Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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2018/12/15

Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v4.4

Outdoor - Mid Output Parking Garage Luminaire			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	5000	7684
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	104.0
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	⩾30%	36.29%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	⩽25%	15.05%
Power (Input Wattage)	IES LM-79-2008	Wrost Case	73.9
Input Voltage	IES LM-79-2008	Wrost Case	480
Input Current	IES LM-79-2008	Wrost Case	0.155
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	4781
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	76
Power Factor	ANSI C82.77:2014	0.873	0.995
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	10.28%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/12/14	IVGT5C-70L750Z4	L1
2	Goniophotometer Test	2018/12/14	IVGT5C-70L750Z4	L1
3	THD and PF Test	2018/12/14	IVGT5C-70L750Z4	L1

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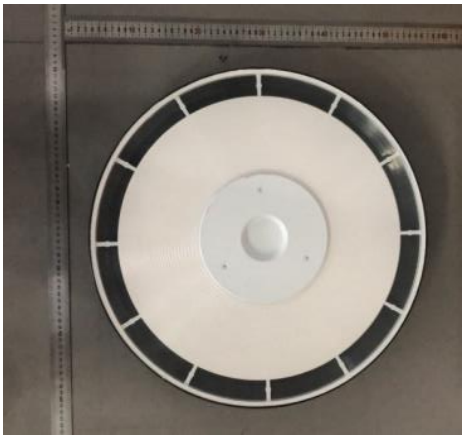
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing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

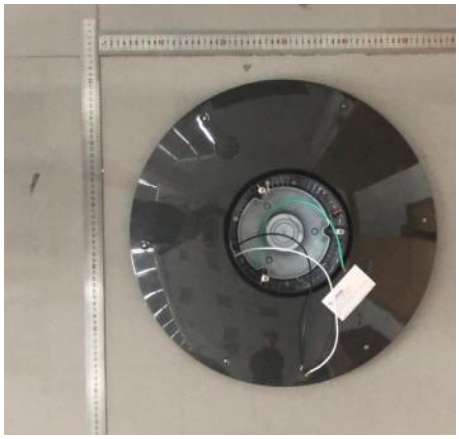
3.0 Production Description

Luminaire Description: IVGT5C-70L750Z4

Electrical Specification: 480V,50/60HZ, 70W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5C-70L750Z4	Sample ID.	L1
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	480.03	60	0.155	73.9	0.995

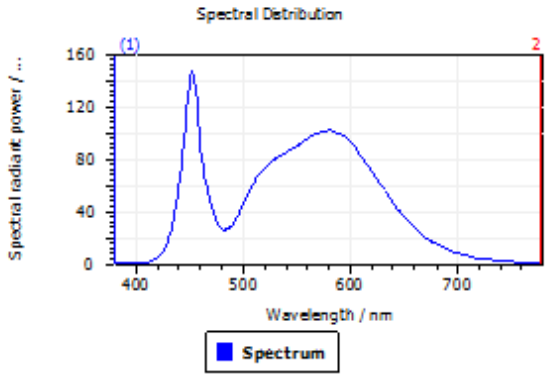
Test Result

CCT (K)	CRI (Ra)	Duv
4781	75.6	4.6E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



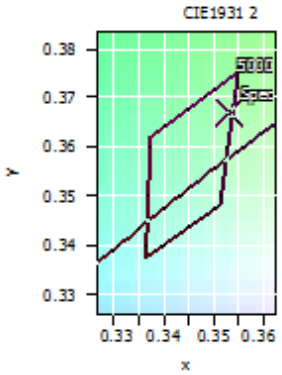
Spectral Distribution

Spectral values

DominantWavelength	571.61 nm
Purity	0.161
PeakWavelength	451.99 nm
Width50%:	20.56 nm

Color Coordinates

Correlated Color Temperatu		4781 K			
x:	0.3529	u:	0.2107	u':	0.2107
y:	0.3672	v:	0.3288	v':	0.4932
CRI01		71.6	CRI09		-27.3
CRI02		82.1	CRI10		57.8
CRI03		90.2	CRI11		70.8
CRI04		73.8	CRI12		45.1
CRI05		72.3	CRI13		74.0
CRI06		74.9	CRI14		94.7
CRI07		83.9	CRI15		63.9
CRI08		55.8	CRI16		62.5
ResultsCRI		75.6			



PlanckDistance 4.6E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-70L750Z4	Sample ID.	L1
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

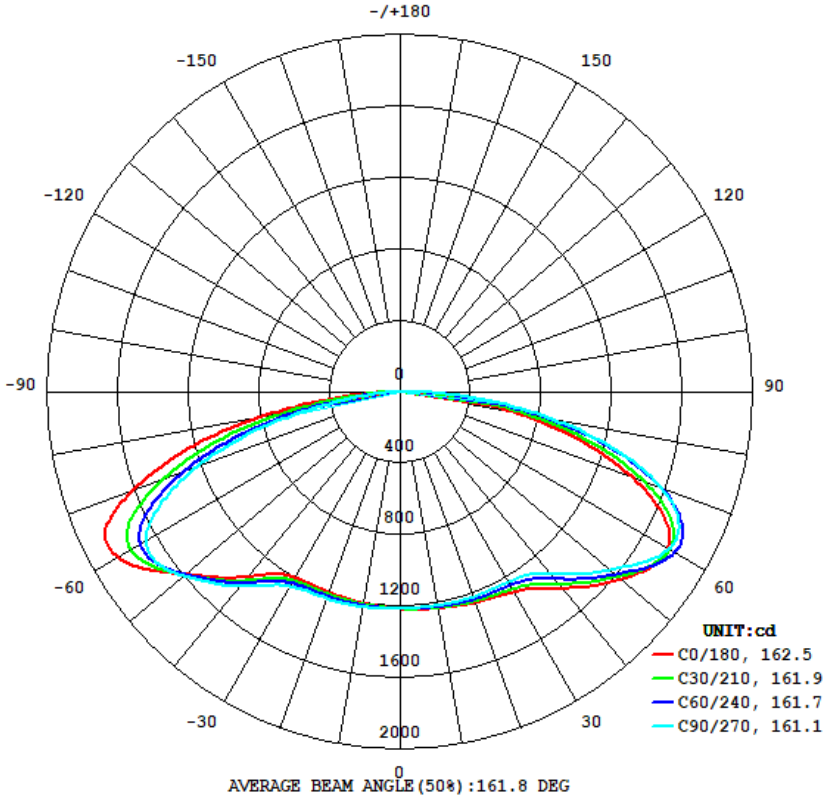
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	480.07	60	0.155	73.9	0.994	Light Down

Test Result

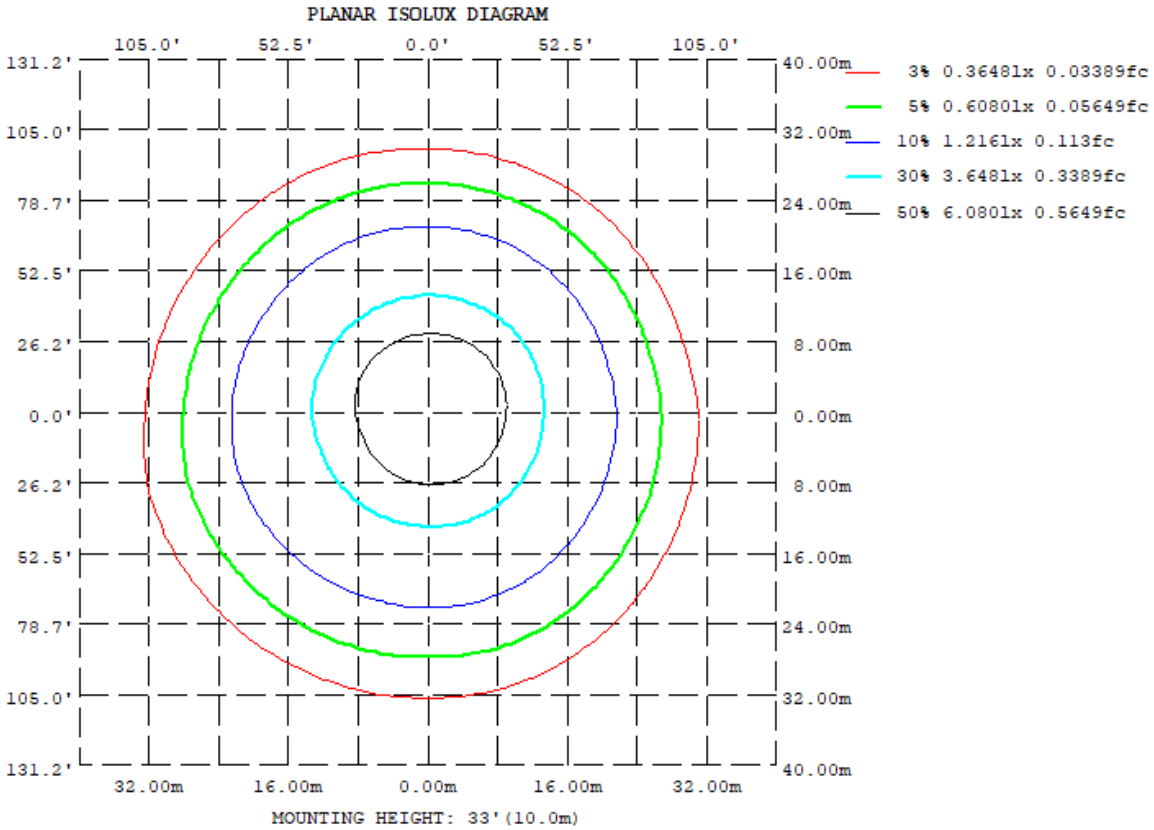
Flux (lm)	Zonal Lumen Requirement (60°-80°)	Zonal Lumen Requirement (70°-80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7684	36.29%	15.05%	174.5	173.4	162.5	161.1	104.0

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	1231	1224	1214	1205	1204	1211	1223	1231
20	1254	1241	1220	1199	1196	1211	1231	1251
30	1293	1262	1227	1200	1203	1230	1258	1298
40	1436	1386	1331	1307	1353	1389	1423	1471
50	1632	1599	1551	1540	1590	1592	1604	1661
60	1752	1783	1759	1794	1850	1730	1662	1720
70	1402	1529	1575	1664	1616	1366	1231	1267
80	655.1	792.5	872.1	943.1	797.3	584.1	448.8	470.3
90	6.798	36.04	60.78	87.02	29.67	0.6626	0.3746	0.4205
100	0.8498	0.7688	0.7394	0.7539	0.7652	0.8151	0.7460	0.8114
110	1.134	1.104	1.019	1.009	1.273	1.316	1.318	1.193
120	1.252	1.271	1.251	1.206	1.553	1.770	1.601	1.604
130	1.403	1.482	1.551	1.397	1.906	2.014	1.942	1.903
140	1.473	1.671	1.741	1.659	2.204	2.388	2.365	2.379
150	1.681	1.783	1.845	1.911	2.662	2.867	2.618	2.830
160	2.800	1.814	1.896	1.891	3.316	2.714	2.847	2.690
170	2.092	1.753	1.819	2.967	3.250	2.291	2.398	3.193
180	1.945	2.082	2.119	2.054	1.972	1.994	2.136	2.138

DEG	LUMINOUS INTENSITY:cd

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	116.14	0 - 10	116.14	1.51%
10-20	346.41	0 - 20	462.55	6.02%
20-30	571.08	0 - 30	1033.63	13.45%
30-40	821.30	0 - 40	1854.93	24.14%
40-50	1157.21	0 - 50	3012.14	39.20%
50-60	1515.55	0 - 60	4527.69	58.93%
60-70	1632.04	0 - 70	6159.73	80.17%
70-80	1156.20	0 - 80	7315.93	95.21%
80-90	350.65	0 - 90	7666.58	99.78%
90-100	8.46	0 - 100	7675.04	99.89%
100-110	1.03	0 - 110	7676.07	99.90%
110-120	1.29	0 - 120	7677.36	99.92%
120-130	1.58	0 - 130	7678.94	99.94%
130-140	1.44	0 - 140	7680.38	99.96%
140-150	1.37	0 - 150	7681.75	99.97%
150-160	1.11	0 - 160	7682.86	99.99%
160-170	0.67	0 - 170	7683.53	100.00%
170-180	0.21	0 - 180	7683.74	100.00%

3.2 Goniophotometer Test

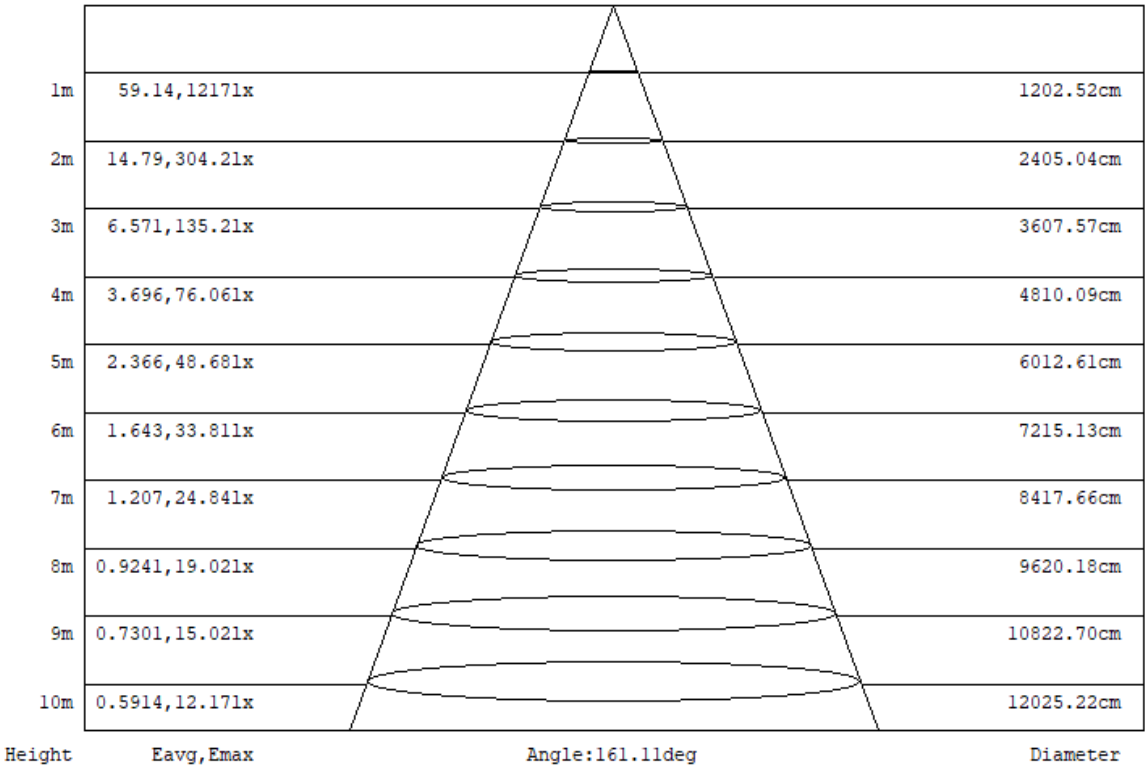
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	105	99	93	88	102	96	91	86	92	87	83	88	84	81	84	81	78	76
2	93	82	73	66	90	80	72	65	76	69	63	73	67	62	69	65	60	58
3	83	69	59	51	80	68	58	51	64	56	50	61	54	49	59	53	48	45
4	74	60	49	41	72	58	48	40	55	47	40	53	45	39	50	44	38	36
5	67	52	41	33	65	51	41	33	48	39	33	46	38	32	44	37	32	29
6	61	46	35	28	59	45	35	28	43	34	27	41	33	27	39	32	27	24
7	56	41	31	24	55	40	30	24	38	30	23	37	29	23	35	28	23	21
8	52	37	27	21	50	36	27	21	35	26	20	33	26	20	32	25	20	18
9	49	33	24	18	47	33	24	18	32	24	18	30	23	18	29	23	18	15
10	45	31	22	16	44	30	22	16	29	21	16	28	21	16	27	20	16	14

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-70L750Z4	Sample ID.	L1

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	480.03	60	0.155	73.9	0.995	10.28%

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**********