IESNA LM-79 TEST REPORT

Applicant's name .....:	Blackjack Lighting
Address .....:	1553 Barclay Blvd. Buffalo Grove, IL 60089
Brand Name.....:	Blackjack Lighting
Report No......:	BTR66.181.17.0031.07
Product Name.....:	Halos 15" Flush Mount - Satin Nickel
Model Number .....:	HAL-15F-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.
Address .....:	1st Floor, 1st Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China Tel:+86-755-28236006, Email: certification@bestcert.cn
Accrediation .....:	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

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.....:	22W
Nominal Power Factor .....:	N/A
Nominal Lumen Output.....:	1340lm
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℃
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℃ ±1℃ 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=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 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 ±1.12% over the wavelength range 380-780 nm.

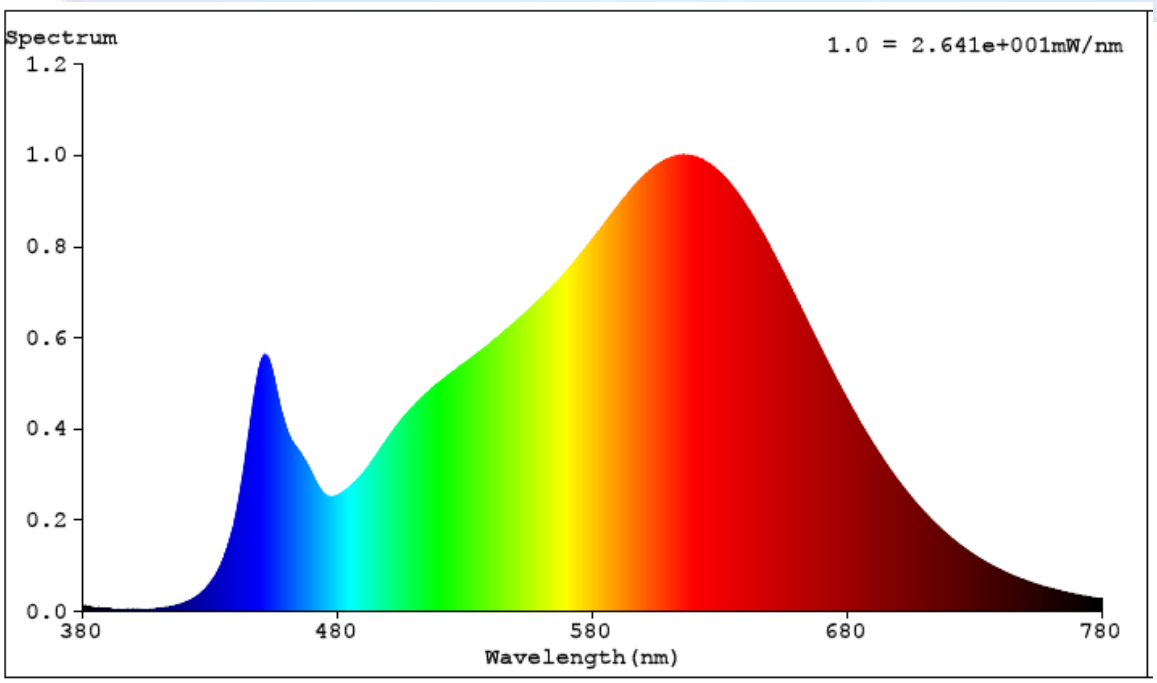
Luminious Intensity

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

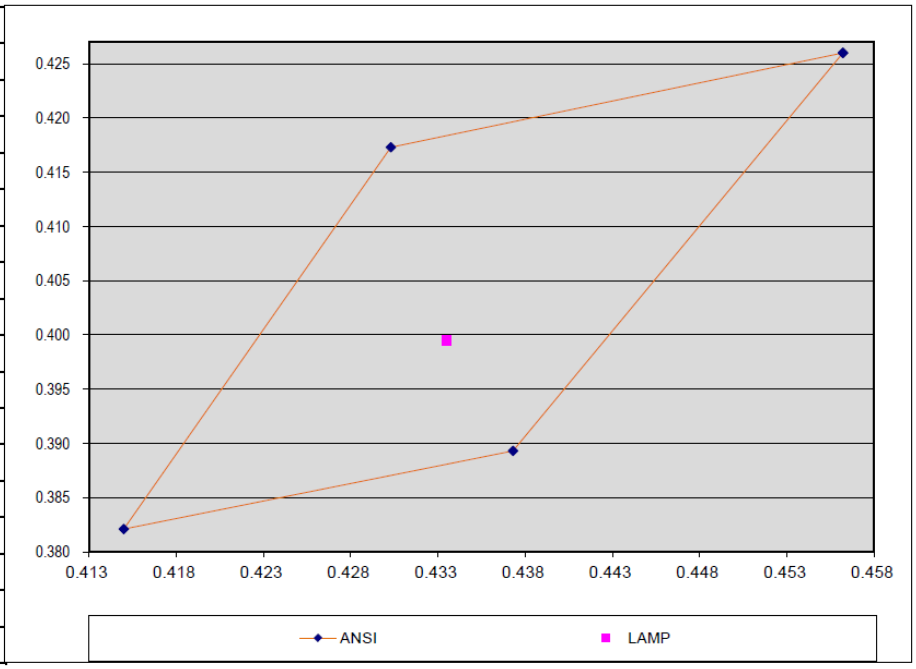
Input Voltage (V)	Frequency (Hz)	Input Current (A)	ITHD	Input Power (W)	Power Factor	Lumen Output (Lumens)	Efficiency Lumen/w
120.0	60.0	0.1787	/	21.35	0.9956	1349.88	63.23
CCT (K)	CRI (Ra)	R9	x CIE1931	y CIE1931	u' CIE1976	v' CIE1976	Duv CIE1976
3021	91.7	53	0.4335	0.3995	0.2503	0.5191	-0.0014

Spectrul Plots



7 Step Quadrangle

	3000K quadrangle	
	x	y
ANSI 78.377-2015	0.4562	0.4260
	0.4303	0.4173
	0.4150	0.3821
	0.4373	0.3893
	0.4562	0.4260
Center		
1	0.4335	0.3995
2		
3		
4		
5		
6		
7		
8		
9		
10		



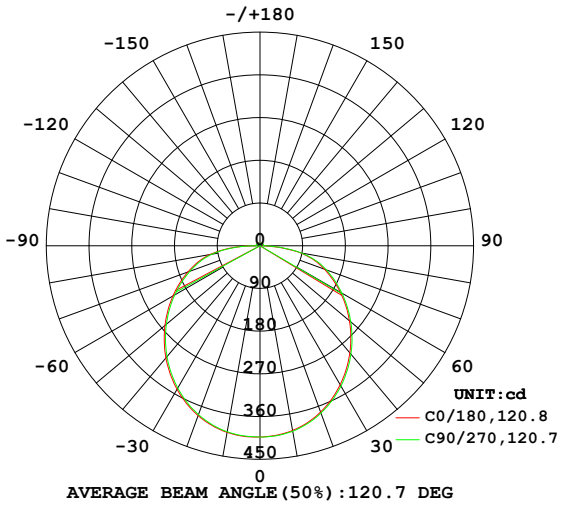
EUT Photo

LUMINAIRE PHOTOMETRIC TEST REPORT

Test:U:120.00V I:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:

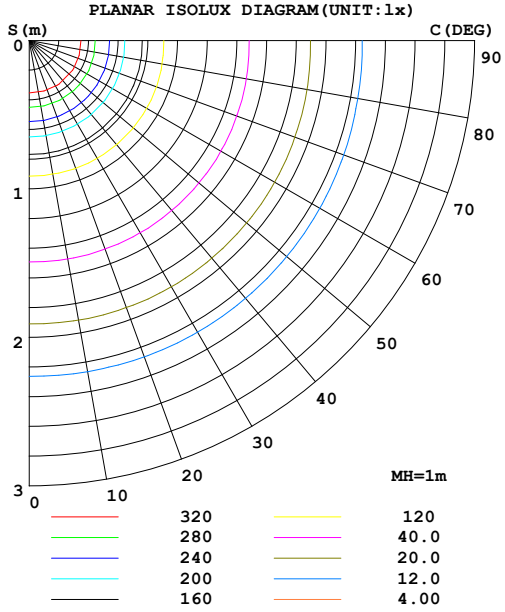
DATA OF LAMP		PHOTOMETRIC DATA Eff: 63.23 lm/W			
MODEL	HAL-15F-SN	Imax(cd)	403.4	S/MH(C0/180)	1.25
NOMINAL POWER(W)	22	LOR(%)	100.0	S/MH(C90/270)	1.26
RATED VOLTAGE(V)	120.0	TOTAL FLUX(lm)	1349.9	η UP,DN(C0-180)	1.7,49.1
NOMINAL FLUX(lm)	1349.88	CIE CLASS	DIRECT	η UP,DN(C180-360)	1.7,47.5
LAMPS INSIDE	1	η up(%)	3.4	CIBSE SHR NOM	1.25
TEST VOLTAGE(V)	120.0	η down(%)	96.6	CIBSE SHR MAX	1.35

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):120.7 DEG

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:

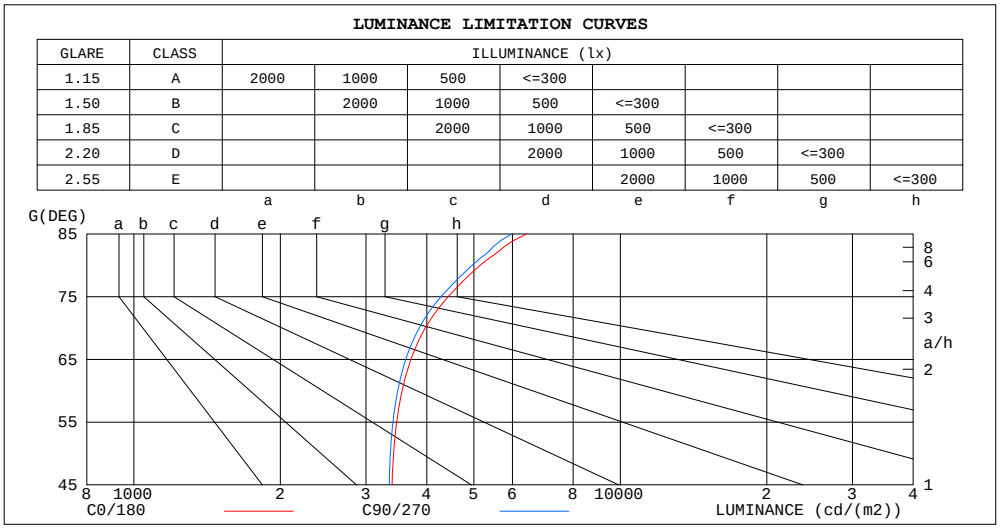
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	399.2	399.5	397.9	396.0	395.2	395.3	396.7	398.4	0- 10	38.21	38.21	2.83,2.83
20	380.8	381.8	378.6	374.4	373.0	373.1	375.3	378.6	10- 20	109.8	148.0	11,11
30	349.4	350.8	346.5	340.2	338.1	338.4	341.2	345.9	20- 30	166.8	314.7	23.3,23.3
40	308.4	310.0	304.8	297.3	294.6	295.0	298.1	304.0	30- 40	202.5	517.3	38.3,38.3
50	261.4	263.1	257.5	249.4	245.9	246.1	249.6	256.4	40- 50	214.7	732.0	54.2,54.2
60	211.8	213.2	207.4	199.0	195.3	195.3	199.2	206.6	50- 60	204.7	936.7	69.4,69.4
70	161.6	163.2	157.1	148.4	144.6	144.4	148.9	156.6	60- 70	176.5	1113	82.5,82.5
80	106.4	109.5	102.5	90.62	85.34	82.13	88.40	100.2	70- 80	133.4	1247	92.4,92.4
90	18.26	22.23	14.91	9.709	6.864	7.097	7.596	10.82	80- 90	57.22	1304	96.6,96.6
100	8.365	8.342	7.669	7.258	7.148	7.274	7.706	8.140	90-100	8.822	1313	97.2,97.2
110	8.288	8.120	7.694	7.333	7.133	7.239	7.569	7.968	100-110	8.215	1321	97.9,97.9
120	7.859	7.701	7.353	7.106	6.954	7.077	7.330	7.640	110-120	7.457	1328	98.4,98.4
130	7.668	7.403	7.285	7.212	7.211	7.326	7.435	7.717	120-130	6.610	1335	98.9,98.9
140	7.605	7.279	7.423	7.155	7.277	7.120	7.269	7.738	130-140	5.751	1341	99.3,99.3
150	6.974	6.979	6.830	6.586	6.503	6.232	6.372	6.847	140-150	4.446	1345	99.7,99.7
160	5.758	5.953	5.853	5.684	5.664	5.296	5.248	5.757	150-160	2.867	1348	99.9,99.9
170	4.720	5.063	4.995	4.993	4.827	4.524	4.409	4.806	160-170	1.496	1350	100,100
180	1.283	1.584	1.220	0.8837	1.234	1.327	1.364	1.160	170-180	0.3612	1350	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
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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:



LUMINANCE cd/(m2)		
G(DEG)	C0/180	C90/270
85	6429	5980
80	5151	4961
75	4427	4281
70	3971	3860
65	3710	3622
60	3560	3486
55	3471	3409
50	3419	3367
45	3394	3348

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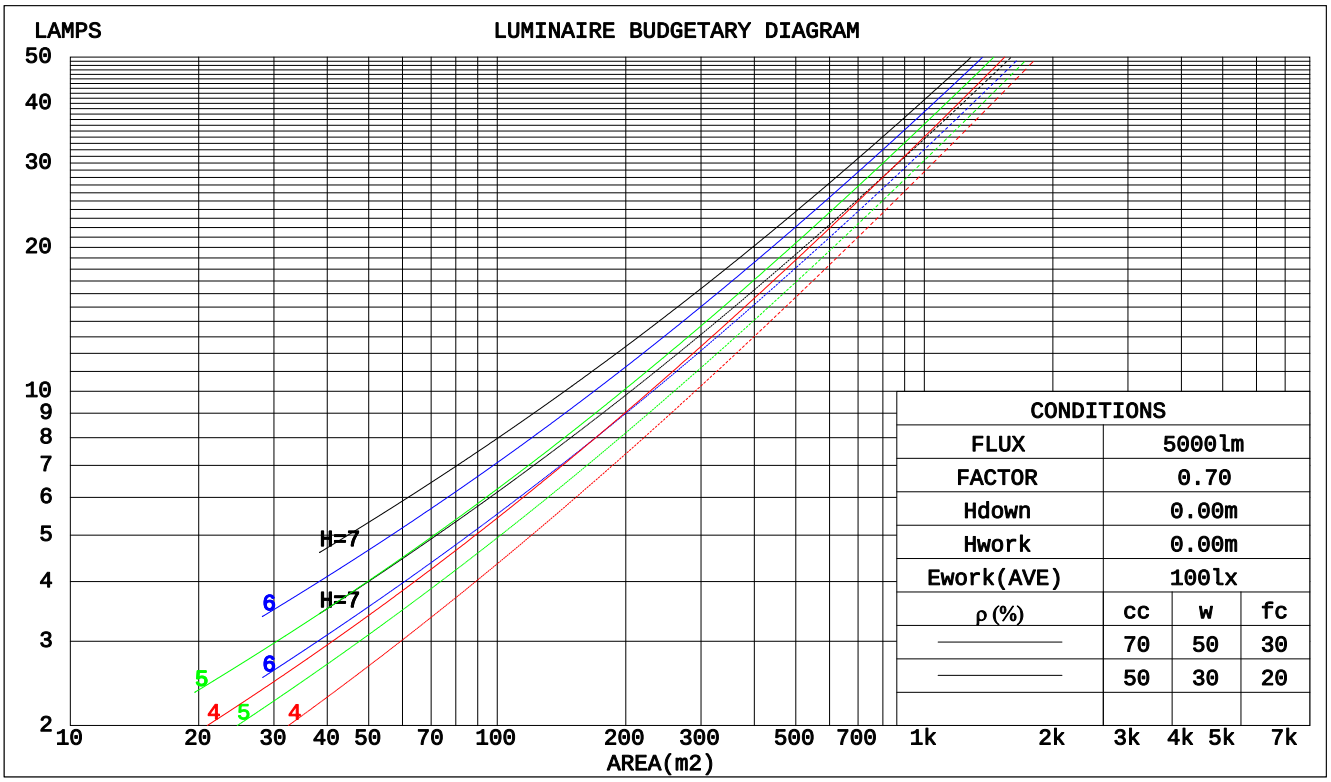
γ Interval: 1.0DEG
Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.366
Humidity:67.1%
Test Distance:2.455m [K=1.0000]
Remarks:

CU AND LUMINAIRE BUDGETARY ESTIMATE DIAGRAM

Test:U:120.00V I:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding 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			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	1.01	.96	.92	.98	.94	.90	.93	.90	.86	.89	.86	.83	.85	.82	.80	.77
2.0	.87	.79	.73	.85	.78	.72	.80	.75	.70	.77	.72	.67	.73	.69	.65	.63
3.0	.76	.67	.60	.74	.66	.59	.70	.63	.57	.67	.61	.56	.64	.59	.55	.52
4.0	.67	.57	.50	.65	.56	.50	.62	.54	.48	.59	.53	.47	.57	.51	.46	.44
5.0	.59	.50	.43	.58	.49	.42	.55	.48	.42	.53	.46	.41	.51	.45	.40	.38
6.0	.53	.44	.37	.52	.43	.37	.50	.42	.36	.48	.41	.36	.46	.40	.35	.33
7.0	.48	.39	.33	.47	.39	.32	.45	.38	.32	.43	.37	.31	.42	.36	.31	.29
8.0	.44	.35	.29	.43	.35	.29	.41	.34	.28	.40	.33	.28	.38	.32	.28	.26
9.0	.40	.32	.26	.39	.31	.26	.38	.31	.26	.37	.30	.25	.35	.29	.25	.23
10.0	.37	.29	.24	.36	.29	.23	.35	.28	.23	.34	.27	.23	.33	.27	.23	.21



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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding 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 Coeffcients(WEC)									
0.0																
1.0	.352	.200	.063	.344	.196	.062	.329	.189	.060	.314	.181	.058	.301	.175	.056	
2.0	.319	.175	.054	.312	.172	.053	.298	.166	.051	.285	.160	.050	.274	.155	.049	
3.0	.289	.154	.046	.283	.151	.046	.270	.146	.045	.259	.142	.044	.248	.138	.043	
4.0	.263	.137	.040	.257	.135	.040	.246	.131	.039	.236	.127	.038	.227	.123	.038	
5.0	.241	.123	.036	.236	.121	.035	.226	.118	.035	.217	.114	.034	.208	.111	.033	
6.0	.222	.111	.032	.217	.110	.032	.208	.107	.031	.200	.104	.031	.192	.101	.030	
7.0	.205	.101	.029	.201	.100	.029	.193	.098	.028	.186	.095	.028	.179	.093	.027	
8.0	.191	.093	.026	.187	.092	.026	.180	.090	.026	.173	.088	.025	.167	.086	.025	
9.0	.178	.086	.024	.175	.085	.024	.168	.083	.024	.162	.081	.023	.156	.079	.023	
10.0	.167	.080	.022	.164	.079	.022	.158	.077	.022	.152	.076	.022	.147	.074	.021	

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	.216	.216	.216	.185	.185	.185	.126	.126	.126	.073	.073	.073	.023	.023	.023	
1.0	.209	.182	.157	.179	.156	.135	.123	.107	.094	.071	.062	.054	.023	.020	.018	
2.0	.202	.158	.121	.173	.136	.105	.119	.094	.073	.068	.055	.043	.022	.018	.014	
3.0	.195	.141	.098	.167	.122	.085	.115	.084	.060	.066	.049	.035	.021	.016	.012	
4.0	.187	.128	.083	.160	.111	.072	.110	.077	.051	.064	.045	.030	.021	.015	.010	
5.0	.179	.118	.072	.154	.102	.063	.106	.071	.044	.061	.042	.026	.020	.014	.009	
6.0	.172	.109	.065	.148	.095	.056	.102	.066	.040	.059	.039	.024	.019	.013	.008	
7.0	.165	.103	.059	.142	.089	.052	.098	.062	.037	.057	.037	.022	.018	.012	.007	
8.0	.158	.097	.055	.136	.084	.048	.094	.059	.034	.055	.035	.020	.018	.011	.007	
9.0	.152	.092	.052	.131	.080	.045	.090	.056	.032	.053	.033	.019	.017	.011	.006	
10.0	.146	.088	.049	.126	.076	.043	.087	.054	.030	.051	.032	.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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*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	17.2	18.7	17.5	19.0	19.3	17.1	18.6	17.4	18.9	19.2
3H	19.3	20.7	19.6	21.0	21.3	19.2	20.6	19.5	20.9	21.2
4H	20.4	21.7	20.7	22.0	22.4	20.2	21.6	20.6	21.9	22.2
6H	21.4	22.7	21.8	23.0	23.4	21.2	22.5	21.6	22.9	23.2
8H	21.9	23.1	22.3	23.5	23.9	21.7	23.0	22.1	23.3	23.7
12H	22.3	23.5	22.7	23.9	24.3	22.1	23.3	22.5	23.7	24.1
4H 2H	17.9	19.3	18.3	19.6	20.0	17.9	19.2	18.2	19.6	19.9
3H	20.3	21.5	20.7	21.8	22.2	20.2	21.4	20.6	21.7	22.1
4H	21.5	22.6	21.9	23.0	23.4	21.4	22.5	21.8	22.9	23.3
6H	22.7	23.7	23.2	24.1	24.6	22.6	23.6	23.1	24.0	24.5
8H	23.3	24.2	23.8	24.7	25.1	23.2	24.1	23.6	24.5	25.0
12H	23.8	24.7	24.3	25.1	25.6	23.7	24.5	24.1	25.0	25.4
8H 4H	22.0	22.9	22.5	23.4	23.8	21.9	22.8	22.4	23.3	23.7
6H	23.5	24.3	24.0	24.7	25.2	23.4	24.2	23.9	24.6	25.1
8H	24.2	24.9	24.7	25.4	25.9	24.1	24.8	24.6	25.3	25.8
12H	24.9	25.5	25.4	26.0	26.6	24.8	25.4	25.3	25.9	26.4
12H 4H	22.1	23.0	22.6	23.4	23.9	22.0	22.9	22.5	23.3	23.8
6H	23.7	24.4	24.2	24.9	25.4	23.6	24.3	24.1	24.8	25.3
8H	24.5	25.1	25.0	25.6	26.2	24.4	25.0	24.9	25.5	26.0
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 / - 0.3					+ 0.2 / - 0.3				

CIE Pub.117, 1350 lm Total Lamp Luminous Flux Corrected (8log(F/F0) = 1.0)

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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:

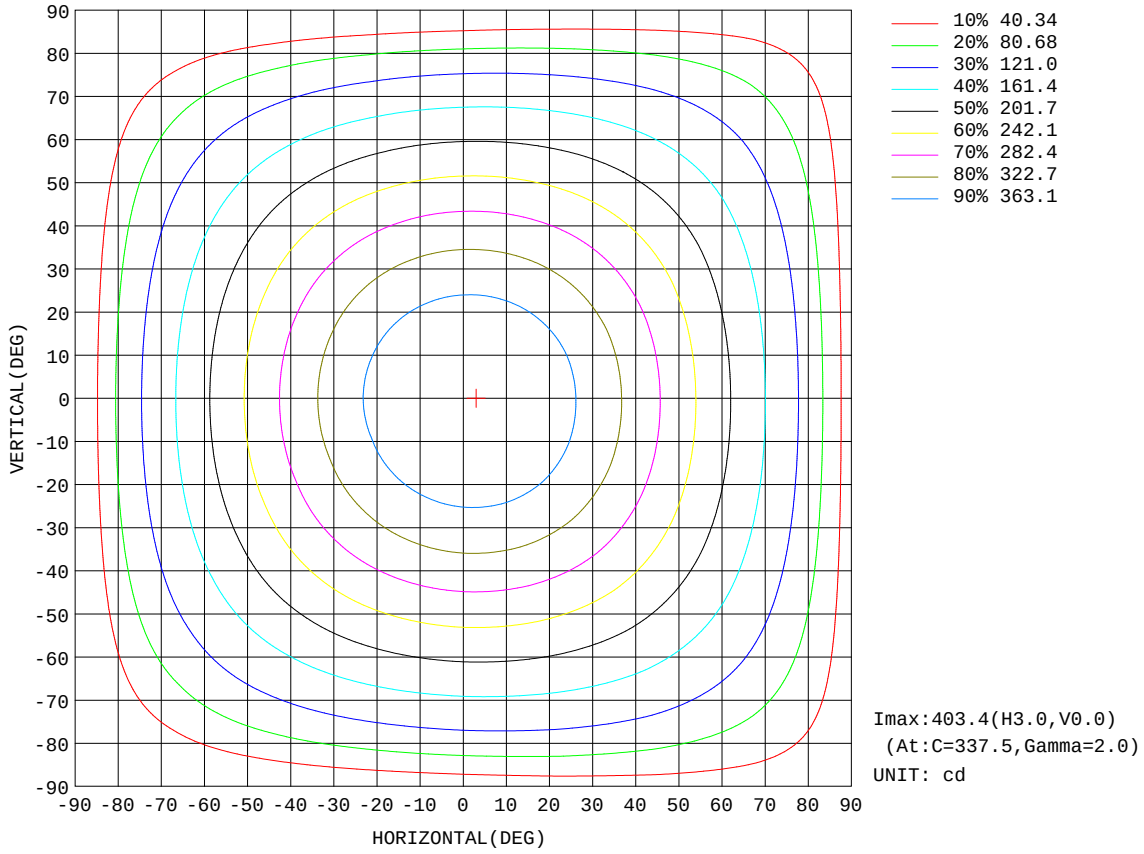
REFLECTANCE										
Ceiling	0.8	0.8	0.8	0.7	0.7	0.7	0.5	0.5	0.5	0
Walls	0.7	0.5	0.3	0.7	0.5	0.3	0.7	0.5	0.3	0
Working plane	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
ROOM INDEX	UTILIZATION FACTORS(PERCENT) k(RI) x RCR = 5									
k = 0.60	54	42	35	53	42	35	52	41	34	28
0.80	64	51	44	63	51	43	60	50	43	36
1.00	72	60	52	70	59	52	68	60	51	43
1.25	79	67	60	77	67	59	74	65	58	50
1.50	84	73	65	82	72	65	78	70	63	55
2.00	91	81	74	89	80	73	85	77	71	62
2.50	95	87	80	93	85	79	88	82	76	67
3.00	99	91	85	96	89	83	92	86	81	71
4.00	103	97	91	101	95	90	96	91	87	76
5.00	106	100	96	103	98	94	98	94	90	80
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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:



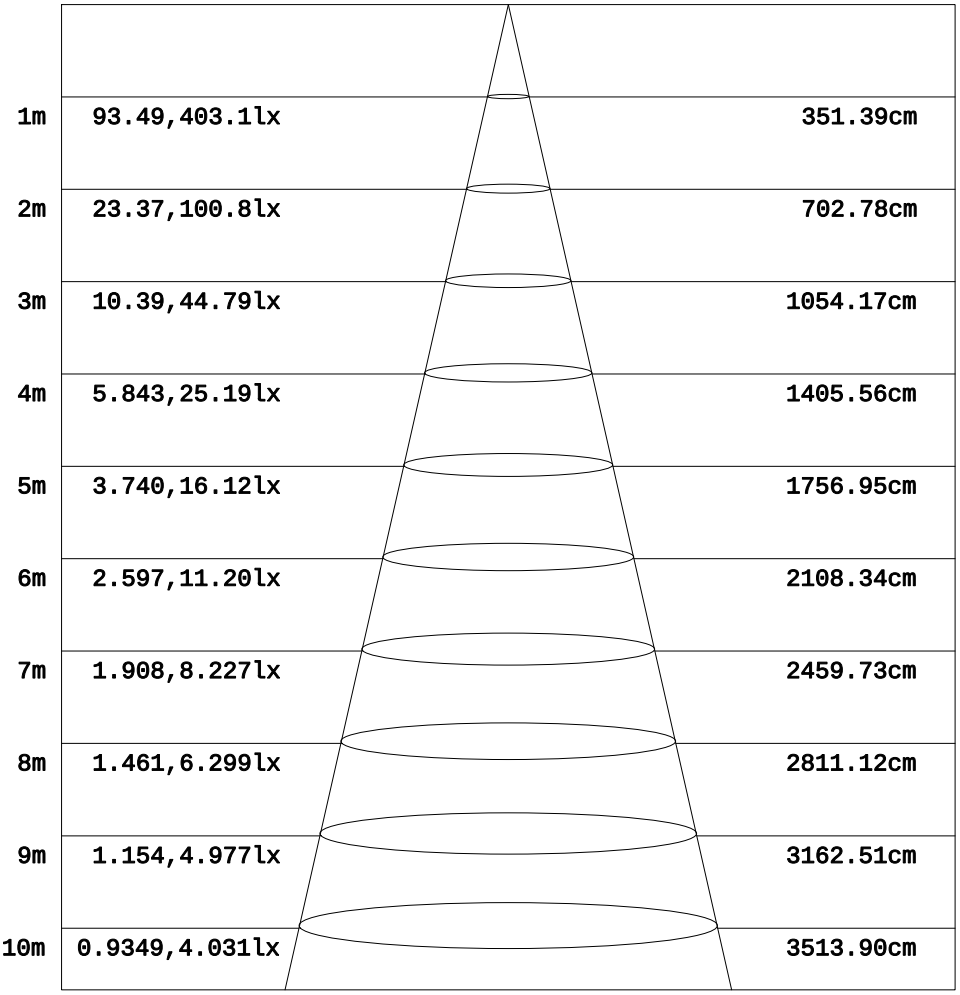
C Range: 0 - 360DEG
C Interval: 22.5DEG
Test Speed: HIGH
Temperature:25.6DEG
Operators:David
Test Date:04 June 2018

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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:

Flux out:955.9 lm



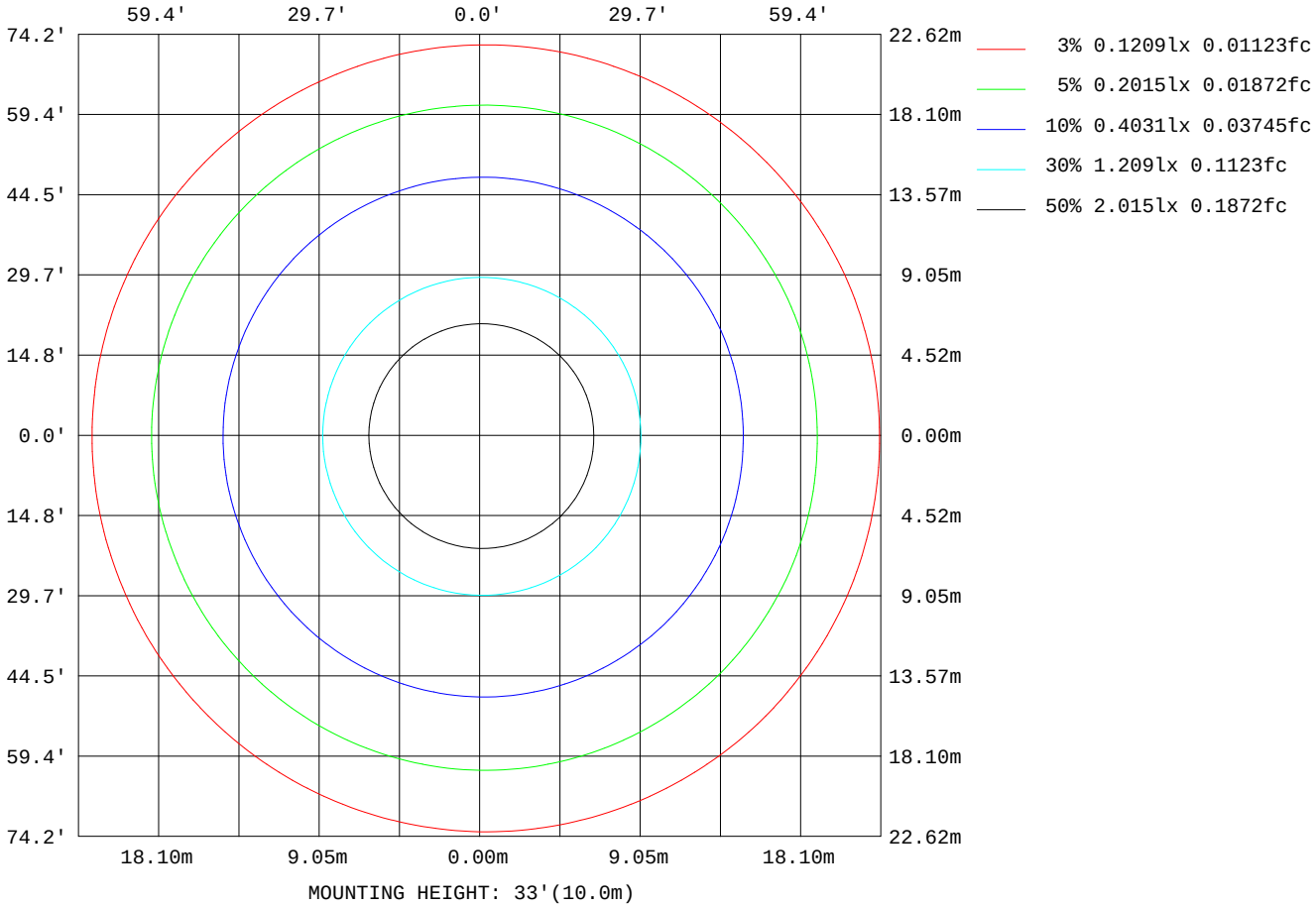
Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*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:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:

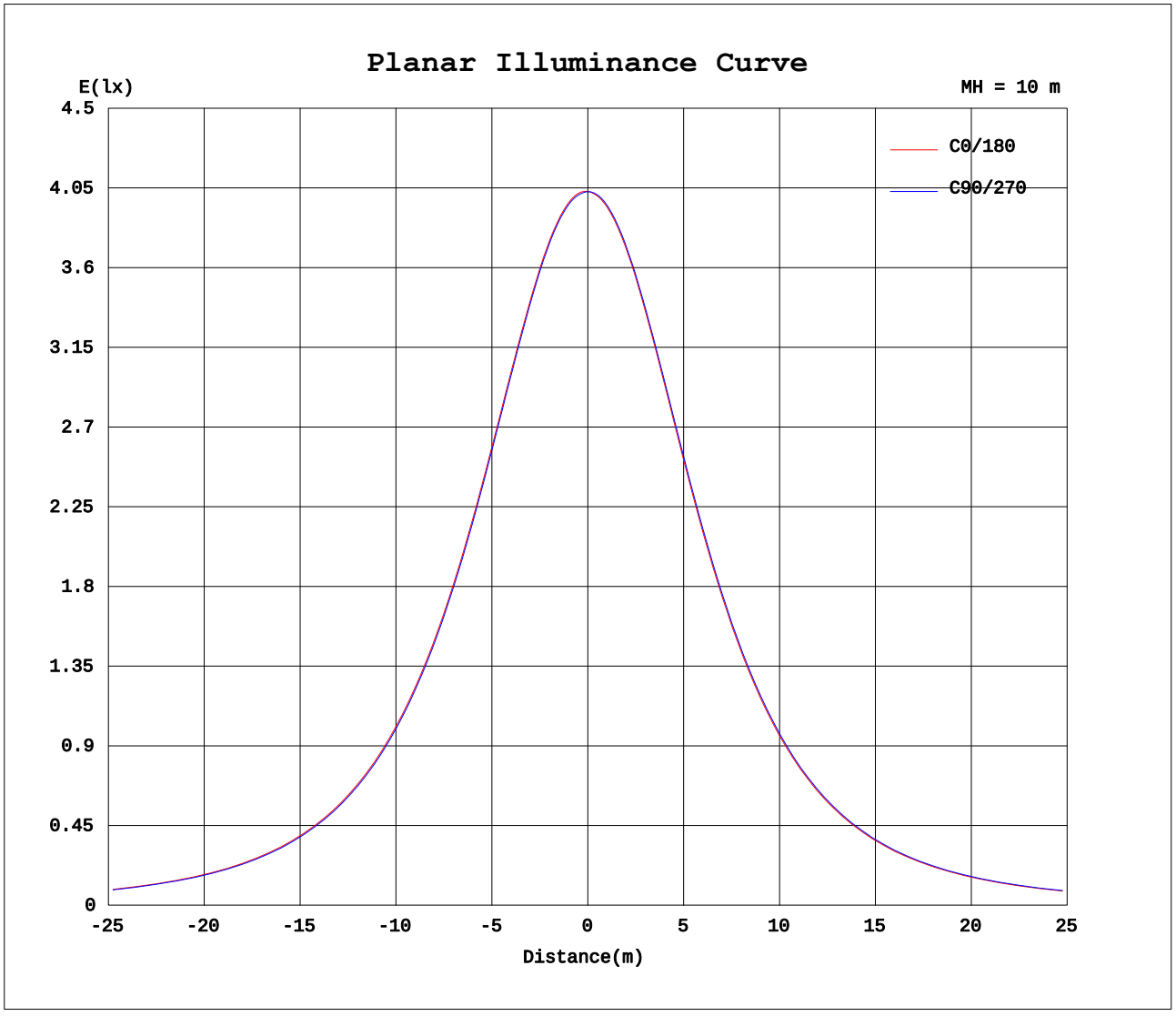
AvgL	cd/m2
L_0~180(65)av	3541
L_0~180(75)av	4139
L_0~180(85)av	5057
L_90~270(65)av	3538
L_90~270(75)av	4129
L_90~270(85)av	5034
L_45(65)av	3542
L_45(75)av	4136
L_45(85)av	5040

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

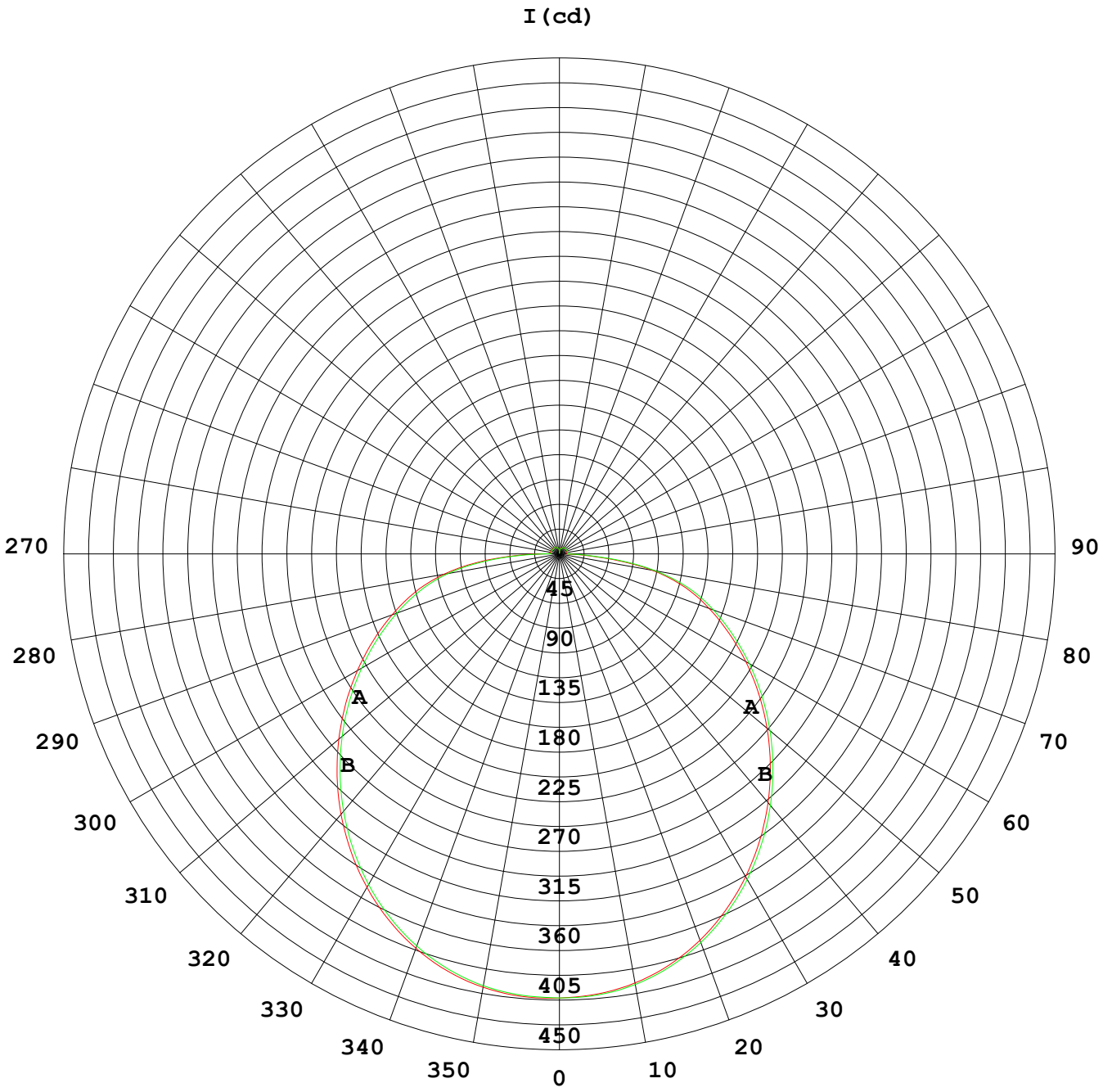
Test:U:120.00V I:0.1787A P:21.348W PF:0.9956 Freq:60.00Hz Lamp Flux:1349.88x1 lm		
NAME:	TYPE:HAL-15F-SN	WEIGHT:
SPEC.:	DIM.:	SERIAL No.:
MFR.: Blackjack Lighting	SUR.:0.195*0.195*3.14	Shielding Angle:

Table--1 UNIT: cd

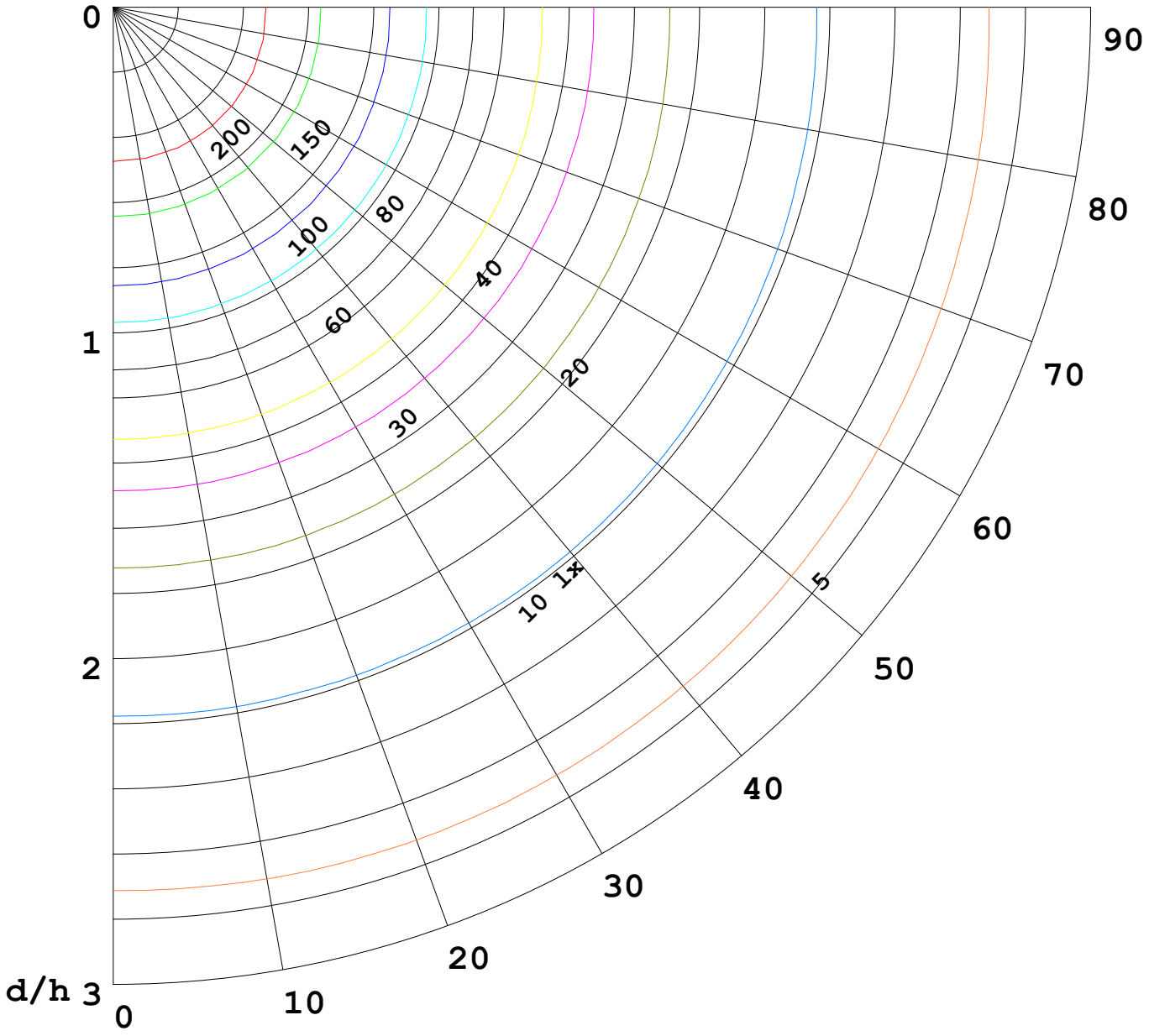
C(DEG) / γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403	403			
5	403	403	403	403	402	401	401	401	401	401	401	401	402	402	403	403			
10	399	400	400	399	398	397	396	395	395	395	395	396	397	398	398	399			
15	392	393	392	392	390	388	387	386	386	386	386	387	388	389	390	392			
20	381	382	382	381	379	376	374	373	373	373	373	374	375	377	379	380			
25	366	368	368	366	364	361	359	357	357	357	357	358	360	362	364	366			
30	349	351	351	349	346	343	340	338	338	338	338	339	341	343	346	349			
35	330	331	331	330	327	323	320	317	317	317	317	319	320	323	326	329			
40	308	310	310	308	305	301	297	295	295	294	295	296	298	301	304	307			
45	285	287	287	285	282	278	274	271	271	270	271	272	274	277	281	284			
50	261	263	263	261	258	253	249	246	246	246	246	247	250	253	256	260			
55	237	239	238	236	233	228	224	221	221	220	221	222	225	228	232	236			
60	212	213	213	211	207	203	199	196	195	195	195	196	199	203	207	211			
65	187	188	188	185	182	178	174	170	170	169	170	171	174	177	181	186			
70	162	163	163	161	157	153	148	145	145	144	144	146	149	153	157	161			
75	136	138	138	136	132	127	123	119	119	118	117	118	122	127	132	136			
80	106	109	110	107	103	96.4	90.6	86.0	85.3	83.0	82.1	83.9	88.4	94.4	100	105			
85	66.7	69.1	70.2	68.4	62.0	54.2	46.7	40.3	38.2	35.2	34.7	37.1	42.4	49.7	57.4	64.4			
90	18.3	21.5	22.2	19.8	14.9	9.81	9.71	9.00	6.86	6.88	7.10	7.26	7.60	7.83	10.8	17.7			
95	8.35	8.55	8.46	8.13	7.65	7.26	7.08	6.98	6.93	6.96	7.12	7.25	7.61	7.87	8.13	8.33			
100	8.36	8.48	8.34	8.05	7.67	7.41	7.26	7.17	7.15	7.15	7.27	7.43	7.71	7.92	8.14	8.35			
105	8.42	8.43	8.26	8.01	7.75	7.56	7.43	7.30	7.29	7.25	7.36	7.53	7.74	7.93	8.18	8.39			
110	8.29	8.30	8.12	7.92	7.69	7.50	7.33	7.16	7.13	7.13	7.24	7.41	7.57	7.72	7.97	8.20			
115	8.06	8.08	7.91	7.72	7.51	7.35	7.20	7.03	7.00	7.02	7.14	7.31	7.44	7.57	7.78	7.96			
120	7.86	7.86	7.70	7.54	7.35	7.23	7.11	6.97	6.95	6.97	7.08	7.21	7.33	7.45	7.64	7.79			
125	7.71	7.67	7.52	7.41	7.28	7.22	7.11	7.03	7.03	7.07	7.15	7.25	7.33	7.48	7.64	7.72			
130	7.67	7.57	7.40	7.35	7.29	7.32	7.21	7.17	7.21	7.29	7.33	7.37	7.44	7.59	7.72	7.77			
135	7.67	7.54	7.34	7.34	7.37	7.38	7.23	7.22	7.33	7.36	7.33	7.34	7.42	7.66	7.79	7.81			
140	7.61	7.48	7.28	7.28	7.42	7.41	7.16	7.13	7.28	7.20	7.12	7.10	7.27	7.59	7.74	7.72			
145	7.39	7.32	7.19	7.17	7.23	7.17	6.97	6.88	6.94	6.83	6.68	6.72	6.93	7.26	7.38	7.39			
150	6.97	7.04	6.98	6.94	6.83	6.72	6.59	6.50	6.50	6.42	6.23	6.22	6.37	6.68	6.85	6.85			
155	6.39	6.50	6.50	6.47	6.36	6.23	6.12	6.08	6.10	5.98	5.75	5.65	5.78	6.12	6.35	6.29			
160	5.76	5.89	5.95	5.95	5.85	5.65	5.68	5.76	5.66	5.57	5.30	5.10	5.25	5.56	5.76	5.63			
165	5.17	5.33	5.50	5.51	5.38	5.20	5.33	5.46	5.37	5.31	4.99	4.76	4.88	5.16	5.30	5.10			
170	4.72	4.87	5.06	5.10	5.00	4.90	4.99	4.96	4.83	4.81	4.52	4.34	4.41	4.59	4.81	4.78			
175	3.93	4.10	4.16	4.10	3.96	3.72	3.33	3.04	2.81	2.81	2.51	2.45	2.47	2.65	2.95	3.41			
180	1.28	1.47	1.58	1.48	1.22	0.97	0.88	0.81	1.23	1.22	1.33	1.39	1.36	1.23	1.16	1.24			

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)
90
80
70
60
50
40
30
20
10
0
350
340
330
320
310
300
290
280
270
45
90
135
180
225
270
315
360
405
450
A
B
A
B

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