

Photometric Test Report

Relevant Standards

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

Prepared For

RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, gary.xiao@rabweb.com

Prepared By

Deliver Co., Ltd.

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

Project Number

DLF1811104

Data Number

DLF1811104-10a

Test Date

2018/11/6

Issue Date

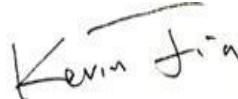
2018/11/7

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

The results contained in this report pertain only to the tested sample.

This report shall not be reproduced, except in full, without written approval of Deliver Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP.

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	7116
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	103.0
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	≥30%	36.22%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	≤25%	14.83%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	2986
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	71
Power Factor	ANSI C82.77:2014	0.873	0.971
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.34%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/6	IVGT5C-70L730ZU	J1
2	Goniophotometer Test	2018/11/6	IVGT5C-70L730ZU	J1
3	THD and PF Test	2018/11/6	IVGT5C-70L730ZU	J1

Remark(If any)

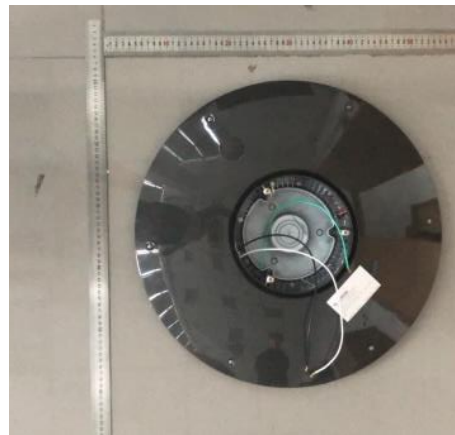
- 1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.
- 2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without 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-70L730ZU

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-70L730ZU	Sample ID.	J1
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	119.96	60	0.583	69.7	0.997

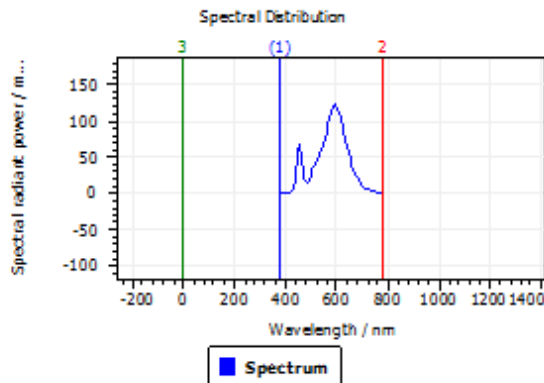
Test Result

CCT (K)	CRI (Ra)	Duv
2986	71.3	4.8E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

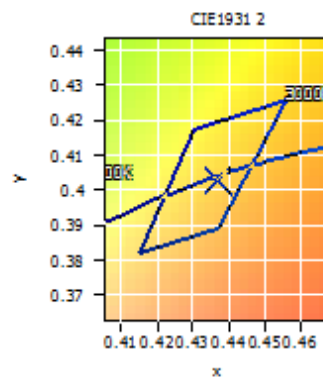
DominantWavelength	583.05 nm
Purity	0.522
PeakWavelength	593.45 nm
Radiant Power	15.97 W
Width50%:	101.41 nm

Color Coordinates

Correlated Color Temperatu 2986 K

x: 0.4373 u: 0.2512 u': 0.2512
y: 0.4030 v: 0.3473 v': 0.5210

ResultsCRICRI01	67.1	ResultsCRICRI09	-40.2
ResultsCRICRI02	83.9	ResultsCRICRI10	64.1
ResultsCRICRI03	94.0	ResultsCRICRI11	60.3
ResultsCRICRI04	65.4	ResultsCRICRI12	53.5
ResultsCRICRI05	67.3	ResultsCRICRI13	70.5
ResultsCRICRI06	78.5	ResultsCRICRI14	97.2
ResultsCRICRI07	75.0	ResultsCRICRI15	58.5
ResultsCRICRI08	39.0	ResultsCRICRI16	56.1
ResultsCRI	71.3		



PlanckDistance 4.8E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5C-70L730ZU	Sample ID.	J1
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

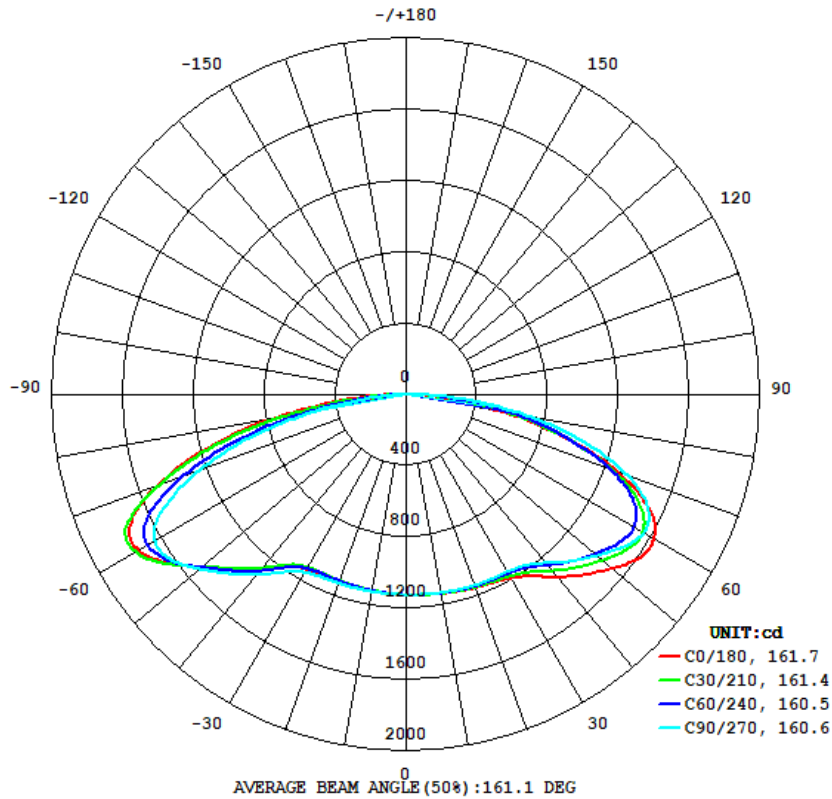
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	119.99	60	0.578	69.1	0.996	Light Down

Test Result

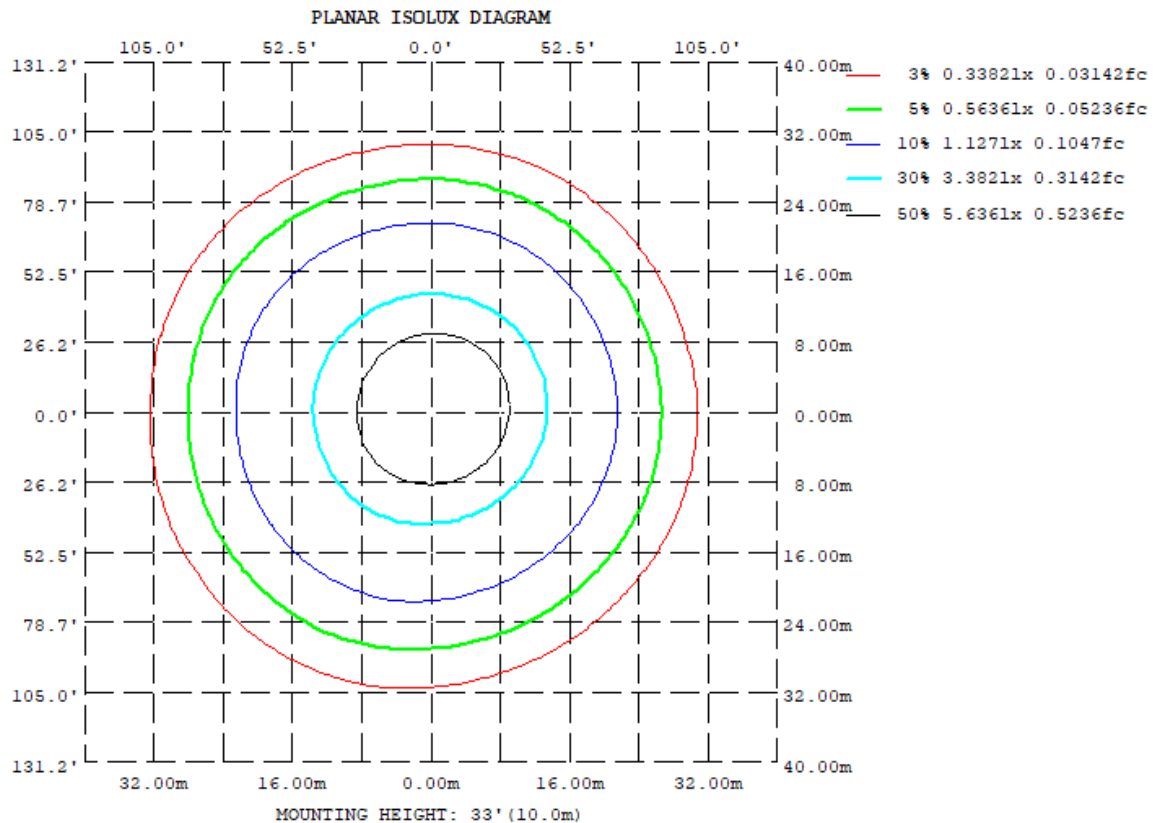
Flux (lm)	Zonal Lumen Requirement (60° - 80°)	Zonal Lumen Requirement (70° - 80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7116	36.22%	14.83%	173.7	172.9	161.7	160.6	103.0

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	1137	1135	1131	1126	1122	1120	1126	1134		
20	1155	1148	1140	1133	1122	1113	1128	1150		
30	1192	1170	1149	1150	1135	1124	1155	1191		
40	1339	1270	1238	1270	1278	1283	1325	1366		
50	1521	1411	1407	1495	1512	1509	1527	1562		
60	1622	1501	1553	1708	1746	1736	1638	1651		
70	1269	1217	1332	1522	1495	1426	1245	1249		
80	545.5	578.4	688.8	826.5	734.8	622.8	477.4	477.7		
90	4.812	9.922	23.18	46.64	27.20	0.8657	0.2666	0.2971		
100	0.7510	0.7075	0.6807	0.6525	0.7791	0.8084	0.7568	0.8230		
110	0.9804	1.165	1.092	0.9006	1.260	1.255	1.190	1.149		
120	1.124	1.430	1.445	1.213	1.445	1.617	1.485	1.496		
130	1.515	1.651	1.738	1.563	1.764	1.798	1.859	1.715		
140	1.856	1.853	1.980	2.418	2.131	2.182	2.193	2.155		
150	2.121	2.127	1.655	3.244	2.497	2.583	2.398	2.532		
160	2.362	1.629	1.744	3.576	5.088	2.442	2.687	2.354		
170	4.105	1.606	1.634	3.260	3.141	3.466	2.099	3.951		
180	1.733	2.217	2.511	4.122	1.733	1.776	1.893	1.893		

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	107.62	0 - 10	107.62	1.51%
10-20	321.05	0 - 20	428.67	6.02%
20-30	529.89	0 - 30	958.56	13.47%
30-40	765.28	0 - 40	1723.84	24.23%
40-50	1082.15	0 - 50	2805.99	39.43%
50-60	1420.35	0 - 60	4226.34	59.39%
60-70	1521.73	0 - 70	5748.07	80.78%
70-80	1055.40	0 - 80	6803.47	95.61%
80-90	299.05	0 - 90	7102.52	99.81%
90-100	4.51	0 - 100	7107.03	99.88%
100-110	0.98	0 - 110	7108.01	99.89%
110-120	1.25	0 - 120	7109.26	99.91%
120-130	1.44	0 - 130	7110.70	99.93%
130-140	1.44	0 - 140	7112.14	99.95%
140-150	1.42	0 - 150	7113.56	99.97%
150-160	1.20	0 - 160	7114.76	99.99%
160-170	0.77	0 - 170	7115.53	100.00%
170-180	0.26	0 - 180	7115.79	100.00%

3.2 Goniophotometer Test

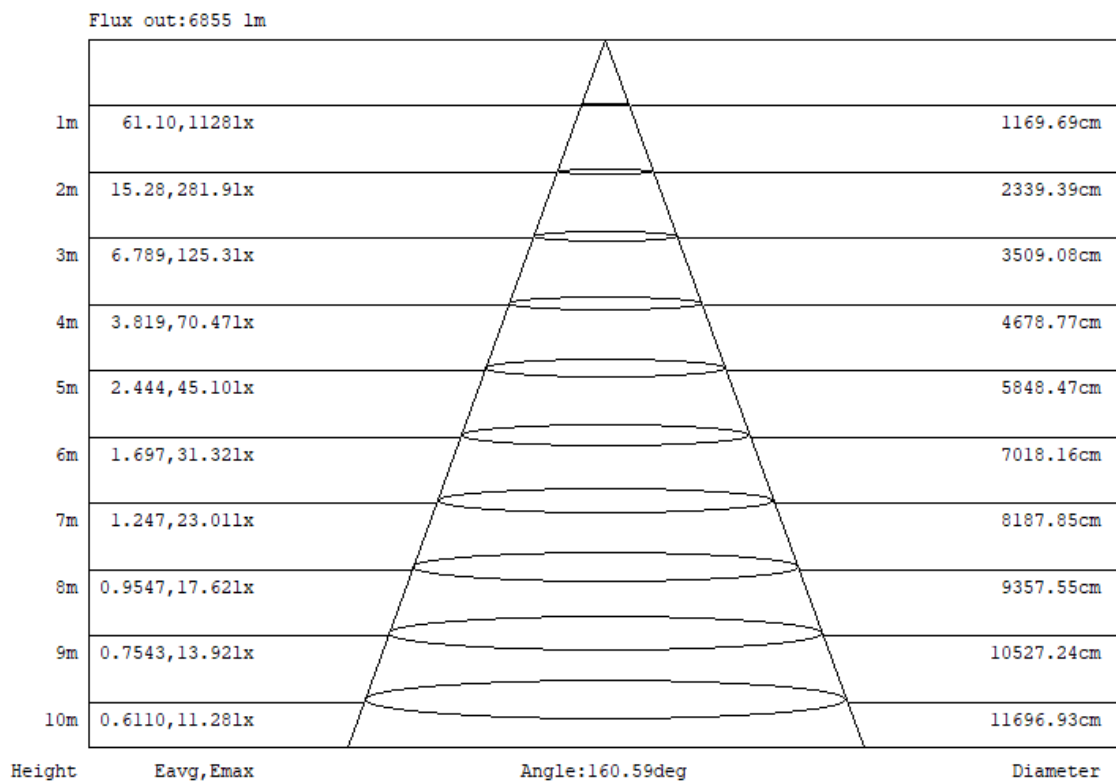
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	26	26	26	26	26	26	26	26	25	25	25	24	24	24	23	23	23	22
1	23	22	21	20	23	21	20	19	20	19	19	19	19	18	19	18	17	17
2	21	18	16	15	20	18	16	14	17	15	14	16	15	14	15	14	13	13
3	18	15	13	11	18	15	13	11	14	13	11	14	12	11	13	12	11	10
4	16	13	11	9	16	13	11	9	12	10	9	12	10	9	11	10	9	8
5	15	12	9	7	14	11	9	7	11	9	7	10	9	7	10	8	7	7
6	14	10	8	6	13	10	8	6	10	8	6	9	7	6	9	7	6	5
7	13	9	7	5	12	9	7	5	9	7	5	8	6	5	8	6	5	5
8	12	8	6	5	11	8	6	5	8	6	5	7	6	4	7	6	4	4
9	11	7	5	4	10	7	5	4	7	5	4	7	5	4	7	5	4	3
10	10	7	5	4	10	7	5	4	6	5	4	6	5	3	6	5	3	3

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5C-70L730ZU	Sample ID.	J1
-----------	-----------------	------------	----

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	277.01	60	0.251	67.4	0.971	7.34%
25.1	119.96	60	0.583	69.7	0.997	6.39%

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*****