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

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2018/11/7

Prepared By	**Approved By**
Wangzun Zhu	Kevin Jia

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	7216
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	105.0
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	⩾30%	42.58%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	⩽25%	17.20%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3063
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	71
Power Factor	ANSI C82.77:2014	0.873	0.970
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	7.65%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/6	IVGT5-70L730ZU	I1
2	Goniophotometer Test	2018/11/6	IVGT5-70L730ZU	I1
3	THD and PF Test	2018/11/6	IVGT5-70L730ZU	I1

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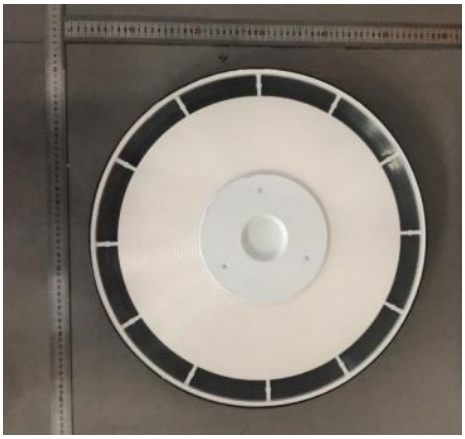
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing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

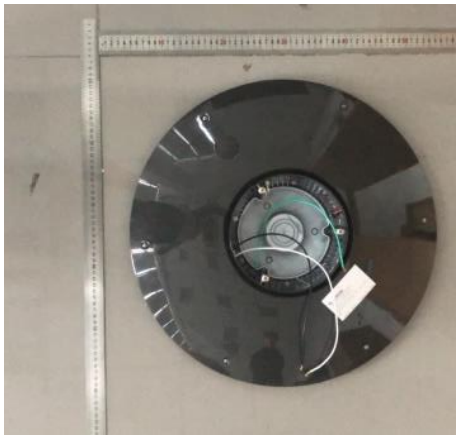
3.0 Production Description

Luminaire Description: IVGT5-70L730ZU

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.	IVGT5-70L730ZU	Sample ID.	I1
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	0.580	69.4	0.997

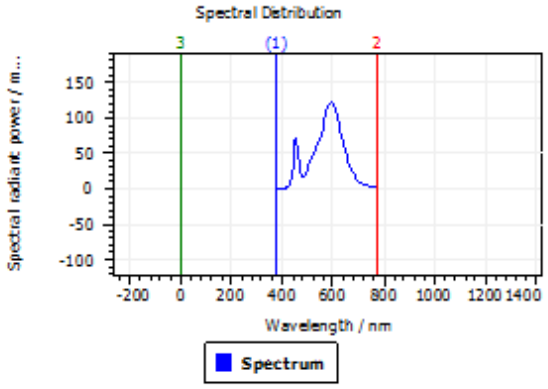
Test Result

CCT (K)	CRI (Ra)	Duv
3063	71.2	6.4E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

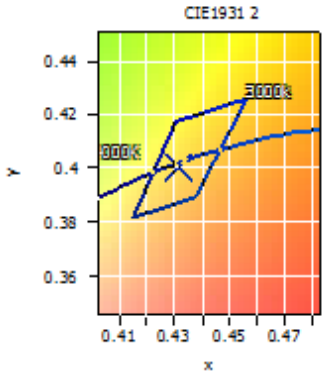
DominantWavelength	582.79 nm
Purity	0.498
PeakWavelength	592.83 nm
Radiant Power	16.31 W
Width50%:	103.19 nm

Color Coordinates

Correlated Color Temperatu 3063 K

x:	0.4316	u:	0.2486	u':	0.2486
y:	0.4006	v:	0.3461	v':	0.5192

ResultsCRICRI01	67.4	ResultsCRICRI09	-40.9
ResultsCRICRI02	84.4	ResultsCRICRI10	65.0
ResultsCRICRI03	93.3	ResultsCRICRI11	60.0
ResultsCRICRI04	64.9	ResultsCRICRI12	54.3
ResultsCRICRI05	67.2	ResultsCRICRI13	71.1
ResultsCRICRI06	78.8	ResultsCRICRI14	96.7
ResultsCRICRI07	74.8	ResultsCRICRI15	58.5
ResultsCRICRI08	39.0	ResultsCRICRI16	56.1
ResultsCRI	71.2		



PlanckDistance 6.4E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5-70L730ZU	Sample ID.	I1
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

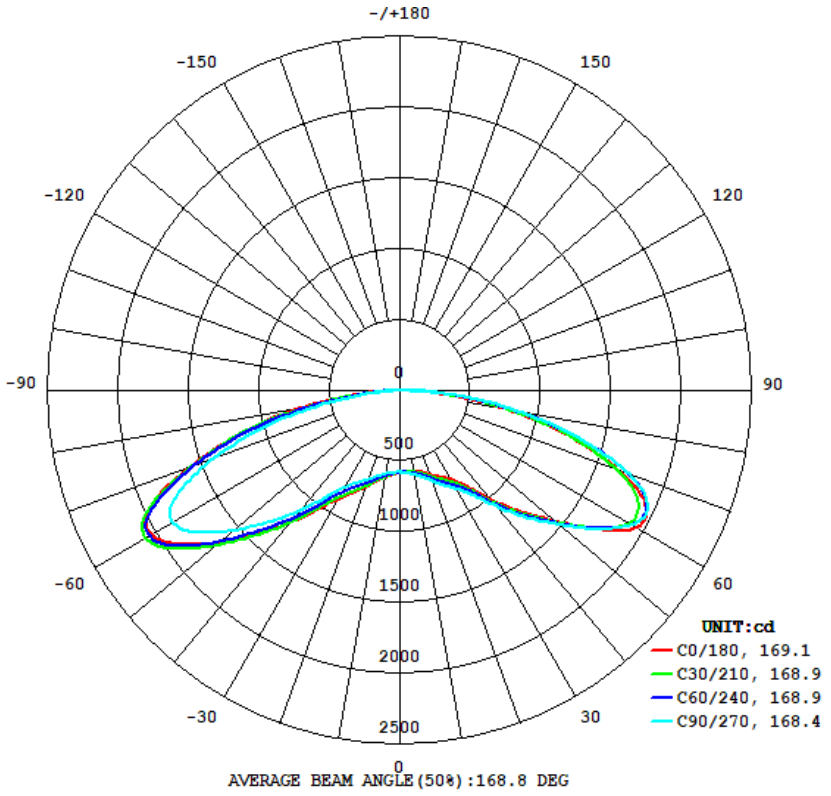
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.03	60	0.574	68.7	0.996	Light Down

Test Result

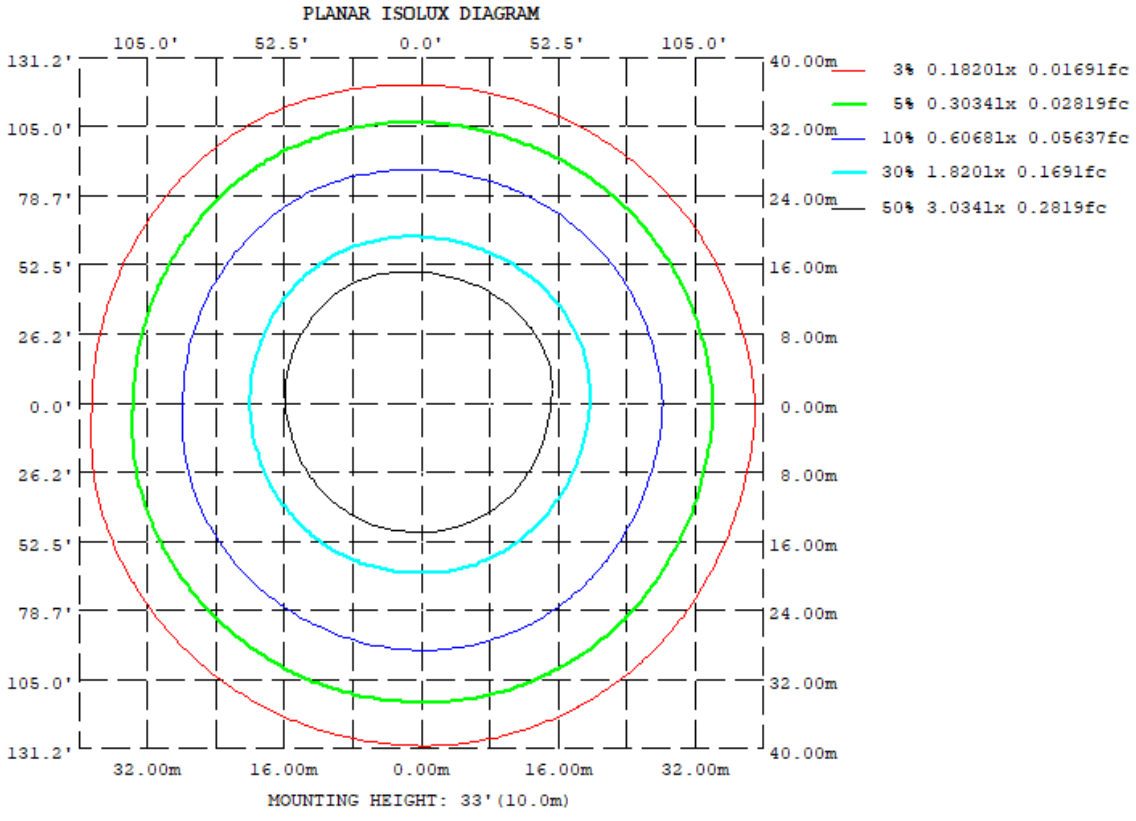
Flux (lm)	Zonal Lumen Requirement (60°-80°)	Zonal Lumen Requirement (70°-80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
7216	42.58%	17.20%	176.3	175.2	169.1	168.4	105.0

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	584.6	594.2	608.8	620.5	627.8	619.8	602.5	588.8
20	640.2	659.8	684.8	711.4	730.0	712.8	673.6	646.2
30	733.5	768.5	807.0	854.3	890.7	851.9	790.1	750.9
40	1013	1040	1070	1143	1221	1204	1109	1058
50	1442	1464	1482	1569	1673	1698	1542	1505
60	1939	1895	1903	1997	2036	2091	1865	1931
70	1651	1684	1734	1736	1585	1578	1408	1472
80	762.9	818.0	848.4	867.9	678.5	622.8	516.2	579.8
90	8.283	23.99	25.74	35.72	0.5538	0.3319	0.3152	0.3565
100	0.8506	0.7911	0.7707	0.7747	0.7856	0.7857	0.7843	0.8460
110	1.119	1.097	1.002	0.9917	1.198	1.198	1.243	1.163
120	1.165	1.230	1.274	1.152	1.304	1.470	1.387	1.472
130	1.273	1.425	1.479	1.225	1.469	1.578	1.697	1.610
140	1.220	1.532	1.504	1.353	1.533	1.798	1.966	1.848
150	1.269	1.563	1.433	1.416	1.772	1.986	2.053	2.009
160	1.223	1.548	1.495	1.310	1.727	1.829	1.947	1.856
170	1.225	1.509	1.348	1.321	1.774	1.430	2.614	1.639
180	1.324	1.451	1.480	1.411	1.322	1.369	1.490	1.466

DEG	LUMINOUS INTENSITY:cd

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	56.73	0 - 10	56.73	0.79%
10-20	182.23	0 - 20	238.96	3.31%
20-30	343.76	0 - 30	582.72	8.08%
30-40	593.37	0 - 40	1176.09	16.30%
40-50	1026.58	0 - 50	2202.67	30.52%
50-60	1592.59	0 - 60	3795.26	52.59%
60-70	1831.56	0 - 70	5626.82	77.97%
70-80	1241.40	0 - 80	6868.22	95.18%
80-90	336.83	0 - 90	7205.05	99.84%
90-100	4.14	0 - 100	7209.19	99.90%
100-110	1.02	0 - 110	7210.21	99.92%
110-120	1.20	0 - 120	7211.41	99.93%
120-130	1.27	0 - 130	7212.68	99.95%
130-140	1.20	0 - 140	7213.88	99.97%
140-150	1.06	0 - 150	7214.94	99.98%
150-160	0.78	0 - 160	7215.72	99.99%
160-170	0.44	0 - 170	7216.16	100.00%
170-180	0.15	0 - 180	7216.31	100.00%

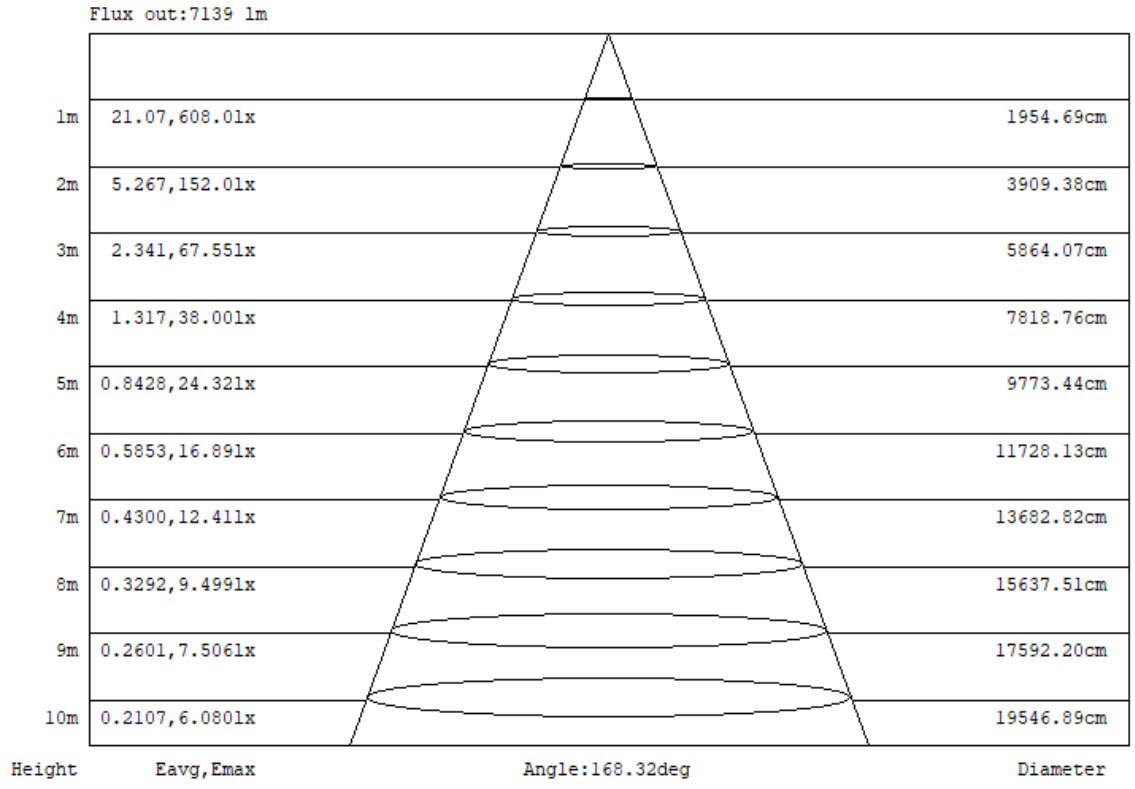
3.2 Goniophotometer Test

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	167	167	167	167	163	163	163	163	155	155	155	149	149	149	143	143	143	140
1	146	136	128	120	141	133	125	118	126	120	114	121	115	110	115	111	107	103
2	127	111	98	87	123	108	96	86	103	93	84	98	89	82	93	86	80	76
3	112	92	77	65	108	90	76	65	85	73	63	81	71	62	77	68	61	57
4	100	78	62	50	96	76	61	50	72	59	49	69	57	48	65	55	47	43
5	90	67	52	40	86	66	51	40	62	49	39	59	47	38	56	46	38	34
6	82	59	43	32	78	57	43	32	54	41	32	52	40	31	49	39	31	27
7	75	52	37	27	72	51	37	27	48	36	26	46	35	26	44	34	26	22
8	69	46	32	23	66	45	32	23	43	31	22	41	30	22	39	29	22	19
9	64	42	29	19	62	41	28	19	39	27	19	38	27	19	36	26	19	16
10	59	38	25	17	57	37	25	17	36	25	17	34	24	17	33	23	16	14

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5-70L730ZU	Sample ID.	I1

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	276.92	60	0.249	67.0	0.970	7.65%
25.1	120.04	60	0.580	69.4	0.997	5.84%

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**********