



IESNA LM-79 TEST REPORT

Applicant's name	Blackjack Lighting
Address	1553 Barclay Blvd. Buffalo Grove, IL 60089
Brand Name	Blackjack Lighting
Report No.	BTR66.181.17.0031.08
Product Name	Halos 21" Flush Mount- Satin Nickel
Model Number	HAL-21F-SN
 Tested by (printed name and signature) David Zhang Title Test Engineer Approved by (printed name and signature) Steven Huo Title Approved Signatory Date of issue Jun 07, 2018	
Testing Laboratory Name BEST Test Service Shenzhen Co., Ltd. 1 st Floor, 1 st Building, Weitai Industrial Park, Yingrenshi, Shiyao, Baoan, Address Shenzhen, China Tel: +86-755-28236006, Email: certification@bestcert.cn Accreditation DLC/Lighting Facts/UL/ETL/ELI/CEC/EPA/DOE NVLAP Testing Lab Code: 200770-0	
Test specification Standard IESNA LM-79 Test procedure IESNA LM-79 Test Procedure Non-standard test method No	
Test Report Form No. BEST_LM-79 TRF originator. BEST Test Service Shenzhen Co., Ltd. Mr Tseng Master TRF BEST_LM-79.doc	

Note:

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description:	
Test date	May 29, 2018 to Jun 07, 2018
Sample Quantity	1 unit
SKU.....	N/A
Rating(s) (V; Hz)	120V 60HZ
Nominal Power.....	29W
Nominal Power Factor	N/A
Nominal Lumen Output.....	1756lm
Nominal CCT	3000K
Nominal CRI(Ra)	90
Number of hours operated prior to measurement	0H
Total operating time of the product for measurements including stabilization	3.5H
Ambient temperature	24.7°C
Orientation (burning position) of SSL product during test	Lighting Surface Down or Base Up
Stabilization time	1.5 H
Photometric method	Sphere-spectroradiometer+Goniophotometer
Calibration standard lamp used	DC 24V 100W Omni-Directional Halogen Calibrated by NIM China(Sphere) DC 120V 500W Omni-Directional Halogen Calibrated by NIM China(Goniophotometer)
Correction factors applied	Self absorbing applied
Photometric measurement conditions	See test method description below
Equipments used	EVERFINE HASS-2000 Sphere System CHROMA 61602 AC Source YOKOGAWA WT 310 Power Meter FLUKE 52II EVERFINE GOR-5000 Goniophotometer CALIFORNIA INSTRUMENT 1501I AC Source YOKOGAWA WT 210 Power Meter FLUKE 233 Temperature Meter
Bandwidth of spectroradiometer	2nm
Statement of uncertainties	1.12%
Deviation from standard operating procedures,	None

Photometric and Electrical Measurement

Total light output (luminous flux) for the $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ambient temperature conditions is measured using a EVERFINE 2.0 m 4 Π geometry integrating sphere. Temperature is measured at a position inside the sphere. Spectral radiant flux measurements are made using Integral Sphere to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation by a CHROMA 61602 AC SOURCE. Each lamp should be stable before measurements are made as below:

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 380 to 780 nm by EVERFINE HASS-2000. The calibration of the sphere photometer-spectrometer system is traceable to the NIM China by a calibrated halogen incandescent lamp. 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 YOKOGAWA WT310 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 380-780 nm.

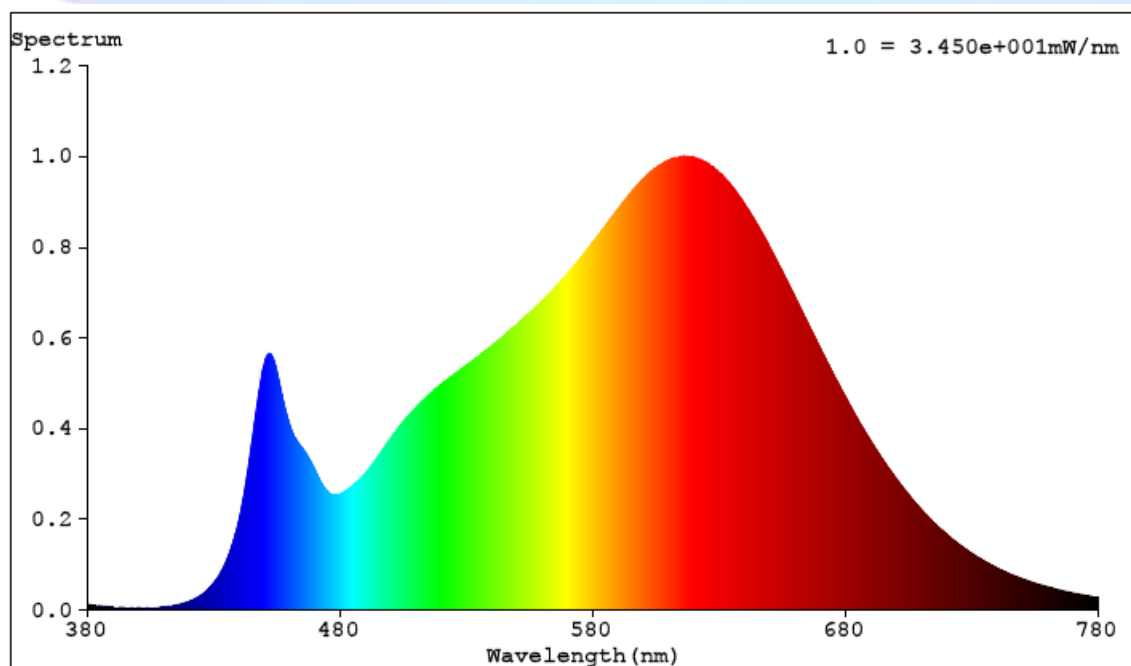
Luminous Intensity

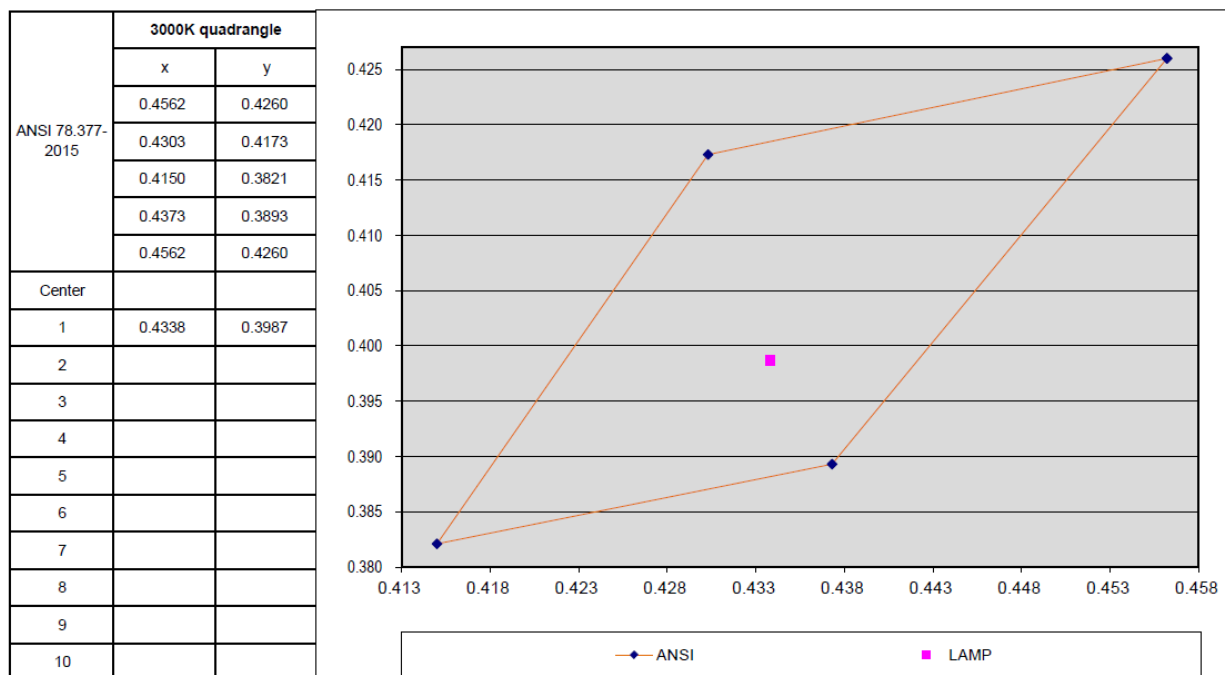
A Everfine GOR-5000 Goniophotometer was used to measure the intensity at each angle of distribution, Luminous intensity (cd) is measured within each vertical plane at a 5° vertical angle increment (maximum) from 0° to 180° Luminous intensity (cd), measurements repeated in vertical planes about the lamp (polar) axis in maximum increments of 22.5° from 0° to 180° , and export the intensity (cd) with excel format. The test distance is 25meters from the Goniophotometer to the detector

Photometric and Electrical Test Data

Input Voltage (V)	Frequency (Hz)	Input Current (A)	ITHD	Input Power (W)	Power Factor	Lumen Output (Lumens)	Efficiency Lumen/w
120.0	60.0	0.2360	/	28.27	0.9977	1772.01	62.68
CCT (K)	CRI (Ra)	R9	x CIE1931	y CIE1931	u' CIE1976	v' CIE1976	Duv CIE1976
3009	91.9	54	0.4338	0.3987	0.2509	0.5188	-0.0017

Spectral Plots



7 Step Quadrangle

BEST

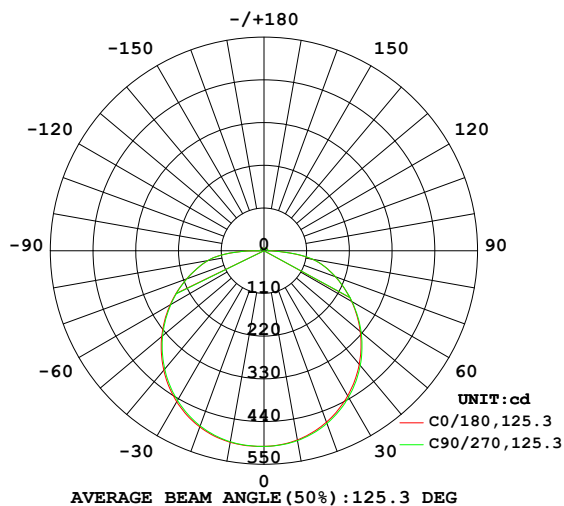
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LUMINAIRE PHOTOMETRIC TEST REPORT

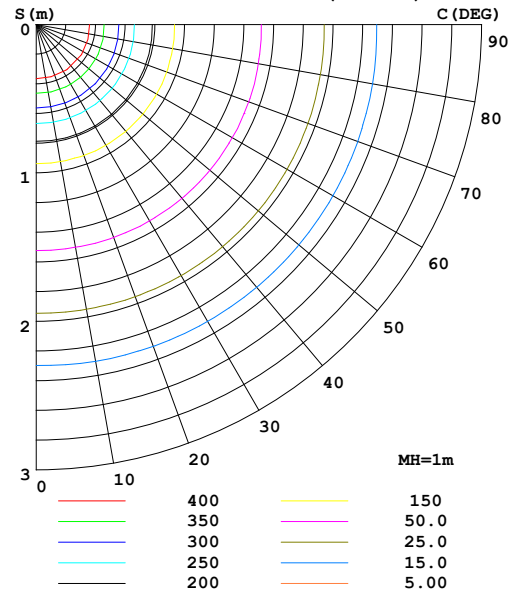
Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:

DATA OF LAMP		PHOTOMETRIC DATA Eff: 62.68 lm/W			
MODEL	HAL-21F-SN	I _{max} (cd)	504.2	S/MH (C0/180)	1.27
NOMINAL POWER (W)	29	LOR (%)	100.0	S/MH (C90/270)	1.29
RATED VOLTAGE (V)	120.0	TOTAL FLUX (lm)	1772.0	η UP,DN (C0-180)	1.6,49.4
NOMINAL FLUX (lm)	1772.01	CIE CLASS	DIRECT	η UP,DN (C180-360)	1.6,47.3
LAMPS INSIDE	1	η up (%)	3.3	CIBSE SHR NOM	1.50
TEST VOLTAGE (V)	120.0	η down (%)	96.7	CIBSE SHR MAX	1.50

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:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

ZONAL FLUX DIAGRAM

ZONAL FLUX DIAGRAM:

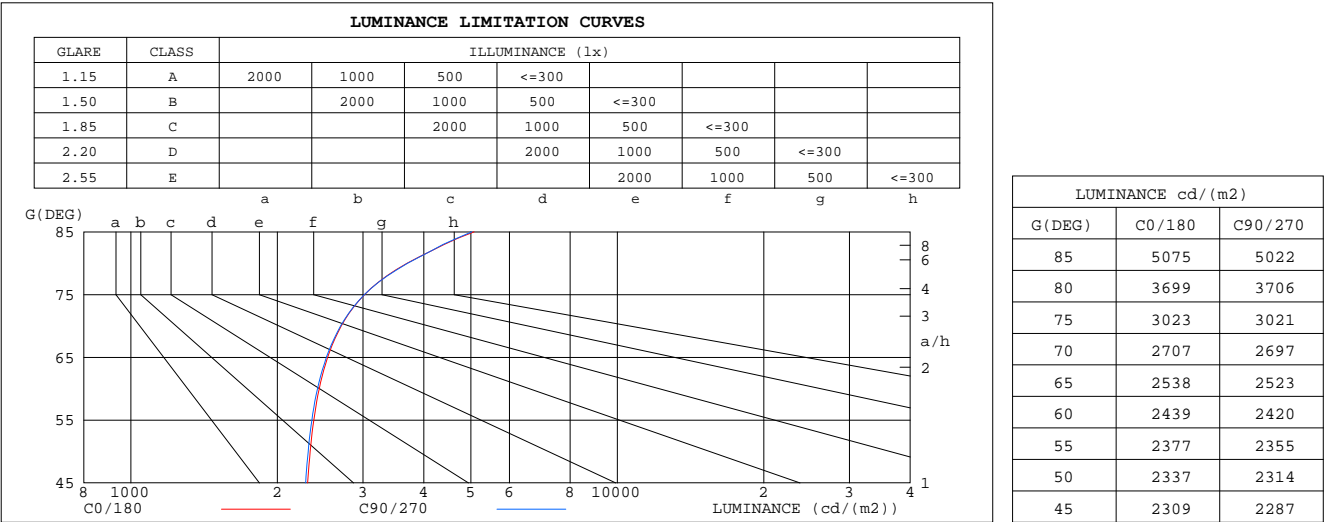
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	$\%lum, lamp$
10	500.8	501.1	499.5	496.4	494.7	494.4	496.5	499.0	0- 10	47.81	47.81	2.7,2.7
20	483.0	483.9	480.1	473.6	469.9	469.5	473.4	479.2	10- 20	138.2	186.0	10.5,10.5
30	449.2	450.8	445.3	436.4	431.3	430.5	435.6	443.8	20- 30	212.2	398.2	22.5,22.5
40	401.6	404.0	397.9	387.6	381.5	380.1	385.7	395.3	30- 40	261.3	659.5	37.2,37.2
50	343.9	346.8	340.7	329.9	323.6	321.1	326.5	336.9	40- 50	280.7	940.2	53.1,53.1
60	279.2	282.9	277.1	266.4	260.3	256.9	261.6	272.1	50- 60	270.3	1211	68.3,68.3
70	211.9	216.3	211.3	201.2	195.6	191.4	195.7	205.3	60- 70	234.4	1445	81.5,81.5
80	147.0	151.4	147.4	136.8	126.7	121.4	127.3	139.5	70- 80	180.8	1626	91.7,91.7
90	29.47	37.01	27.57	10.63	10.76	10.26	9.669	20.22	80- 90	88.13	1714	96.7,96.7
100	9.690	9.922	9.971	10.12	10.49	10.13	9.934	9.861	90-100	11.82	1726	97.4,97.4
110	9.422	9.592	9.564	9.480	9.754	9.534	9.572	9.617	100-110	10.44	1736	98,98
120	9.003	8.918	8.848	8.900	9.320	9.251	9.174	9.204	110-120	9.198	1745	98.5,98.5
130	9.505	9.217	8.908	8.957	9.526	9.538	9.395	9.403	120-130	8.215	1754	99,99
140	9.619	9.376	8.971	8.821	9.085	9.282	9.254	9.271	130-140	7.224	1761	99.4,99.4
150	8.734	8.633	8.177	7.905	7.827	8.196	8.495	8.387	140-150	5.557	1766	99.7,99.7
160	7.393	7.282	6.859	6.417	6.076	6.526	7.187	7.259	150-160	3.546	1770	99.9,99.9
170	6.017	5.831	5.478	5.040	4.369	4.395	5.123	5.795	160-170	1.769	1772	100,100
180	1.040	1.092	1.153	1.223	1.142	1.007	0.9038	0.4216	170-180	0.3529	1772	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 γ Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

LUMINANCE LIMITATION CURVES

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:



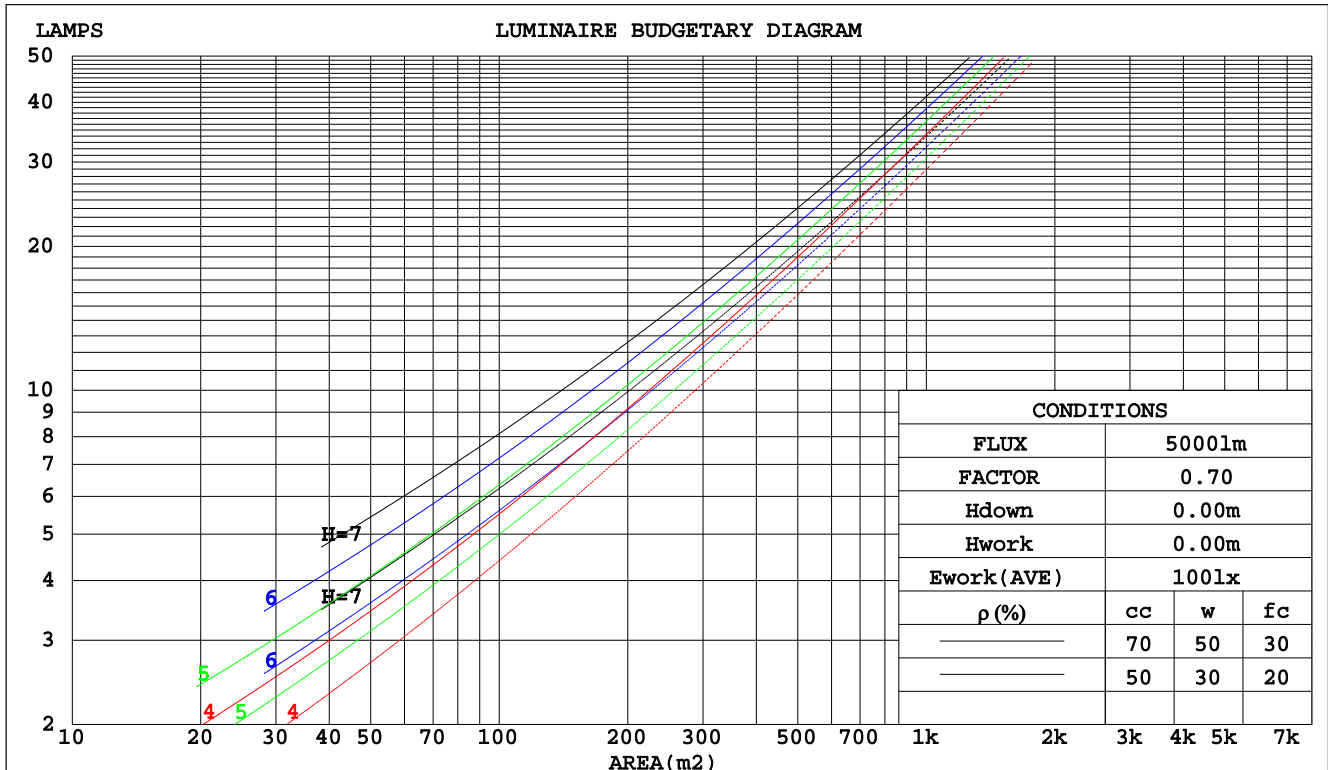
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C Interval: 22.5DEG
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γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
Humidity:67.1%
Test Distance:2.455m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding 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	1.18	1.18	1.18	1.15	1.15	1.15	1.09	1.09	1.09	1.04	1.04	1.04	.99	.99	.99	.97
1.0	1.00	.95	.91	.98	.93	.89	.93	.89	.86	.88	.85	.82	.84	.82	.79	.77
2.0	.86	.78	.72	.84	.77	.71	.80	.74	.69	.76	.71	.67	.72	.68	.65	.62
3.0	.75	.66	.59	.73	.65	.58	.69	.62	.57	.66	.60	.55	.63	.58	.54	.51
4.0	.66	.56	.49	.64	.55	.49	.61	.54	.48	.59	.52	.47	.56	.50	.46	.43
5.0	.59	.49	.42	.57	.48	.42	.55	.47	.41	.52	.45	.40	.50	.44	.39	.37
6.0	.53	.43	.36	.51	.43	.36	.49	.41	.35	.47	.40	.35	.45	.39	.34	.32
7.0	.48	.38	.32	.47	.38	.32	.45	.37	.31	.43	.36	.31	.41	.35	.30	.28
8.0	.43	.34	.28	.42	.34	.28	.41	.33	.28	.39	.32	.27	.38	.32	.27	.25
9.0	.40	.31	.25	.39	.31	.25	.37	.30	.25	.36	.29	.25	.35	.29	.24	.22
10.0	.36	.28	.23	.36	.28	.23	.35	.27	.23	.33	.27	.22	.32	.26	.22	.20



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

WEC AND CCEC

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding 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	.362	.206	.065	.354	.202	.064	.339	.194	.062	.325	.187	.060	.312	.181	.058		
2.0	.325	.178	.055	.318	.175	.054	.304	.169	.053	.292	.164	.051	.280	.158	.050		
3.0	.293	.156	.047	.287	.154	.046	.275	.149	.045	.263	.144	.044	.253	.140	.043		
4.0	.266	.138	.041	.261	.136	.040	.250	.132	.040	.239	.129	.039	.230	.125	.038		
5.0	.243	.124	.036	.238	.122	.036	.228	.119	.035	.219	.116	.034	.211	.113	.034		
6.0	.224	.112	.032	.219	.111	.032	.210	.108	.031	.202	.105	.031	.194	.102	.030		
7.0	.207	.102	.029	.203	.101	.029	.195	.098	.028	.187	.096	.028	.180	.094	.028		
8.0	.192	.094	.026	.188	.093	.026	.181	.091	.026	.175	.088	.026	.168	.086	.025		
9.0	.179	.087	.024	.176	.086	.024	.169	.084	.024	.163	.082	.023	.158	.080	.023		
10.0	.168	.081	.022	.165	.080	.022	.159	.078	.022	.154	.076	.022	.148	.075	.021		

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	.215	.215	.215	.184	.184	.184	.126	.126	.126	.072	.072	.072	.023	.023	.023	
1.0	.209	.181	.155	.179	.155	.134	.122	.107	.092	.070	.062	.054	.023	.020	.017	
2.0	.202	.157	.119	.173	.135	.103	.119	.094	.072	.068	.054	.042	.022	.018	.014	
3.0	.195	.140	.096	.167	.121	.084	.114	.084	.059	.066	.049	.035	.021	.016	.011	
4.0	.187	.127	.081	.160	.110	.071	.110	.076	.050	.064	.045	.029	.021	.015	.010	
5.0	.179	.117	.071	.154	.101	.062	.106	.071	.044	.061	.041	.026	.020	.014	.009	
6.0	.171	.109	.063	.147	.094	.055	.102	.066	.039	.059	.039	.023	.019	.013	.008	
7.0	.164	.102	.058	.141	.088	.051	.098	.062	.036	.057	.036	.021	.018	.012	.007	
8.0	.157	.096	.054	.136	.083	.047	.094	.058	.033	.055	.034	.020	.018	.011	.007	
9.0	.151	.091	.051	.130	.079	.044	.090	.056	.031	.053	.033	.019	.017	.011	.006	
10.0	.145	.087	.048	.125	.075	.042	.087	.053	.030	.051	.031	.018	.016	.010	.006	

C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:04 June 2018

γ Range: 0 - 180DEG
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
Humidity:67.1%
Test Distance:2.455m [K=1.0000]
Remarks:

UGR(Unified Glare Rating) Table

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm											
NAME:					TYPE:HAL-21F-SN			WEIGHT:			
SPEC.:					DIM.:			SERIAL No.:			
MFR.: Blackjack Lighting					SUR.:0.27*0.27*3.14			Shielding 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	2H	15.9	17.4	16.2	17.7	18.0	15.8	17.4	16.2	17.7	17.9
	3H	18.0	19.4	18.3	19.7	20.0	17.9	19.4	18.3	19.7	20.0
	4H	19.0	20.4	19.4	20.7	21.1	19.0	20.4	19.4	20.7	21.1
	6H	20.2	21.5	20.5	21.8	22.2	20.1	21.4	20.5	21.8	22.1
	8H	20.7	22.0	21.1	22.3	22.7	20.7	22.0	21.1	22.3	22.7
	12H	21.3	22.5	21.7	22.8	23.2	21.2	22.5	21.6	22.8	23.2
4H	2H	16.6	18.0	17.0	18.3	18.7	16.6	18.0	17.0	18.3	18.6
	3H	19.0	20.2	19.4	20.5	20.9	18.9	20.2	19.3	20.5	20.9
	4H	20.2	21.3	20.6	21.7	22.1	20.2	21.3	20.6	21.7	22.1
	6H	21.5	22.5	22.0	22.9	23.4	21.5	22.5	21.9	22.9	23.4
	8H	22.2	23.1	22.6	23.5	24.0	22.2	23.1	22.6	23.5	24.0
	12H	22.8	23.7	23.3	24.1	24.6	22.8	23.7	23.3	24.1	24.6
8H	4H	20.7	21.7	21.2	22.1	22.6	20.7	21.6	21.2	22.1	22.5
	6H	22.3	23.1	22.8	23.6	24.1	22.3	23.1	22.8	23.5	24.0
	8H	23.1	23.8	23.6	24.3	24.9	23.1	23.8	23.6	24.3	24.8
	12H	24.0	24.6	24.5	25.1	25.6	23.9	24.6	24.5	25.1	25.6
12H	4H	20.8	21.7	21.3	22.1	22.6	20.8	21.7	21.3	22.1	22.6
	6H	22.5	23.2	23.0	23.7	24.2	22.5	23.2	23.0	23.7	24.2
	8H	23.4	24.1	24.0	24.6	25.1	23.4	24.0	24.0	24.6	25.1
Variations with the observer position at spacings:											
S = 1.0H		+ 0.1 / - 0.1				+ 0.1 / - 0.1					
1.5H		+ 0.2 / - 0.3				+ 0.2 / - 0.3					
2.0H		+ 0.2 / - 0.4				+ 0.2 / - 0.4					

CIE Pub.117, 1772 lm Total Lamp Luminous Flux Corrected ($8\log(F/F_0) = 2.0$)

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

UTILIZATION FACTORS TABLE

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:

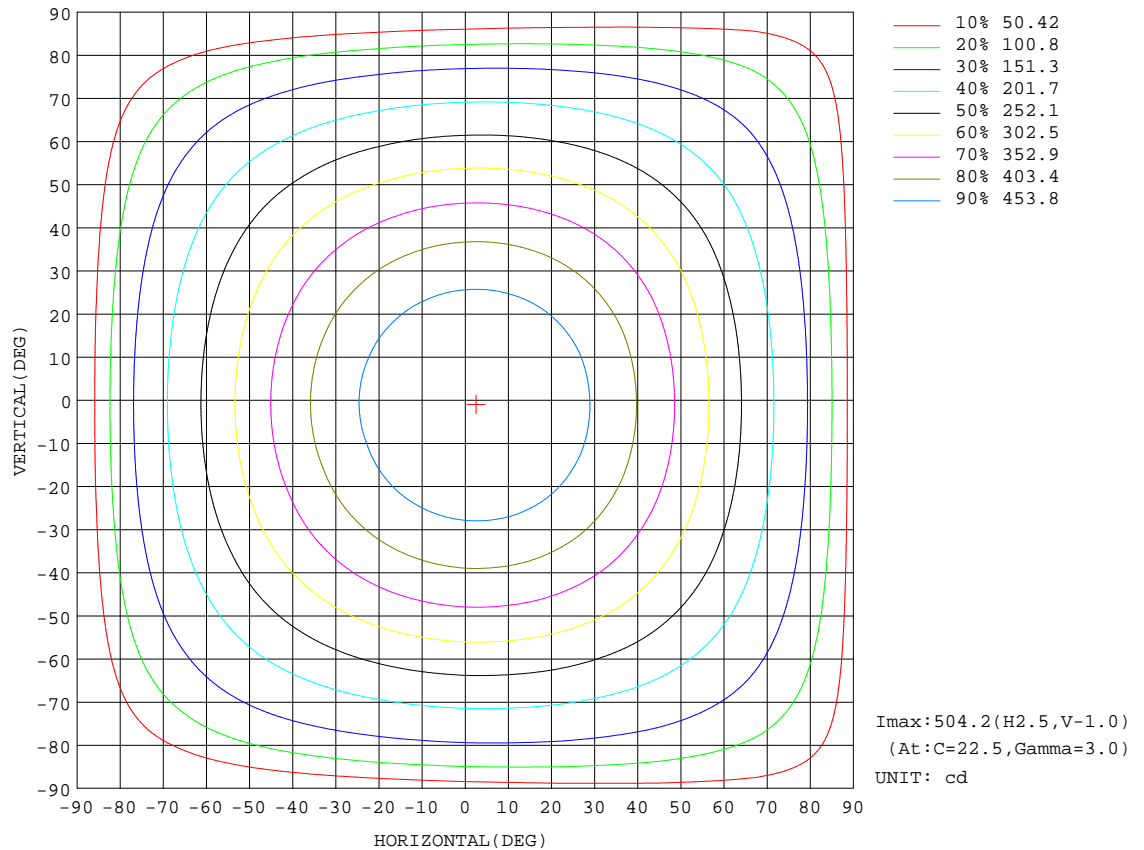
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) $k(RI) \times RCR = 5$									
$k = 0.60$	53	41	34	53	41	34	51	40	34	27
0.80	63	51	43	62	50	43	60	49	42	35
1.00	71	59	51	70	58	51	67	60	50	42
1.25	78	67	59	77	66	58	73	64	57	49
1.50	83	72	64	81	71	64	78	69	62	54
2.00	90	81	73	88	79	72	84	77	71	62
2.50	95	86	79	92	84	78	88	81	76	66
3.00	98	90	84	96	89	83	91	85	80	70
4.00	103	96	91	100	94	89	95	90	86	75
5.00	106	100	95	103	98	93	98	93	90	79
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:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]
 Remarks:

ISOCANDELA DIAGRAM

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:



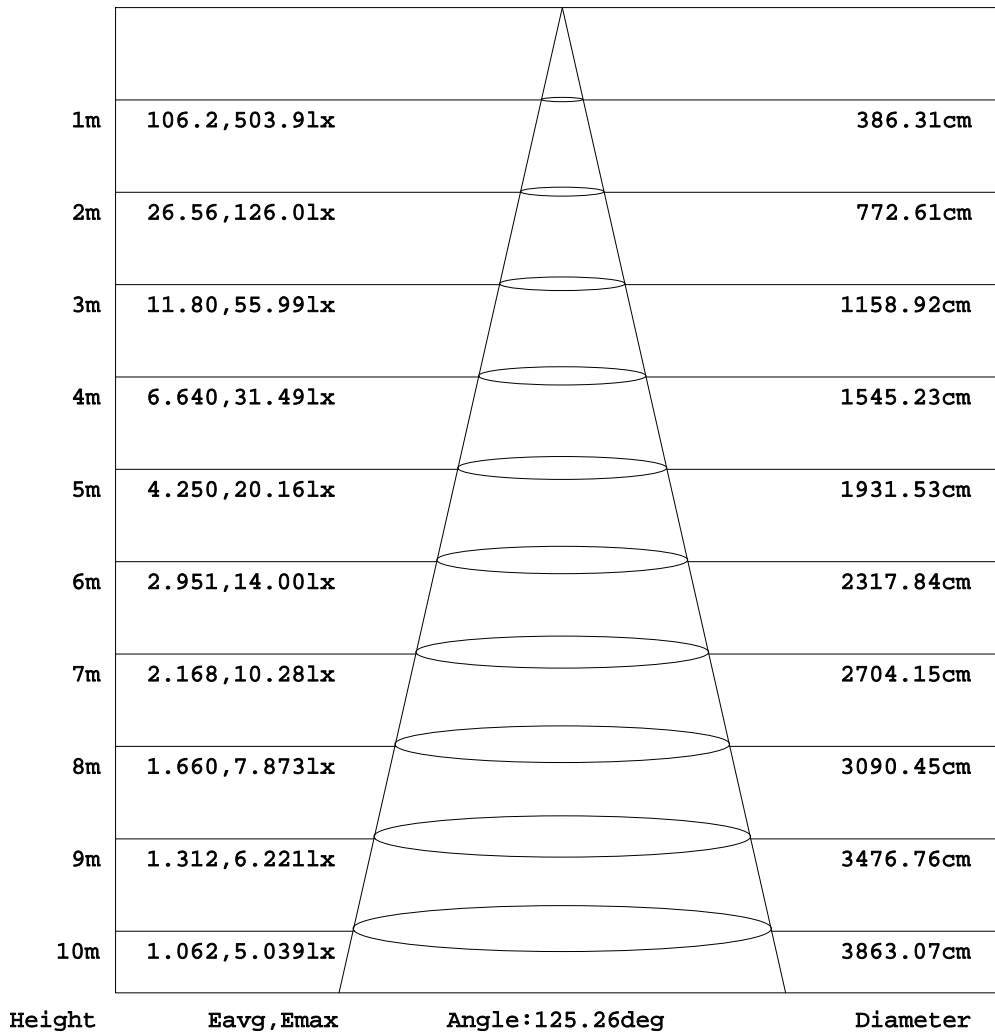
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
Humidity:67.1%
Test Distance:2.455m [K=1.0000]
Remarks:

AAI Figure

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:

Flux out:1286 lm



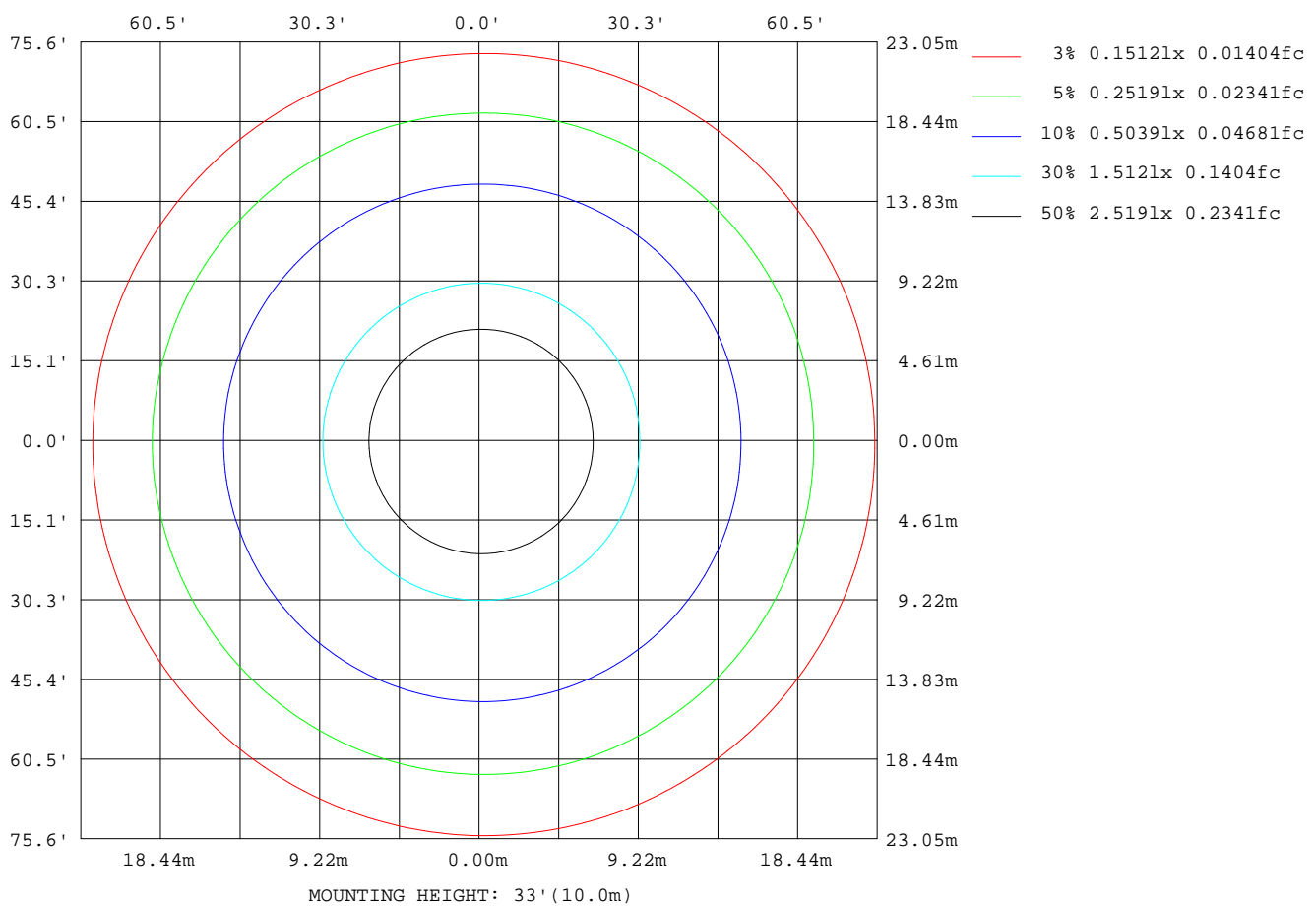
Note: The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity: 67.1%
 Test Distance: 2.455m [K=1.0000]
 Remarks:

ISOLUX DIAGRAM

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:



C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature: 25.6DEG
 Operators: David
 Test Date: 04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 Humidity: 67.1%
 Test Distance: 2.455m [K=1.0000]
 Remarks:

LED Avg.L Report

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:

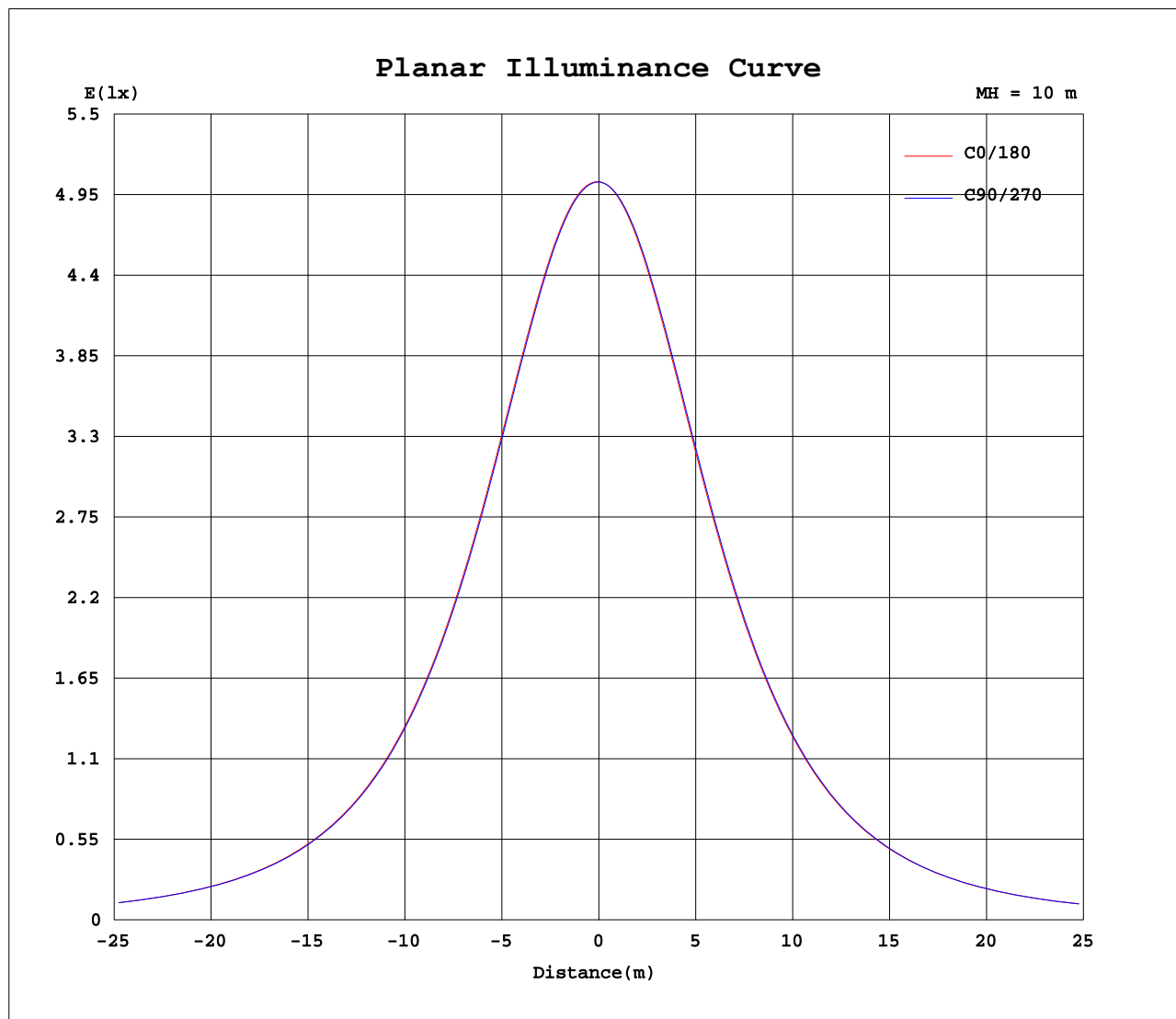
AvgL	cd/m2
L_0~180 (65) av	2446
L_0~180 (75) av	2893
L_0~180 (85) av	4164
L_90~270 (65) av	2442
L_90~270 (75) av	2890
L_90~270 (85) av	4183
L_45 (65) av	2444
L_45 (75) av	2892
L_45 (85) av	4158

Standard: GB/T 29293-2012

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David
 Test Date:04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
 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: 04 June 2018

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
Test System: EVERFINE GO-R5000_V2 SYSTEM V2.0.366
Humidity: 67.1%
Test Distance: 2.455m [K=1.0000]
Remarks:

LUMINOUS DISTRIBUTION INTENSITY DATA

Test:U:120.00V I:0.2360A P:28.270W PF:0.9977 Freq:60.00Hz Lamp Flux:1772.01x1 lm		
NAME:	TYPE:HAL-21F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.27*0.27*3.14	Shielding Angle:

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504			
5	504	504	504	503	503	503	502	501	501	501	501	501	501	502	503	503	504		
10	501	501	501	501	499	498	496	495	495	494	494	495	496	498	499	500			
15	494	495	495	494	492	489	487	485	484	484	484	485	487	489	491	493			
20	483	484	484	482	480	477	474	471	470	469	469	471	473	476	479	482			
25	468	469	469	467	464	461	457	453	452	451	452	453	456	460	463	467			
30	449	451	451	449	445	441	436	433	431	430	430	432	436	440	444	448			
35	427	429	429	427	423	418	413	409	408	406	407	408	412	416	421	425			
40	402	404	404	402	398	393	388	383	382	380	380	382	386	390	395	400			
45	374	376	376	374	370	365	360	355	353	352	351	353	357	362	367	372			
50	344	346	347	345	341	335	330	325	324	322	321	323	326	331	337	342			
55	312	315	315	313	309	304	299	294	292	290	289	291	295	300	305	310			
60	279	282	283	281	277	272	266	262	260	258	257	258	262	266	272	277			
65	246	249	250	248	244	239	234	230	228	225	224	225	228	233	239	244			
70	212	215	216	215	211	206	201	197	196	193	191	192	196	200	205	210			
75	179	182	183	182	179	174	170	166	164	161	160	160	163	168	173	178			
80	147	150	151	150	147	142	137	131	127	123	121	123	127	133	140	145			
85	101	106	107	105	100	91.9	80.2	69.6	65.0	58.5	56.7	59.3	66.7	77.1	87.6	97.3			
90	29.5	35.7	37.0	34.1	27.6	18.4	10.6	10.8	10.8	10.6	10.3	9.81	9.67	9.69	20.2	29.1			
95	9.58	9.71	9.96	9.96	10.00	9.97	10.2	10.4	10.5	10.4	10.1	9.82	9.74	9.71	9.61	9.57			
100	9.69	9.75	9.92	9.96	9.97	9.91	10.1	10.4	10.5	10.4	10.1	9.89	9.93	9.94	9.86	9.75			
105	9.69	9.76	9.87	9.92	9.90	9.81	9.91	10.1	10.2	10.1	9.90	9.77	9.88	9.94	9.88	9.79			
110	9.42	9.47	9.59	9.63	9.56	9.44	9.48	9.63	9.75	9.68	9.53	9.48	9.57	9.66	9.62	9.51			
115	9.10	9.08	9.16	9.21	9.14	9.06	9.10	9.28	9.43	9.40	9.31	9.24	9.29	9.38	9.33	9.20			
120	9.00	8.93	8.92	8.94	8.85	8.78	8.90	9.15	9.32	9.29	9.25	9.18	9.17	9.24	9.20	9.10			
125	9.18	9.06	8.96	8.89	8.77	8.70	8.90	9.21	9.42	9.40	9.40	9.32	9.27	9.29	9.29	9.25			
130	9.51	9.37	9.22	9.06	8.91	8.81	8.96	9.23	9.53	9.56	9.54	9.43	9.39	9.44	9.40	9.49			
135	9.70	9.60	9.38	9.25	9.05	8.88	8.96	9.14	9.48	9.49	9.49	9.42	9.40	9.50	9.45	9.60			
140	9.62	9.60	9.38	9.24	8.97	8.83	8.82	8.88	9.09	9.21	9.28	9.29	9.25	9.31	9.27	9.50			
145	9.26	9.30	9.14	9.00	8.69	8.55	8.47	8.41	8.54	8.71	8.84	8.90	8.92	8.96	8.91	9.18			
150	8.73	8.76	8.63	8.48	8.18	8.06	7.91	7.79	7.83	7.99	8.20	8.32	8.50	8.49	8.39	8.65			
155	8.10	8.09	8.01	7.89	7.58	7.44	7.22	7.08	7.00	7.10	7.45	7.60	7.87	7.87	7.82	8.01			
160	7.39	7.39	7.28	7.12	6.86	6.74	6.42	6.26	6.08	6.11	6.53	6.85	7.19	7.32	7.26	7.17			
165	6.77	6.75	6.54	6.32	6.17	6.08	5.77	5.55	5.30	5.30	5.57	6.07	6.59	6.80	6.78	6.71			
170	6.02	5.98	5.83	5.60	5.48	5.35	5.04	4.68	4.37	4.35	4.39	4.60	5.12	5.51	5.79	5.99			
175	3.93	4.06	3.99	3.81	3.49	3.08	2.67	2.19	1.60	1.61	1.51	1.66	2.13	2.73	3.24	3.66			
180	1.04	1.08	1.09	1.13	1.15	1.16	1.22	1.01	1.14	1.13	1.01	0.90	0.90	0.47	0.42	1.05			

C Range: 0 - 360DEG

C Interval: 22.5DEG

Test Speed: HIGH

Temperature:25.6DEG

Operators:David

Test Date:04 June 2018

γ Range: 0 - 180DEG

γ Interval: 1.0DEG

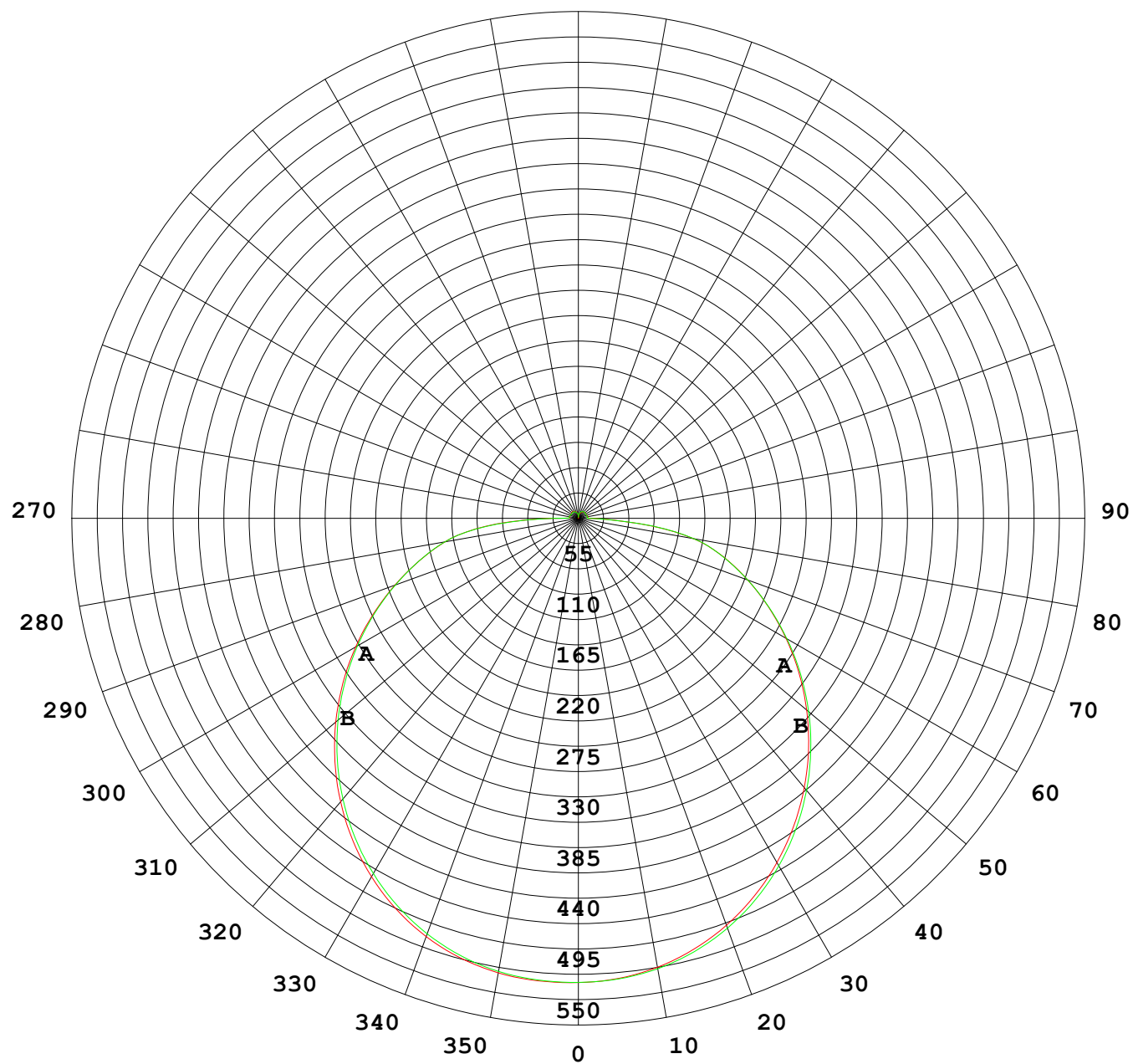
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366

Humidity:67.1%

Test Distance:2.455m [K=1.0000]

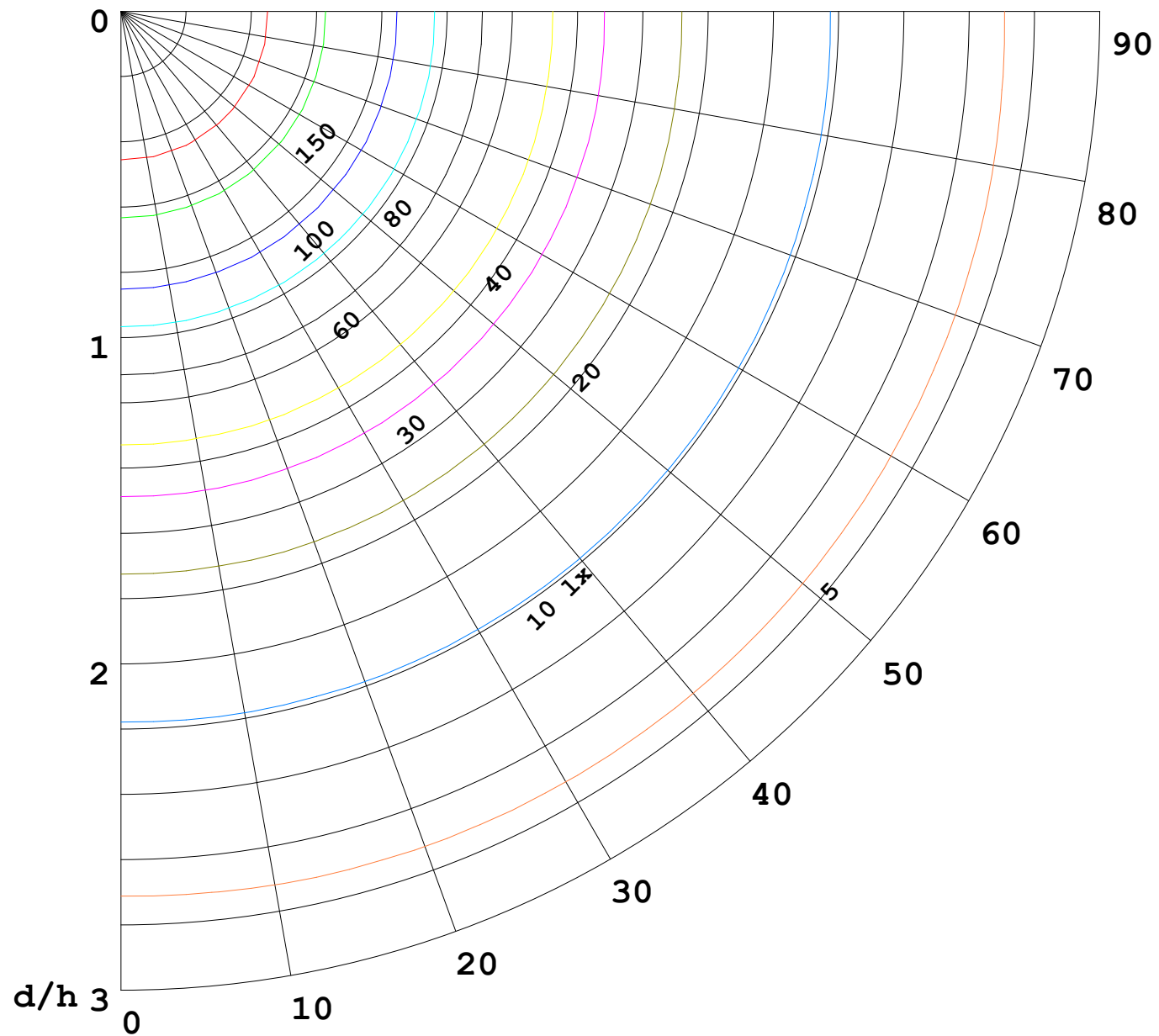
Remarks:

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

