

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2017

Prepared For

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Issue Date

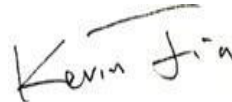
2021/9/22

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v5.1

Retrofit Kits for Direct Linear Ambient Luminaires				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	1500		5054
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	130.9
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		38.6
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	10.15%
		20.00%	277V	17.01%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.991
		0.9	277V	0.926
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3045±175	2977
		4 step	3045±100	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		85
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		14
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		86
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		96
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥75%		80.28%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22		21.0

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/9/10	VEKM-L24F/830 N	H1
2	Goniophotometer Test	2021/9/10	VEKM-L24F/830 N	H1

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.

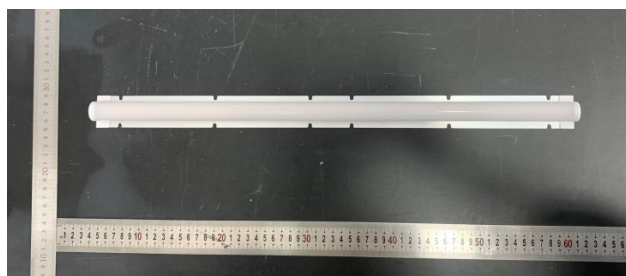
3.0 Production Description

Tested Model: VEKM-L24F/830 N

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

Test in Fixture: Lithonia C2 32 MVOLT GEB10IS

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	VEKM-L24F/830 N	Sample ID.	H1
Operate time (Min.)	90	Stabilization time (Min.)	70
Temperature (°C)	25.1	Humidity (%RH)	52.0

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

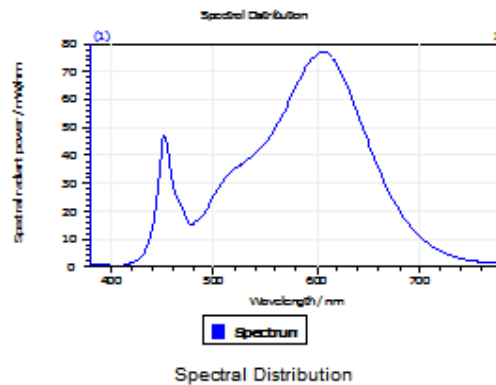
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.05	60	0.324	38.48	0.991	10.15%
277.07	60	0.151	38.68	0.926	17.01%

CCT (K)	CRI	R9	Duv
2977	84.6	13.6	0.0018

Rf	Rg	IES Rcs,h1
86	96	-11%

4.1 Integrating Sphere Test

Results



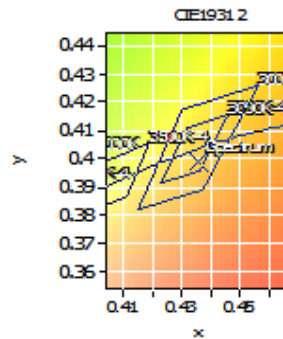
Spectral values

DominantWavelength 583.59 nm
Purity 0.507
PeakWavelength 605.33 nm
Radiant Power 11.3 W
Width50%:

Color Coordinates

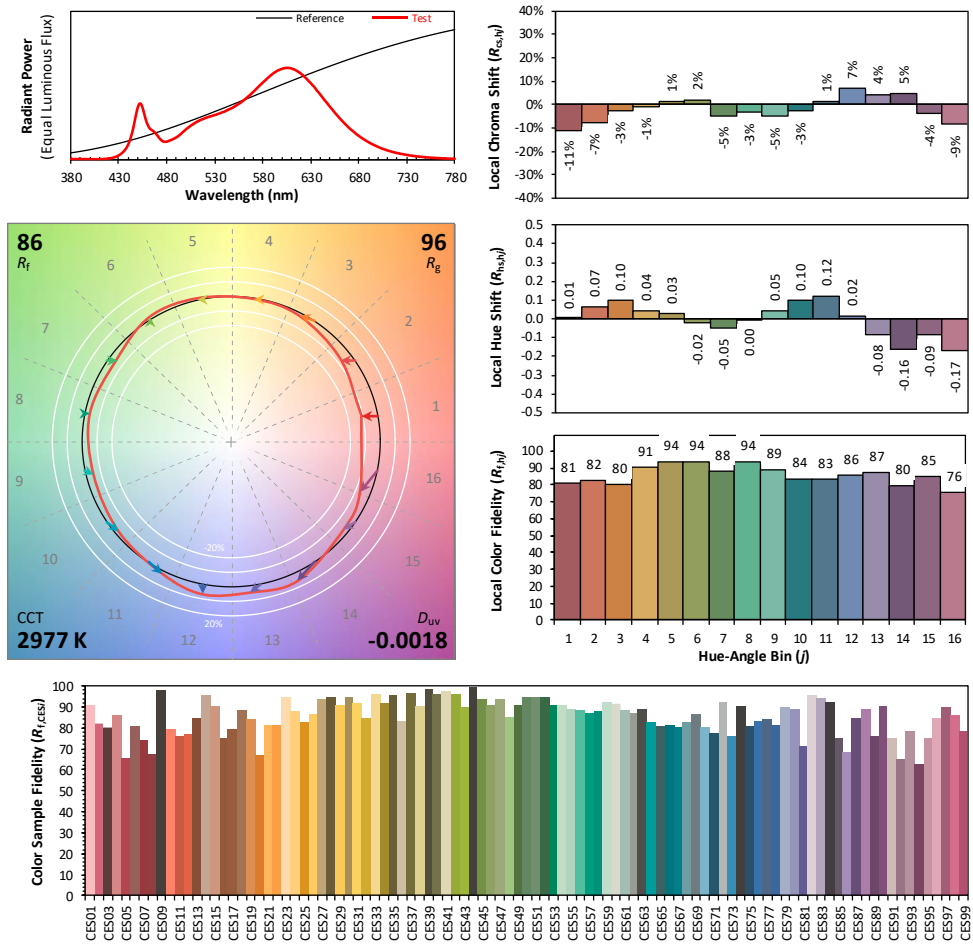
Correlated Color Temporal 2977 K
x: 0.4359 u: 0.2520 u': 0.2520
y: 0.3992 v: 0.3462 v': 0.5193

CRI01	83.8	CRI09	13.6
CRI02	93.4	CRI10	84.9
CRI03	95.5	CRI11	83.7
CRI04	83.3	CRI12	74.7
CRI05	84.7	CRI13	86.3
CRI06	92.3	CRI14	98.4
CRI07	82.6	CRI15	76.7
CRI08	61.1	CRI16	73.4
ResultsCRI	84.6		



PlanckDistance 1.8E-003

4.1 Integrating Sphere Test



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4359
 y 0.3992
 u' 0.2520
 v' 0.5193

CIE 13.3-1995
(CRI)

R_a 84
 R_9 12

lors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.0

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	VEKM-L24F/830 N	Sample ID.	H1
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-79-2008.

Photometric paramters 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

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	276.93	60	0.150	38.6	0.931

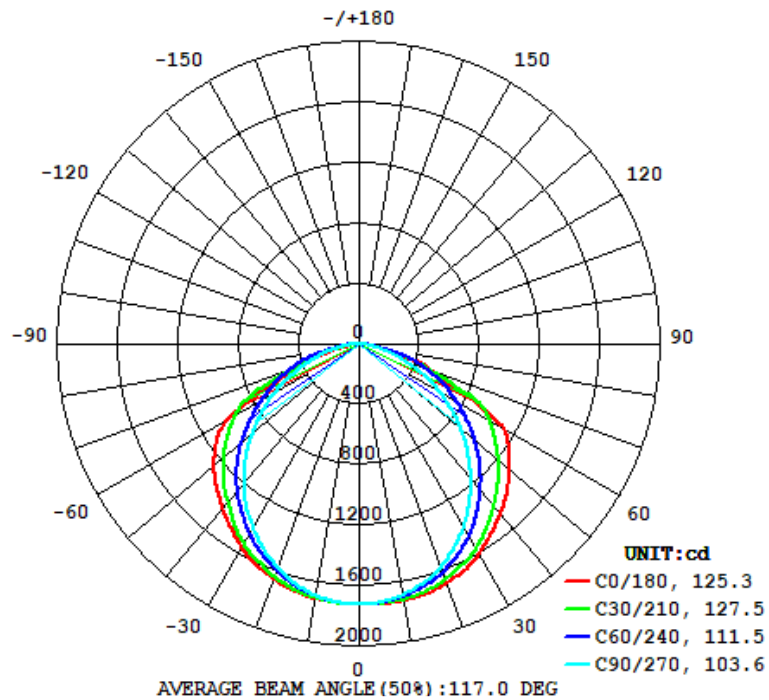
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
5054	153.1	153.8	125.3	103.6	130.9

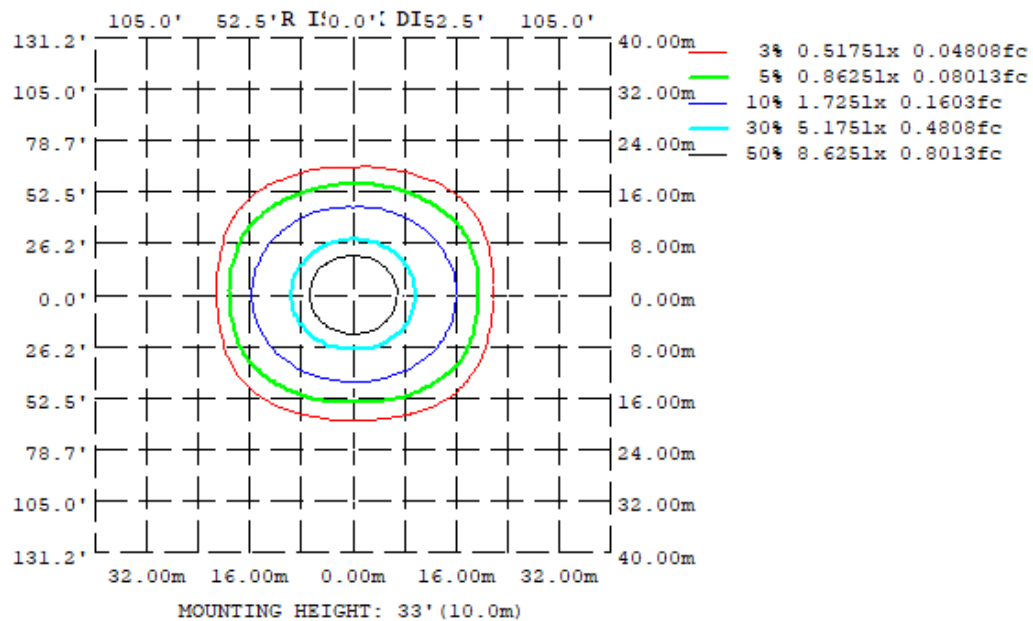
Zonal Lumen Requirement (0° - 60°)	UGR (X=4H, Y=8H, 70/50/20%)	Length (ft)	Lumen (lm/ft)
80.28%	21.0	4	1264

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	1724	1704	1684	1692	1710	1697	1690	1708
20	1684	1637	1574	1617	1656	1623	1581	1642
30	1599	1512	1395	1484	1559	1490	1406	1518
40	1464	1332	1160	1300	1413	1317	1189	1348
50	1305	1107	893.6	1070	1256	1091	931.0	1129
60	1097	869.1	607.0	830.5	1022	858.6	655.1	896.9
70	506.0	543.7	324.7	474.0	458.2	557.4	372.2	624.4
80	61.52	112.7	85.34	67.79	46.48	116.9	120.0	173.3
90	1.650	1.097	0.6831	1.040	0.4899	1.263	0.5604	2.293
100	0.6141	0.5816	0.8455	0.6350	0.6355	0.6499	0.6430	0.6641
110	0.8873	0.8322	0.7147	0.8308	1.083	0.9169	0.6864	1.007
120	1.210	1.112	1.202	1.006	1.267	1.069	1.202	1.213
130	1.430	1.217	1.461	1.070	1.581	1.180	1.428	1.291
140	1.269	1.533	1.582	1.621	1.708	1.652	1.715	1.697
150	1.586	1.743	1.734	1.479	1.851	1.677	1.742	1.749
160	1.448	1.784	1.867	1.784	1.937	1.809	1.822	1.870
170	1.518	1.656	1.577	1.638	1.609	1.434	1.587	1.648
180	1.806	1.911	1.956	1.807	1.744	1.738	1.940	1.819
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected

Reflectances											
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30	
Walls	50	30	50	30	30	50	30	50	30	30	
Floor Cavity	20	20	20	20	20	20	20	20	20	20	
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	16.4	18.0	16.7	18.3	18.6	18.9	20.5	19.3	20.9	21.2
	3H	17.8	19.3	18.2	19.6	20.0	20.0	21.5	20.3	21.8	22.1
	4H	18.2	19.6	18.6	20.0	20.3	20.2	21.6	20.6	22.0	22.4
	6H	18.4	19.7	18.8	20.1	20.4	20.2	21.5	20.6	21.9	22.3
	8H	18.4	19.6	18.8	20.0	20.4	20.2	21.4	20.6	21.8	22.2
	12H	18.4	19.6	18.9	20.0	20.4	20.2	21.4	20.6	21.8	22.2
4H	2H	17.5	18.9	17.9	19.2	19.6	19.4	20.8	19.8	21.1	21.5
	3H	19.1	20.3	19.5	20.7	21.1	20.6	21.8	21.0	22.2	22.6
	4H	19.7	20.7	20.1	21.1	21.6	21.0	22.0	21.4	22.5	22.9
	6H	19.9	20.8	20.4	21.3	21.7	21.0	21.9	21.5	22.4	22.8
	8H	19.9	20.8	20.4	21.2	21.7	21.0	21.8	21.4	22.3	22.7
	12H	19.9	20.7	20.4	21.2	21.6	21.0	21.7	21.5	22.2	22.7
8H	4H	19.9	20.8	20.4	21.2	21.7	21.1	22.0	21.6	22.4	22.9
	6H	20.2	20.9	20.7	21.4	21.9	21.2	21.9	21.7	22.4	22.8
	8H	20.2	20.9	20.7	21.4	21.9	21.1	21.8	21.6	22.3	22.8
	12H	20.3	20.8	20.8	21.3	21.9	21.1	21.7	21.6	22.2	22.8
12H	4H	19.9	20.7	20.4	21.1	21.6	21.1	21.9	21.6	22.4	22.9
	6H	20.2	20.8	20.7	21.3	21.8	21.2	21.8	21.7	22.3	22.8
	8H	20.3	20.8	20.8	21.3	21.9	21.2	21.7	21.7	22.2	22.8

Maximum UGR = 22.9

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	163.47	0 - 10	163.47	3.23%
10-20	471.87	0 - 20	635.34	12.57%
20-30	723.06	0 - 30	1358.40	26.88%
30-40	882.54	0 - 40	2240.94	44.34%
40-50	935.68	0 - 50	3176.62	62.85%
50-60	881.32	0 - 60	4057.94	80.28%
60-70	656.52	0 - 70	4714.46	93.27%
70-80	295.13	0 - 80	5009.59	99.11%
80-90	37.53	0 - 90	5047.12	99.86%
90-100	0.76	0 - 100	5047.88	99.87%
100-110	0.80	0 - 110	5048.68	99.89%
110-120	1.00	0 - 120	5049.68	99.91%
120-130	1.13	0 - 130	5050.81	99.93%
130-140	1.14	0 - 140	5051.95	99.95%
140-150	1.04	0 - 150	5052.99	99.97%
150-160	0.81	0 - 160	5053.80	99.99%
160-170	0.48	0 - 170	5054.28	100.00%
170-180	0.16	0 - 180	5054.44	100.00%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2020/12/26	2021/12/25
DLF108	Auxiliary Lamp	2020/12/26	2021/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF116	AC Power Source	2020/12/26	2021/12/25
DLF113	Power Meter	2020/12/26	2021/12/25
DLF112	Temperature Recorder	2020/12/26	2021/12/25
DLF114	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF101	Goniophotometer	2020/12/26	2021/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2020/12/26	2021/12/25
DLF104	AC Power Source	2020/12/26	2021/12/25
DLF507	DC Power Source	2020/12/26	2021/12/25
DLF102	Power Meter	2020/12/26	2021/12/25
DLF111	Temperature & Humidity Datalogger	2020/12/26	2021/12/25
DLF119	Power Meter	2020/12/26	2021/12/25
DLF031	Temperature data logger	2020/12/26	2021/12/25
DLF022	Digital power meter	2020/12/26	2021/12/25
DLF003	Temperature & Humidity Datalogger	2020/12/26	2021/12/25

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