

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

Mar 07, 2016

Product Name:	LED Lamp
Model No:	33TRLG4DIM/930/W/H; 33TRLG4DIM/930/W/L; 33TRLG4DIM/930/W/J; 33TRLG4DIM/930/B/H; 33TRLG4DIM/930/B/L; 33TRLG4DIM/930/B/J
Test Engineer:	David Zhang 
Report No.:	BTR66.181.15.0033.50
Sample Received Date:	Mar 01, 2016
Test Performed Date:	Mar 01, 2016 to Mar 07, 2016
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



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1 - GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

Applicant	: Green Creative Ltd.
Product Name	: LED Lamp
Model No	: 33TRLG4DIM/930/W/H; 33TRLG4DIM/930/W/L; 33TRLG4DIM/930/W/J; 33TRLG4DIM/930/B/H; 33TRLG4DIM/930/B/L; 33TRLG4DIM/930/B/J
Brand	: GREEN CREATIVE
Nominal Operation Voltage	: AC 120V/60Hz
Nominal Power	: 33 W
Nominal CCT	: 3000K
Nominal CRI	: 90
Nominal Lumen Output	: 2400 Lumens
Nominal Life Time	: 25000 Hours
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
Date of Receiving Sample	: Mar 01,2016
Measurement quantities measured	: 1 pcs Base up
Orientation During Testing	: Electrical and Photometric Test Luminous Intensity Distribution Test

Note: 33TRLG4DIM/930/W/H; 33TRLG4DIM/930/W/L; 33TRLG4DIM/930/W/J; 33TRLG4DIM/930/B/H; 33TRLG4DIM/930/B/L; 33TRLG4DIM/930/B/J are different in lamp holder, here we choose 33TRLG4DIM/930/W/H to be tested and the other to share the test 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 – 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, 2015	Mar 09, 2016
2	Digital Power Meter	Oct 18, 2015	Oct 17, 2016
3	Goniophotometer+ Spectrophotometer System	Nov 20, 2015	Nov 19, 2016
4	Standard Light Source	Sep 17, 2015	Sep 16, 2016
5	Standard Light Source	Sep 17, 2015	Sep 16, 2016
6	Digital Storage Oscilloscope	Oct 18, 2015	Oct 17, 2016
7	Ultra Compact Simulator	Oct 20, 2015	Oct 19, 2016
8	Temperature Chamber	Oct 20, 2015	Oct 19, 2016
9	Digital Caliper	Nov 20, 2015	Nov 19, 2016
10	Digital CC&CV DC Power Supply(30V 5A)	N/A	N/A
11	5 1/2 Digital Multimeter	Oct 18, 2015	Oct 17, 2016
12	Digital CC&CV DC Power Supply(120V 10A)	N/A	N/A
13	6 1/2 Digital Multimeter	Oct 18, 2015	Oct 17, 2016
14	Digital Multimeter	Oct 18, 2015	Oct 17, 2016
15	Temperature Recorder+Thermocouple	Nov 20, 2015	Nov 19, 2016
16	Timer Controller	Nov 20, 2015	Nov 19, 2016

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 Φ 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=30minutes.) 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 (GonioPhotometer 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=30minutes.) 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

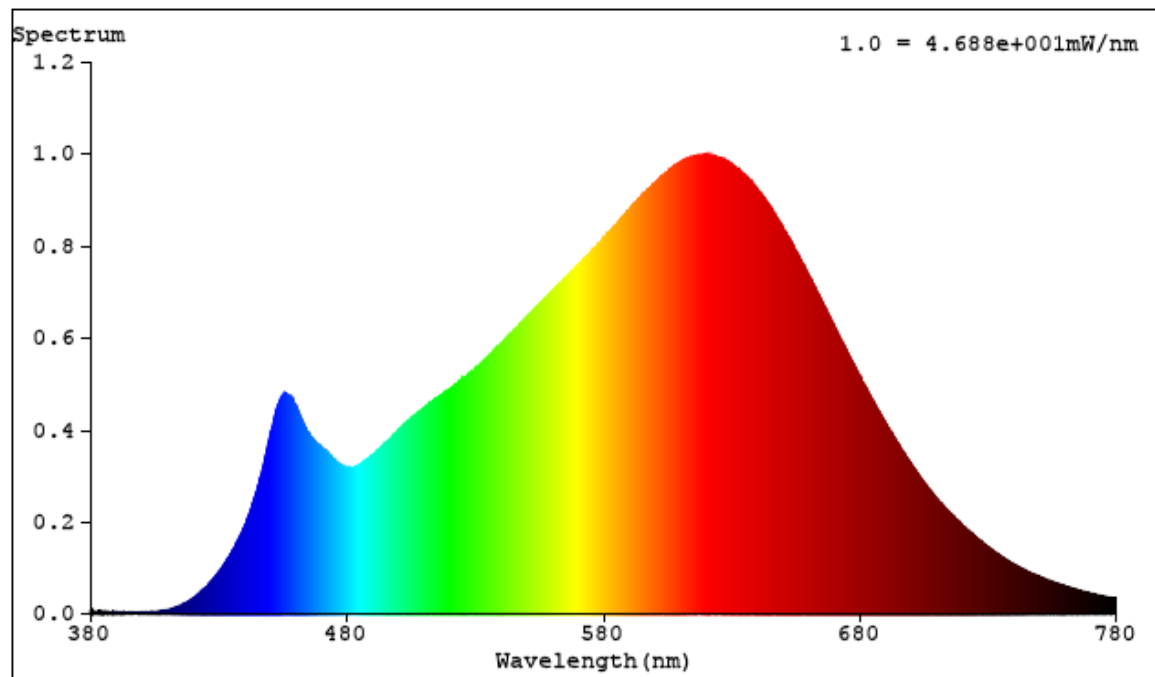
	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	2460		NVLAP/EPA
	Luminous Efficacy (lm/w)	74.17		NVLAP/EPA
	Correlated Color Temperature (CCT)	3031		NVLAP/EPA
	Color Rendering Index– CRI	92.5		NVLAP/EPA
	Input Power (W)	33.17		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.2778		NVLAP/EPA
	Power Factor	0.9948		NVLAP/EPA
	x(CIE 1931)	0.4334		NVLAP/EPA
	y(CIE 1931)	0.4005		NVLAP/EPA
	u' (CIE 1976)	0.2498		NVLAP/EPA
	v' (CIE 1976)	0.5194		NVLAP/EPA
	Duv(CIE 1976)	-0.0010		NVLAP/EPA
	Beam Angle: (Degree)	20.7		NVLAP/EPA
	Center beam candlepower: (cd)	11762		NVLAP/EPA
	Zonal lumen density (0-60°):	96.9%		NVLAP/EPA
	Zonal lumen density (60-90°):	3.1%		NVLAP/EPA
	Zonal lumen density (90-120°):	0.0%		NVLAP/EPA
	Zonal lumen density (120-180°):	0.0%		NVLAP/EPA

CRI (R1)	93	NVLAP/EPA
CRI (R2)	98	NVLAP/EPA
CRI (R3)	97	NVLAP/EPA
CRI (R4)	91	NVLAP/EPA
CRI (R5)	93	NVLAP/EPA
CRI (R6)	97	NVLAP/EPA
CRI (R7)	90	NVLAP/EPA
CRI (R8)	81	NVLAP/EPA
CRI (R9)	59	NVLAP/EPA
CRI (R10)	95	NVLAP/EPA
CRI (R11)	91	NVLAP/EPA
CRI (R12)	84	NVLAP/EPA
CRI (R13)	95	NVLAP/EPA
CRI (R14)	99	NVLAP/EPA

Lumen summary:

[OTHER]	Gamma(deg)	Fz(1m)	Ft(1m)	%Lum	%Lamp
[OTHER]	0- 10	809.32	809.32	32.90	32.90
[OTHER]	10- 20	921.84	1731.17	70.37	70.37
[OTHER]	20- 30	410.03	2141.20	87.04	87.04
[OTHER]	30- 40	114.50	2255.70	91.69	91.69
[OTHER]	40- 50	67.90	2323.60	94.46	94.46
[OTHER]	50- 60	60.78	2384.38	96.93	96.93
[OTHER]	60- 70	47.69	2432.07	98.86	98.86
[OTHER]	70- 80	24.21	2456.28	99.85	99.85
[OTHER]	80- 90	3.69	2459.97	100.00	100.00
[OTHER]	90-100	0.00	2459.97	100.00	100.00
[OTHER]	100-110	0.00	2459.97	100.00	100.00
[OTHER]	110-120	0.00	2459.97	100.00	100.00
[OTHER]	120-130	0.00	2459.97	100.00	100.00
[OTHER]	130-140	0.00	2459.97	100.00	100.00
[OTHER]	140-150	0.00	2459.97	100.00	100.00
[OTHER]	150-160	0.00	2459.98	100.00	100.00
[OTHER]	160-170	0.02	2459.99	100.00	100.00
[OTHER]	170-180	0.01	2460.00	100.00	100.00

4 – Spectral Flux Plots



5 – EUT Photos



6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

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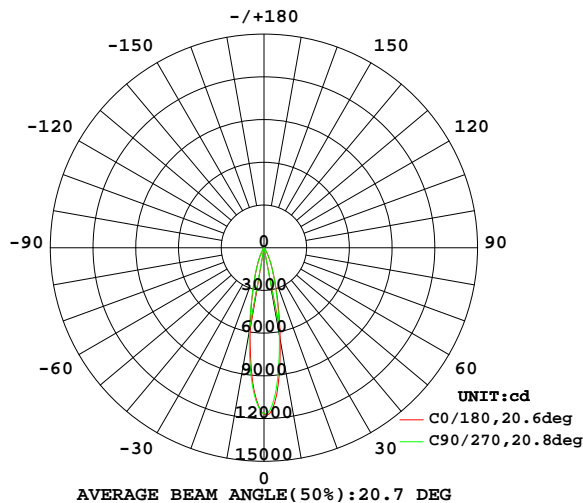


LUMINAIRE PHOTOMETRIC TEST REPORT

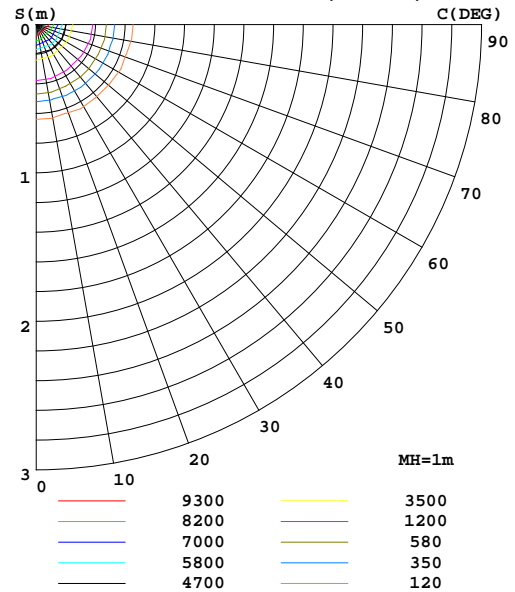
Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 74.17 lm/W			
MODEL	33TRLG4DIM/930/W/H	I _{max} (cd)	11762	S/MH(C0/180)	0.38
NOMINAL POWER(W)	33	LOR(%)	100.0	S/MH(C90/270)	0.36
RATED VOLTAGE(V)	120	TOTAL FLUX(lm)	2460.0	η UP,DN(C0-180)	0.0,47.6
NOMINAL FLUX(lm)	2460	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.0,52.4
LAMPS INSIDE	1	η up(%)	0.0	CIBSE SHR NOM	0.00
TEST VOLTAGE(V)	120	η down(%)	100.0	CIBSE SHR MAX	1.00

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



PLANAR ISOLUX DIAGRAM(UNIT:lx)



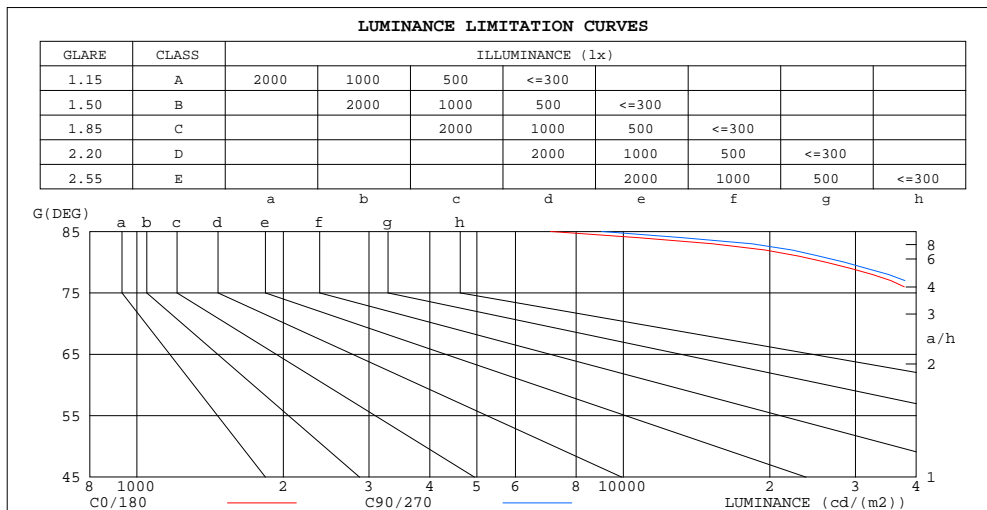
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [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	Φ lum, lamp
10	560.5	567.8	593.6	625.0	659.8	653.3	625.4	592.0	0- 10	809.3	809.3	32.9,32.9
20	152.9	149.0	156.4	169.3	189.1	196.2	185.9	167.2	10- 20	921.8	1731	70.4,70.4
30	28.44	29.78	31.12	34.93	42.49	48.47	43.44	35.47	20- 30	410.0	2141	87,87
40	9.971	9.956	10.19	10.38	10.78	11.69	11.08	10.15	30- 40	114.5	2256	91.7,91.7
50	7.466	7.465	7.606	7.693	7.840	7.887	7.751	7.603	40- 50	67.90	2324	94.5,94.5
60	5.727	5.718	5.850	5.981	6.130	6.142	6.057	5.886	50- 60	60.78	2384	96.9,96.9
70	3.351	3.363	3.528	3.702	3.850	3.843	3.794	3.565	60- 70	47.69	2432	98.9,98.9
80	0.9054	0.9145	0.9892	1.110	1.256	1.255	1.155	1.023	70- 80	24.21	2456	99.8,99.8
90	0.0000	0.0000	0.0000	0.0018	0.0183	0.0177	0.0074	0	80- 90	3.690	2460	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0030	2460	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2460	100,100
120	0	0	0	0	0	0	0	0	110-120	0.0000	2460	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2460	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2460	100,100
150	0	0	0	0	0	0	0	0	140-150	0	2460	100,100
160	0.0030	0.0030	0.0026	0.0022	0.0026	0.0024	0.0025	0.0029	150-160	0.0037	2460	100,100
170	0.0117	0.0115	0.0107	0.0101	0.0111	0.0106	0.0111	0.0118	160-170	0.0166	2460	100,100
180	0	0	0	0	0.0009	0.0008	0.0008	0.0007	170-180	0.0111	2460	100,100
DEG	LUMINOUS INTENSITY: $\times 10\text{cd}$									UNIT: lm		



LUMINANCE cd/(m ²)		
G(°)	C0/180	C90/270
85	7083	9020
80	26071	28484
75	40008	42133
70	48986	51577
65	54614	55951
60	57268	58505
55	57206	58606
50	58074	59167
45	60057	60734

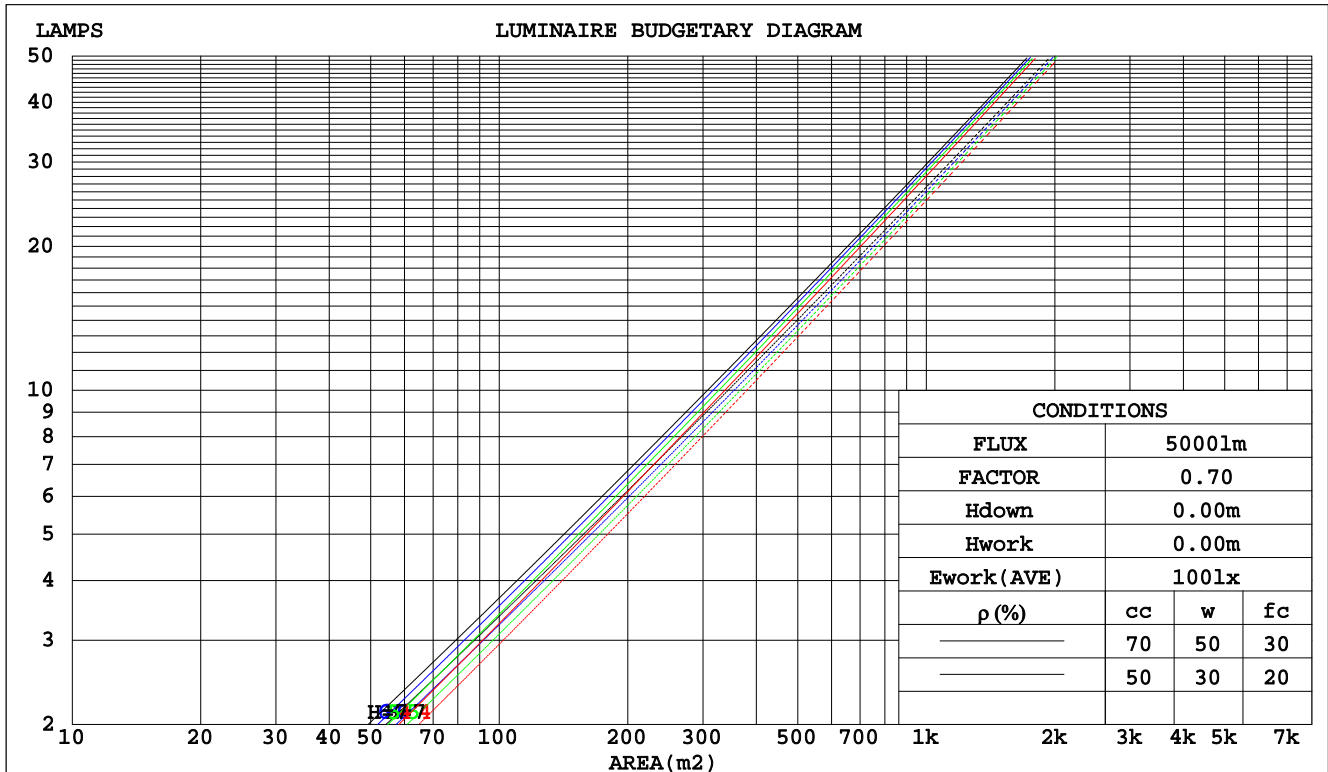
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 Test Speed: HIGH
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 Operators: David
 Test Date: 2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 67.1%
 Test Distance: 2.455m [K=1.0000]
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Coefficients of Utilization(CU)									
0.0	1.19	1.19	1.19	1.16	1.16	1.16	1.11	1.11	1.11	1.06	1.06	1.06	1.02	1.02	1.02	.00
1.0	1.12	1.10	1.08	1.10	1.08	1.06	1.06	1.04	1.03	1.02	1.01	.00	.99	.98	.97	.95
2.0	1.05	1.02	.99	1.04	1.01	.98	1.01	.98	.96	.98	.96	.94	.95	.93	.92	.90
3.0	1.00	.96	.93	.99	.95	.92	.96	.93	.90	.94	.91	.89	.92	.90	.88	.86
4.0	.95	.91	.87	.94	.90	.87	.92	.89	.86	.90	.87	.85	.89	.86	.84	.83
5.0	.91	.87	.83	.90	.86	.83	.89	.85	.82	.87	.84	.81	.86	.83	.81	.80
6.0	.88	.83	.80	.87	.83	.79	.86	.82	.79	.84	.81	.78	.83	.80	.78	.77
7.0	.85	.80	.76	.84	.79	.76	.83	.79	.76	.82	.78	.76	.81	.78	.75	.74
8.0	.82	.77	.74	.81	.77	.74	.80	.76	.73	.79	.76	.73	.78	.75	.73	.72
9.0	.79	.74	.71	.79	.74	.71	.78	.74	.71	.77	.73	.71	.76	.73	.71	.70
10.0	.77	.72	.69	.76	.72	.69	.75	.72	.69	.75	.71	.69	.74	.71	.69	.68



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

WEC AND CCEC

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

pcc	80%			70%			50%			30%			10%			0	
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0	
pfc	20%			20%			20%			20%			20%			0	
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)										
0.0																	
1.0	.158	.090	.028	.151	.086	.027	.139	.080	.025	.127	.073	.024	.117	.068	.022		
2.0	.147	.081	.025	.142	.078	.024	.131	.073	.023	.122	.068	.021	.113	.064	.020		
3.0	.137	.073	.022	.132	.071	.021	.124	.067	.020	.116	.063	.019	.108	.060	.019		
4.0	.128	.066	.020	.124	.065	.019	.117	.062	.018	.110	.059	.018	.103	.056	.017		
5.0	.120	.061	.018	.117	.060	.017	.110	.057	.017	.104	.055	.016	.099	.053	.016		
6.0	.113	.057	.016	.110	.056	.016	.104	.054	.016	.099	.052	.015	.094	.050	.015		
7.0	.107	.053	.015	.104	.052	.015	.099	.050	.014	.095	.049	.014	.091	.047	.014		
8.0	.101	.049	.014	.099	.049	.014	.095	.047	.014	.091	.046	.013	.087	.045	.013		
9.0	.096	.047	.013	.094	.046	.013	.090	.045	.013	.087	.044	.012	.084	.042	.012		
10.0	.092	.044	.012	.090	.043	.012	.087	.042	.012	.083	.041	.012	.080	.040	.012		

pcc	80%			70%			50%			30%			10%			0
pw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
pfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.190	.190	.190	.163	.163	.163	.111	.111	.111	.064	.064	.064	.020	.020	.020	
1.0	.170	.157	.146	.145	.135	.126	.099	.093	.087	.057	.054	.051	.018	.017	.016	
2.0	.153	.133	.116	.131	.114	.100	.090	.079	.070	.052	.046	.041	.017	.015	.013	
3.0	.139	.113	.093	.119	.098	.081	.082	.068	.057	.047	.040	.033	.015	.013	.011	
4.0	.127	.098	.076	.109	.085	.066	.075	.059	.047	.043	.035	.028	.014	.011	.009	
5.0	.117	.086	.064	.100	.075	.055	.069	.052	.039	.040	.031	.023	.013	.010	.008	
6.0	.108	.076	.054	.093	.066	.047	.064	.046	.033	.037	.027	.020	.012	.009	.006	
7.0	.101	.068	.046	.087	.059	.040	.060	.042	.028	.035	.024	.017	.011	.008	.006	
8.0	.094	.062	.040	.081	.054	.034	.056	.038	.024	.033	.022	.015	.011	.007	.005	
9.0	.088	.056	.034	.076	.049	.030	.053	.034	.021	.031	.020	.013	.010	.007	.004	
10.0	.083	.051	.030	.072	.045	.026	.050	.031	.019	.029	.019	.011	.009	.006	.004	

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

UGR(Unified Glare Rating) Table

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm											
NAME:					TYPE:33TRLG4DIM/930/W/H			WEIGHT:			
SPEC.:					DIM.:			SERIAL No.:			
MFR.: GC					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		20.7	21.4	20.9	21.6	21.7	20.8	21.5	21.0	21.7	21.9
3H		22.1	22.8	22.4	23.0	23.2	22.3	23.0	22.5	23.2	23.4
4H		22.6	23.3	22.8	23.5	23.7	22.8	23.4	23.0	23.6	23.9
6H		22.8	23.4	23.1	23.7	23.9	23.0	23.6	23.3	23.9	24.1
8H		22.8	23.4	23.1	23.7	23.9	23.0	23.6	23.3	23.9	24.1
12H		22.8	23.4	23.1	23.6	23.9	23.0	23.6	23.3	23.8	24.1
4H	2H	21.3	22.0	21.6	22.2	22.4	21.4	22.1	21.7	22.3	22.5
	3H	22.9	23.5	23.2	23.8	24.0	23.1	23.6	23.4	23.9	24.2
	4H	23.5	24.0	23.8	24.3	24.6	23.6	24.1	23.9	24.4	24.7
	6H	23.7	24.2	24.1	24.5	24.9	23.9	24.4	24.3	24.7	25.0
	8H	23.7	24.2	24.1	24.5	24.9	23.9	24.4	24.3	24.7	25.1
	12H	23.7	24.1	24.1	24.5	24.9	23.9	24.3	24.3	24.7	25.0
8H	4H	23.6	24.1	24.0	24.4	24.8	23.8	24.2	24.1	24.5	24.9
	6H	23.9	24.3	24.3	24.7	25.1	24.1	24.5	24.5	24.8	25.3
	8H	24.0	24.3	24.4	24.7	25.1	24.1	24.5	24.6	24.9	25.3
	12H	23.9	24.2	24.4	24.6	25.1	24.1	24.4	24.6	24.8	25.3
12H	4H	23.6	24.0	24.0	24.4	24.8	23.7	24.1	24.1	24.5	24.9
	6H	23.9	24.2	24.3	24.6	25.1	24.1	24.4	24.5	24.8	25.2
	8H	23.9	24.2	24.4	24.7	25.1	24.1	24.4	24.6	24.8	25.3
Variations with the observer position at spacings:											
S = 1.0H		+ 0.2 / - 0.3					+ 0.2 / - 0.3				
1.5H		+ 0.1 / - 0.2					+ 0.1 / - 0.2				
2.0H		+ 0.2 / - 0.3					+ 0.2 / - 0.3				

CIE Pub.117 Corrected 2460 lm Total Lamp Luminous Flux.(8log(F/F0) = 3.1)

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	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) $k(RI) \times RCR = 5$									
$k = 0.60$	86	80	76	86	80	76	85	79	76	72
0.80	94	88	84	93	87	84	92	87	83	80
1.00	98	92	89	97	92	88	96	92	88	84
1.25	102	97	93	101	96	93	99	95	92	88
1.50	105	100	96	104	99	96	101	98	95	90
2.00	108	103	100	106	102	99	104	100	98	92
2.50	110	106	102	108	104	102	105	102	100	94
3.00	111	108	105	109	106	104	106	104	102	95
4.00	113	111	108	111	109	107	108	106	104	97
5.00	115	112	111	113	111	109	109	107	106	98
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:25.6DEG
 Operators:David
 Test Date:2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

ISOCANDELA DIAGRAM

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

Conical surface Flux(90deg):

2290.7 lm

%lum = 93.1%

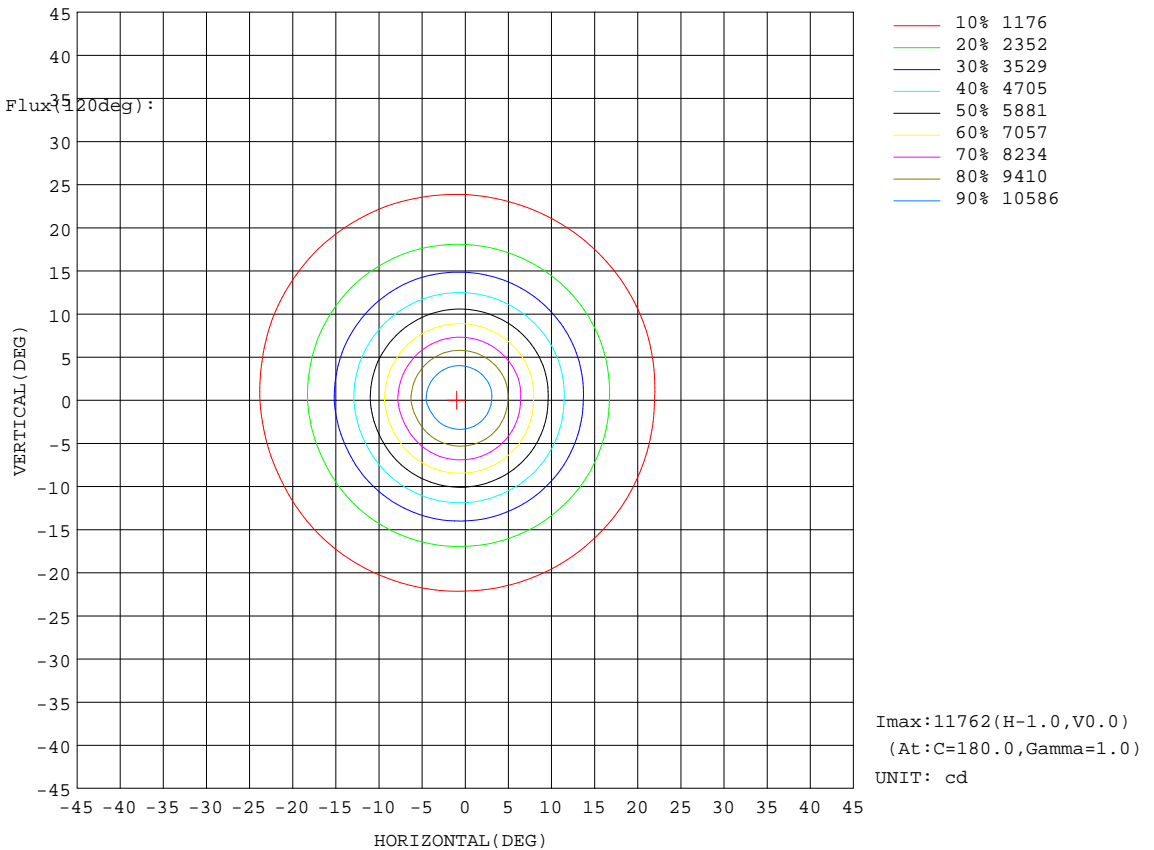
%lamp = 93.1%

Conical surface Flux(20deg):

2384.4 lm

%lum = 96.9%

%lamp = 96.9%

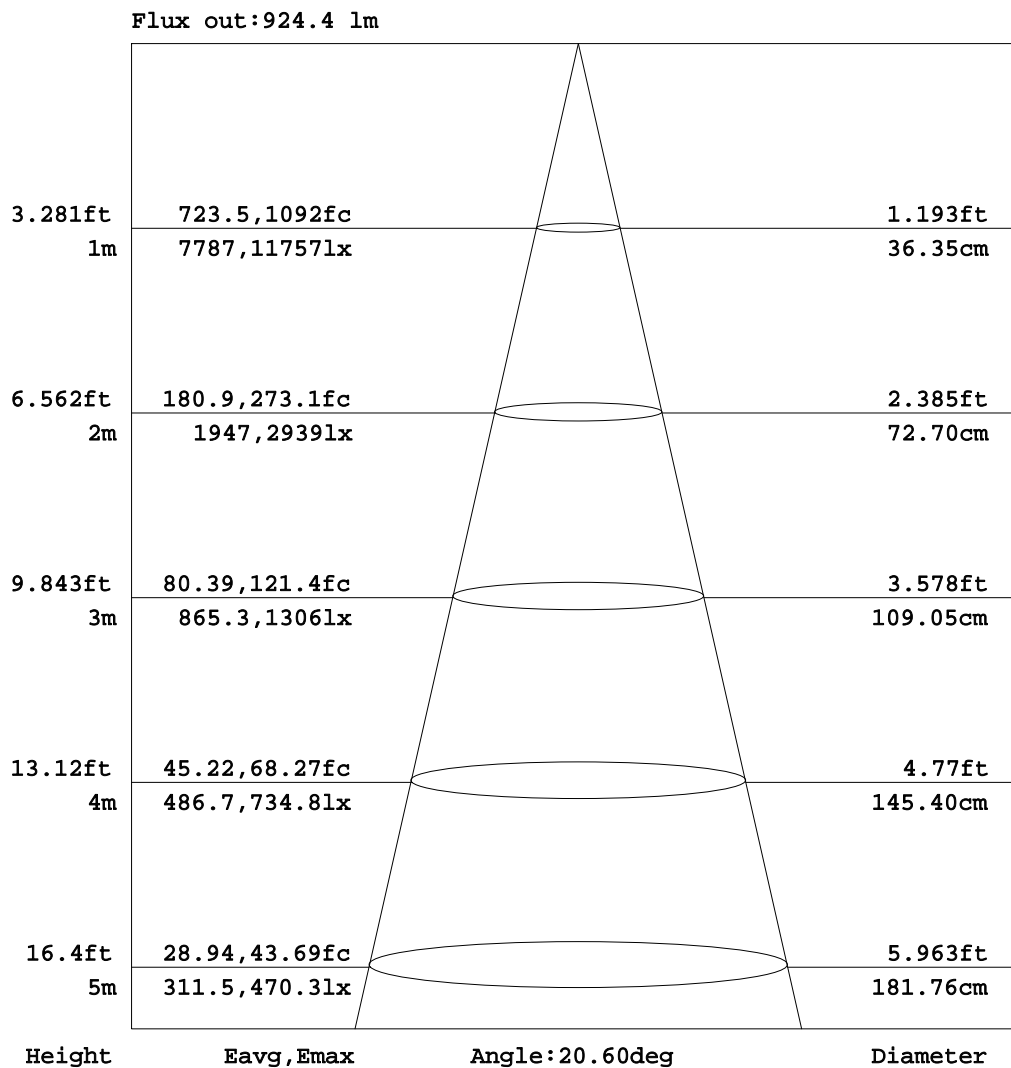


C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-03-02

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.455m [K=1.0000]
Remarks:

AAI Figure

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



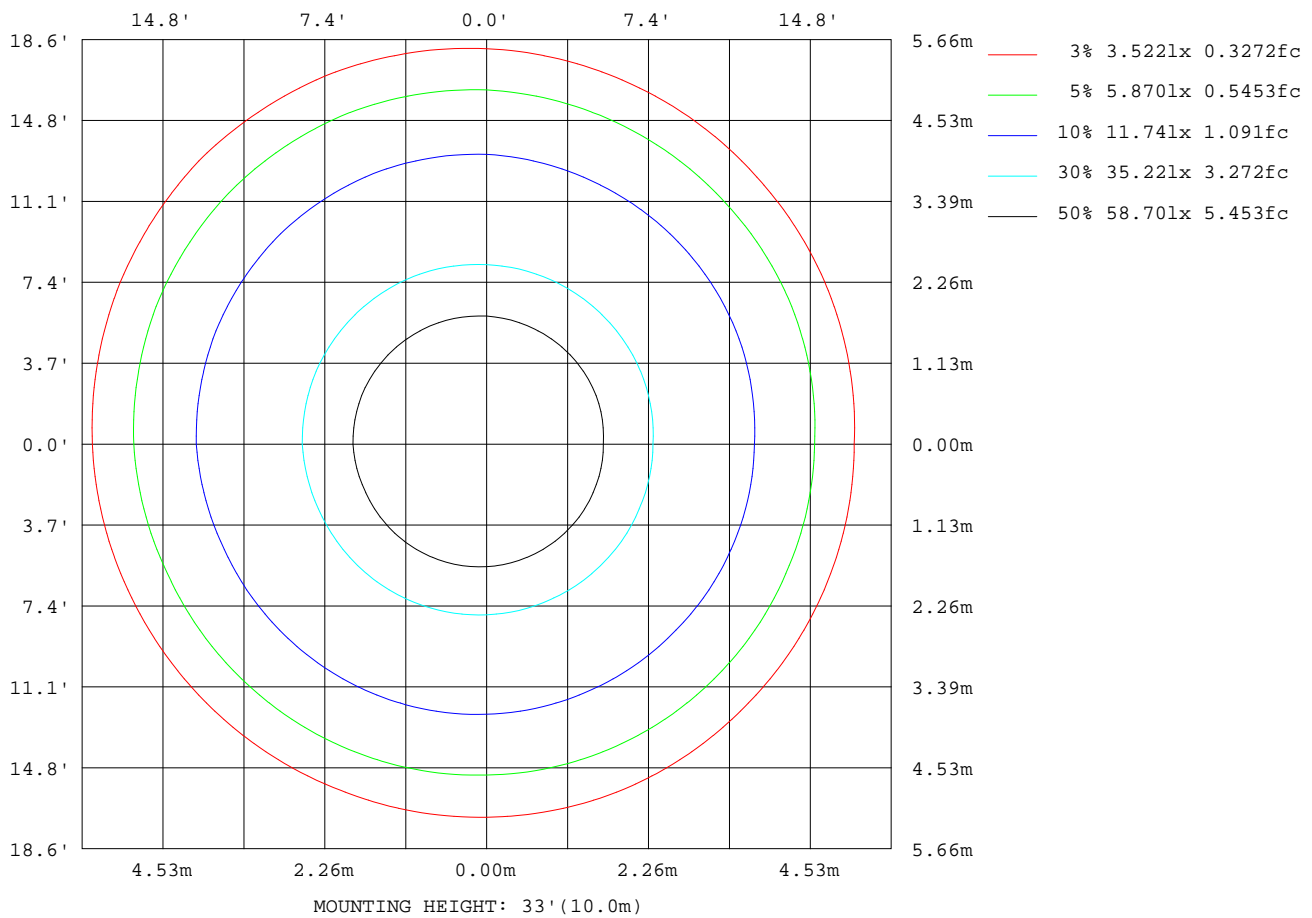
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2016-03-02

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.455m [K=1.0000]
Remarks:

ISOLUX DIAGRAM

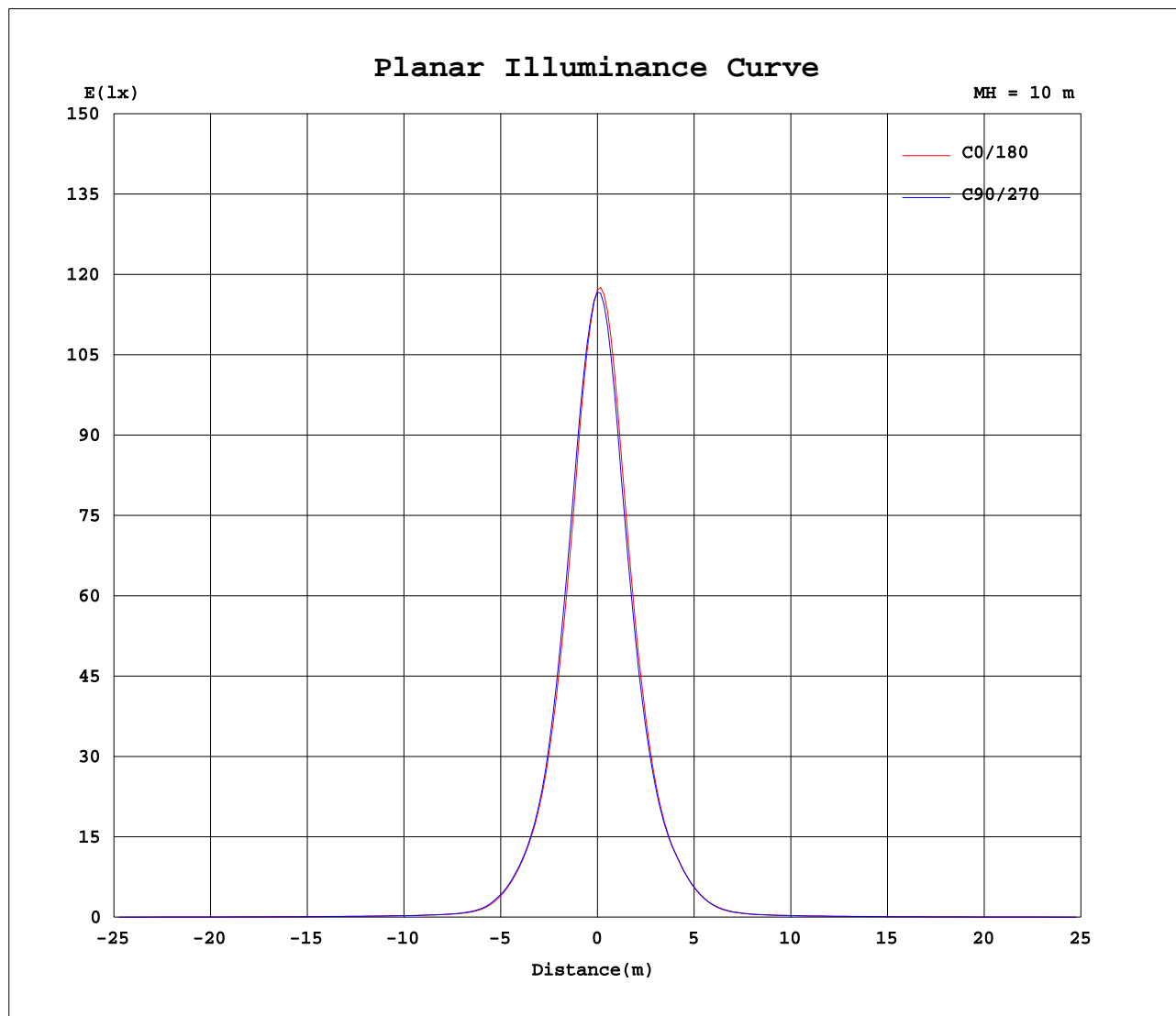
Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm		
NAME:	TYPE:33TRLG4DIM/930/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 67.1%
 Test Distance: 2.455m [K=1.0000]
 Remarks:

Planar Illuminance Curve



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.6DEG
Operators: David
Test Date: 2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 67.1%
Test Distance: 2.455m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:120.0V I:0.2778A P:33.17W PF:0.9948 Lamp Flux:2460x1 lm																	
NAME:									TYPE:33TRLG4DIM/930/W/H						WEIGHT:		
SPEC.:									DIM.:						SERIAL No.:		
MFR.: GC									SUR.:						PROTECTION ANGLE:		

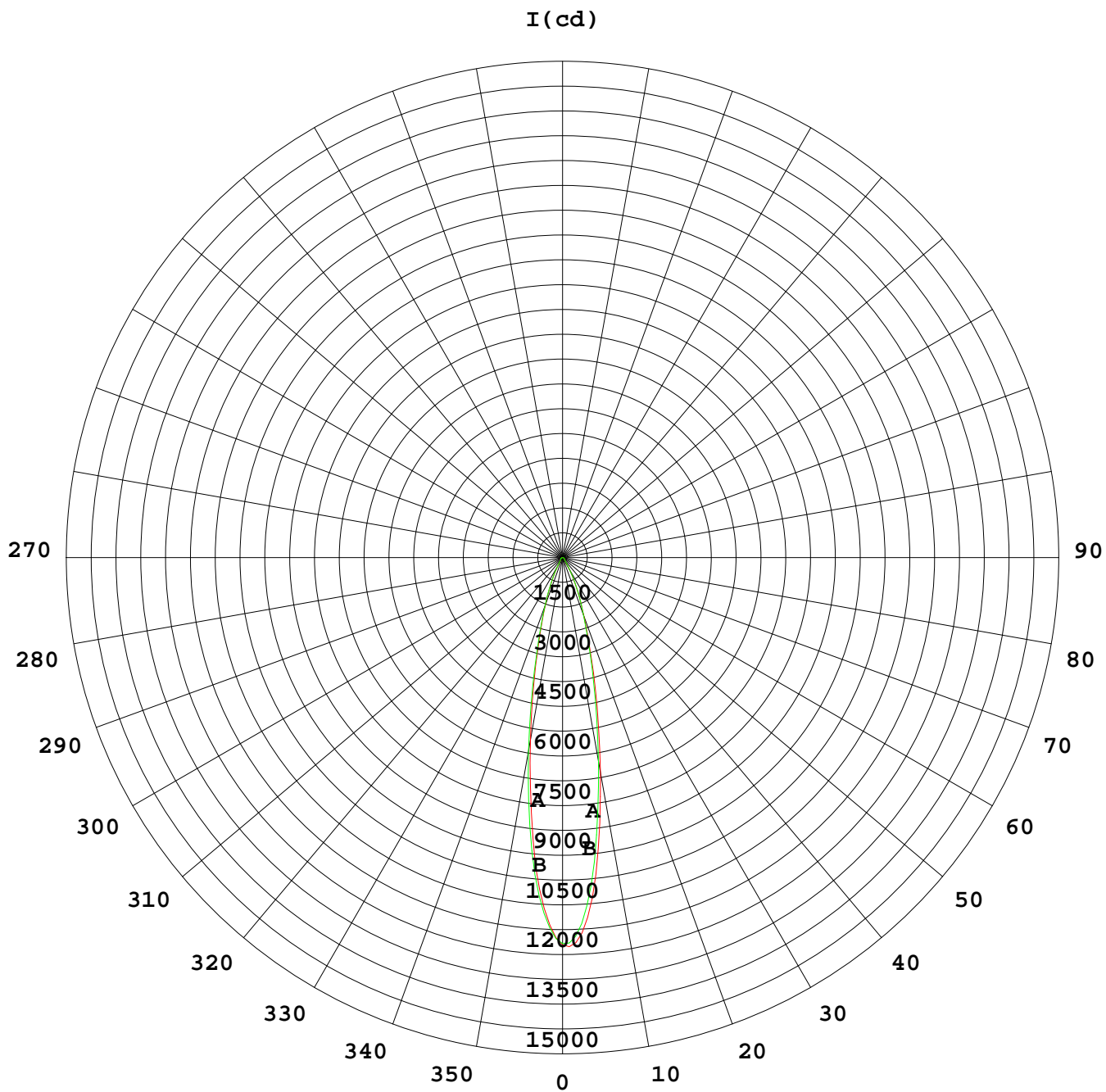
Table--1

UNIT: ×10cd

C(DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1171	1170	1169	1168	1167	1167	1167	1168	1171	1170	1169	1168	1167	1167	1167	1168			
5	937	936	940	950	962	978	996	1010	1032	1032	1024	1012	994	977	964	951			
10	561	562	568	578	594	609	625	638	660	661	653	641	625	606	592	578			
15	294	292	292	298	306	317	331	343	361	366	364	358	345	333	320	308			
20	153	150	149	152	156	163	169	177	189	195	196	193	186	176	167	160			
25	73.4	71.6	72.5	74.2	76.2	79.7	84.1	89.5	98.9	104	106	104	99.9	91.7	84.5	79.4			
30	28.4	29.2	29.8	30.4	31.1	31.4	34.9	38.0	42.5	46.2	48.5	47.1	43.4	38.9	35.5	32.2			
35	13.5	13.9	14.1	14.4	14.6	14.3	15.4	16.4	17.2	19.6	20.5	20.1	18.7	17.0	16.2	14.8			
40	9.97	9.88	9.96	10.1	10.2	10.2	10.4	10.5	10.8	11.3	11.7	11.5	11.1	10.5	10.2	9.96			
45	8.49	8.36	8.43	8.57	8.59	8.67	8.70	8.71	8.87	8.92	9.05	9.01	8.80	8.71	8.58	8.44			
50	7.47	7.41	7.46	7.55	7.61	7.67	7.69	7.71	7.84	7.82	7.89	7.88	7.75	7.72	7.60	7.49			
55	6.56	6.56	6.58	6.67	6.72	6.76	6.81	6.85	6.96	6.94	6.98	6.95	6.90	6.84	6.74	6.67			
60	5.73	5.67	5.72	5.81	5.85	5.92	5.98	6.01	6.13	6.13	6.14	6.10	6.06	5.99	5.89	5.81			
65	4.62	4.60	4.61	4.67	4.73	4.83	4.88	4.94	5.08	5.07	5.08	5.04	4.97	4.90	4.80	4.72			
70	3.35	3.37	3.36	3.42	3.53	3.59	3.70	3.77	3.85	3.88	3.84	3.82	3.79	3.62	3.56	3.48			
75	2.07	2.07	2.09	2.13	2.18	2.25	2.30	2.35	2.45	2.46	2.45	2.41	2.35	2.28	2.21	2.16			
80	0.91	0.91	0.91	0.94	0.99	1.05	1.11	1.15	1.26	1.26	1.26	1.22	1.16	1.09	1.02	0.97			
85	0.12	0.12	0.12	0.14	0.16	0.18	0.21	0.23	0.29	0.30	0.30	0.27	0.24	0.20	0.17	0.15			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01	0.00	0.00	0.00			
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	0.01	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			
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	0.01	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			
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			

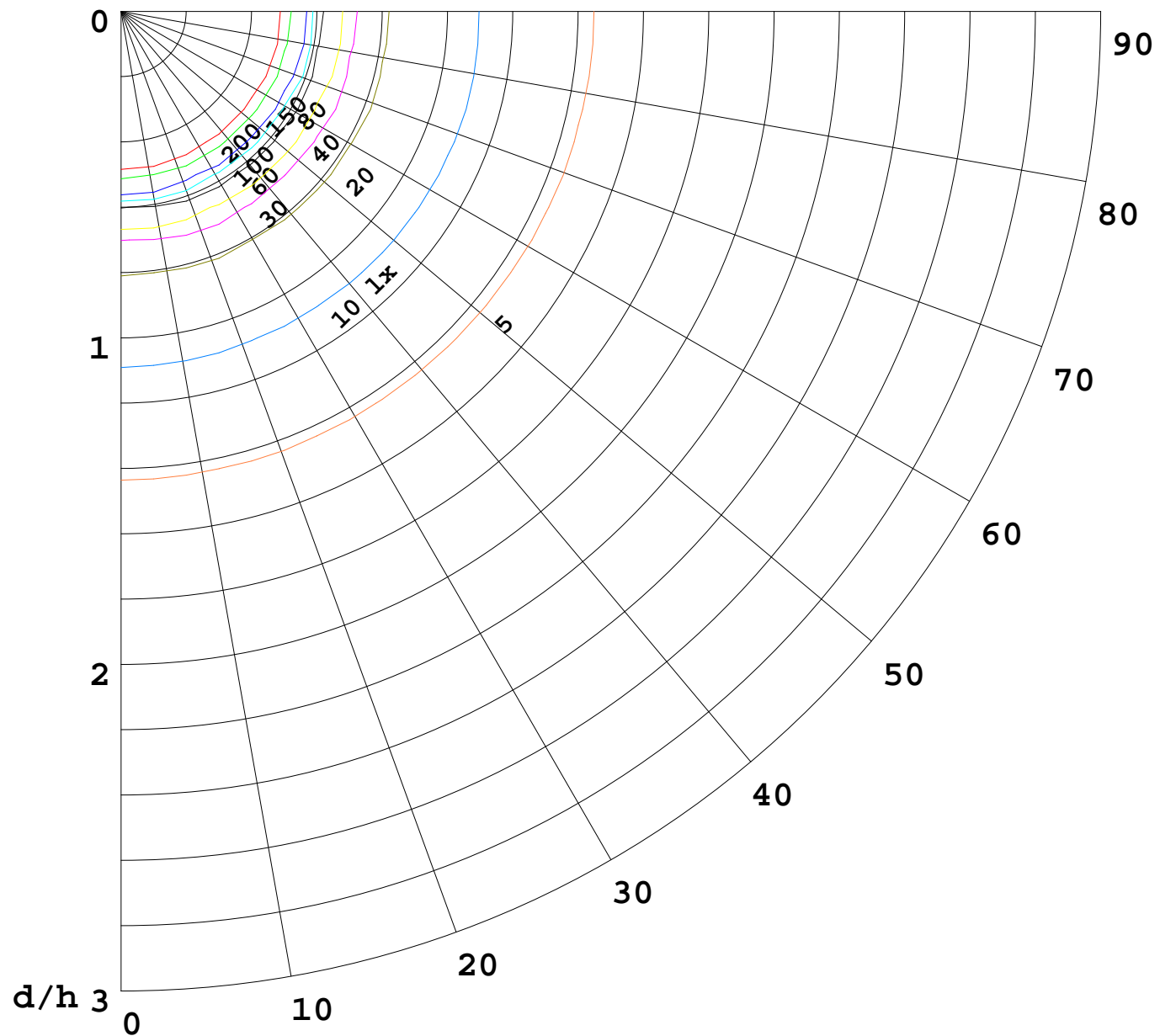
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2016-03-02

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:



1000 lm

$\kappa = 1$



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

