Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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1.0 Test Summary

DLC Technical Requirements v4.4

Outdoor - Mid output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	5000	8158
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	111.55	111.6
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	4.07%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3000
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	79.5
Power Factor	ANSI C82.77:2014	0.873	0.940
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	10.89%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVAT2-75L730[H, 4]	F1
2	Goniophotometer Test	2018/11/22	IVAT2-75L730[H, 4]	F1
3	THD and PF Test	2018/11/22	IVAT2-75L730[H, 4]	F1

Remark(If any)
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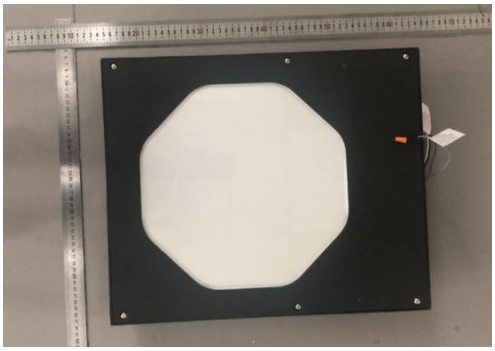
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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.

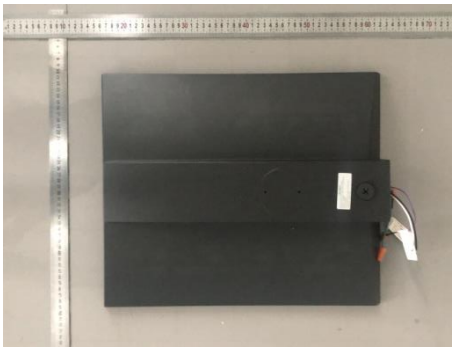
3.0 Production Description

Luminaire Description: IVAT2-75L730[H, 4]

Electrical Specification: 480V,50/60HZ, 75W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT2-75L730[H, 4]	Sample ID.	F1
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	480.08	60	0.163	73.5	0.940

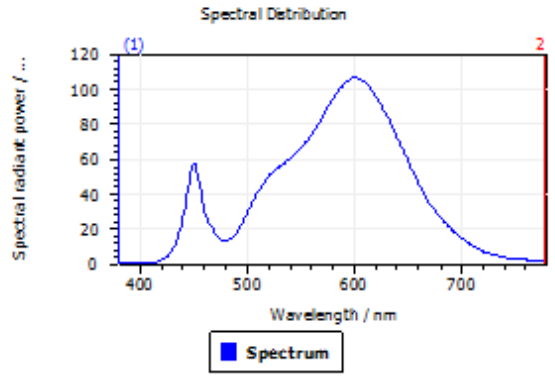
Test Result

CCT (K)	CRI (Ra)	Duv
3000	79.5	2.2E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

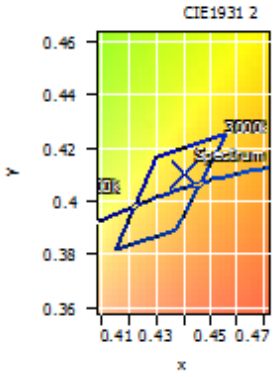
Spectral values

DominantWavelength	582.08 nm
Purity	0.554
PeakWavelength	600.59 nm
Width50%:	129.51 nm

Color Coordinates

Correlated Color Temperatu		3000 K			
x:	0.4401	u:	0.2498	u':	0.2498
y:	0.4107	v:	0.3496	v':	0.5245

CRI01	76.8	CRI09	-4.9
CRI02	86.8	CRI10	69.9
CRI03	96.0	CRI11	76.9
CRI04	78.3	CRI12	61.2
CRI05	76.7	CRI13	78.8
CRI06	83.3	CRI14	97.7
CRI07	82.6	CRI15	68.6
CRI08	55.2	CRI16	67.0
ResultsCRI	79.5		



PlanckDistance 2.2E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT2-75L730[H, 4]	Sample ID.	F1
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

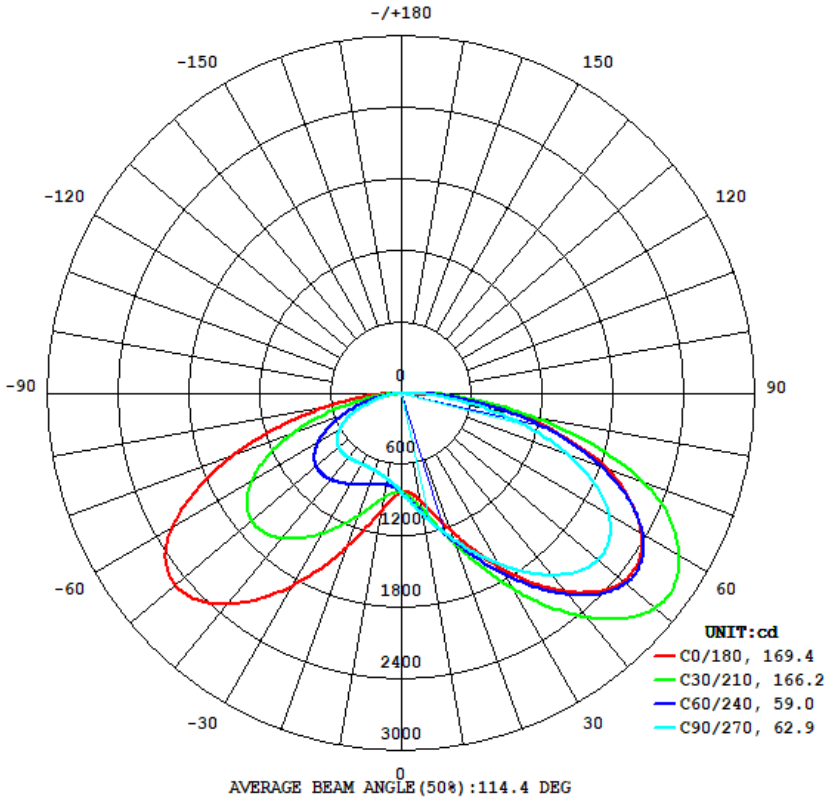
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	480.02	60	0.162	73.1	0.940	Light Down

Test Result

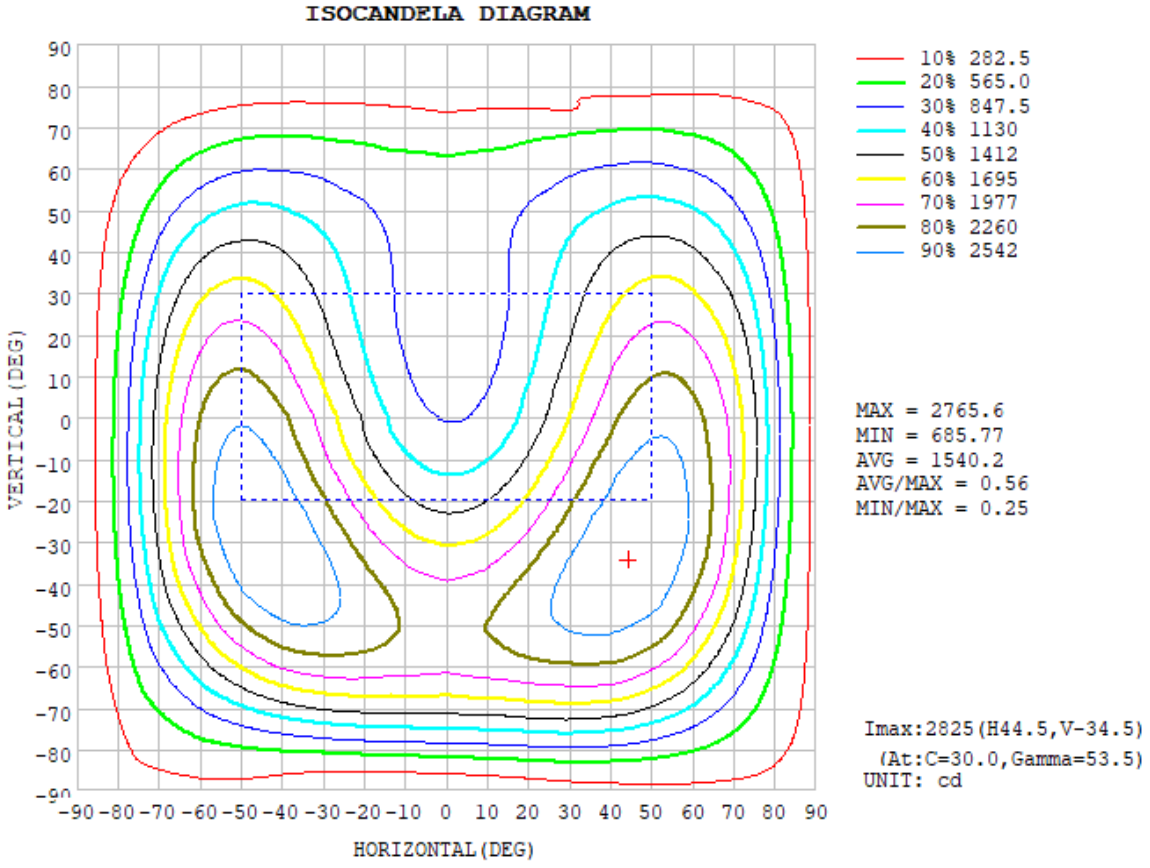
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
8158	100.00%	4.07%	178.0	163.4	169.4	62.9	111.6

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	911.1	998.6	1024	1037	994.9	833.0	732.1	792.1
20	1219	1342	1308	1417	1374	940.6	691.6	871.0
30	1690	1837	1655	1927	1863	1094	688.7	1019
40	2173	2361	1994	2424	2311	1227	707.8	1169
50	2456	2687	2177	2692	2504	1251	700.5	1229
60	2354	2596	2037	2511	2247	1088	608.5	1107
70	1860	2062	1510	1802	1518	727.8	407.4	781.4
80	965.6	1066	719.4	825.4	631.6	268.6	137.6	329.3
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

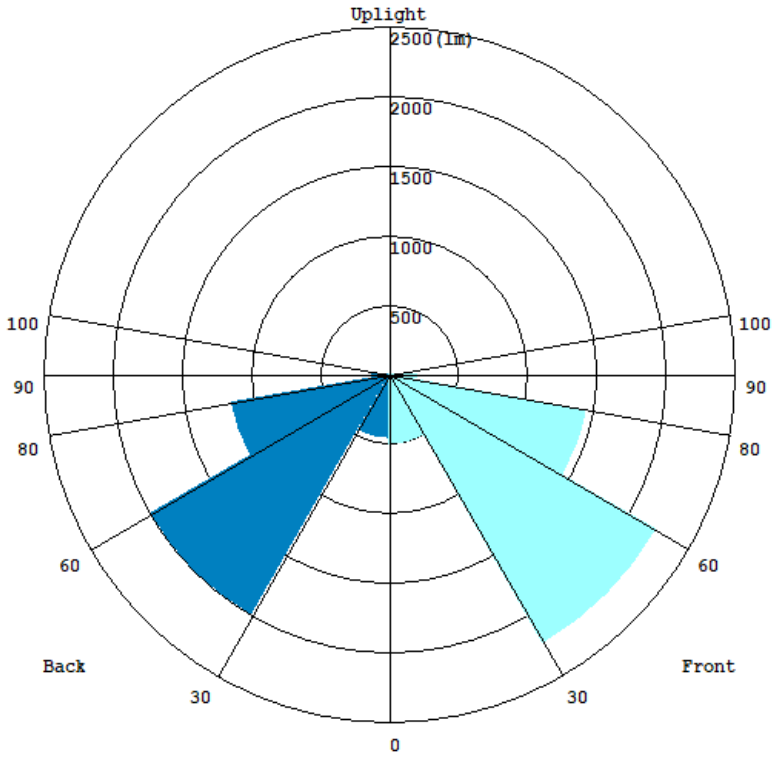
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	83.43	0 - 10	83.43	1.02%
10-20	292.64	0 - 20	376.07	4.61%
20-30	608.39	0 - 30	984.46	12.07%
30-40	1033.72	0 - 40	2018.18	24.74%
40-50	1470.92	0 - 50	3489.10	42.77%
50-60	1718.10	0 - 60	5207.20	63.83%
60-70	1583.76	0 - 70	6790.96	83.24%
70-80	1035.13	0 - 80	7826.09	95.93%
80-90	332.00	0 - 90	8158.09	100.00%
90-100	0.00	0 - 100	8158.09	100.00%
100-110	0.00	0 - 110	8158.09	100.00%
110-120	0.00	0 - 120	8158.09	100.00%
120-130	0.00	0 - 130	8158.09	100.00%
130-140	0.00	0 - 140	8158.09	100.00%
140-150	0.00	0 - 150	8158.09	100.00%
150-160	0.00	0 - 160	8158.09	100.00%
160-170	0.00	0 - 170	8158.09	100.00%
170-180	0.00	0 - 180	8158.09	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	514.69	6.3
FM - Front-Medium(30-60)	2233.3	27.3
FH - Front-High(60-80)	1456.2	17.8
FVH - Front-Very High(80-90)	207.15	2.5
Total Forward Light	4411.3	53.9

BL - Back-Low(0-30)	470.64	5.7
BM - Back-Medium(30-60)	2002.3	24.5
BH - Back-High(60-80)	1169.4	14.3
BVH - Back-Very High(80-90)	134.12	1.6
Total Back Light	3776.4	46.1

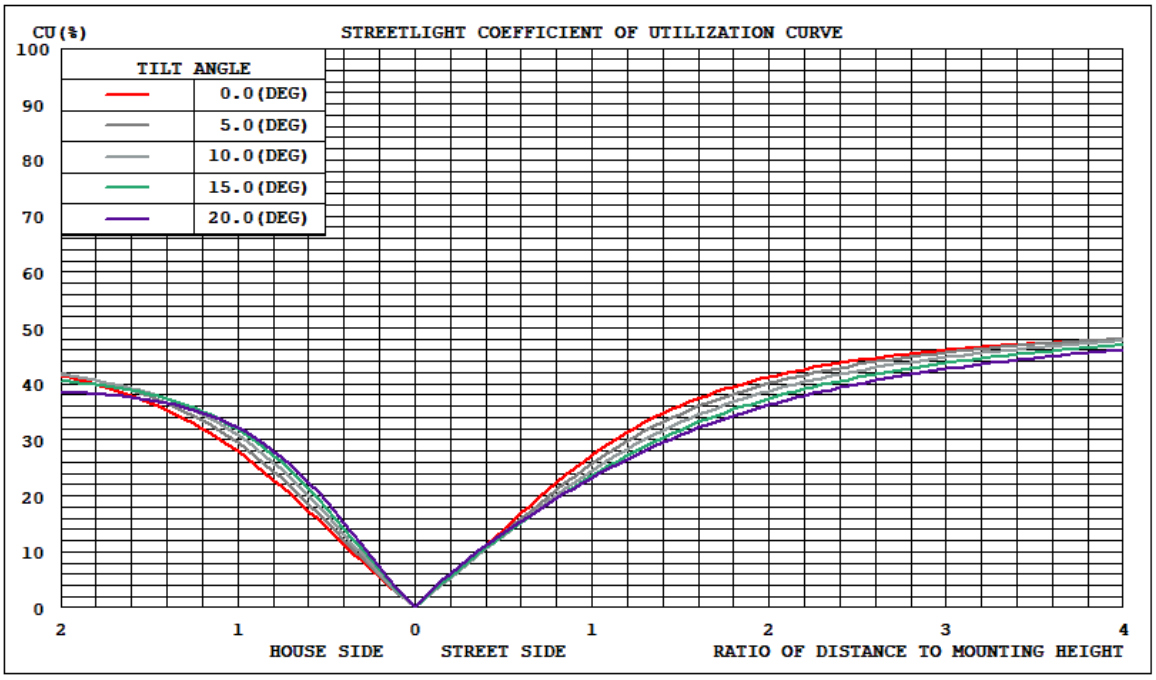
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3

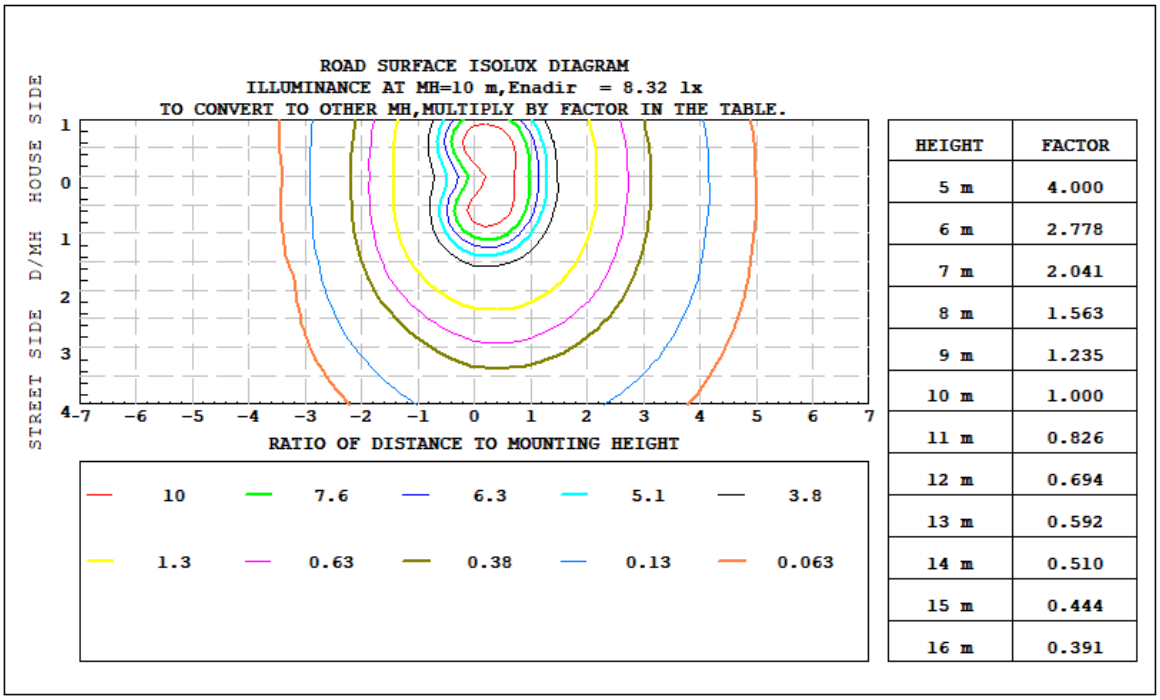
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	3776.4	0	3776.4
Street Side	4411.3	0	4411.3

3.2 Goniophotometer Test

Coefficients of Utilization



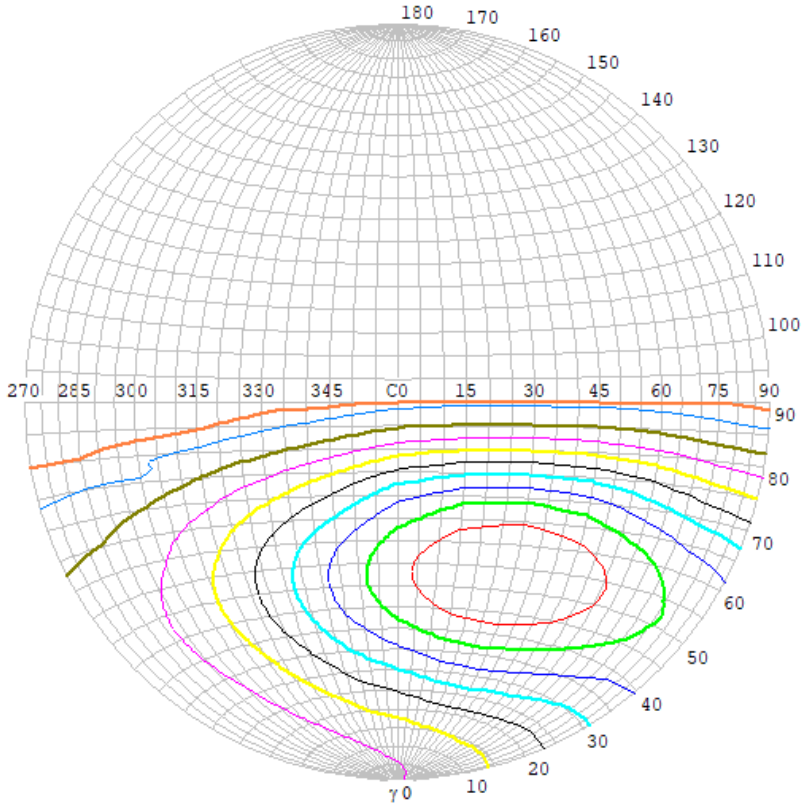
Iso-footcandle Lines of Horizontal Illumination



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

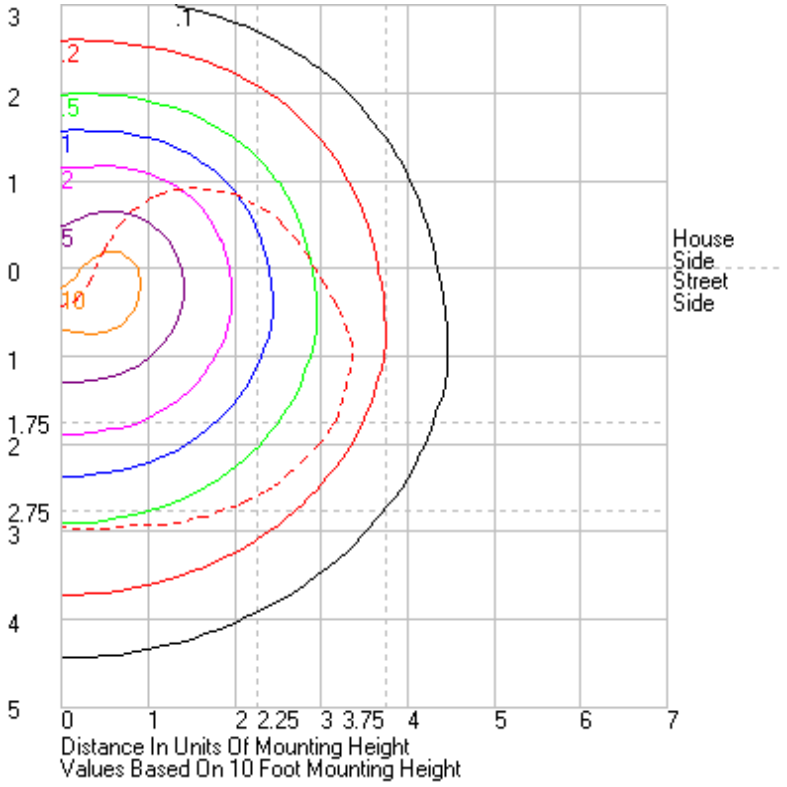


Classification:

IES:Type IV - Short
CIE:Broad - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:137.1cd/klm
Max.At90:0cd/klm
Max.80-90:137.1cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	2830
90%	2547
80%	2264
70%	1981
60%	1698
50%	1415
40%	1132
30%	849
20%	566
10%	283
5%	142

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT2-75L730[H, 4]	Sample ID.	F1

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	480.08	60	0.163	73.5	0.940	10.89%

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**********