Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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2018/10/31

Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Hight output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	10000	12659
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	108.7
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	3.51%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	2989
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	80
Power Factor	ANSI C82.77:2014	0.873	0.968
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.45%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/30	IVAT5S-130L730U	Y1
2	Goniophotometer Test	2018/10/30	IVAT5S-130L730U	Y1
3	THD and PF Test	2018/10/30	IVAT5S-130L730U	Y1

Remark(If any)
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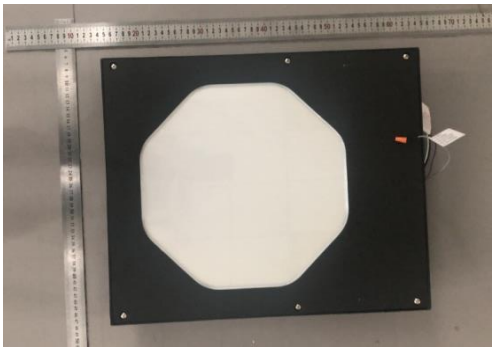
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

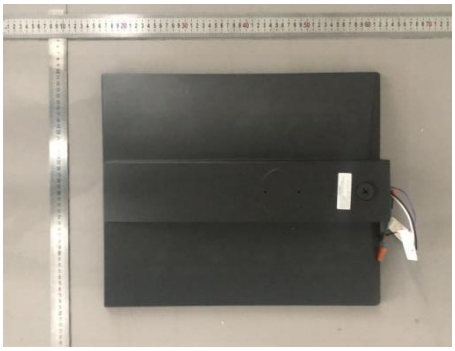
3.0 Production Description

Luminaire Description: IVAT5S-130L730U

Electrical Specification: 120V-277V,50/60HZ, 45W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT5S-130L730U	Sample ID.	Y1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load. The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	119.99	60	0.977	117.1	0.998

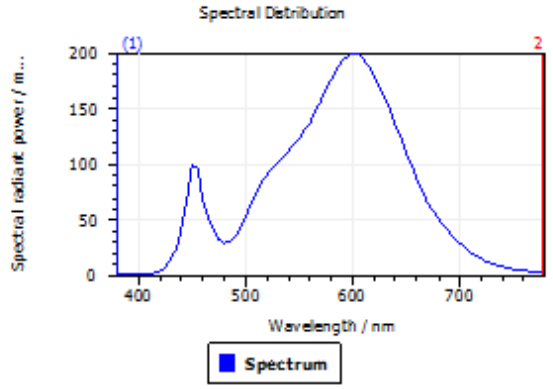
Test Result

CCT (K)	CRI (Ra)	Duv
2989	79.9	1.6E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	582.34 nm
Purity	0.549
PeakWavelength	600.62 nm
Radiant Power	28.91 W
Width50%:	127.66 nm

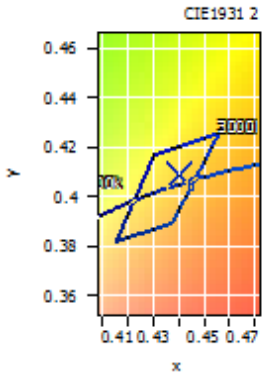
Color Coordinates

Correlated Color Temperatu 2989 K

x:	0.4400	u:	0.2504	u':	0.2504
y:	0.4090	v:	0.3492	v':	0.5238

ResultsCRICRI01	77.4	ResultsCRICRI09	-3.1
ResultsCRICRI02	87.6	ResultsCRICRI10	71.7
ResultsCRICRI03	96.5	ResultsCRICRI11	76.3
ResultsCRICRI04	78.1	ResultsCRICRI12	62.2
ResultsCRICRI05	77.3	ResultsCRICRI13	79.4
ResultsCRICRI06	84.3	ResultsCRICRI14	98.1
ResultsCRICRI07	82.5	ResultsCRICRI15	69.6
ResultsCRICRI08	55.7	ResultsCRICRI16	67.7

ResultsCRI 79.9



PlanckDistance 1.6E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT5S-130L730U	Sample ID.	Y1
Opreate time (Min.)	90	Stabilization time (Min.	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample.
The voltage of an AC power supply (RMS voltage)or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.
The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

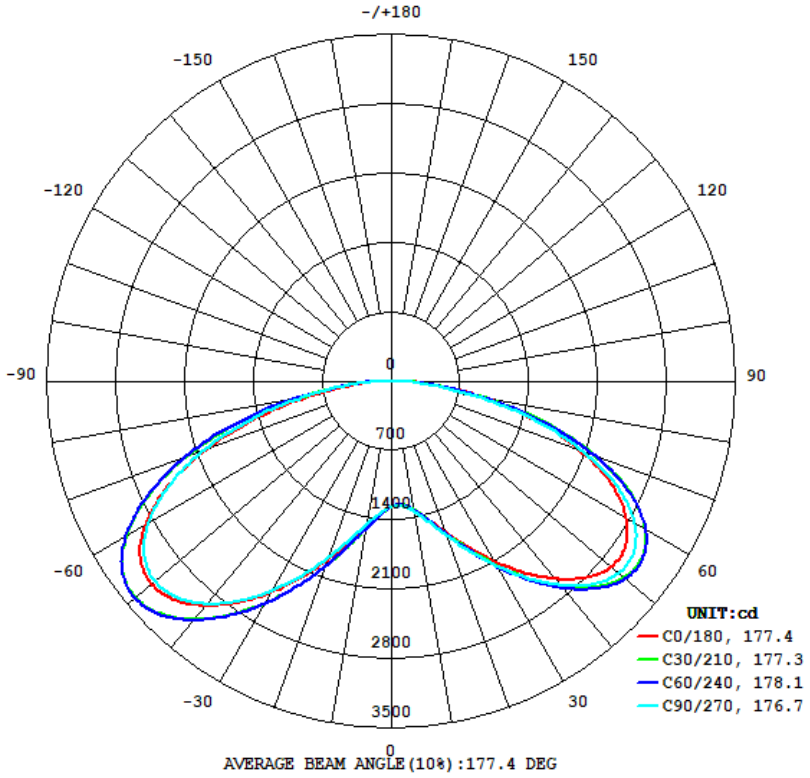
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.93	60	0.973	116.4	0.998	Light Down

Test Result

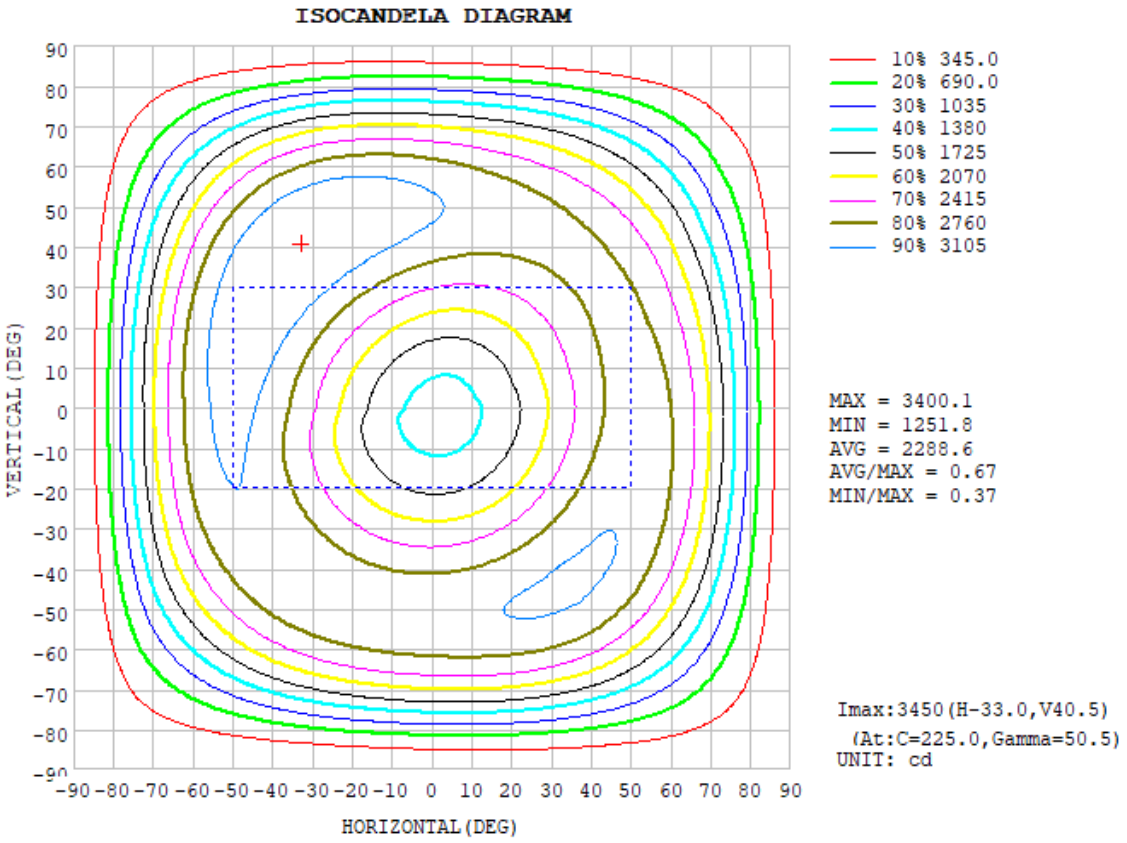
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
12659	100.00%	3.51%	177.4	176.8	164.4	164.7	108.7

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	C0	C45	C90	C135	C180	C225	C270	C315
180	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0
80	942.4	974.9	875.6	831.9	814.2	983.9	906.9	818.5
70	2048	2241	2077	2040	2001	2275	2032	1882
60	2761	3028	2860	2864	2892	3158	2853	2625
50	2912	3119	3014	3056	3183	3441	3140	2857
40	2603	2729	2688	2725	2954	3172	2932	2643
30	2096	2154	2155	2209	2455	2604	2439	2193
20	1622	1637	1653	1725	1912	1997	1886	1728
10	1319	1314	1333	1381	1479	1507	1459	1388
γ	LUMINOUS INTENSITY:cd							

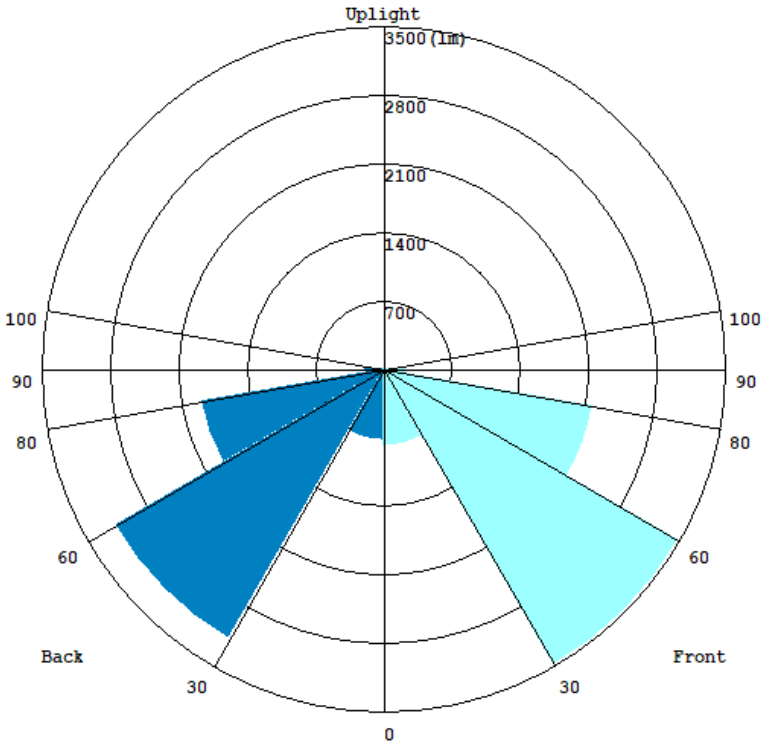
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	127.06	0 - 10	127.06	1.00%
10-20	449.62	0 - 20	576.68	4.56%
20-30	942.61	0 - 30	1519.29	12.00%
30-40	1609.09	0 - 40	3128.38	24.71%
40-50	2305.15	0 - 50	5433.53	42.92%
50-60	2712.27	0 - 60	8145.80	64.35%
60-70	2491.50	0 - 70	10637.30	84.03%
70-80	1577.64	0 - 80	12214.94	96.49%
80-90	443.88	0 - 90	12658.82	100.00%
90-100	0.00	0 - 100	12658.82	100.00%
100-110	0.00	0 - 110	12658.82	100.00%
110-120	0.00	0 - 120	12658.82	100.00%
120-130	0.00	0 - 130	12658.82	100.00%
130-140	0.00	0 - 140	12658.82	100.00%
140-150	0.00	0 - 150	12658.82	100.00%
150-160	0.00	0 - 160	12658.82	100.00%
160-170	0.00	0 - 170	12658.82	100.00%
170-180	0.00	0 - 180	12658.82	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	791.53	6.2
FM - Front-Medium(30-60)	3481.2	27.4
FH - Front-High(60-80)	2176.6	17.2
FVH - Front-Very High(80-90)	240.87	1.9
Total Forward Light	6690.2	52.7

BL - Back-Low(0-30)	729.16	5.7
BM - Back-Medium(30-60)	3166.1	25.0
BH - Back-High(60-80)	1904.7	15.0
BVH - Back-Very High(80-90)	196.92	1.6
Total Back Light	5996.9	47.3

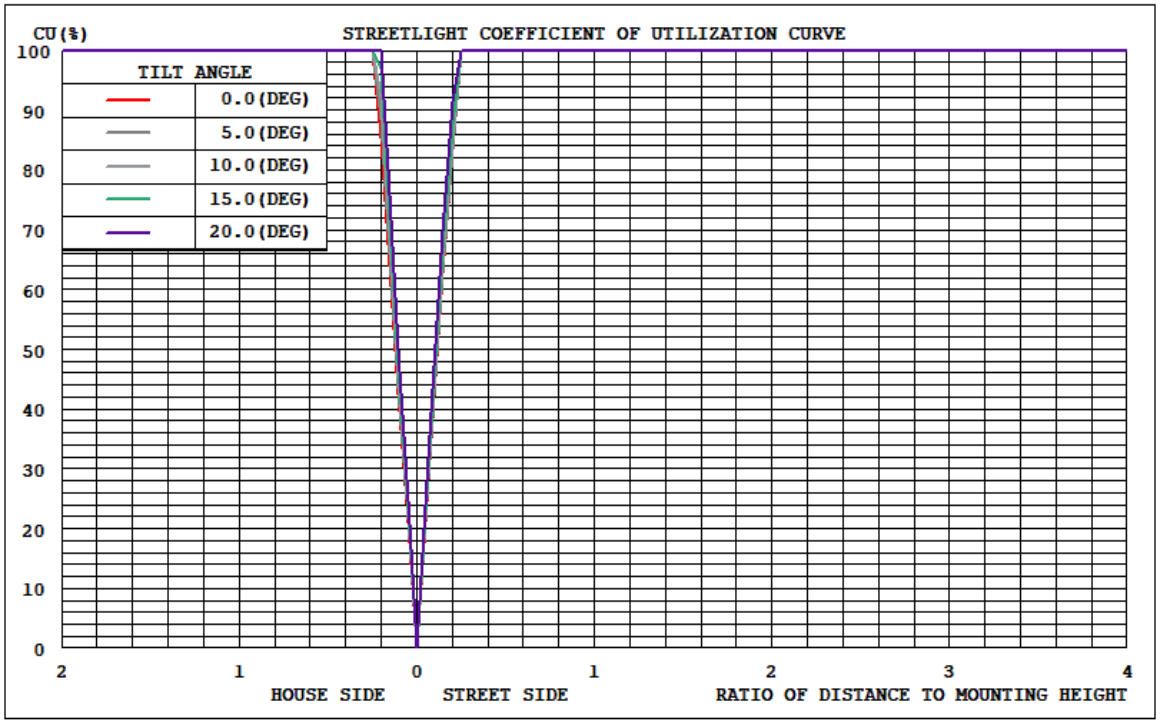
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G2

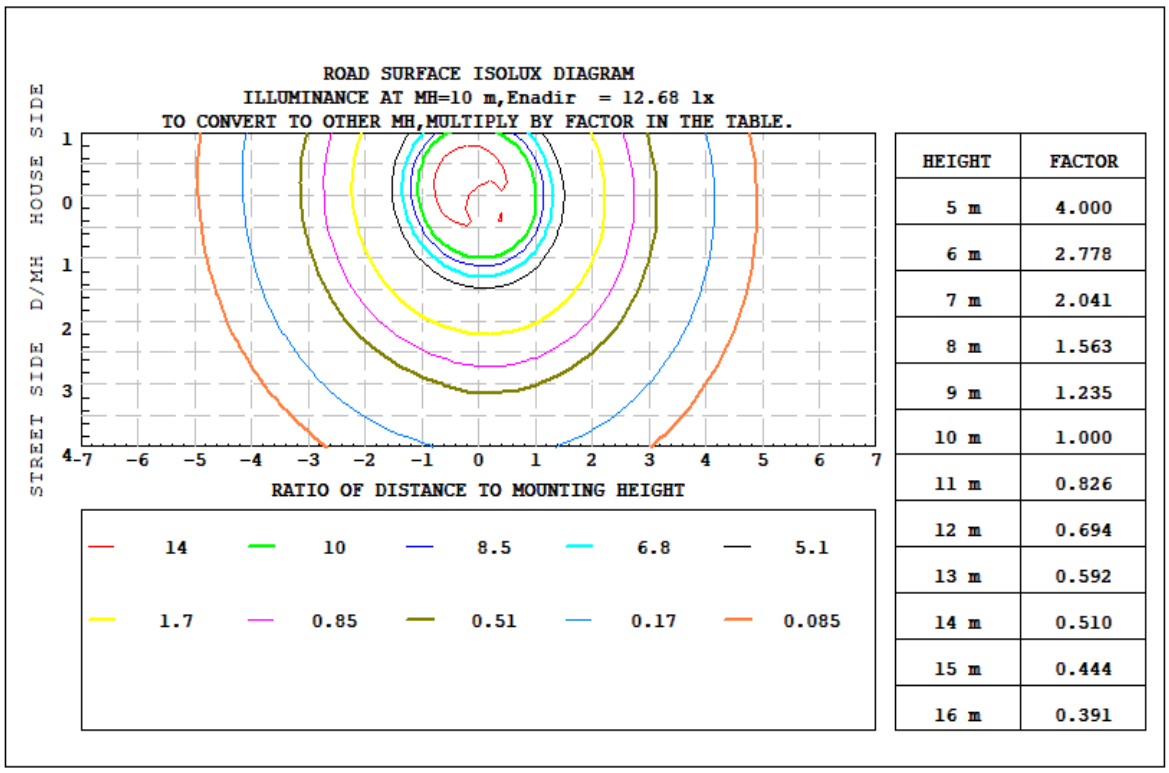
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	5996.9	0	5996.9
Street Side	6690.2	0	6690.2

3.2 Goniophotometer Test

Coefficients of Utilization



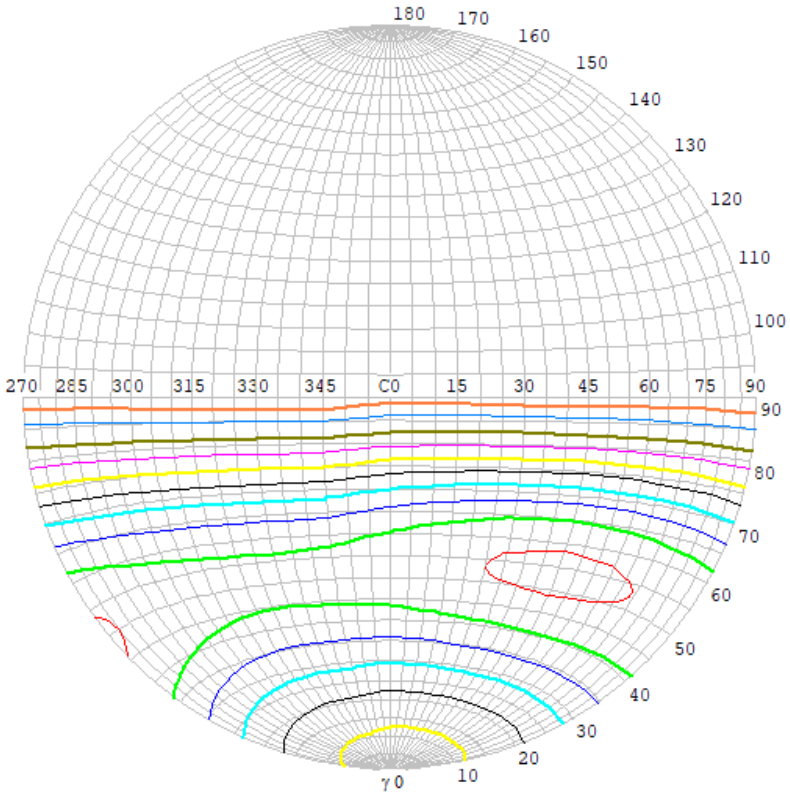
Iso-footcandle Lines of Horizontal Illumination



HEIGHT	FACTOR
5 m	4.000
6 m	2.778
7 m	2.041
8 m	1.563
9 m	1.235
10 m	1.000
11 m	0.826
12 m	0.694
13 m	0.592
14 m	0.510
15 m	0.444
16 m	0.391

3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

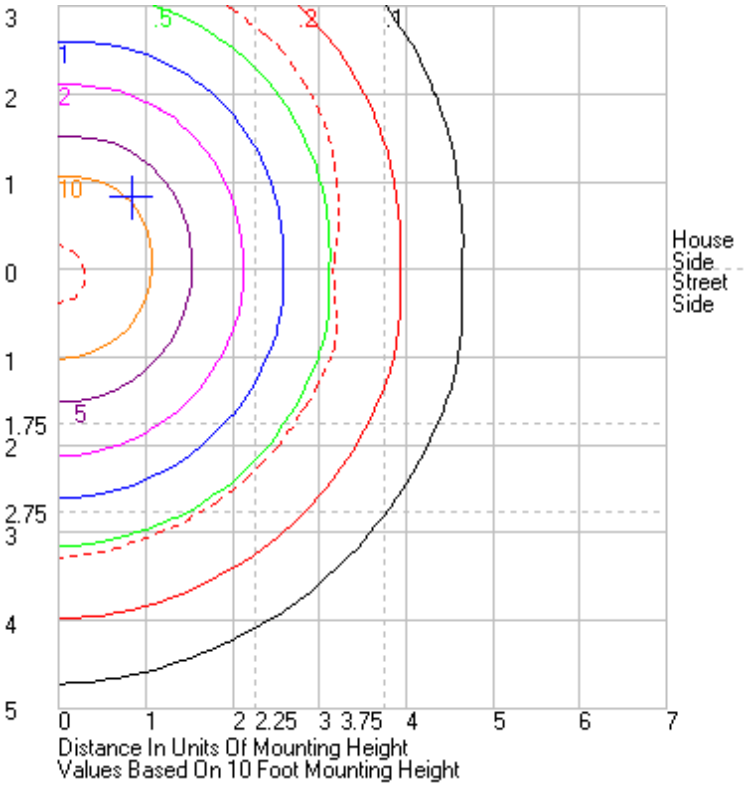


Classification:

IES:Type V - Very Short
CIE:Average - Short
IES:None cut-off
CIE:Non-cut-off
Max.At80:989.5cd/klm
Max.At90:0cd/klm
Max.80-90:989.5cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	3442
90%	3098
80%	2753
70%	2409
60%	2065
50%	1721
40%	1377
30%	1033
20%	688
10%	344
5%	172

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT5S-130L730U	Sample ID.	Y1

Test Method
The samples were tested according to the ANSI C82.77:2002. The total harmonic distortion shall be measured to the 40th order. The ambient temperature condition was maintained at 25º C ± 1º C. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.1	276.99	60	0.425	113.9	0.968	7.45%
25.1	119.99	60	0.977	117.1	0.998	4.78%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

********** End of Test Report**********