Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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2019/5/24

Prepared By	**Approved By**
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1.0 Test Summary

DLC Technical Requirements v4.4

Indoor - 2x4 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	3000		4472
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 97	Premium 121.25	112.9
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		39.6
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	25.00%	120V	10.90%
		25.00%	277V	10.01%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.873	120V	0.989
		0.873	277V	0.951
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	5000		3918
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	78		80
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	⩾72%		75.48%
SC: 0-180° (Goniophotometer - Section 4.2)	IES LM-79-2008	0.9-2.1		1.28
SC: 90-270° (Goniophotometer - Section 4.2)	IES LM-79-2008	0.9-2.1		1.38
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		120
(THD & PF - section 4.3)		Non-Wrost Case		277
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		0.334
(THD & PF - section 4.3)		Non-Wrost Case		0.151
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		39.6
(THD & PF - section 4.3)		Non-Wrost Case		39.7

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2019/5/16	T34-2X4-40N/D10	C1
2	Goniophotometer Test	2019/5/16	T34-2X4-40N/D10	C1
3	THD and PF Test	2019/5/16	T34-2X4-40N/D10	C1

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.

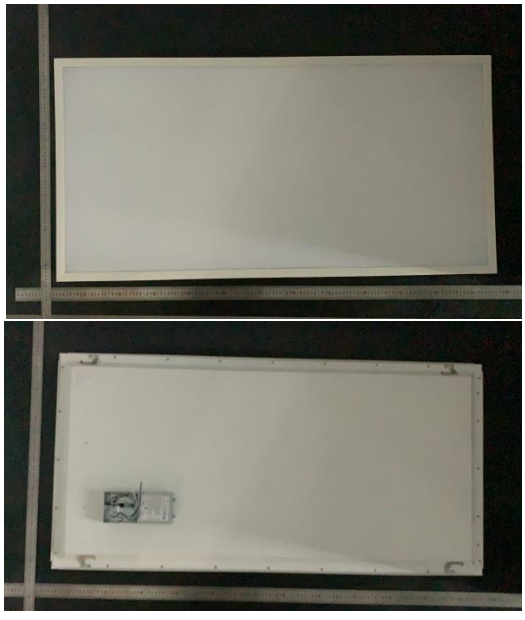
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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: T34-2X4-40N/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.	T34-2X4-40N/D10	Sample ID.	C1
Opreate time (Min.)	10	Stabilization time (Min.)	30
Temperature (°C)	25.0	Humidity (%RH)	55.0

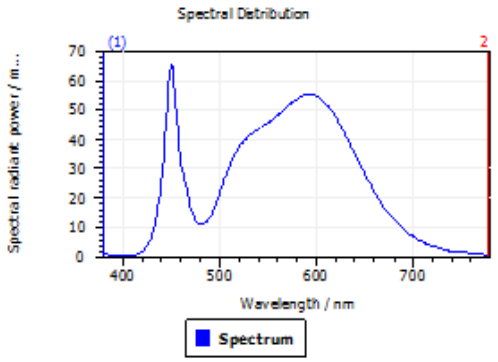
Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º C. The sample measurements were made using a spectroradiometer 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 Result

Voltage (V)	CCT (K)	CRI	Duv
120.05	3918	80	2.0E-03

4.1 Integrating Sphere Test

Results



Spectral values

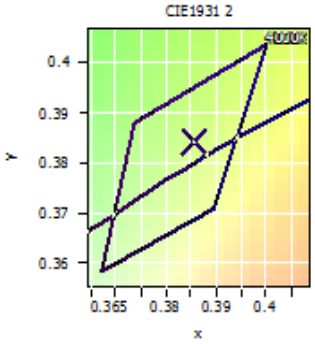
DominantWavelength	578.39 nm
Purity	0.311
PeakWavelength	449.97 nm
Radiant Power	9.498 W
Width50%:	17.81 nm

Color Coordinates

Correlated Color Temperatu 3918 K

x:	0.3856	u:	0.2255	u':	0.2255
y:	0.3842	v:	0.3371	v':	0.5056

ResultsCRICRI01	78.0	ResultsCRICRI09	0.9
ResultsCRICRI02	85.2	ResultsCRICRI10	64.9
ResultsCRICRI03	91.0	ResultsCRICRI11	77.8
ResultsCRICRI04	79.8	ResultsCRICRI12	53.6
ResultsCRICRI05	77.8	ResultsCRICRI13	79.3
ResultsCRICRI06	79.8	ResultsCRICRI14	94.8
ResultsCRICRI07	85.7	ResultsCRICRI15	71.4
ResultsCRICRI08	62.5	ResultsCRICRI16	70.6
ResultsCRI	80.0		



PlanckDistance	2.0E-003

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	T34-2X4-40N/D10	Sample ID.	C1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.0	Humidity (%RH)	55.0

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

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
119.95	60	0.334	39.6	0.988	Light Down

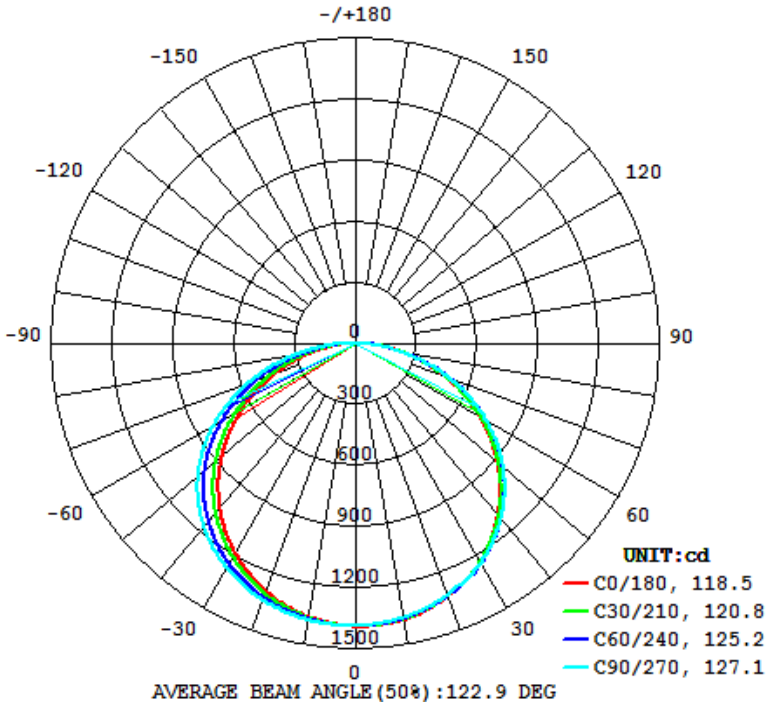
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
4472	166.1	168.1	118.5	127.1	112.9

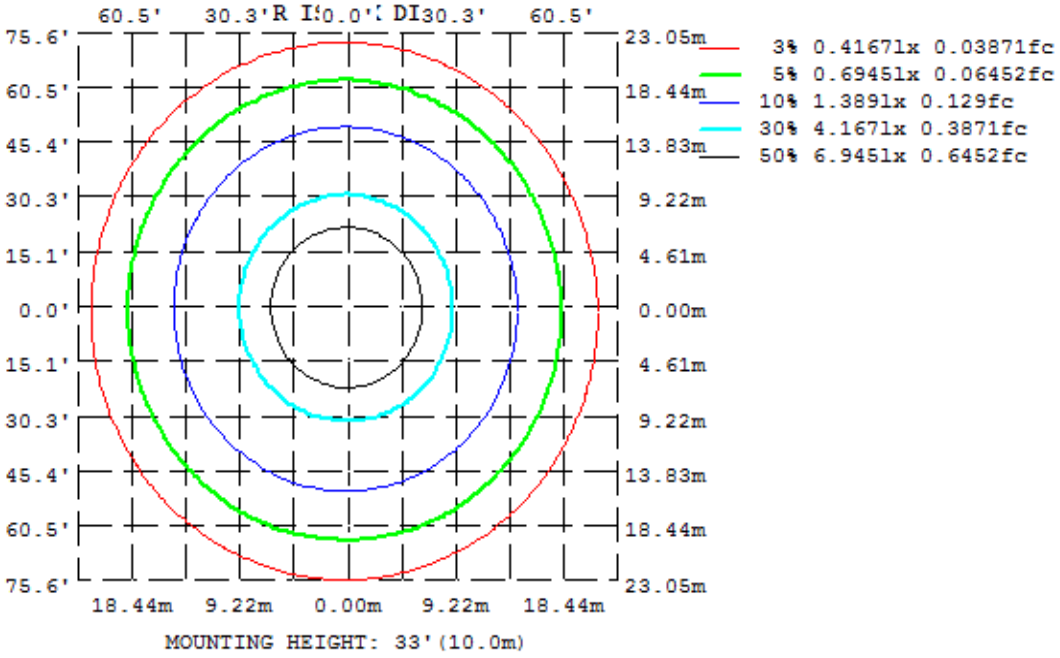
Zonal Lumen Requirement (0°-60°)	SC:0-180°	SC:90°-270°
75.48%	1.28	1.38

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	1362	1370	1378	1377	1375	1370	1364	1357
20	1296	1319	1341	1335	1321	1319	1314	1295
30	1190	1232	1273	1255	1233	1239	1240	1204
40	1044	1106	1168	1136	1096	1111	1120	1067
50	863.0	938.8	1016	973.3	918.7	940.5	954.3	889.8
60	650.3	730.2	815.4	768.2	705.8	728.0	742.0	674.9
70	419.7	490.5	568.1	529.5	466.9	480.8	487.1	431.5
80	187.5	233.7	282.1	268.6	225.1	223.6	212.8	185.3
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	131.48	0 - 10	131.48	2.94%
10-20	380.69	0 - 20	512.17	11.45%
20-30	590.31	0 - 30	1102.48	24.65%
30-40	734.75	0 - 40	1837.23	41.08%
40-50	791.38	0 - 50	2628.61	58.78%
50-60	746.90	0 - 60	3375.51	75.48%
60-70	601.11	0 - 70	3976.62	88.92%
70-80	375.16	0 - 80	4351.78	97.31%
80-90	120.16	0 - 90	4471.94	100.00%
90-100	0.00	0 - 100	4471.94	100.00%
100-110	0.00	0 - 110	4471.94	100.00%
110-120	0.00	0 - 120	4471.94	100.00%
120-130	0.00	0 - 130	4471.94	100.00%
130-140	0.00	0 - 140	4471.94	100.00%
140-150	0.00	0 - 150	4471.94	100.00%
150-160	0.00	0 - 160	4471.94	100.00%
160-170	0.00	0 - 170	4471.94	100.00%
170-180	0.00	0 - 180	4471.94	100.00%

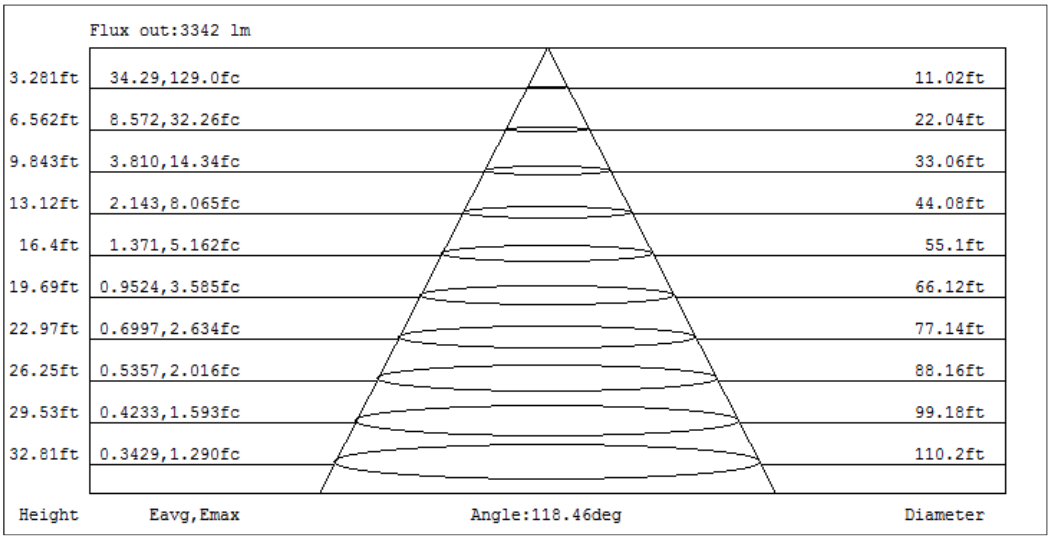
4.2 Goniophotometer Test

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	98	94	105	101	96	93	96	93	90	92	89	87	89	86	84	82
2	98	89	82	76	95	87	80	75	83	78	73	80	75	71	77	73	70	67
3	89	78	69	62	86	76	68	62	73	66	60	70	64	59	68	63	58	56
4	81	68	59	52	79	67	58	52	64	57	51	62	56	50	60	54	50	47
5	74	61	51	45	72	60	51	44	58	50	44	55	49	43	54	48	43	41
6	68	55	45	39	66	54	45	38	52	44	38	50	43	38	48	42	37	35
7	63	49	40	34	62	49	40	34	47	39	34	45	39	33	44	38	33	31
8	59	45	36	30	57	44	36	30	43	35	30	42	35	30	40	34	29	28
9	55	41	33	27	53	41	32	27	39	32	27	38	32	27	37	31	26	25
10	51	38	30	24	50	37	30	24	36	29	24	35	29	24	35	28	24	22

CONE OF LIGHT DIAGRAM



4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	T34-2X4-40N/D10	Sample ID.	C1
Temperature (°C)	25.0	Humidity (%RH)	55.0

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 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							
Wrost Case			Non-Wrost Case				
Voltage (Vac)	Power Factor	THD	Voltage (Vac)	Current	Wattage	Power Factor	THD
120.05	0.989	10.90%	277.03	0.151	39.7	0.951	10.01%

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**********