Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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DLF1810114-19a

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2018/10/24

Issue Date
2018/10/25

Prepared By	**Approved By**
Wangzun Zhu	Kevin Jia

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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**	**Results (Fail/Pass)**
Lamp Output (lm)	IES LM-79-2008	10000	9970	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	120	107.6	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	3.85%	P
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3091	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	80	P
Power Factor	ANSI C82.77:2014	0.873	0.963	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.23%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/24	IVATFT-100L730U	S1
2	Goniophotometer Test	2018/10/24	IVATFT-100L730U	S1
3	THD and PF Test	2018/10/24	IVATFT-100L730U	S1

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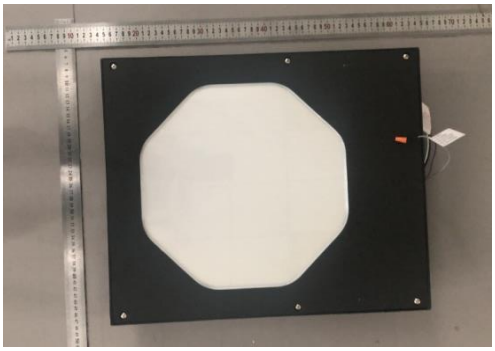
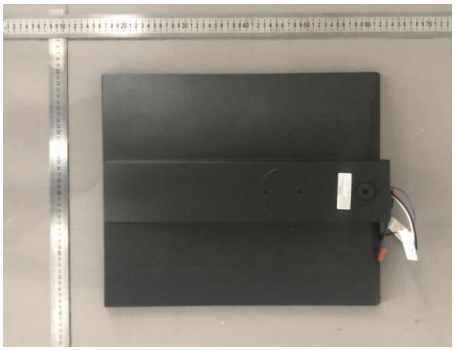
3.0 Production Description

Luminaire Description: IVATFT-100L730U

Electrical Specification: 120V-277V,50/60HZ, 100W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVATFT-100L730U	Sample ID.	S1
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	120.00	60	0.767	91.8	0.998

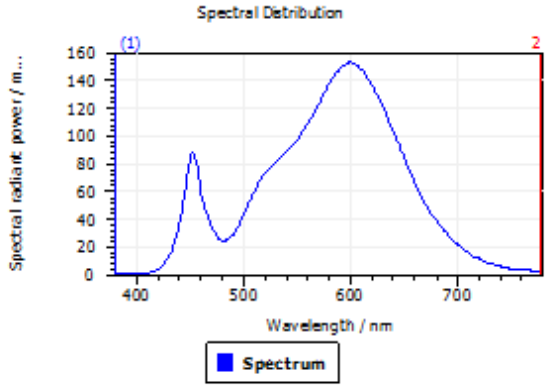
Test Result

CCT (K)	CRI (Ra)	Duv
3091	80.2	9.4E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

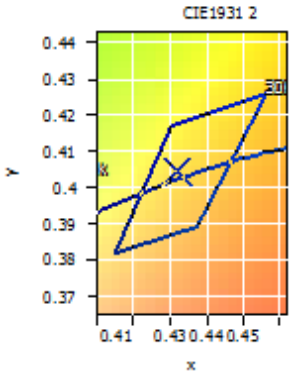
DominantWavelength	582.11 nm
Purity	0.511
PeakWavelength	599.72 nm
Radiant Power	22.7 W
Width50%:	131.19 nm

Color Coordinates

Correlated Color Temperatu 3091 K

x:	0.4319	u:	0.2471	u':	0.2471
y:	0.4046	v:	0.3472	v':	0.5208

ResultsCRICRI01	77.8	ResultsCRICRI09	-1.8
ResultsCRICRI02	87.8	ResultsCRICRI10	71.7
ResultsCRICRI03	95.9	ResultsCRICRI11	76.4
ResultsCRICRI04	78.3	ResultsCRICRI12	62.2
ResultsCRICRI05	77.7	ResultsCRICRI13	79.8
ResultsCRICRI06	84.3	ResultsCRICRI14	97.8
ResultsCRICRI07	82.9	ResultsCRICRI15	70.3
ResultsCRICRI08	56.7	ResultsCRICRI16	68.4
ResultsCRI	80.2		



PlanckDistance 9.4E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVATFT-100L730U	Sample ID.	S1
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

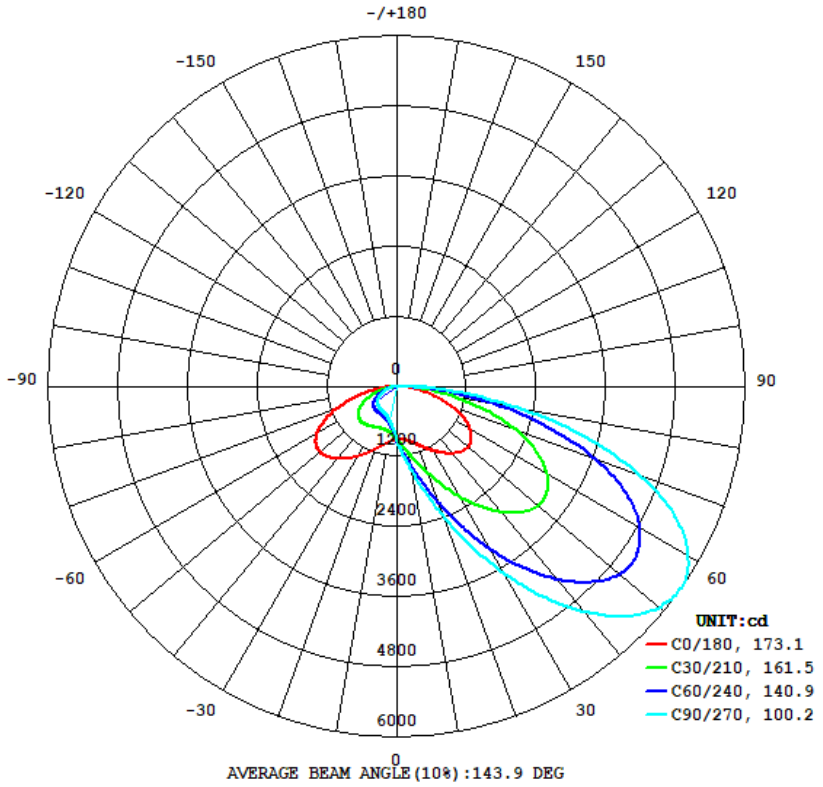
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.05	60	0.774	92.7	0.998	Light Down

Test Result

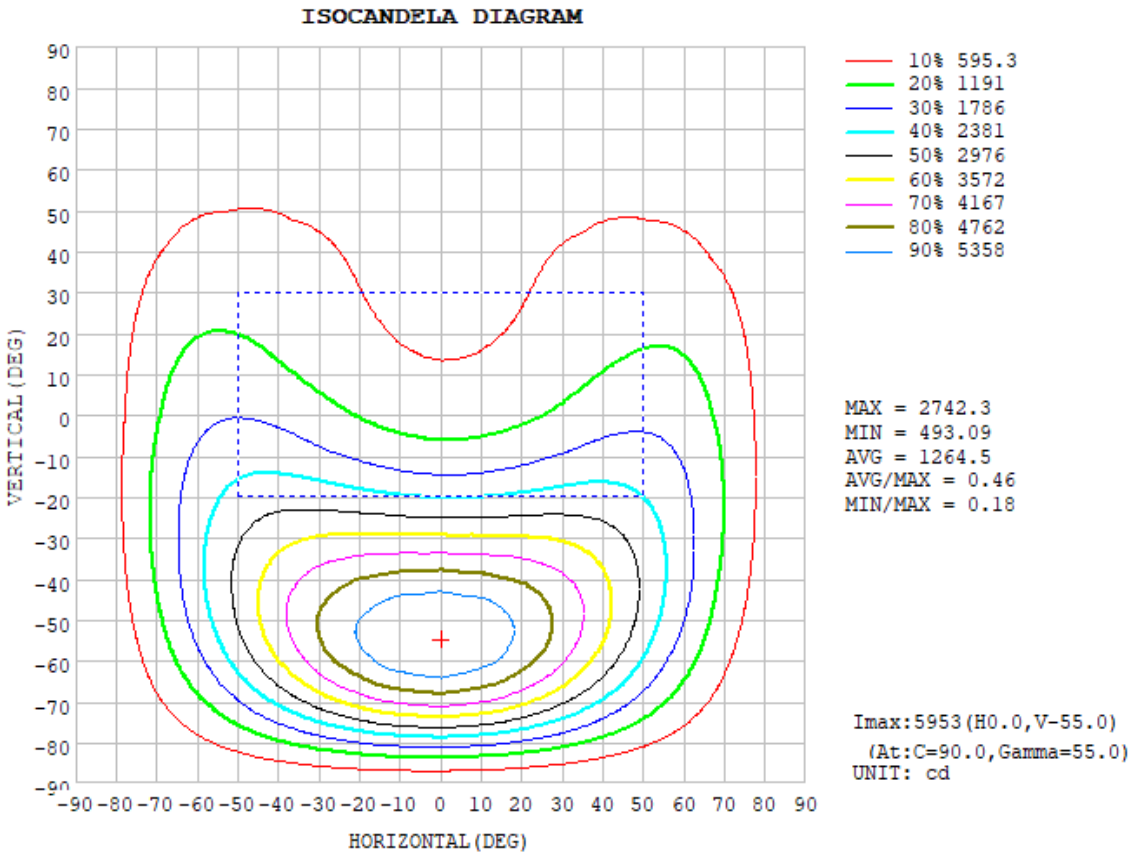
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
9970	100.00%	3.85%	175.4	108	158.6	54.2	107.6

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	938.5	1260	1426	1289	981.7	732.7	645.4	713.8
20	1069	1860	2357	1926	1149	666.1	536.0	638.2
30	1279	2715	3675	2800	1384	656.8	495.8	624.3
40	1503	3597	5031	3694	1624	668.8	479.6	637.9
50	1612	4117	5882	4258	1743	652.3	447.5	624.1
60	1472	3942	5794	4178	1590	555.1	364.4	528.9
70	1035	2942	4463	3183	1119	362.1	228.4	338.6
80	417.9	1331	2120	1491	447.2	119.7	71.57	105.7
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

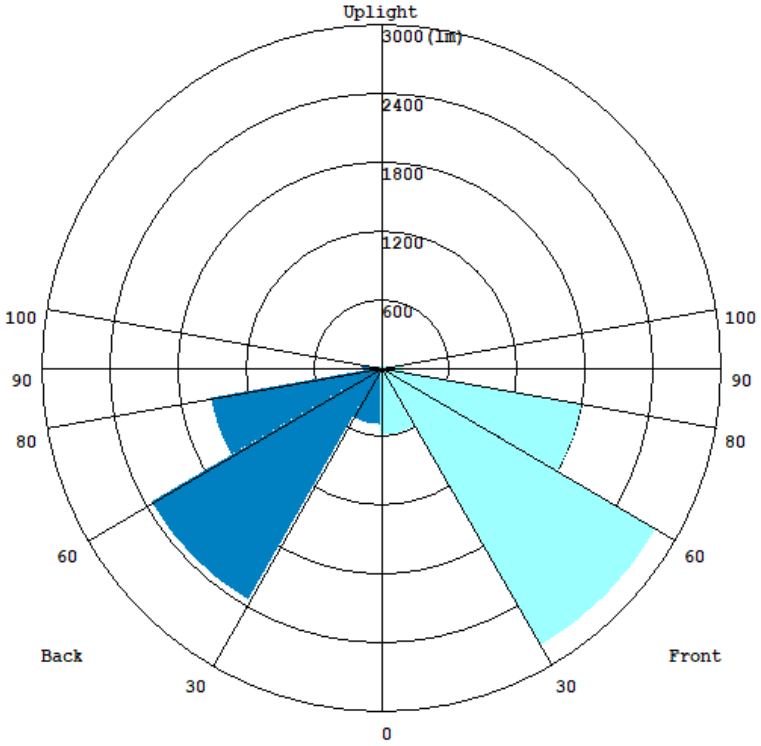
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	90.83	0 - 10	90.83	0.91%
10-20	321.96	0 - 20	412.79	4.14%
20-30	690.82	0 - 30	1103.61	11.07%
30-40	1218.74	0 - 40	2322.35	23.29%
40-50	1787.82	0 - 50	4110.17	41.23%
50-60	2144.27	0 - 60	6254.44	62.73%
60-70	2017.15	0 - 70	8271.59	82.97%
70-80	1314.79	0 - 80	9586.38	96.15%
80-90	383.43	0 - 90	9969.81	100.00%
90-100	0.00	0 - 100	9969.81	100.00%
100-110	0.00	0 - 110	9969.81	100.00%
110-120	0.00	0 - 120	9969.81	100.00%
120-130	0.00	0 - 130	9969.81	100.00%
130-140	0.00	0 - 140	9969.81	100.00%
140-150	0.00	0 - 150	9969.81	100.00%
150-160	0.00	0 - 160	9969.81	100.00%
160-170	0.00	0 - 170	9969.81	100.00%
170-180	0.00	0 - 180	9969.81	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	595.77	6.0
FM - Front-Medium(30-60)	2814.9	28.2
FH - Front-High(60-80)	1810.3	18.1
FVH - Front-Very High(80-90)	205.07	2.1
Total Forward Light	5426	54.3

BL - Back-Low(0-30)	508.04	5.1
BM - Back-Medium(30-60)	2347.3	23.5
BH - Back-High(60-80)	1529.3	15.3
BVH - Back-Very High(80-90)	179.22	1.8
Total Back Light	4563.9	45.7

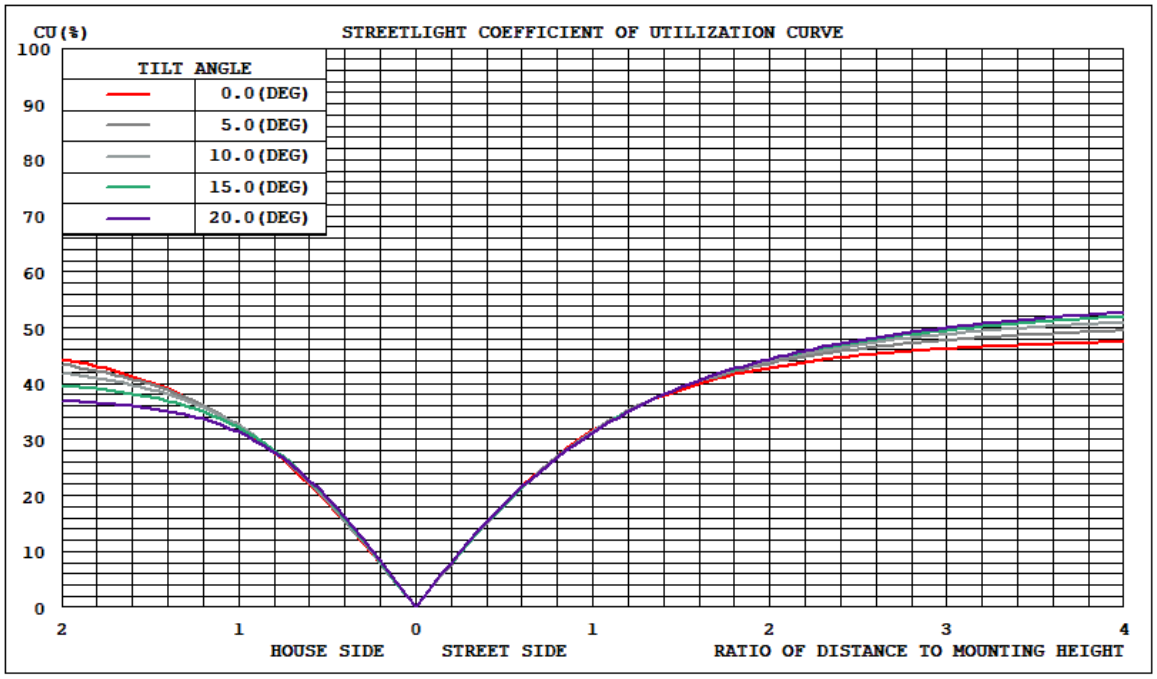
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

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

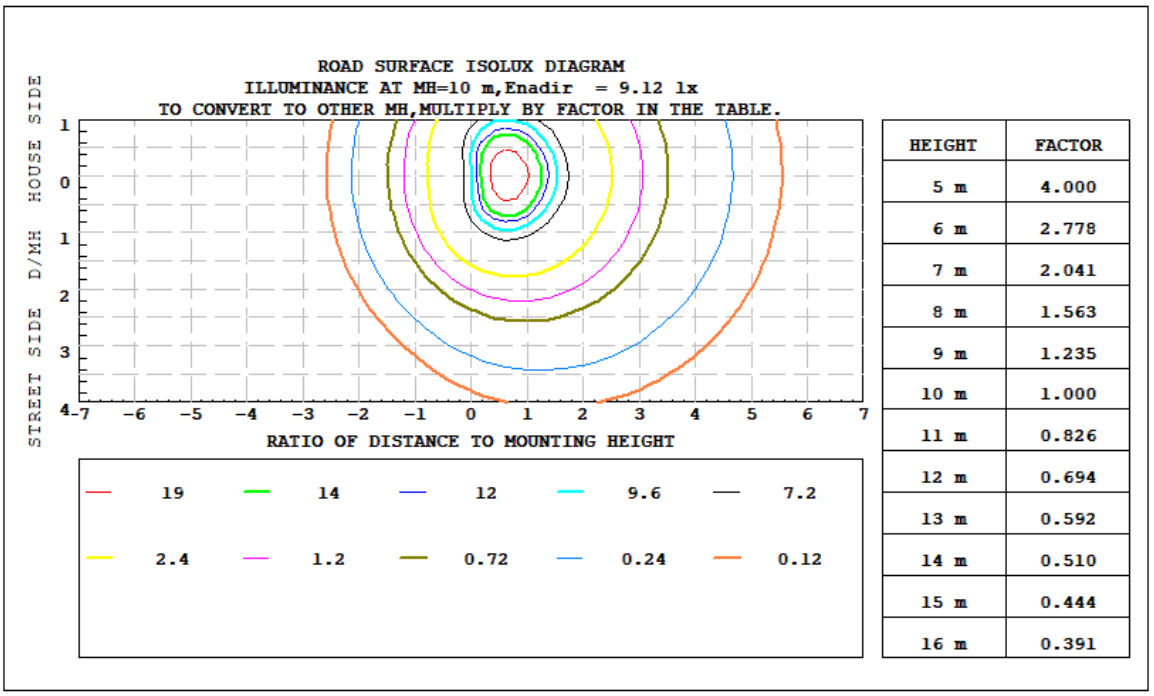
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4563.9	0	4563.9
Street Side	5426	0	5426

3.2 Goniophotometer Test

Coefficients of Utilization



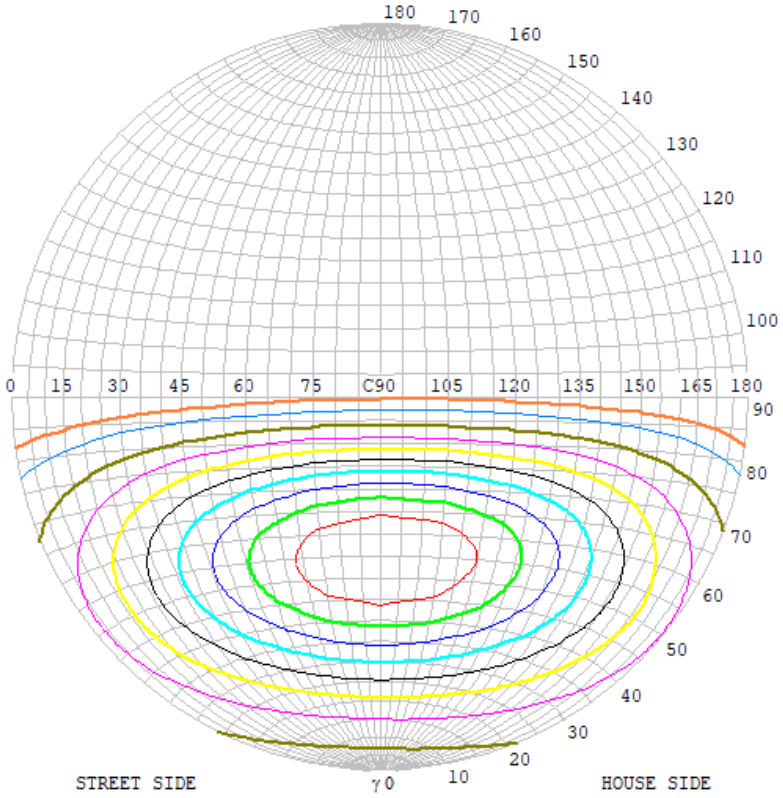
Iso-footcandle Lines of Horizontal Illumination



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

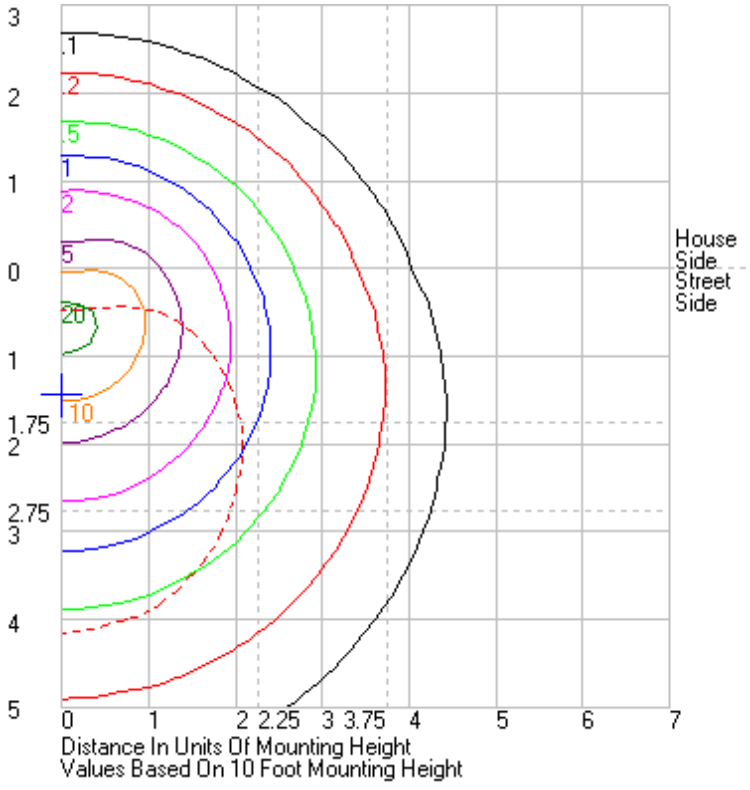


Classification:

IES:Type II – Very Short
CIE:Narrow – Short
IES:None cut-off
CIE:Non-cut-off
Max.At80:212.2cd/klm
Max.At90:0cd/klm
Max.80-90:212.2cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	5986
90%	5387
80%	4789
70%	4190
60%	3592
50%	2993
40%	2394
30%	1796
20%	1197
10%	599
5%	299

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVATFT-100L730U	Sample ID.	S1

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	277.03	60	0.336	89.7	0.963	9.23%
25.1	120.00	60	0.767	91.8	0.998	4.67%

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**********