Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road,Shanghai ,China

Xiao Xiang,15921313292,gary.xiao@rabweb.com

Prepared By

Deliver Co.， Ltd.
Block 11, 78 Keling Road, SSTP, Suzhou, China
0512-66801950,kevin.jia@szdeliver.com

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2018/10/25

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

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	9588	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	105.3	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	3.48%	P
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3093	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	81	P
Power Factor	ANSI C82.77:2014	0.873	0.963	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.86%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/24	IVAT3-100L730U	P1
2	Goniophotometer Test	2018/10/24	IVAT3-100L730U	P1
3	THD and PF Test	2018/10/24	IVAT3-100L730U	P1

Remark(If any)
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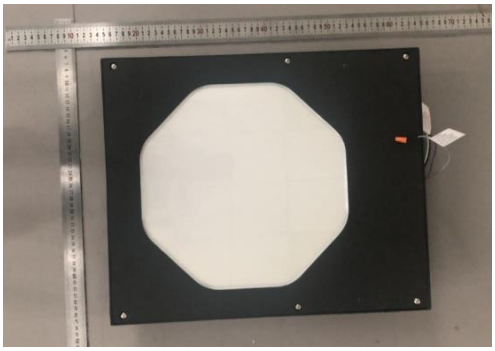
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

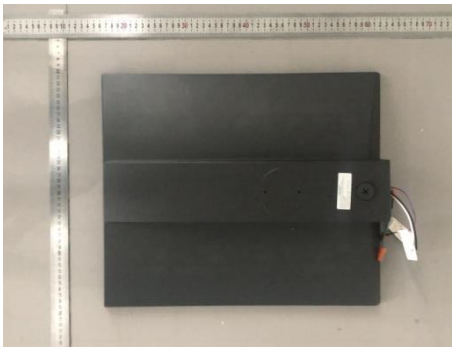
3.0 Production Description

Luminaire Description: IVAT3-100L730U

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.	IVAT3-100L730U	Sample ID.	P1
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	120.06	60	0.772	92.5	0.998

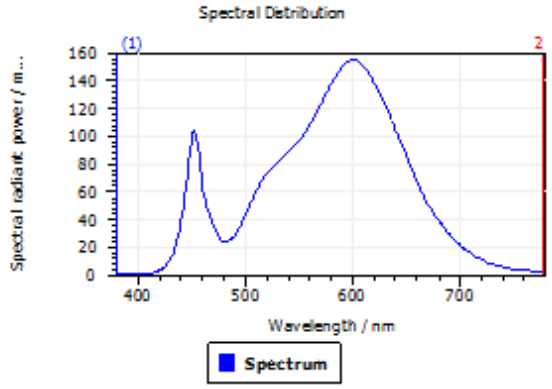
Test Result

CCT (K)	CRI (Ra)	Duv
3093	80.7	1.2E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

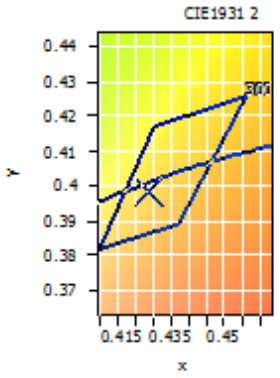
DominantWavelength	582.88 nm
Purity	0.482
PeakWavelength	600.30 nm
Radiant Power	23 W
Width50%:	130.43 nm

Color Coordinates

Correlated Color Temperatu 3093 K

x:	0.4288	u:	0.2478	u':	0.2478
y:	0.3982	v:	0.3452	v':	0.5178

ResultsCRICRI01	78.8	ResultsCRICRI09	0.6
ResultsCRICRI02	88.7	ResultsCRICRI10	73.8
ResultsCRICRI03	95.8	ResultsCRICRI11	77.2
ResultsCRICRI04	78.7	ResultsCRICRI12	63.9
ResultsCRICRI05	78.8	ResultsCRICRI13	81.0
ResultsCRICRI06	85.5	ResultsCRICRI14	97.9
ResultsCRICRI07	82.3	ResultsCRICRI15	71.7
ResultsCRICRI08	57.1	ResultsCRICRI16	69.7
ResultsCRI	80.7		



PlanckDistance 1.2E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT3-100L730U	Sample ID.	P1
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

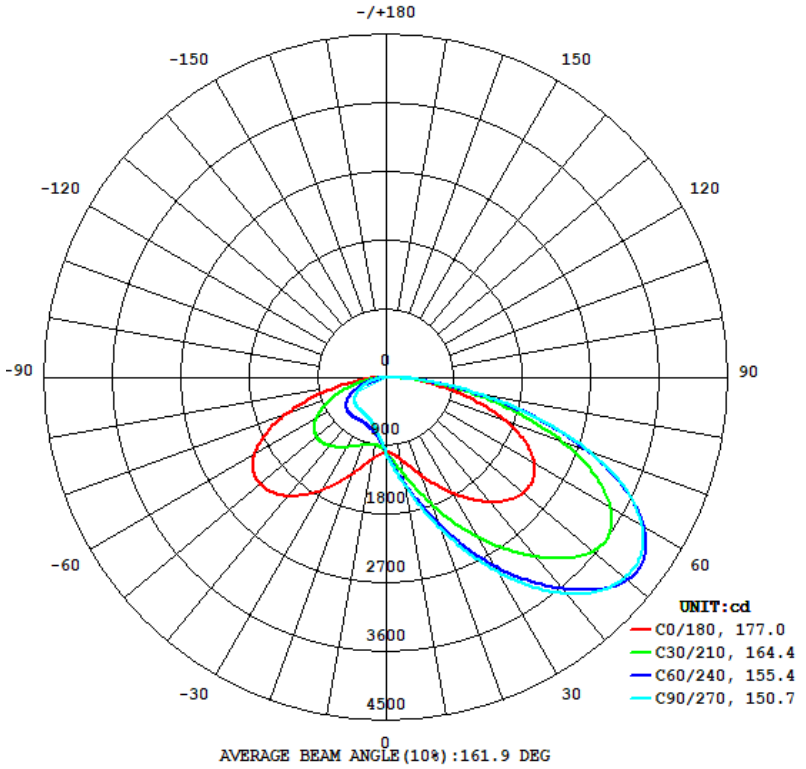
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.03	60	0.761	91.1	0.997	Light Down

Test Result

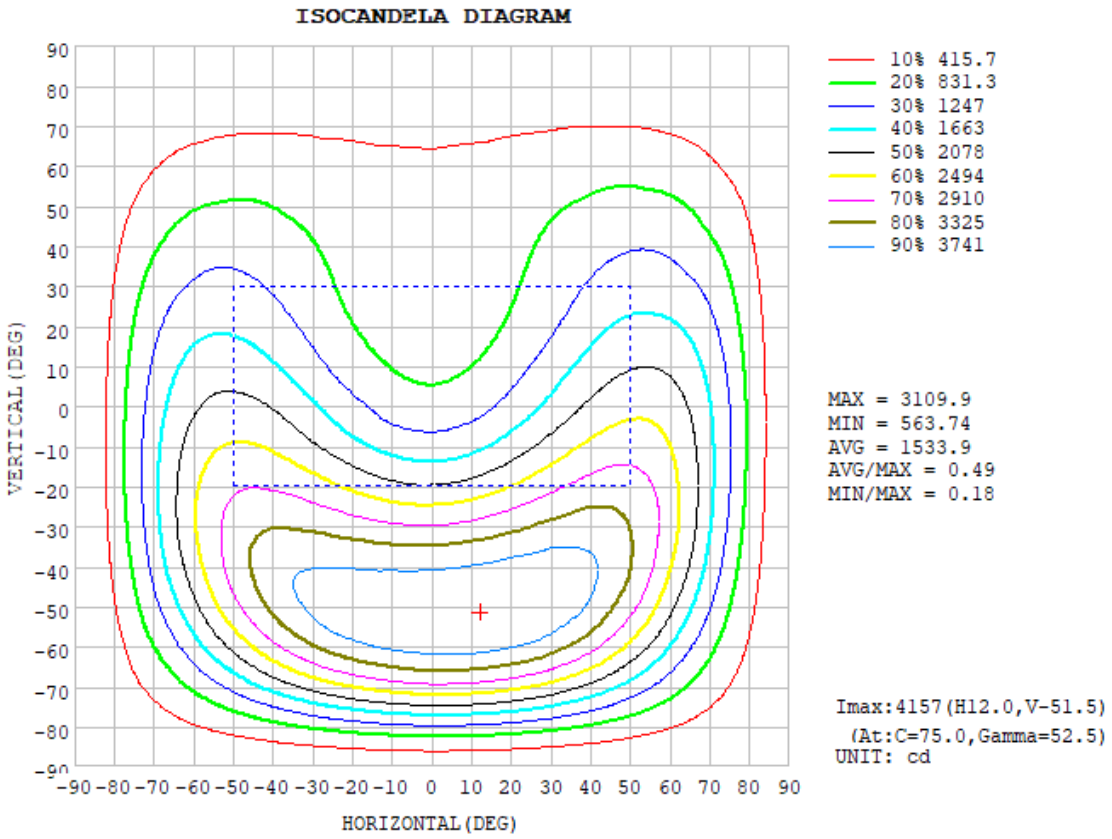
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
9588	100.00%	3.48%	176.9	150.7	164	55.7	105.3

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd											
γ	C0	C45	C90	C135	C180	C225	C270	C315				
10	1089	1341	1429	1319	1087	829.4	731.2	843.7				
20	1371	1932	2110	1870	1351	797.9	611.2	824.8				
30	1758	2679	2944	2573	1705	828.3	566.3	865.9				
40	2139	3417	3706	3242	2035	879.1	556.9	926.7				
50	2355	3945	4090	3707	2175	884.8	538.6	945.6				
60	2258	3761	3894	3505	2002	779.7	467.0	845.7				
70	1685	2702	2847	2492	1406	538.0	322.4	596.4				
80	763.2	1142	1228	1027	568.4	212.2	130.4	247.7				
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				

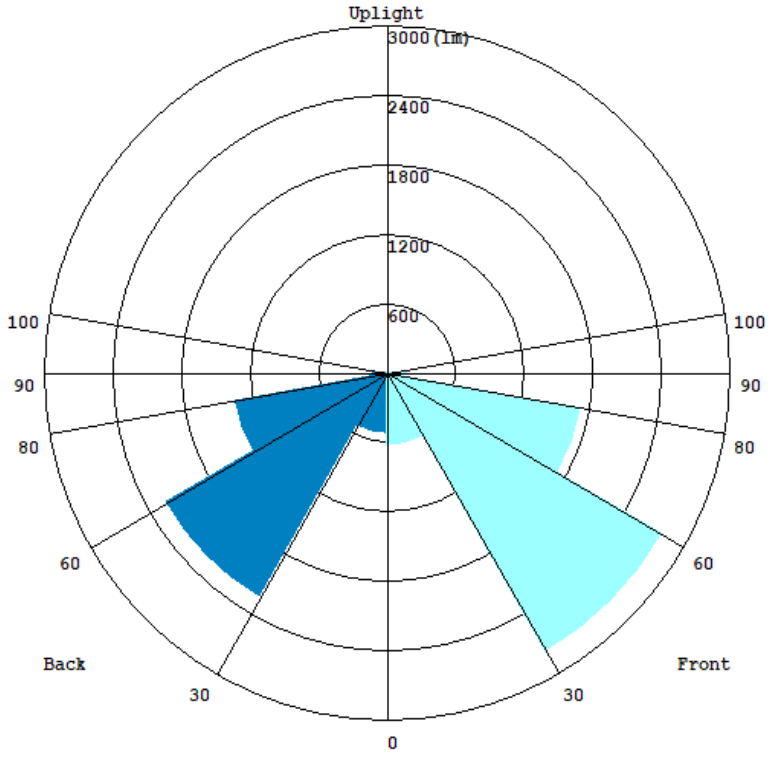
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	98.71	0 - 10	98.71	1.03%
10-20	346.57	0 - 20	445.28	4.64%
20-30	719.70	0 - 30	1164.98	12.15%
30-40	1216.66	0 - 40	2381.64	24.84%
40-50	1735.79	0 - 50	4117.43	42.94%
50-60	2057.53	0 - 60	6174.96	64.40%
60-70	1892.76	0 - 70	8067.72	84.15%
70-80	1186.71	0 - 80	9254.43	96.52%
80-90	333.28	0 - 90	9587.71	100.00%
90-100	0.00	0 - 100	9587.71	100.00%
100-110	0.00	0 - 110	9587.71	100.00%
110-120	0.00	0 - 120	9587.71	100.00%
120-130	0.00	0 - 130	9587.71	100.00%
130-140	0.00	0 - 140	9587.71	100.00%
140-150	0.00	0 - 150	9587.71	100.00%
150-160	0.00	0 - 160	9587.71	100.00%
160-170	0.00	0 - 170	9587.71	100.00%
170-180	0.00	0 - 180	9587.71	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	638.94	6.7
FM - Front-Medium(30-60)	2783	29.0
FH - Front-High(60-80)	1732.4	18.0
FVH - Front-Very High(80-90)	186.96	1.9
Total Forward Light	5341.3	55.6

BL - Back-Low(0-30)	527.18	5.5
BM - Back-Medium(30-60)	2242.2	23.3
BH - Back-High(60-80)	1355.8	14.1
BVH - Back-Very High(80-90)	138.9	1.4
Total Back Light	4264	44.4

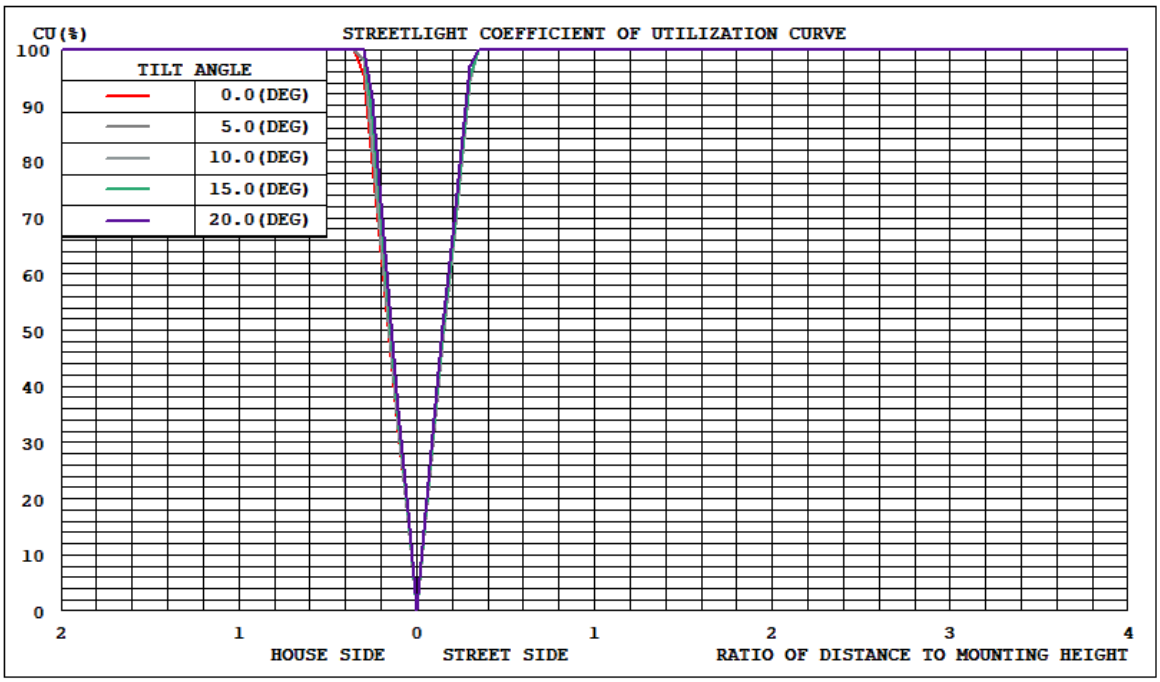
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

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

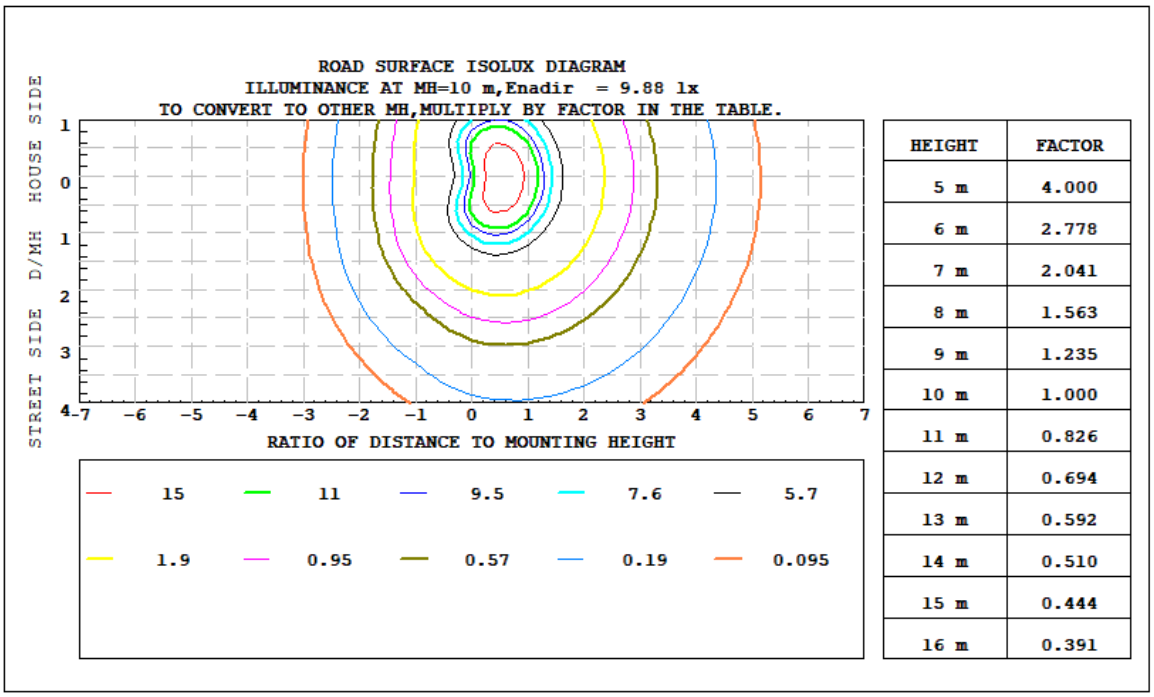
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4264	0	4264
Street Side	5341.3	0	5341.3

3.2 Goniophotometer Test

Coefficients of Utilization



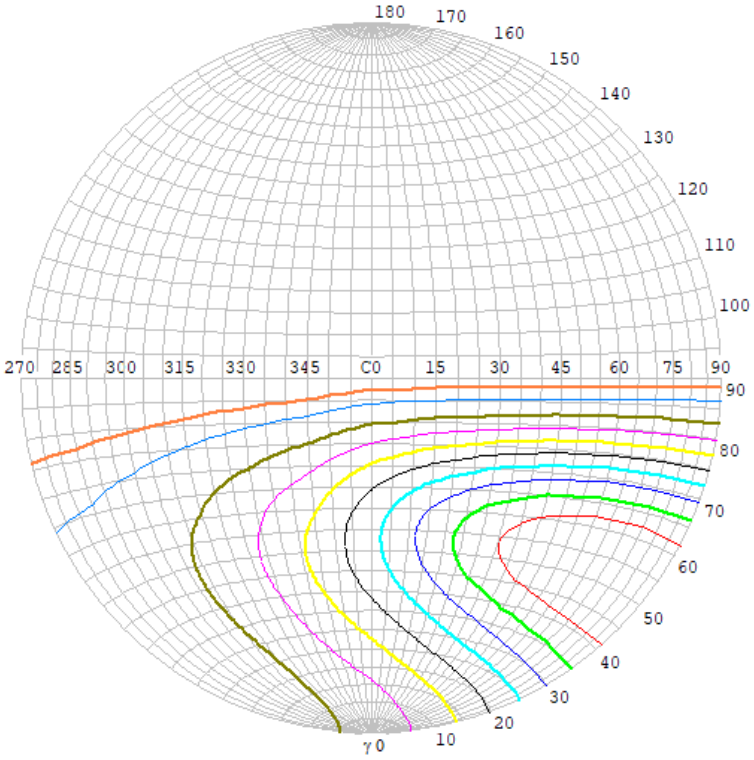
Iso-footcandle Lines of Horizontal Illumination



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

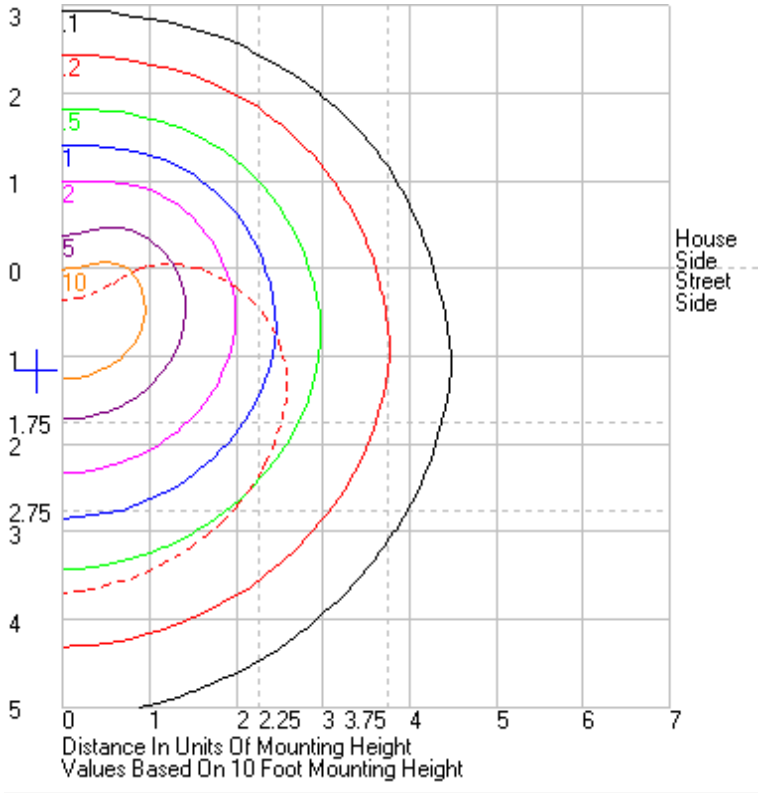


Classification:

IES:Type III – Very Short
CIE:Narrow – Short
IES:None cut-off
CIE:Non-cut-off
Max.At80:1228cd/klm
Max.At90:0cd/klm
Max.80-90:1228cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	4175
90%	3757
80%	3340
70%	2922
60%	2505
50%	2087
40%	1670
30%	1252
20%	835
10%	417
5%	209

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT3-100L730U	Sample ID.	P1

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	277.01	60	0.336	89.7	0.963	8.86%
25.1	120.06	60	0.772	92.5	0.998	4.51%

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**********