

Photometric Test Report

Relevant Standards

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

Prepared For

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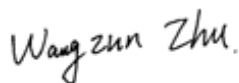
Test Date

2019/5/16

Issue Date

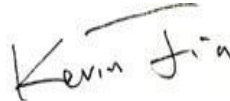
2019/5/24

Prepared By



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Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v4.4

Indoor - 2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces				
Requirement Category (Test Data Source)	Test Method	DLC Requirements with tolerances		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	2000		2904
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 97	Premium 121.25	107.6
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrosted Case		27.0
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	25.00%	120V	10.07%
		25.00%	277V	12.17%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.873	120V	0.989
		0.873	277V	0.936
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	5000		4828
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	78		81
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥72%		76.87%
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	0.9-2.1		1.30
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	0.9-2.1		1.30
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrosted Case		120
(THD & PF - section 4.3)		Non-Wrosted Case		277
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrosted Case		0.227
(THD & PF - section 4.3)		Non-Wrosted Case		0.104
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrosted Case		27.0
(THD & PF - section 4.3)		Non-Wrosted Case		26.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/5/16	T34-2X2-30/D10	B1
2	Goniophotometer Test	2019/5/16	T34-2X2-30/D10	B1
3	THD and PF Test	2019/5/16	T34-2X2-30/D10	B1

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: T34-2X2-30/D10

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

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	T34-2X2-30/D10	Sample ID.	B1
Operate time (Min.)	10	Stabilization time (Min.)	30
Temperature (°C)	25.2	Humidity (%RH)	51.0

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.

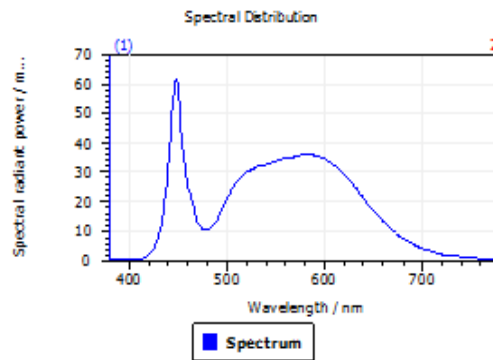
The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

Voltage (V)	CCT (K)	CRI	Duv
120.00	4828	81	3.3E-03

4.1 Integrating Sphere Test

Results



Spectral values

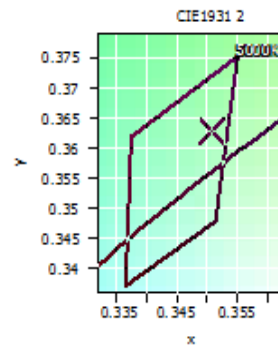
DominantWavelength	571.98 nm
Purity	0.142
PeakWavelength	447.71 nm
Radiant Power	6.952 W
Width50%:	17.34 nm

Color Coordinates

Correlated Color Temperature 4828 K

x: 0.3510 u: 0.2111 u': 0.2111
y: 0.3629 v: 0.3273 v': 0.4909

ResultsCRICRI01	79.0	ResultsCRICRI09	4.1
ResultsCRICRI02	84.9	ResultsCRICRI10	64.6
ResultsCRICRI03	89.8	ResultsCRICRI11	80.7
ResultsCRICRI04	81.6	ResultsCRICRI12	55.7
ResultsCRICRI05	79.4	ResultsCRICRI13	80.1
ResultsCRICRI06	79.5	ResultsCRICRI14	94.5
ResultsCRICRI07	86.9	ResultsCRICRI15	72.7
ResultsCRICRI08	66.8	ResultsCRICRI16	72.0
ResultsCRI	81.0		



PlanckDistance 3.3E-003

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34-2X2-30/D10	Sample ID.	B1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.2	Humidity (%RH)	52.0

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

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
120.03	60	0.227	27.0	0.988	Light Down

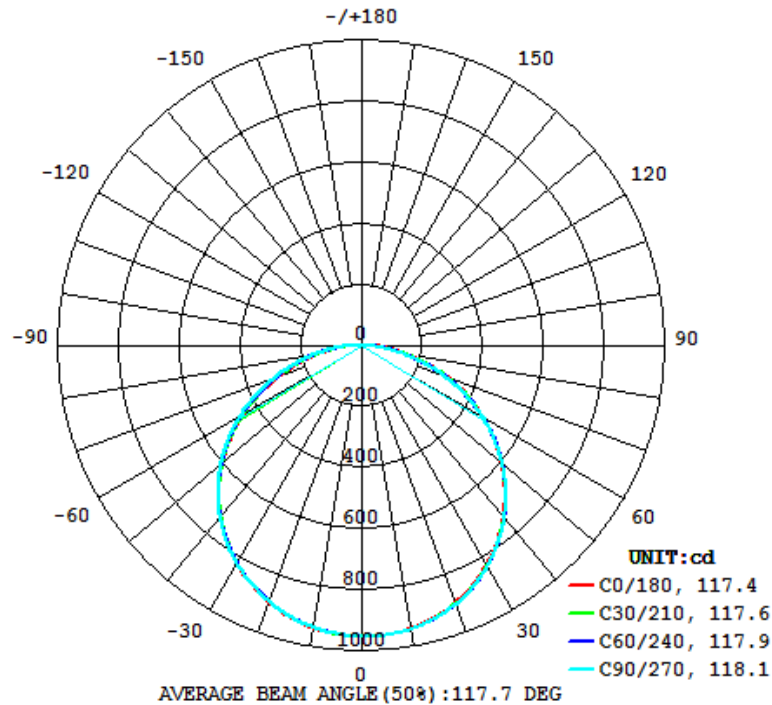
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2904	165.3	164.9	117.4	118.1	107.6

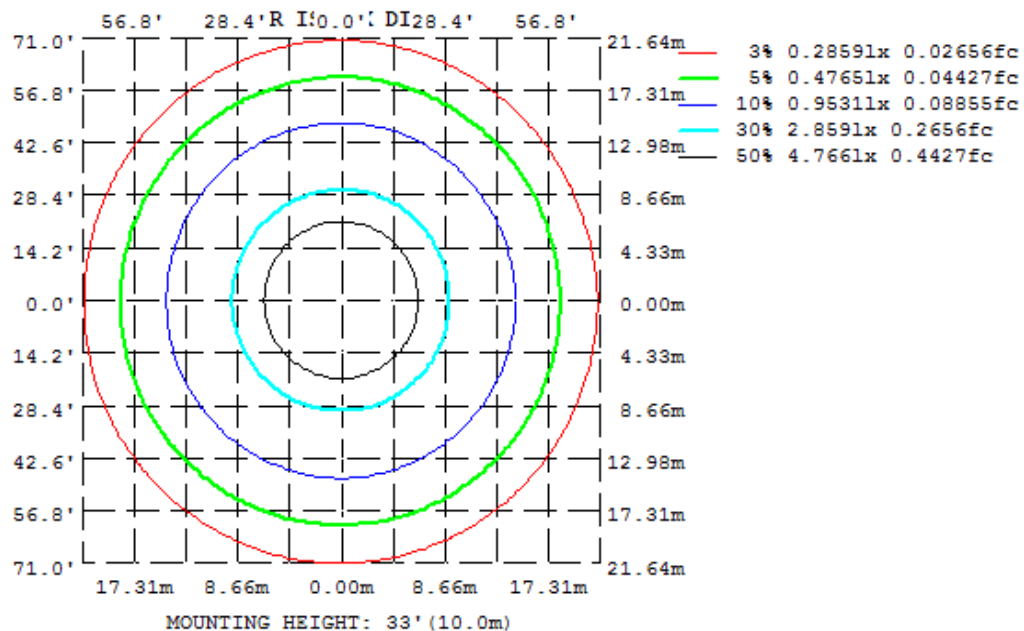
Zonal Lumen Requirement (0° - 60°)	SC: 0 - 180°	SC: 90° - 270°
76.87%	1.30	1.30

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	938.2	936.5	936.6	937.5	940.1	940.9	940.6	938.6
20	894.9	892.7	893.3	895.6	897.9	900.8	900.6	896.5
30	823.9	821.3	823.7	826.1	828.3	831.6	831.8	826.2
40	724.8	724.0	727.5	730.1	730.2	734.2	733.9	727.6
50	600.1	602.1	607.3	609.5	606.4	608.8	608.0	601.7
60	453.3	458.6	465.5	466.8	459.4	459.5	457.6	451.7
70	292.3	299.9	308.6	308.8	297.2	294.0	289.7	286.4
80	132.8	141.8	147.8	149.6	136.4	127.8	118.2	121.2
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	90.26	0 - 10	90.26	3.11%
10-20	260.09	0 - 20	350.35	12.06%
20-30	398.80	0 - 30	749.15	25.80%
30-40	488.68	0 - 40	1237.83	42.62%
40-50	516.93	0 - 50	1754.76	60.42%
50-60	477.69	0 - 60	2232.45	76.87%
60-70	375.07	0 - 70	2607.52	89.78%
70-80	227.10	0 - 80	2834.62	97.60%
80-90	69.60	0 - 90	2904.22	100.00%
90-100	0.00	0 - 100	2904.22	100.00%
100-110	0.00	0 - 110	2904.22	100.00%
110-120	0.00	0 - 120	2904.22	100.00%
120-130	0.00	0 - 130	2904.22	100.00%
130-140	0.00	0 - 140	2904.22	100.00%
140-150	0.00	0 - 150	2904.22	100.00%
150-160	0.00	0 - 160	2904.22	100.00%
160-170	0.00	0 - 170	2904.22	100.00%
170-180	0.00	0 - 180	2904.22	100.00%

4.2 Goniophotometer Test

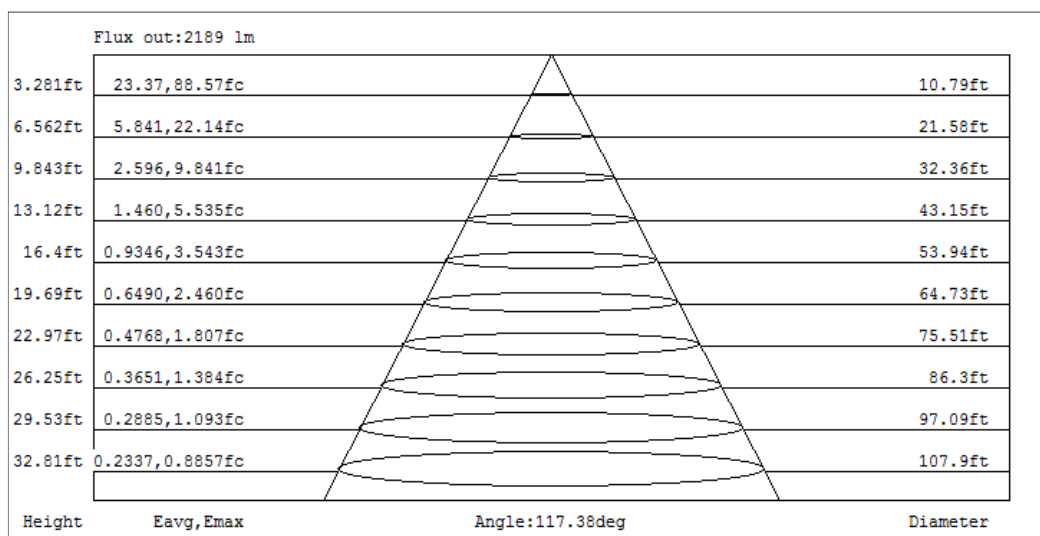
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

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	108	103	99	95	105	101	97	93	97	93	90	93	90	87	89	87	85	83
2	98	90	82	77	95	88	81	76	84	79	74	81	76	72	78	74	70	68
3	89	78	70	63	87	77	69	63	74	67	61	71	65	60	68	63	59	57
4	82	69	60	53	79	68	59	53	65	58	52	63	57	51	61	55	51	48
5	75	62	52	46	73	61	52	45	58	51	45	56	50	44	54	49	44	42
6	69	55	46	40	67	54	46	39	53	45	39	51	44	39	49	43	38	36
7	64	50	41	35	62	49	41	35	48	40	35	46	39	34	45	39	34	32
8	59	46	37	31	58	45	37	31	44	36	31	42	36	31	41	35	30	28
9	56	42	34	28	54	41	33	28	40	33	28	39	32	27	38	32	27	25
10	52	39	31	25	51	38	30	25	37	30	25	36	30	25	35	29	25	23

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34-2X2-30/D10	Sample ID.	B1
Temperature (°C)	25.2	Humidity (%RH)	51.0

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

Worst Case			Non-Worst Case				
Voltage (Vac)	Power Factor	THD	Voltage (Vac)	Current	Wattage	Power Factor	THD
120.00	0.989	10.07%	277.04	0.104	26.9	0.936	12.17%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2018/12/26	2019/12/25
DLF108	Auxiliary Lamp	2018/12/26	2019/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF116	AC Power Source	2018/12/26	2019/12/25
DLF113	Power Meter	2018/12/26	2019/12/25
DLF112	Temperature Recorder	2018/12/26	2019/12/25
DLF114	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF101	Goniophotometer	2018/12/26	2019/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2018/12/26	2019/12/25
DLF104	AC Power Source	2018/12/26	2019/12/25
DLF507	DC Power Source	2018/12/26	2019/12/25
DLF102	Power Meter	2018/12/26	2019/12/25
DLF111	Temperature & Humidity Datalogger	2018/12/26	2019/12/25
DLF119	Power Meter	2018/12/26	2019/12/25
DLF031	Temperature data logger	2018/12/26	2019/12/25
DLF022	Digital power meter	2018/12/26	2019/12/25
DLF003	Temperature & Humidity Datalogger	2018/12/26	2019/12/25

***** End of Test Report*****