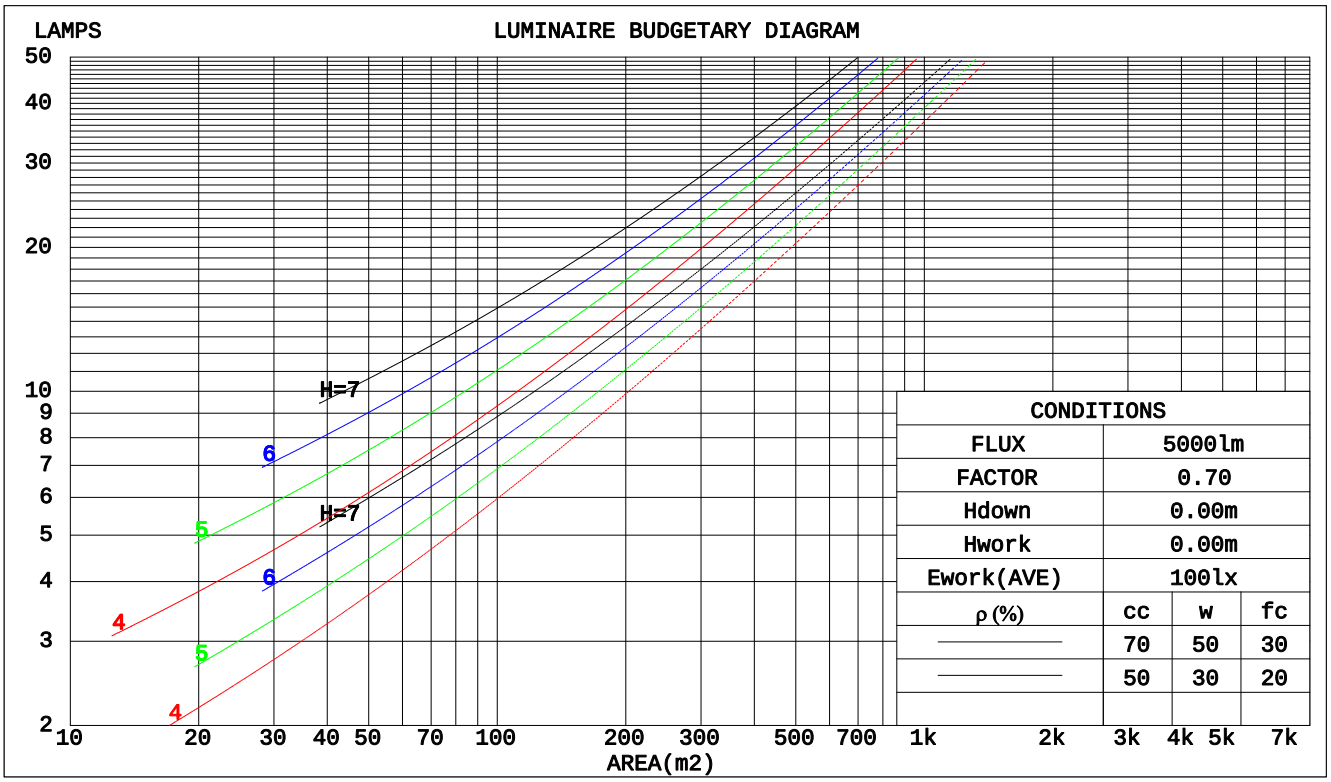
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio			Coefficients of Utilization(CU)												
0.0	1.08	1.08	1.08	.00	.00	.00	.85	.85	.85	.71	.71	.71	.59	.59	.59	.53
1.0	.85	.79	.73	.78	.73	.68	.65	.61	.57	.53	.50	.47	.42	.40	.37	.32
2.0	.71	.62	.55	.65	.57	.51	.54	.48	.42	.43	.39	.34	.34	.30	.27	.22
3.0	.60	.51	.43	.55	.47	.40	.45	.39	.33	.36	.31	.26	.28	.24	.20	.16
4.0	.52	.42	.35	.48	.39	.32	.39	.32	.26	.31	.26	.21	.24	.19	.16	.12
5.0	.46	.36	.29	.42	.33	.26	.34	.27	.22	.27	.22	.17	.21	.16	.13	.09
6.0	.40	.31	.24	.37	.28	.22	.30	.23	.18	.24	.18	.14	.18	.14	.10	.07
7.0	.36	.27	.20	.33	.25	.19	.27	.20	.15	.22	.16	.12	.16	.12	.09	.06
8.0	.32	.24	.17	.30	.22	.16	.24	.18	.13	.20	.14	.10	.15	.11	.07	.05
9.0	.29	.21	.15	.27	.19	.14	.22	.16	.11	.18	.13	.09	.14	.09	.06	.04
10.0	.27	.19	.13	.24	.17	.12	.20	.14	.10	.16	.11	.08	.13	.09	.06	.03



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

WEC AND CCEC

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coeffcients(WEC)									
0.0																
1.0	.448	.255	.081	.427	.243	.077	.386	.221	.071	.348	.201	.064	.314	.182	.059	
2.0	.368	.202	.062	.348	.192	.059	.311	.173	.054	.277	.155	.049	.245	.139	.044	
3.0	.318	.169	.051	.300	.160	.048	.265	.144	.044	.234	.128	.039	.205	.113	.035	
4.0	.280	.146	.043	.264	.138	.041	.233	.123	.037	.204	.109	.033	.177	.096	.029	
5.0	.251	.128	.037	.236	.121	.035	.208	.108	.032	.181	.095	.028	.156	.083	.025	
6.0	.228	.114	.033	.214	.108	.031	.188	.096	.028	.163	.085	.025	.140	.074	.022	
7.0	.209	.103	.029	.196	.097	.028	.171	.087	.025	.148	.076	.022	.127	.066	.019	
8.0	.192	.094	.026	.180	.089	.025	.157	.079	.022	.136	.069	.020	.116	.060	.017	
9.0	.178	.086	.024	.167	.081	.023	.146	.072	.020	.126	.063	.018	.107	.054	.016	
10.0	.166	.080	.022	.156	.075	.021	.136	.067	.019	.117	.058	.017	.100	.050	.014	

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.551	.551	.551	.471	.471	.471	.321	.321	.321	.185	.185	.185	.059	.059	.059	
1.0	.553	.518	.487	.473	.445	.419	.324	.306	.290	.186	.177	.168	.060	.057	.054	
2.0	.548	.497	.454	.469	.428	.393	.322	.296	.274	.185	.172	.161	.060	.056	.052	
3.0	.541	.482	.435	.464	.416	.377	.319	.289	.265	.184	.169	.156	.059	.055	.051	
4.0	.534	.471	.423	.458	.407	.367	.315	.284	.259	.182	.166	.153	.059	.054	.050	
5.0	.526	.462	.415	.452	.400	.361	.311	.279	.255	.180	.164	.151	.058	.053	.050	
6.0	.519	.455	.409	.446	.394	.356	.308	.276	.252	.178	.162	.150	.058	.053	.049	
7.0	.512	.449	.404	.440	.389	.352	.304	.273	.250	.177	.161	.149	.057	.053	.049	
8.0	.505	.443	.401	.435	.385	.350	.301	.270	.248	.175	.159	.148	.057	.052	.049	
9.0	.499	.439	.399	.429	.381	.348	.298	.268	.247	.173	.158	.147	.056	.052	.049	
10.0	.493	.435	.397	.425	.378	.346	.295	.266	.246	.172	.157	.147	.056	.052	.049	

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

Uncorrected UGR Table

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

ceiling/cavity	0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
walls	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions	Viewed crosswise					Viewed endwise				
x = 2H y = 2H	6.5	7.6	7.3	8.5	9.7	6.6	7.8	7.4	8.6	9.8
3H	10.2	11.3	11.1	12.2	13.3	10.1	11.1	10.9	12.0	13.2
4H	12.2	13.2	13.1	14.2	15.3	12.0	13.0	12.9	13.9	15.1
6H	14.5	15.5	15.4	16.4	17.6	14.2	15.2	15.1	16.1	17.3
8H	15.8	16.7	16.7	17.7	18.9	15.5	16.5	16.4	17.4	18.6
12H	17.3	18.1	18.2	19.1	20.3	17.0	17.9	17.9	18.8	20.0
4H 2H	7.7	8.7	8.6	9.6	10.8	7.8	8.8	8.6	9.7	10.9
3H	11.3	12.2	12.2	13.2	14.4	11.2	12.1	12.1	13.0	14.3
4H	13.4	14.2	14.4	15.2	16.4	13.2	14.0	14.2	15.0	16.2
6H	15.8	16.5	16.8	17.5	18.8	15.6	16.3	16.5	17.3	18.5
8H	17.2	17.9	18.2	18.9	20.1	16.9	17.6	17.9	18.6	19.9
12H	18.7	19.4	19.7	20.4	21.6	18.5	19.1	19.4	20.1	21.4
8H 4H	14.2	14.8	15.1	15.8	17.1	14.0	14.7	15.0	15.7	16.9
6H	16.8	17.4	17.7	18.4	19.6	16.6	17.2	17.6	18.2	19.5
8H	18.3	18.8	19.3	19.8	21.1	18.1	18.6	19.1	19.6	20.9
12H	20.0	20.5	21.0	21.5	22.8	19.8	20.2	20.8	21.2	22.6
12H 4H	14.4	15.0	15.3	16.0	17.3	14.2	14.9	15.2	15.9	17.1
6H	17.1	17.6	18.1	18.6	19.9	16.9	17.4	17.9	18.5	19.8
8H	18.7	19.2	19.7	20.2	21.5	18.5	19.0	19.5	20.0	21.3

Variations with the observer position at spacings:		
S = 1.0H	+ 0.1 / - 0.1	+ 0.1 / - 0.1
1.5H	+ 0.2 / - 0.2	+ 0.2 / - 0.3
2.0H	+ 0.3 / - 0.4	+ 0.3 / - 0.4

CIE Pub.117 Corrected 230.5 lm Total Lamp Luminous Flux.(8log(F/F0) = -5.1)

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

UTILIZATION FACTORS TABLE

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

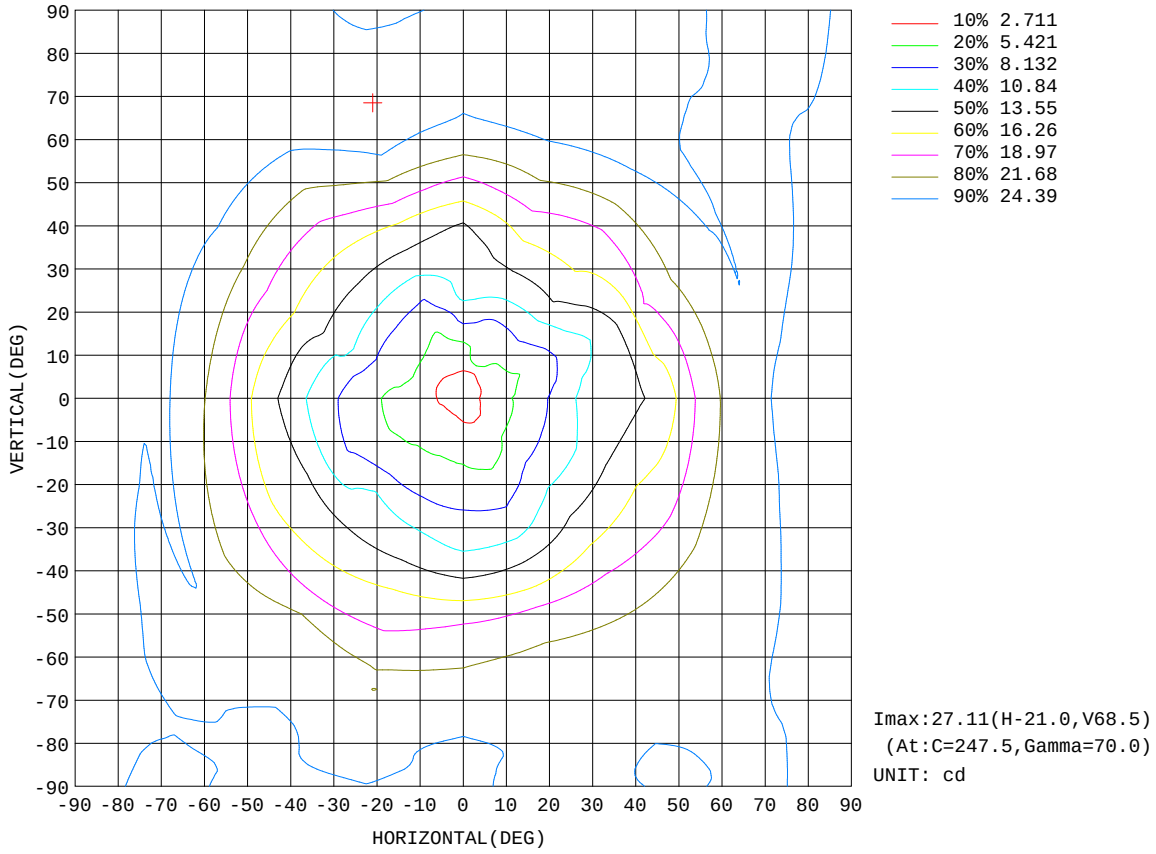
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	34	20	13	32	19	12	29	18	11	4
0.80	42	27	18	39	26	18	35	23	16	7
1.00	49	34	24	46	32	23	40	31	21	9
1.25	56	41	31	52	38	29	45	34	26	12
1.50	61	46	36	57	44	34	49	38	30	15
2.00	69	55	45	64	52	42	55	45	37	19
2.50	75	62	52	69	58	48	59	50	42	23
3.00	79	67	57	73	62	54	62	54	47	26
4.00	85	74	66	78	69	61	66	59	53	30
5.00	88	79	71	82	73	67	69	63	57	33
ROOM INDEX	UF(total)									Direct
According to DIN EN 13032-2 2004				Suspended					SHRNOM = 1.25	

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

ISOCANDELA DIAGRAM

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:



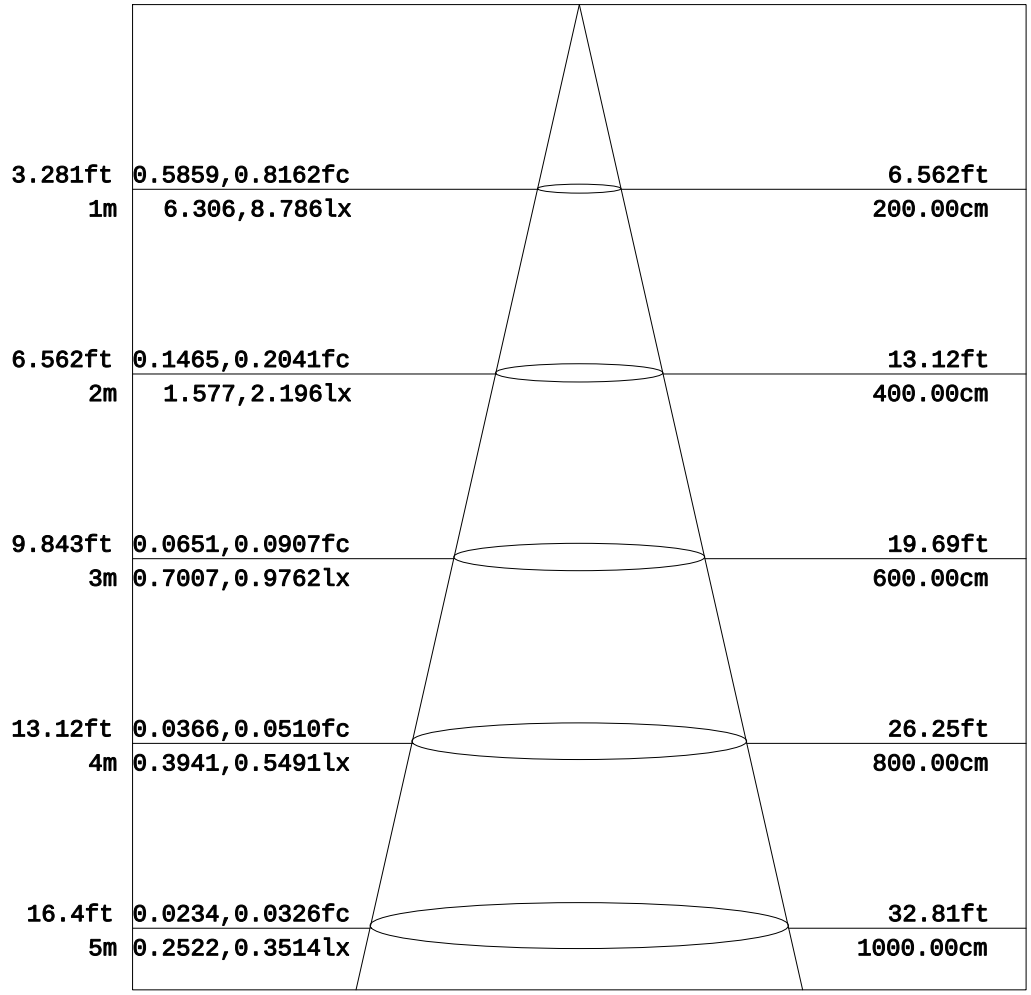
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

AAI Figure

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

Flux out:19.81 lm



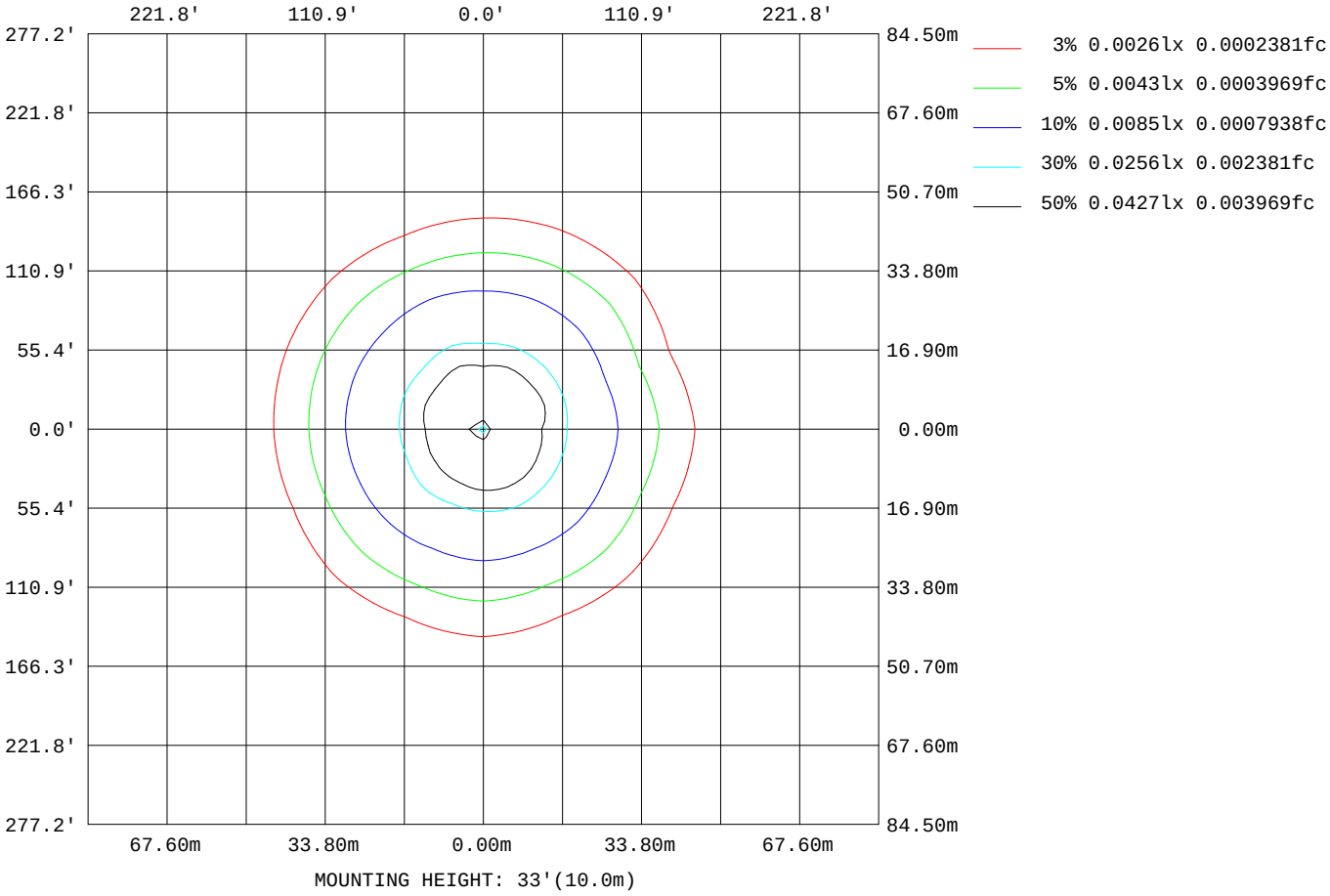
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

ISOLUX DIAGRAM

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

Average Luminance Table(CIBSE)

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

Parameter description for average Luminance	Symbol	Value	Unit
Luminance in Azimuth Plane	Bc	refer Table 2	cd/sq.m.
Intensity at angle Gamma in given azimuth plane	I	from data	cd/klm
Number of lamps	N	1	
Output of each lamp(initial lumens as specified)	F	230.503	lm
Multiplying factor	K	1	
Luminous area in horizontal plane used in calculations	A	0.1	sq.m.
Angle to the downward vertical from light centre	Gamma	from data	deg

Table 1. Calculation parameters for determination of CIBSE LG3:1996 Average Luminance

G	C plane(deg)																		
deg	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
55	344	355	363	368	370	372	374	372	364	356	359	362	358	350	348	350	350	345	341
60	437	444	448	451	452	455	458	457	446	437	443	451	451	447	442	439	436	435	435
65	552	553	557	565	573	579	580	575	562	550	556	564	564	559	556	555	554	551	550
70	699	670	659	675	701	713	708	701	700	702	707	713	718	722	725	728	733	741	746
75	969	901	870	892	937	957	945	934	940	944	929	917	928	950	959	951	944	947	950
80	1488	1373	1321	1356	1430	1459	1433	1415	1433	1447	1411	1377	1401	1450	1469	1452	1434	1432	1434
85	3030	2771	2651	2728	2887	2937	2859	2810	2868	2920	2849	2776	2810	2894	2935	2921	2907	2919	2930

Table 2. Average Luminance(cd/sq.m.) for defined C plane,Gamma angle

CIBSE Category	Gamma (deg)	Average Luminance		Patch Luminance	
		maximum calculated	specified maximum	maximum measured	specified maximum
Category 1	55 to 90	3030	200	---	500
Category 2	65 to 90	3030	200	---	500
Category 3	75 to 90	3030	200	---	500

Table 3. Tabulation of Average and Patch Luminance(cd/sq.m.) for defined CIBSE categories

No match

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

Average Luminance Table(CIBSE)

Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

Parameter description for average Luminance	Symbol	Value	Unit
Luminance in Azimuth Plane	Bc	refer Table 2	cd/sq.m.
Intensity at angle Gamma in given azimuth plane	I	from data	cd/klm
Number of lamps	N	1	
Output of each lamp(initial lumens as specified)	F	230.503	lm
Multiplying factor	K	1	
Luminous area in horizontal plane used in calculations	A	0.1	sq.m.
Angle to the downward vertical from light centre	Gamma	from data	deg

Table 1. Calculation parameters for determination of CIBSE LG3:2001 Average Luminance

G	C plane(deg)																		
deg	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
55	344	355	363	368	370	372	374	372	364	356	359	362	358	350	348	350	350	345	341
60	437	444	448	451	452	455	458	457	446	437	443	451	451	447	442	439	436	435	435
65	552	553	557	565	573	579	580	575	562	550	556	564	564	559	556	555	554	551	550
70	699	670	659	675	701	713	708	701	700	702	707	713	718	722	725	728	733	741	746
75	969	901	870	892	937	957	945	934	940	944	929	917	928	950	959	951	944	947	950
80	1488	1373	1321	1356	1430	1459	1433	1415	1433	1447	1411	1377	1401	1450	1469	1452	1434	1432	1434
85	3030	2771	2651	2728	2887	2937	2859	2810	2868	2920	2849	2776	2810	2894	2935	2921	2907	2919	2930

Table 2. Average Luminance(cd/sq.m.) for defined C plane,Gamma angle

range (deg)	Maximum measured	Average Luminance(cd/sq.m) Maximum limit for screen type & software category used			
		Type I,II screen Some neg.s'ware	Type I,II screen Only pos.s'ware	Type III screen Some neg.s'ware	Type III screen Only pos.s'ware
55 to 90	3030	1000	1500	200	500
65 to 90	3030	1000	1500	200	500

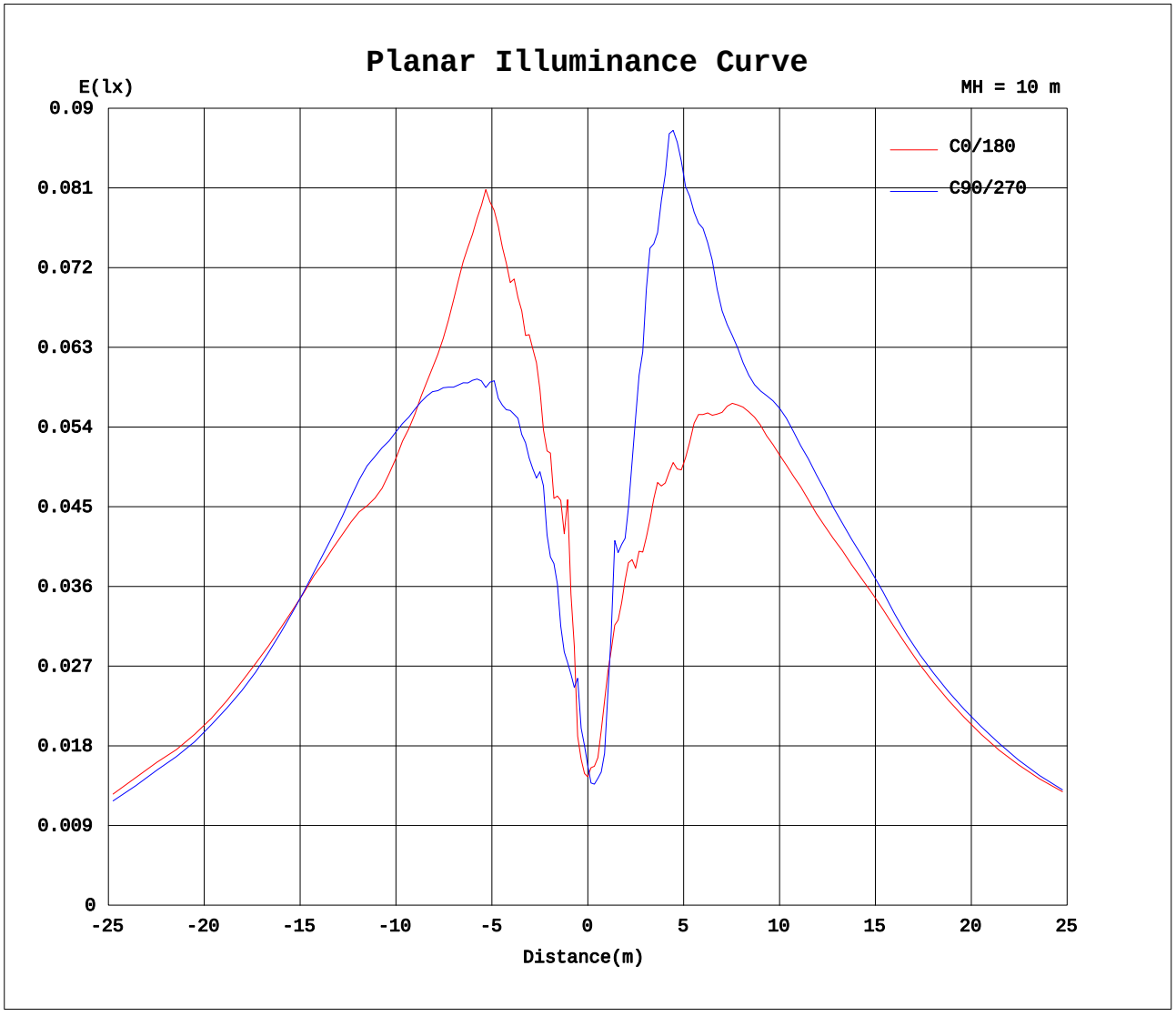
Table 3. Tabulation of average luminance(cd/sq.m.) and luminance limits

No match

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

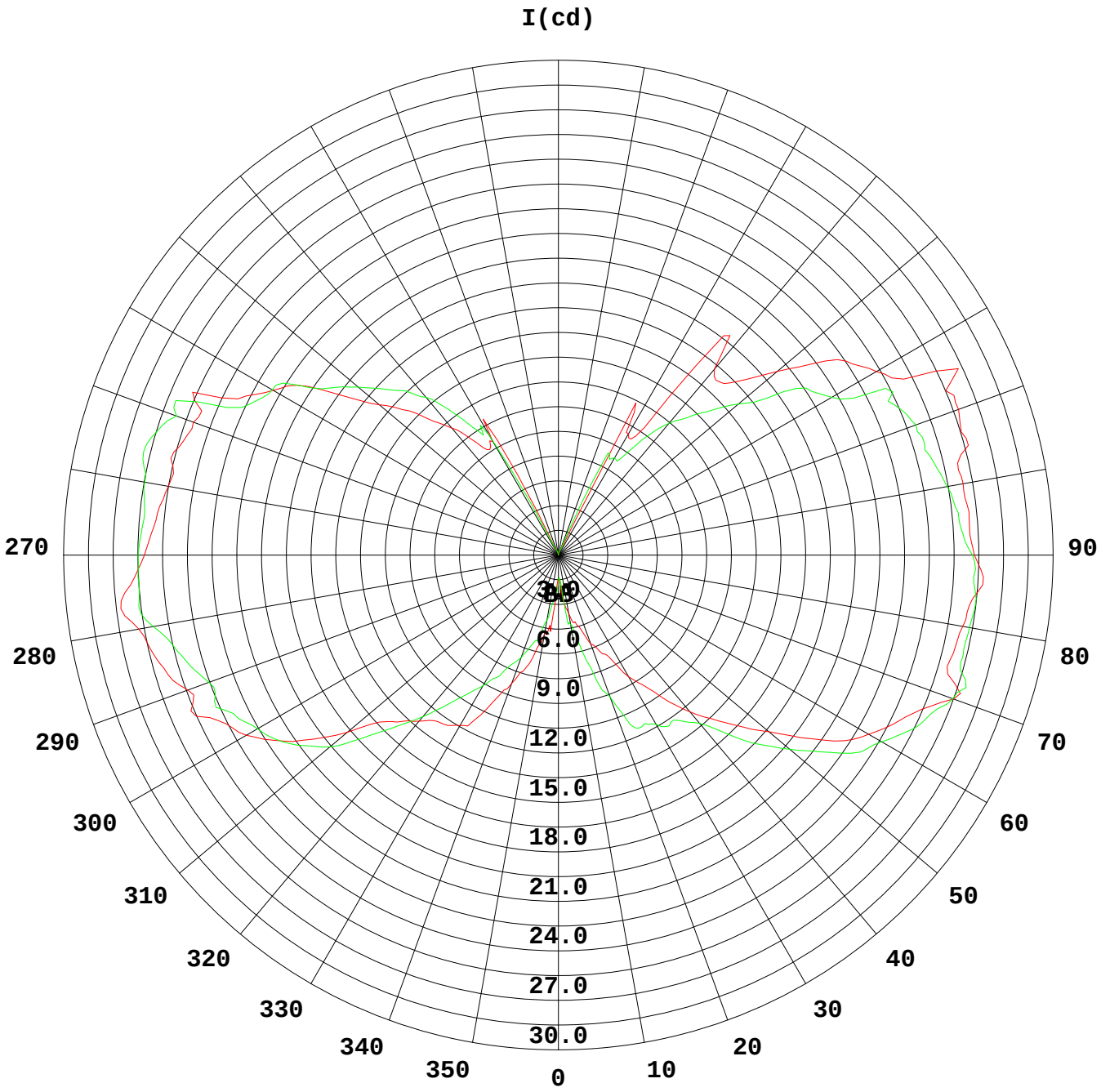
Test:U:120.0V I:0.0546A P:4.838W PF:0.7378 Lamp Flux:230.503x1 lm		
NAME:	TYPE:01-717-D/827	WEIGHT:
DIM.:	SPEC.:	SERIAL No.:
MFR.: Green Creative	SUR.:	PROTECTION ANGLE:

Table--1 UNIT: cd

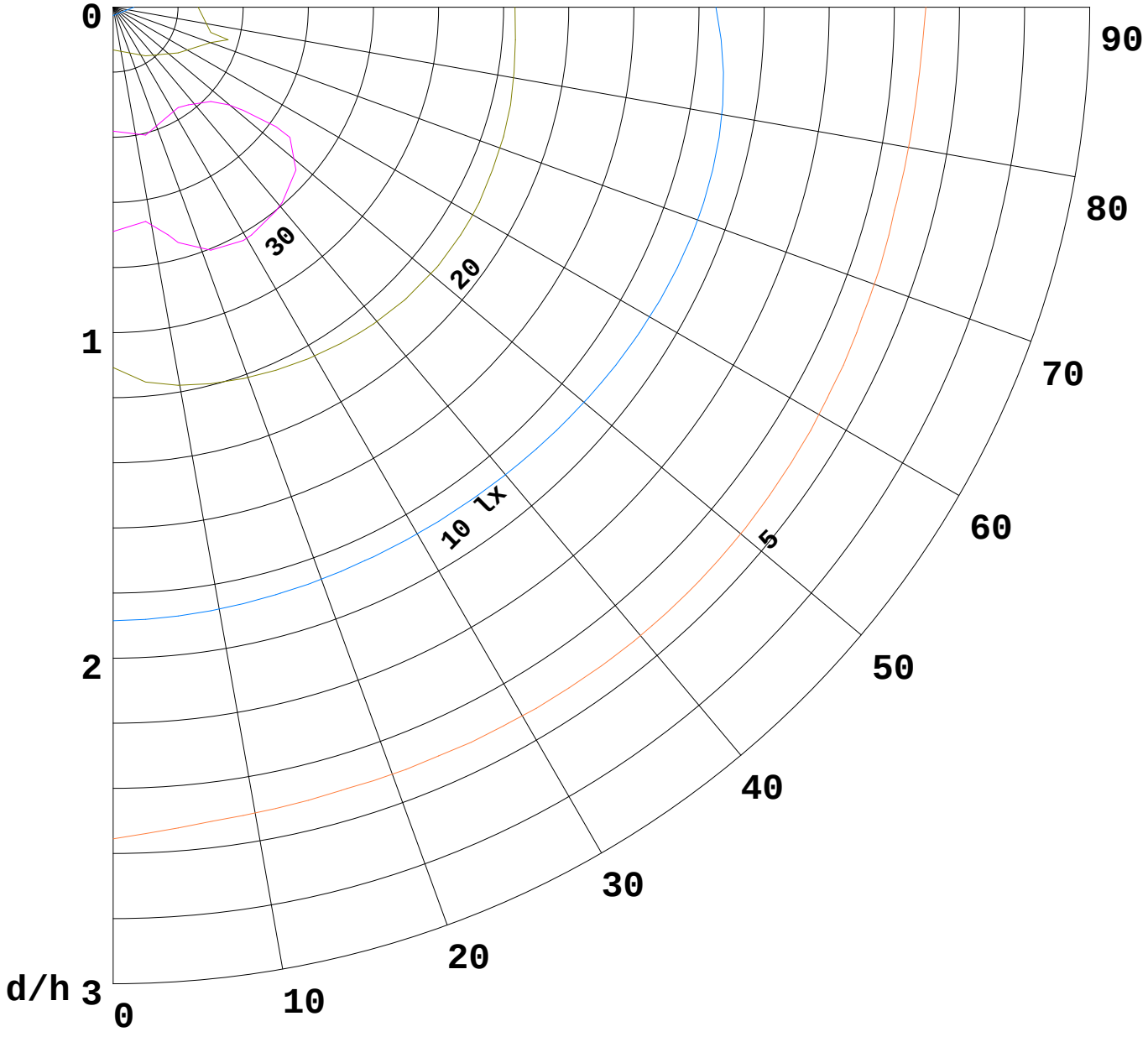
C(DEG) / γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1.45	1.47	1.51	1.55	1.58	1.61	1.60	1.57	1.45	1.47	1.51	1.55	1.58	1.61	1.60	1.57			
5	3.55	3.21	2.44	2.49	2.64	2.84	3.21	2.81	2.34	2.08	1.79	1.88	1.74	1.79	2.83	3.16			
10	4.81	4.93	5.09	3.40	4.04	4.04	4.04	3.73	3.57	4.50	4.81	4.06	4.27	7.08	4.77	4.59			
15	6.80	6.24	5.94	4.51	5.35	5.52	5.38	4.52	4.44	6.74	6.00	5.04	6.64	6.99	6.95	5.68			
20	8.27	8.20	7.90	5.97	6.63	7.00	6.46	5.93	5.75	8.05	7.47	6.40	9.15	8.48	8.94	6.60			
25	10.3	10.1	9.78	7.50	7.69	8.24	8.54	7.12	6.62	9.39	9.40	8.21	11.6	11.0	11.0	8.72			
30	11.9	11.4	11.5	9.12	9.15	10.0	11.1	8.42	8.53	11.6	11.5	10.7	11.9	12.8	13.5	10.1			
35	12.4	13.0	13.1	11.1	10.6	11.9	11.9	11.0	10.1	13.4	13.4	12.9	12.2	15.1	15.5	11.5			
40	13.1	15.1	14.7	13.5	12.8	13.7	13.8	13.7	12.4	14.7	15.3	14.9	13.3	16.8	16.6	14.0			
45	14.3	16.5	16.7	15.8	15.1	15.6	15.4	15.5	14.4	17.0	16.9	17.6	15.9	18.7	17.4	18.6			
50	16.7	17.8	18.7	18.6	18.1	17.2	17.0	16.5	16.7	18.7	18.7	20.4	18.3	20.8	19.3	20.3			
55	19.7	19.7	20.7	20.5	19.9	18.6	19.2	19.5	19.5	20.7	20.7	23.0	20.9	22.4	21.8	22.2			
60	21.8	21.6	21.8	22.0	21.1	20.4	21.9	20.7	21.7	23.0	22.5	24.9	22.6	23.9	23.5	23.4			
65	23.3	22.8	23.1	23.5	22.3	21.7	22.9	22.5	23.2	24.4	24.2	26.1	24.2	25.3	25.6	24.4			
70	23.9	22.5	23.0	21.9	22.6	21.8	23.6	24.3	25.5	25.7	25.9	27.1	25.5	26.1	25.8	22.6			
75	25.1	23.0	23.7	22.3	23.6	22.6	23.9	23.4	24.6	25.4	25.8	24.8	25.2	26.0	25.9	22.0			
80	25.8	23.5	24.1	22.8	25.0	23.0	24.9	23.9	24.9	25.9	26.2	24.7	25.3	26.3	26.8	22.2			
85	26.4	23.7	24.8	22.4	25.5	23.5	24.8	24.5	25.5	26.2	26.3	24.7	25.4	26.4	26.8	22.4			
90	25.1	24.0	24.8	21.9	25.5	24.5	25.6	23.6	25.2	25.8	26.4	23.3	25.1	26.3	27.1	21.8			
95	24.5	23.7	24.3	22.0	25.2	24.1	25.6	23.4	25.0	25.9	26.1	22.4	24.4	26.6	26.2	21.6			
100	24.0	23.4	24.5	22.8	25.5	23.6	25.1	23.4	24.9	25.1	25.5	21.9	23.9	26.0	25.4	21.9			
105	24.1	22.4	24.8	23.5	25.9	23.8	25.1	25.0	25.7	24.6	25.3	21.6	23.3	25.0	24.9	22.9			
110	23.6	22.4	25.1	24.3	24.6	23.3	26.1	25.2	25.8	23.9	25.5	21.8	23.1	23.7	24.9	22.9			
115	22.6	21.2	24.8	22.6	21.2	21.6	25.9	24.6	26.8	23.7	24.4	21.4	22.1	22.6	24.0	24.5			
120	20.0	18.4	20.9	20.4	20.0	19.5	22.0	21.6	22.3	20.4	22.5	20.4	19.1	20.1	21.1	20.6			
125	17.5	16.3	17.4	18.1	17.6	18.0	19.4	19.5	20.7	18.4	20.1	17.7	17.6	18.1	18.6	18.6			
130	14.2	14.4	13.9	14.5	15.9	16.1	16.1	16.9	17.3	15.9	15.4	16.1	14.2	16.1	17.0	14.2			
135	12.1	12.3	9.52	12.8	14.1	14.3	12.0	13.6	14.8	13.4	10.3	11.4	12.2	13.7	14.8	12.8			
140	10.1	11.6	8.21	10.6	12.5	13.8	9.54	11.7	14.7	11.7	7.73	9.90	10.4	12.3	13.9	11.1			
145	7.96	11.3	6.95	8.09	9.96	12.8	8.08	9.78	11.8	10.5	6.49	8.01	8.04	11.2	11.9	8.80			
150	7.95	5.72	4.79	8.15	8.41	3.73	7.46	10.0	8.51	9.14	5.56	6.01	6.82	6.80	8.77	7.63			
155	0.51	0.41	0.43	0.51	0.43	0.40	0.51	3.81	0.83	0.59	1.04	3.67	5.07	2.08	0.50	0.62			
160	0.26	0.29	0.30	0.30	0.28	0.30	0.36	0.36	0.38	0.38	0.41	0.43	0.37	0.35	0.32	0.30			
165	0.19	0.21	0.22	0.19	0.19	0.23	0.23	0.24	0.28	0.29	0.30	0.27	0.25	0.25	0.25	0.23			
170	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.11	0.16	0.15	0.15	0.16	0.16	0.13			
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:24.3DEG
Operators:David
Test Date:2013-02-25

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.265
Humidity:46.4%
Test Distance:2.421m [K=1.0000]
Remarks:


I(cd)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
3.0
6.0
9.0
12.0
15.0
18.0
21.0
24.0
27.0
30.0

1000 lm K = 1



F = 5000 lm
K = 0.7
Hcc = 0.0 m
Hfc = 0.0 m
Eave = 100 lx

	Pcc	Pw	Pfc
———	70	50	30
———	50	30	20