Photometric Test Report

Relevant Standards

☑IES LM-79-2024

☑ANSI C82.77-10:2020

Prepared For

Espen Technology Inc.

12257 Florence Ave. Santa Fe Springs, CA 90670

Maofu Miao, 562-529-2938, maofu@espentech.com

Prepared By

Deliver Co., Ltd.

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

0512-66801950,kevin.jia@szdeliver.com

Project Number

DLF2604102

Report Number

DLF2604102-1a

Test Date

2026/5/7

Issue Date

2026/5/8

Test By	Prepared By	Approved By
Hengshan Li	Wangzun Zhu	Kevin Jia

1.0 Test Summary

Linear Replacement Lamps - 2' T5 Lamps- 2-lamp External Driver (UL Type C) Lamps			
Requirement Category	**Test Method**	**Requirements**	**Test value**
Luminaire Output (lm) (Goniophotometer - Section 4.1)	IES LM-79-2024	-	1703
Minimum Efficacy (lm/W) (Goniophotometer - Section 4.1)	IES LM-79-2024	-	106.4
Power (Input Wattage) (W) (Goniophotometer - Section 4.1)	IES LM-79-2024	Wrost Case	16.0
Beam Angle (Goniophotometer - Section 4.1)	IES LM-79-2024	-	201.3
Input Voltage (V)			
(Goniophotometer - Section 4.1)	IES LM-79-2024	Worst Case	277
(Goniophotometer - Section 4.1)		Non-Worst Case	120
Input Current (A)			
(Goniophotometer - Section 4.1)	IES LM-79-2024	Worst Case	0.060
(Goniophotometer - Section 4.1)		Non-Worst Case	0.133
Power (Input Wattage - W)			
(Goniophotometer - Section 4.1)	IES LM-79-2024	Worst Case	16.0
(Goniophotometer - Section 4.1)		Non-Worst Case	15.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Goniophotometer Test	2026/5/7	L24T5/835/11G-XT	DLF2604102-A1

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 DUT Description

Model Number: L24T5/835/11G-XT

Electrical Rating: 120-277V,50/60Hz

Received Date: 2026/4/30

External Driver Model: VPL50-2C-025/036/050

Photos of DUT Characteristics

4.0 Test Results

4.1 Goniophotometer Test

Model No.	L24T5/835/11G-XT	Sample ID.	DLF2604102-A1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method
The samples were tested according to the IES LM-79-2024.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25º C ± 1.2º C and 10% - 65% RH, 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.
Airflow for the instantaneous tangential velocity of any point on the DUT shall be less than an upper tolerance limit of 0.20 m/s.
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

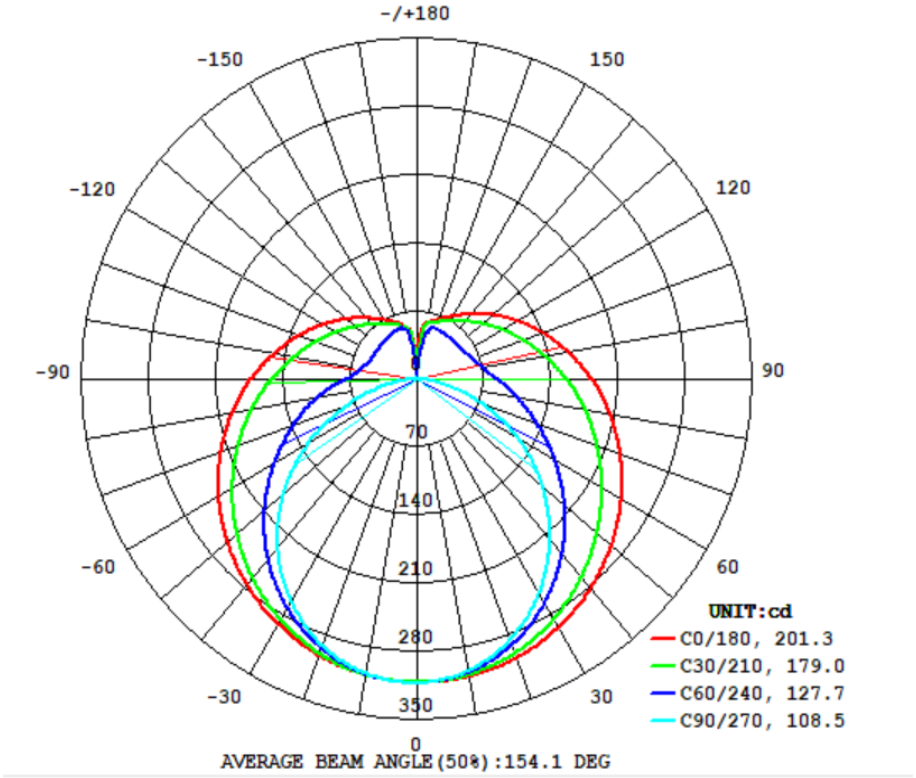
Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
WORST CASE	276.99	60	0.060	16.0	0.959	9.01%
NON-WORST CASE	120.01	60	0.133	15.9	0.997	4.98%

Test Result

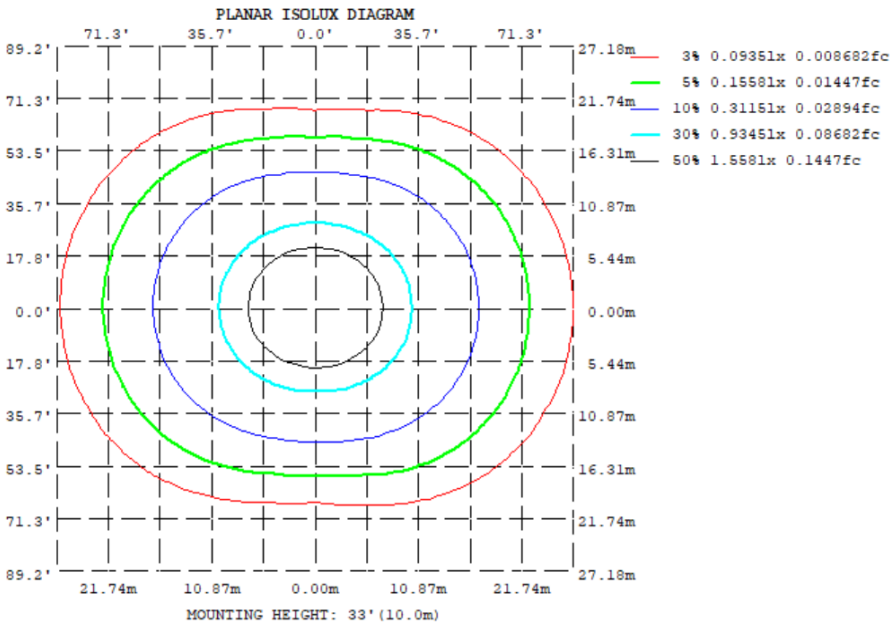
Flux (lm)	Luminous Efficacy (lm/W)	Beam Angle
1703	106.4	201.3

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	310.2	307.0	304.2	306.1	308.8	308.2	307.4	309.4
20	304.4	294.4	284.8	292.4	301.7	296.9	291.0	298.7
30	294.5	275.5	254.9	271.8	290.7	278.7	263.6	280.8
40	281.3	251.6	216.6	246.4	276.3	255.3	226.6	257.3
50	265.2	225.0	171.8	218.4	258.9	228.5	182.1	230.3
60	246.7	197.7	122.4	189.5	239.3	200.3	131.4	202.0
70	226.2	171.2	70.71	161.7	218.1	172.5	78.12	174.2
80	204.7	147.0	23.42	136.4	196.1	144.9	27.80	148.3
90	182.9	126.1	0.5120	112.8	174.2	119.4	0.3194	126.3
100	161.5	108.6	0.5901	94.60	152.7	101.4	0.5865	108.2
110	140.9	94.54	3.587	82.21	132.6	87.85	2.995	93.77
120	121.6	83.15	1.000	72.87	113.8	77.18	1.376	82.36
130	103.8	74.36	0.4476	66.31	97.09	69.92	2.298	73.77
140	88.28	67.86	0.4463	61.77	82.64	64.24	2.420	67.42
150	75.38	63.14	0.6195	58.78	71.02	60.80	0.8383	62.37
160	65.69	59.89	0.4668	53.10	62.60	56.75	1.225	57.08
170	58.95	50.66	0.4844	32.22	54.12	52.75	0.8805	46.70
180	0.3204	0.3754	2.211	0.2404	0.3539	0.4387	1.902	1.735
DEG	LUMINOUS INTENSITY:cd							

	Zonal (lm)		Total (lm)	Percent
0-10	29.56	0 - 10	29.56	1.74%
10-20	85.49	0 - 20	115.05	6.75%
20-30	132.33	0 - 30	247.38	14.52%
30-40	165.72	0 - 40	413.10	24.25%
40-50	183.44	0 - 50	596.54	35.02%
50-60	185.53	0 - 60	782.07	45.92%
60-70	174.10	0 - 70	956.17	56.14%
70-80	153.39	0 - 80	1109.56	65.14%
80-90	129.15	0 - 90	1238.71	72.73%
90-100	108.23	0 - 100	1346.94	79.08%
100-110	91.78	0 - 110	1438.72	84.47%
110-120	76.42	0 - 120	1515.14	88.96%
120-130	62.21	0 - 130	1577.35	92.61%
130-140	49.10	0 - 140	1626.45	95.49%
140-150	36.81	0 - 150	1663.26	97.65%
150-160	24.83	0 - 160	1688.09	99.11%
160-170	13.02	0 - 170	1701.11	99.87%
170-180	2.14	0 - 180	1703.25	100.00%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2025/12/10	2026/12/9
DLF108	Auxiliary Lamp	2025/12/10	2026/12/9
DLF122	Measurement Standard Lamp Standard Lamp Type: Tungsten, Omni-derectional	2025/12/10	2026/12/9
DLF116	AC Power Source	2025/12/8	2026/12/7
DLF516	Power Meter	2025/12/8	2026/12/7
DLF112	Temperature Recorder	2025/12/15	2026/12/14
DLF114	Temperature & Humidity Datalogger	2025/12/11	2026/12/10
DLF521	Measurement Standard Lamp Standard Lamp Type: Tungsten, Omni-derectional	2025/12/10	2026/12/9
DLF101	Goniophotometer	2025/12/10	2026/12/9
DLF511	AC Power Source	2025/12/8	2026/12/7
DLF512	AC Power Source	2025/12/8	2026/12/7
DLF513	AC Power Source	2025/12/8	2026/12/7
DLF507	DC Power Source	2025/12/8	2026/12/7
DLF111	Temperature & Humidity Datalogger	2025/12/11	2026/12/10
DLF119	Power Meter	2025/12/8	2026/12/7
DLF530	Hot-wire anemometer	2026/1/26	2027/1/25
DLF129	Clock	2025/9/4	2026/9/3

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