

Photometric Test Report

Relevant Standards

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

Prepared For

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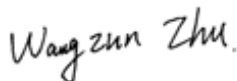
Test Date

2018/11/7

Issue Date

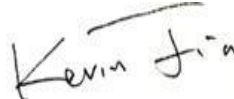
2018/11/8

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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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	3700
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	95	131.7
Zonal Lumen Requirement (60°-80°)	IES LM-79-2008	≥30%	39.68%
Zonal Lumen Requirement (70°-80°)	IES LM-79-2008	≤25%	16.25%
Allowable 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	0.912
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	15.18%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/7	IVGT5U-30L730WU	C1
2	Goniophotometer Test	2018/11/7	IVGT5U-30L730WU	C1
3	THD and PF Test	2018/11/7	IVGT5U-30L730WU	C1

Remark(If any)

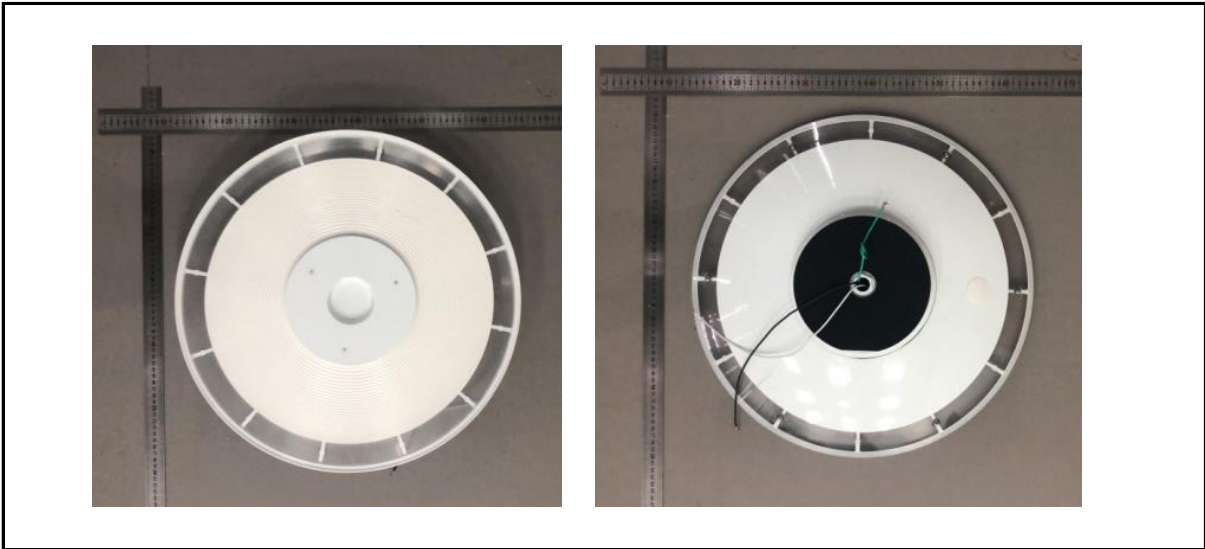
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3.0 Production Description

Luminaire Description: IVGT5U-30L730WU

Electrical Specification: 120V-277V,50/60HZ, 30W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVGT5U-30L730WU	Sample ID.	C1
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	277.05	60	0.112	28.2	0.912

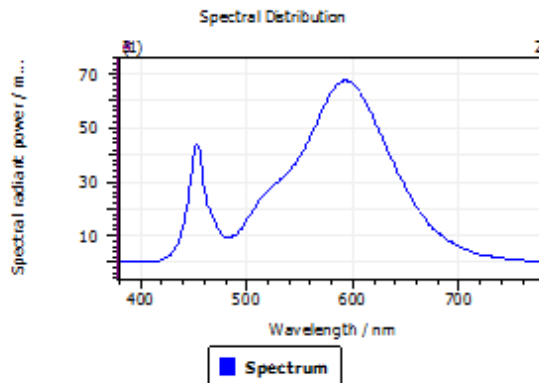
Test Result

CCT (K)	CRI (Ra)	Duv
3063	71.4	2.4E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

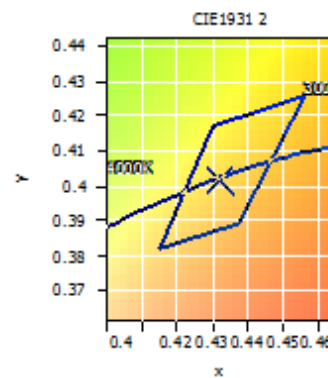
DominantWavelength	582.65 nm
Purity	0.503
PeakWavelength	592.97 nm
Radiant Power	8.85 W
Width50%:	102.34 nm

Color Coordinates

Correlated Color Temperatu 3063 K

x: 0.4322 u: 0.2485 u': 0.2485
y: 0.4018 v: 0.3465 v': 0.5198

ResultsCRICRI01	67.6	ResultsCRICRI09	-41.2
ResultsCRICRI02	84.5	ResultsCRICRI10	65.4
ResultsCRICRI03	93.3	ResultsCRICRI11	61.1
ResultsCRICRI04	65.5	ResultsCRICRI12	53.4
ResultsCRICRI05	67.5	ResultsCRICRI13	71.3
ResultsCRICRI06	79.1	ResultsCRICRI14	96.7
ResultsCRICRI07	74.9	ResultsCRICRI15	58.4
ResultsCRICRI08	38.9	ResultsCRICRI16	55.8
ResultsCRI	71.4		



PlanckDistance 2.4E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVGT5U-30L730WU	Sample ID.	C1
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

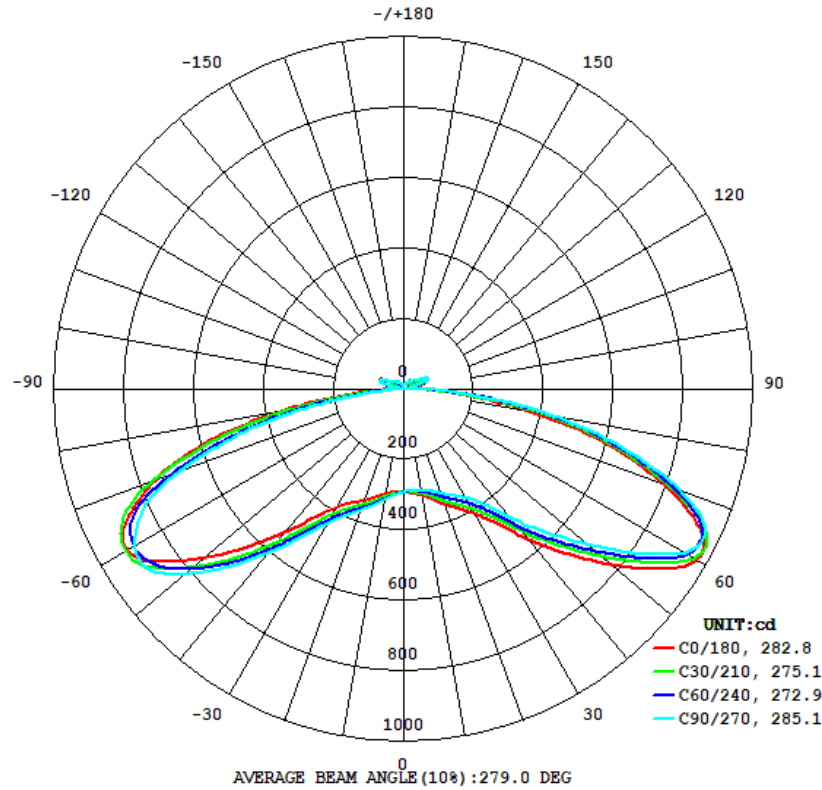
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	276.99	60	0.112	28.1	0.909	Light Down

Test Result

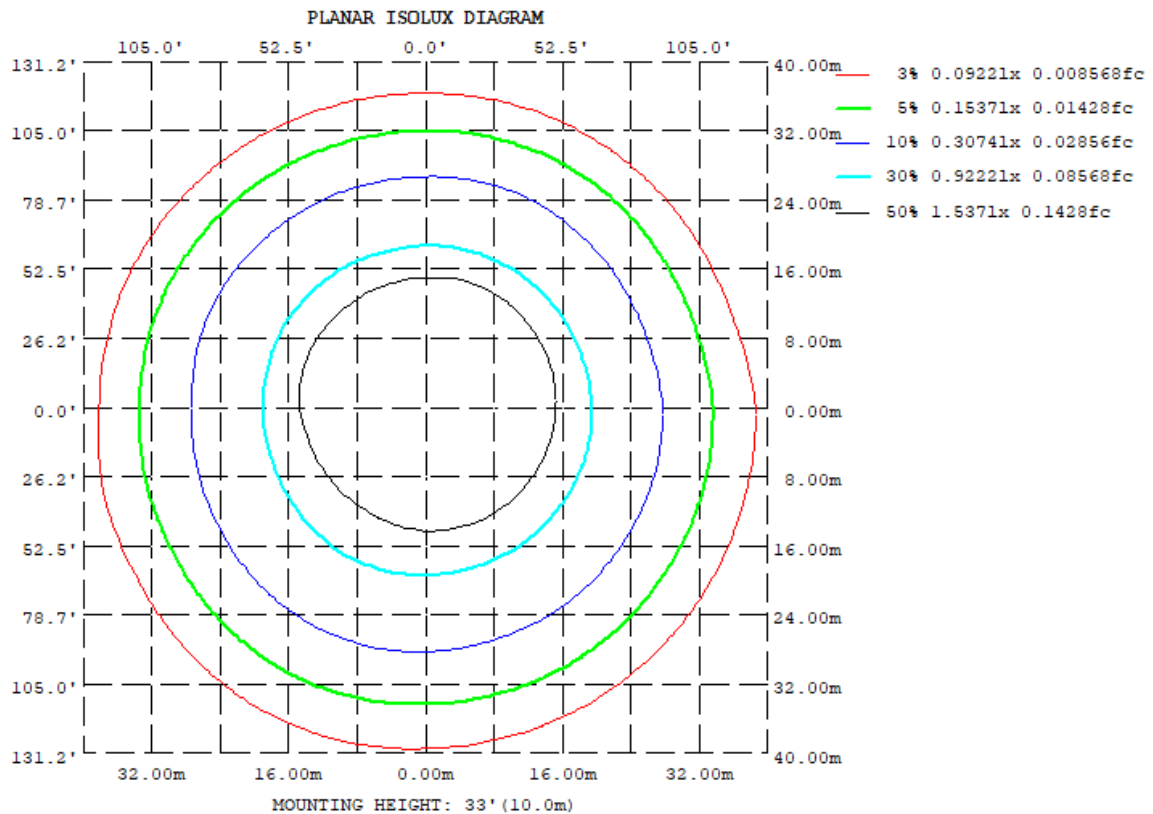
Flux (lm)	Zonal Lumen Requirement (60° - 80°)	Zonal Lumen Requirement (70° - 80°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3700	39.68%	16.25%	282.8	285.1	169.4	168.4	131.7

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	307.5	299.1	292.7	292.5	302.0	312.6	317.9	316.2
20	349.8	332.9	316.1	315.8	337.4	354.7	365.5	366.3
30	410.9	385.1	357.9	354.2	387.8	419.8	440.2	444.6
40	557.2	516.4	476.9	463.9	531.7	581.7	608.0	615.1
50	775.6	725.9	684.7	661.4	743.9	790.4	817.4	838.7
60	968.6	945.0	929.5	911.0	913.9	903.3	887.0	944.5
70	789.8	815.7	840.4	837.5	756.9	732.4	686.1	714.9
80	367.9	409.9	434.4	443.9	345.9	291.4	240.4	266.3
90	13.33	23.36	29.34	34.48	10.10	1.799	0.4495	0.6318
100	9.465	16.46	14.35	14.10	13.24	30.47	33.48	32.20
110	74.44	56.44	51.16	55.67	73.02	51.41	73.77	51.48
120	55.92	46.65	61.53	50.59	51.67	49.21	49.12	45.33
130	19.44	40.04	39.76	39.10	27.04	36.84	34.61	38.03
140	33.19	29.02	27.54	30.27	30.47	26.25	26.17	28.05
150	20.28	21.09	21.55	21.05	18.19	19.34	20.28	21.33
160	14.41	15.71	17.62	14.78	15.12	14.71	18.18	16.39
170	12.41	12.45	12.38	10.63	10.27	9.895	10.82	11.47
180	8.938	8.736	7.832	9.361	8.904	9.024	8.180	8.715
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	28.56	0 - 10	28.56	0.77%
10-20	91.80	0 - 20	120.36	3.25%
20-30	171.32	0 - 30	291.68	7.88%
30-40	292.85	0 - 40	584.53	15.80%
40-50	503.23	0 - 50	1087.76	29.40%
50-60	764.38	0 - 60	1852.14	50.05%
60-70	867.03	0 - 70	2719.17	73.48%
70-80	601.17	0 - 80	3320.34	89.73%
80-90	171.31	0 - 90	3491.65	94.36%
90-100	12.75	0 - 100	3504.40	94.70%
100-110	44.64	0 - 110	3549.04	95.91%
110-120	61.74	0 - 120	3610.78	97.58%
120-130	36.42	0 - 130	3647.20	98.56%
130-140	24.83	0 - 140	3672.03	99.23%
140-150	15.08	0 - 150	3687.11	99.64%
150-160	8.38	0 - 160	3695.49	99.86%
160-170	4.08	0 - 170	3699.57	99.98%
170-180	0.92	0 - 180	3700.49	100.00%

3.2 Goniophotometer Test

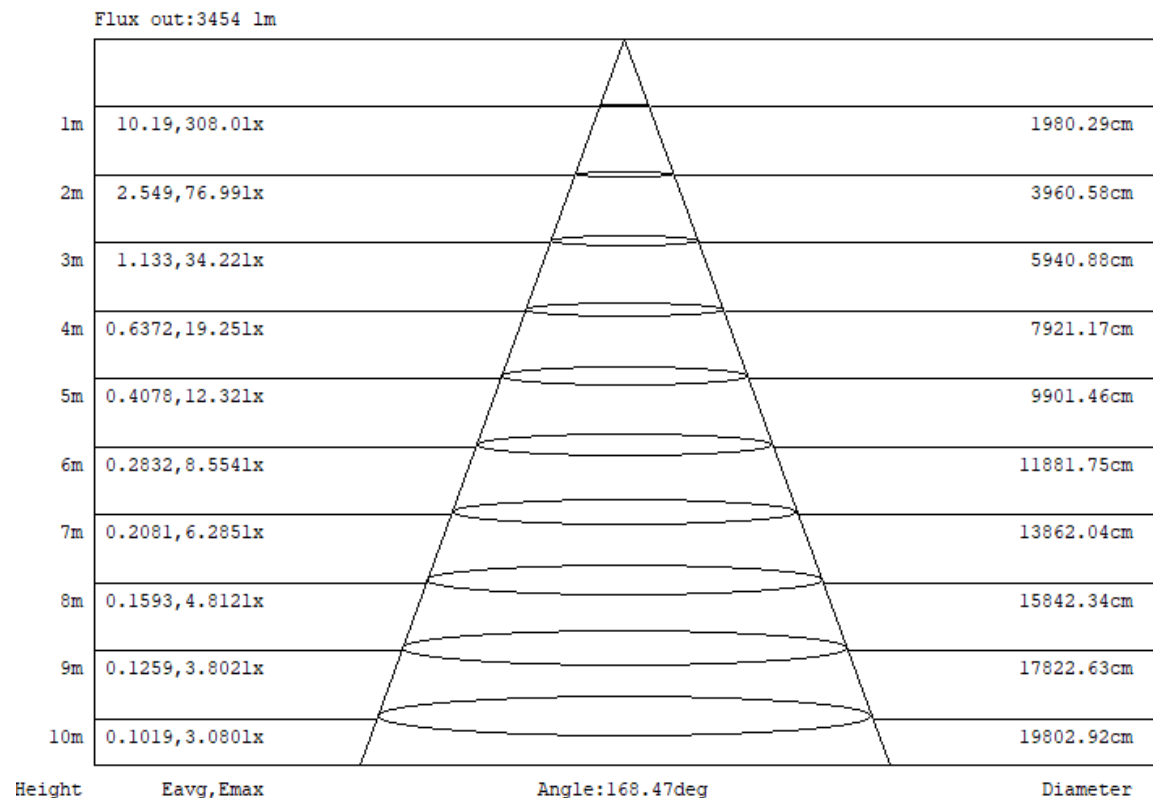
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	118	118	118	118	114	114	114	114	108	108	108	102	102	102	97	97	97	94
1	103	96	90	85	99	93	88	83	88	83	79	83	79	76	78	75	73	70
2	90	79	70	62	87	77	68	61	72	65	59	68	62	56	63	59	54	51
3	80	66	55	47	76	64	54	46	60	51	45	56	49	43	53	47	41	39
4	71	56	45	37	68	54	44	36	51	42	35	48	40	34	45	38	32	30
5	64	48	37	29	61	47	36	29	44	35	28	41	33	27	38	32	26	23
6	58	42	32	24	56	41	31	23	38	29	23	36	28	22	34	27	21	19
7	53	37	27	20	51	36	26	20	34	25	19	32	24	18	30	23	18	15
8	49	33	24	17	47	32	23	17	31	22	16	29	21	16	27	20	15	13
9	46	30	21	14	44	29	20	14	28	20	14	26	19	13	25	18	13	11
10	42	28	19	13	41	27	18	12	25	17	12	24	17	12	23	16	11	9

CONE OF LIGHT DIAGRAM



5.0 THD and PF Test

Model No.	IVGT5U-30L730WU	Sample ID.	C1
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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	277.05	60	0.112	28.2	0.912	15.18%
25.1	119.99	60	0.234	27.8	0.989	9.71%

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*****