

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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Issue Date

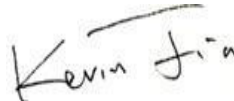
2018/11/23

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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	7141
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	103.5
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.51%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3051
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80.2
Power Factor	ANSI C82.77:2014	0.873	0.934
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	14.72%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVAT3-75L730[H, 4]	G1
2	Goniophotometer Test	2018/11/22	IVAT3-75L730[H, 4]	G1
3	THD and PF Test	2018/11/22	IVAT3-75L730[H, 4]	G1

Remark(If any)

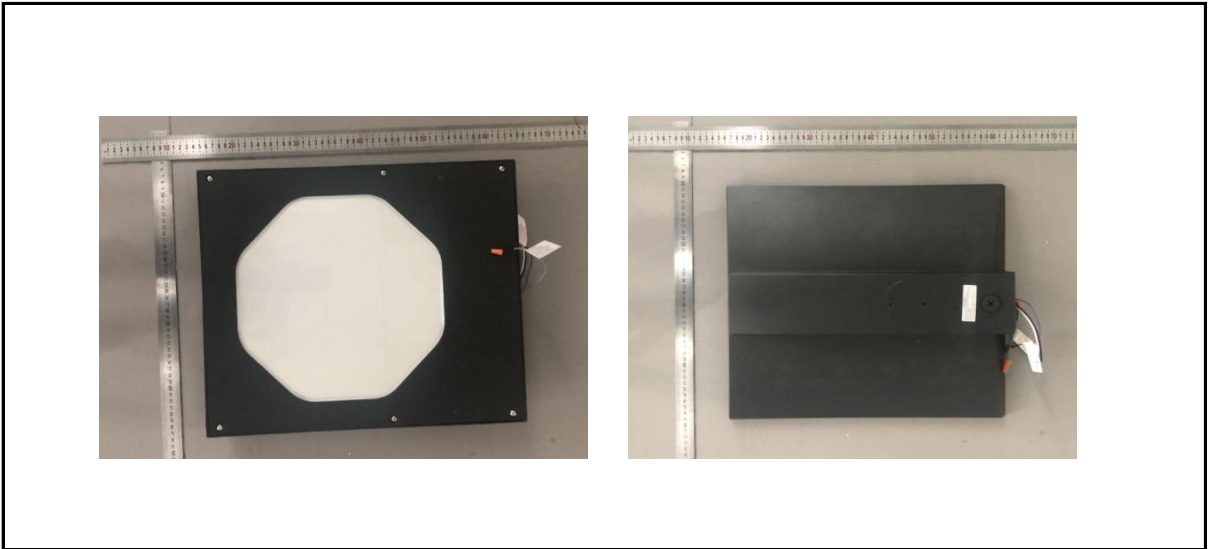
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3.0 Production Description

Luminaire Description: IVAT3-75L730[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.	IVAT3-75L730[H, 4]	Sample ID.	G1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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 ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	480.03	60	0.152	68.9	0.934

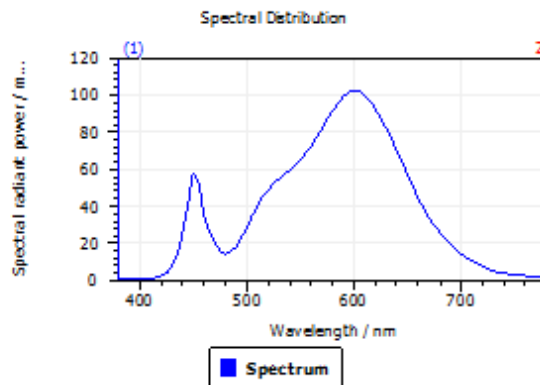
Test Result

CCT (K)	CRI (Ra)	Duv
3051	80.2	1.3E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

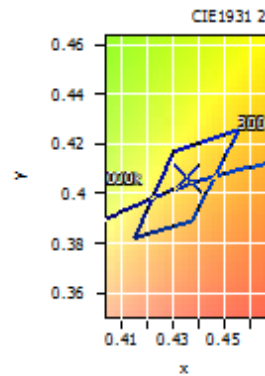
DominantWavelength	582.14 nm
Purity	0.528
PeakWavelength	600.54 nm
Radiant Power	15.08 W
Width50%	131.29 nm

Color Coordinates

Correlated Color Temperatu 3051 K

x: 0.4353 u: 0.2483 u': 0.2483
y: 0.4069 v: 0.3482 v': 0.5222

ResultsCRICRI01	78.0	ResultsCRICRI09	-1.9
ResultsCRICRI02	87.8	ResultsCRICRI10	71.9
ResultsCRICRI03	96.1	ResultsCRICRI11	77.1
ResultsCRICRI04	78.4	ResultsCRICRI12	62.4
ResultsCRICRI05	77.5	ResultsCRICRI13	80.1
ResultsCRICRI06	84.2	ResultsCRICRI14	97.9
ResultsCRICRI07	83.0	ResultsCRICRI15	70.1
ResultsCRICRI08	56.6	ResultsCRICRI16	68.3
ResultsCRI	80.2		



PlanckDistance 1.3E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT3-75L730[H, 4]	Sample ID.	G1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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° vertical intervals and 10° horizontal intervals.

Test Conditions

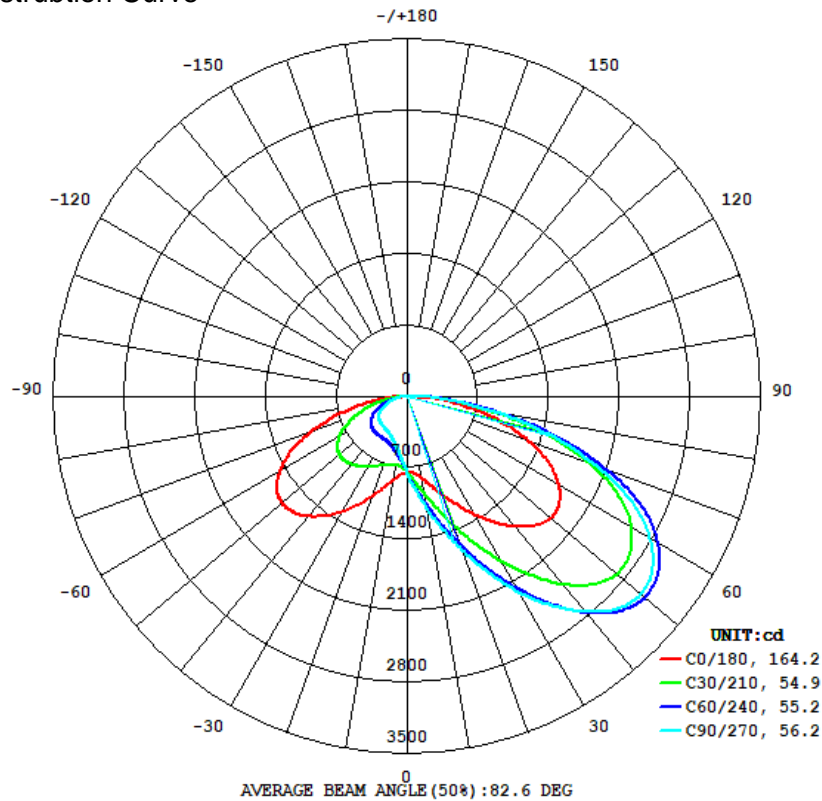
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.94	60	0.154	69.0	0.934	Light Down

Test Result

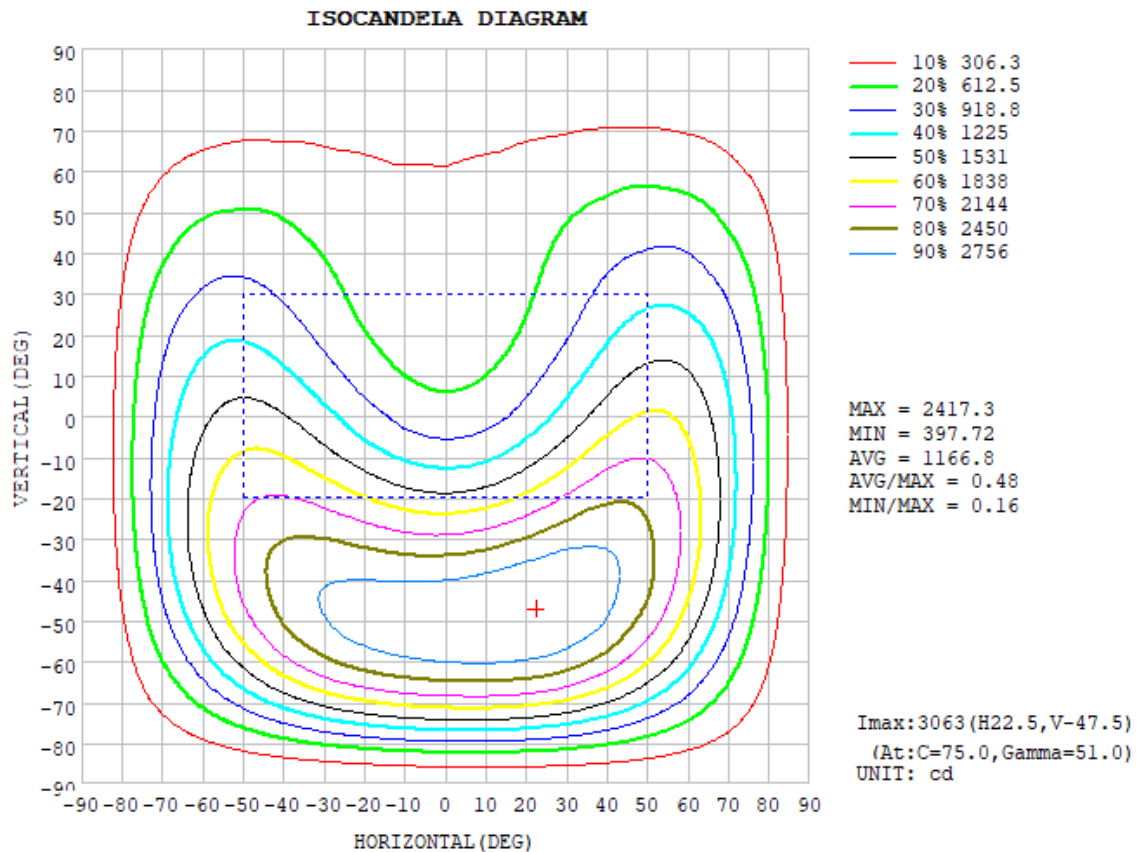
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7141	100.00%	3.51%	177.5	147.6	164.2	56.2	103.5

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	810.2	1012	1097	1021	834.1	626.2	543.7	624.9
20	1024	1458	1603	1447	1042	596.0	443.5	606.1
30	1340	2046	2210	1969	1305	611.4	399.1	641.0
40	1669	2643	2756	2453	1538	637.6	382.5	693.8
50	1858	2955	3016	2713	1623	630.9	364.9	713.7
60	1742	2797	2776	2542	1457	550.3	314.8	642.1
70	1286	2069	1999	1840	1024	381.3	217.5	456.0
80	606.0	911.9	879.2	772.3	417.8	139.7	89.23	194.8
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	74.75	0 - 10	74.75	1.05%
10-20	262.64	0 - 20	337.39	4.72%
20-30	544.27	0 - 30	881.66	12.35%
30-40	919.80	0 - 40	1801.46	25.23%
40-50	1302.60	0 - 50	3104.06	43.47%
50-60	1513.40	0 - 60	4617.46	64.66%
60-70	1389.31	0 - 70	6006.77	84.11%
70-80	883.96	0 - 80	6890.73	96.49%
80-90	250.52	0 - 90	7141.25	100.00%
90-100	0.00	0 - 100	7141.25	100.00%
100-110	0.00	0 - 110	7141.25	100.00%
110-120	0.00	0 - 120	7141.25	100.00%
120-130	0.00	0 - 130	7141.25	100.00%
130-140	0.00	0 - 140	7141.25	100.00%
140-150	0.00	0 - 150	7141.25	100.00%
150-160	0.00	0 - 160	7141.25	100.00%
160-170	0.00	0 - 170	7141.25	100.00%
170-180	0.00	0 - 180	7141.25	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	480.16	6.7
FM - Front-Medium(30-60)	2097.1	29.3
FH - Front-High(60-80)	1299.3	18.2
FVH - Front-Very High(80-90)	148.3	2.1
Total Forward Light	4024.8	56.2

BL - Back-Low(0-30)	402.38	5.6
BM - Back-Medium(30-60)	1650.1	23.1
BH - Back-High(60-80)	980.62	13.7
BVH - Back-Very High(80-90)	99.033	1.4
Total Back Light	3132.1	43.8

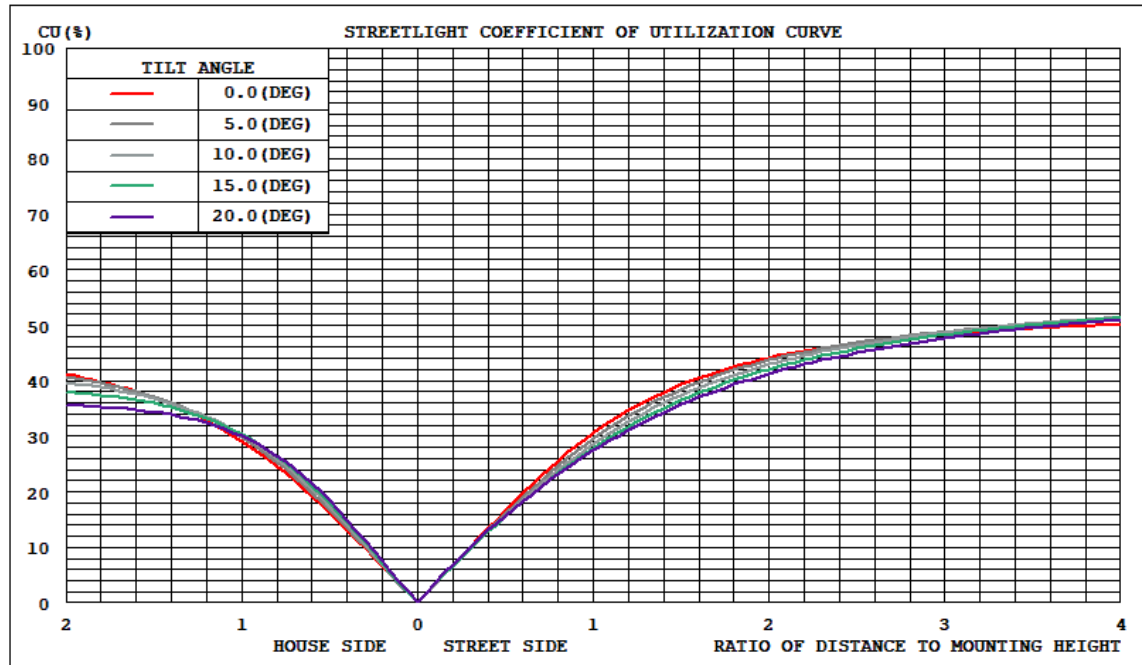
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B2-U0-G2
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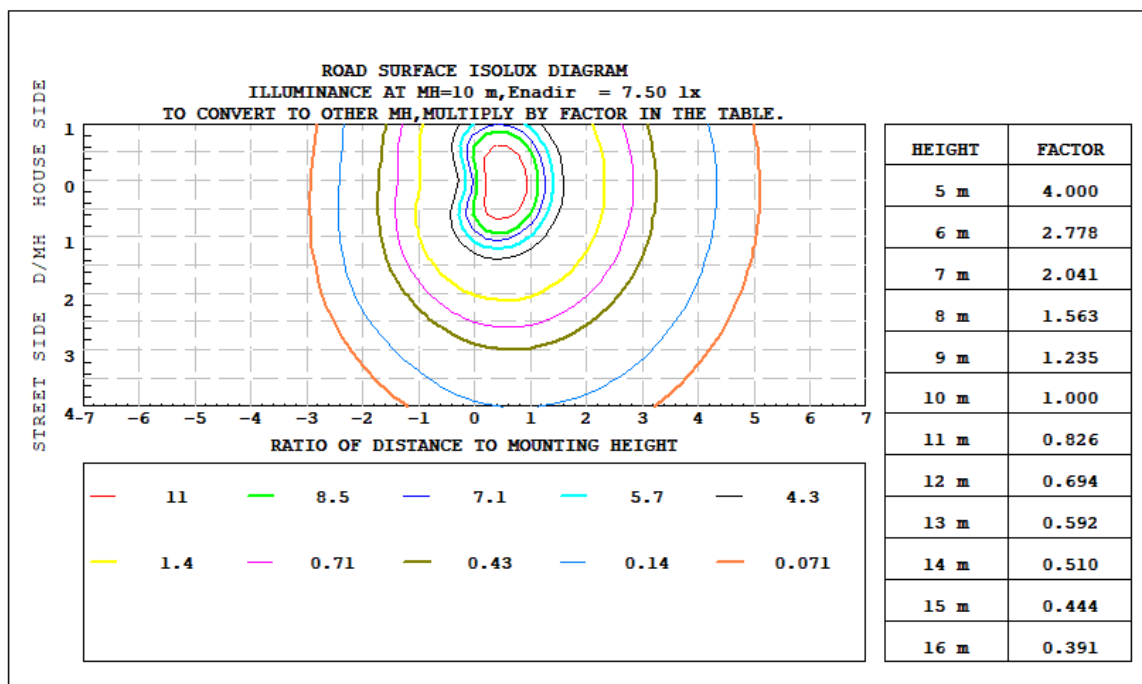
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	3132.1	0	3132.1
Street Side	4024.8	0	4024.8

3.2 Goniophotometer Test

Coefficients of Utilization

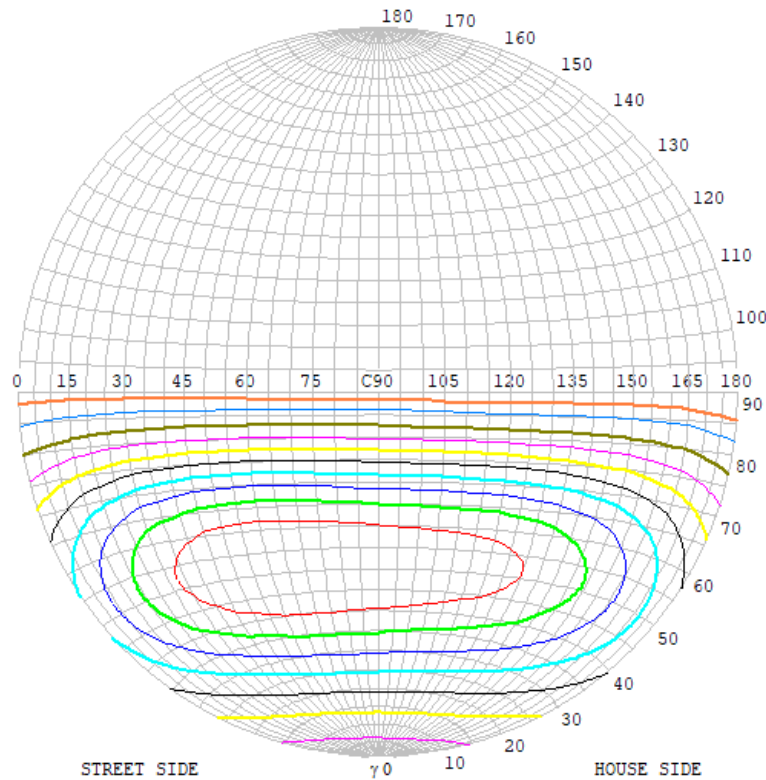


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

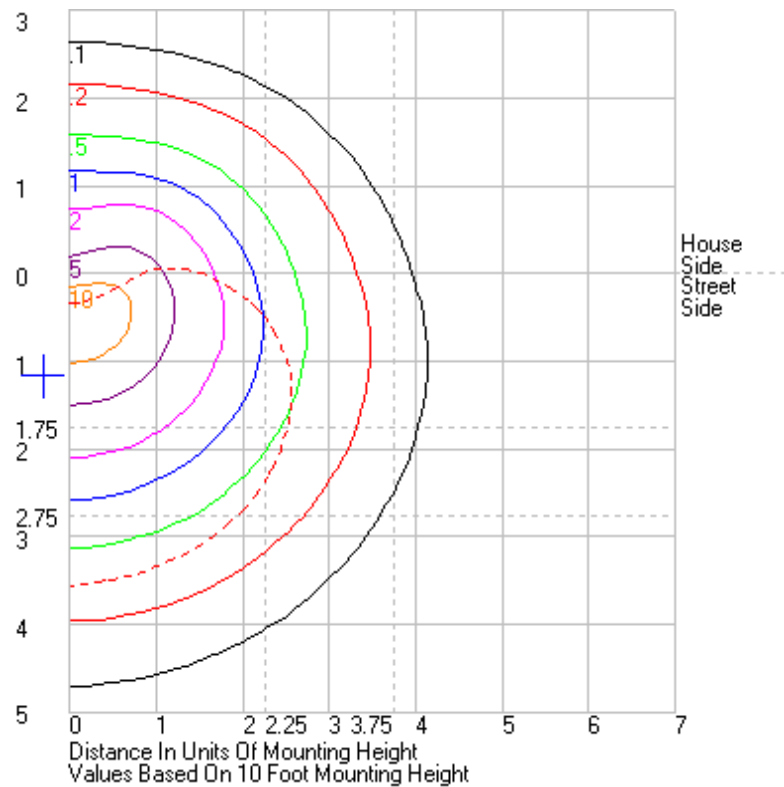


Classification:

IES:Type III - Very Short
CIE:Narrow - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:129.4cd/klm
Max.At90:0cd/klm
Max.80-90:129.4cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	3072
90%	2764
80%	2457
70%	2150
60%	1843
50%	1536
40%	1229
30%	921
20%	614
10%	307
5%	154

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT3-75L730[H, 4]	Sample ID.	G1
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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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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	480.03	60	0.152	68.9	0.934	14.72%

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-directional	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-directional	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*****