

Photometric Test Report

Relevant Standards

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

Prepared For

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Prepared By



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Approved By



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
Lamp Output (lm)	IES LM-79-2008	10000	14174
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	116.4	122.0
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.43%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3910
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	72
Power Factor	ANSI C82.77:2014	0.873	0.968
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.11%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/30	IVAT4-130L740U	U1
2	Goniophotometer Test	2018/10/30	IVAT4-130L740U	U1
3	THD and PF Test	2018/10/30	IVAT4-130L740U	U1

Remark(If any)

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3.0 Production Description

Luminaire Description: IVAT4-130L740U

Electrical Specification: 120V-277V,50/60HZ, 130W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT4-130L740U	Sample ID.	U1
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	120.02	60	0.977	117.1	0.998

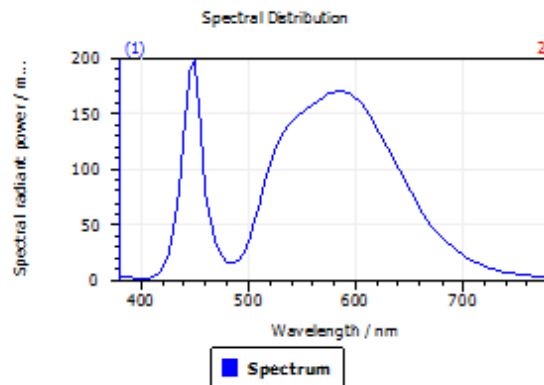
Test Result

CCT (K)	CRI (Ra)	Duv
3910	72.2	1.3E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	579.48 nm
Purity	0.291
PeakWavelength	448.21 nm
Radiant Power	28.65 W
Width50%	21.69 nm

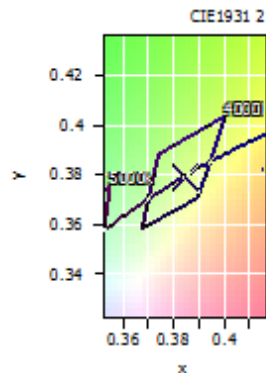
Color Coordinates

Correlated Color Temperature 3910 K

x: 0.3844 u: 0.2269 u': 0.2269
y: 0.3789 v: 0.3354 v': 0.5031

ResultsCRICRI01	70.6	ResultsCRICRI09	-16.7
ResultsCRICRI02	77.6	ResultsCRICRI10	45.5
ResultsCRICRI03	81.6	ResultsCRICRI11	67.3
ResultsCRICRI04	72.3	ResultsCRICRI12	38.1
ResultsCRICRI05	69.4	ResultsCRICRI13	71.1
ResultsCRICRI06	67.7	ResultsCRICRI14	89.1
ResultsCRICRI07	81.5	ResultsCRICRI15	65.3
ResultsCRICRI08	57.2	ResultsCRICRI16	67.7

ResultsCRI 72.2



PlanckDistance 1.3E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT4-130L740U	Sample ID.	U1
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

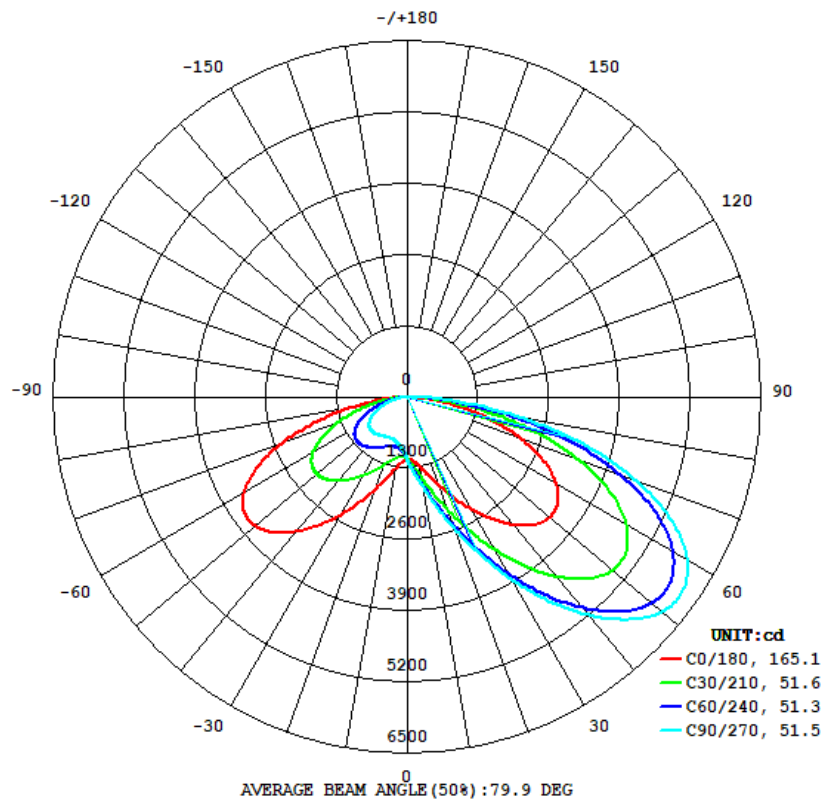
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.03	60	0.970	116.2	0.998	Light Down

Test Result

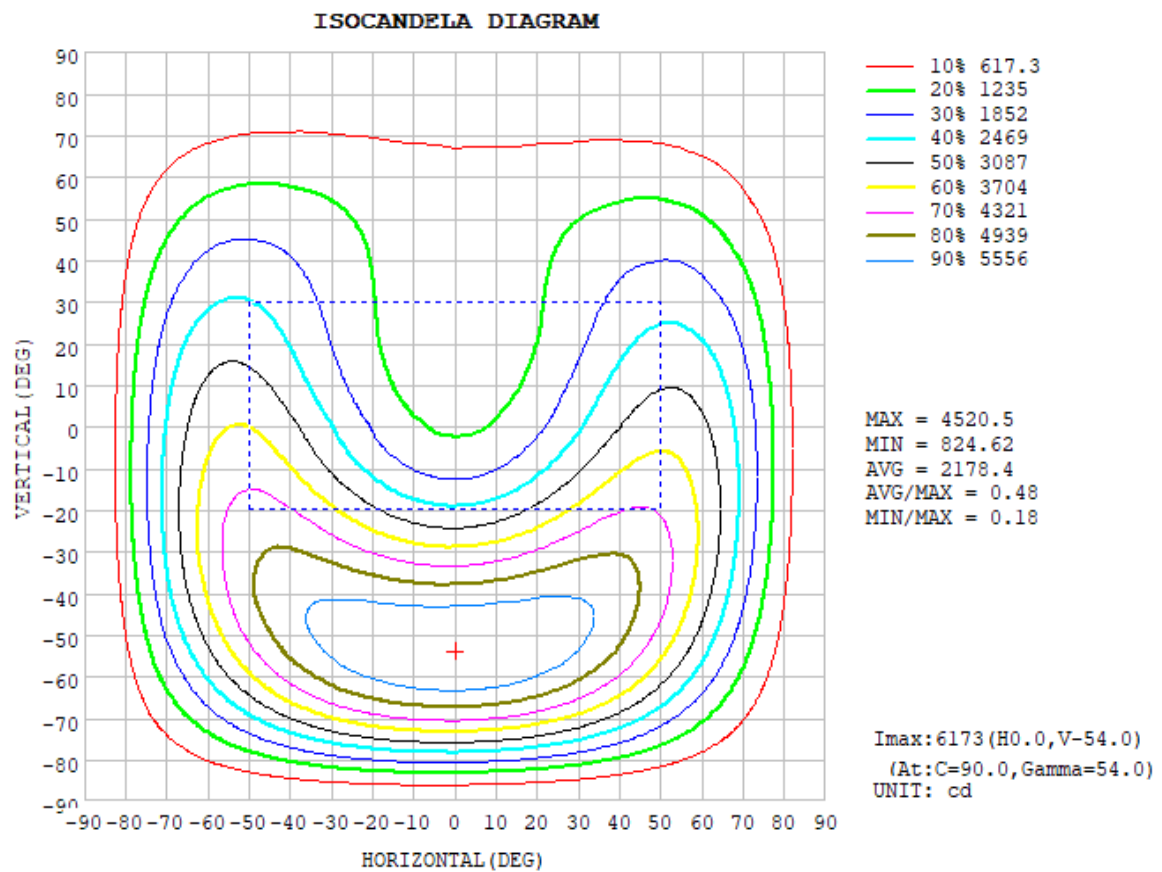
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
14174	100.00%	3.43%	179	153.9	165.4	53.1	122.0

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd									
	C0	C45	C90	C135	C180	C225	C270	C315		
γ										
10	1276	1548	1643	1552	1323	1030	899.0	1013		
20	1716	2362	2555	2337	1798	1124	827.8	1074		
30	2369	3520	3835	3448	2479	1324	846.2	1238		
40	3047	4746	5195	4649	3206	1536	899.7	1423		
50	3418	5494	6093	5503	3665	1628	906.1	1488		
60	3168	5248	5943	5408	3464	1458	786.4	1310		
70	2224	3841	4487	4089	2463	997.9	516.8	869.1		
80	868.7	1652	2069	1873	967.3	356.8	168.8	289.0		
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		

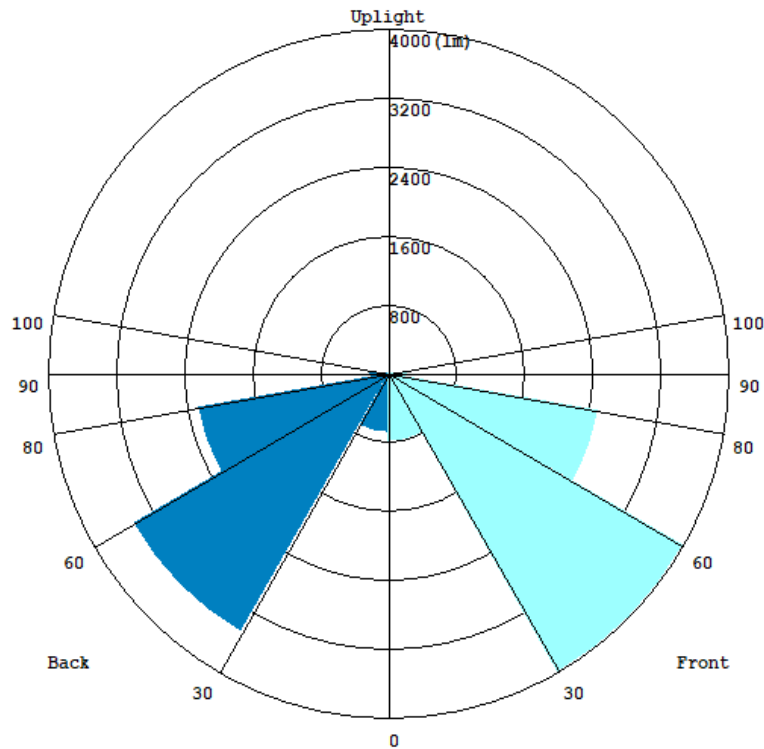
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	115.49	0 - 10	115.49	0.81%
10-20	426.65	0 - 20	542.14	3.82%
20-30	952.44	0 - 30	1494.58	10.54%
30-40	1727.47	0 - 40	3222.05	22.73%
40-50	2585.76	0 - 50	5807.81	40.97%
50-60	3123.11	0 - 60	8930.92	63.01%
60-70	2910.59	0 - 70	11841.51	83.54%
70-80	1846.55	0 - 80	13688.06	96.57%
80-90	486.35	0 - 90	14174.41	100.00%
90-100	0.00	0 - 100	14174.41	100.00%
100-110	0.00	0 - 110	14174.41	100.00%
110-120	0.00	0 - 120	14174.41	100.00%
120-130	0.00	0 - 130	14174.41	100.00%
130-140	0.00	0 - 140	14174.41	100.00%
140-150	0.00	0 - 150	14174.41	100.00%
150-160	0.00	0 - 160	14174.41	100.00%
160-170	0.00	0 - 170	14174.41	100.00%
170-180	0.00	0 - 180	14174.41	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	805.56	5.7
FM - Front-Medium(30-60)	3994.3	28.1
FH - Front-High(60-80)	2504.6	17.6
FVH - Front-Very High(80-90)	235.74	1.7
Total Forward Light	7540.2	53.1

BL - Back-Low(0-30)	690.01	4.9
BM - Back-Medium(30-60)	3467.6	24.4
BH - Back-High(60-80)	2268.2	16.0
EVH - Back-Very High(80-90)	229.34	1.6
Total Back Light	6655.1	46.9

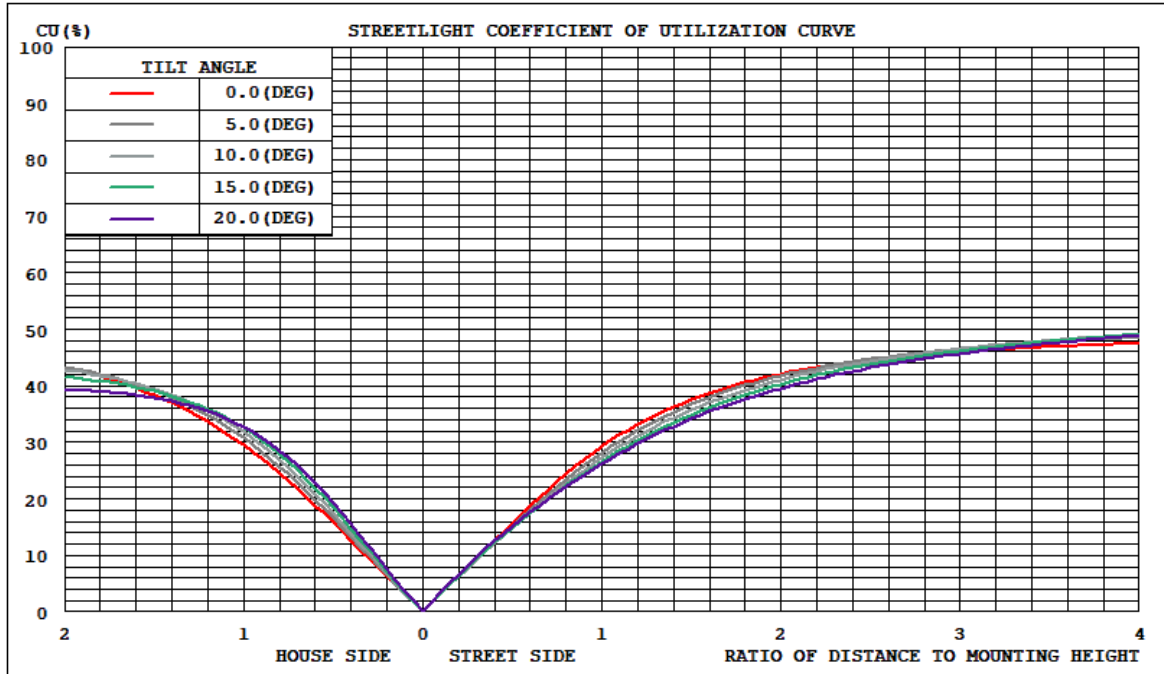
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3
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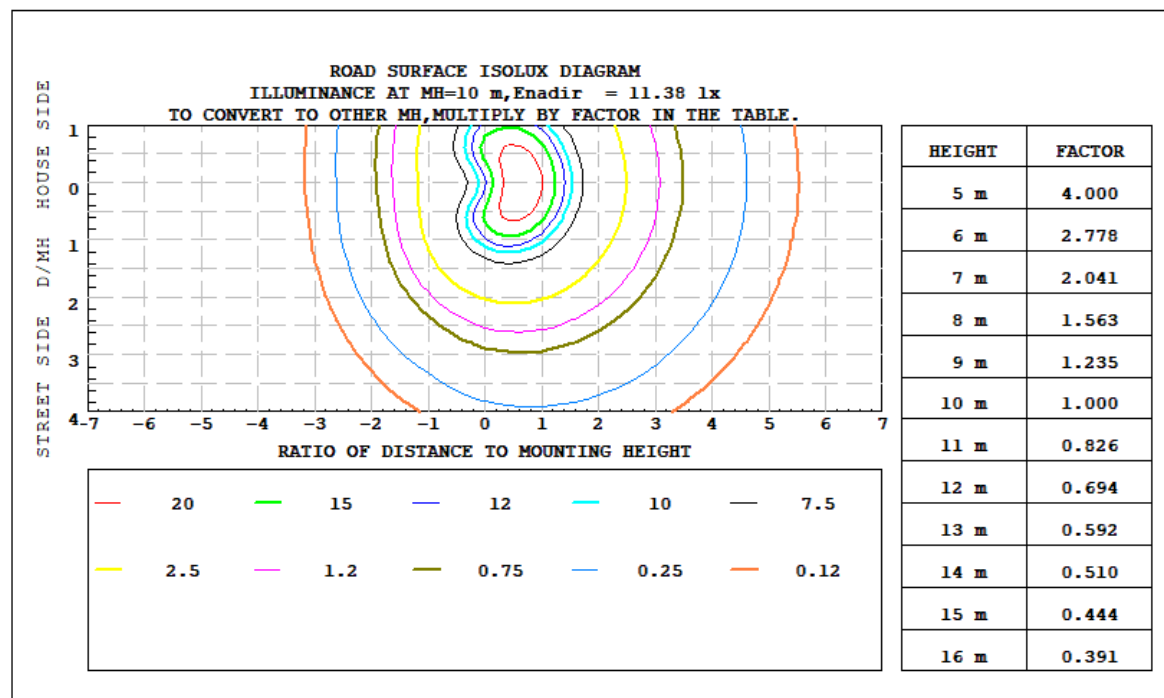
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	6655.1	0	6655.1
Street Side	7540.2	0	7540.2

3.2 Goniophotometer Test

Coefficients of Utilization

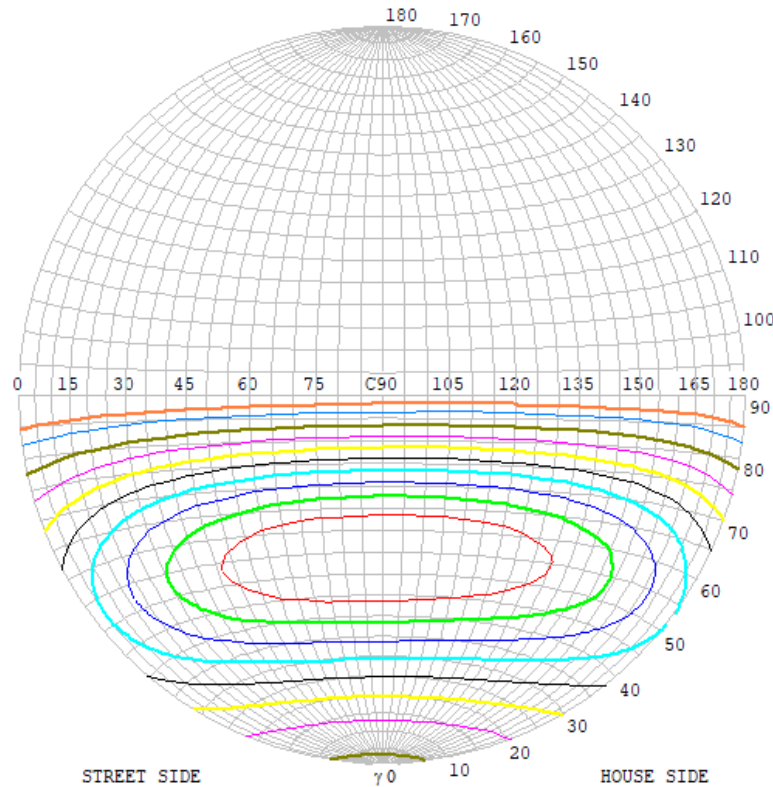


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

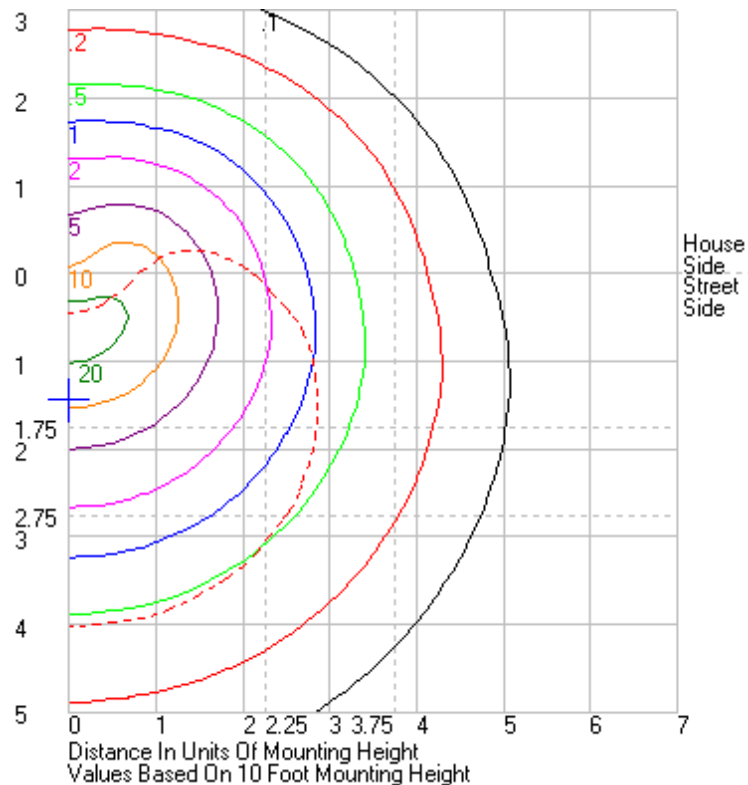


Classification:

IES:Type III - Very Short
CIE:Narrow - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:145.8cd/klm
Max.At90:0cd/klm
Max.80-90:145.8cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
I _{max} =100%	6183
90%	5565
80%	4947
70%	4328
60%	3710
50%	3092
40%	2473
30%	1855
20%	1237
10%	618
5%	309

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT4-130L740U	Sample ID.	U1
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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	277.04	60	0.420	112.7	0.968	7.11%
25.1	120.02	60	0.977	117.1	0.998	5.13%

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*****