

# 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 25, 2015

<b>Model Name:</b>	LED PAR38
<b>Model No:</b>	19PAR38HO/840NF25/277V
<b>Test Engineer:</b>	David Zhang 
<b>Report No.:</b>	BTR66.181.15.0012.02-3
<b>Sample Received Date:</b>	May 17, 2015
<b>Test Performed Date:</b>	May 17, 2015 to May 23, 2015
<b>Reviewed By:</b>	Steven Hsu 
<b>Prepared By:</b>	<b>BEST Test Service Shenzhen Co., Ltd.</b> 1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China TEL: +86-755-28236006 FAX: +86-755-23467087-811 Email: <a href="mailto:certification@bestcert.cn">certification@bestcert.cn</a>



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## 1 - GENERAL INFORMATION

### 1.1 Product Description for Equipment under Test (EUT)

Applicant	: GREEN CREATIVE LTD
Model Name	: LED PAR38
Model No	: 19PAR38HO/840NF25/277V
Brand	: GREEN CREATIVE
Nominal Operation Voltage	: AC 120-277V/60Hz
Nominal Power	: 19W
Nominal CCT	: 4000K
Nominal CRI	: 80
Nominal Lumen Output	: 1850 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	: May 17, 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 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, 2015	Sep 16, 2016
5	Standard Light Source	Sep 17, 2015	Sep 16, 2016
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  $\Phi$  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

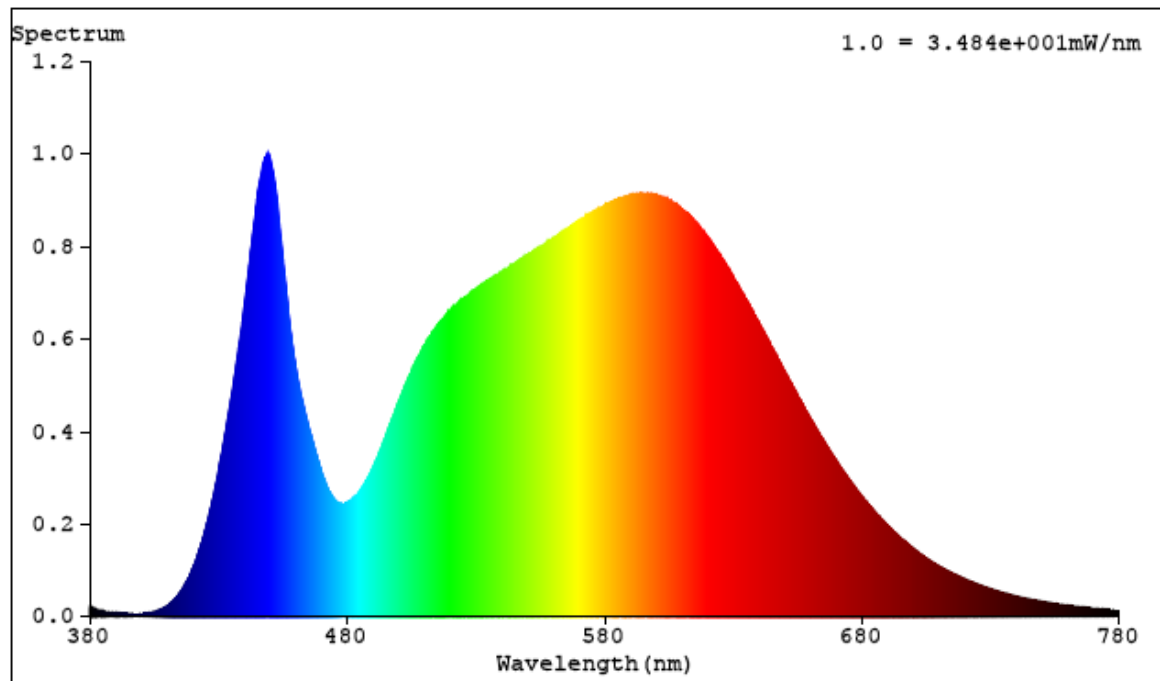
	Item	Test Result		Accreditation
Required Fields	Lumen Output (Lumens)	1963.71		NVLAP/EPA
	Luminous Efficacy (lm/w)	103.75		NVLAP/EPA
	Correlated Color Temperature (CCT)	4109		NVLAP/EPA
	Color Rendering Index– CRI	84.1		NVLAP/EPA
	Input Power (W)	18.93		NVLAP/EPA
Optional Fields	Power Type	<input checked="" type="checkbox"/> AC	<input type="checkbox"/> DC	/
	Input Voltage (V)	120.0		NVLAP/EPA
	Input Current (A)	0.1585		NVLAP/EPA
	Power Factor	0.9951		NVLAP/EPA
	x(CIE 1931)	0.3757		NVLAP/EPA
	y(CIE 1931)	0.3734		NVLAP/EPA
	u' (CIE 1976)	0.2233		NVLAP/EPA
	v' (CIE 1976)	0.4994		NVLAP/EPA
	Duv(CIE 1976)	0.0016		NVLAP/EPA
	Beam Angle: (Degree)	20.1		NVLAP/EPA
	Center beam candlepower: (cd)	11685		NVLAP/EPA
	Zonal lumen density (0-60°):	96.8%		NVLAP/EPA
	Zonal lumen density (60-90°):	3.2%		NVLAP/EPA
	Zonal lumen density (90-120°):	0.0%		NVLAP/EPA
	Zonal lumen density (120-180°):	0.0%		NVLAP/EPA

	CRI (R1)	83	NVLAP/EPA
	CRI (R2)	88	NVLAP/EPA
	CRI (R3)	92	NVLAP/EPA
	CRI (R4)	85	NVLAP/EPA
	CRI (R5)	83	NVLAP/EPA
	CRI (R6)	84	NVLAP/EPA
	CRI (R7)	88	NVLAP/EPA
	CRI (R8)	70	NVLAP/EPA
	CRI (R9)	21	NVLAP/EPA
	CRI (R10)	71	NVLAP/EPA
	CRI (R11)	84	NVLAP/EPA
	CRI (R12)	66	NVLAP/EPA
	CRI (R13)	84	NVLAP/EPA
	CRI (R14)	95	NVLAP/EPA

**Lumen summary:**

[OTHER]	Gamma(deg)	Fz(lm)	Ft(lm)	%Lum	%Lamp
[OTHER]	0- 10	845.95	845.95	43.08	43.08
[OTHER]	10- 20	688.44	1534.39	78.14	78.14
[OTHER]	20- 30	160.68	1695.07	86.32	86.32
[OTHER]	30- 40	71.71	1766.78	89.97	89.97
[OTHER]	40- 50	71.66	1838.44	93.62	93.62
[OTHER]	50- 60	62.17	1900.61	96.79	96.79
[OTHER]	60- 70	39.45	1940.06	98.80	98.80
[OTHER]	70- 80	19.20	1959.26	99.77	99.77
[OTHER]	80- 90	4.42	1963.68	100.00	100.00
[OTHER]	90-100	0.00	1963.68	100.00	100.00
[OTHER]	100-110	0.00	1963.68	100.00	100.00
[OTHER]	110-120	0.00	1963.68	100.00	100.00
[OTHER]	120-130	0.00	1963.68	100.00	100.00
[OTHER]	130-140	0.00	1963.68	100.00	100.00
[OTHER]	140-150	0.00	1963.68	100.00	100.00
[OTHER]	150-160	0.00	1963.68	100.00	100.00
[OTHER]	160-170	0.01	1963.70	100.00	100.00
[OTHER]	170-180	0.01	1963.71	100.00	100.00

## 4 – Spectral Flux Plots





## 5 – EUT Photos

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## 6 – Luminous Intensity Distribution Test Plots (CIE Chromaticity)

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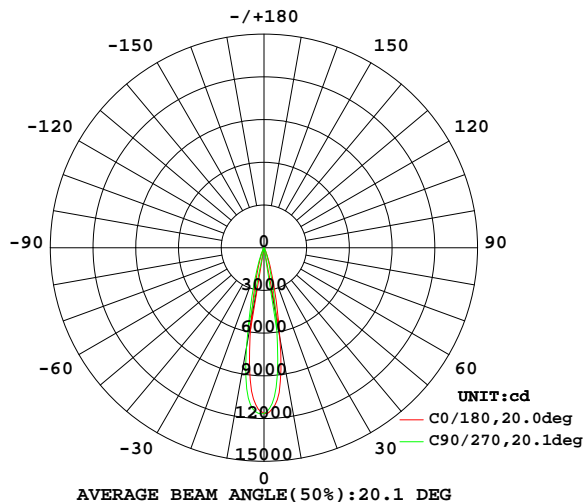


## LUMINAIRE PHOTOMETRIC TEST REPORT

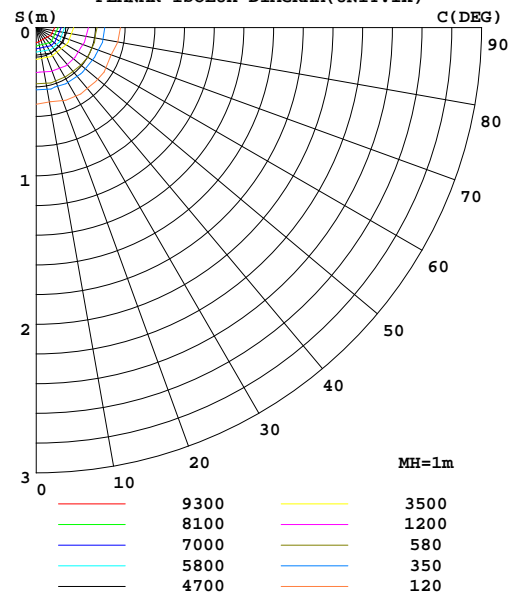
Test:U:120.0V I:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm		
NAME:	TYPE:19PAR38HO/840NF25/277V	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 103.75 lm/W			
MODEL	19PAR38HO/840NF25/277V	Imax(cd)	11685	S/MH(C0/180)	0.36
NOMINAL POWER(W)	19	LOR(%)	100.0	S/MH(C90/270)	0.31
RATED VOLTAGE(V)	120.0	TOTAL FLUX(lm)	1963.7	$\eta$ UP,DN(C0-180)	0.0,54.0
NOMINAL FLUX(lm)	1963.71	CIE CLASS	DIRECT	$\eta$ UP,DN(C180-360)	0.0,46.0
LAMPS INSIDE	1	$\eta$ up(%)	0.0	CIBSE SHR NOM	0.00
TEST VOLTAGE(V)	120.0	$\eta$ down(%)	100.0	CIBSE SHR MAX	1.00

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



PLANAR ISOLUX DIAGRAM(UNIT:lx)



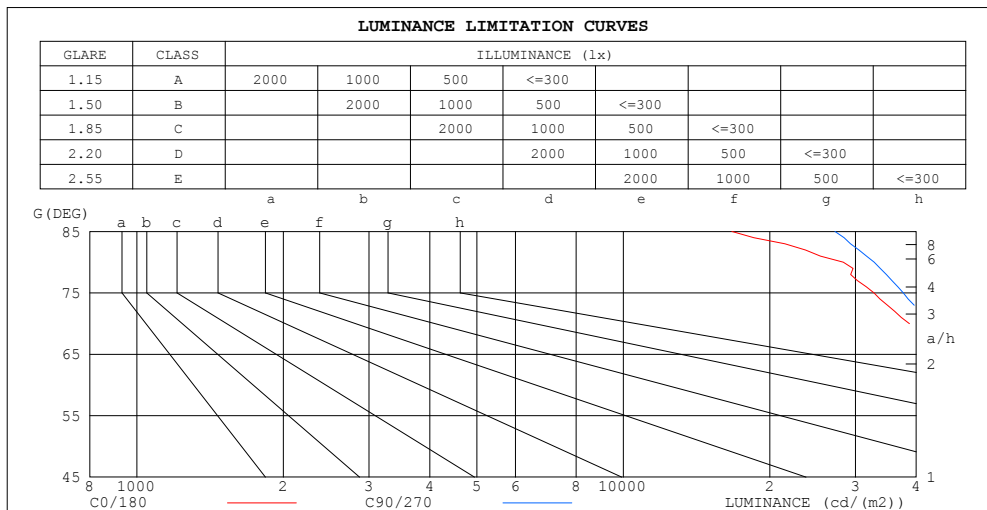
C Range: 0 - 360DEG  
 C Interval: 22.5DEG  
 Test Speed: HIGH  
 Temperature:25.6DEG  
 Operators:David  
 Test Date:

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  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:

$\gamma$	C0	C45	C90	C135	C180	C225	C270	C315	$\gamma$	$\Phi$ zone	$\Phi$ total	%lum, lamp
10	523.2	623.7	707.3	713.2	646.8	546.1	481.1	480.5	0- 10	846.0	846.0	43.1,43.1
20	70.74	89.04	110.9	117.0	101.5	75.67	62.51	66.45	10- 20	688.4	1534	78.1,78.1
30	13.29	14.16	15.18	16.06	15.78	13.80	12.43	12.69	20- 30	160.7	1695	86.3,86.3
40	9.895	10.14	10.50	10.55	10.22	10.06	10.10	9.984	30- 40	71.71	1767	90,90
50	8.025	8.211	8.513	8.528	8.305	8.172	8.148	8.095	40- 50	71.66	1838	93.6,93.6
60	5.251	5.540	5.756	5.731	5.573	5.327	5.215	5.167	50- 60	62.17	1901	96.8,96.8
70	2.649	2.803	2.945	2.929	2.844	2.608	2.565	2.556	60- 70	39.45	1940	98.8,98.8
80	0.9834	1.072	1.139	1.152	1.090	0.9472	0.9197	0.8851	70- 80	19.20	1959	99.8,99.8
90	0.0000	0.0013	0.0212	0.0194	0.0010	0	0	0	80- 90	4.419	1964	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0031	1964	100,100
110	0	0	0	0	0	0	0	0	100-110	0	1964	100,100
120	0	0	0	0	0	0	0	0	110-120	0.0000	1964	100,100
130	0	0	0	0	0	0	0	0	120-130	0	1964	100,100
140	0	0	0	0	0	0	0	0	130-140	0	1964	100,100
150	0	0.0000	0	0	0	0	0	0	140-150	0.0001	1964	100,100
160	0.0015	0.0009	0.0006	0.0006	0.0010	0.0013	0.0019	0.0022	150-160	0.0009	1964	100,100
170	0.0115	0.0101	0.0092	0.0094	0.0103	0.0110	0.0125	0.0134	160-170	0.0136	1964	100,100
180	0	0.0030	0.0032	0.0034	0.0010	0.0013	0.0013	0.0013	170-180	0.0117	1964	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		



LUMINANCE cd/ (m2)		
G (DEG)	C0/180	C90/270
85	16715	27237
80	28317	32783
75	32751	37643
70	38731	43052
65	44587	50011
60	52513	57559
55	59146	63215
50	62425	66221
45	63890	68324

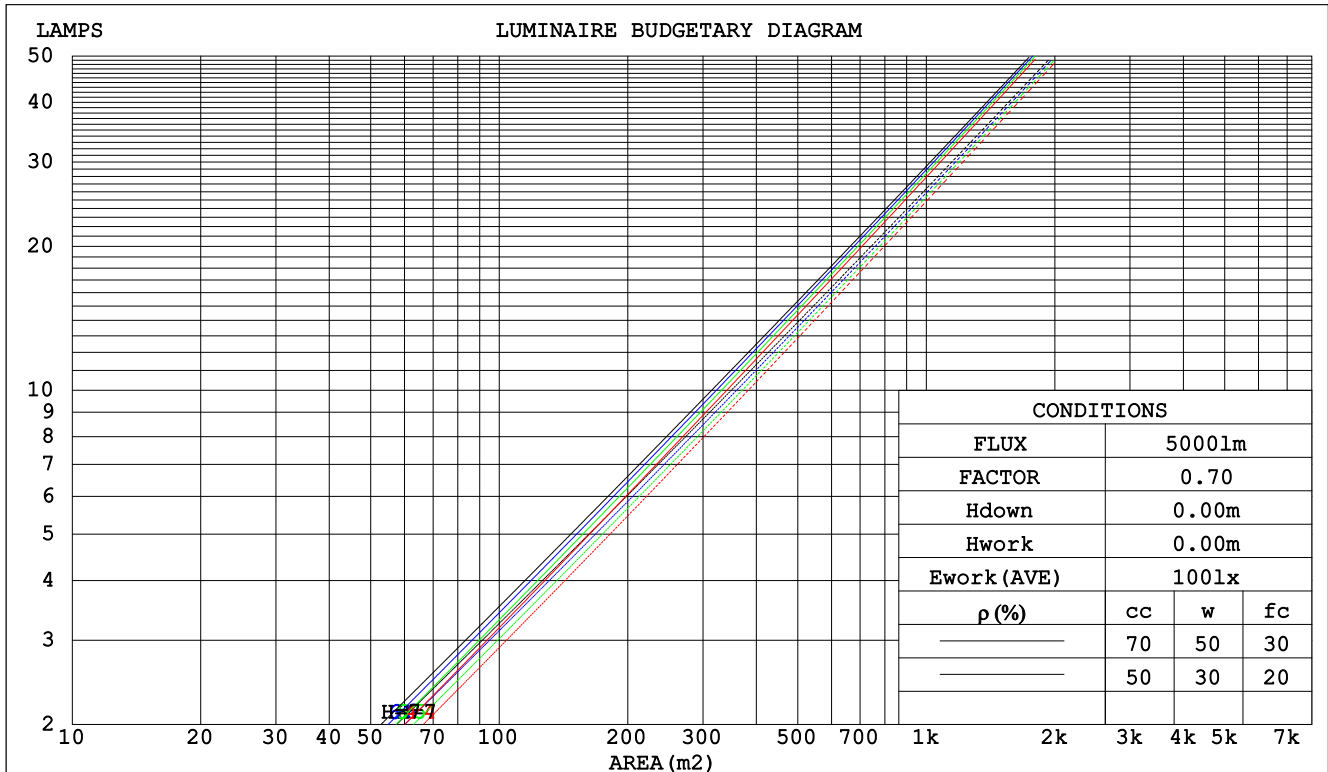
C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.6DEG  
Operators:David  
Test Date:

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  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:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm		
NAME:	TYPE:19PAR38HO/840NF25/277V	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	1.00	.99	.98	.97	.95
2.0	1.06	1.03	1.00	1.04	1.01	.99	1.01	.99	.97	.98	.96	.95	.96	.94	.93	.91
3.0	1.01	.97	.94	.90	.96	.93	.97	.94	.92	.95	.93	.90	.93	.91	.89	.88
4.0	.97	.93	.89	.96	.92	.89	.94	.90	.88	.92	.89	.87	.90	.88	.86	.85
5.0	.93	.89	.86	.92	.88	.85	.91	.87	.84	.89	.86	.84	.88	.85	.83	.82
6.0	.90	.86	.82	.89	.85	.82	.88	.84	.82	.87	.84	.81	.86	.83	.81	.80
7.0	.87	.83	.80	.87	.83	.80	.86	.82	.79	.84	.81	.79	.83	.81	.78	.77
8.0	.85	.80	.77	.84	.80	.77	.83	.80	.77	.82	.79	.77	.82	.79	.76	.75
9.0	.82	.78	.75	.82	.78	.75	.81	.78	.75	.81	.77	.75	.80	.77	.75	.74
10.0	.80	.76	.74	.80	.76	.74	.79	.76	.73	.79	.76	.73	.78	.75	.73	.72



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

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:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.71lx1 lm						
NAME:			TYPE:19PAR38HO/840NF25/277V 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	.152	.086	.027	.145	.083	.026	.133	.076	.024	.121	.070	.022	.111	.064	.021		
2.0	.141	.077	.024	.135	.075	.023	.125	.069	.022	.115	.065	.020	.107	.060	.019		
3.0	.130	.069	.021	.126	.067	.020	.117	.063	.019	.109	.060	.018	.102	.056	.017		
4.0	.121	.063	.018	.117	.061	.018	.110	.058	.017	.103	.055	.017	.097	.052	.016		
5.0	.113	.057	.017	.109	.056	.016	.103	.054	.016	.097	.051	.015	.092	.049	.015		
6.0	.105	.053	.015	.103	.052	.015	.097	.050	.014	.092	.048	.014	.088	.046	.014		
7.0	.099	.049	.014	.097	.048	.014	.092	.047	.013	.088	.045	.013	.084	.043	.013		
8.0	.094	.046	.013	.091	.045	.013	.087	.044	.012	.083	.042	.012	.080	.041	.012		
9.0	.089	.043	.012	.087	.042	.012	.083	.041	.012	.080	.040	.011	.076	.039	.011		
10.0	.084	.040	.011	.082	.040	.011	.079	.039	.011	.076	.038	.011	.073	.037	.011		

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	.169	.158	.147	.145	.135	.126	.099	.093	.087	.057	.054	.051	.018	.017	.016	
2.0	.152	.133	.116	.130	.114	.101	.089	.079	.070	.051	.046	.041	.017	.015	.013	
3.0	.138	.113	.094	.118	.098	.082	.081	.068	.057	.047	.040	.034	.015	.013	.011	
4.0	.125	.098	.077	.107	.085	.067	.074	.059	.047	.043	.035	.028	.014	.011	.009	
5.0	.115	.086	.065	.099	.074	.056	.068	.052	.040	.039	.030	.024	.013	.010	.008	
6.0	.106	.076	.055	.091	.066	.048	.063	.046	.034	.036	.027	.020	.012	.009	.007	
7.0	.098	.068	.047	.084	.059	.041	.058	.041	.029	.034	.024	.017	.011	.008	.006	
8.0	.091	.061	.040	.078	.053	.035	.054	.037	.025	.032	.022	.015	.010	.007	.005	
9.0	.085	.055	.035	.073	.048	.031	.051	.034	.022	.030	.020	.013	.010	.007	.004	
10.0	.080	.051	.031	.069	.044	.027	.048	.031	.019	.028	.018	.011	.009	.006	.004	

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

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:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm											
NAME:					TYPE:19PAR38HO/840NF25/277V 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	21.3	22.0	21.5	22.1	22.3	21.6	22.3	21.8	22.5	22.6	
	3H	22.3	23.0	22.6	23.2	23.4	22.8	23.4	23.0	23.6	23.8
	4H	22.7	23.3	22.9	23.5	23.7	23.2	23.8	23.4	24.0	24.2
	6H	22.9	23.5	23.2	23.7	24.0	23.4	24.0	23.7	24.3	24.5
	8H	23.0	23.5	23.3	23.8	24.0	23.5	24.1	23.8	24.3	24.6
	12H	23.0	23.5	23.3	23.8	24.1	23.6	24.1	23.9	24.4	24.7
4H	2H	21.9	22.5	22.1	22.7	22.9	22.1	22.8	22.4	23.0	23.2
	3H	23.0	23.6	23.3	23.9	24.1	23.4	24.0	23.7	24.2	24.5
	4H	23.5	24.0	23.8	24.3	24.6	23.9	24.4	24.2	24.7	25.0
	6H	23.8	24.3	24.2	24.6	24.9	24.3	24.7	24.6	25.1	25.4
	8H	23.9	24.3	24.3	24.6	25.0	24.4	24.8	24.8	25.2	25.5
	12H	23.9	24.3	24.3	24.6	25.0	24.5	24.9	24.9	25.2	25.6
8H	4H	23.6	24.1	24.0	24.4	24.8	24.0	24.5	24.4	24.8	25.2
	6H	24.1	24.4	24.5	24.8	25.2	24.5	24.9	24.9	25.3	25.7
	8H	24.2	24.5	24.6	24.9	25.3	24.7	25.0	25.1	25.4	25.9
	12H	24.2	24.5	24.7	24.9	25.4	24.8	25.1	25.3	25.5	26.0
12H	4H	23.6	24.0	24.0	24.4	24.8	24.0	24.4	24.4	24.8	25.2
	6H	24.1	24.4	24.5	24.8	25.2	24.5	24.8	25.0	25.2	25.7
	8H	24.2	24.5	24.7	24.9	25.4	24.7	25.0	25.2	25.4	25.9
Variations with the observer position at spacings:											
S = 1.0H	+ 0.2 / - 0.3					+ 0.2 / - 0.3					
1.5H	+ 0.3 / - 0.5					+ 0.3 / - 0.4					
2.0H	+ 0.4 / - 0.5					+ 0.4 / - 0.3					

CIE Pub.117 Corrected 1964 lm Total Lamp Luminous Flux. (8log(F/F0) = 2.3)

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

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:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm		
NAME:	TYPE:19PAR38HO/840NF25/277V	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) $k(RI) \times RCR = 5$									
$k = 0.60$	85	79	75	85	78	75	84	78	74	71
0.80	93	87	83	92	86	82	91	86	82	78
1.00	97	91	88	97	91	87	95	91	87	83
1.25	102	96	92	101	95	92	99	94	91	87
1.50	104	99	96	103	99	95	101	97	94	89
2.00	107	103	99	106	102	99	103	100	97	92
2.50	109	105	102	108	104	101	105	102	99	93
3.00	111	107	104	109	106	103	106	103	101	95
4.00	113	110	108	111	109	106	107	105	104	97
5.00	115	112	110	112	110	109	108	107	105	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:

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  Interval: 1.0DEG  
 Test System: EVERFINE GO-R5000\_V2 SYSTEM V2.0.287  
 Humidity: 67.1%  
 Test Distance: 2.455m [K=1.0000]  
 Remarks:

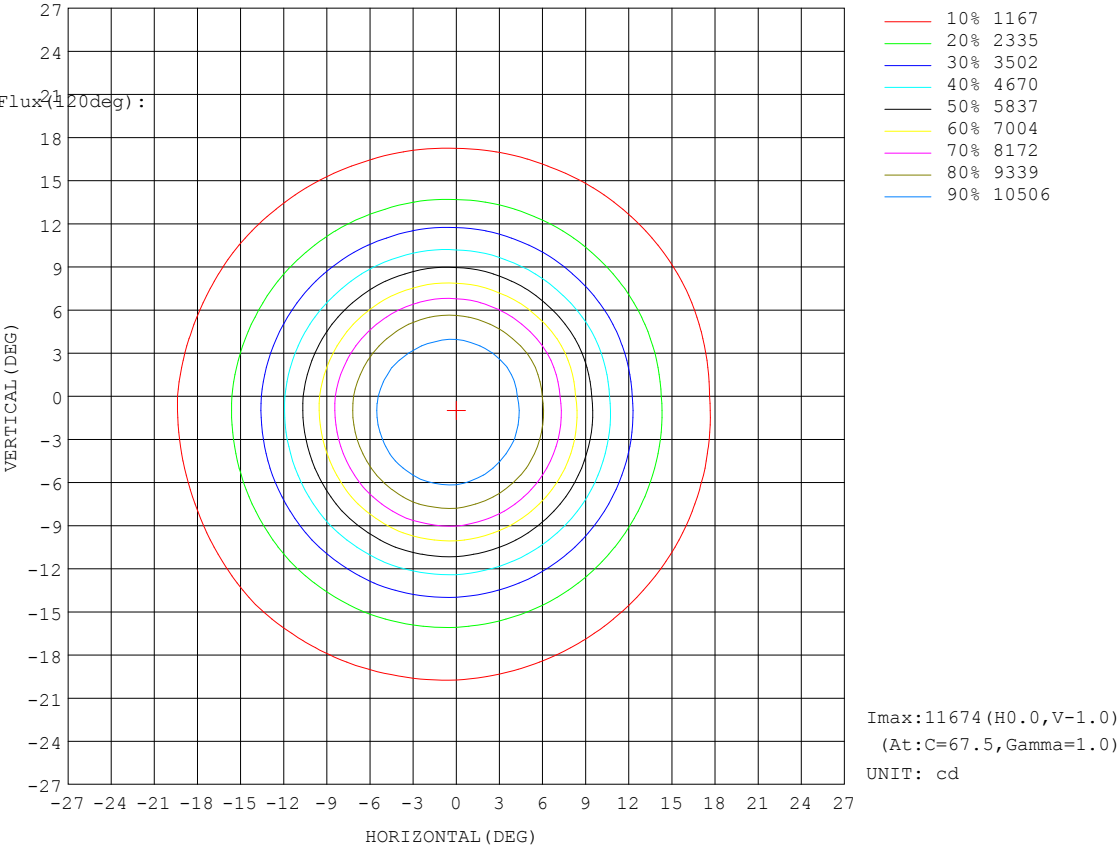


ISOCANDELA DIAGRAM

Test:U:120.0V I:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm		
NAME:	TYPE:19PAR38HO/840NF25/277V	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

Conical surface Flux(90deg):  
1803 lm  
%lum = 91.8%  
%lamp = 91.8%

Conical surface Flux(24deg):  
1900.6 lm  
%lum = 96.8%  
%lamp = 96.8%



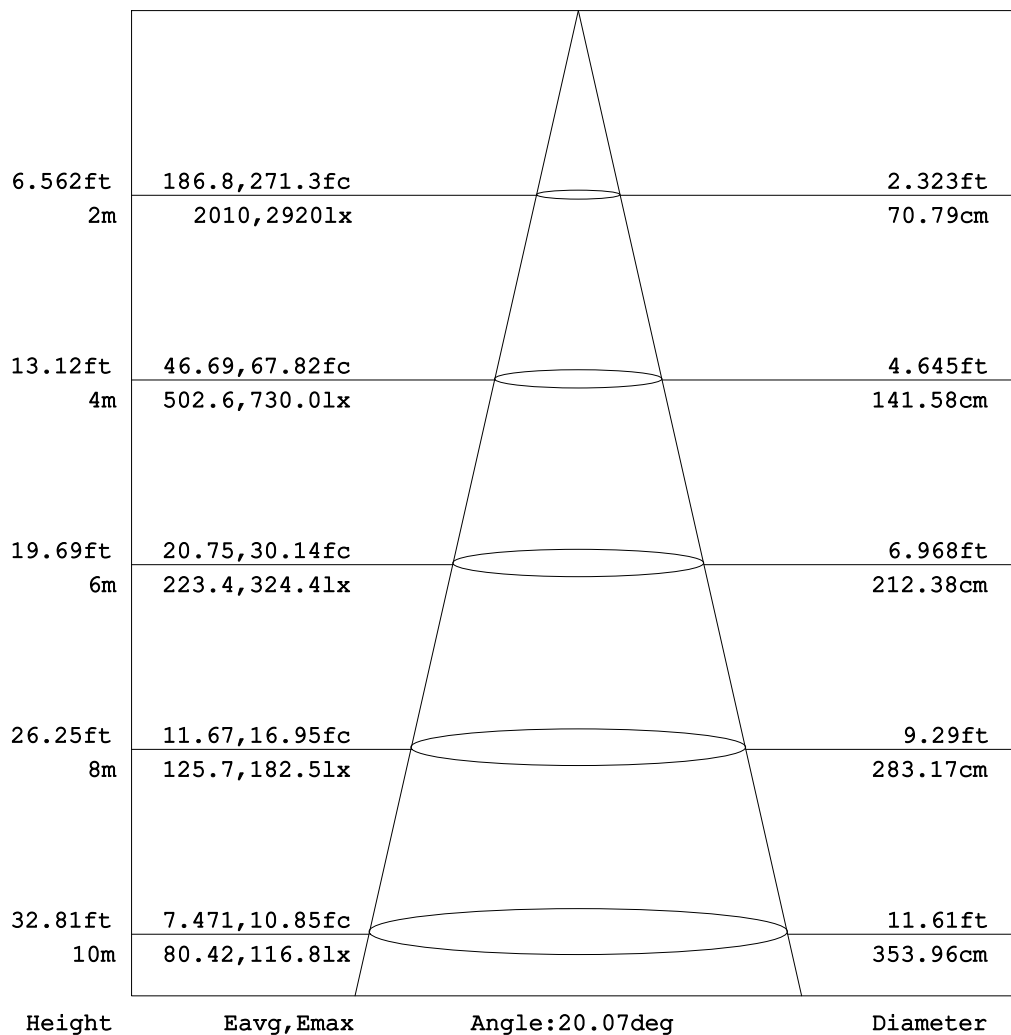
C Range: 0 - 360DEG  
C Interval: 22.5DEG  
Test Speed: HIGH  
Temperature:25.6DEG  
Operators:David  
Test Date:

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:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm		
NAME:	TYPE:19PAR38HO/840NF25/277V	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:

Flux out:954.6 lm



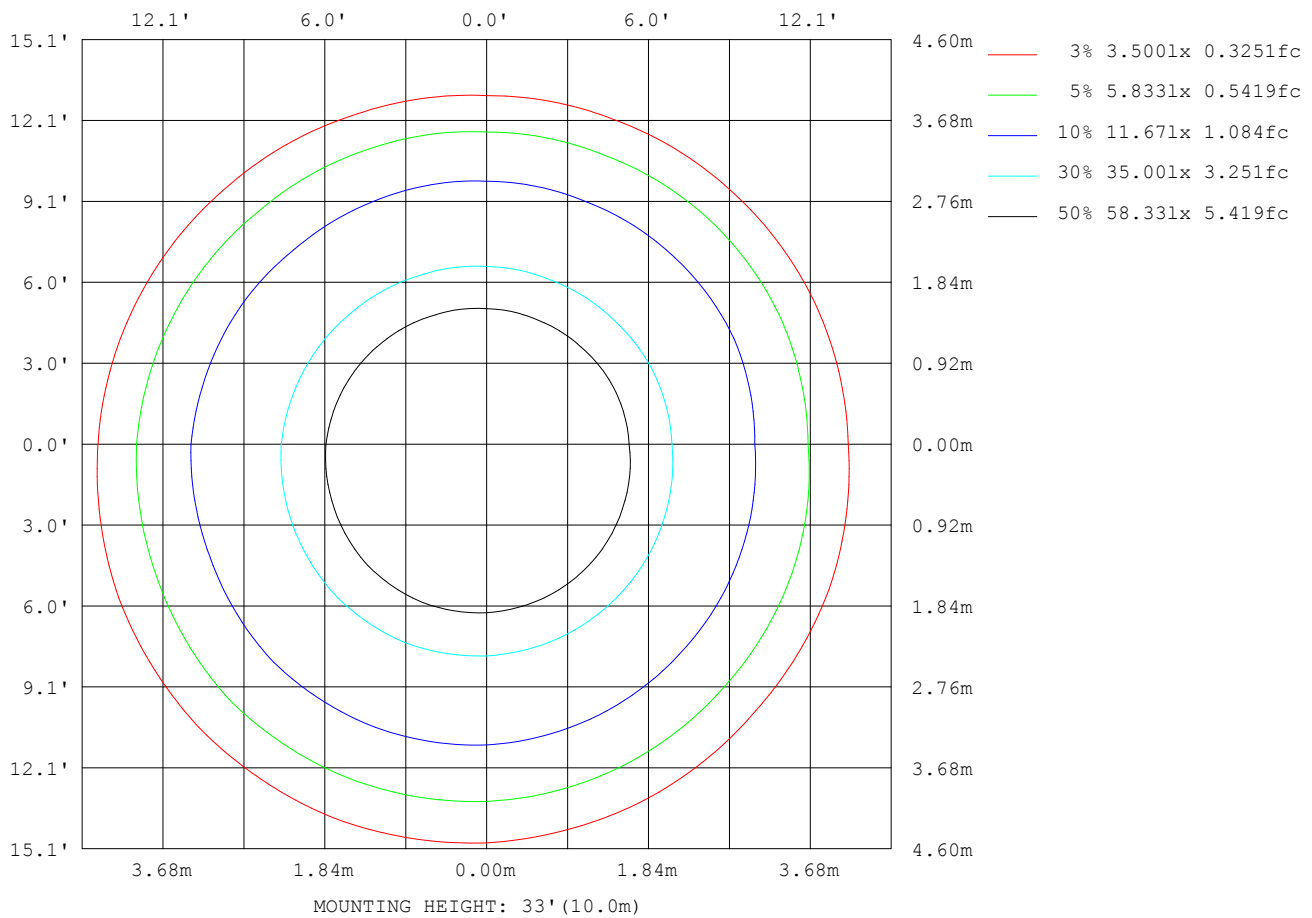
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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

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

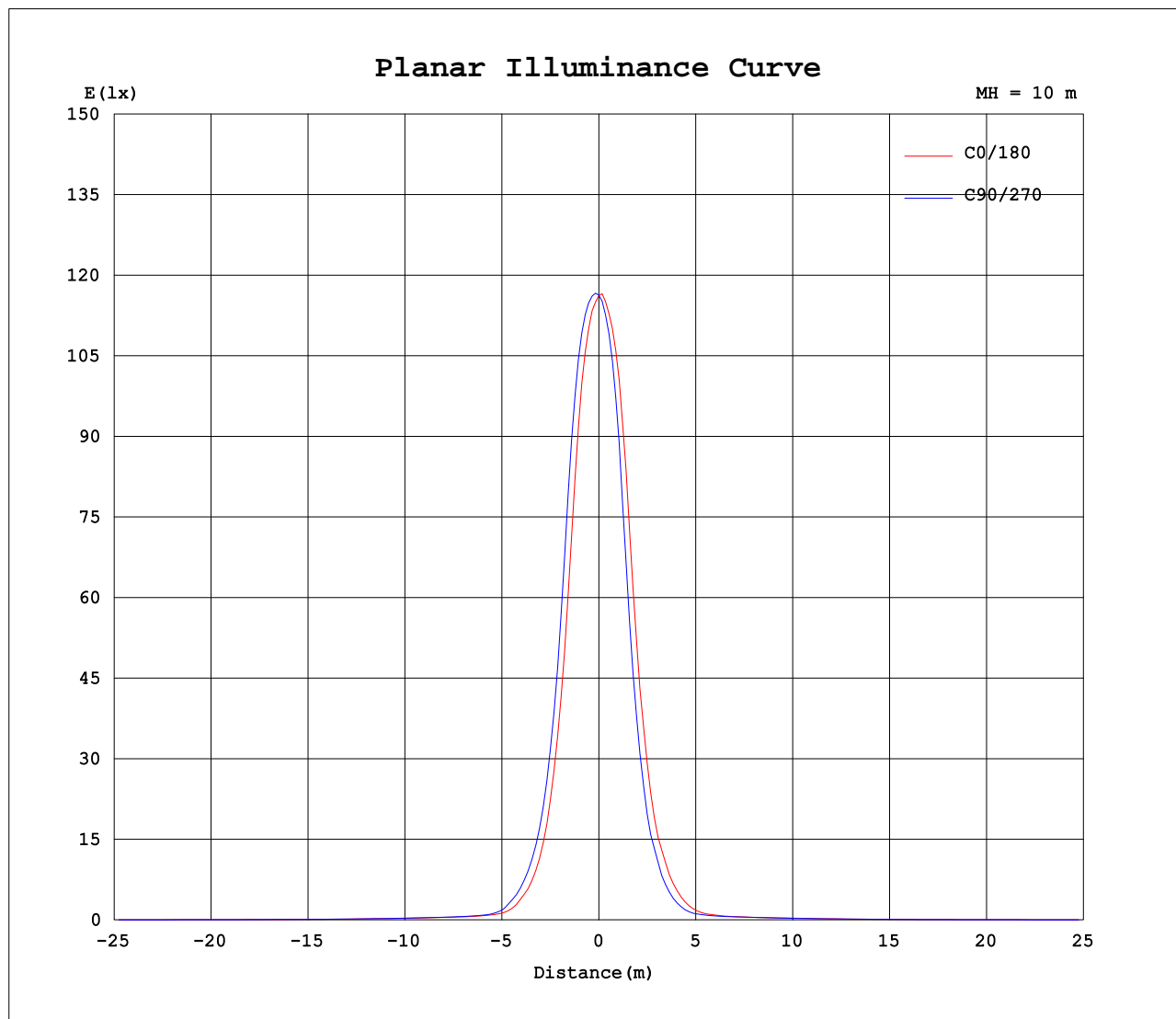
Test:U:120.0V I:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.7lx1 lm		
NAME:	TYPE:19PAR38HO/840NF25/277V	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: GC	SUR.:	PROTECTION ANGLE:



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

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:

$\gamma$  Range: 0 - 180DEG  
 $\gamma$  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:0.1585A P:18.93W PF:0.9951 Lamp Flux:1963.71x1 lm																	
NAME:									TYPE:19PAR38HO/840NF25/277V 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	1162	1161	1161	1162	1163	1163	1164	1165	1162	1161	1161	1162	1163	1163	1164	1165			
5	1010	1036	1063	1088	1105	1112	1106	1094	1072	1048	1019	997	983	977	982	1000			
10	523	569	624	672	707	722	713	679	647	597	546	505	481	472	481	505			
15	198	219	244	268	288	300	298	281	263	232	204	185	177	174	179	191			
20	70.7	80.5	89.0	100	111	115	117	108	102	88.4	75.7	68.1	62.5	62.5	66.4	69.9			
25	23.5	25.7	30.2	33.5	40.0	43.1	42.9	40.2	35.3	30.6	26.1	21.6	20.3	20.4	20.3	22.7			
30	13.3	13.7	14.2	14.4	15.2	15.9	16.1	16.0	15.8	14.9	13.8	12.6	12.4	12.3	12.7	13.2			
35	10.7	10.9	11.2	11.5	11.8	11.9	11.9	11.6	11.4	11.2	10.9	10.7	10.7	10.6	10.7	10.7			
40	9.90	9.98	10.1	10.3	10.5	10.6	10.6	10.3	10.2	10.2	10.1	10.1	10.1	10.0	9.98	9.91			
45	9.04	9.18	9.32	9.49	9.66	9.72	9.71	9.50	9.41	9.33	9.23	9.21	9.16	9.13	9.08	9.03			
50	8.03	8.13	8.21	8.38	8.51	8.55	8.53	8.36	8.31	8.23	8.17	8.19	8.15	8.11	8.09	8.01			
55	6.78	6.89	6.98	7.14	7.25	7.31	7.27	7.13	7.10	7.00	6.97	6.97	6.94	6.91	6.86	6.79			
60	5.25	5.40	5.54	5.67	5.76	5.80	5.73	5.65	5.57	5.44	5.33	5.23	5.22	5.16	5.17	5.16			
65	3.77	3.90	4.03	4.19	4.23	4.26	4.20	4.09	4.02	3.90	3.82	3.78	3.72	3.73	3.72	3.72			
70	2.65	2.70	2.80	2.93	2.94	2.98	2.93	2.84	2.84	2.68	2.61	2.59	2.56	2.57	2.56	2.56			
75	1.70	1.80	1.84	1.95	1.95	1.99	1.94	1.90	1.82	1.77	1.70	1.70	1.66	1.68	1.66	1.69			
80	0.98	1.03	1.07	1.15	1.14	1.18	1.15	1.10	1.09	1.03	0.95	0.94	0.92	0.90	0.89	0.93			
85	0.29	0.36	0.40	0.47	0.47	0.50	0.48	0.41	0.38	0.34	0.31	0.28	0.27	0.26	0.27	0.28			
90	0.00	0.00	0.00	0.01	0.02	0.03	0.02	0.01	0.00	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	0.00	0.00	0.00	0.00			
165	0.01	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	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:

γ Range: 0 - 180DEG

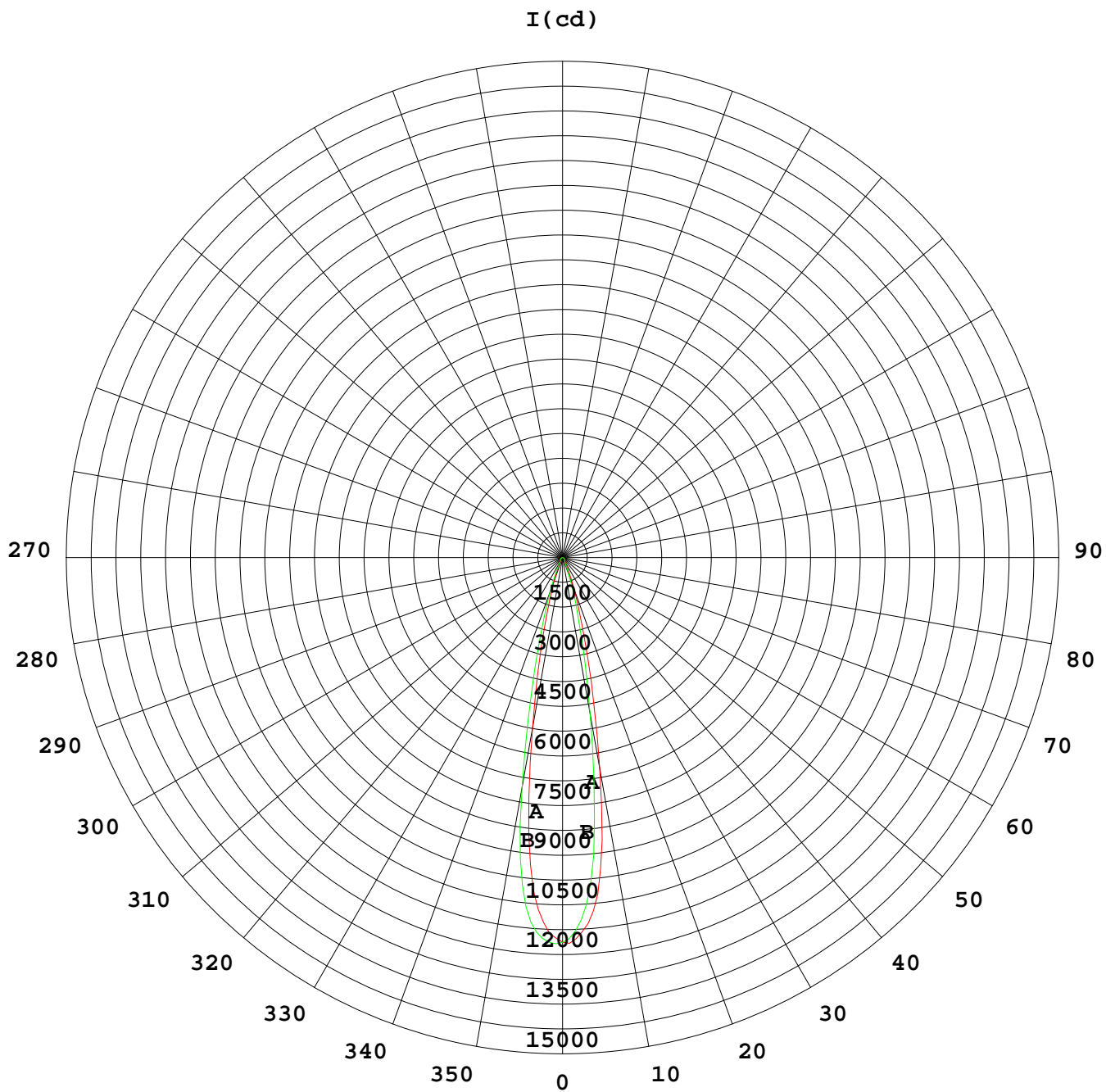
γ Interval: 1.0DEG

Test System:EVERFINE GO-R5000\_V2 SYSTEM V2.0.287

Humidity:67.1%

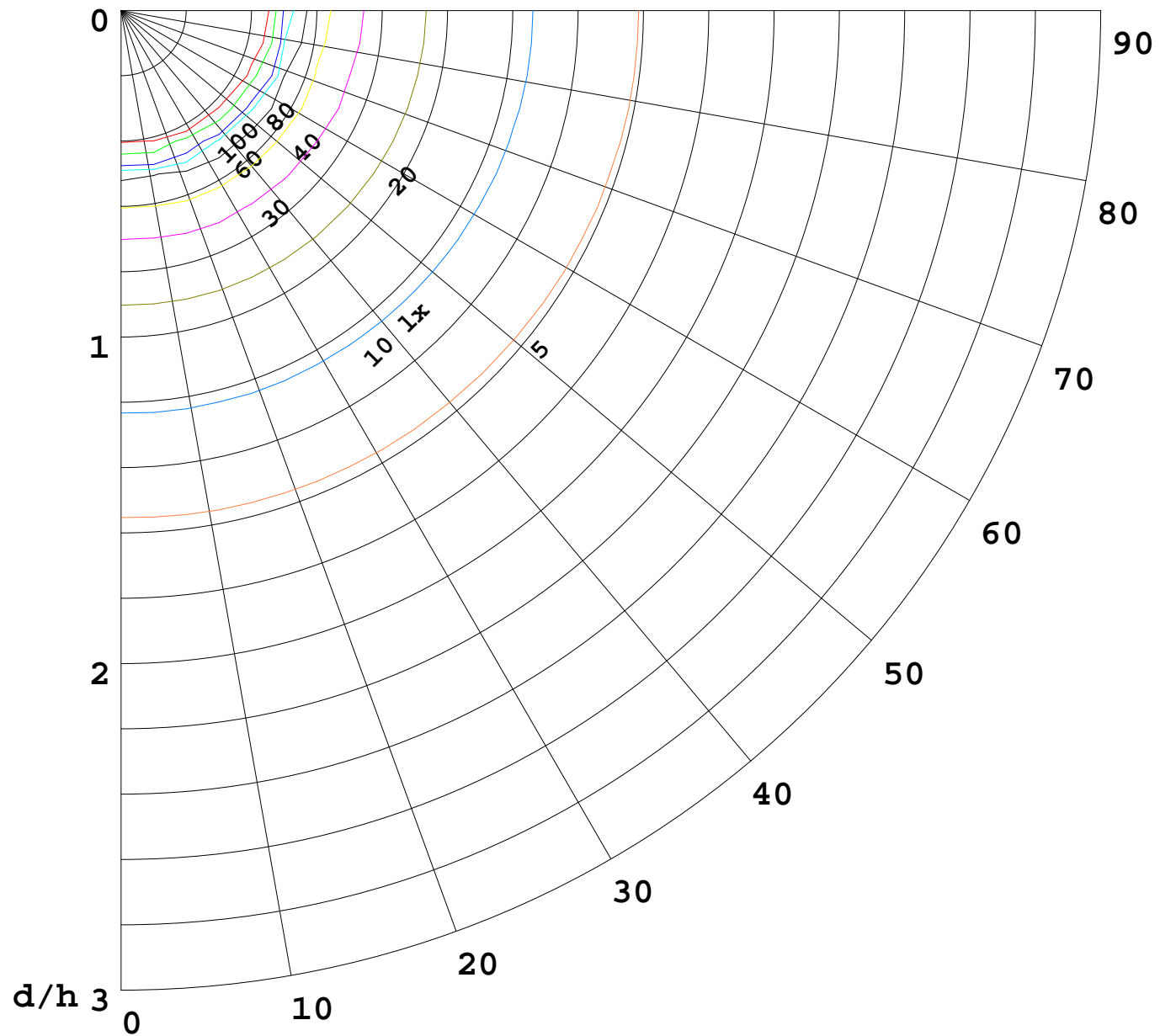
Test Distance:2.455m [K=1.0000]

Remarks:



1000 lm

$K = 1$



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

