

Photometric Test Report

Relevant Standards

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

Prepared For

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Data Number

DLF1810114-2a

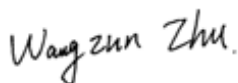
Test Date

2018/10/30

Issue Date

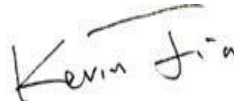
2018/10/31

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	4189
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	110.9
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.78%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3008
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	80
Power Factor	ANSI C82.77:2014	0.873	0.920
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	17.01%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/30	IVAT3-45L730U	B1
2	Goniophotometer Test	2018/10/30	IVAT3-45L730U	B1
3	THD and PF Test	2018/10/30	IVAT3-45L730U	B1

Remark(If any)

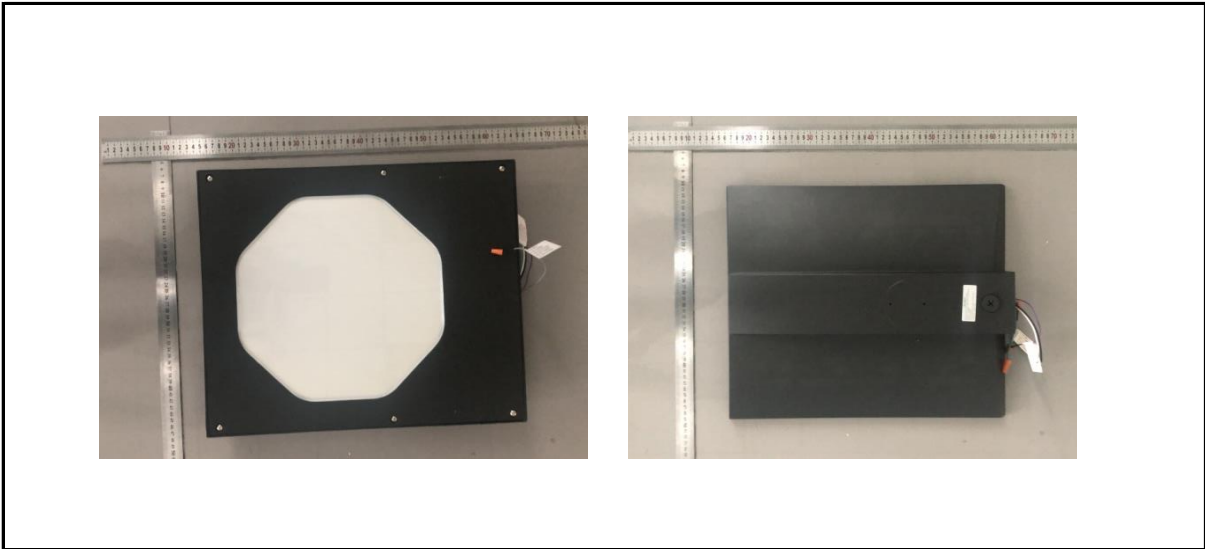
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3.0 Production Description

Luminaire Description: IVAT3-45L730U

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.	IVAT3-45L730U	Sample ID.	B1
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	119.93	60	0.318	37.8	0.990

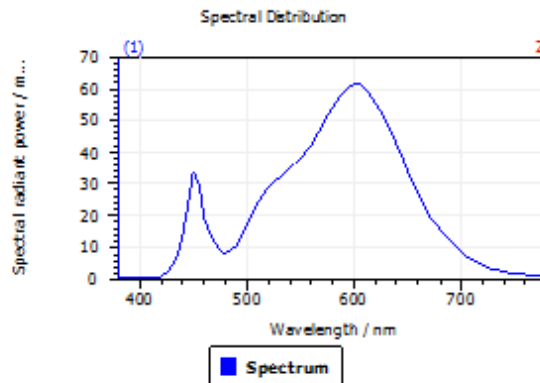
Test Result

CCT (K)	CRI (Ra)	Duv
3008	80.3	1.6E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

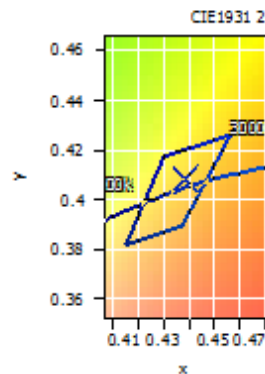
DominantWavelength	582.23 nm
Purity	0.544
PeakWavelength	601.32 nm
Radiant Power	8.919 W
Width50%:	130.72 nm

Color Coordinates

Correlated Color Temperatu 3008 K

x: 0.4388 u: 0.2497 u': 0.2497
y: 0.4088 v: 0.3490 v': 0.5235

ResultsCRICRI01	78.0	ResultsCRICRI09	-1.7
ResultsCRICRI02	87.9	ResultsCRICRI10	72.4
ResultsCRICRI03	96.4	ResultsCRICRI11	77.7
ResultsCRICRI04	78.8	ResultsCRICRI12	63.1
ResultsCRICRI05	77.9	ResultsCRICRI13	80.1
ResultsCRICRI06	84.9	ResultsCRICRI14	98.1
ResultsCRICRI07	82.6	ResultsCRICRI15	69.8
ResultsCRICRI08	56.1	ResultsCRICRI16	67.9
ResultsCRI	80.3		



PlanckDistance 1.6E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT3-45L730U	Sample ID.	B1
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

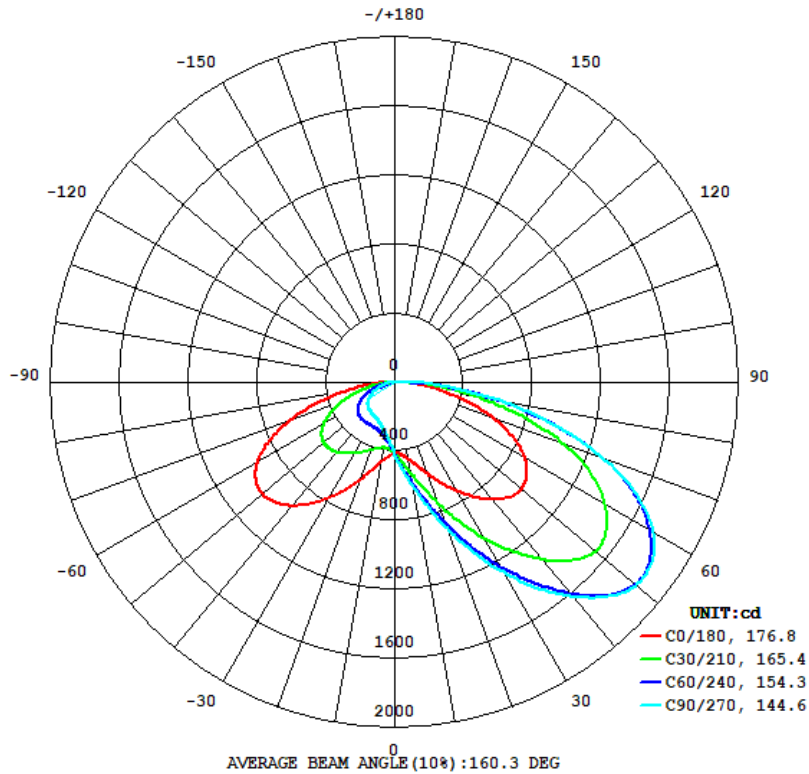
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.06	60	0.318	37.8	0.990	Light Down

Test Result

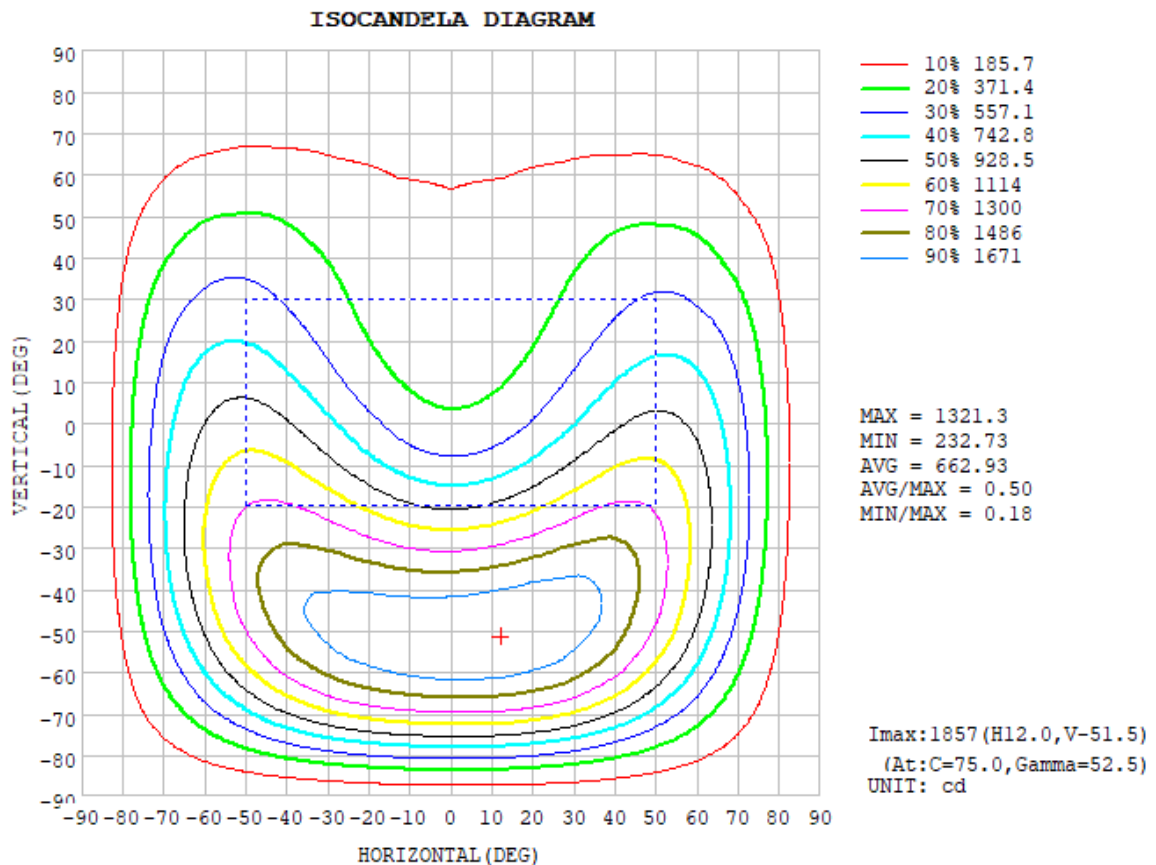
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10°)		Beam Angle(50°)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
4189	100.00%	3.78%	177.1	151.0	164.0	55.0	110.9

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

°	C0	C45	C90	C135	C180	C225	C270	C315
10	450.1	558.4	604.8	568.0	468.8	355.4	308.5	349.8
20	565.3	816.4	903.4	825.1	600.7	348.0	256.8	337.4
30	729.5	1160	1270	1154	774.4	366.5	233.8	351.5
40	888.9	1504	1623	1463	936.2	388.1	223.0	372.1
50	965.3	1714	1830	1663	1008	384.1	207.0	368.6
60	878.9	1608	1738	1596	920.7	331.0	170.0	314.3
70	614.3	1206	1292	1212	652.4	222.4	108.3	204.5
80	262.5	546.7	621.5	565.8	274.7	82.12	35.61	67.45
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							

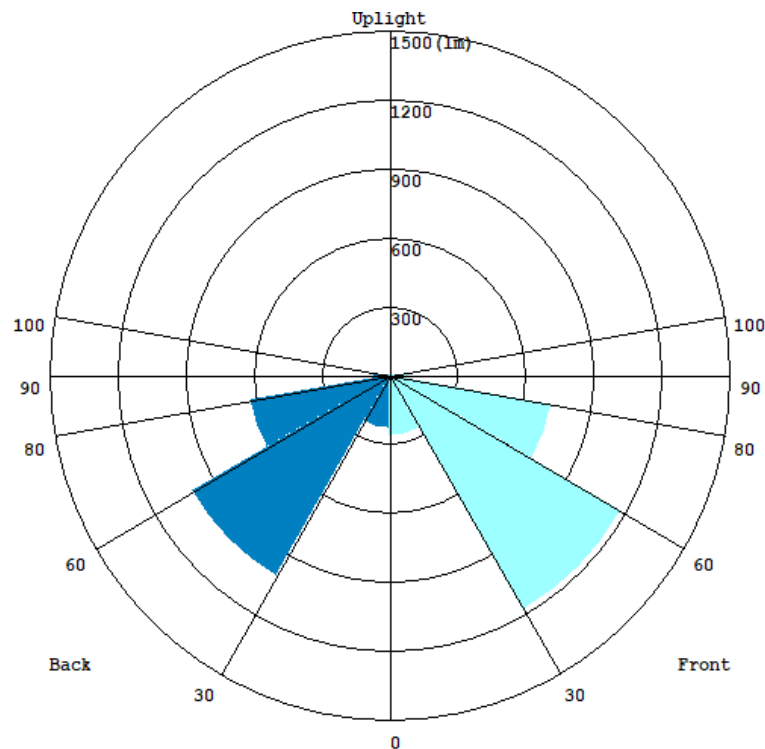
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	41.61	0 - 10	41.61	0.99%
10-20	147.52	0 - 20	189.13	4.52%
20-30	310.44	0 - 30	499.57	11.93%
30-40	530.21	0 - 40	1029.78	24.58%
40-50	759.33	0 - 50	1789.11	42.71%
50-60	890.67	0 - 60	2679.78	63.97%
60-70	820.02	0 - 70	3499.80	83.55%
70-80	530.59	0 - 80	4030.39	96.22%
80-90	158.46	0 - 90	4188.85	100.00%
90-100	0.00	0 - 100	4188.85	100.00%
100-110	0.00	0 - 110	4188.85	100.00%
110-120	0.00	0 - 120	4188.85	100.00%
120-130	0.00	0 - 130	4188.85	100.00%
130-140	0.00	0 - 140	4188.85	100.00%
140-150	0.00	0 - 150	4188.85	100.00%
150-160	0.00	0 - 160	4188.85	100.00%
160-170	0.00	0 - 170	4188.85	100.00%
170-180	0.00	0 - 180	4188.85	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	268.57	6.4
FM - Front-Medium(30-60)	1182.6	28.2
FH - Front-High(60-80)	726.16	17.3
FVH - Front-Very High(80-90)	85.868	2.0
Total Forward Light	2263.2	53.9

BL - Back-Low(0-30)	231.52	5.5
BM - Back-Medium(30-60)	1004	23.9
BH - Back-High(60-80)	627.9	14.9
BVH - Back-Very High(80-90)	74.19	1.8
Total Back Light	1937.6	46.1

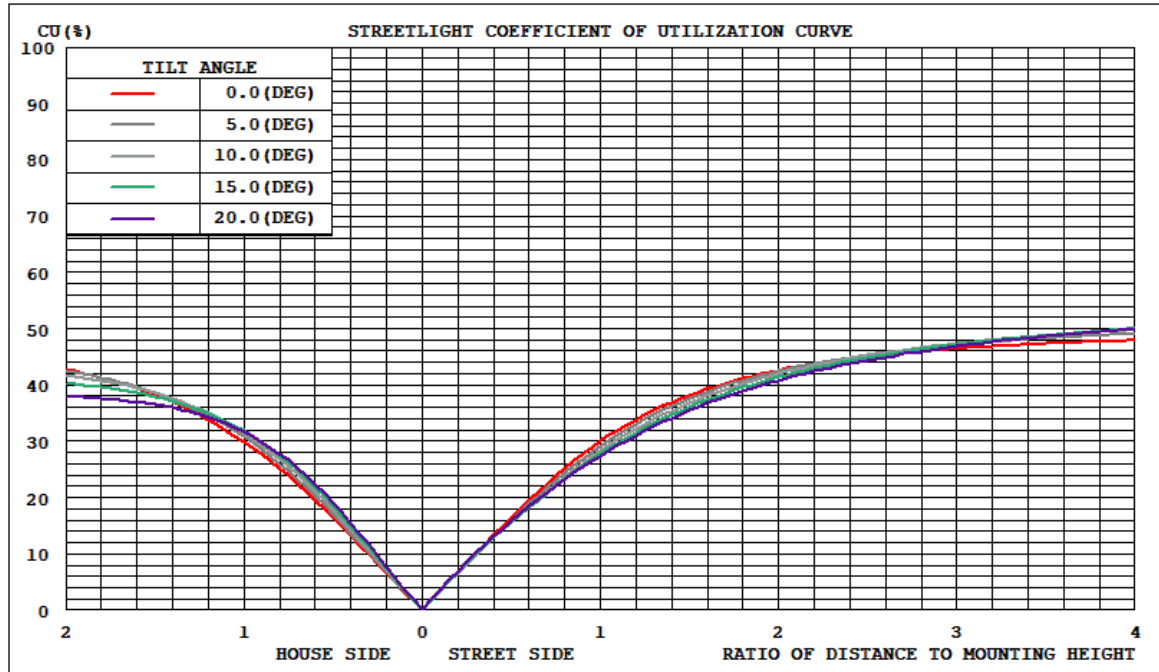
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B2-U0-G2
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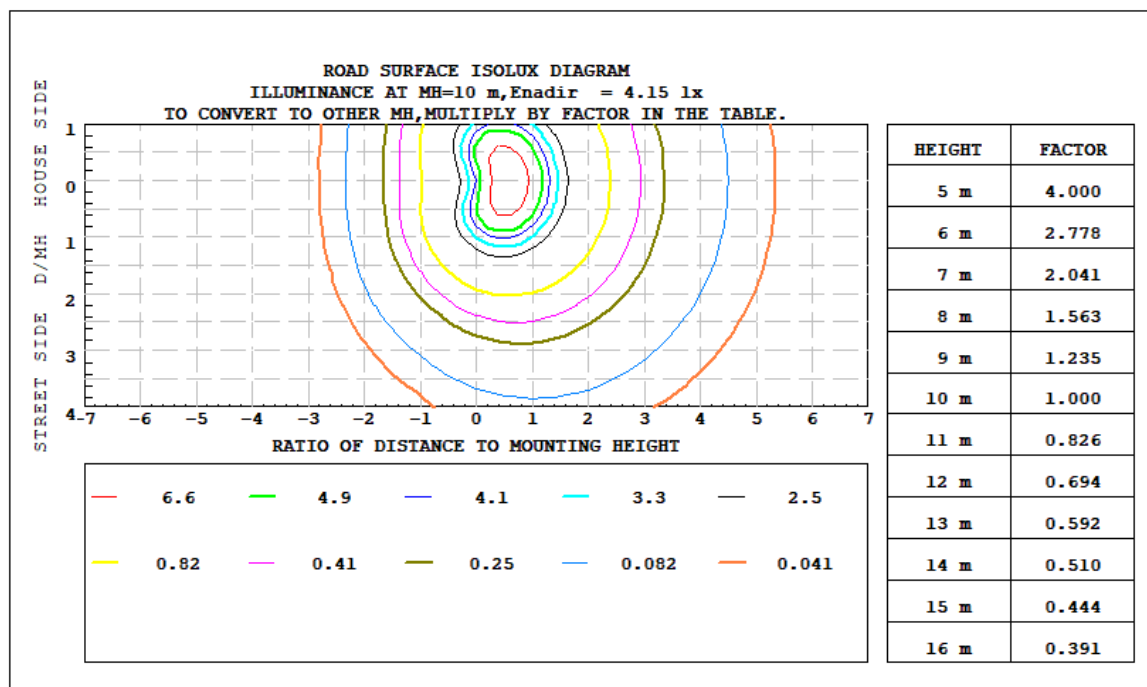
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	1937.6	0	1937.6
Street Side	2263.2	0	2263.2

3.2 Goniophotometer Test

Coefficients of Utilization

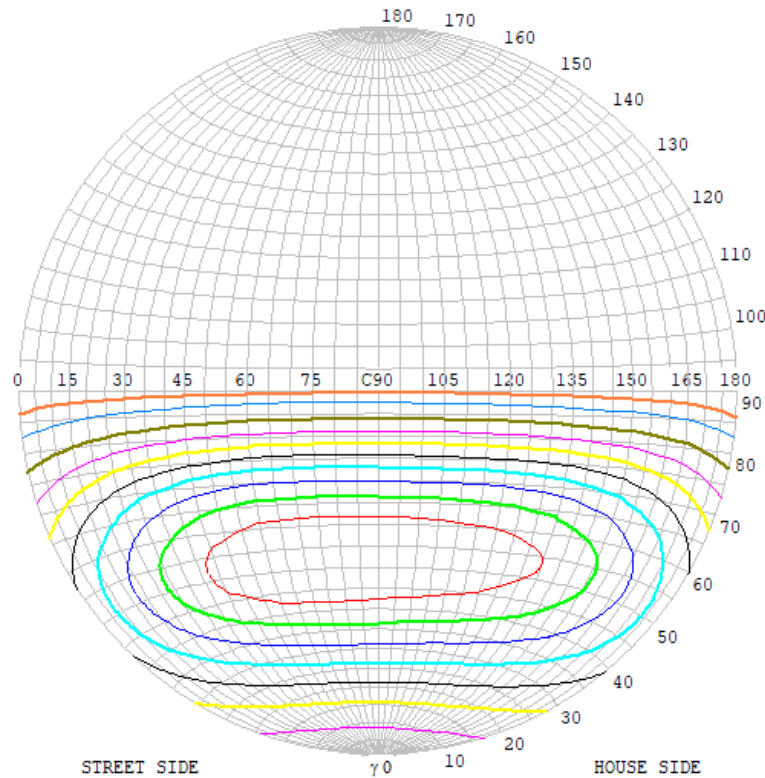


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM



Classification:

IES:Type III - Very Short

CIE:Narrow - Short

IES:Semi cut-off

CIE:Non-cut-off

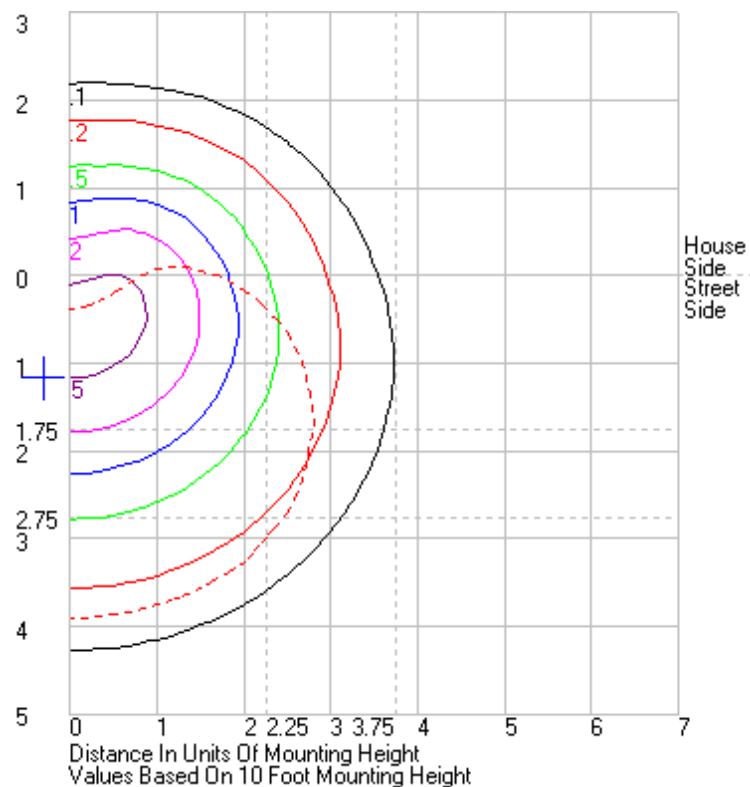
Max.At80:148.6cd/klm

Max.At90:0cd/klm

Max.80-90:148.6cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	1865
90%	1678
80%	1492
70%	1305
60%	1119
50%	932
40%	746
30%	559
20%	373
10%	186
5%	93

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT3-45L730U	Sample ID.	B1
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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	270.09	60	0.151	37.4	0.920	17.01%
25.1	119.93	60	0.318	37.8	0.990	9.36%

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*****