

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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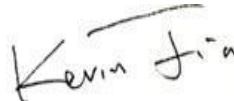
2018/12/15

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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	7336
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	90	98.3
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	≥30%	36.57%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	≤25%	15.18%
Power (Input Wattage)	IES LM-79-2008	Worst Case	74.6
Input Voltage	IES LM-79-2008	Worst Case	480
Input Current	IES LM-79-2008	Worst Case	0.156
Allowable CCTs* (K)	IES LM-79-2008	≤5700	4015
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	75
Power Factor	ANSI C82.77:2014	0.873	0.996
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.10%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/12/14	IVGT5C-70L740Z4	K1
2	Goniophotometer Test	2018/12/14	IVGT5C-70L740Z4	K1
3	THD and PF Test	2018/12/14	IVGT5C-70L740Z4	K1

Remark(If any)

1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.

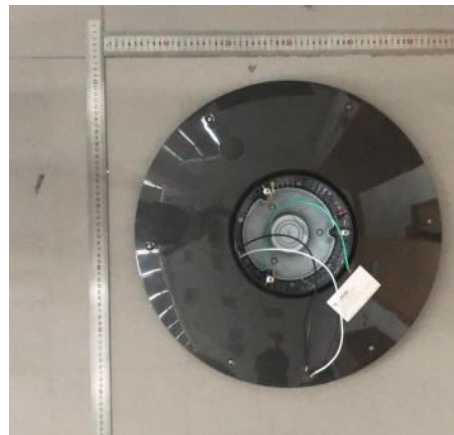
2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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-70L740Z4

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-70L740Z4	Sample ID.	K1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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 ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	479.97	60	0.156	74.5	0.996

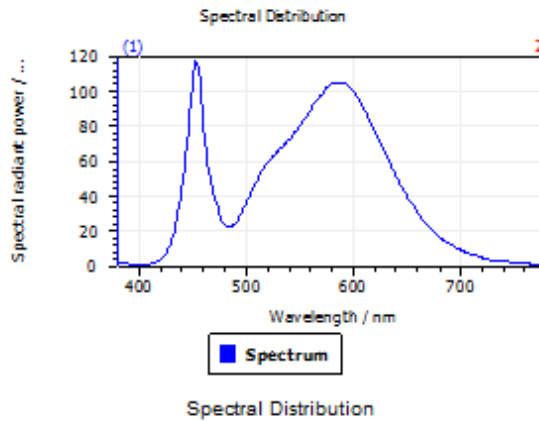
Test Result

CCT (K)	CRI (Ra)	Duv
4015	74.9	2.5E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results

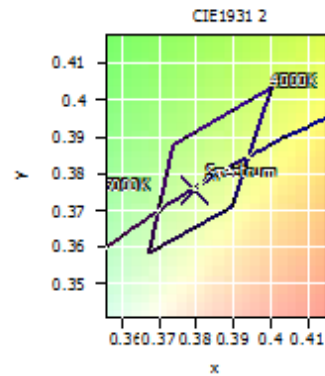


Spectral values

DominantWavelength	579.16 nm
Purity	0.267
PeakWavelength	452.97 nm
Width50%:	21.32 nm

Color Coordinates

Correlated Color Temperature		4015 K	
x: 0.3796	u: 0.2250	u': 0.2250	
y: 0.3757	v: 0.3340	v': 0.5010	
CRI01	71.4	CRI09	-29.0
CRI02	84.1	CRI10	62.6
CRI03	92.7	CRI11	67.3
CRI04	71.1	CRI12	49.8
CRI05	71.6	CRI13	74.4
CRI06	77.3	CRI14	96.3
CRI07	80.4	CRI15	63.9
CRI08	50.4	CRI16	62.1
ResultsCRI	74.9		



PlanckDistance 2.5E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-70L740Z4	Sample ID.	K1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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° vertical intervals and 10° horizontal intervals.

Test Conditions

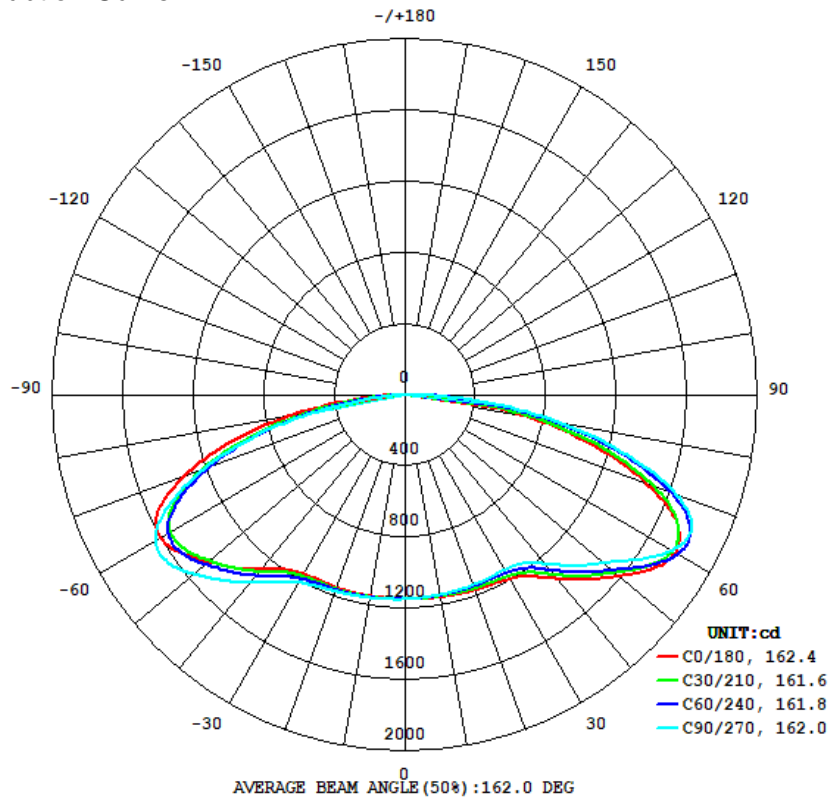
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.95	60	0.156	74.6	0.995	Light Down

Test Result

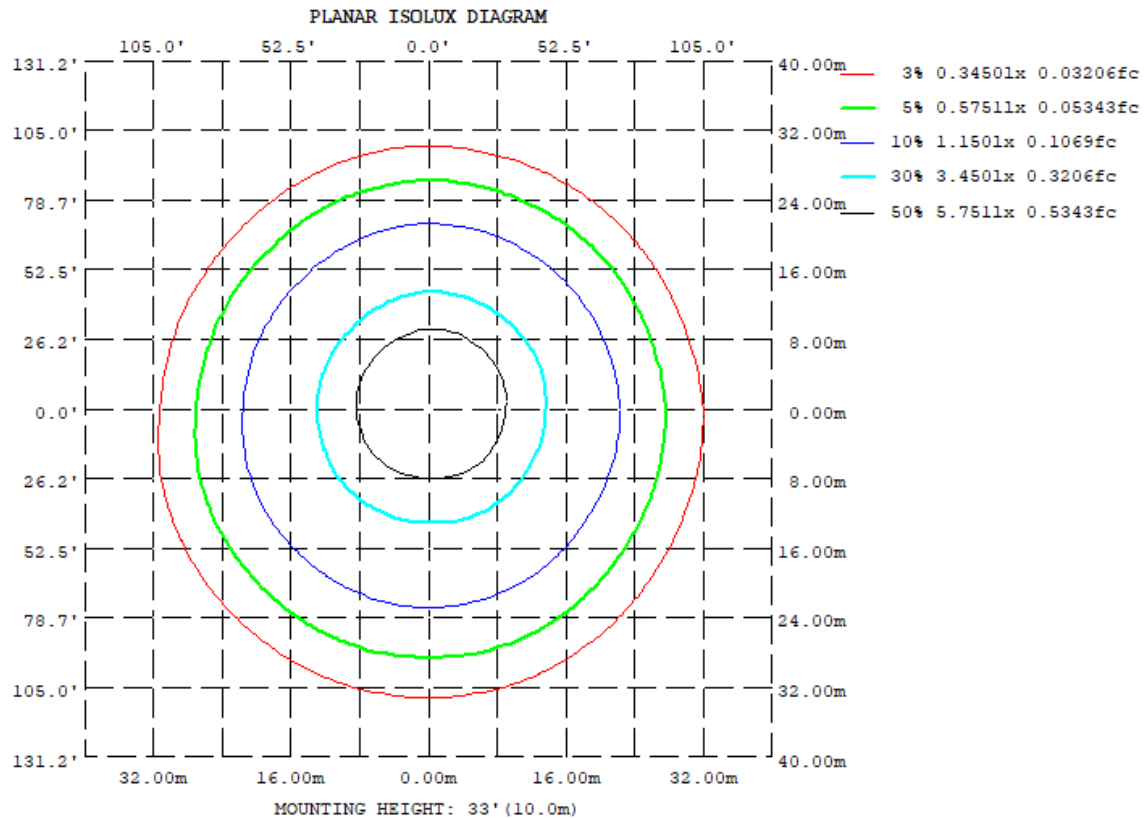
Flux (lm)	Zonal Lumen Requirement (60° - 80°)	Zonal Lumen Requirement (70° - 80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7336	36.57%	15.18%	174.4	173.7	162.4	162.0	98.3

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	1154	1146	1140	1142	1149	1155	1159	1159		
20	1166	1151	1135	1140	1153	1163	1174	1178		
30	1194	1166	1134	1146	1163	1184	1217	1222		
40	1351	1306	1240	1262	1283	1307	1380	1393		
50	1584	1545	1471	1485	1459	1456	1569	1606		
60	1771	1764	1750	1706	1603	1526	1634	1698		
70	1462	1546	1638	1561	1337	1186	1224	1282		
80	703.2	799.8	885.3	850.6	643.7	502.4	465.0	506.7		
90	8.043	32.87	50.12	62.61	22.37	0.5142	0.3672	0.4153		
100	0.7684	0.7256	0.7232	0.7577	0.7255	0.7579	0.7303	0.7666		
110	1.038	1.046	0.9796	0.9961	1.189	1.210	1.241	1.118		
120	1.145	1.220	1.181	1.184	1.460	1.623	1.487	1.509		
130	1.338	1.423	1.470	1.311	1.735	1.877	1.811	1.760		
140	1.649	1.637	1.662	1.540	2.058	2.228	2.222	2.160		
150	1.880	1.728	1.725	1.845	2.438	2.716	2.485	2.627		
160	2.697	1.720	1.781	1.898	2.963	2.579	2.713	2.656		
170	2.707	1.648	1.690	2.189	3.258	2.049	2.412	2.916		
180	1.848	1.967	2.001	2.004	1.866	1.877	2.001	1.996		

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	109.73	0 - 10	109.73	1.50%
10-20	327.18	0 - 20	436.91	5.96%
20-30	539.59	0 - 30	976.50	13.31%
30-40	777.53	0 - 40	1754.03	23.91%
40-50	1101.17	0 - 50	2855.20	38.92%
50-60	1449.12	0 - 60	4304.32	58.67%
60-70	1568.72	0 - 70	5873.04	80.05%
70-80	1113.84	0 - 80	6986.88	95.24%
80-90	334.41	0 - 90	7321.29	99.80%
90-100	6.81	0 - 100	7328.10	99.89%
100-110	0.98	0 - 110	7329.08	99.90%
110-120	1.21	0 - 120	7330.29	99.92%
120-130	1.41	0 - 130	7331.70	99.94%
130-140	1.35	0 - 140	7333.05	99.96%
140-150	1.29	0 - 150	7334.34	99.97%
150-160	1.06	0 - 160	7335.40	99.99%
160-170	0.66	0 - 170	7336.06	100.00%
170-180	0.22	0 - 180	7336.28	100.00%

3.2 Goniophotometer Test

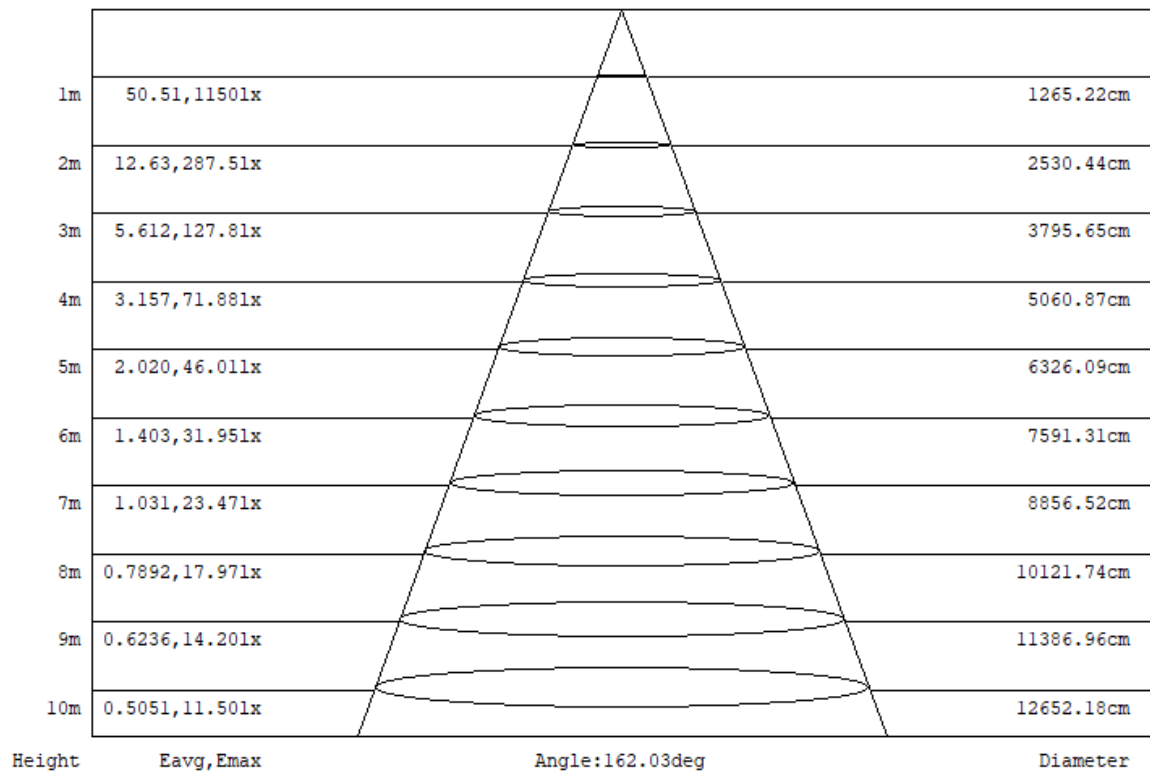
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	82	69	59	51	80	68	58	50	64	56	49	61	54	48	58	53	47	45
4	74	59	49	41	71	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	54	40	30	24	38	30	23	37	29	23	35	28	23	21
8	52	37	27	20	50	36	27	20	35	26	20	33	26	20	32	25	20	18
9	48	33	24	18	47	33	24	18	31	23	18	30	23	18	29	22	17	15
10	45	31	22	16	44	30	22	16	29	21	16	28	21	16	27	20	15	14

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-70L740Z4	Sample ID.	K1
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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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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	0.156	74.5	0.996	9.10%

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-directional	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-directional	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*****