Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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Project Number
DLF1812112

Data Number
DLF1812112-4a

Test Date
2018/12/14

Issue Date
2018/12/15

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1.0 Test Summary

DLC Technical Requirements v4.4

Outdoor - Low Output Parking Garage Luminaire			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	2000	3740
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	122.3
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	⩾30%	34.59%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	⩽25%	14.46%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	30.6
Input Voltage	IES LM-79-2008	Wrost Case	480
Input Current	IES LM-79-2008	Wrost Case	0.067
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3052
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	72
Power Factor	ANSI C82.77:2014	0.873	0.958
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	29.38%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/12/14	IVGT5CU-30L730W4	D1
2	Goniophotometer Test	2018/12/14	IVGT5CU-30L730W4	D1
3	THD and PF Test	2018/12/14	IVGT5CU-30L730W4	D1

Remark(If any)
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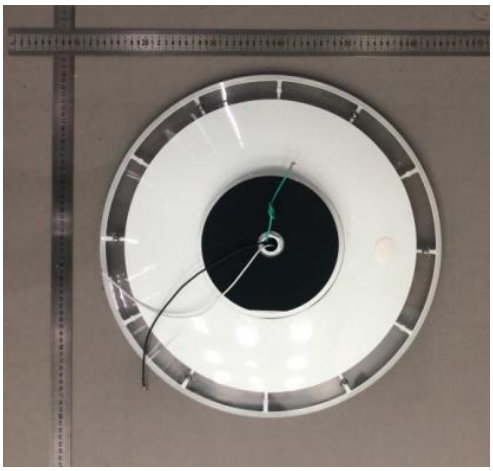
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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: IVGT5CU-30L730W4

Electrical Specification: 480V,50/60HZ, 30W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5CU-30L730W4	Sample ID.	D1
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	479.97	60	0.067	30.7	0.958

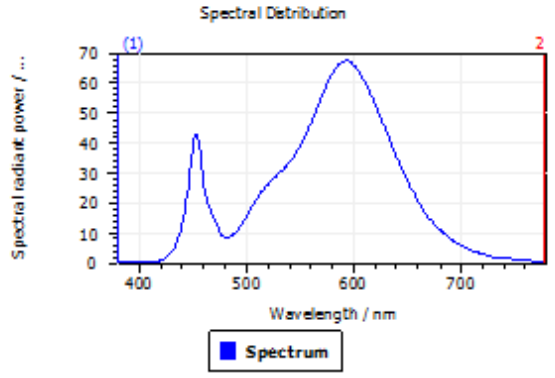
Test Result

CCT (K)	CRI (Ra)	Duv
3052	71.6	1.3E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

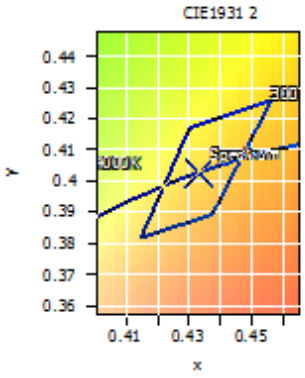
Spectral values

DominantWavelength	582.65 nm
Purity	0.508
PeakWavelength	593.06 nm
Width50%:	102.37 nm

Color Coordinates

Correlated Color Temperatu		3052 K			
x:	0.4331	u:	0.2488	u':	0.2488
y:	0.4024	v:	0.3468	v':	0.5202

CRI01	67.7	CRI09	-40.3
CRI02	84.2	CRI10	64.8
CRI03	93.7	CRI11	61.4
CRI04	65.8	CRI12	52.8
CRI05	67.6	CRI13	71.2
CRI06	78.7	CRI14	96.9
CRI07	75.3	CRI15	58.6
CRI08	39.5	CRI16	56.1
ResultsCRI	71.6		



PlanckDistance 1.3E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5CU-30L730W4	Sample ID.	D1
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

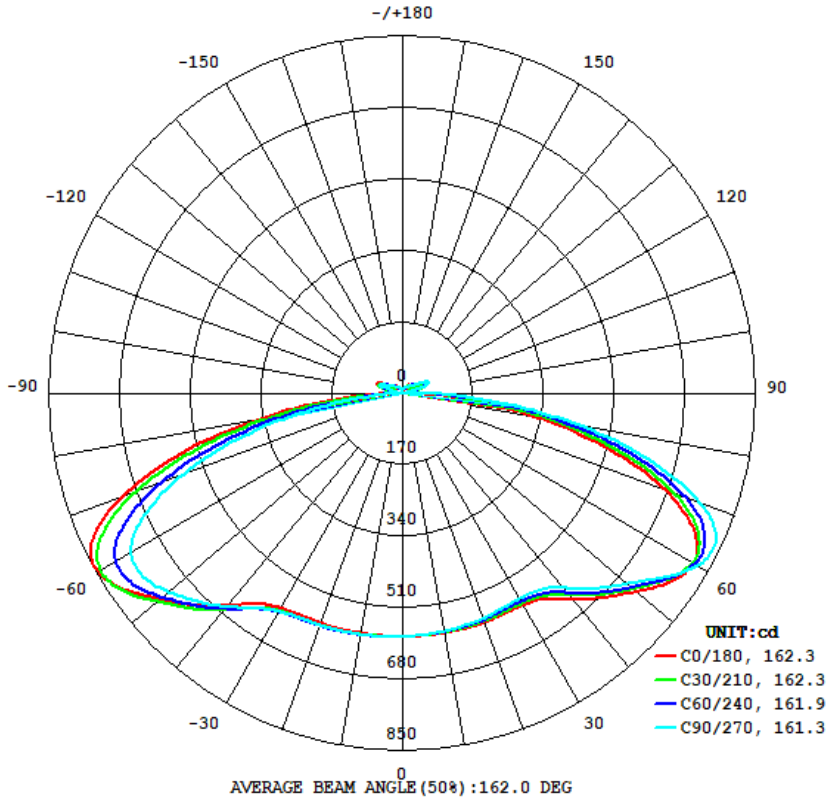
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.99	60	0.067	30.6	0.956	Light Down

Test Result

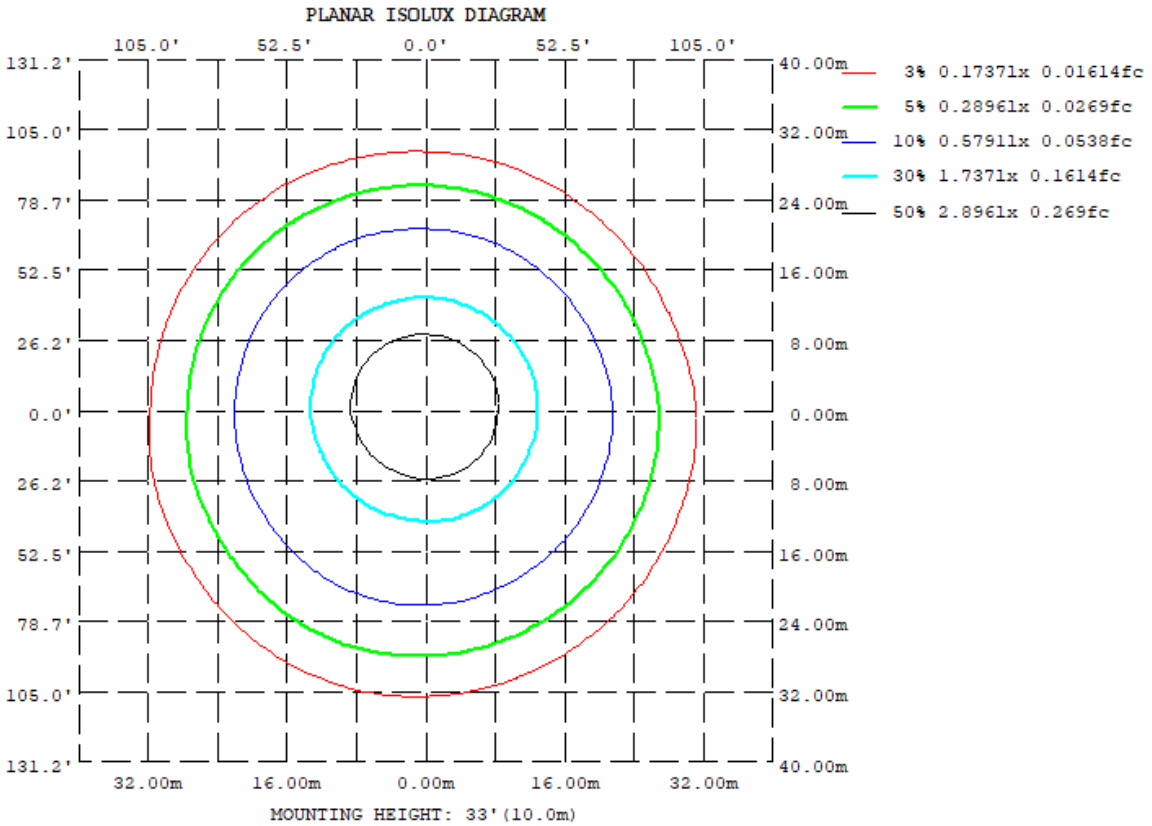
Flux (lm)	Zonal Lumen Requirement (60°-80°)	Zonal Lumen Requirement (70°-80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3740	34.59%	14.46%	233.4	231.7	162.3	161.3	122.3

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	578.8	576.2	574.5	575.5	580.0	583.4	583.0	581.3
20	579.4	574.8	569.2	572.2	582.2	587.7	586.7	583.8
30	580.8	573.9	563.3	570.9	590.6	599.6	598.7	594.4
40	639.8	625.1	605.1	618.8	659.0	672.3	663.1	656.7
50	733.5	721.1	705.1	721.8	761.9	766.3	735.2	733.1
60	808.5	807.9	819.3	827.5	846.3	822.8	753.4	756.3
70	672.2	710.5	760.0	772.9	719.3	653.6	561.1	566.2
80	327.9	380.3	423.1	430.2	348.2	285.1	219.1	226.1
90	9.656	26.08	41.62	43.38	13.48	2.127	0.5073	0.4730
100	9.757	14.61	13.54	14.24	10.53	21.72	23.72	23.04
110	62.00	41.74	23.73	45.01	62.58	45.66	59.13	43.95
120	47.52	43.50	53.05	38.75	46.14	40.22	40.77	38.67
130	18.81	34.59	31.89	33.60	17.33	32.47	30.70	33.12
140	28.16	24.45	22.40	24.77	26.36	23.87	24.10	24.25
150	16.38	17.37	18.54	17.46	16.75	17.04	16.36	16.66
160	12.50	12.86	14.49	13.11	12.42	12.62	14.58	12.46
170	8.400	9.607	10.15	8.795	8.510	8.062	9.468	9.538
180	7.484	6.206	6.516	5.751	7.897	7.791	7.216	7.266

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	55.26	0 - 10	55.26	1.48%
10-20	164.22	0 - 20	219.48	5.87%
20-30	268.69	0 - 30	488.17	13.05%
30-40	382.25	0 - 40	870.42	23.28%
40-50	534.30	0 - 50	1404.72	37.56%
50-60	695.75	0 - 60	2100.47	56.17%
60-70	752.56	0 - 70	2853.03	76.29%
70-80	540.87	0 - 80	3393.90	90.76%
80-90	170.03	0 - 90	3563.93	95.30%
90-100	12.25	0 - 100	3576.18	95.63%
100-110	35.58	0 - 110	3611.76	96.58%
110-120	51.44	0 - 120	3663.20	97.96%
120-130	31.09	0 - 130	3694.29	98.79%
130-140	21.38	0 - 140	3715.67	99.36%
140-150	12.82	0 - 150	3728.49	99.71%
150-160	6.96	0 - 160	3735.45	99.89%
160-170	3.31	0 - 170	3738.76	99.98%
170-180	0.75	0 - 180	3739.51	100.00%

3.2 Goniophotometer Test

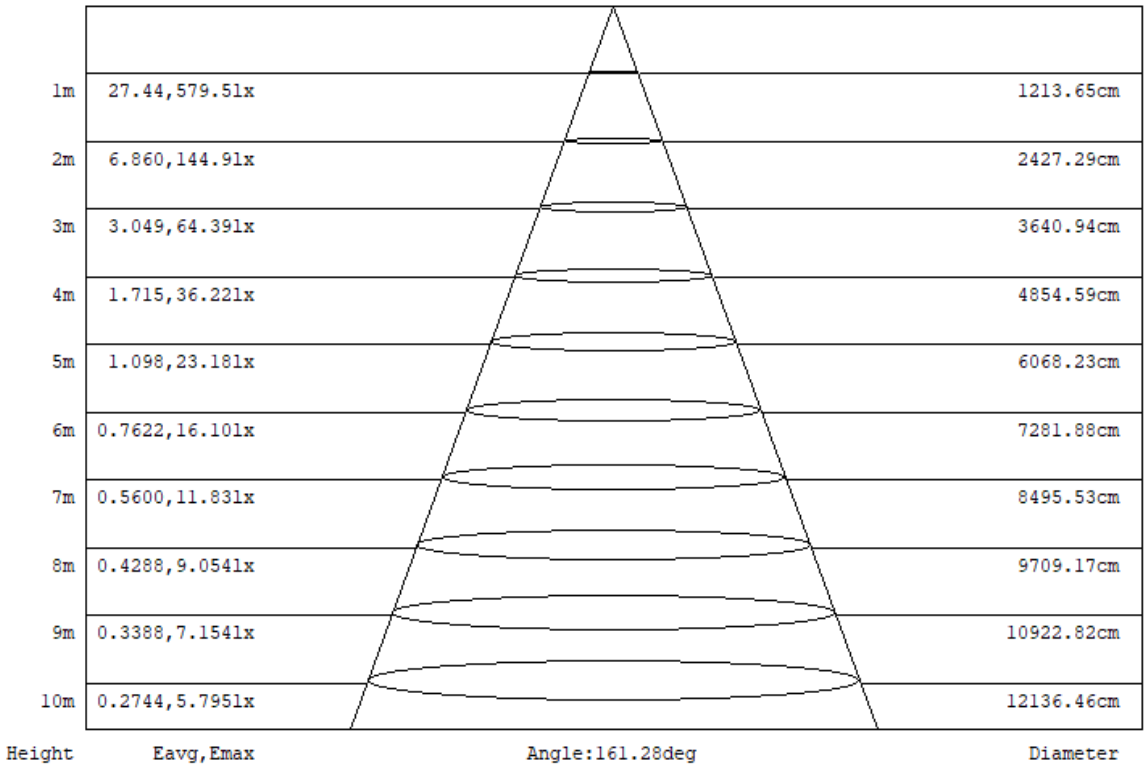
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	108	108	108	103	103	103	98	98	98	95
1	104	98	92	87	101	95	90	85	90	85	82	85	81	78	80	78	75	72
2	92	82	73	66	89	79	71	64	75	68	62	70	65	60	67	62	58	55
3	82	69	59	51	79	67	58	50	63	55	49	60	53	47	56	51	46	43
4	74	59	49	41	71	58	48	40	54	46	39	51	44	38	48	42	37	34
5	67	52	41	34	64	50	41	33	48	39	32	45	37	31	42	36	31	28
6	61	46	36	28	59	45	35	28	42	34	27	40	32	26	38	31	26	23
7	56	41	31	24	54	40	30	24	38	29	23	36	28	23	34	27	22	20
8	52	37	27	21	50	36	27	21	34	26	20	32	25	20	31	24	19	17
9	48	34	24	18	47	33	24	18	31	23	18	30	22	17	28	22	17	15
10	45	31	22	16	44	30	22	16	29	21	16	27	20	15	26	20	15	13

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5CU-30L730W4	Sample ID.	D1

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	479.97	60	0.067	30.7	0.958	29.38%

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**********