

Photometric Test Report

Relevant Standards

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

Prepared For

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Data Number

DLF1810114-5a

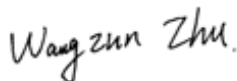
Test Date

2018/11/1

Issue Date

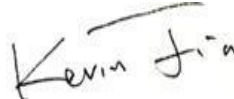
2018/11/2

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Low output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	1000	4638
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	122.3
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	4.44%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	2972
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80
Power Factor	ANSI C82.77:2014	0.873	0.913
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	17.28%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/1	IVATFT-45L730U	E1
2	Goniophotometer Test	2018/11/1	IVATFT-45L730U	E1
3	THD and PF Test	2018/11/1	IVATFT-45L730U	E1

Remark(If any)

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3.0 Production Description

Luminaire Description: IVATFT-45L730U

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.	IVATFT-45L730U	Sample ID.	E1
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	120.01	60	0.319	37.9	0.990

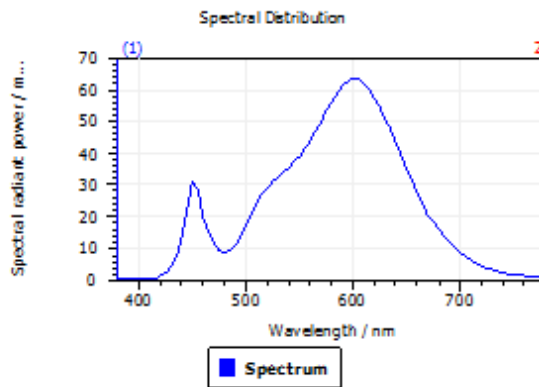
Test Result

CCT (K)	CRI (Ra)	Duv
2972	79.5	2.3E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

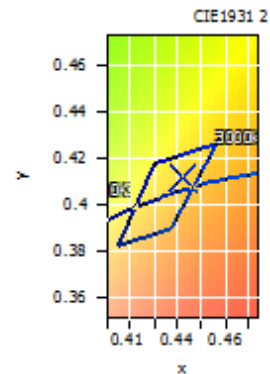
DominantWavelength	582.19 nm
Purity	0.563
PeakWavelength	601.11 nm
Radiant Power	9.133 W
Width50%:	127.91 nm

Color Coordinates

Correlated Color Temperatu 2972 K

x: 0.4423 u: 0.2508 u': 0.2508
y: 0.4116 v: 0.3501 v': 0.5251

ResultsCRICRI01	77.1	ResultsCRICRI09	-5.4
ResultsCRICRI02	87.7	ResultsCRICRI10	72.2
ResultsCRICRI03	96.7	ResultsCRICRI11	76.1
ResultsCRICRI04	77.4	ResultsCRICRI12	63.1
ResultsCRICRI05	76.7	ResultsCRICRI13	79.4
ResultsCRICRI06	84.7	ResultsCRICRI14	98.4
ResultsCRICRI07	81.8	ResultsCRICRI15	68.3
ResultsCRICRI08	54.2	ResultsCRICRI16	66.3
ResultsCRI	79.5		



PlanckDistance 2.2E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVATFT-45L730U	Sample ID.	E1
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

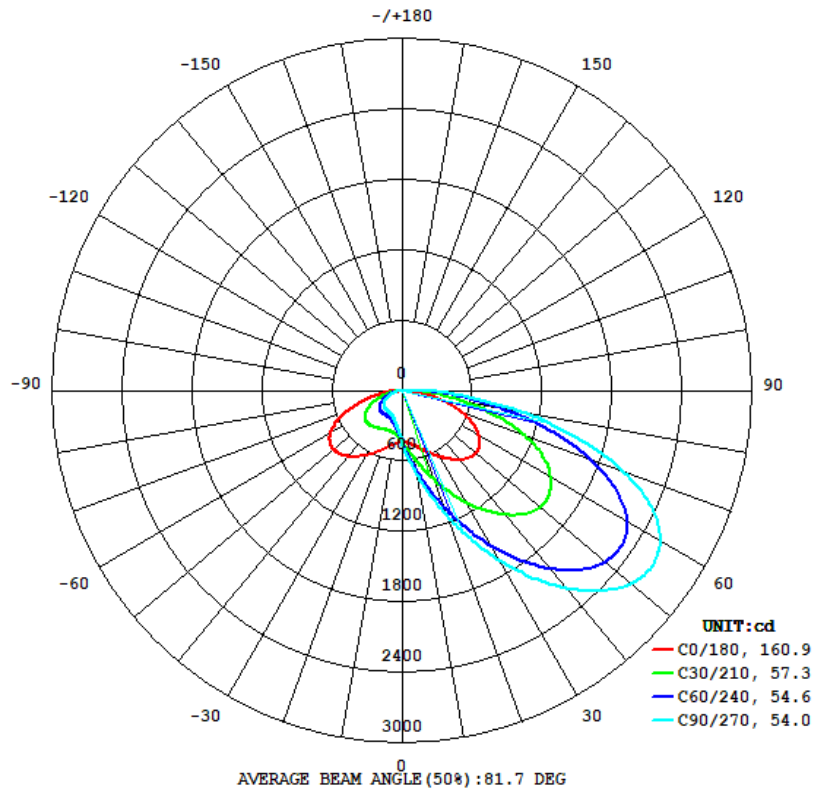
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.03	60	0.319	37.9	0.989	Light Down

Test Result

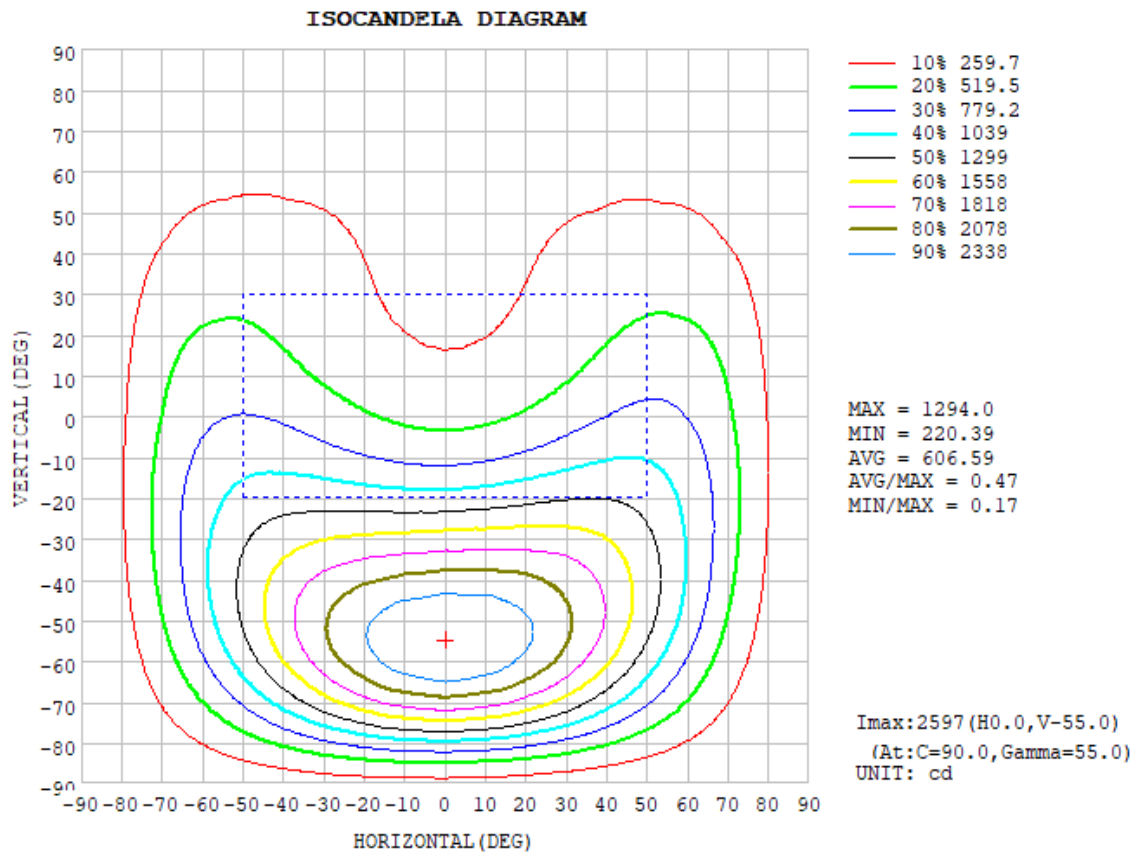
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
4638	100.00%	4.44%	175.7	104.8	160.9	54.0	122.3

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
7	466.5	630.8	707.8	623.6	466.9	344.5	303.4	344.0
10	541.4	943.5	1138	906.1	537.7	309.2	244.2	303.6
20	653.8	1330	1666	1246	636.9	304.8	221.6	294.2
30	769.6	1710	2196	1587	733.6	313.8	215.9	300.2
40	827.9	1937	2558	1822	778.0	311.7	206.1	296.6
50	764.2	1883	2559	1799	712.3	272.6	174.9	257.3
60	553.1	1437	2015	1405	512.2	185.2	115.1	171.4
70	246.9	697.7	1029	712.6	224.2	67.27	38.66	58.69
80	0	0	0	0	0	0	0	0
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

LUMINOUS INTENSITY:cd

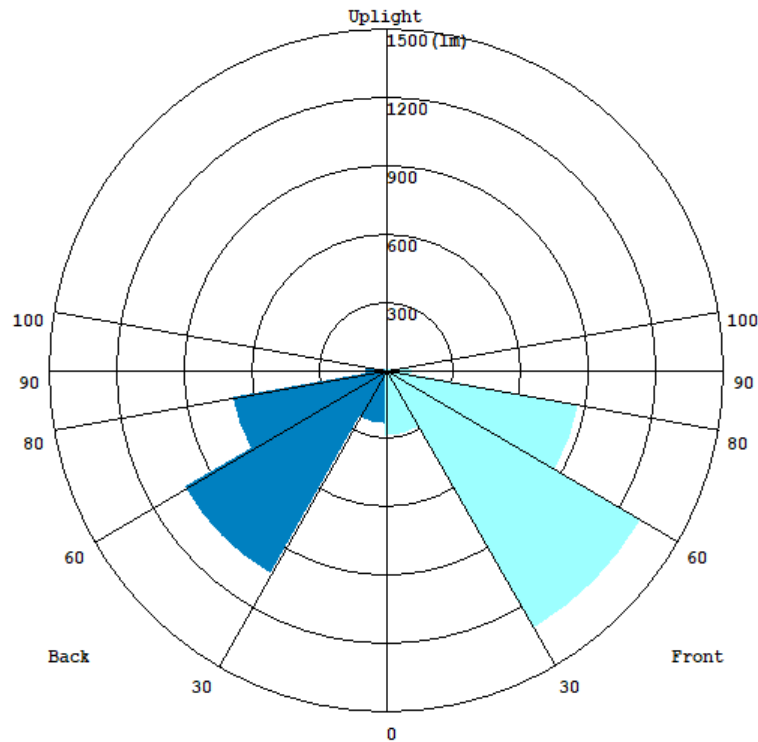
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	44.17	0 - 10	44.17	0.95%
10-20	156.27	0 - 20	200.44	4.32%
20-30	327.53	0 - 30	527.97	11.38%
30-40	560.07	0 - 40	1088.04	23.46%
40-50	808.78	0 - 50	1896.82	40.89%
50-60	972.60	0 - 60	2869.42	61.86%
60-70	931.43	0 - 70	3800.85	81.94%
70-80	631.38	0 - 80	4432.23	95.56%
80-90	206.10	0 - 90	4638.33	100.00%
90-100	0.00	0 - 100	4638.33	100.00%
100-110	0.00	0 - 110	4638.33	100.00%
110-120	0.00	0 - 120	4638.33	100.00%
120-130	0.00	0 - 130	4638.33	100.00%
130-140	0.00	0 - 140	4638.33	100.00%
140-150	0.00	0 - 150	4638.33	100.00%
150-160	0.00	0 - 160	4638.33	100.00%
160-170	0.00	0 - 170	4638.33	100.00%
170-180	0.00	0 - 180	4638.33	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	291.35	6.3
FM - Front-Medium(30-60)	1315	28.3
FH - Front-High(60-80)	874.41	18.8
FVH - Front-Very High(80-90)	117.16	2.5
Total Forward Light	2597.9	55.8

BL - Back-Low(0-30)	236.95	5.1
BM - Back-Medium(30-60)	1031	22.2
BH - Back-High(60-80)	691.78	14.9
BVH - Back-Very High(80-90)	96.285	2.1
Total Back Light	2056	44.2

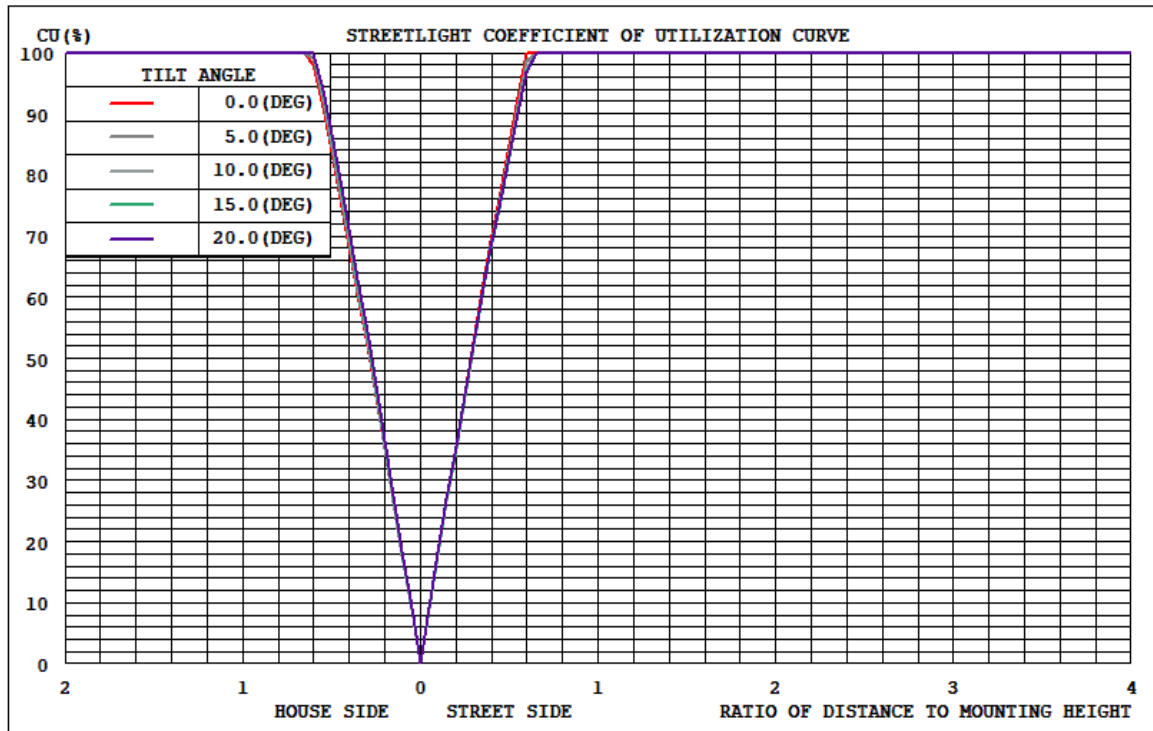
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B2-U0-G2
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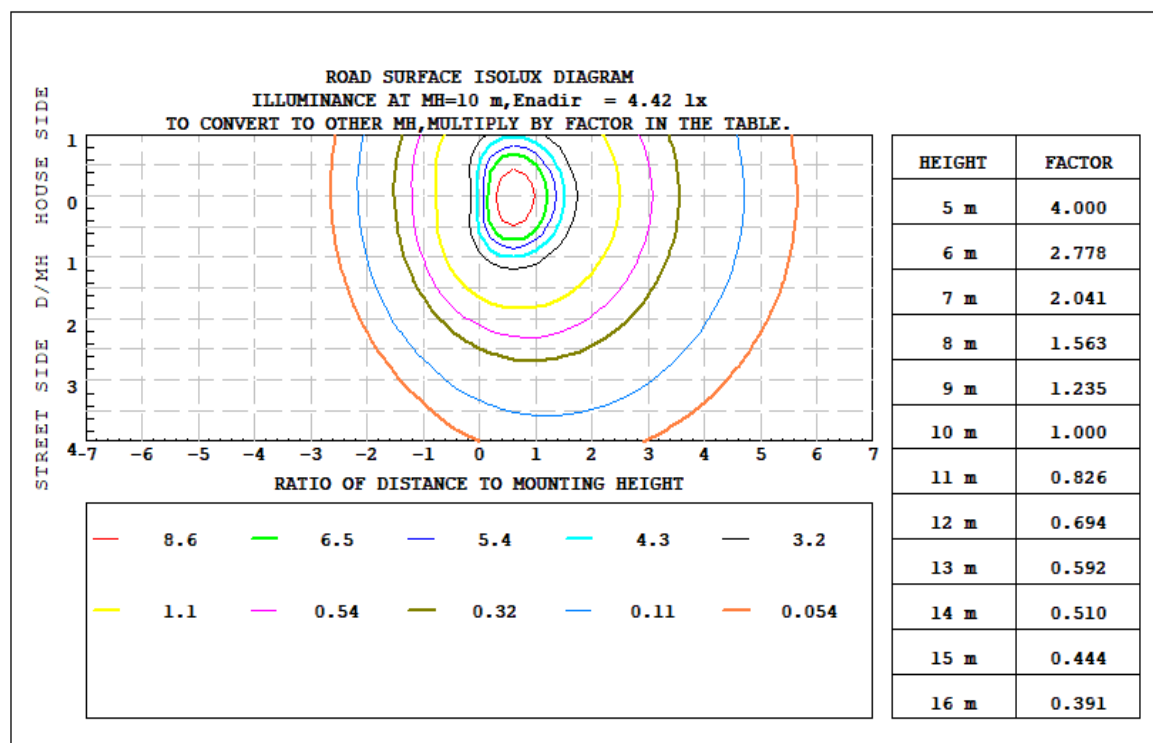
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	2056	0	2056
Street Side	2597.9	0	2597.9

3.2 Goniophotometer Test

Coefficients of Utilization

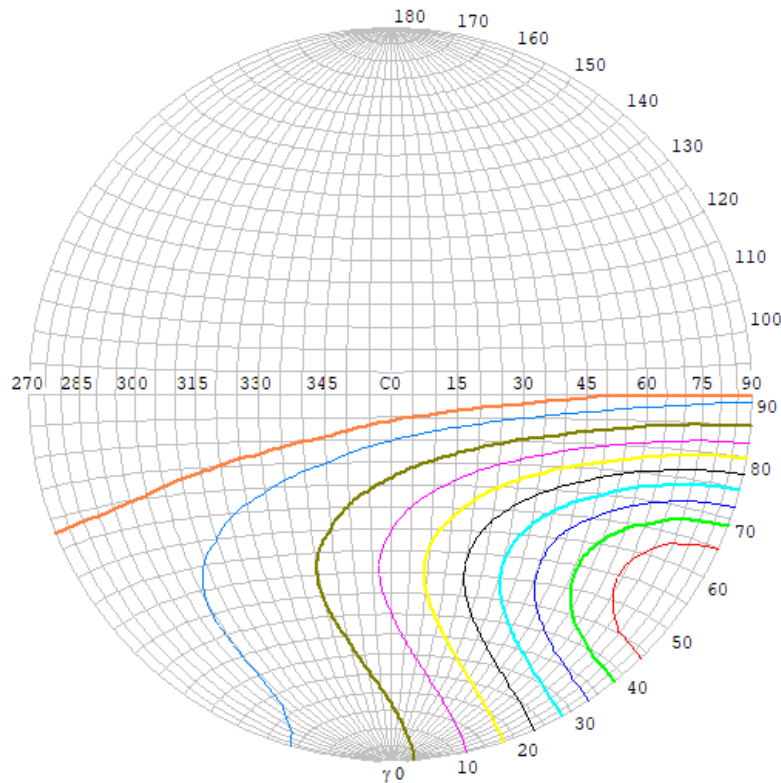


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

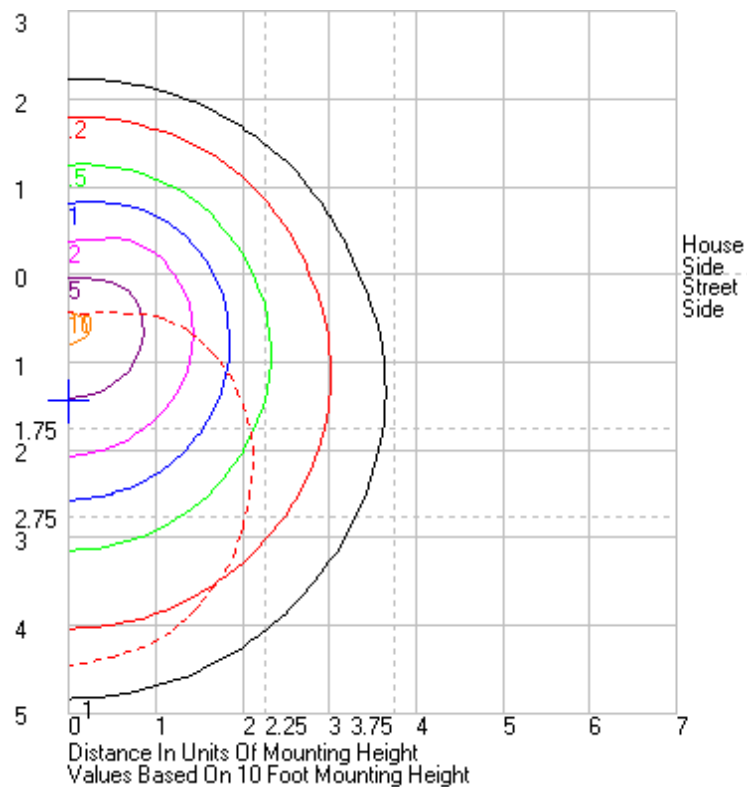


Classification:

IES:Type II - Very Short
CIE:Narrow - Short
IES:None cut-off
CIE:Non-cut-off
Max.At80:1029cd/klm
Max.At90:0cd/klm
Max.80-90:1029cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
I _{max} =100%	2612
90%	2351
80%	2089
70%	1828
60%	1567
50%	1306
40%	1045
30%	784
20%	522
10%	261
5%	131

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVATFT-45L730U	Sample ID.	E1
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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	276.92	60	0.149	37.6	0.913	17.28%
25.1	120.01	60	0.319	37.9	0.990	8.58%

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*****