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 - Mid Output Parking Garage Luminaire			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Lamp Output (lm)	IES LM-79-2008	5000	7276
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	104.0
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	⩾30%	36.29%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	⩽25%	14.88%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3992
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	75
Power Factor	ANSI C82.77:2014	0.873	0.972
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.19%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/6	IVGT5C-70L740ZU	K1
2	Goniophotometer Test	2018/11/6	IVGT5C-70L740ZU	K1
3	THD and PF Test	2018/11/6	IVGT5C-70L740ZU	K1

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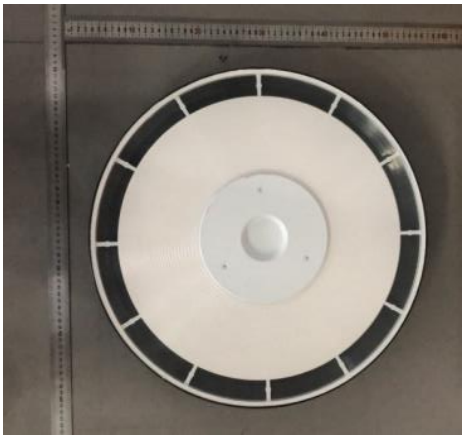
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing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

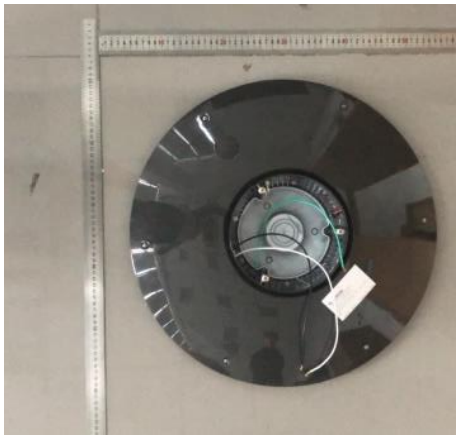
3.0 Production Description

Luminaire Description: IVGT5C-70L740ZU

Electrical Specification: 120V-277V,50/60HZ, 70W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5C-70L740ZU	Sample ID.	K1
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	120.04	60	0.591	70.7	0.997

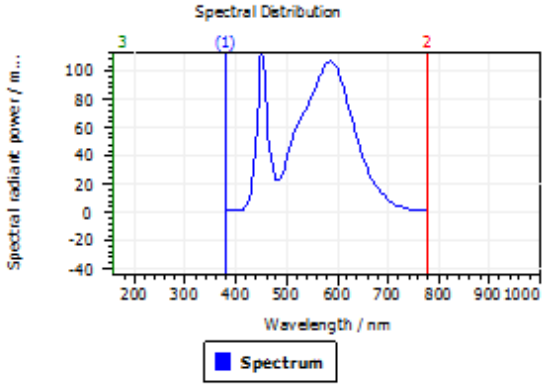
Test Result

CCT (K)	CRI (Ra)	Duv
3992	75	8.0E-05

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

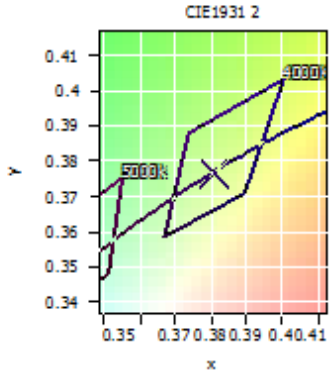
DominantWavelength	579.15 nm
Purity	0.273
PeakWavelength	452.40 nm
Radiant Power	16.69 W
Width50%:	23.01 nm

Color Coordinates

Correlated Color Temperatu 3992 K

x:	0.3807	u:	0.2253	u':	0.2253
y:	0.3768	v:	0.3344	v':	0.5016

ResultsCRICRI01	71.5	ResultsCRICRI09	-28.5
ResultsCRICRI02	83.8	ResultsCRICRI10	61.8
ResultsCRICRI03	92.6	ResultsCRICRI11	68.0
ResultsCRICRI04	71.7	ResultsCRICRI12	49.6
ResultsCRICRI05	71.8	ResultsCRICRI13	74.2
ResultsCRICRI06	76.9	ResultsCRICRI14	96.2
ResultsCRICRI07	80.8	ResultsCRICRI15	64.0
ResultsCRICRI08	50.9	ResultsCRICRI16	62.4
ResultsCRI	75.0		



PlanckDistance 8.0E-005

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-70L740ZU	Sample ID.	K1
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

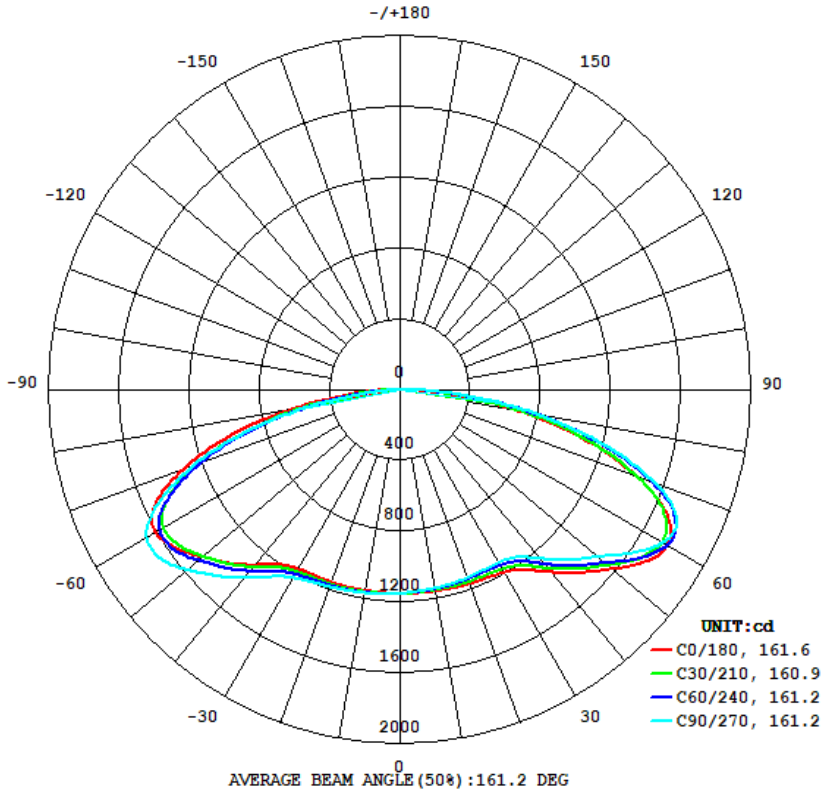
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.96	60	0.585	70.0	0.997	Light Down

Test Result

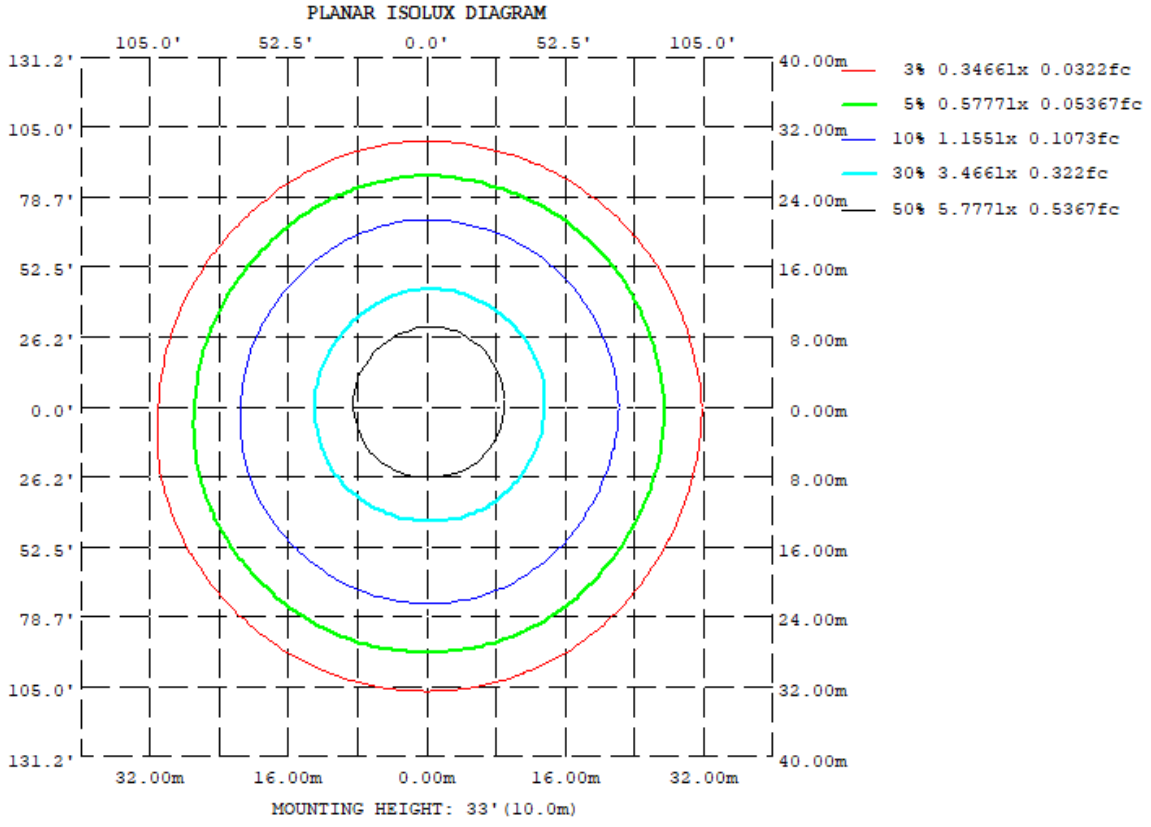
Flux (lm)	Zonal Lumen Requirement (60°-80°)	Zonal Lumen Requirement (70°-80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7276	36.29%	14.88%	173.7	173	161.6	161.2	104.0

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	1157	1146	1140	1144	1155	1163	1167	1165
20	1167	1146	1129	1140	1159	1174	1186	1185
30	1192	1159	1127	1146	1171	1196	1228	1226
40	1349	1307	1248	1274	1295	1320	1389	1394
50	1576	1537	1469	1489	1471	1474	1586	1609
60	1758	1737	1729	1692	1608	1552	1665	1720
70	1440	1480	1548	1488	1318	1204	1252	1309
80	683.8	738.1	790.0	763.4	607.7	499.9	477.8	528.9
90	5.973	23.77	26.02	35.50	11.94	0.3546	0.2913	0.3248
100	0.6780	0.6701	0.6890	0.7050	0.7275	0.7489	0.7211	0.7481
110	0.9262	0.9804	0.9312	0.9250	1.183	1.226	1.219	1.058
120	1.043	1.160	1.185	1.108	1.397	1.595	1.441	1.441
130	1.228	1.375	1.439	1.244	1.788	1.807	1.822	1.684
140	1.339	1.531	1.589	1.464	2.000	2.171	2.193	2.093
150	1.739	1.708	1.641	1.750	2.446	2.671	2.425	2.571
160	2.665	1.669	1.668	1.806	2.948	2.472	2.700	2.419
170	3.100	1.564	1.653	1.801	2.596	2.640	2.189	3.949
180	1.747	1.560	1.244	1.868	1.764	1.789	1.915	1.898
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	110.09	0 - 10	110.09	1.51%
10-20	328.19	0 - 20	438.28	6.02%
20-30	540.72	0 - 30	979.00	13.45%
30-40	779.77	0 - 40	1758.77	24.17%
40-50	1105.38	0 - 50	2864.15	39.36%
50-60	1452.41	0 - 60	4316.56	59.32%
60-70	1557.86	0 - 70	5874.42	80.73%
70-80	1082.50	0 - 80	6956.92	95.61%
80-90	307.11	0 - 90	7264.03	99.83%
90-100	4.22	0 - 100	7268.25	99.89%
100-110	0.93	0 - 110	7269.18	99.90%
110-120	1.16	0 - 120	7270.34	99.92%
120-130	1.64	0 - 130	7271.98	99.94%
130-140	1.37	0 - 140	7273.35	99.96%
140-150	1.25	0 - 150	7274.60	99.97%
150-160	1.03	0 - 160	7275.63	99.99%
160-170	0.64	0 - 170	7276.27	100.00%
170-180	0.20	0 - 180	7276.47	100.00%

3.2 Goniophotometer Test

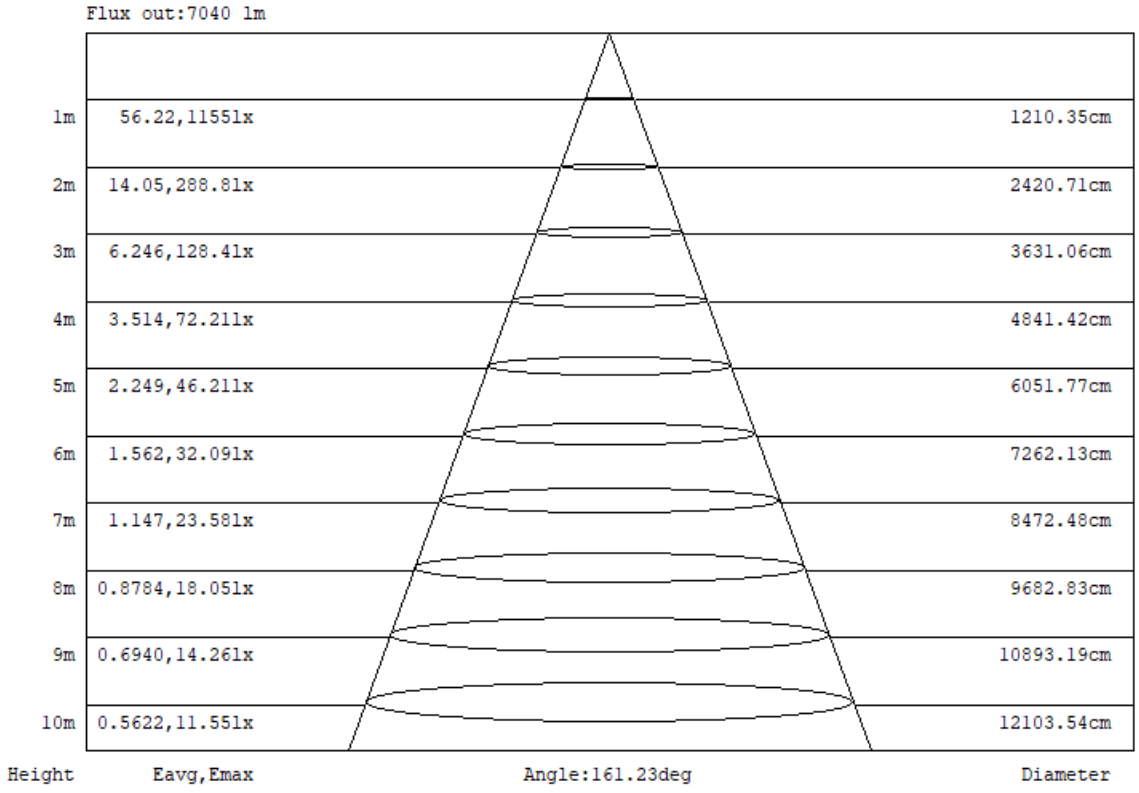
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	114	114	114	114	112	112	112	112	107	107	107	102	102	102	98	98	98	96
1	101	95	89	85	98	93	88	83	88	84	80	84	81	78	81	78	75	73
2	89	79	71	64	86	77	69	63	73	67	61	70	64	60	67	62	58	56
3	79	67	57	49	77	65	56	49	62	54	48	59	52	47	56	51	46	43
4	71	57	47	39	69	56	46	39	53	45	38	51	44	38	49	42	37	35
5	65	50	40	32	62	49	39	32	47	38	31	44	37	31	43	36	31	28
6	59	44	34	27	57	43	34	27	41	33	26	39	32	26	38	31	26	23
7	54	39	30	23	52	38	29	23	37	29	23	35	28	22	34	27	22	20
8	50	35	26	20	48	35	26	20	33	25	20	32	25	19	31	24	19	17
9	47	32	23	17	45	32	23	17	30	23	17	29	22	17	28	22	17	15
10	44	29	21	15	42	29	21	15	28	20	15	27	20	15	26	20	15	13

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-70L740ZU	Sample ID.	K1

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	276.96	60	0.254	68.3	0.972	7.19%
25.1	120.04	60	0.591	70.7	0.997	5.63%

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**********