

IESNA LM-79: 2008

Measurement and Test Report

for

Blackjack Lighting

2961 Kingston Dr. Buffalo Grove, IL 60089

Aug 14, 2015 (Renew: Nov 30, 2015)

Product Name:	Wedge LED Chandelier
Model No:	WEG-29P-PC
Test Engineer:	David Zhang 
Report No.:	BTR66.181.15.0005.12
Sample Received Date:	Jul 10, 2015
Test Performed Date:	Jul 10, 2015 to Aug 13, 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	:	Blackjack Lighting
Product Name	:	Wedge LED Chandelier
Model No	:	WEG-29P-PC
Brand	:	Blackjack Lighting
Nominal Operation Voltage	:	AC 120V
Nominal Power	:	34W
Nominal CCT	:	3000K
Nominal CRI	:	80
Nominal Lumen Output	:	2380 Lumens
Nominal Life Time	:	35000 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	:	Jul 10, 2015
Measurement quantities measured	:	1 pcs
Orientation During Testing	:	Base up
Test Requested	:	Electrical and Photometric Test Luminous Intensity Distribution Test

1.2 Objective

The following test report is prepared on behalf of Blackjack Lighting 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, Shiyuan, 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 4Π 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=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable. Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 350 to 1050 nm. The calibration of the sphere photometer-spectrometer system is traceable to the NIST USA. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the 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=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Some graphics were created with Photometric Plus software.

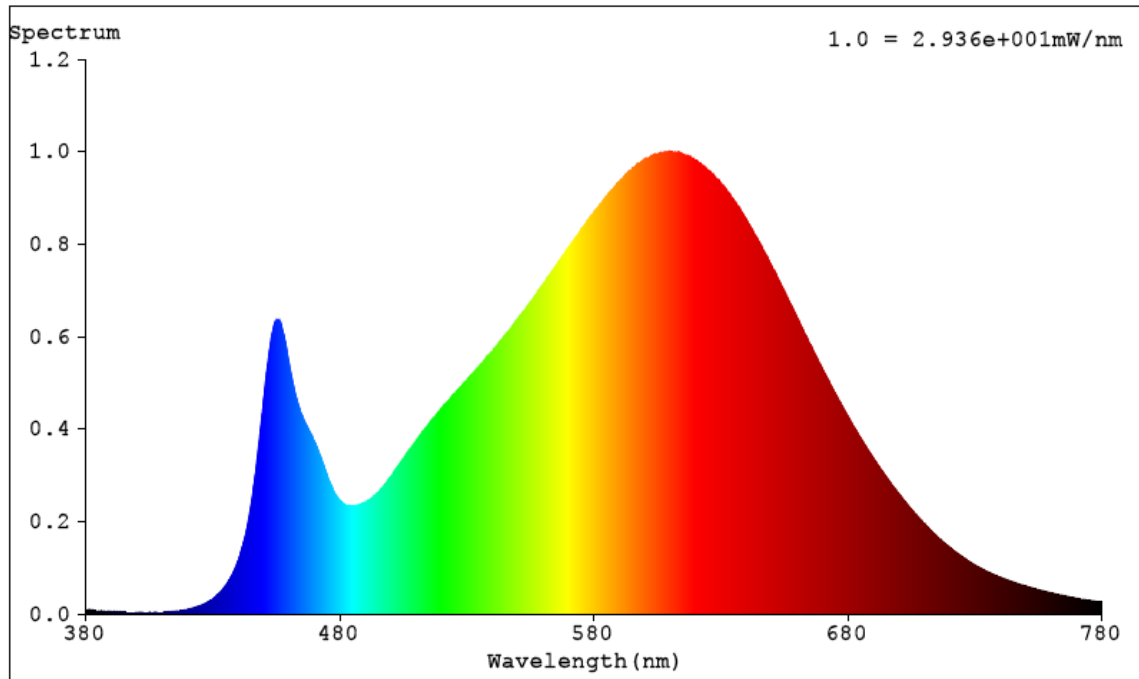
2.3 Deviation from standard operating procedure

None.

3 – Summary of Test Result

	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	2432.45		NVLAP/EPA
	Luminous Efficacy (lm/w)	72.72		NVLAP/EPA
	Correlated Color Temperature (CCT)	2938		NVLAP/EPA
	Color Rendering Index- CRI	86.2		NVLAP/EPA
	Input Power (W)	33.45		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)	0.2883		NVLAP/EPA
	Power Factor	0.9665		NVLAP/EPA
	x(CIE 1931)	0.4380		NVLAP/EPA
	y(CIE 1931)	0.3988		NVLAP/EPA
	u' (CIE 1976)	0.2536		NVLAP/EPA
	v' (CIE 1976)	0.5195		NVLAP/EPA
	Duv(CIE 1976)	0.0023		NVLAP/EPA
	R9	33		NVLAP/EPA
	Beam Angle: (Degree)	360.0		NVLAP/EPA
	Center beam candlepower: (cd)	463.8		NVLAP/EPA
	Zonal lumen density (0-60°):	38.2%		NVLAP/EPA
	Zonal lumen density (60-90°):	12.5%		NVLAP/EPA
	Zonal lumen density (90-120°):	10.8%		NVLAP/EPA
Zonal lumen density (120-180°):	38.5%		NVLAP/EPA	

4 – Spectral Flux Plots



5 – EUT Photos



6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

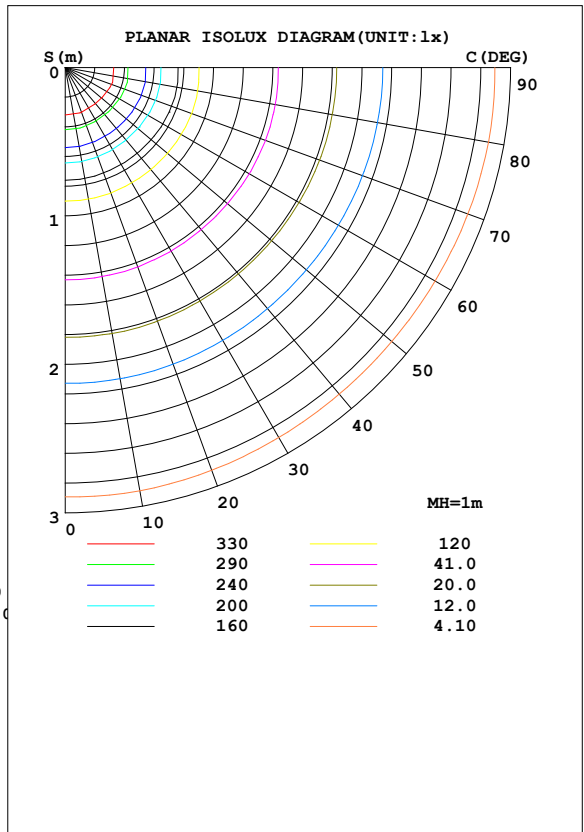
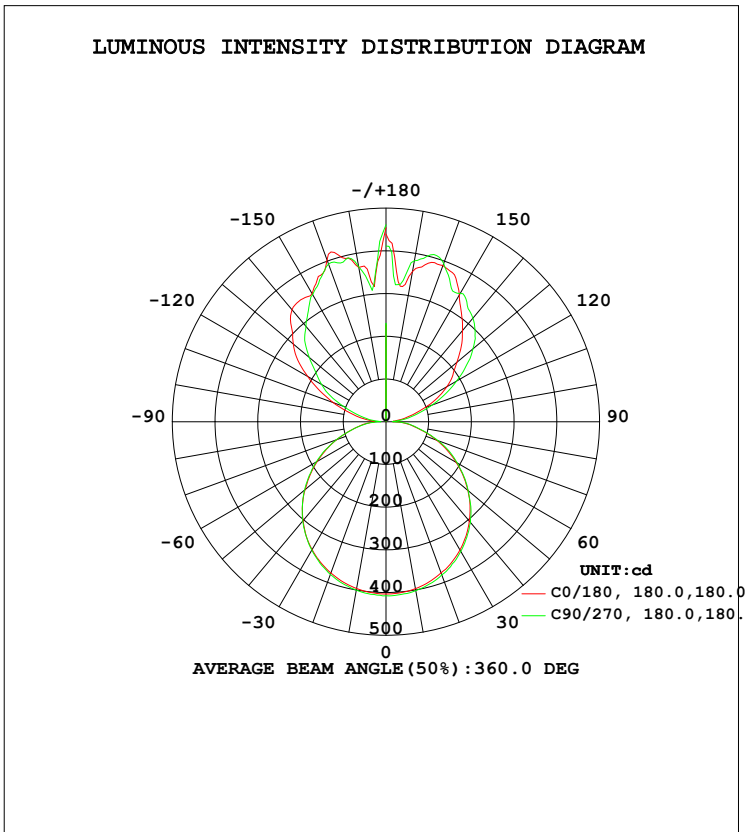
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LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 72.72 lm/W			
MODEL	WEG29P-PC	I _{max} (cd)	463.8	S/MH (C0/180)	1.28
NOMINAL POWER (W)	35	LOR (%)	100.0	S/MH (C90/270)	1.28
RATED VOLTAGE (V)	120.0	TOTAL FLUX (lm)	2432.5	η UP, DN (C0-180)	24.3, 25.2
NOMINAL FLUX (lm)	2432.45	CIE CLASS	DIFFUSE	η UP, DN (C180-360)	25.0, 25.5
LAMPS INSIDE	1	η up (%)	49.3	CIBSE SHR NOM	1.25
TEST VOLTAGE (V)	120.0	η down (%)	50.7	CIBSE SHR MAX	1.35



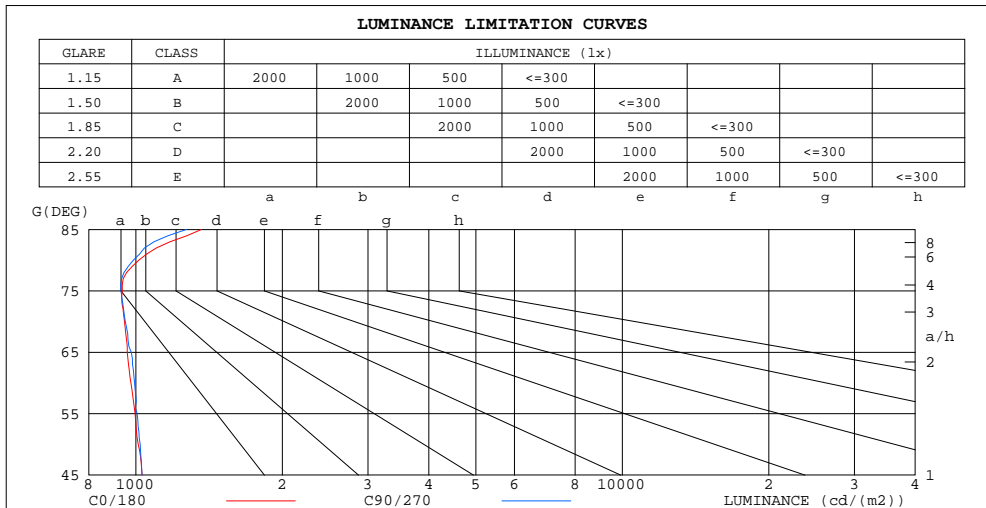
C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity: 67.1%
 Test Distance: 2.676m [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	396.4	396.5	400.4	396.0	396.7	396.6	401.2	396.4	0- 10	38.28	38.28	1.57,1.57
20	376.9	376.7	380.4	376.1	376.7	376.5	381.7	378.6	10- 20	110.0	148.2	6.09,6.09
30	346.0	344.2	347.3	344.0	346.5	344.5	350.4	349.3	20- 30	167.7	316.0	13,13
40	302.1	300.7	303.1	301.2	303.5	301.5	307.8	304.4	30- 40	204.0	519.9	21.4,21.4
50	247.0	246.3	249.2	248.1	250.3	248.6	251.1	247.3	40- 50	213.5	733.4	30.2,30.2
60	185.6	184.9	188.8	188.7	189.4	188.7	192.6	185.0	50- 60	195.4	928.8	38.2,38.2
70	123.1	120.2	123.6	126.0	126.3	125.1	129.9	123.1	60- 70	155.1	1084	44.6,44.6
80	66.90	60.83	65.20	68.38	67.50	66.06	70.48	72.15	70- 80	99.97	1184	48.7,48.7
90	28.29	19.25	13.86	17.68	20.93	20.99	20.65	25.38	80- 90	48.70	1233	50.7,50.7
100	64.59	53.51	48.16	43.57	40.66	42.86	53.39	63.19	90-100	32.01	1265	52,52
110	131.4	117.9	106.3	103.2	97.25	99.93	114.7	127.4	100-110	83.08	1348	55.4,55.4
120	211.4	194.6	173.4	161.6	164.9	178.2	191.0	215.4	110-120	147.4	1495	61.5,61.5
130	283.2	270.3	234.4	221.3	216.7	249.7	265.9	294.1	120-130	197.2	1692	69.6,69.6
140	342.1	320.9	291.8	266.6	278.7	313.6	316.6	332.4	130-140	217.3	1910	78.5,78.5
150	346.4	367.1	343.8	306.2	343.4	360.4	346.9	371.6	140-150	205.4	2115	86.9,86.9
160	403.4	404.1	393.3	408.1	389.1	390.5	394.8	407.7	150-160	171.9	2287	94,94
170	366.8	376.4	368.2	368.3	357.1	365.1	382.9	393.2	160-170	111.8	2399	98.6,98.6
180	454.4	463.8	461.3	430.8	439.4	442.3	411.3	428.3	170-180	33.70	2432	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



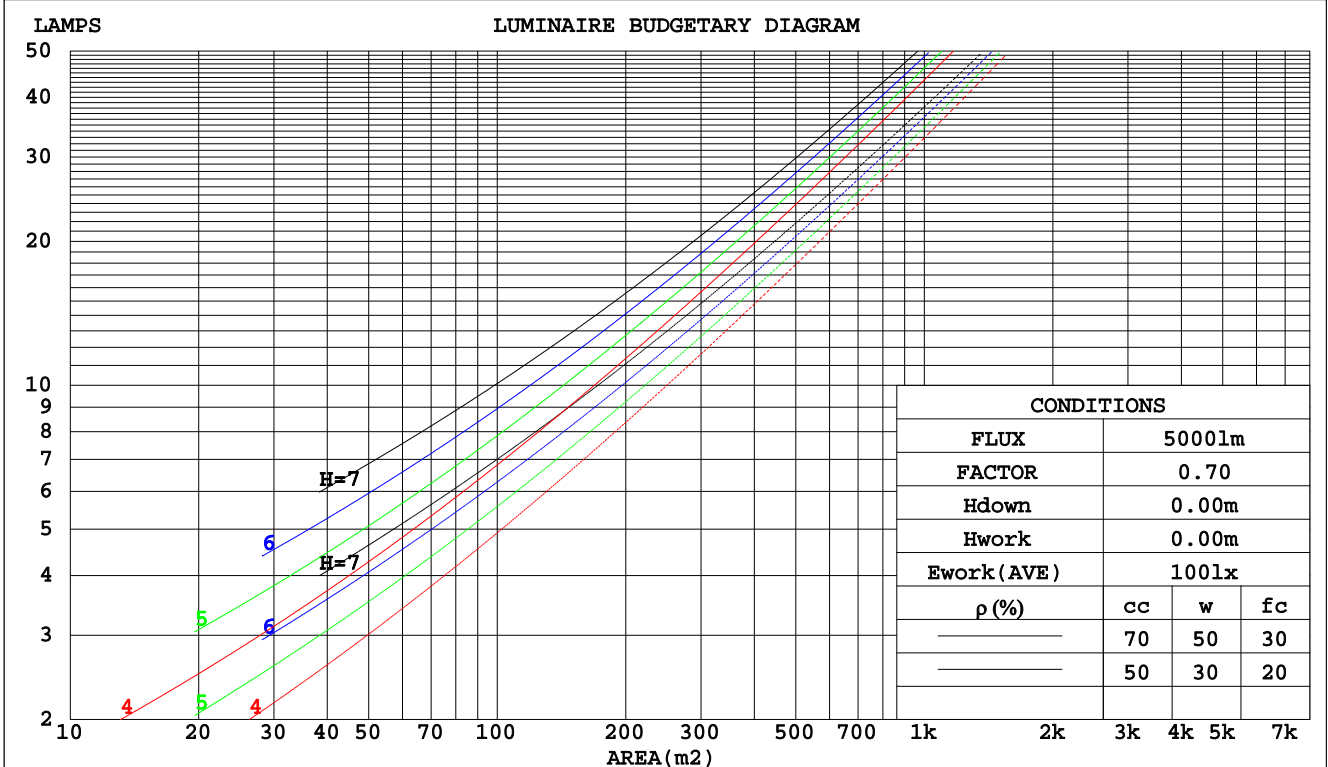
C Range: 0 - 360DEG
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 Test Speed: HIGH
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 Operators:David
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γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	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	1.07	1.07	1.07	.99	.99	.99	.84	.84	.84	.70	.70	.70	.57	.57	.57	.51
1.0	.93	.88	.85	.86	.82	.79	.72	.70	.67	.60	.58	.57	.49	.48	.47	.41
2.0	.80	.74	.69	.74	.69	.64	.63	.59	.55	.52	.49	.47	.43	.41	.39	.34
3.0	.70	.63	.57	.65	.59	.53	.55	.50	.46	.46	.42	.39	.38	.35	.33	.28
4.0	.62	.54	.48	.58	.50	.45	.49	.43	.39	.41	.37	.33	.33	.30	.28	.24
5.0	.55	.47	.41	.51	.44	.38	.44	.38	.33	.37	.32	.29	.30	.27	.24	.21
6.0	.49	.41	.35	.46	.39	.33	.39	.33	.29	.33	.28	.25	.27	.24	.21	.18
7.0	.45	.36	.31	.41	.34	.29	.36	.30	.25	.30	.25	.22	.25	.21	.19	.16
8.0	.40	.33	.27	.38	.31	.26	.32	.27	.23	.27	.23	.20	.23	.19	.17	.14
9.0	.37	.29	.24	.34	.27	.23	.30	.24	.20	.25	.21	.18	.21	.17	.15	.13
10.0	.34	.26	.22	.32	.25	.20	.27	.22	.18	.23	.19	.16	.19	.16	.14	.12



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

WEC AND CCEC

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm									
NAME:					TYPE:WEG29P-PC			WEIGHT:	
SPEC.:					DIM.:			SERIAL No.:	
MFR.: Blackjack Lighting					SUR.:0.35*0.35*3.14			PROTECTION ANGLE:	

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Wall Exitance Coefficients(WEC)									
0.0																
1.0	.298	.170	.054	.276	.158	.050	.235	.135	.043	.197	.114	.037	.162	.094	.030	
2.0	.273	.150	.046	.253	.139	.043	.216	.120	.037	.181	.102	.032	.149	.084	.027	
3.0	.250	.133	.040	.232	.124	.037	.198	.107	.033	.166	.091	.028	.137	.076	.023	
4.0	.230	.120	.035	.214	.112	.033	.182	.097	.029	.153	.082	.025	.126	.068	.021	
5.0	.213	.108	.031	.197	.101	.029	.168	.088	.026	.141	.075	.022	.116	.062	.019	
6.0	.197	.099	.028	.183	.092	.027	.156	.080	.023	.131	.068	.020	.108	.057	.017	
7.0	.183	.091	.026	.170	.085	.024	.146	.074	.021	.122	.063	.018	.101	.052	.015	
8.0	.171	.084	.024	.159	.078	.022	.136	.068	.019	.115	.058	.017	.094	.048	.014	
9.0	.161	.078	.022	.149	.073	.020	.128	.063	.018	.108	.054	.015	.089	.045	.013	
10.0	.151	.072	.020	.141	.068	.019	.120	.059	.017	.101	.050	.014	.084	.042	.012	

ρcc	80%			70%			50%			30%			10%			0
ρw	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0
ρfc	20%			20%			20%			20%			20%			0
RCR	RCR:Room Cavity Ratio						Ceiling Cavity Exitance Coefficients(CCEC)									
0.0	.566	.566	.566	.484	.484	.484	.330	.330	.330	.190	.190	.190	.061	.061	.061	
1.0	.558	.535	.514	.478	.459	.443	.327	.316	.306	.188	.183	.178	.060	.059	.058	
2.0	.551	.513	.482	.472	.442	.416	.324	.306	.290	.187	.178	.170	.060	.058	.055	
3.0	.544	.498	.461	.467	.429	.399	.320	.298	.280	.185	.174	.165	.059	.057	.054	
4.0	.537	.486	.446	.461	.420	.388	.317	.293	.273	.183	.171	.162	.059	.056	.053	
5.0	.531	.476	.436	.456	.412	.380	.314	.288	.268	.182	.169	.159	.059	.055	.052	
6.0	.524	.469	.429	.451	.406	.374	.311	.284	.264	.180	.167	.157	.058	.055	.052	
7.0	.518	.463	.424	.446	.401	.369	.308	.281	.262	.179	.166	.156	.058	.054	.052	
8.0	.513	.458	.420	.441	.397	.366	.305	.279	.260	.178	.164	.155	.057	.054	.051	
9.0	.507	.453	.417	.437	.393	.364	.303	.277	.258	.176	.163	.154	.057	.054	.051	
10.0	.502	.449	.414	.433	.390	.362	.300	.275	.257	.175	.162	.153	.057	.053	.051	

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

UGR(Unified Glare Rating) Table

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm										
NAME:			TYPE:WEG29P-PC				WEIGHT:			
SPEC.:			DIM.:				SERIAL No.:			
MFR.: Blackjack Lighting			SUR.:0.35*0.35*3.14				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	9.6	10.5	10.4	11.4	12.5	9.6	10.6	10.5	11.5	12.6
3H	11.1	12.0	12.0	12.9	14.0	11.2	12.1	12.1	12.9	14.1
4H	11.8	12.6	12.7	13.5	14.7	11.8	12.7	12.7	13.5	14.7
6H	12.4	13.2	13.3	14.1	15.2	12.4	13.2	13.3	14.1	15.2
8H	12.7	13.4	13.6	14.3	15.5	12.7	13.4	13.6	14.3	15.5
12H	13.0	13.7	13.9	14.6	15.8	12.9	13.6	13.8	14.5	15.7
4H 2H	10.0	10.9	10.9	11.8	12.9	10.1	10.9	11.0	11.8	13.0
3H	11.8	12.5	12.7	13.4	14.6	11.8	12.5	12.7	13.4	14.6
4H	12.6	13.2	13.5	14.1	15.3	12.6	13.2	13.5	14.1	15.4
6H	13.3	13.8	14.3	14.8	16.1	13.3	13.8	14.3	14.8	16.0
8H	13.7	14.2	14.6	15.1	16.4	13.6	14.1	14.6	15.1	16.4
12H	14.1	14.5	15.0	15.5	16.8	14.0	14.4	15.0	15.4	16.7
8H 4H	12.7	13.3	13.7	14.2	15.5	12.8	13.3	13.7	14.2	15.5
6H	13.7	14.1	14.7	15.1	16.4	13.7	14.1	14.7	15.1	16.4
8H	14.2	14.5	15.2	15.6	16.9	14.1	14.5	15.1	15.5	16.8
12H	14.7	15.0	15.7	16.1	17.4	14.6	14.9	15.6	16.0	17.3
12H 4H	12.7	13.2	13.7	14.2	15.5	12.8	13.2	13.7	14.2	15.5
6H	13.7	14.1	14.7	15.1	16.4	13.7	14.1	14.7	15.1	16.4
8H	14.3	14.6	15.3	15.6	17.0	14.2	14.6	15.3	15.6	16.9
Variations with the observer position at spacings:										
S = 1.0H	+ 0.1 / - 0.2					+ 0.1 / - 0.2				
1.5H	+ 0.2 / - 0.3					+ 0.2 / - 0.3				
2.0H	+ 0.1 / - 0.3					+ 0.1 / - 0.3				

CIE Pub.117 Corrected 2432 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:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	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	43	32	26	41	31	25	37	28	23	15
0.80	53	41	34	49	39	32	44	35	30	20
1.00	60	49	41	57	46	39	49	43	36	24
1.25	67	56	48	63	53	46	55	47	41	27
1.50	73	62	54	67	58	51	58	51	46	30
2.00	80	70	63	74	66	59	63	57	52	34
2.50	84	75	69	78	70	65	67	61	57	36
3.00	88	80	73	81	74	69	69	64	60	38
4.00	92	86	80	85	80	75	72	68	65	41
5.00	95	89	84	88	83	79	74	71	68	42
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:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

ISOCANDELA DIAGRAM

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	PROTECTION ANGLE:

Conical surface Flux(90deg):

627.25 lm

%lum = 25.8%

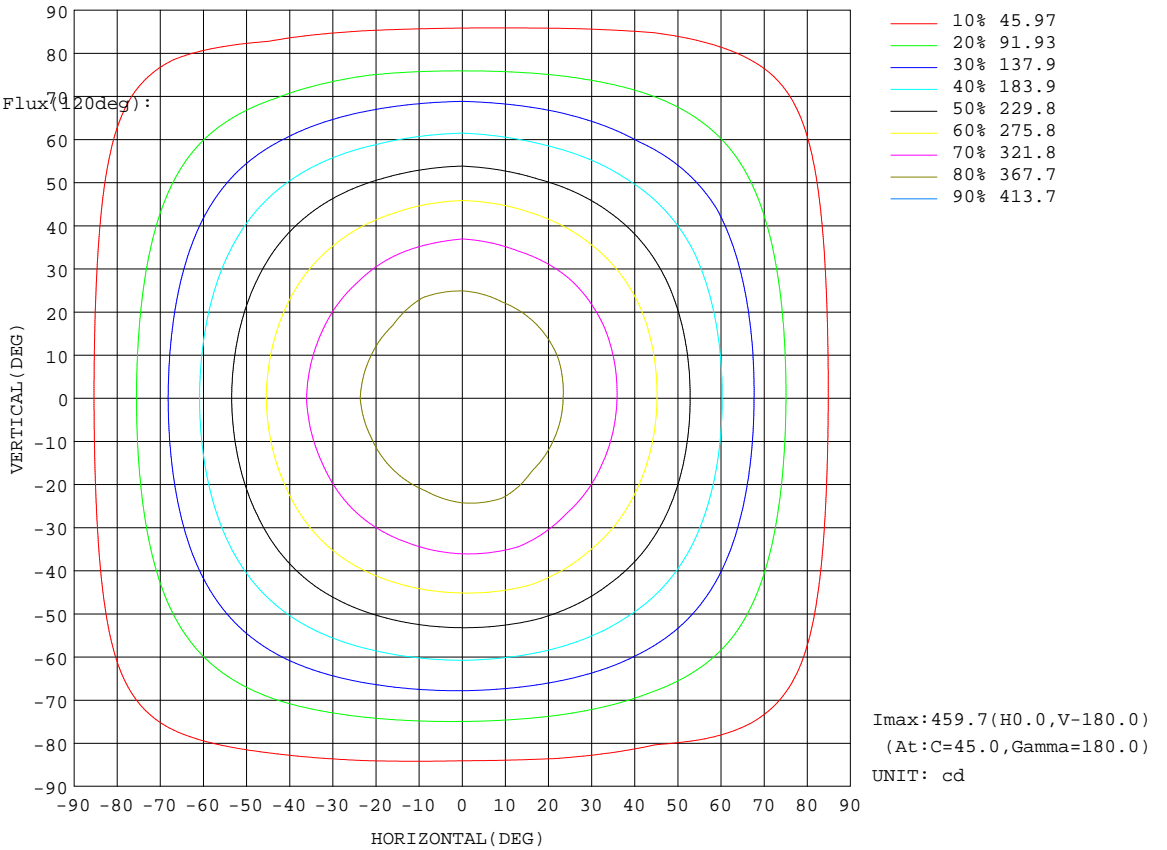
%lamp = 25.8%

Conical surface Flux(70deg):

928.83 lm

%lum = 38.2%

%lamp = 38.2%

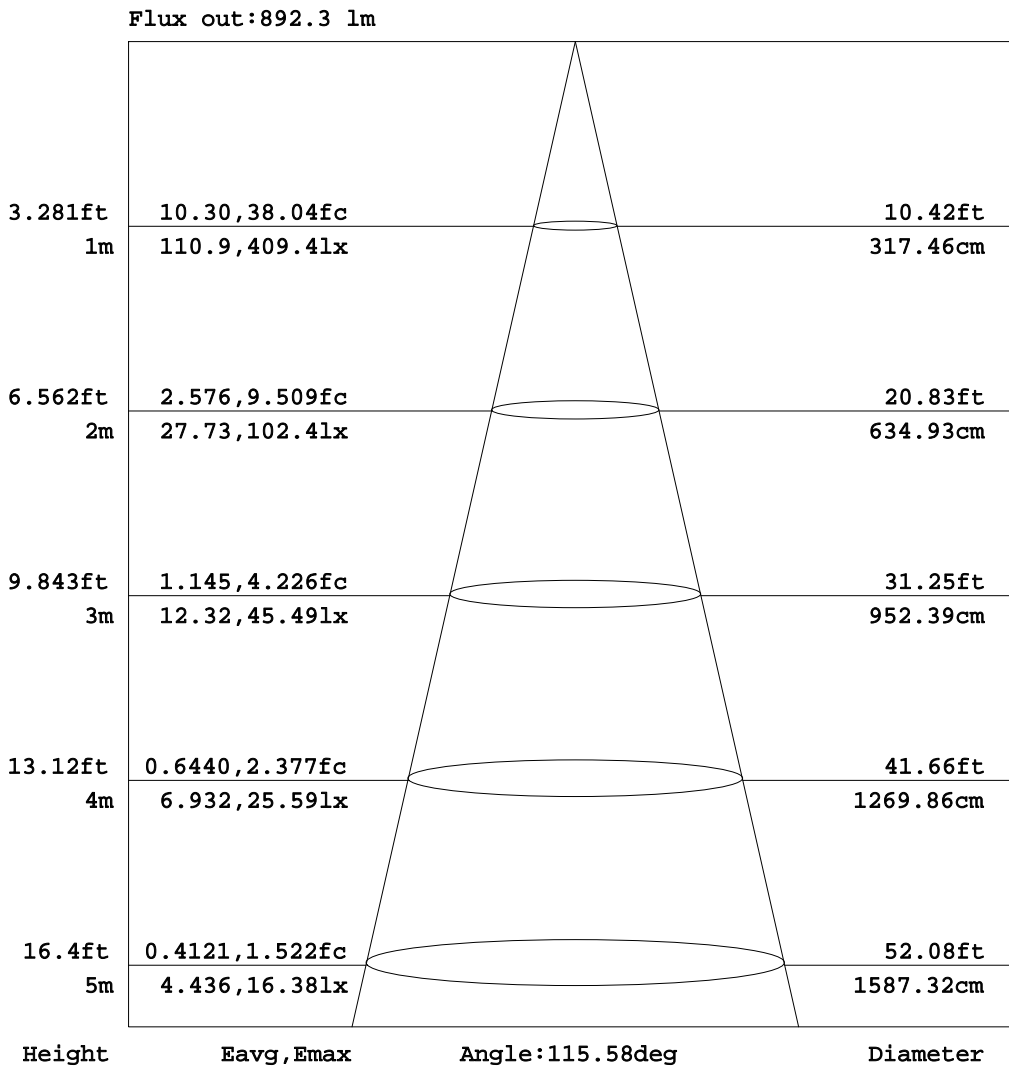


C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

AAI Figure

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	PROTECTION ANGLE:



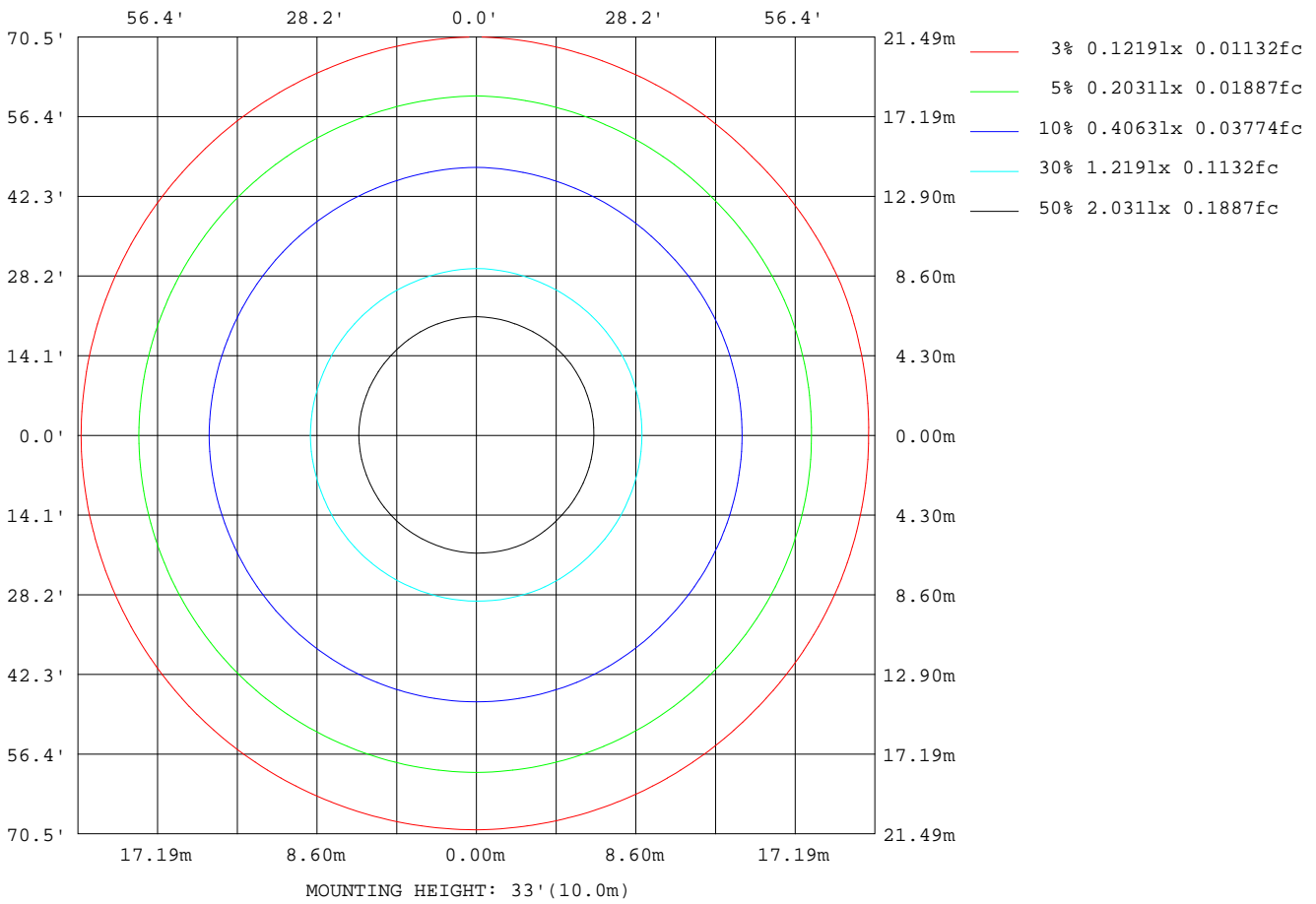
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

ISOLUX DIAGRAM

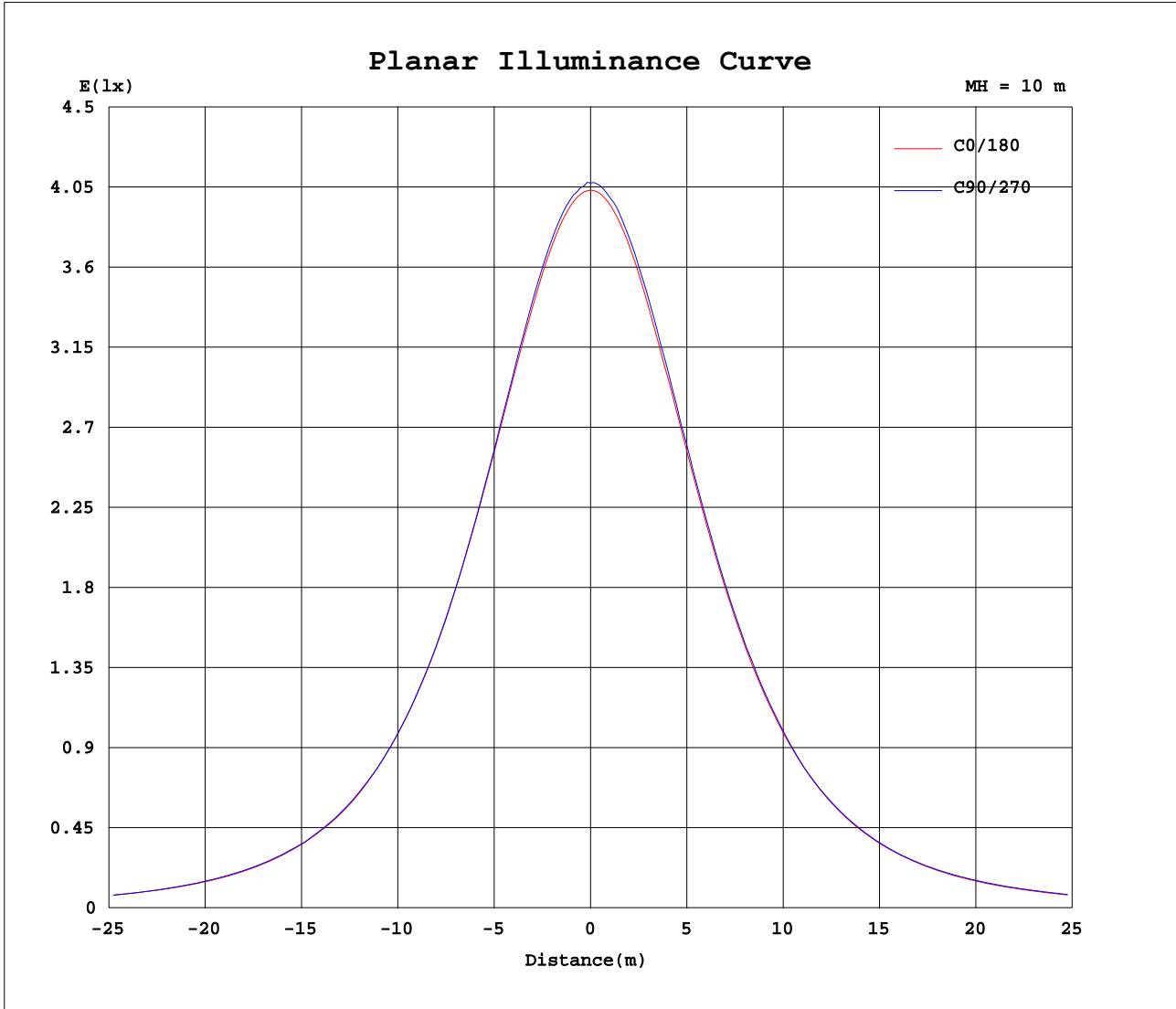
Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	PROTECTION ANGLE:



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [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:2015-08-14

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
Humidity:67.1%
Test Distance:2.676m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:120.0V I:0.2883A P:33.45W PF:0.9665 Lamp Flux:2432.45x1 lm		
NAME:	TYPE:WEG29P-PC	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.35*0.35*3.14	PROTECTION ANGLE:

Table--1

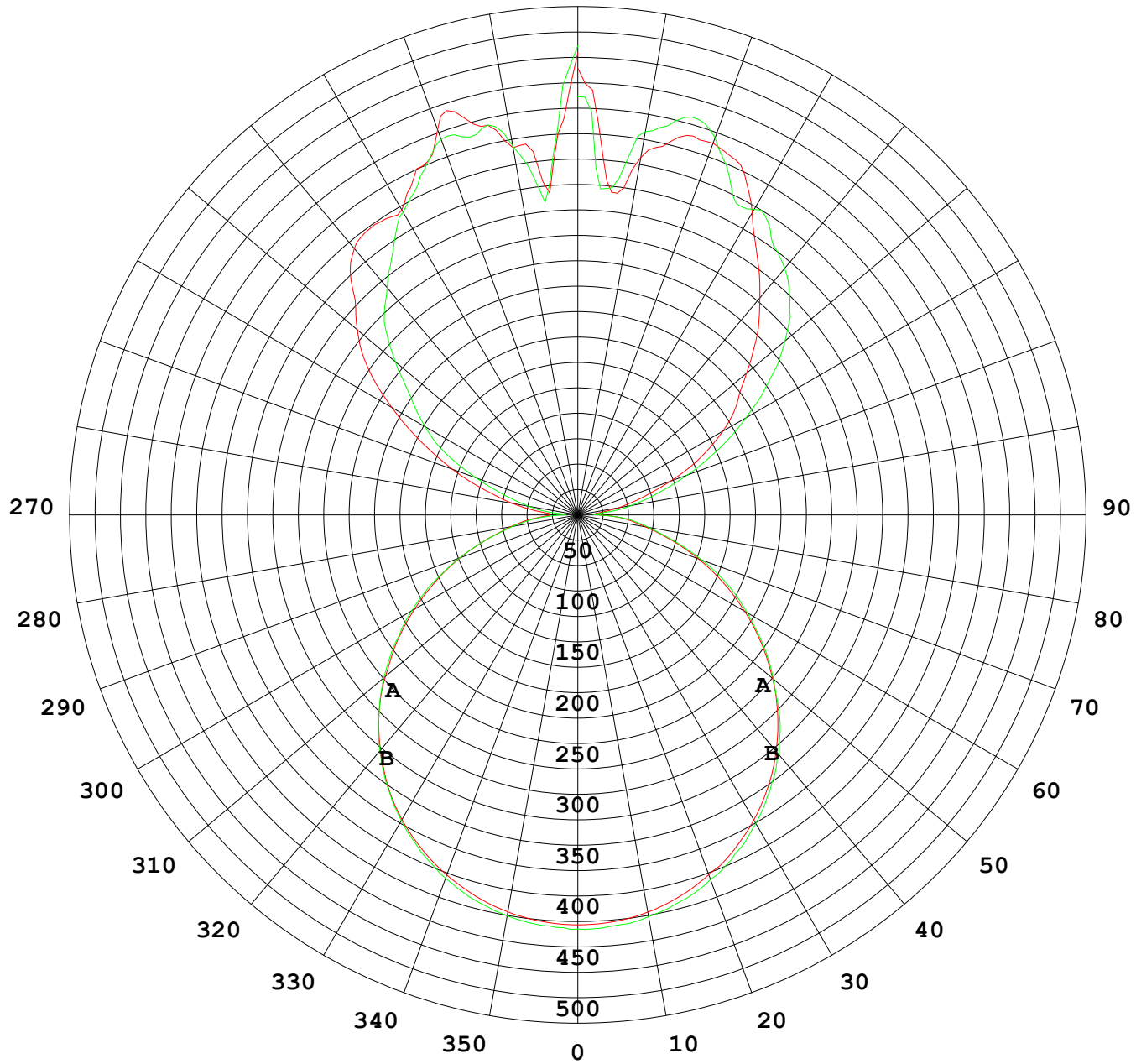
UNIT: cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	403	403	403	409	407	403	403	403	403	403	403	409	407	403	403	403			
5	402	402	401	407	405	401	401	401	402	402	402	402	408	406	401	401	402		
10	396	397	397	402	400	396	396	396	397	397	397	402	401	397	396	397			
15	388	388	388	393	392	388	388	388	388	388	388	394	393	389	389	389			
20	377	377	377	383	380	376	376	376	377	377	377	381	382	378	379	378			
25	363	362	362	367	365	362	361	361	364	362	362	368	367	365	365	365			
30	346	345	344	350	347	344	344	344	346	345	344	349	350	348	349	348			
35	326	324	324	329	326	324	324	324	327	325	324	328	330	327	329	328			
40	302	301	301	305	303	301	301	301	304	302	301	302	308	304	304	305			
45	277	275	275	279	277	276	276	276	278	276	276	277	281	277	277	278			
50	247	247	246	250	249	248	248	248	250	249	249	249	251	247	247	249			
55	217	217	216	219	219	219	219	219	221	219	219	220	223	218	215	217			
60	186	186	185	187	189	188	189	189	189	189	189	189	193	187	185	187			
65	154	154	153	155	157	157	158	157	158	158	157	159	163	157	154	157			
70	123	122	120	122	124	124	126	126	126	126	125	128	130	127	123	127			
75	92.2	91.4	88.4	90.5	91.7	93.3	94.9	94.8	95.2	94.9	93.5	98.0	97.5	97.7	96.9	95.2			
80	66.9	65.4	60.8	63.9	65.2	66.8	68.4	67.8	67.5	68.3	66.1	70.9	70.5	70.7	72.1	69.3			
85	45.2	41.1	36.9	41.1	42.1	43.6	42.9	45.7	47.5	48.6	45.5	49.5	50.7	50.2	52.8	49.0			
90	28.3	24.4	19.3	17.8	13.9	15.1	17.7	17.7	20.9	21.8	21.0	22.6	20.6	26.1	25.4	23.2			
95	37.2	33.2	27.7	26.0	22.6	19.2	15.7	15.2	17.6	19.3	22.0	20.5	24.3	32.1	36.5	36.4			
100	64.6	60.0	53.5	51.8	48.2	46.6	43.6	41.8	40.7	37.1	42.9	46.6	53.4	57.4	63.2	64.2			
105	94.2	89.4	82.9	78.4	74.2	71.6	68.6	65.9	65.0	60.7	67.0	70.6	80.2	87.9	88.8	90.0			
110	131	124	118	112	106	108	103	97.8	97.2	92.9	99.9	103	115	124	127	122			
115	170	164	156	151	144	145	137	135	133	130	139	139	153	165	173	160			
120	211	204	195	183	173	170	162	165	165	164	178	178	191	207	215	203			
125	252	244	235	217	200	196	187	193	191	201	215	218	230	249	257	245			
130	283	282	270	249	234	227	221	225	217	237	250	252	266	286	294	279			
135	313	307	300	278	269	243	241	249	249	262	282	282	295	313	318	305			
140	342	333	321	305	292	266	267	271	279	287	314	311	317	334	332	331			
145	349	339	343	336	317	295	287	296	308	320	337	332	332	346	350	354			
150	346	347	367	361	344	322	306	334	343	352	360	346	347	369	372	374			
155	376	366	382	382	367	359	349	353	380	382	381	365	357	378	400	384			
160	403	407	404	396	393	410	408	391	389	388	390	404	395	396	408	398			
165	398	409	395	383	387	388	394	393	385	388	383	408	405	413	399	402			
170	367	372	376	353	368	366	368	363	357	354	365	374	383	394	393	385			
175	318	321	333	335	324	331	334	344	330	328	335	323	322	328	328	350			
180	454	461	464	456	461	445	431	446	439	440	442	429	411	422	428	440			

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:2015-08-14

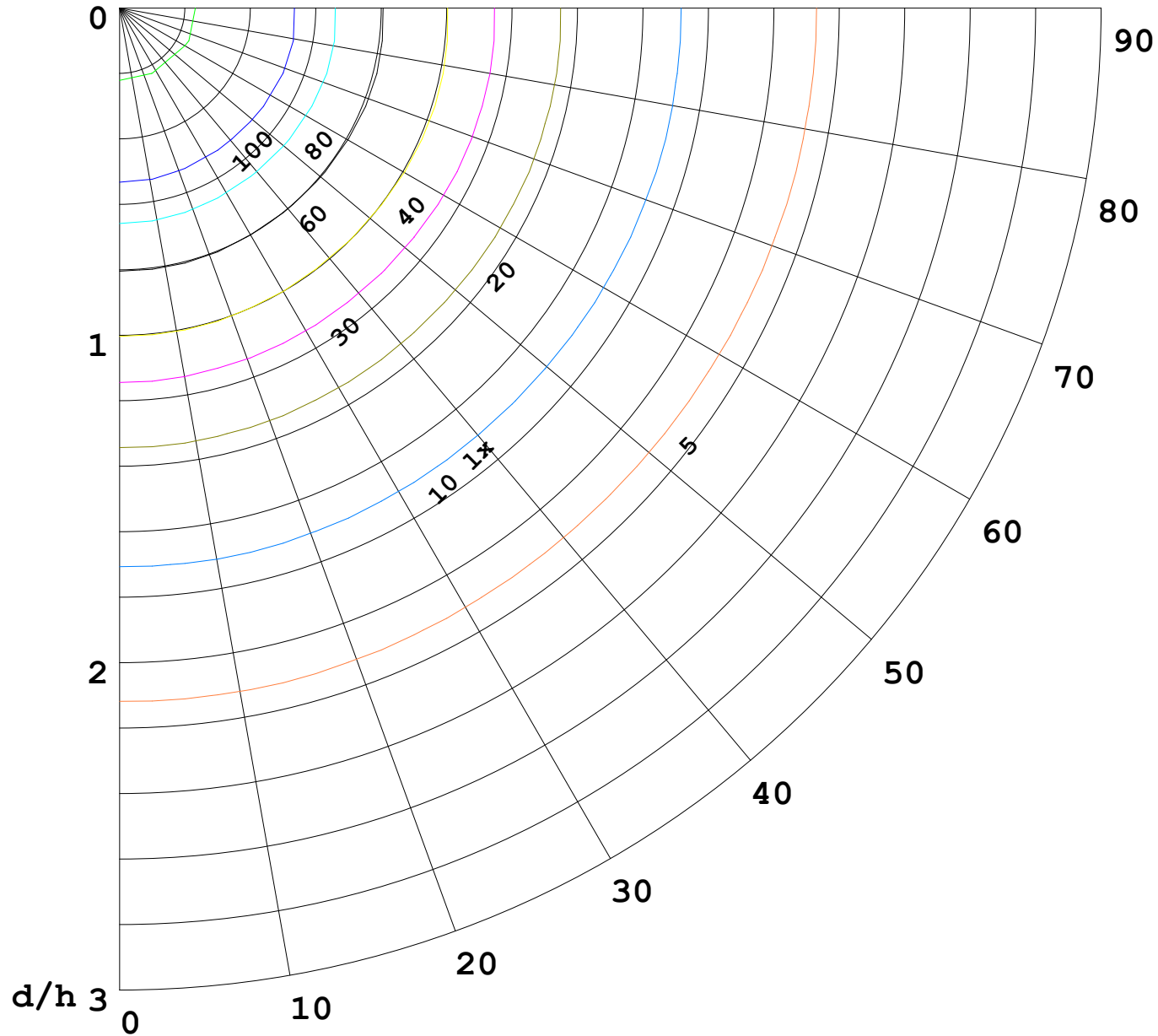
γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.676m [K=1.0000]
 Remarks:

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

