Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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2018/11/7

Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v4.3

Outdoor - Low Output Parking Garage Luminaire			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	2000	3526
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	125.0
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	⩾30%	36.06%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	⩽25%	14.69%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3038
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	72
Power Factor	ANSI C82.77:2014	0.873	0.915
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	14.96%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/6	IVGT5C-30L730ZU	B1
2	Goniophotometer Test	2018/11/6	IVGT5C-30L730ZU	B1
3	THD and PF Test	2018/11/6	IVGT5C-30L730ZU	B1

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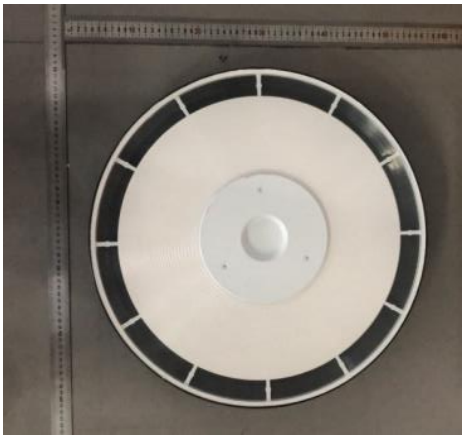
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing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

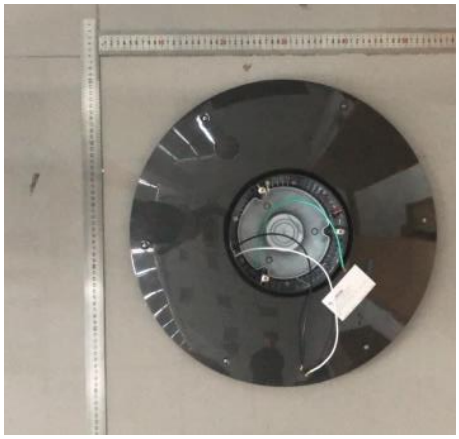
3.0 Production Description

Luminaire Description: IVGT5C-30L730ZU

Electrical Specification: 120V-277V,50/60HZ, 30W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5C-30L730ZU	Sample ID.	B1
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	277.01	60	0.114	28.8	0.915

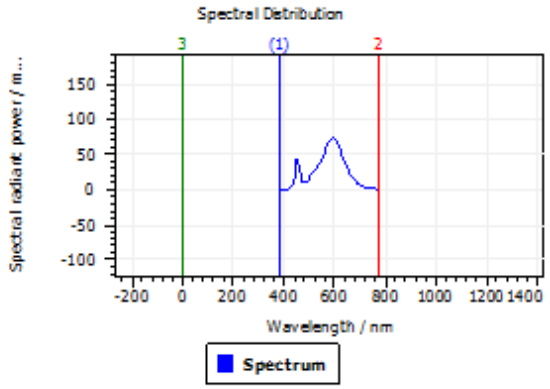
Test Result

CCT (K)	CRI (Ra)	Duv
3038	71.8	2.8E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	582.76 nm
Purity	0.510
PeakWavelength	593.40 nm
Radiant Power	9.759 W
Width50%:	102.37 nm

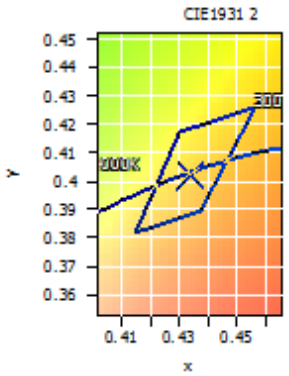
Color Coordinates

Correlated Color Temperatu 3038 K

x:	0.4338	u:	0.2493	u':	0.2493
y:	0.4023	v:	0.3468	v':	0.5202

ResultsCRICRI01	67.9	ResultsCRICRI09	-39.4
ResultsCRICRI02	84.3	ResultsCRICRI10	64.8
ResultsCRICRI03	93.9	ResultsCRICRI11	61.6
ResultsCRICRI04	66.1	ResultsCRICRI12	53.0
ResultsCRICRI05	67.8	ResultsCRICRI13	71.3
ResultsCRICRI06	78.7	ResultsCRICRI14	97.1
ResultsCRICRI07	75.6	ResultsCRICRI15	59.1
ResultsCRICRI08	40.0	ResultsCRICRI16	56.6

ResultsCRI 71.8



PlanckDistance 2.8E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-30L730ZU	Sample ID.	B1
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

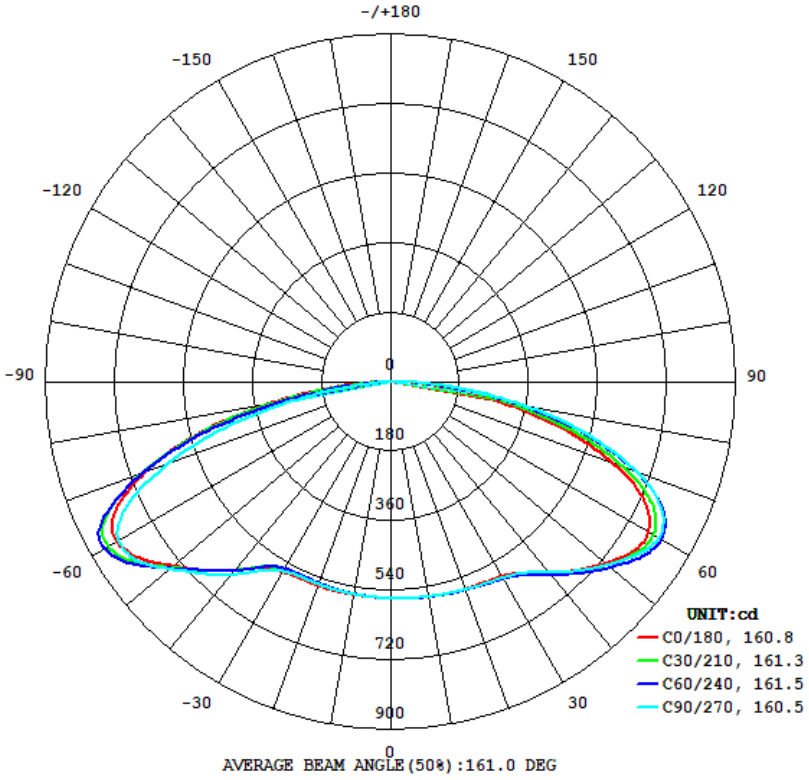
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	277.01	60	0.111	28.2	0.914	Light Down

Test Result

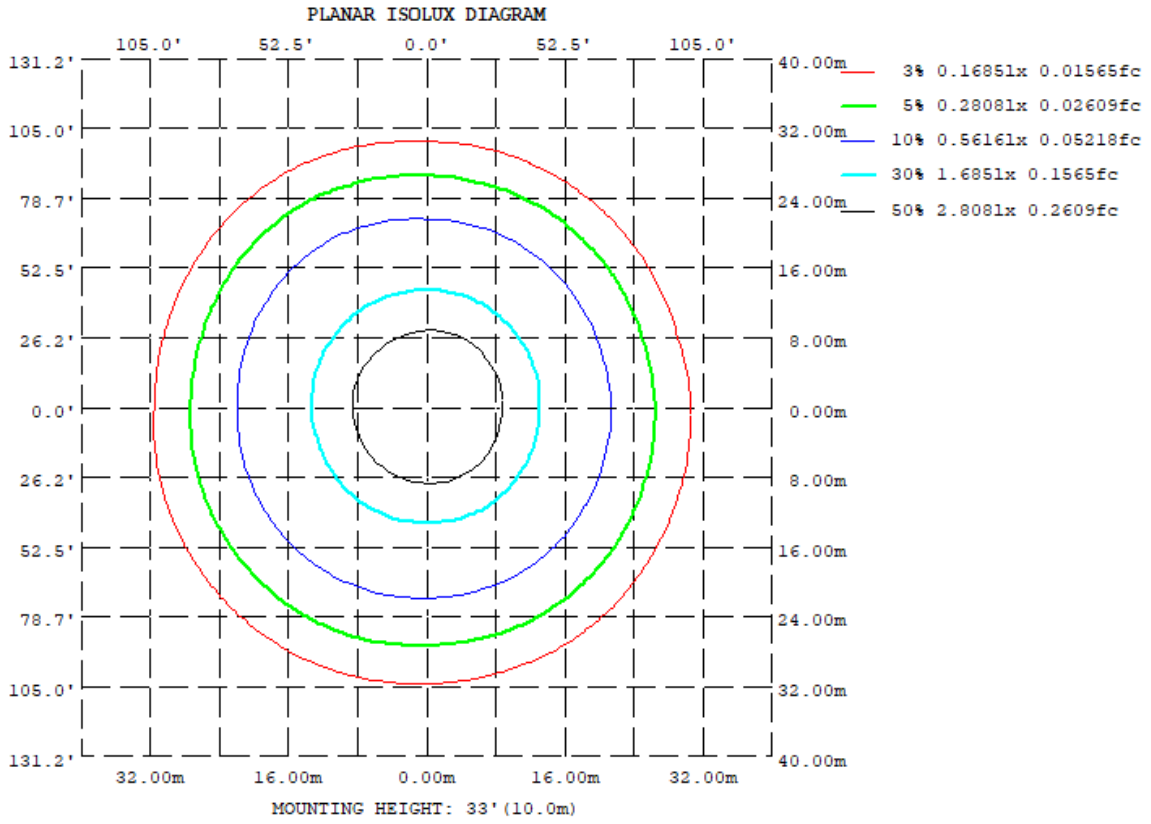
Flux (lm)	Zonal Lumen Requirement (60°-80°)	Zonal Lumen Requirement (70°-80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3526	36.06%	14.69%	173.4	172.7	160.8	160.5	125.0

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	564.7	565.4	564.6	562.6	560.0	558.2	559.3	562.5
20	570.4	573.3	571.7	567.6	561.6	555.2	557.2	564.5
30	581.1	588.4	585.2	575.8	567.9	559.2	566.6	577.5
40	646.5	653.3	644.0	632.3	637.0	637.1	651.9	659.1
50	730.1	743.9	737.1	735.2	742.4	751.6	755.0	755.5
60	776.9	807.0	807.8	832.8	825.2	865.6	819.7	803.6
70	617.5	667.3	683.3	725.0	683.6	700.7	619.3	607.0
80	276.6	329.2	352.1	383.6	318.9	297.3	227.0	229.5
90	4.898	7.933	15.11	22.00	3.277	0.1704	0.1283	0.1448
100	0.3576	0.3413	0.3497	0.3195	0.3274	0.3391	0.4374	0.4519
110	0.5336	0.4933	0.4460	0.4358	0.5643	0.5701	0.6318	0.6578
120	0.5885	0.6017	0.5790	0.5335	0.6706	0.7566	0.7945	0.8872
130	0.6694	0.7568	0.6896	0.6115	1.795	0.8459	1.016	0.9406
140	0.7000	0.7574	0.7535	0.7272	0.9223	0.9961	1.504	1.267
150	0.7908	0.7622	0.9060	0.7914	1.151	1.203	1.558	1.226
160	0.8320	0.7945	0.8732	0.7935	1.223	1.201	1.348	1.597
170	0.7069	1.150	1.218	1.921	1.005	2.639	1.557	1.719
180	0.7822	0.8044	0.8948	0.8936	0.8330	0.8677	0.9076	0.9162

LUMINOUS INTENSITY:cd

DEG

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	53.60	0 - 10	53.60	1.52%
10-20	159.81	0 - 20	213.41	6.05%
20-30	263.39	0 - 30	476.80	13.52%
30-40	380.58	0 - 40	857.38	24.32%
40-50	538.75	0 - 50	1396.13	39.60%
50-60	707.29	0 - 60	2103.42	59.66%
60-70	753.55	0 - 70	2856.97	81.03%
70-80	517.79	0 - 80	3374.76	95.72%
80-90	144.63	0 - 90	3519.39	99.82%
90-100	2.17	0 - 100	3521.56	99.88%
100-110	0.49	0 - 110	3522.05	99.90%
110-120	0.61	0 - 120	3522.66	99.91%
120-130	0.78	0 - 130	3523.44	99.94%
130-140	0.69	0 - 140	3524.13	99.96%
140-150	0.64	0 - 150	3524.77	99.97%
150-160	0.48	0 - 160	3525.25	99.99%
160-170	0.33	0 - 170	3525.58	100.00%
170-180	0.12	0 - 180	3525.70	100.00%

3.2 Goniophotometer Test

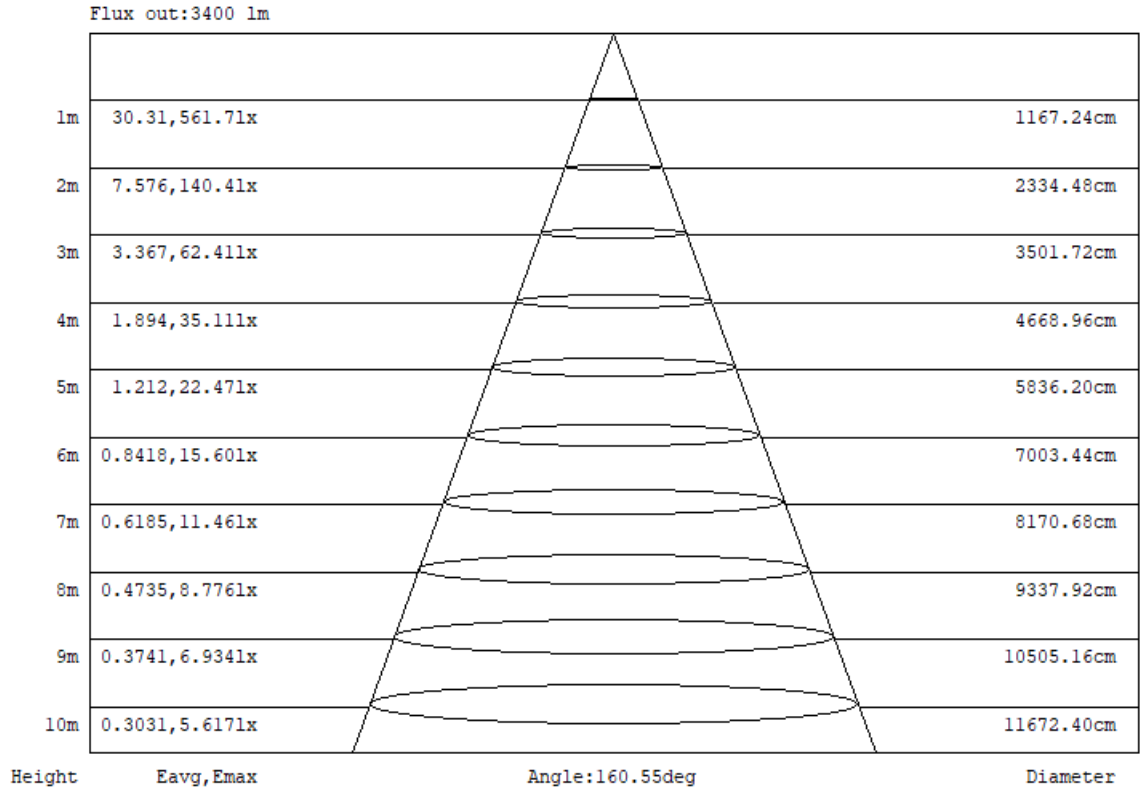
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	55	55	55	55	54	54	54	54	52	52	52	49	49	49	47	47	47	46
1	49	46	43	41	47	45	42	40	43	41	39	41	39	38	39	38	37	35
2	43	38	34	31	42	37	34	30	36	32	30	34	31	29	32	30	28	27
3	38	32	28	24	37	32	27	24	30	26	23	29	25	23	27	25	22	21
4	35	28	23	19	33	27	22	19	26	22	19	25	21	18	24	21	18	17
5	31	24	19	16	30	24	19	16	23	18	15	22	18	15	21	17	15	14
6	29	21	17	13	28	21	16	13	20	16	13	19	15	13	18	15	13	11
7	26	19	14	11	25	19	14	11	18	14	11	17	14	11	16	13	11	10
8	24	17	13	10	23	17	13	10	16	12	9	16	12	9	15	12	9	8
9	23	16	11	8	22	15	11	8	15	11	8	14	11	8	14	11	8	7
10	21	14	10	7	20	14	10	7	14	10	7	13	10	7	13	10	7	6

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-30L730ZU	Sample ID.	B1

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	0.114	28.8	0.915	14.96%
25.1	119.97	60	0.238	28.2	0.988	11.06%

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**********