

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:	33TRLG4DIM/927/B/H; 33TRLG4DIM/927/B/J; 33TRLG4DIM/927/B/L; 33TRLG4DIM/927/W/H; 33TRLG4DIM/927/W/J; 33TRLG4DIM/927/W/L
Test Engineer:	David Zhang 
Report No.:	BTR66.181.14.0057.04
Sample Received Date:	Feb 06, 2015
Test Performed Date:	Feb 06, 2015 to Feb 12, 2015
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 TRACK LAMP
Model No	: 33TRLG4DIM/927/B/H; 33TRLG4DIM/927/B/J; 33TRLG4DIM/927/B/L; 33TRLG4DIM/927/W/H; 33TRLG4DIM/927/W/J; 33TRLG4DIM/927/W/L
Brand	: GREEN CREATIVE
Nominal Operation Voltage	: AC 120V/60Hz
Nominal Power	: 33 W
Nominal CCT	: 2700K
Nominal CRI	: 90
Nominal Lumen Output	: 2200 Lumens
Nominal Life Time	: 40000 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	: Feb 06, 2015
Measurement quantities measured	: 1 pcs
Orientation During Testing	: Base up
Test Requested	: Electrical and Photometric Test Luminous Intensity Distribution Test

Note: 33TRLG4DIM/927/B/J; 33TRLG4DIM/927/B/L; 33TRLG4DIM/927/W/H; 33TRLG4DIM/927/W/J; 33TRLG4DIM/927/W/L and 33TRLG4DIM/927/B/H are only lamp base and color different, here we choose 33TRLG4DIM/927/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

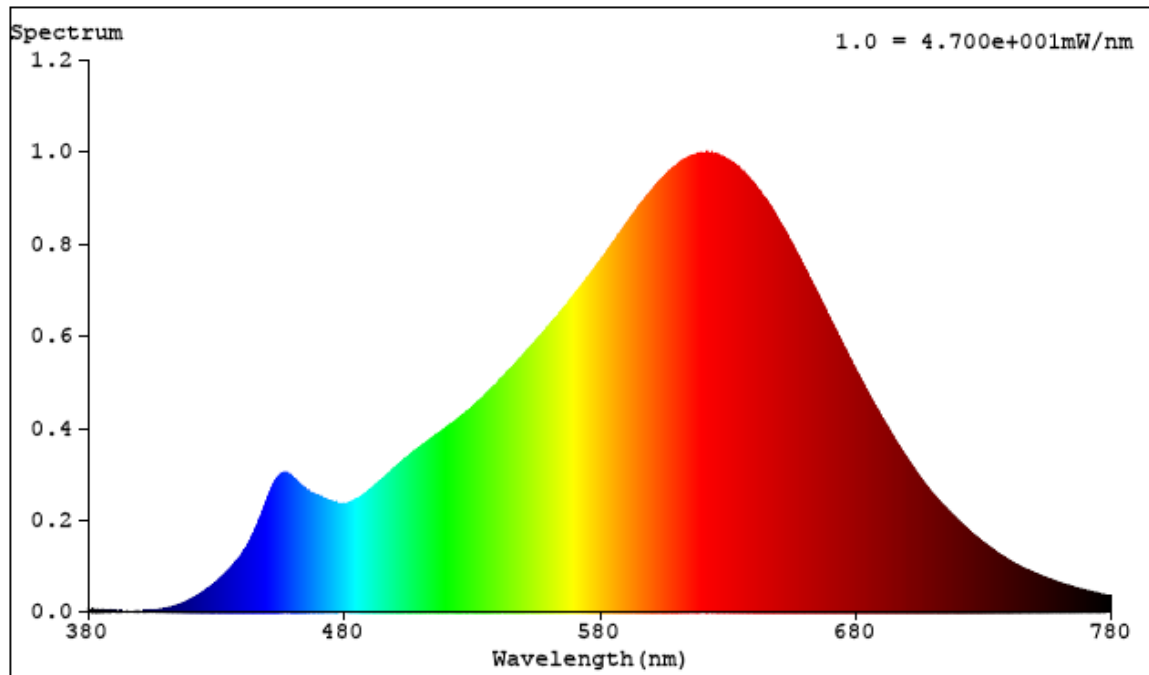
	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	2388.56		NVLAP/EPA
	Luminous Efficacy (lm/w)	70.49		NVLAP/EPA
	Correlated Color Temperature (CCT)	2681		NVLAP/EPA
	Color Rendering Index– CRI	91.3		NVLAP/EPA
	Input Power (W)	33.88		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.2836		NVLAP/EPA
	Power Factor	0.9950		NVLAP/EPA
	x(CIE 1931)	0.4612		NVLAP/EPA
	y(CIE 1931)	0.4106		NVLAP/EPA
	u' (CIE 1976)	0.2634		NVLAP/EPA
	v' (CIE 1976)	0.5276		NVLAP/EPA
	Duv(CIE 1976)	0.0001		NVLAP/EPA
	Beam Angle: (Degree)	21.0		NVLAP/EPA
	Center beam candlepower: (cd)	11257		NVLAP/EPA
	Zonal lumen density (0-60°):	97.1%		NVLAP/EPA
	Zonal lumen density (60-90°):	2.9%		NVLAP/EPA
	Zonal lumen density (90-120°):	0.0%		NVLAP/EPA
	Zonal lumen density (120-180°):	0.0%		NVLAP/EPA

	CRI (R1)	91	NVLAP/EPA
	CRI (R2)	97	NVLAP/EPA
	CRI (R3)	97	NVLAP/EPA
	CRI (R4)	90	NVLAP/EPA
	CRI (R5)	91	NVLAP/EPA
	CRI (R6)	97	NVLAP/EPA
	CRI (R7)	89	NVLAP/EPA
	CRI (R8)	77	NVLAP/EPA
	CRI (R9)	52	NVLAP/EPA
	CRI (R10)	93	NVLAP/EPA
	CRI (R11)	90	NVLAP/EPA
	CRI (R12)	87	NVLAP/EPA
	CRI (R13)	93	NVLAP/EPA
	CRI (R14)	99	NVLAP/EPA

Lumen summary:

[OTHER]	Gamma(deg)	Fz(lm)	Ft(lm)	%Lum	%Lamp
[OTHER]	0- 10	779.55	779.55	32.64	32.64
[OTHER]	10- 20	908.74	1688.29	70.68	70.68
[OTHER]	20- 30	404.07	2092.37	87.60	87.60
[OTHER]	30- 40	107.46	2199.83	92.10	92.10
[OTHER]	40- 50	61.93	2261.76	94.69	94.69
[OTHER]	50- 60	56.51	2318.27	97.06	97.06
[OTHER]	60- 70	44.69	2362.96	98.93	98.93
[OTHER]	70- 80	22.21	2385.17	99.86	99.86
[OTHER]	80- 90	3.35	2388.52	100.00	100.00
[OTHER]	90-100	0.00	2388.52	100.00	100.00
[OTHER]	100-110	0.00	2388.52	100.00	100.00
[OTHER]	110-120	0.00	2388.52	100.00	100.00
[OTHER]	120-130	0.00	2388.52	100.00	100.00
[OTHER]	130-140	0.00	2388.52	100.00	100.00
[OTHER]	140-150	0.00	2388.52	100.00	100.00
[OTHER]	150-160	0.01	2388.53	100.00	100.00
[OTHER]	160-170	0.02	2388.55	100.00	100.00
[OTHER]	170-180	0.01	2388.56	100.00	100.00

4 – Spectral Flux Plots



5 – EUT Photos



6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

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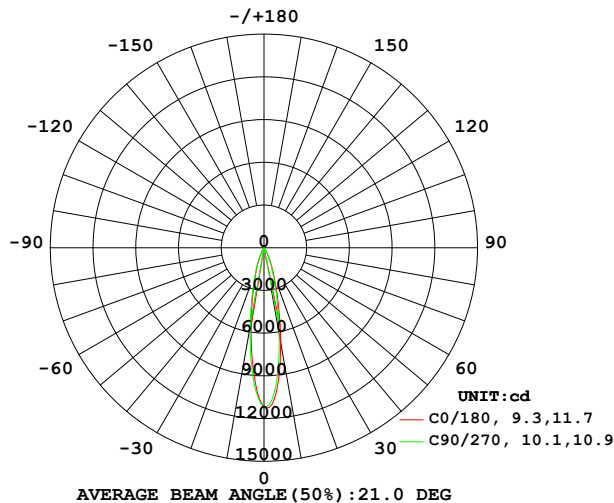


LUMINAIRE PHOTOMETRIC TEST REPORT

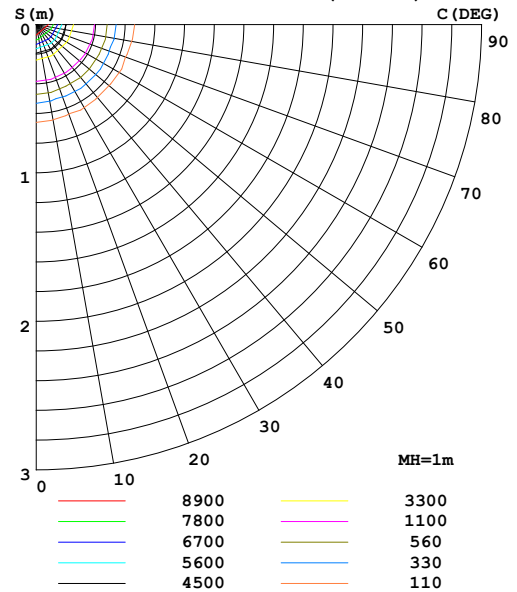
Test:U:120.0V I:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: IE	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 70.49 lm/W			
MODEL		I _{max} (cd)	11257	S/MH (C0/180)	0.40
NOMINAL POWER (W)	35	LOR (%)	100.0	S/MH (C90/270)	0.37
RATED VOLTAGE (V)	120.0	TOTAL FLUX (lm)	2388.6	η UP, DN (C0-180)	0.0, 47.7
NOMINAL FLUX (lm)	2388.56	CIE CLASS	DIRECT	η UP, DN (C180-360)	0.0, 52.3
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)



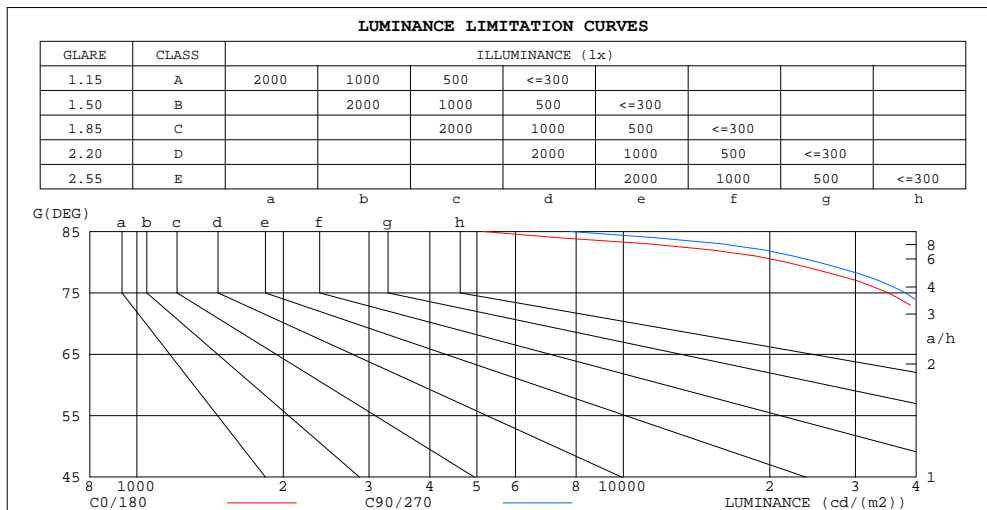
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2015-02-10

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	Φ lum, lamp
10	520.4	526.9	564.6	619.3	677.4	669.3	617.0	563.2	0- 10	779.5	779.5	32.6,32.6
20	147.3	147.9	161.0	179.0	197.0	191.7	174.9	158.4	10- 20	908.7	1688	70.7,70.7
30	29.80	28.98	31.26	37.49	41.35	40.92	37.76	34.72	20- 30	404.1	2092	87.6,87.6
40	9.159	9.010	9.251	9.622	9.491	9.616	9.579	9.851	30- 40	107.5	2200	92.1,92.1
50	6.973	6.899	7.026	7.202	7.195	7.119	7.083	7.239	40- 50	61.93	2262	94.7,94.7
60	5.327	5.304	5.424	5.594	5.701	5.662	5.589	5.522	50- 60	56.51	2318	97.1,97.1
70	3.122	3.149	3.263	3.469	3.662	3.662	3.486	3.296	60- 70	44.69	2363	98.9,98.9
80	0.7506	0.7680	0.8739	1.033	1.198	1.170	1.019	0.8710	70- 80	22.21	2385	99.9,99.9
90	0	0	0.0003	0.0067	0.0254	0.0218	0.0061	0	80- 90	3.346	2389	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0044	2389	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2389	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2389	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2389	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2389	100,100
150	0	0	0	0	0.0000	0.0000	0.0000	0.0002	140-150	0.0000	2389	100,100
160	0.0037	0.0037	0.0034	0.0028	0.0031	0.0029	0.0032	0.0038	150-160	0.0058	2389	100,100
170	0.0134	0.0134	0.0129	0.0117	0.0117	0.0113	0.0117	0.0128	160-170	0.0194	2389	100,100
180	0	0	0	0	0.0007	0.0009	0.0009	0.0008	170-180	0.0126	2389	100,100
DEG	LUMINOUS INTENSITY: $\times 10 \text{cd}$									UNIT: lm		



LUMINANCE cd/(m ²)		
G(DEG)	C0/180	C90/270
85	5135	7762
80	21614	25162
75	35058	38037
70	45645	47702
65	51198	52895
60	53274	54243
55	53978	54525
50	54239	54649
45	55176	55532

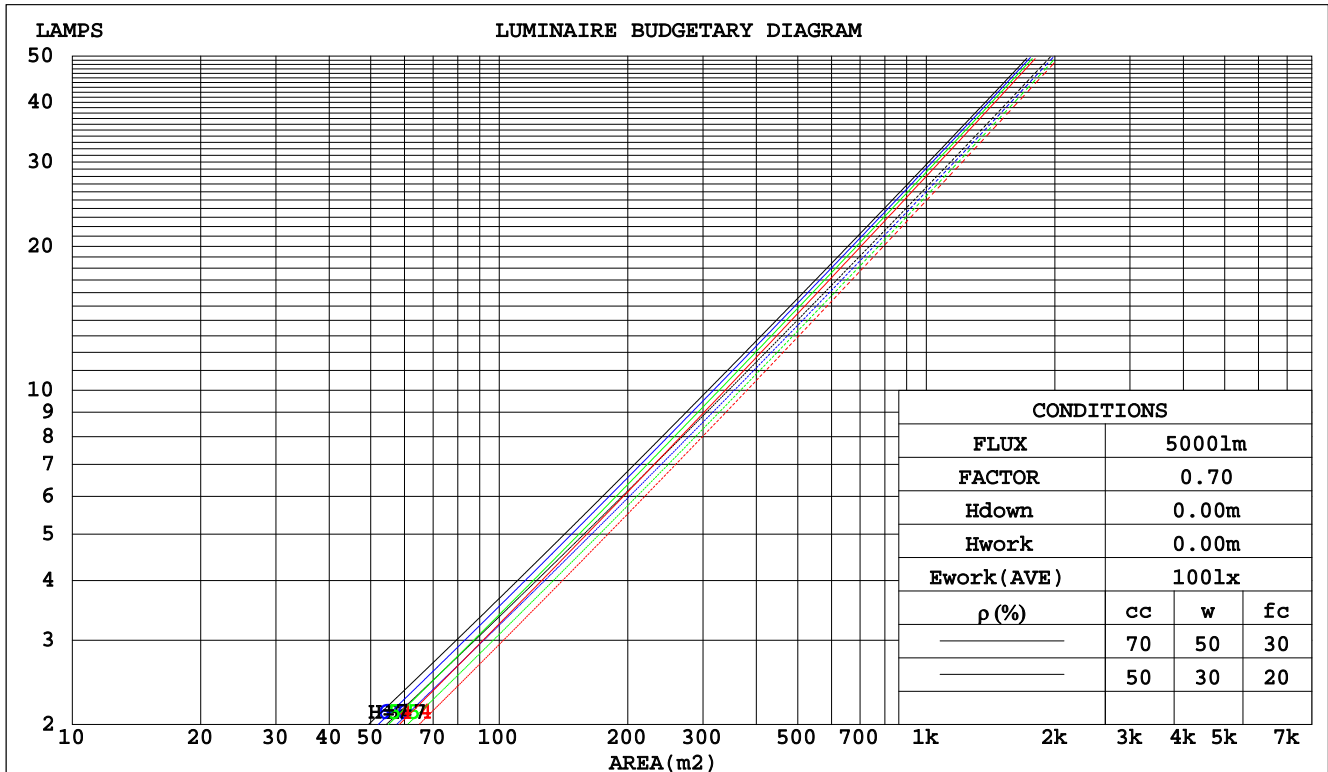
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/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	1.12	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	1.06	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	.91	.94	.91	.89	.92	.90	.88	.86
4.0	.96	.91	.88	.94	.90	.87	.92	.89	.86	.91	.88	.85	.89	.86	.84	.83
5.0	.92	.87	.83	.91	.86	.83	.89	.85	.82	.87	.84	.82	.86	.83	.81	.80
6.0	.88	.83	.80	.87	.83	.80	.86	.82	.79	.85	.81	.79	.83	.80	.78	.77
7.0	.85	.80	.77	.84	.80	.76	.83	.79	.76	.82	.78	.76	.81	.78	.75	.74
8.0	.82	.77	.74	.81	.77	.74	.80	.76	.74	.79	.76	.73	.79	.75	.73	.72
9.0	.79	.75	.72	.79	.74	.71	.78	.74	.71	.77	.74	.71	.76	.73	.71	.70
10.0	.77	.72	.69	.76	.72	.69	.76	.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:2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/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	.157	.089	.028	.150	.086	.027	.138	.079	.025	.126	.073	.023	.116	.067	.022	
2.0	.146	.080	.025	.141	.078	.024	.131	.073	.023	.121	.068	.021	.112	.063	.020	
3.0	.136	.073	.022	.132	.071	.021	.123	.067	.020	.115	.063	.019	.107	.059	.018	
4.0	.127	.066	.019	.123	.065	.019	.116	.061	.018	.109	.059	.018	.103	.056	.017	
5.0	.119	.061	.018	.116	.060	.017	.110	.057	.017	.104	.055	.016	.098	.052	.016	
6.0	.112	.056	.016	.109	.055	.016	.104	.053	.015	.099	.051	.015	.094	.049	.015	
7.0	.106	.053	.015	.104	.052	.015	.099	.050	.014	.094	.048	.014	.090	.047	.014	
8.0	.101	.049	.014	.098	.048	.014	.094	.047	.013	.090	.046	.013	.087	.044	.013	
9.0	.096	.046	.013	.094	.046	.013	.090	.045	.013	.087	.043	.012	.083	.042	.012	
10.0	.091	.044	.012	.090	.043	.012	.086	.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	.158	.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	.100	.068	.046	.086	.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:2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm											
NAME:					TYPE:33TRLG4DIM/927/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		20.3	21.1	20.6	21.2	21.4	20.4	21.2	20.6	21.3	21.5
3H		21.8	22.5	22.0	22.7	22.9	21.9	22.6	22.1	22.8	23.0
4H		22.2	22.8	22.4	23.1	23.3	22.3	23.0	22.6	23.2	23.4
6H		22.3	23.0	22.6	23.2	23.4	22.5	23.2	22.8	23.4	23.6
8H		22.3	22.9	22.6	23.2	23.4	22.5	23.2	22.8	23.4	23.7
12H		22.3	22.9	22.6	23.1	23.4	22.5	23.1	22.8	23.4	23.6
4H	2H	21.0	21.7	21.3	21.9	22.1	21.1	21.7	21.3	21.9	22.2
	3H	22.6	23.1	22.9	23.4	23.7	22.7	23.2	23.0	23.5	23.8
	4H	23.0	23.6	23.4	23.8	24.2	23.2	23.7	23.5	24.0	24.3
	6H	23.2	23.7	23.6	24.0	24.4	23.4	23.9	23.8	24.2	24.6
	8H	23.2	23.7	23.6	24.0	24.4	23.4	23.9	23.8	24.2	24.6
	12H	23.2	23.6	23.6	23.9	24.3	23.4	23.8	23.8	24.2	24.6
8H	4H	23.1	23.6	23.5	23.9	24.3	23.3	23.7	23.7	24.1	24.4
	6H	23.4	23.8	23.8	24.1	24.6	23.6	23.9	24.0	24.3	24.7
	8H	23.4	23.7	23.8	24.1	24.6	23.6	23.9	24.1	24.4	24.8
	12H	23.3	23.6	23.8	24.1	24.5	23.6	23.9	24.0	24.3	24.8
12H	4H	23.1	23.5	23.5	23.9	24.3	23.3	23.7	23.7	24.0	24.4
	6H	23.4	23.7	23.8	24.1	24.5	23.5	23.9	24.0	24.3	24.7
	8H	23.4	23.7	23.8	24.1	24.6	23.6	23.9	24.0	24.3	24.8
Variations with the observer position at spacings:											
S = 1.0H		+ 0.2 / - 0.3					+ 0.2 / - 0.3				
1.5H		+ 0.1 / - 0.3					+ 0.1 / - 0.2				
2.0H		+ 0.3 / - 0.4					+ 0.2 / - 0.4				

CIE Pub.117 Corrected 2389 lm Total Lamp Luminous Flux.(8log(F/F0) = 3.0)

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

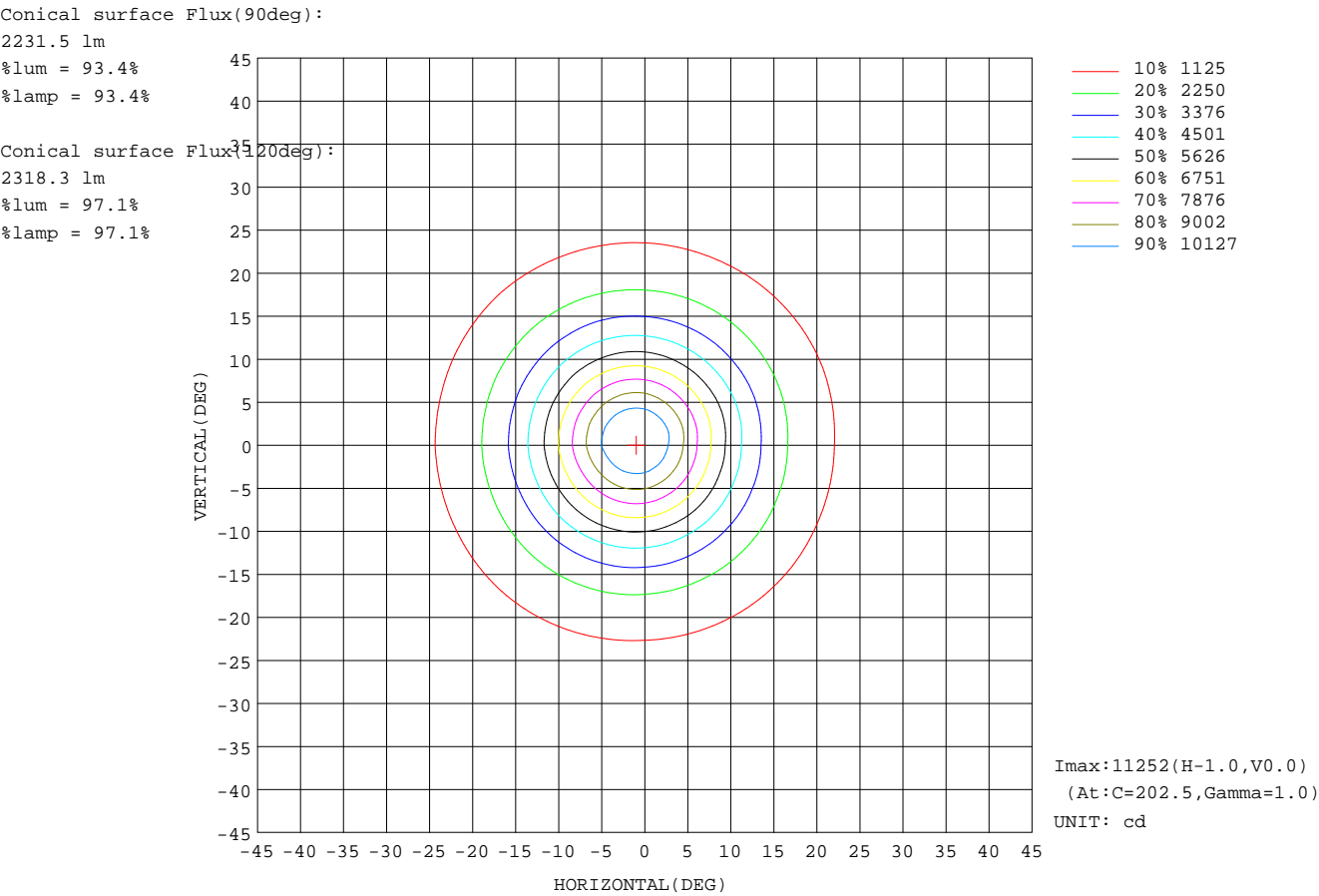
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	87	80	76	86	80	76	85	80	76	73
0.80	94	88	84	93	88	84	92	87	84	80
1.00	98	93	89	98	92	89	96	92	88	84
1.25	102	97	93	101	96	93	99	95	92	88
1.50	105	100	97	104	99	96	102	98	95	91
2.00	108	104	100	106	102	99	104	101	98	93
2.50	110	106	103	108	104	102	105	102	100	94
3.00	111	108	105	110	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:2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



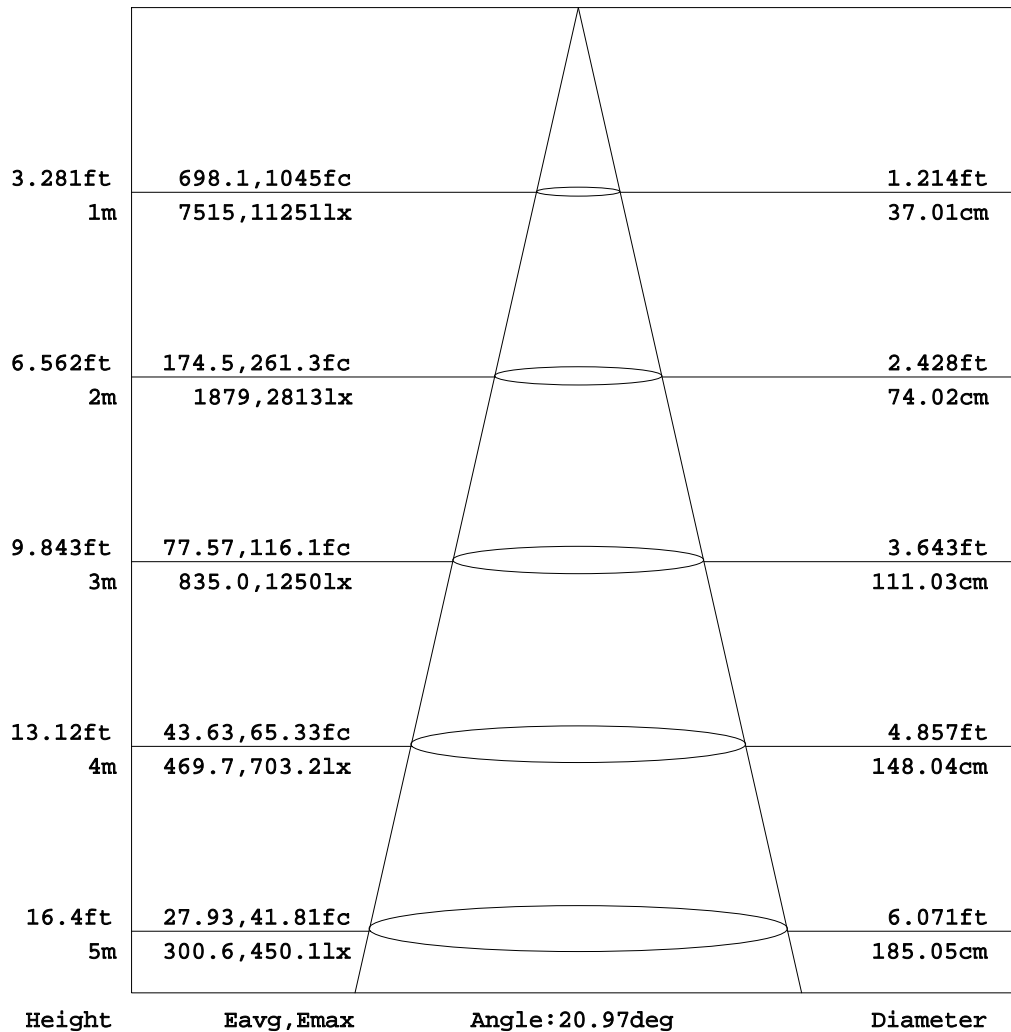
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

Flux out:892.0 lm



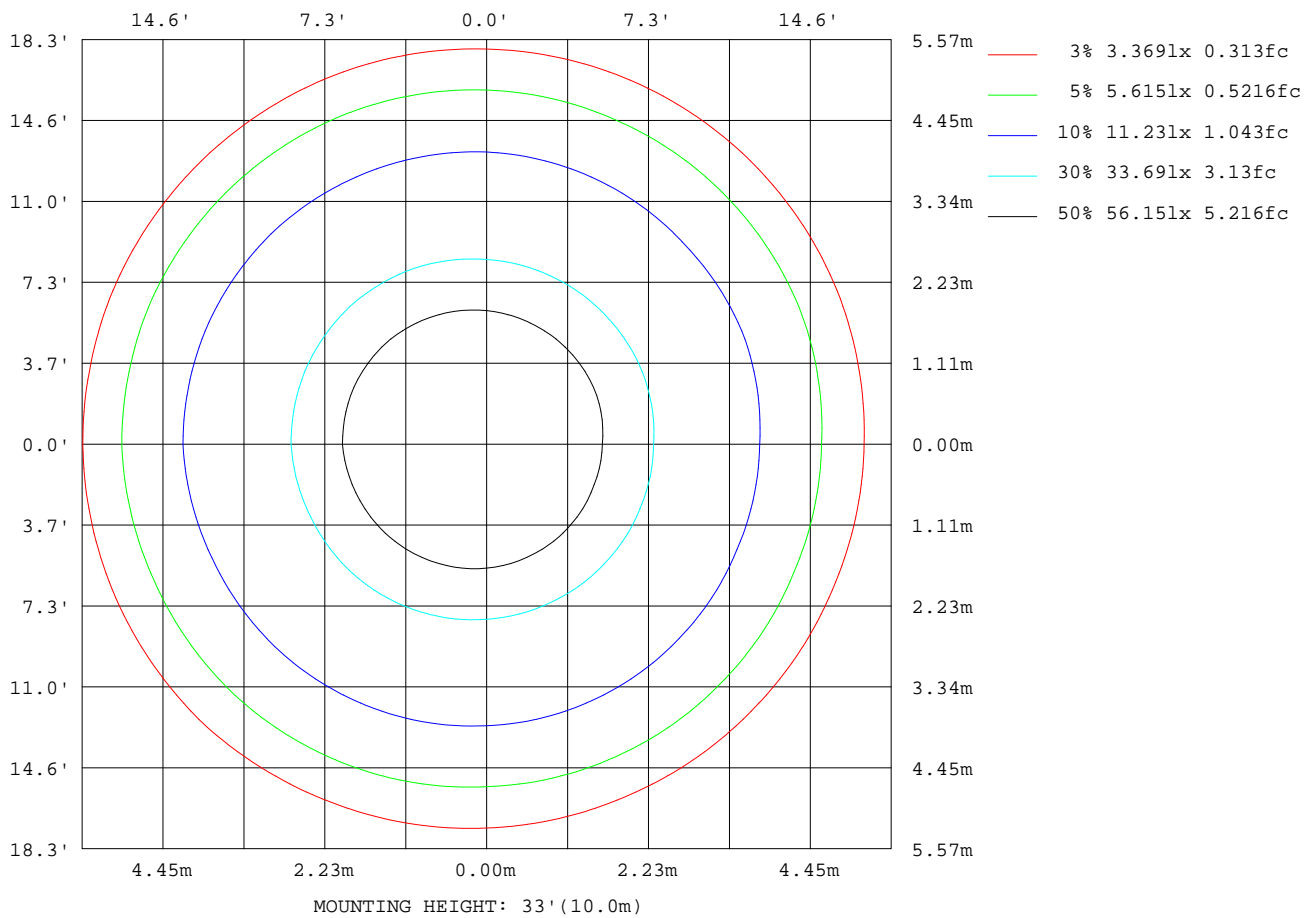
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature: 25.6DEG
Operators: David
Test Date: 2015-02-10

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

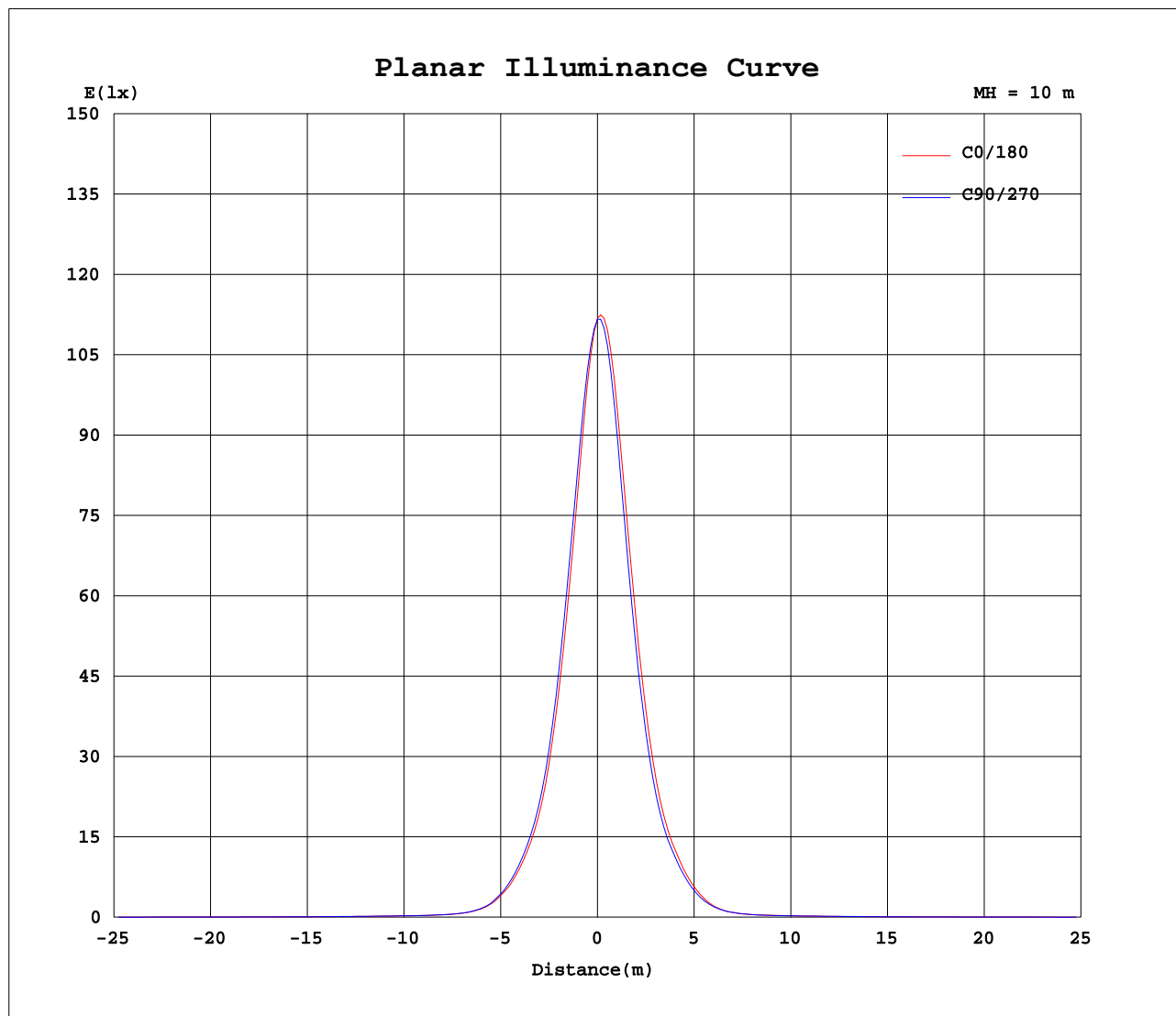
Test:U:120.0V I:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm		
NAME:	TYPE:33TRLG4DIM/927/B/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2015-02-10

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: 2015-02-10

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:0.2836A P:33.88W PF:0.9950 Lamp Flux:2388.56x1 lm																	
NAME:									TYPE:33TRLG4DIM/927/B/H						WEIGHT:		
SPEC.:									DIM.:						SERIAL No.:		
MFR.: GC									SUR.:						PROTECTION ANGLE:		

Table--1

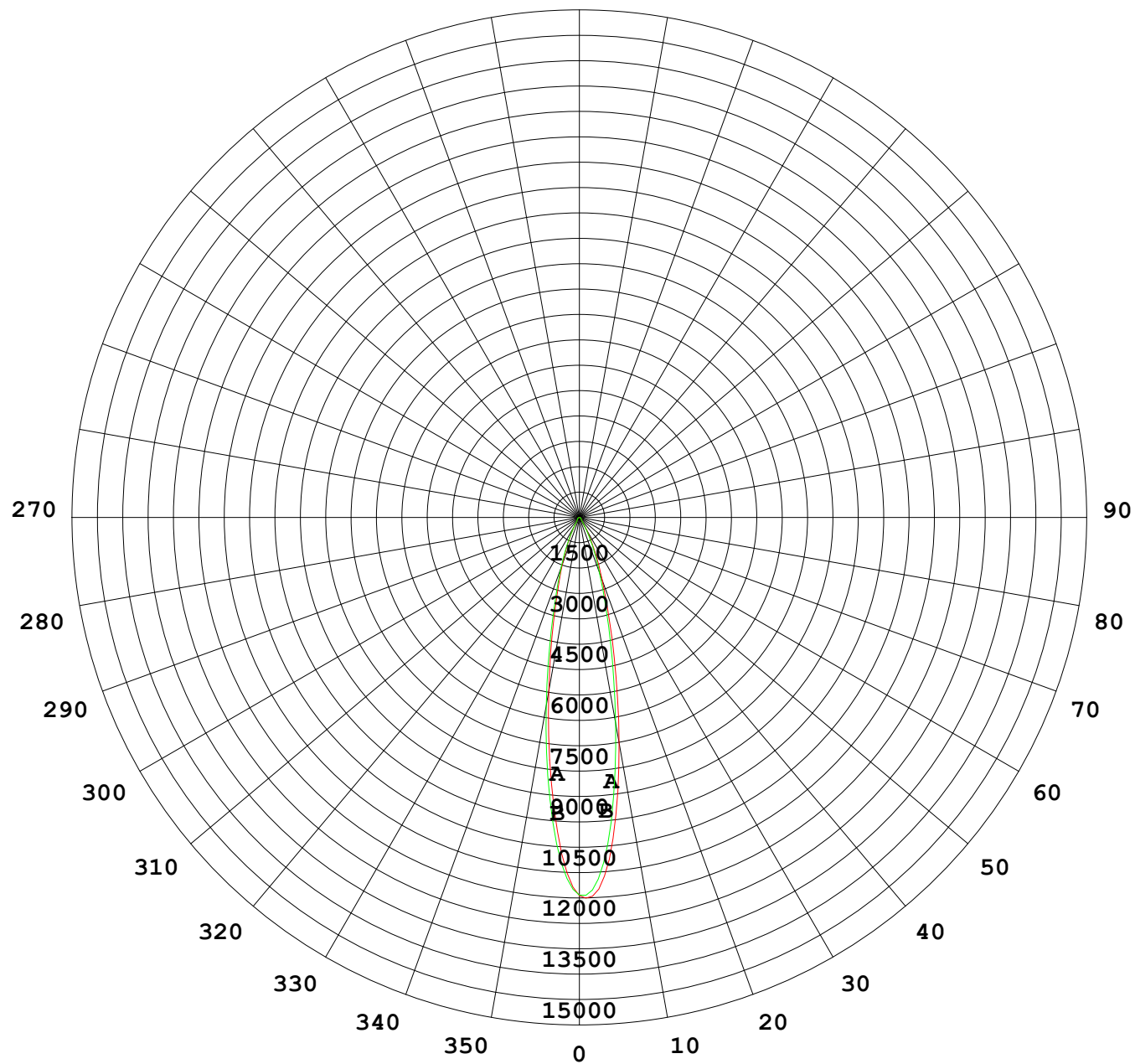
UNIT: ×10cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1118	1116	1116	1116	1116	1117	1116	1117	1118	1116	1116	1116	1116	1117	1116	1117			
5	863	860	866	880	904	931	958	984	1014	1017	1008	991	968	938	910	887			
10	520	518	527	541	565	591	619	648	677	679	669	645	617	587	563	545			
15	277	275	279	289	303	321	341	357	377	377	371	356	336	317	302	290			
20	147	145	148	153	161	170	179	187	197	197	192	184	175	167	158	156			
25	71.7	69.9	71.2	74.4	78.7	85.2	91.4	95.9	102	102	99.4	95.0	90.2	84.4	80.3	77.0			
30	29.8	28.8	29.0	29.4	31.3	34.4	37.5	39.6	41.3	41.6	40.9	39.2	37.8	36.7	34.7	32.9			
35	13.8	13.4	13.5	13.2	14.1	15.2	15.2	16.1	16.1	16.0	17.2	16.0	16.5	17.3	16.6	15.6			
40	9.16	9.09	9.01	9.03	9.25	9.44	9.62	9.59	9.49	9.48	9.62	9.34	9.58	9.99	9.85	9.60			
45	7.80	7.77	7.71	7.79	7.85	7.89	8.18	7.99	8.03	8.01	7.89	7.93	7.89	8.05	8.14	7.94			
50	6.97	6.95	6.90	6.97	7.03	7.07	7.20	7.14	7.19	7.18	7.12	7.12	7.08	7.17	7.24	7.08			
55	6.19	6.18	6.14	6.21	6.25	6.32	6.38	6.39	6.43	6.42	6.38	6.35	6.32	6.37	6.40	6.27			
60	5.33	5.32	5.30	5.36	5.42	5.52	5.59	5.64	5.70	5.67	5.66	5.64	5.59	5.58	5.52	5.41			
65	4.33	4.32	4.34	4.37	4.47	4.55	4.63	4.69	4.79	4.79	4.78	4.71	4.64	4.59	4.49	4.44			
70	3.12	3.09	3.15	3.17	3.26	3.38	3.47	3.57	3.66	3.68	3.66	3.57	3.49	3.39	3.30	3.23			
75	1.81	1.80	1.83	1.90	1.97	2.06	2.14	2.23	2.35	2.35	2.33	2.23	2.14	2.07	1.98	1.92			
80	0.75	0.75	0.77	0.81	0.87	0.95	1.03	1.11	1.20	1.20	1.17	1.10	1.02	0.94	0.87	0.82			
85	0.09	0.09	0.09	0.11	0.14	0.17	0.22	0.27	0.34	0.34	0.32	0.27	0.22	0.17	0.13	0.11			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.03	0.02	0.02	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:2015-02-10

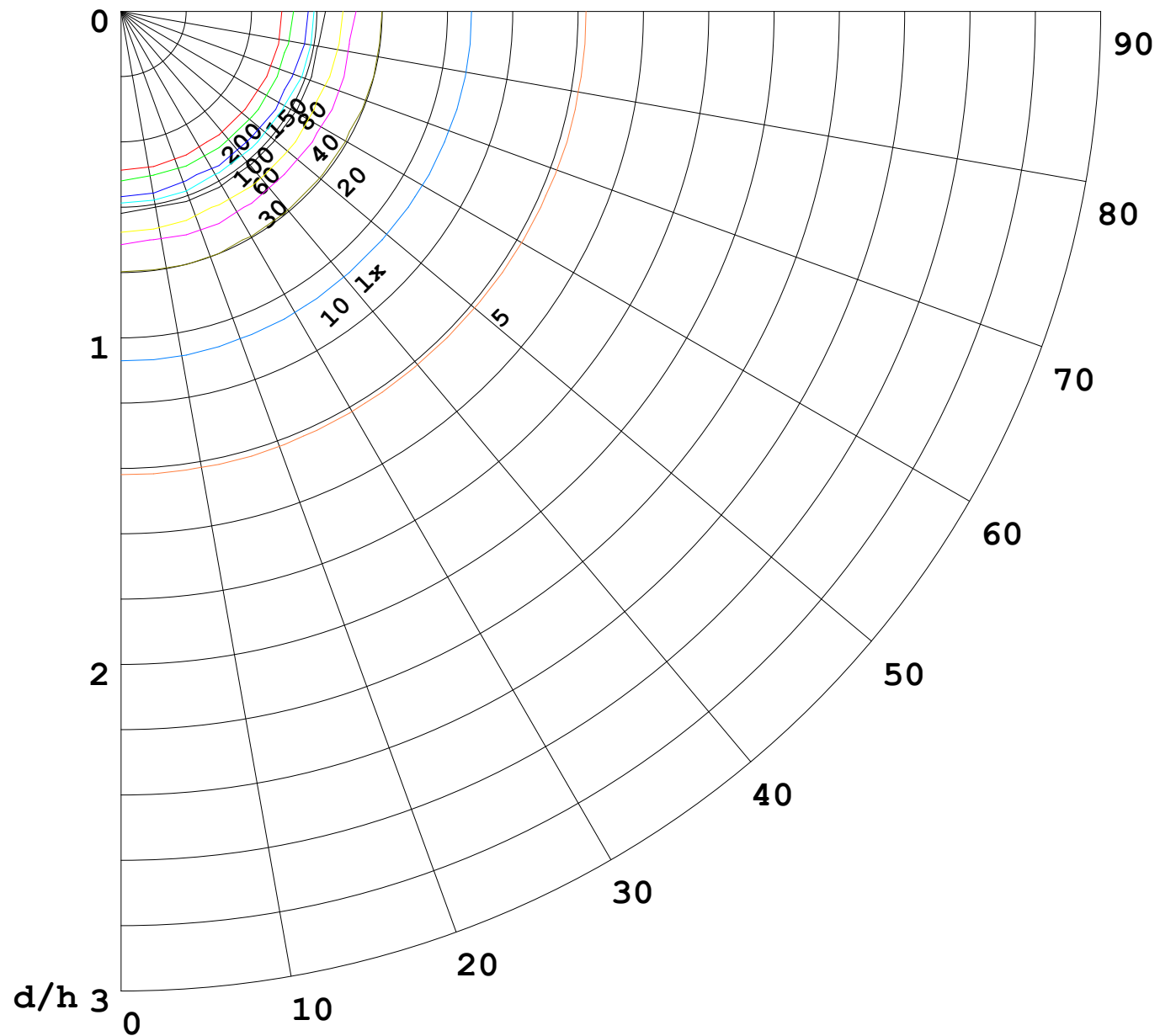
γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.508m [K=1.0000]
 Remarks:

I (cd)



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

