

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

May 21, 2015

Product Name:	LED TRACK LAMP
Model No:	8TRSG4DIM/830NF30/B/H; 8TRSG4DIM/830NF30/B/J; 8TRSG4DIM/830NF30/B/L; 8TRSG4DIM/830NF30/W/H; 8TRSG4DIM/830NF30/W/J; 8TRSG4DIM/830NF30/W/L
Test Engineer:	David Zhang 
Report No.:	BTR66.181.14.0057.02
Sample Received Date:	Nov 20, 2014
Test Performed Date:	Nov 20, 2014 to Nov 28, 2014
Reviewed By:	Steven Hsu 
Prepared By:	BEST Test Service Shenzhen Co., Ltd. 1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyuan, 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 TRACK LAMP
Model No	: 8TRSG4DIM/830NF30/B/H; 8TRSG4DIM/830NF30/B/J; 8TRSG4DIM/830NF30/B/L; 8TRSG4DIM/830NF30/W/H; 8TRSG4DIM/830NF30/W/J; 8TRSG4DIM/830NF30/W/L
Brand	: GREEN CREATIVE
Nominal Operation Voltage	: AC 120V/60Hz
Nominal Power	: 8.5 W
Nominal CCT	: 3000K
Nominal CRI	: 80
Nominal Lumen Output	: 550 Lumens
Nominal Life Time	: 40000 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	: 2.5 hours
Date of Receiving Sample	: Nov 20, 2014
Measurement quantities measured	: 1 pcs
Orientation During Testing	: Base up
Test Requested	: Electrical and Photometric Test Luminous Intensity Distribution Test

Note: 8TRSG4DIM/830NF30/B/J; 8TRSG4DIM/830NF30/B/L; 8TRSG4DIM/830NF30/W/H; 8TRSG4DIM/830NF30/W/J; 8TRSG4DIM/830NF30/W/L and 8TRSG4DIM/830NF30/B/H are only lamp base and color different, here we choose 8TRSG4DIM/830NF30/B/H to be tested and others 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, 2014	Oct 17, 2015
3	Goniophotometer+ Spectrophotometer System	Nov 20, 2014	Nov 19, 2015
4	Standard Light Source	Sep 17, 2014	Sep 16, 2015
5	Standard Light Source	Sep 17, 2014	Sep 16, 2015
6	Digital Storage Oscilloscope	Oct 18, 2014	Oct 17, 2015
7	Ultra Compact Simulator	Oct 20, 2014	Oct 19, 2015
8	Temperature Chamber	Oct 20, 2014	Oct 19, 2015
9	Digital Caliper	Nov 20, 2014	Nov 19, 2015
10	Digital CC&CV DC Power Supply(30V 5A)	N/A	N/A
11	5 1/2 Digital Multimeter	Oct 18, 2014	Oct 17, 2015
12	Digital CC&CV DC Power Supply(120V 10A)	N/A	N/A
13	6 1/2 Digital Multimeter	Oct 18, 2014	Oct 17, 2015
14	Digital Multimeter	Oct 18, 2014	Oct 17, 2015
15	Temperature Recorder+Thermocouple	Nov 20, 2014	Nov 19, 2015
16	Timer Controller	Nov 20, 2014	Nov 19, 2015

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

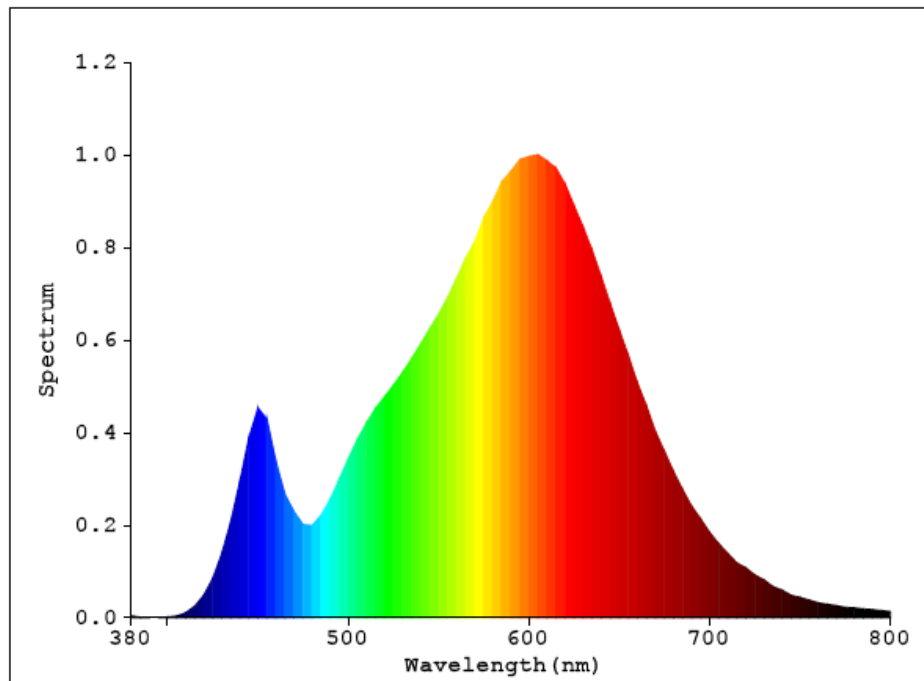
	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	695.42		NVLAP/EPA
	Luminous Efficacy (lm/w)	82.24		NVLAP/EPA
	Correlated Color Temperature (CCT)	3067		NVLAP/EPA
	Color Rendering Index– CRI	82.5		NVLAP/EPA
	Input Power (W)	8.46		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.0763		NVLAP/EPA
	Power Factor	0.9228		NVLAP/EPA
	x(CIE 1931)	0.4341		NVLAP/EPA
	y(CIE 1931)	0.4063		NVLAP/EPA
	u' (CIE 1976)	0.2478		NVLAP/EPA
	v' (CIE 1976)	0.5218		NVLAP/EPA
	Duv(CIE 1976)	0.0013		NVLAP/EPA
	Beam Angle: (Degree)	25.9		NVLAP/EPA
	Center beam candlepower: (cd)	2169		NVLAP/EPA
	Zonal lumen density (0-60°):	96.7%		NVLAP/EPA
	Zonal lumen density (60-90°):	3.3%		NVLAP/EPA
	Zonal lumen density (90-120°):	0.0%		NVLAP/EPA
	Zonal lumen density (120-180°):	0.0%		NVLAP/EPA

	CRI (R1)	80	NVLAP/EPA
	CRI (R2)	90	NVLAP/EPA
	CRI (R3)	97	NVLAP/EPA
	CRI (R4)	81	NVLAP/EPA
	CRI (R5)	80	NVLAP/EPA
	CRI (R6)	87	NVLAP/EPA
	CRI (R7)	84	NVLAP/EPA
	CRI (R8)	61	NVLAP/EPA
	CRI (R9)	10	NVLAP/EPA
	CRI (R10)	76	NVLAP/EPA
	CRI (R11)	79	NVLAP/EPA
	CRI (R12)	71	NVLAP/EPA
	CRI (R13)	82	NVLAP/EPA
	CRI (R14)	99	NVLAP/EPA

Lumen summary:

[OTHER]	Gamma(deg)	Fz (lm)	Ft (lm)	%Lum	%Lamp
[OTHER]	0- 10	165.14	165.14	23.75	23.75
[OTHER]	10- 20	244.15	409.29	58.86	58.86
[OTHER]	20- 30	135.92	545.22	78.40	78.40
[OTHER]	30- 40	68.31	613.52	88.22	88.22
[OTHER]	40- 50	36.04	649.57	93.41	93.41
[OTHER]	50- 60	23.24	672.81	96.75	96.75
[OTHER]	60- 70	15.25	688.06	98.94	98.94
[OTHER]	70- 80	6.45	694.51	99.87	99.87
[OTHER]	80- 90	0.90	695.41	100.00	100.00
[OTHER]	90-100	0.01	695.41	100.00	100.00
[OTHER]	100-110	0.00	695.41	100.00	100.00
[OTHER]	110-120	0.00	695.41	100.00	100.00
[OTHER]	120-130	0.00	695.41	100.00	100.00
[OTHER]	130-140	0.00	695.41	100.00	100.00
[OTHER]	140-150	0.00	695.41	100.00	100.00
[OTHER]	150-160	0.00	695.41	100.00	100.00
[OTHER]	160-170	0.00	695.41	100.00	100.00
[OTHER]	170-180	0.00	695.42	100.00	100.00

4 – Spectral Flux Plots



5 – EUT Photos



6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

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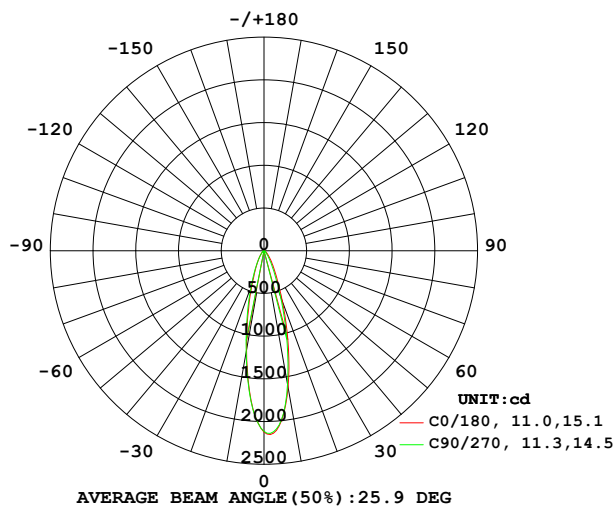


LUMINAIRE PHOTOMETRIC TEST REPORT

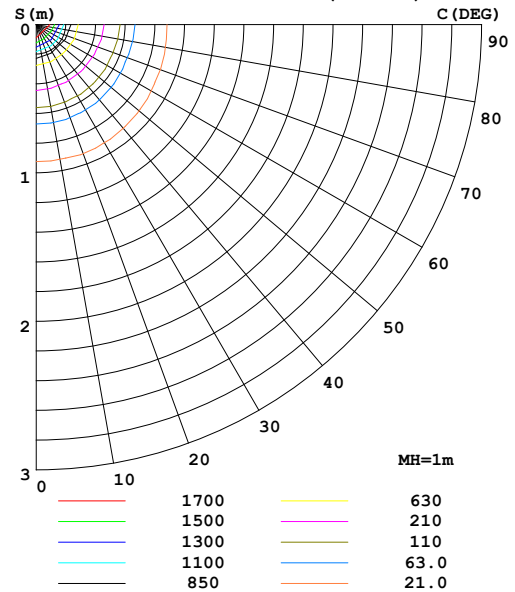
Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE: 8TRSG4DIM/830NF30/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 82.24 lm/W			
MODEL	8TRSG4DIM/830NF30/B/H	I _{max} (cd)	2169	S/MH (C0/180)	0.51
NOMINAL POWER (W)	8.5	LOR (%)	100.0	S/MH (C90/270)	0.49
RATED VOLTAGE (V)	120.0	TOTAL FLUX (lm)	695.42	η UP, DN (C0-180)	0.0, 45.8
NOMINAL FLUX (lm)	695.416	CIE CLASS	DIRECT	η UP, DN (C180-360)	0.0, 54.2
LAMPS INSIDE	1	η up (%)	0.0	CIBSE SHR NOM	0.00
TEST VOLTAGE (V)	120.0	η down (%)	100.0	CIBSE SHR MAX	1.00

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



PLANAR ISOLUX DIAGRAM (UNIT: lx)



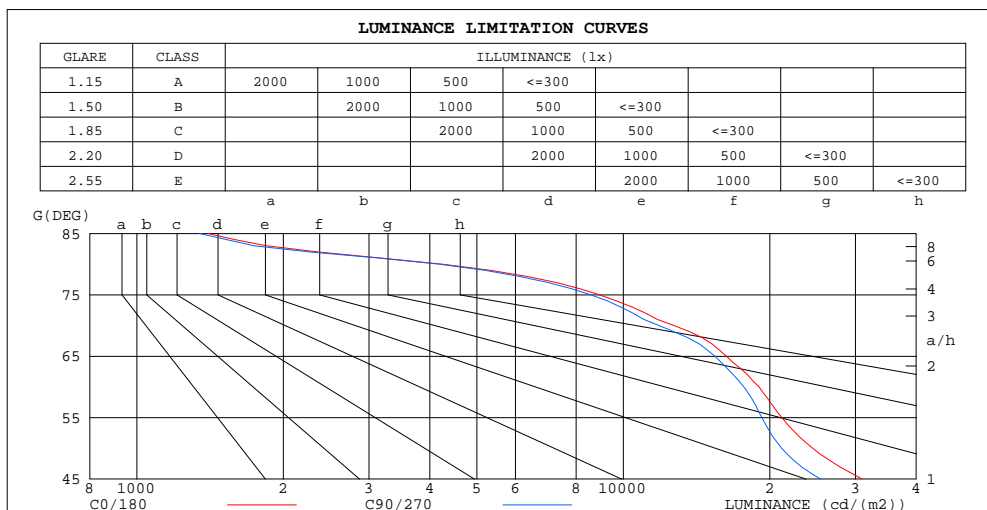
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 67.1%
 Test Distance: 2.508m [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	1181	1135	1205	1392	1622	1707	1587	1367	0- 10	165.1	165.1	23.7,23.7
20	396.3	393.1	438.5	526.7	627.0	650.6	563.2	458.2	10- 20	244.2	409.3	58.9,58.9
30	148.7	147.4	151.4	187.7	224.5	201.0	162.0	150.5	20- 30	135.9	545.2	78.4,78.4
40	65.01	61.61	56.17	74.54	94.44	77.32	54.67	58.07	30- 40	68.31	613.5	88.2,88.2
50	31.52	31.01	27.22	36.35	45.12	36.08	27.68	29.74	40- 50	36.04	649.6	93.4,93.4
60	19.01	18.43	17.69	21.77	25.00	22.37	19.80	19.64	50- 60	23.24	672.8	96.7,96.7
70	8.702	7.756	8.109	10.48	12.88	12.82	11.61	10.63	60- 70	15.25	688.1	98.9,98.9
80	1.476	1.105	1.453	2.481	3.804	4.143	3.564	2.580	70- 80	6.448	694.5	99.9,99.9
90	0	0	0	0.0018	0.1399	0.1826	0.1275	0	80- 90	0.8955	695.4	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0065	695.4	100,100
110	0	0	0	0	0	0	0	0	100-110	0	695.4	100,100
120	0	0	0	0	0	0	0	0	110-120	0.0000	695.4	100,100
130	0	0	0	0	0	0	0	0	120-130	0	695.4	100,100
140	0	0	0	0	0	0	0	0	130-140	0	695.4	100,100
150	0	0	0	0	0	0	0	0	140-150	0	695.4	100,100
160	0	0.0002	0	0	0	0	0	0	150-160	0.0000	695.4	100,100
170	0.0196	0.0208	0.0187	0.0152	0.0145	0.0129	0.0136	0.0152	160-170	0.0016	695.4	100,100
180	0	0	0	0	0	0	0	0	170-180	0.0015	695.4	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



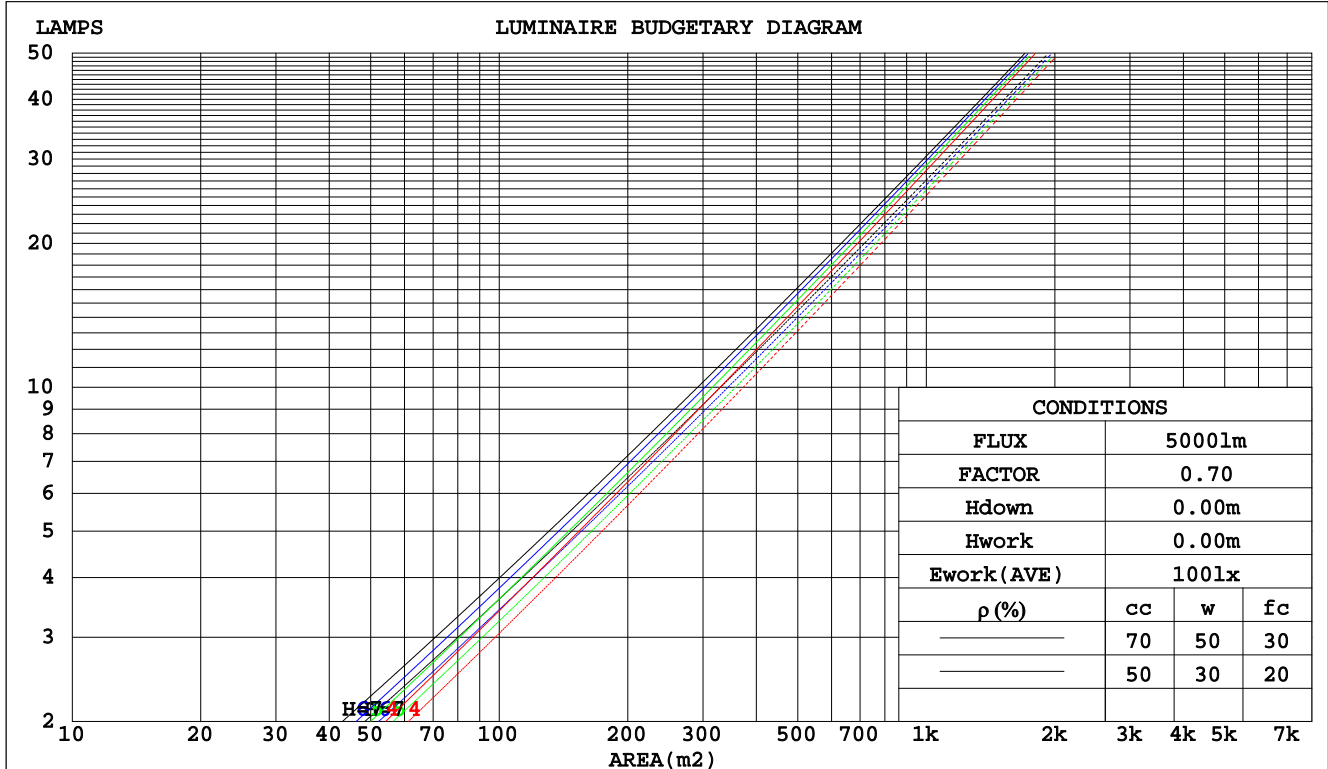
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.508m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE:8TRSG4DIM/830NF30/B/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	1.11	1.09	1.07	1.09	1.07	1.05	1.05	1.03	1.02	1.01	.00	.99	.98	.97	.96	.94
2.0	1.04	1.00	.97	1.02	.99	.96	.99	.96	.94	.96	.94	.92	.93	.91	.90	.88
3.0	.98	.93	.89	.96	.92	.89	.94	.90	.87	.91	.88	.86	.89	.87	.84	.83
4.0	.92	.87	.83	.91	.86	.83	.89	.85	.82	.87	.84	.81	.85	.82	.80	.78
5.0	.87	.82	.78	.86	.82	.78	.85	.80	.77	.83	.79	.76	.82	.78	.76	.74
6.0	.83	.78	.74	.82	.77	.74	.81	.76	.73	.80	.76	.73	.78	.75	.72	.71
7.0	.79	.74	.70	.79	.74	.70	.77	.73	.70	.76	.72	.69	.75	.72	.69	.68
8.0	.76	.71	.67	.75	.70	.67	.74	.70	.67	.73	.69	.66	.72	.69	.66	.65
9.0	.73	.68	.64	.72	.67	.64	.71	.67	.64	.71	.67	.64	.70	.66	.63	.62
10.0	.70	.65	.62	.70	.65	.61	.69	.64	.61	.68	.64	.61	.67	.64	.61	.60



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.508m [K=1.0000]
 Remarks:

WEC AND CCEC

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE:8TRSG4DIM/830NF30/B/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	.172	.098	.031	.165	.094	.030	.153	.088	.028	.141	.082	.026	.131	.076	.024		
2.0	.163	.089	.027	.157	.087	.027	.147	.082	.025	.137	.077	.024	.128	.072	.023		
3.0	.153	.081	.024	.148	.079	.024	.139	.075	.023	.131	.072	.022	.123	.068	.021		
4.0	.144	.075	.022	.140	.073	.022	.132	.070	.021	.125	.067	.020	.118	.064	.020		
5.0	.135	.069	.020	.132	.068	.020	.125	.065	.019	.119	.063	.019	.113	.061	.018		
6.0	.128	.064	.018	.125	.063	.018	.119	.061	.018	.114	.059	.017	.109	.057	.017		
7.0	.121	.060	.017	.118	.059	.017	.113	.057	.016	.109	.056	.016	.104	.054	.016		
8.0	.115	.056	.016	.113	.055	.016	.108	.054	.015	.104	.053	.015	.100	.051	.015		
9.0	.109	.053	.015	.107	.052	.015	.103	.051	.014	.100	.050	.014	.096	.049	.014		
10.0	.104	.050	.014	.103	.050	.014	.099	.048	.014	.096	.047	.013	.092	.046	.013		

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	.171	.157	.145	.146	.135	.125	.100	.093	.086	.058	.054	.050	.018	.017	.016	
2.0	.155	.133	.114	.133	.114	.098	.091	.079	.069	.052	.046	.040	.017	.015	.013	
3.0	.142	.114	.091	.122	.098	.079	.084	.068	.055	.048	.040	.033	.016	.013	.011	
4.0	.131	.099	.074	.112	.085	.064	.077	.059	.045	.045	.035	.027	.014	.011	.009	
5.0	.121	.087	.061	.104	.075	.053	.072	.052	.038	.042	.031	.022	.013	.010	.007	
6.0	.113	.077	.052	.097	.067	.045	.067	.047	.032	.039	.028	.019	.013	.009	.006	
7.0	.106	.069	.044	.091	.060	.038	.063	.042	.027	.037	.025	.016	.012	.008	.005	
8.0	.100	.063	.038	.086	.055	.033	.059	.038	.023	.035	.023	.014	.011	.007	.005	
9.0	.094	.058	.033	.081	.050	.029	.056	.035	.020	.033	.021	.012	.011	.007	.004	
10.0	.089	.053	.029	.077	.046	.025	.053	.032	.018	.031	.019	.011	.010	.006	.004	

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.508m [K=1.0000]
 Remarks:

UGR(Unified Glare Rating) Table

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm											
NAME:					TYPE:8TRSG4DIM/830NF30/B/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		19.0	19.9	19.2	20.0	20.2	18.4	19.3	18.6	19.4	19.6
	3H	19.6	20.4	19.9	20.6	20.8	19.0	19.8	19.3	20.0	20.2
	4H	19.7	20.5	20.0	20.7	20.9	19.2	19.9	19.5	20.2	20.4
	6H	19.7	20.4	20.0	20.7	20.9	19.2	19.9	19.5	20.1	20.4
	8H	19.7	20.4	20.0	20.6	20.9	19.2	19.8	19.5	20.1	20.4
	12H	19.6	20.3	20.0	20.6	20.8	19.1	19.8	19.4	20.0	20.3
4H	2H	19.3	20.0	19.5	20.2	20.4	18.7	19.5	19.0	19.7	19.9
	3H	19.9	20.6	20.3	20.9	21.1	19.5	20.1	19.8	20.4	20.7
	4H	20.1	20.7	20.5	21.0	21.3	19.7	20.3	20.0	20.6	20.9
	6H	20.1	20.7	20.5	21.0	21.3	19.7	20.2	20.0	20.5	20.9
	8H	20.1	20.6	20.5	20.9	21.3	19.6	20.1	20.0	20.5	20.8
	12H	20.0	20.5	20.4	20.9	21.2	19.6	20.0	20.0	20.4	20.8
8H	4H	20.1	20.6	20.5	20.9	21.3	19.6	20.1	20.0	20.5	20.8
	6H	20.1	20.5	20.5	20.9	21.3	19.7	20.1	20.1	20.5	20.9
	8H	20.0	20.4	20.5	20.8	21.3	19.6	20.0	20.1	20.4	20.8
	12H	20.0	20.3	20.5	20.8	21.2	19.6	19.9	20.0	20.3	20.8
12H	4H	20.0	20.5	20.4	20.9	21.2	19.6	20.0	20.0	20.4	20.8
	6H	20.0	20.4	20.5	20.8	21.3	19.6	20.0	20.1	20.4	20.8
	8H	20.0	20.3	20.5	20.8	21.2	19.6	19.9	20.0	20.3	20.8
Variations with the observer position at spacings:											
S = 1.0H	+ 0.7 / - 1.1					+ 0.8 / - 1.0					
1.5H	+ 1.2 / - 0.8					+ 1.3 / - 0.8					
2.0H	+ 1.2 / - 0.9					+ 0.8 / - 0.7					

CIE Pub.117 Corrected 695.4 lm Total Lamp Luminous Flux.(8log(F/F0) = -1.3)

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.508m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE:8TRSG4DIM/830NF30/B/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) $k(RI) \times RCR = 5$									
$k = 0.60$	84	77	73	84	77	73	83	77	73	69
0.80	92	85	81	91	85	81	90	85	81	77
1.00	97	91	87	96	90	86	94	90	86	82
1.25	101	95	92	100	95	91	98	94	90	86
1.50	104	99	95	103	98	95	100	96	93	89
2.00	107	103	99	106	101	98	103	99	97	91
2.50	109	105	102	107	104	101	104	101	99	93
3.00	111	107	104	109	106	103	106	103	101	94
4.00	113	110	108	111	108	106	107	105	103	96
5.00	114	112	110	112	110	108	108	107	105	97
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:2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.508m [K=1.0000]
 Remarks:

ISOCANDELA DIAGRAM

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE:8TRSG4DIM/830NF30/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

Conical surface Flux(90deg):

634.01 lm

%lum = 91.2%

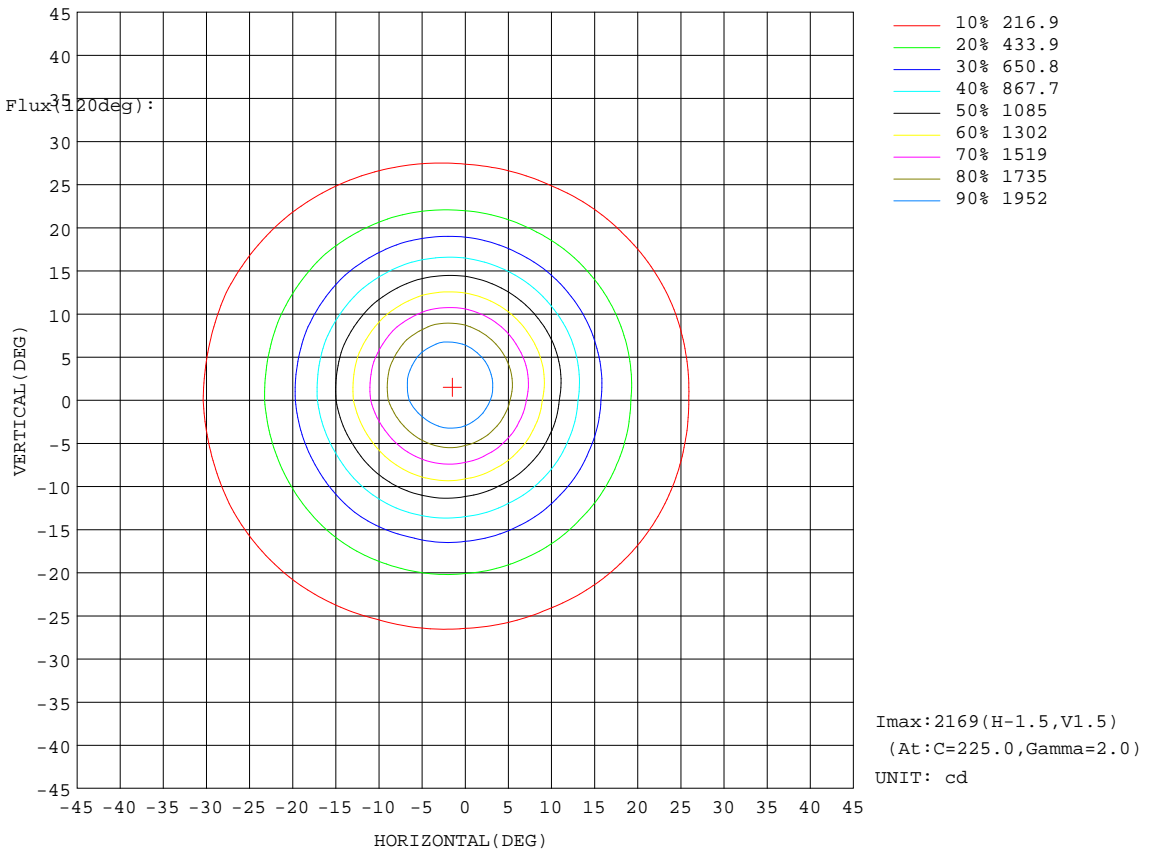
%lamp = 91.2%

Conical surface Flux(20deg):

672.81 lm

%lum = 96.7%

%lamp = 96.7%

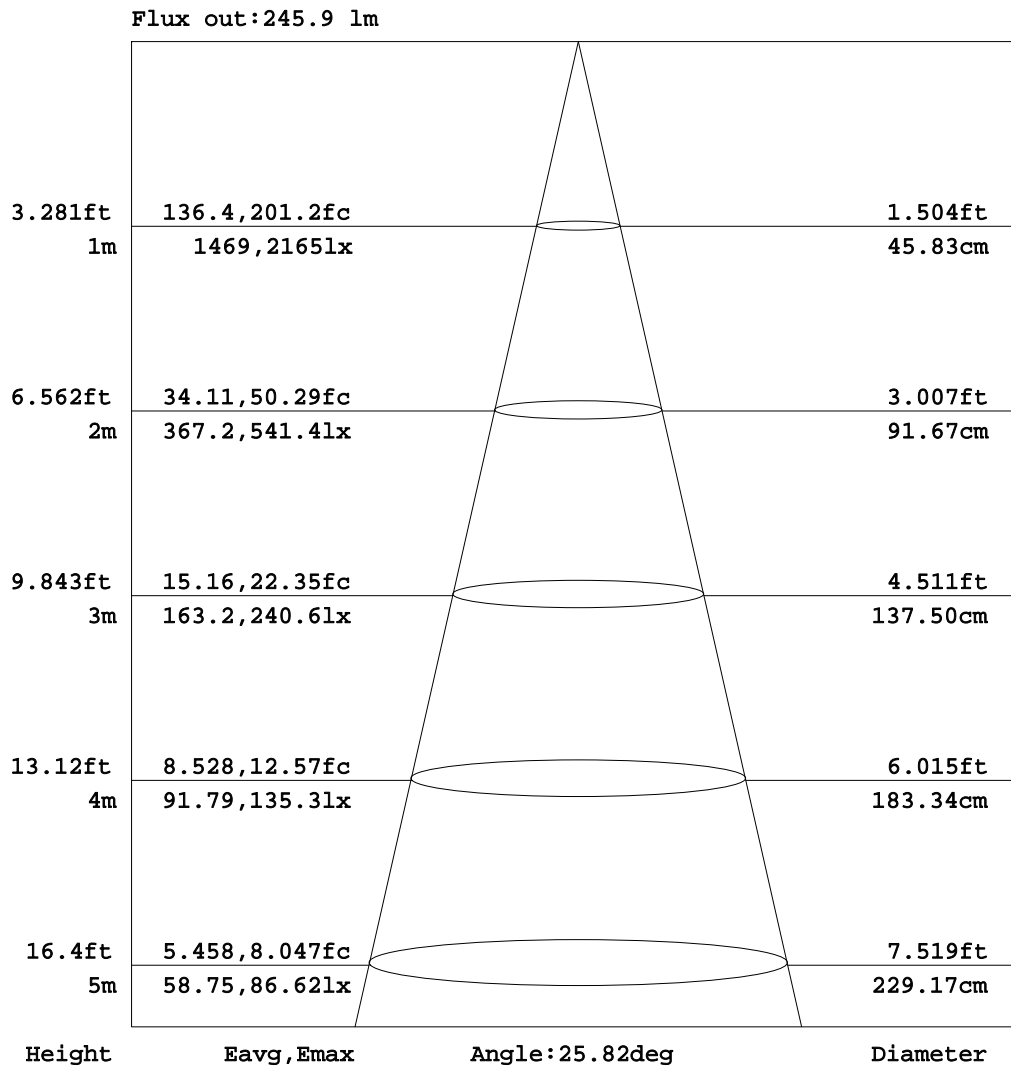


C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.6DEG
Operators: David
Test Date: 2014-11-20

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 67.1%
Test Distance: 2.508m [K=1.0000]
Remarks:

AAI Figure

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE:8TRSG4DIM/830NF30/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



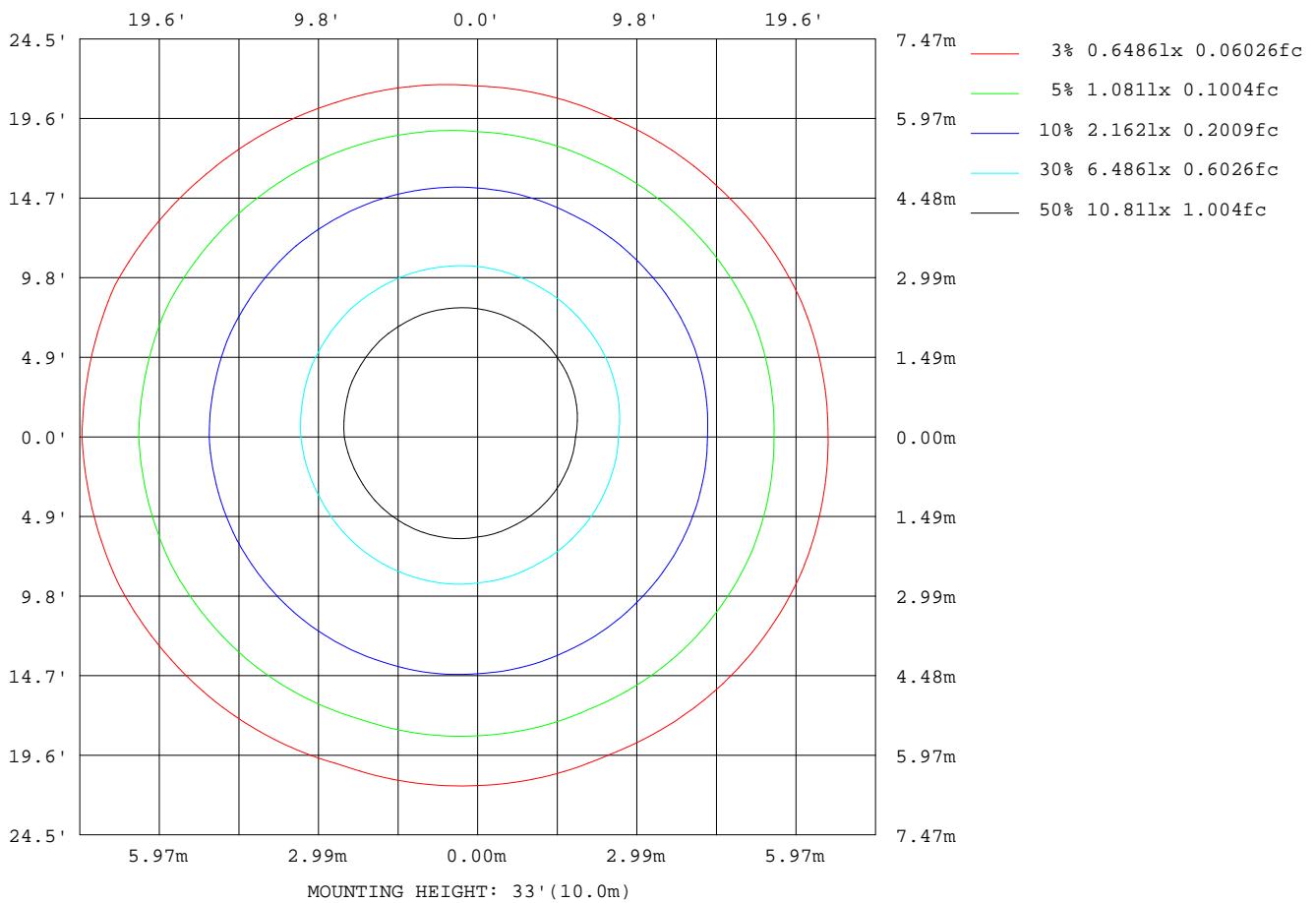
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2014-11-20

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.508m [K=1.0000]
Remarks:

ISOLUX DIAGRAM

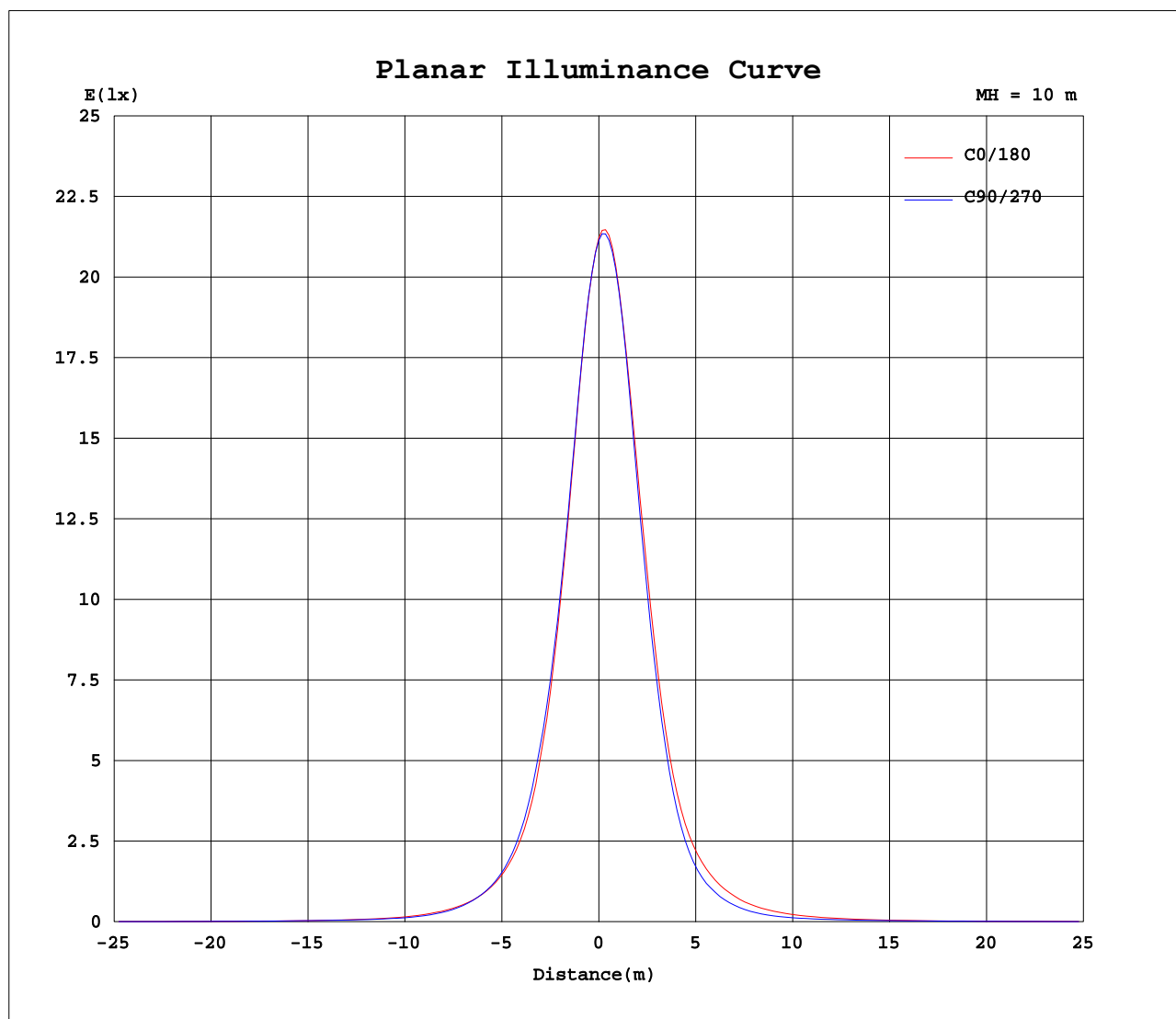
Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm		
NAME:	TYPE:8TRSG4DIM/830NF30/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.6DEG
Operators: David
Test Date: 2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 67.1%
Test Distance: 2.508m [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: 2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity: 67.1%
Test Distance: 2.508m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:120.0V I:0.0763A P:8.456W PF:0.9228 Lamp Flux:695.416x1 lm																		
NAME:									TYPE:8TRSG4DIM/830NF30/B/H									WEIGHT:
SPEC.:									DIM.:									SERIAL No.:
MFR.: GC									SUR.:									PROTECTION ANGLE:

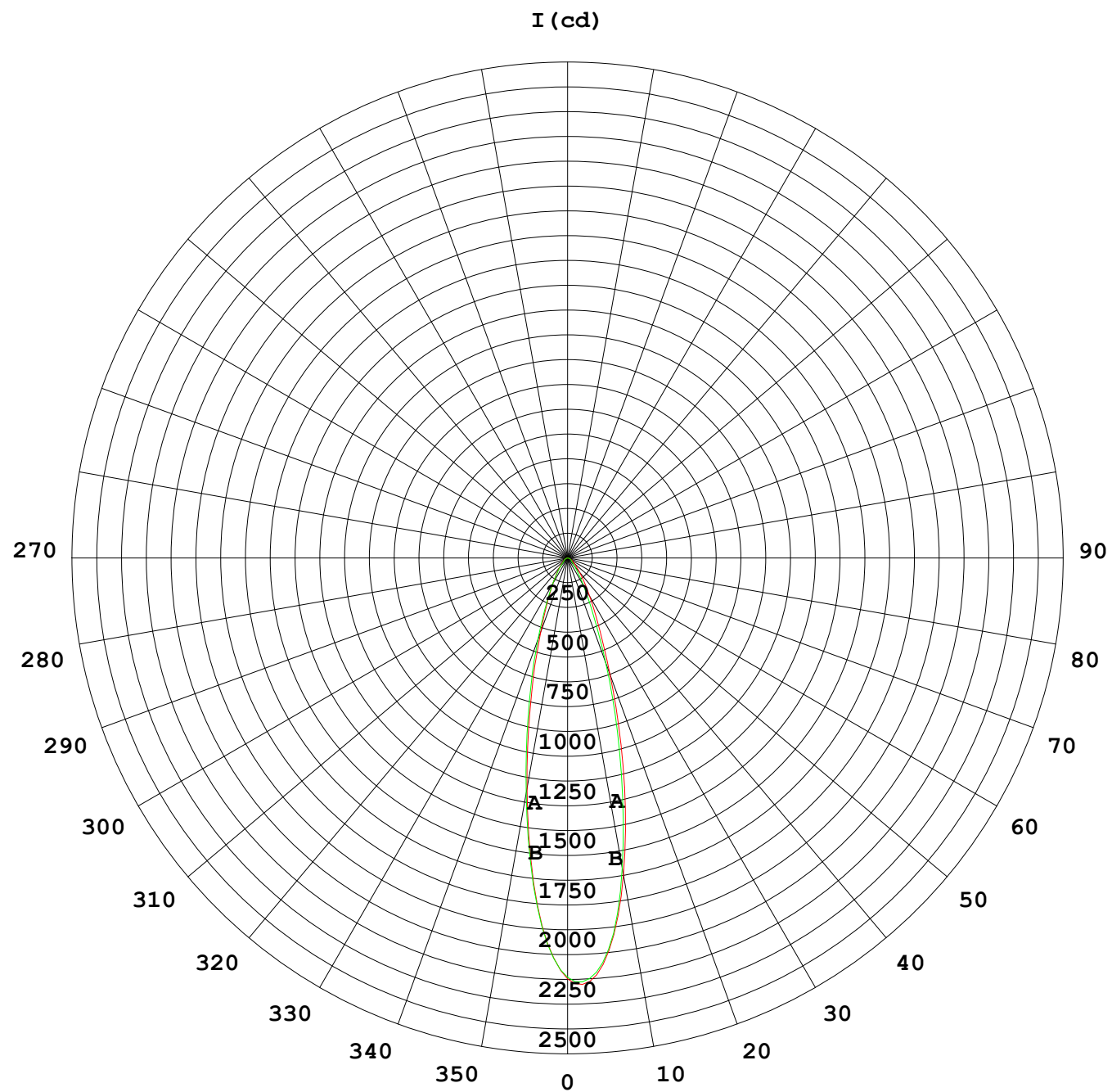
Table--1

UNIT: cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	2122	2120	2117	2115	2114	2115	2116	2118	2122	2120	2117	2115	2114	2115	2116	2118			
5	1756	1718	1705	1721	1762	1825	1897	1972	2057	2098	2114	2097	2046	1973	1897	1826			
10	1181	1144	1135	1152	1205	1292	1392	1501	1622	1686	1707	1675	1587	1477	1367	1276			
15	700	683	684	704	747	813	894	979	1082	1129	1126	1087	1015	922	835	765			
20	396	391	393	411	438	478	527	576	627	654	651	618	563	502	458	426			
25	237	237	237	240	253	275	306	336	360	363	351	323	291	264	252	246			
30	149	150	147	144	151	163	188	210	224	220	201	180	162	152	150	153			
35	96.7	96.8	93.5	89.6	92.1	99.0	118	134	145	141	122	106	93.1	88.9	91.2	95.9			
40	65.0	64.7	61.6	57.9	56.2	63.4	74.5	87.4	94.4	90.6	77.3	63.7	54.7	54.4	58.1	61.4			
45	43.8	44.9	42.4	37.8	36.0	41.6	50.3	59.0	64.4	59.6	51.0	40.4	35.9	36.7	39.8	41.7			
50	31.5	33.0	31.0	27.9	27.2	30.3	36.4	40.9	45.1	42.4	36.1	29.8	27.7	28.1	29.7	30.7			
55	24.3	25.1	23.9	22.2	22.1	23.8	27.6	30.1	32.8	31.9	27.8	24.4	23.3	23.4	24.0	24.2			
60	19.0	19.2	18.4	17.4	17.7	19.0	21.8	23.5	25.0	24.7	22.4	20.6	19.8	19.6	19.6	19.4			
65	13.8	13.6	13.1	12.6	13.0	14.1	16.0	17.5	19.0	19.1	17.7	16.6	15.9	15.4	15.1	14.6			
70	8.70	8.07	7.76	7.69	8.11	9.01	10.5	11.8	12.9	13.4	12.8	12.2	11.6	11.1	10.6	9.77			
75	4.63	4.26	4.07	4.14	4.44	5.05	5.77	6.57	7.38	7.81	7.95	7.56	7.03	6.58	5.99	5.31			
80	1.48	1.21	1.10	1.18	1.45	1.91	2.48	3.11	3.80	4.10	4.14	3.94	3.56	3.10	2.58	2.03			
85	0.24	0.19	0.18	0.19	0.23	0.30	0.40	0.56	0.89	1.11	1.17	1.06	0.84	0.61	0.44	0.34			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.14	0.17	0.18	0.17	0.13	0.07	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01			
170	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02			
175	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	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			

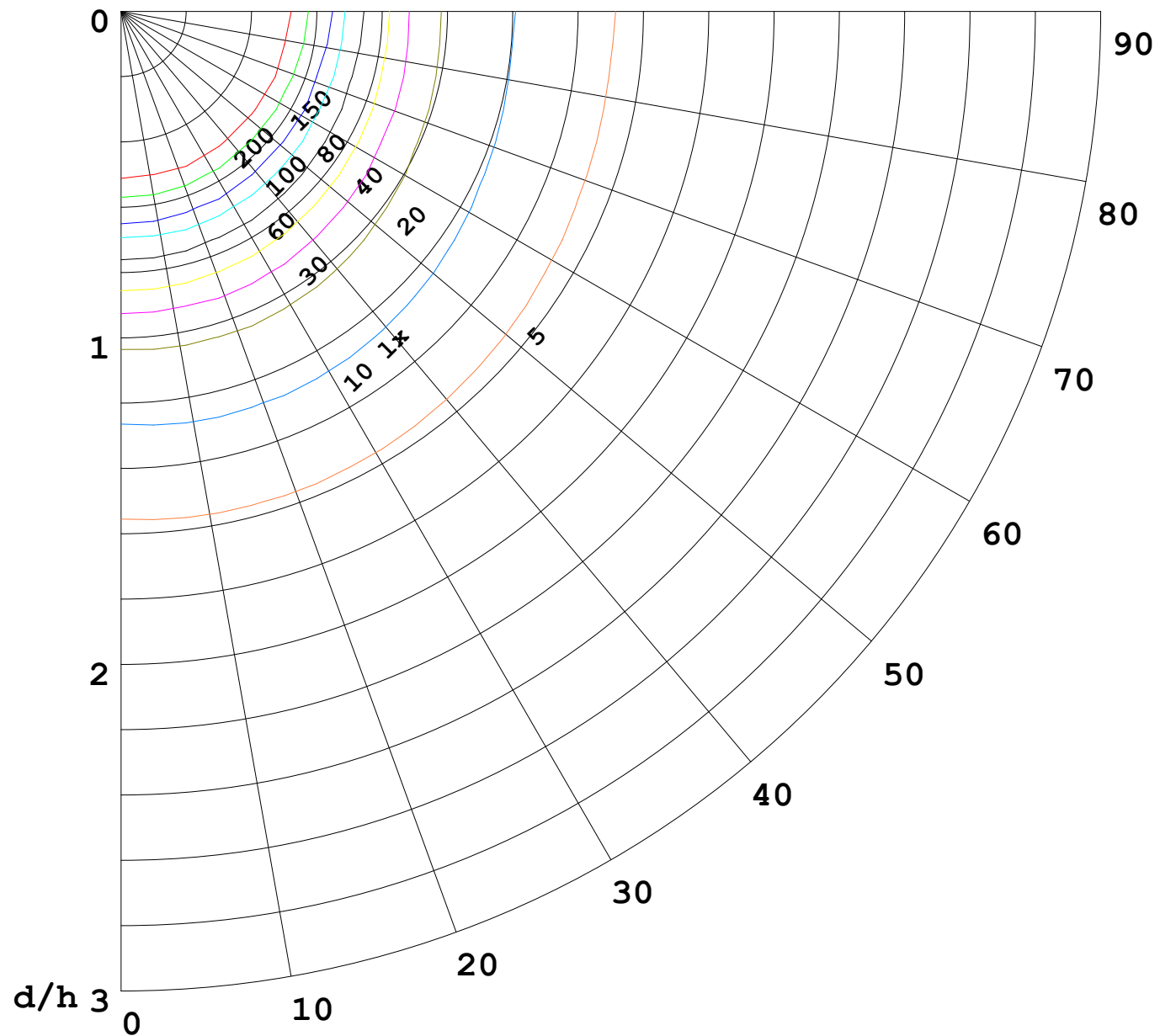
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2014-11-20

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 67.1%
 Test Distance: 2.508m [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

