

IESNA LM-79: 2008

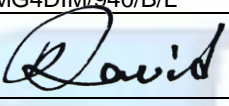

Measurement and Test Report

for

Green Creative Ltd.

Room 1206-7, New Victory House, 93-103 Wing Lok Street, Central, HONG KONG

Sept 09, 2015

Model Name:	LED TRACK
Model No:	33TRLG4DIM/940/W/H; 33TRMG4DIM/940/B/H; 33TRMG4DIM/940/W/J; 33TRMG4DIM/940/B/J; 33TRMG4DIM/940/W/L; 33TRMG4DIM/940/B/L
Test Engineer:	David Zhang 
Report No.:	BTR66.181.15.0012.05
Sample Received Date:	Sept 06, 2015
Test Performed Date:	Sept 06, 2015 to Sept 09, 2015
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.
Model Name	: LED TRACK
Model No	: 33TRLG4DIM/940/W/H; 33TRMG4DIM/940/B/H ; 33TRMG4DIM/940/W/J ; 33TRMG4DIM/940/B/J ; 33TRMG4DIM/940/W/L ; 33TRMG4DIM/940/B/L
Brand	: GREEN CREATIVE
Nominal Operation Voltage	: AC 120V/60Hz
Nominal Power	: 33W
Nominal CCT	: 4000K
Nominal CRI	: 90
Nominal Lumen Output	: 2400 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	: Sept 06, 2015
Measurement quantities measured	: 1 pcs
Orientation During Testing	: Base up
Test Requested	: Electrical and Photometric Test Luminous Intensity Distribution Test

Note: These models are only lamp color and lamp base different, here we choose 33TRLG4DIM/940/W/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

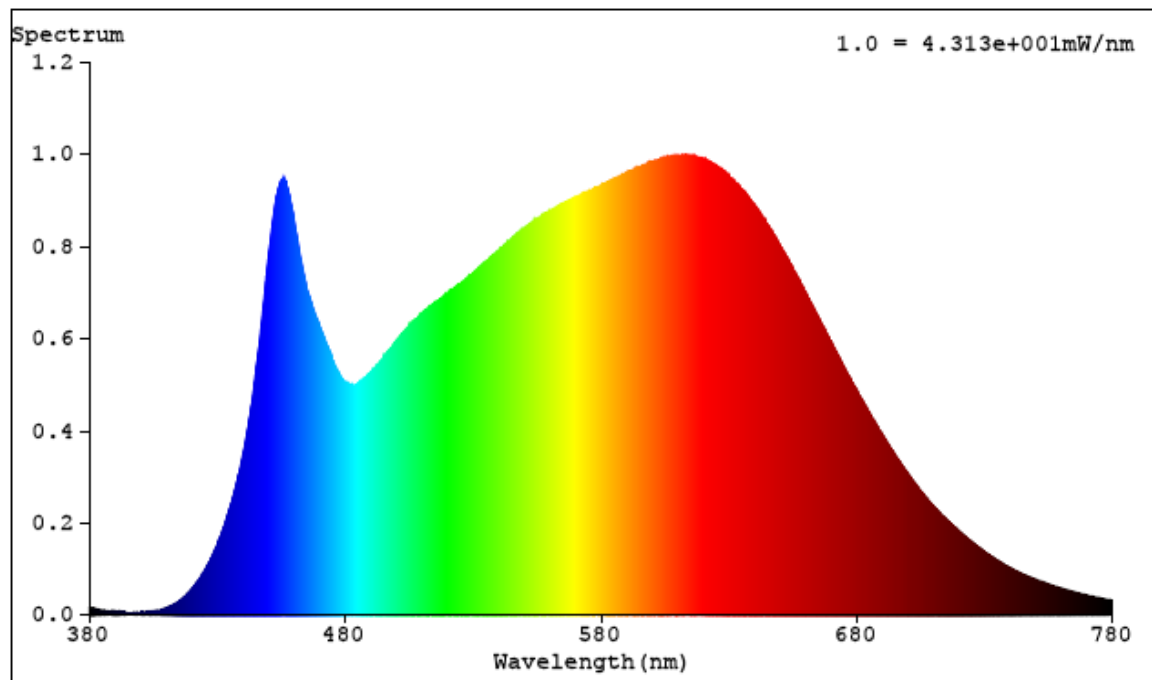
	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	2715.80		NVLAP/EPA
	Luminous Efficacy (lm/w)	81.73		NVLAP/EPA
	Correlated Color Temperature (CCT)	3908		NVLAP/EPA
	Color Rendering Index– CRI	92.8		NVLAP/EPA
	Input Power (W)	33.23		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.2784		NVLAP/EPA
	Power Factor	0.9946		NVLAP/EPA
	x(CIE 1931)	0.3849		NVLAP/EPA
	y(CIE 1931)	0.3803		NVLAP/EPA
	u' (CIE 1976)	0.2266		NVLAP/EPA
	v' (CIE 1976)	0.5038		NVLAP/EPA
	Duv(CIE 1976)	0.0004		NVLAP/EPA
	Beam Angle: (Degree)	20.8		NVLAP/EPA
	Center beam candlepower: (cd)	12829		NVLAP/EPA
	Zonal lumen density (0-60°):	97.0%		NVLAP/EPA
	Zonal lumen density (60-90°):	3.0%		NVLAP/EPA
	Zonal lumen density (90-120°):	0%		NVLAP/EPA
	Zonal lumen density (120-180°):	0%		NVLAP/EPA

	CRI (R1)	93	NVLAP/EPA
	CRI (R2)	98	NVLAP/EPA
	CRI (R3)	98	NVLAP/EPA
	CRI (R4)	90	NVLAP/EPA
	CRI (R5)	92	NVLAP/EPA
	CRI (R6)	95	NVLAP/EPA
	CRI (R7)	92	NVLAP/EPA
	CRI (R8)	84	NVLAP/EPA
	CRI (R9)	63	NVLAP/EPA
	CRI (R10)	93	NVLAP/EPA
	CRI (R11)	90	NVLAP/EPA
	CRI (R12)	76	NVLAP/EPA
	CRI (R13)	95	NVLAP/EPA
	CRI (R14)	100	NVLAP/EPA

Lumen summary:

[OTHER]	Gamma(deg)	Fz(lm)	Ft(lm)	%Lum	%Lamp
[OTHER]	0- 10	875.18	875.18	32.23	32.23
[OTHER]	10- 20	1012.78	1887.97	69.52	69.52
[OTHER]	20- 30	461.65	2349.62	86.52	86.52
[OTHER]	30- 40	139.95	2489.57	91.67	91.67
[OTHER]	40- 50	77.29	2566.86	94.52	94.52
[OTHER]	50- 60	67.06	2633.91	96.98	96.98
[OTHER]	60- 70	51.39	2685.30	98.88	98.88
[OTHER]	70- 80	26.18	2711.48	99.84	99.84
[OTHER]	80- 90	4.25	2715.74	100.00	100.00
[OTHER]	90-100	0.02	2715.75	100.00	100.00
[OTHER]	100-110	0.00	2715.75	100.00	100.00
[OTHER]	110-120	0.00	2715.75	100.00	100.00
[OTHER]	120-130	0.00	2715.75	100.00	100.00
[OTHER]	130-140	0.00	2715.75	100.00	100.00
[OTHER]	140-150	0.00	2715.75	100.00	100.00
[OTHER]	150-160	0.01	2715.76	100.00	100.00
[OTHER]	160-170	0.02	2715.78	100.00	100.00
[OTHER]	170-180	0.01	2715.80	100.00	100.00

4 – Spectral Flux Plots



5 – EUT Photos



6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

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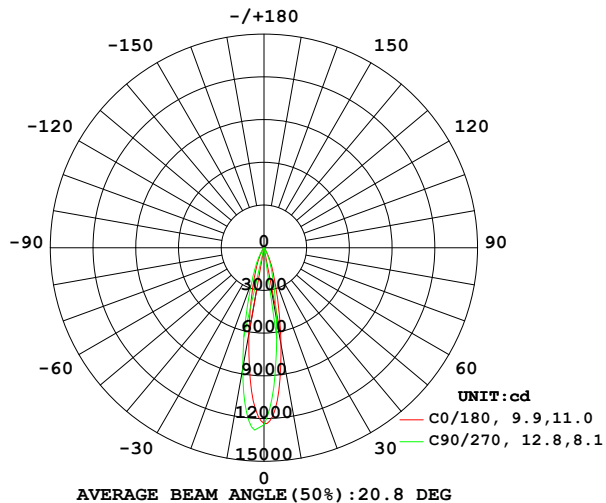


LUMINAIRE PHOTOMETRIC TEST REPORT

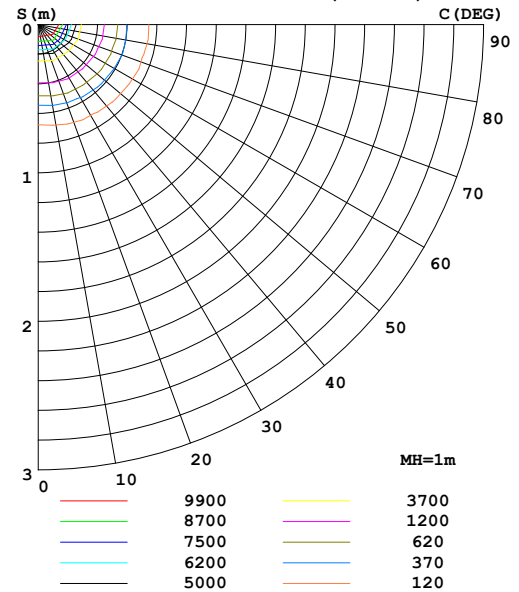
Test:U:120.0V I:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 81.73 lm/W			
MODEL	33TRLG4DIM/940/W/H	Hmax(cd)	12829	S/MH(C0/180)	0.37
NOMINAL POWER(W)	33	LOR(%)	100.0	S/MH(C90/270)	0.28
RATED VOLTAGE(V)	120.0	TOTAL FLUX(lm)	2715.8	η UP,DN(C0-180)	0.0,57.3
NOMINAL FLUX(lm)	2715.8	CIE CLASS	DIRECT	η UP,DN(C180-360)	0.0,42.7
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)



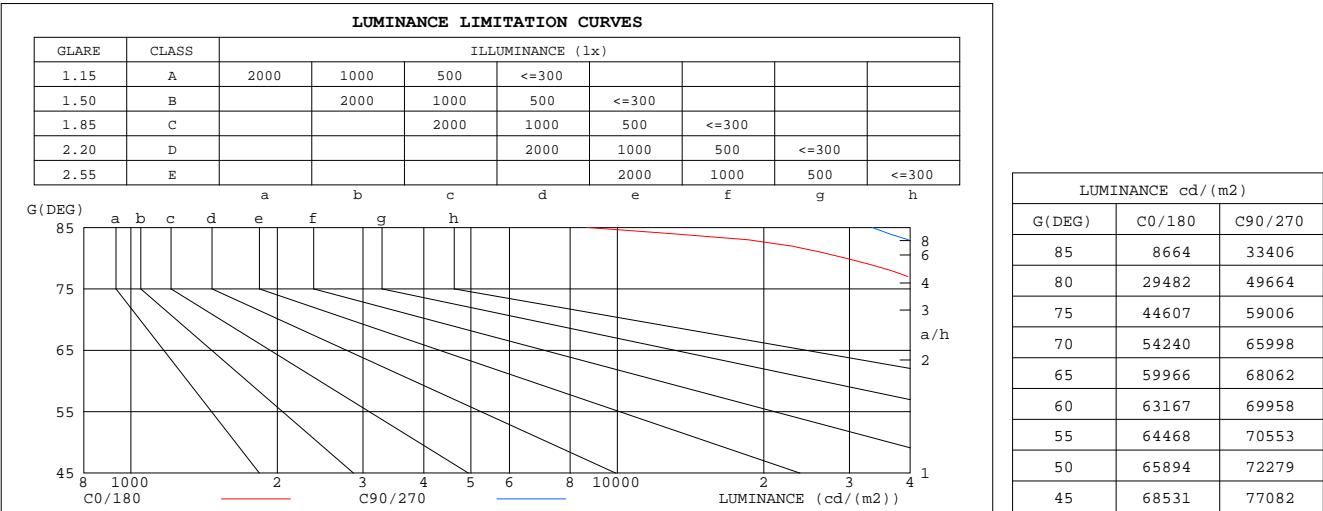
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-09-07

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	lum, lamp
10	610.7	761.2	860.9	822.3	688.9	558.7	504.8	528.5	0- 10	875.2	875.2	32.2,32.2
20	173.3	217.8	246.4	230.7	191.2	155.4	142.7	149.3	10- 20	1013	1888	69.5,69.5
30	38.55	58.51	64.86	58.25	44.64	34.68	29.32	30.53	20- 30	461.6	2350	86.5,86.5
40	11.61	13.90	14.48	13.05	11.95	11.40	10.84	10.86	30- 40	140.0	2490	91.7,91.7
50	8.471	9.123	9.292	8.796	8.471	8.209	8.032	8.144	40- 50	77.29	2567	94.5,94.5
60	6.317	6.852	6.996	6.726	6.499	6.117	5.811	5.943	50- 60	67.06	2634	97.97
70	3.710	4.238	4.515	4.407	4.080	3.534	3.253	3.377	60- 70	51.39	2685	98.9,98.9
80	1.024	1.469	1.725	1.622	1.302	0.8837	0.6866	0.7491	70- 80	26.18	2711	99.8,99.8
90	0.0003	0.0305	0.0590	0.0489	0.0160	0	0	0	80- 90	4.254	2716	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0182	2716	100,100
110	0	0	0	0	0	0	0	0	100-110	0	2716	100,100
120	0	0	0	0	0	0	0	0	110-120	0	2716	100,100
130	0	0	0	0	0	0	0	0	120-130	0	2716	100,100
140	0	0	0	0	0	0	0	0	130-140	0	2716	100,100
150	0	0	0	0	0.0000	0.0004	0.0008	0.0006	140-150	0.0002	2716	100,100
160	0.0035	0.0025	0.0020	0.0022	0.0034	0.0044	0.0055	0.0057	150-160	0.0066	2716	100,100
170	0.0135	0.0111	0.0101	0.0108	0.0132	0.0146	0.0174	0.0185	160-170	0.0214	2716	100,100
180	0	0	0	0	0.0009	0.0010	0.0010	0.0009	170-180	0.0138	2716	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		



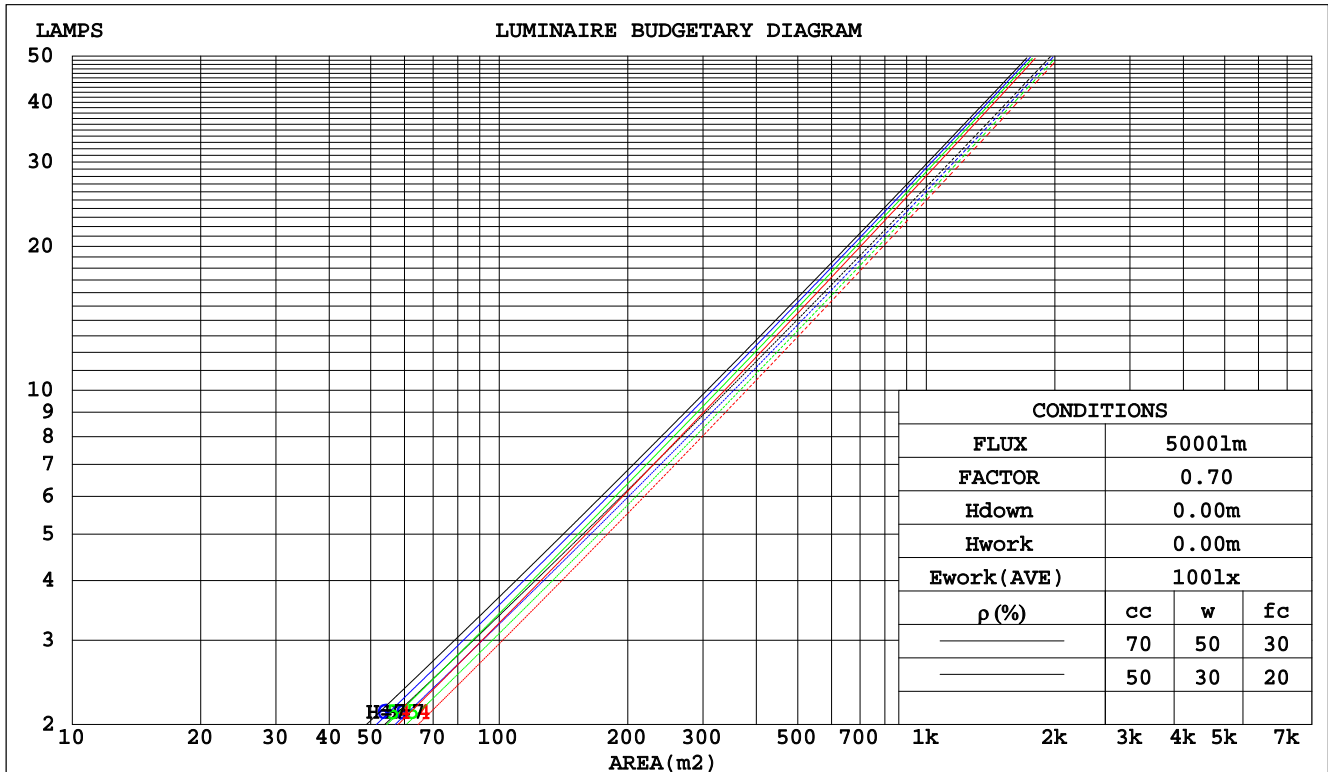
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2015-09-07

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:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/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	.00	.96	.92	.99	.95	.92	.96	.93	.90	.94	.91	.89	.92	.89	.88	.86
4.0	.95	.91	.87	.94	.90	.87	.92	.89	.86	.90	.87	.85	.88	.86	.84	.82
5.0	.91	.86	.83	.90	.86	.83	.89	.85	.82	.87	.84	.81	.86	.83	.80	.79
6.0	.87	.83	.79	.87	.82	.79	.85	.81	.78	.84	.81	.78	.83	.80	.77	.76
7.0	.84	.79	.76	.84	.79	.76	.82	.78	.76	.81	.78	.75	.80	.77	.75	.74
8.0	.81	.77	.73	.81	.76	.73	.80	.76	.73	.79	.75	.73	.78	.75	.72	.71
9.0	.79	.74	.71	.78	.74	.71	.77	.73	.71	.77	.73	.70	.76	.73	.70	.69
10.0	.76	.72	.69	.76	.71	.69	.75	.71	.68	.74	.71	.68	.74	.70	.68	.67



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-09-07

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:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/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	.159	.090	.029	.152	.087	.028	.139	.080	.026	.128	.074	.024	.117	.068	.022		
2.0	.148	.081	.025	.143	.079	.024	.132	.073	.023	.123	.069	.022	.114	.064	.020		
3.0	.138	.073	.022	.133	.071	.021	.125	.067	.021	.116	.064	.020	.109	.060	.019		
4.0	.129	.067	.020	.125	.065	.019	.117	.062	.019	.111	.059	.018	.104	.057	.017		
5.0	.121	.062	.018	.117	.060	.018	.111	.058	.017	.105	.055	.016	.100	.053	.016		
6.0	.114	.057	.016	.111	.056	.016	.105	.054	.016	.100	.052	.015	.095	.050	.015		
7.0	.108	.053	.015	.105	.052	.015	.100	.051	.015	.096	.049	.014	.091	.047	.014		
8.0	.102	.050	.014	.100	.049	.014	.095	.048	.014	.091	.046	.013	.088	.045	.013		
9.0	.097	.047	.013	.095	.046	.013	.091	.045	.013	.088	.044	.013	.084	.043	.012		
10.0	.093	.044	.012	.091	.044	.012	.087	.043	.012	.084	.042	.012	.081	.041	.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	.115	.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	.063	.101	.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	.025	.017	.011	.008	.006	
8.0	.094	.062	.039	.081	.054	.034	.056	.038	.024	.033	.022	.015	.011	.007	.005	
9.0	.089	.056	.034	.076	.049	.030	.053	.034	.021	.031	.020	.013	.010	.007	.004	
10.0	.084	.052	.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:2015-09-07

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:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm											
NAME:					TYPE:33TRLG4DIM/940/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	21.6	22.3	21.8	22.5	22.6	22.4	23.1	22.6	23.3	23.5	
	3H	22.9	23.6	23.1	23.8	24.0	23.8	24.5	24.0	24.7	24.8
	4H	23.3	24.0	23.6	24.2	24.4	24.3	25.0	24.6	25.2	25.4
	6H	23.5	24.2	23.8	24.4	24.7	24.7	25.3	24.9	25.5	25.8
	8H	23.6	24.2	23.9	24.4	24.7	24.7	25.4	25.0	25.6	25.9
	12H	23.5	24.1	23.8	24.4	24.7	24.8	25.4	25.1	25.6	25.9
4H	2H	22.2	22.9	22.5	23.1	23.3	22.9	23.6	23.2	23.8	24.0
	3H	23.8	24.4	24.1	24.6	24.9	24.5	25.1	24.8	25.3	25.6
	4H	24.3	24.8	24.6	25.1	25.4	25.1	25.7	25.4	25.9	26.2
	6H	24.6	25.1	24.9	25.4	25.7	25.6	26.0	25.9	26.4	26.7
	8H	24.6	25.0	25.0	25.4	25.8	25.7	26.1	26.0	26.5	26.8
	12H	24.6	25.0	25.0	25.3	25.7	25.7	26.1	26.1	26.5	26.9
8H	4H	24.5	25.0	24.9	25.3	25.7	25.3	25.7	25.7	26.1	26.4
	6H	24.9	25.3	25.3	25.7	26.1	25.8	26.2	26.2	26.6	27.0
	8H	25.0	25.3	25.4	25.7	26.1	26.0	26.3	26.4	26.7	27.1
	12H	24.9	25.2	25.4	25.7	26.1	26.0	26.3	26.5	26.8	27.2
12H	4H	24.5	24.9	24.9	25.3	25.7	25.2	25.7	25.7	26.0	26.4
	6H	24.9	25.2	25.4	25.7	26.1	25.8	26.1	26.2	26.5	27.0
	8H	25.0	25.3	25.5	25.7	26.2	26.0	26.3	26.4	26.7	27.2
Variations with the observer position at spacings:											
S = 1.0H	+ 0.2 / - 0.3					+ 0.2 / - 0.3					
1.5H	+ 0.1 / - 0.3					+ 0.3 / - 0.2					
2.0H	+ 0.2 / - 0.4					+ 0.2 / - 0.3					

CIE Pub.117 Corrected 2716 lm Total Lamp Luminous Flux.(8log(F/F0) = 3.5)

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-09-07

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:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/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	97	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	110	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:2015-09-07

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

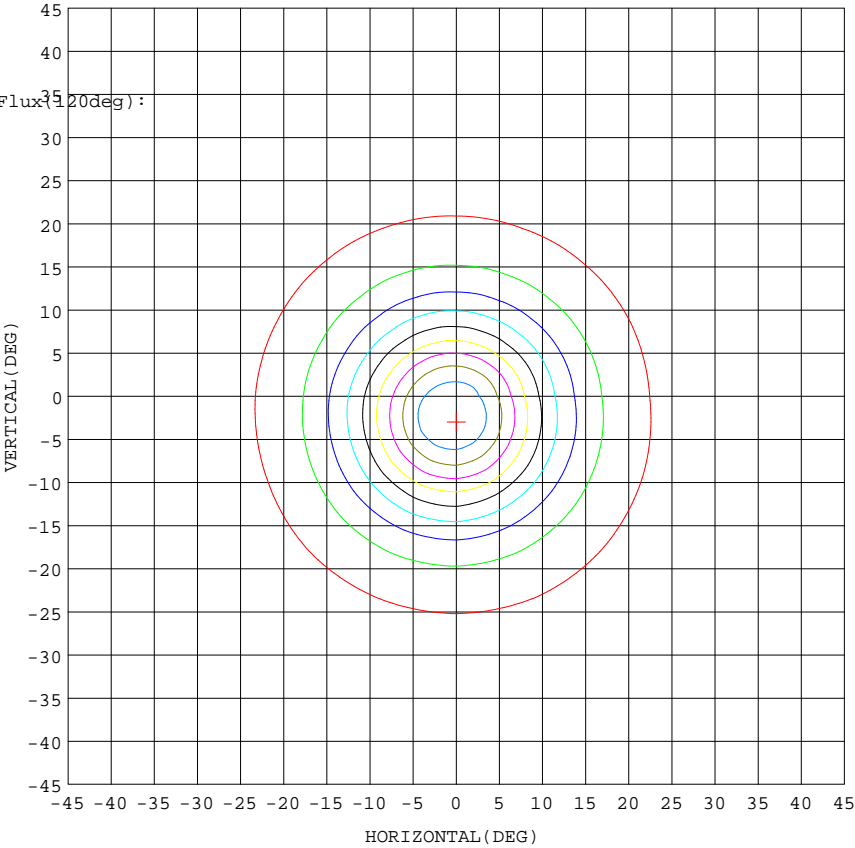
Test:U:120.0V I:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

Conical surface Flux(90deg):

2529.8 lm
%lum = 93.2%
%lamp = 93.2%

Conical surface Flux(20deg):

2633.9 lm
%lum = 97.0%
%lamp = 97.0%



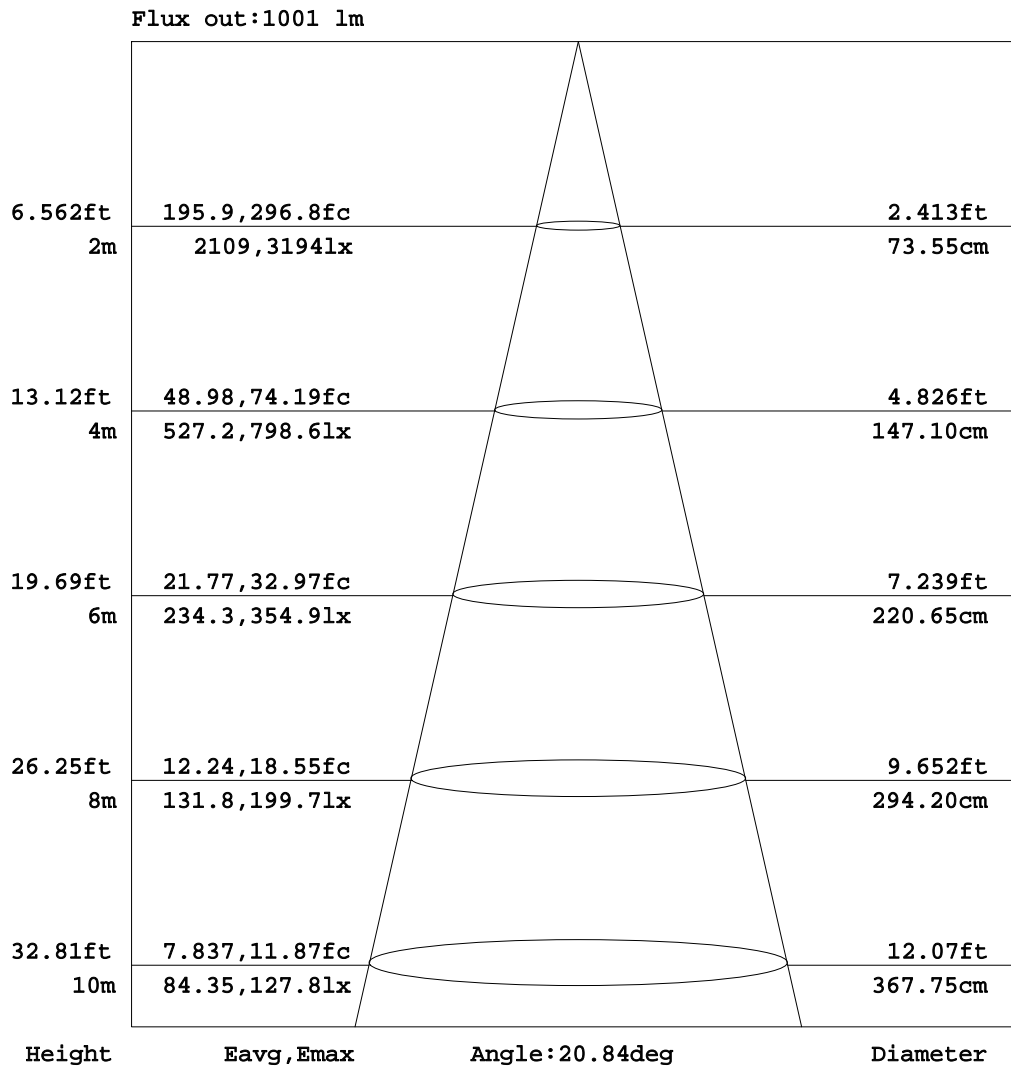
Imax:12824(H0.0,V-3.0)
(At:C=112.5,Gamma=3.0)
UNIT: cd

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2015-09-07

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:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



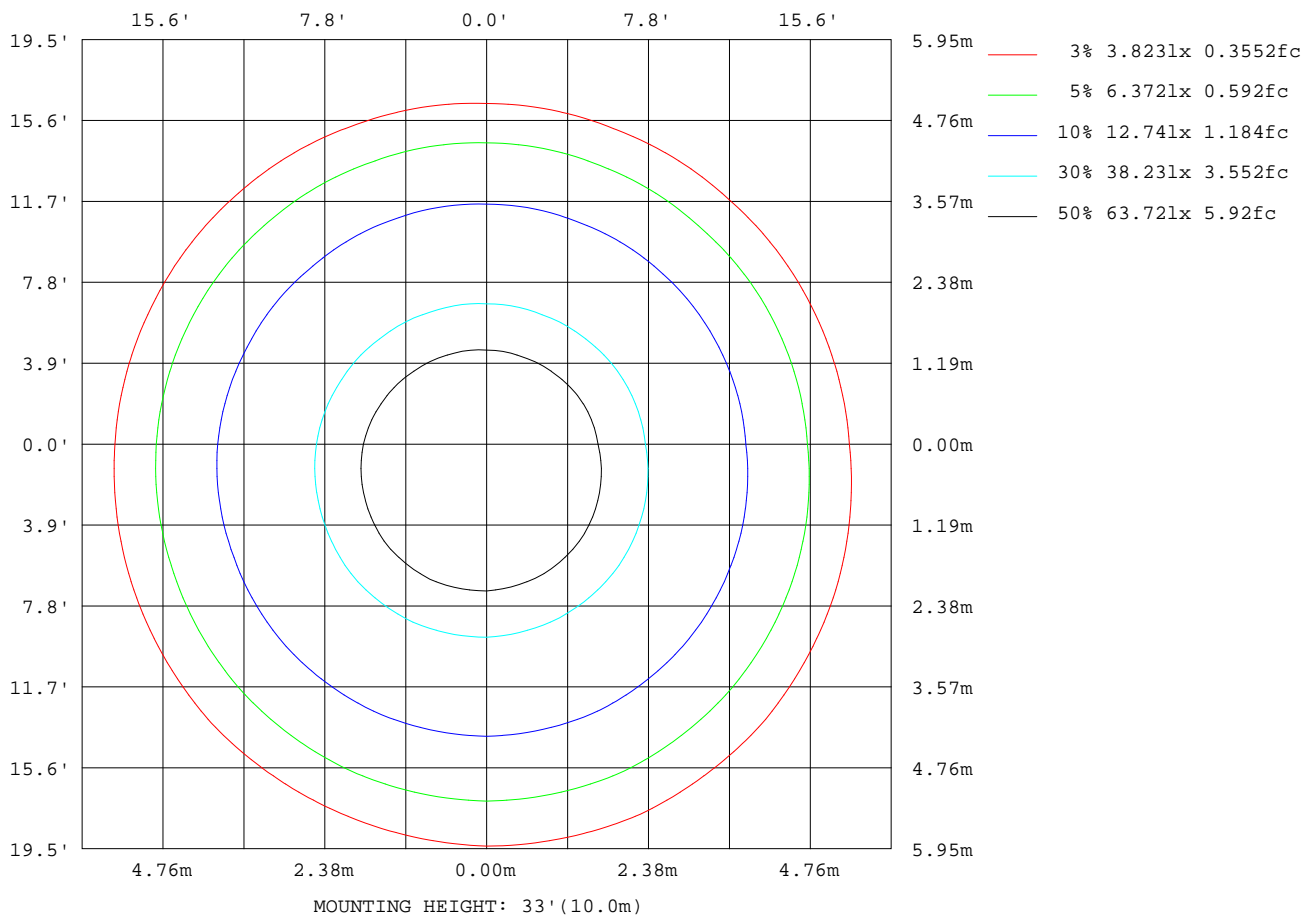
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:2015-09-07

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

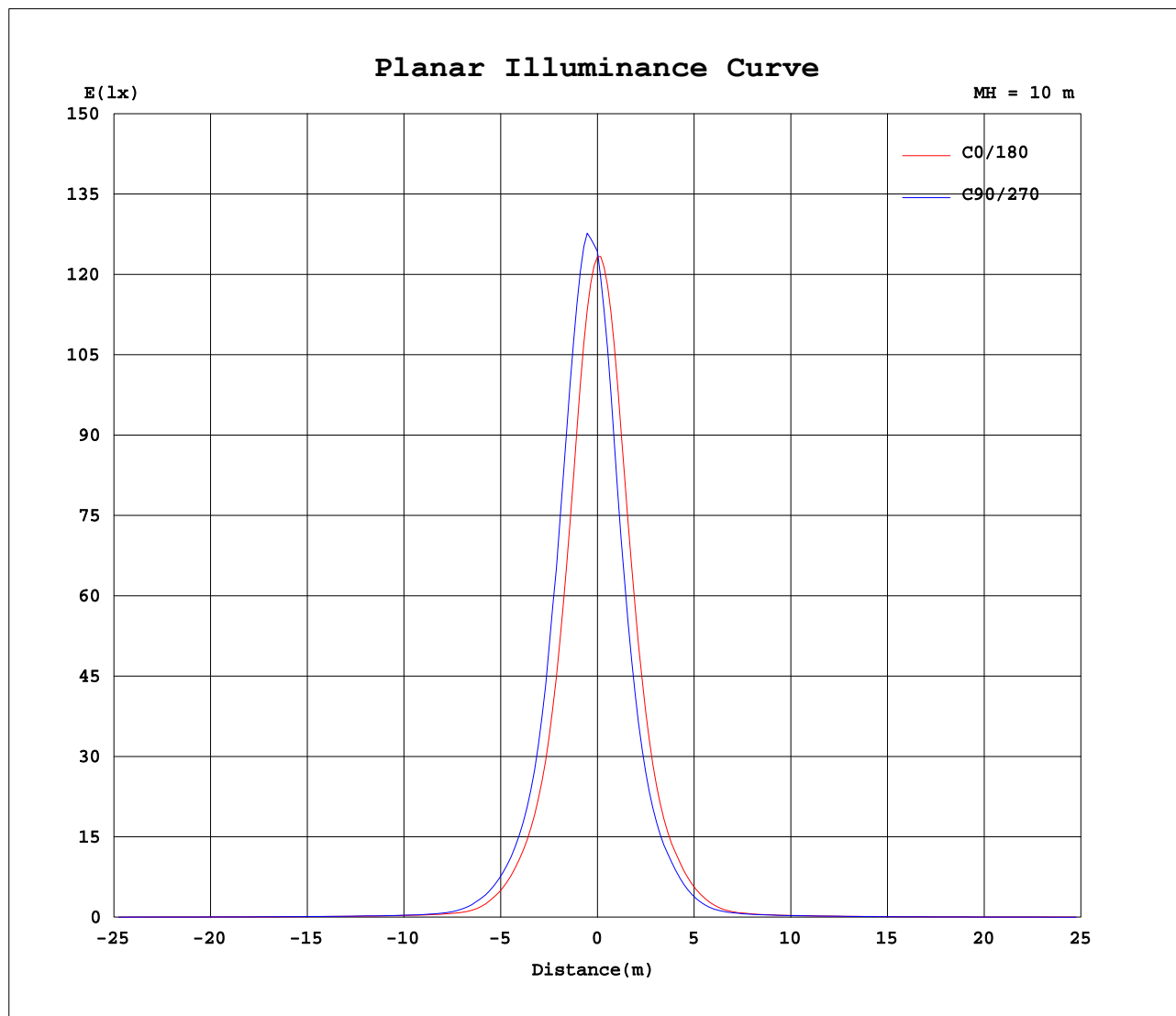
Test:U:120.0V I:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm		
NAME:	TYPE:33TRLG4DIM/940/W/H	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2015-09-07

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: 2015-09-07

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:0.2784A P:33.23W PF:0.9946 Lamp Flux:2715.8x1 lm																	
NAME:									TYPE:33TRLG4DIM/940/W/H						WEIGHT:		
SPEC.:									DIM.:						SERIAL No.:		
MFR.: GC									SUR.:						PROTECTION ANGLE:		

Table--1

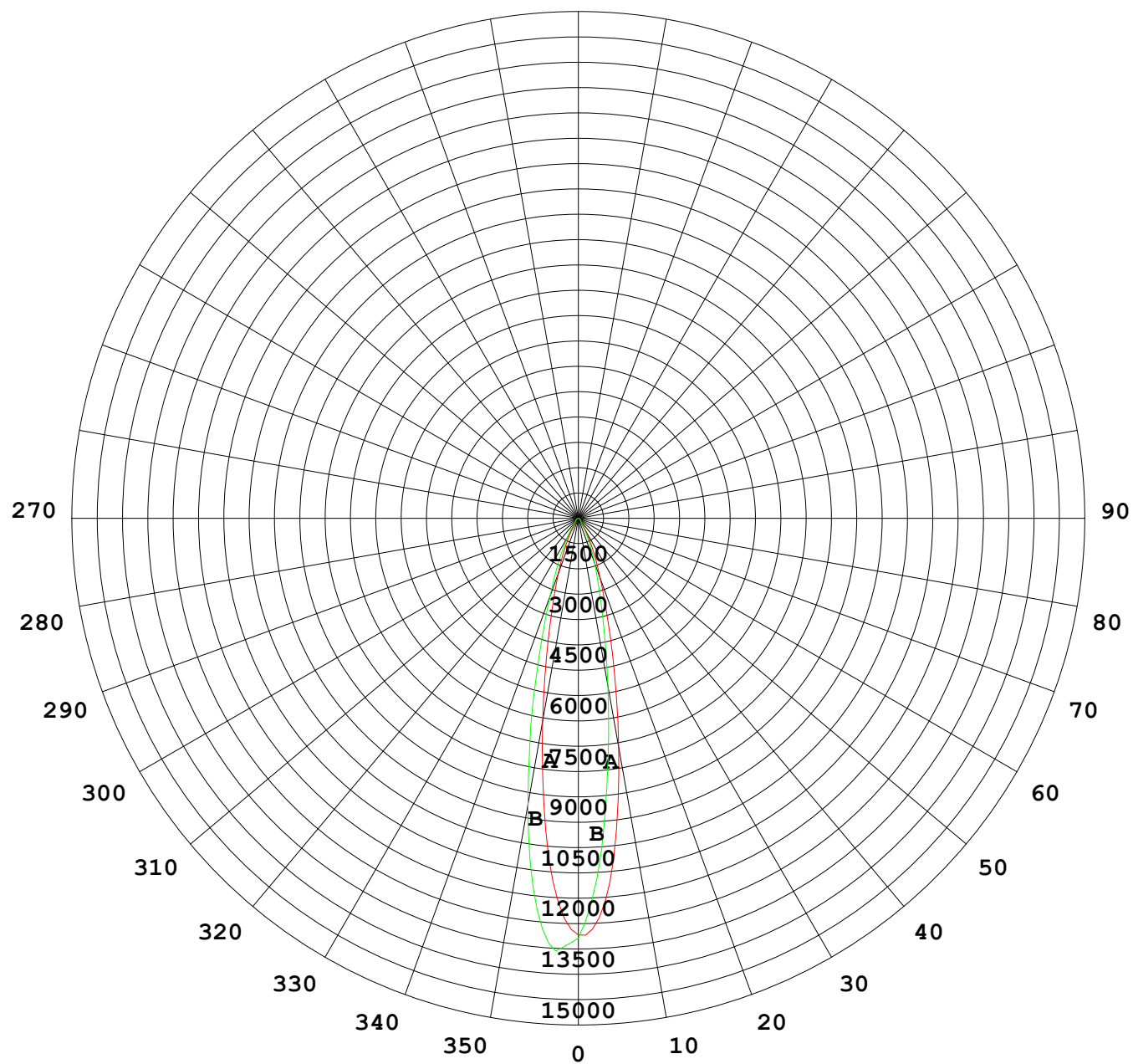
UNIT: ×10cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1233	1235	1238	1239	1243	1244	1246	1245	1233	1235	1238	1239	1243	1244	1246	1245			
5	1009	1078	1143	1194	1221	1220	1196	1143	1078	1012	956	915	895	898	924	970			
10	611	683	761	828	861	860	822	756	689	616	559	522	505	506	529	570			
15	324	368	415	454	480	478	452	409	369	325	292	272	262	263	276	300			
20	173	196	218	237	246	244	231	210	191	171	155	147	143	143	149	160			
25	89.2	104	117	128	132	128	121	110	100	89.4	80.0	73.3	69.7	69.4	72.8	80.6			
30	38.5	49.4	58.5	63.9	64.9	61.5	58.3	51.2	44.6	39.6	34.7	31.4	29.3	28.0	30.5	34.4			
35	16.8	20.9	25.3	28.3	28.1	25.2	24.1	20.6	18.7	18.0	16.6	16.1	15.4	14.7	15.4	15.9			
40	11.6	12.6	13.9	14.7	14.5	13.6	13.0	12.3	12.0	11.6	11.4	11.1	10.8	10.8	10.9	11.2			
45	9.69	10.0	10.7	11.1	10.9	10.5	10.1	9.80	9.64	9.54	9.43	9.27	9.17	9.19	9.28	9.43			
50	8.47	8.75	9.12	9.45	9.29	9.03	8.80	8.58	8.47	8.30	8.21	8.09	8.03	8.05	8.14	8.30			
55	7.40	7.68	7.95	8.16	8.09	7.92	7.73	7.56	7.45	7.27	7.16	7.03	7.00	7.02	7.11	7.26			
60	6.32	6.63	6.85	7.01	7.00	6.88	6.73	6.59	6.50	6.29	6.12	5.91	5.81	5.85	5.94	6.19			
65	5.07	5.31	5.52	5.69	5.75	5.72	5.60	5.47	5.34	5.13	4.94	4.76	4.68	4.67	4.77	4.93			
70	3.71	4.05	4.24	4.41	4.51	4.50	4.41	4.23	4.08	3.82	3.53	3.36	3.25	3.22	3.38	3.56			
75	2.31	2.56	2.78	2.96	3.05	3.06	2.96	2.77	2.59	2.35	2.13	1.96	1.86	1.84	1.95	2.15			
80	1.02	1.26	1.47	1.65	1.72	1.72	1.62	1.44	1.30	1.06	0.88	0.76	0.69	0.68	0.75	0.88			
85	0.15	0.27	0.42	0.51	0.58	0.58	0.50	0.41	0.29	0.17	0.11	0.09	0.08	0.08	0.09	0.11			
90	0.00	0.01	0.03	0.05	0.06	0.06	0.05	0.03	0.02	0.00	0.00	0.00	0.00	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	0.01	0.01	0.01	0.01			
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	0.02	0.02	0.02	0.02	0.02			
175	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
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: 2015-09-07

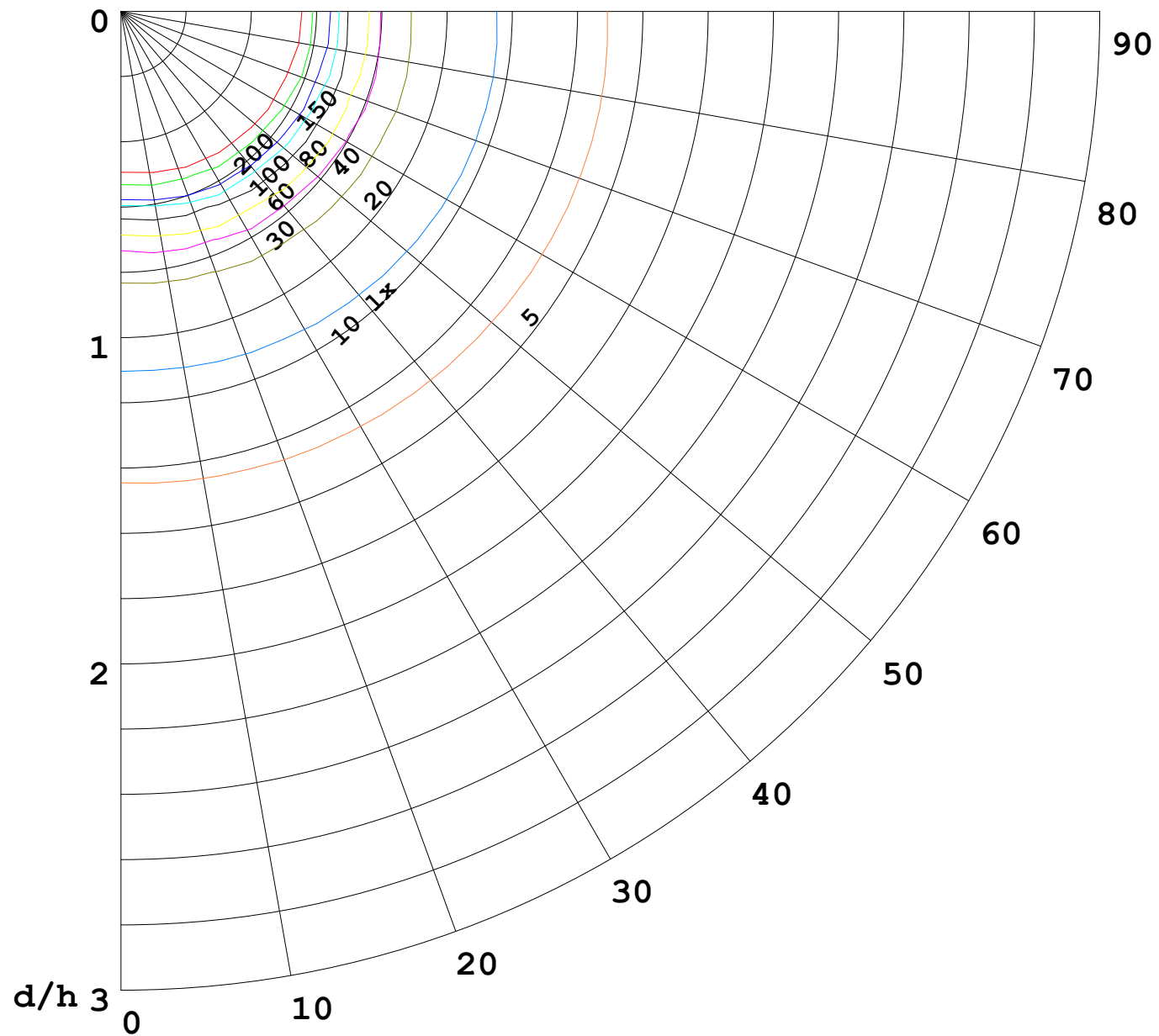
γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 67.1%
 Test Distance: 2.455m [K=1.0000]
 Remarks:

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

