

Photometric Test Report

Relevant Standards

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

Prepared For

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Issue Date

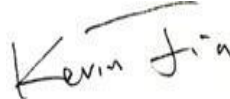
2021/9/17

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		7916
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	138.9
Luminaire Output (lm/ft) (Goniophotometer - Section 4.2)	IES LM-79-2008	$\geq 375 \text{ lm/ft}$		989.5
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		57.0
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	7.64%
		20.00%	277V	10.36%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.993
		0.9	277V	0.962
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029 $\pm$ 355	4957
		4 step	5029 $\pm$ 220	
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		10
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥ 70		84
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥ 89		94
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	$-12\% \leq \text{IES Rcs,h1} \leq +23\%$		-12%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	$\geq 75\%$		80.28%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	< 22		20.2

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/9/10	VEKM-L44F/850 N	B1
2	Goniophotometer Test	2021/9/10	VEKM-L44F/850 N	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.

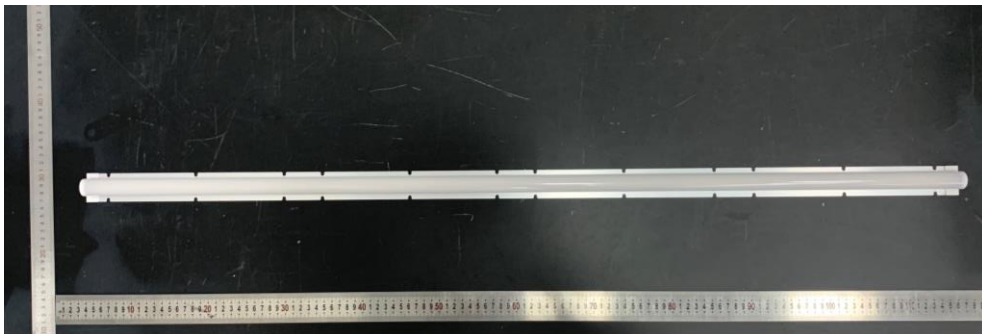
3.0 Production Description

Tested Model: VEKM-L44F/850 N

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

Test in Fixture: Lithonia C2 96T8

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	VEKM-L44F/850 N	Sample ID.	B1
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

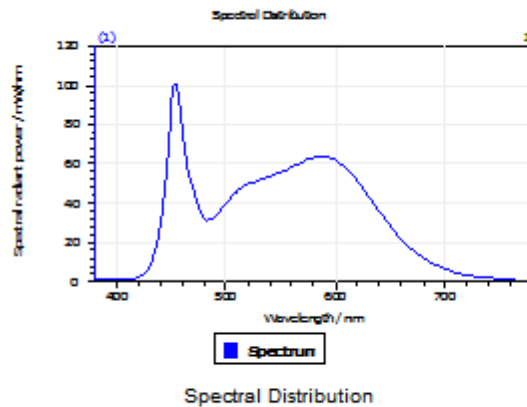
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.02	60	0.477	56.80	0.993	7.64%
277.04	60	0.212	56.54	0.962	10.36%

CCT (K)	CRI	R9	Duv
4957	84.7	9.8	0.0021

Rf	Rg	IES Rcs,h1
84	94	-12%

4.1 Integrating Sphere Test

Results



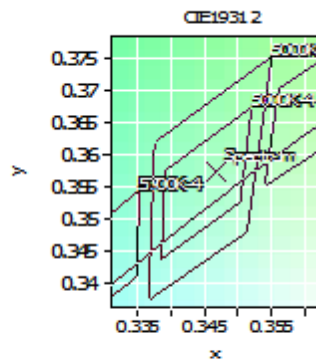
Spectral values

DominantWavelength 571.27 nm
Purity 0.113
PeakWavelength 453.81 nm
Radiant Power 12.21 W
Width50%:

Color Coordinates

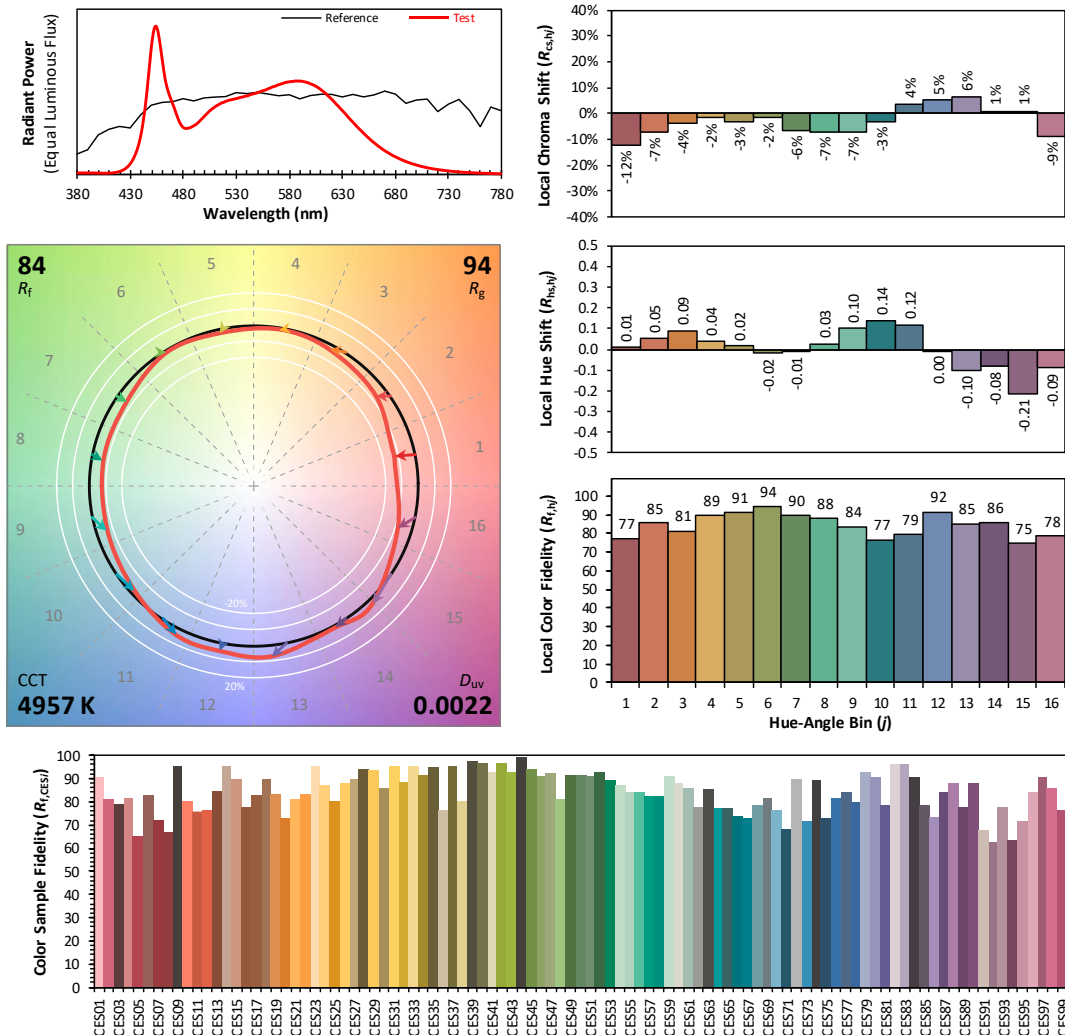
Correlated Color Temperat 4957 K
x: 0.3468 u: 0.2104 u': 0.2104
y: 0.3573 v: 0.3251 v': 0.4877

CRI01	83.4	CRI09	9.8
CRI02	92.2	CRI10	80.9
CRI03	95.5	CRI11	82.5
CRI04	82.7	CRI12	63.8
CRI05	83.9	CRI13	86.2
CRI06	87.9	CRI14	98.2
CRI07	85.7	CRI15	77.5
CRI08	66.2	CRI16	73.4
ResultsCRI	84.7		



PlanckDistance 2.1E-003

4.1 Integrating Sphere Test



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

x 0.3468
 y 0.3573
 u' 0.2104
 v' 0.4877

CIE 13.3-1995
(CRI)

R_a 85
 R_g 15

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	VEKM-L44F/850 N	Sample ID.	B1
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	120.05	60	0.479	57.0	0.992

Test Result

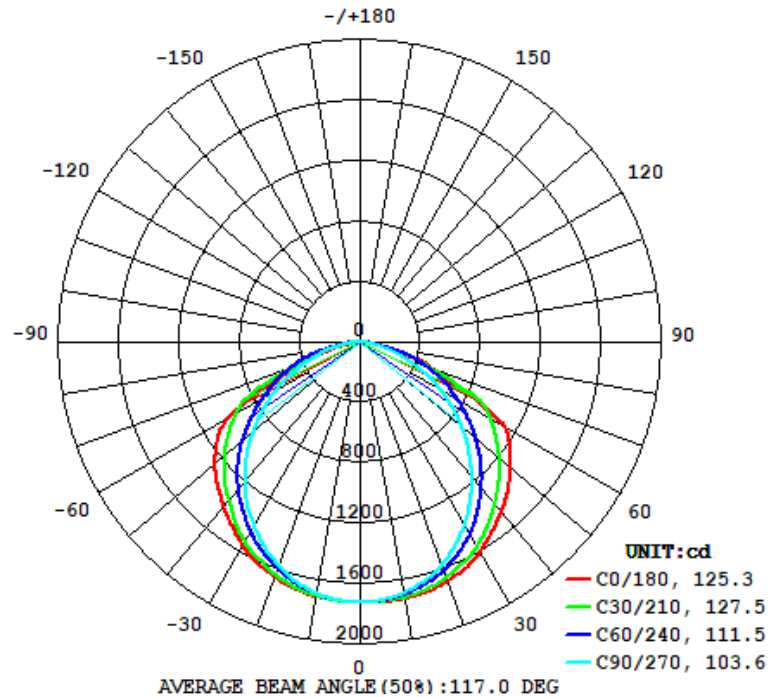
4FT light output in Sphere	5013	Scale Factor	1.56612807
8FT light output in Sphere	7851	4FT Gonio Light output	5054.4

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
7916	153.1	153.8	125.3	103.6	138.9

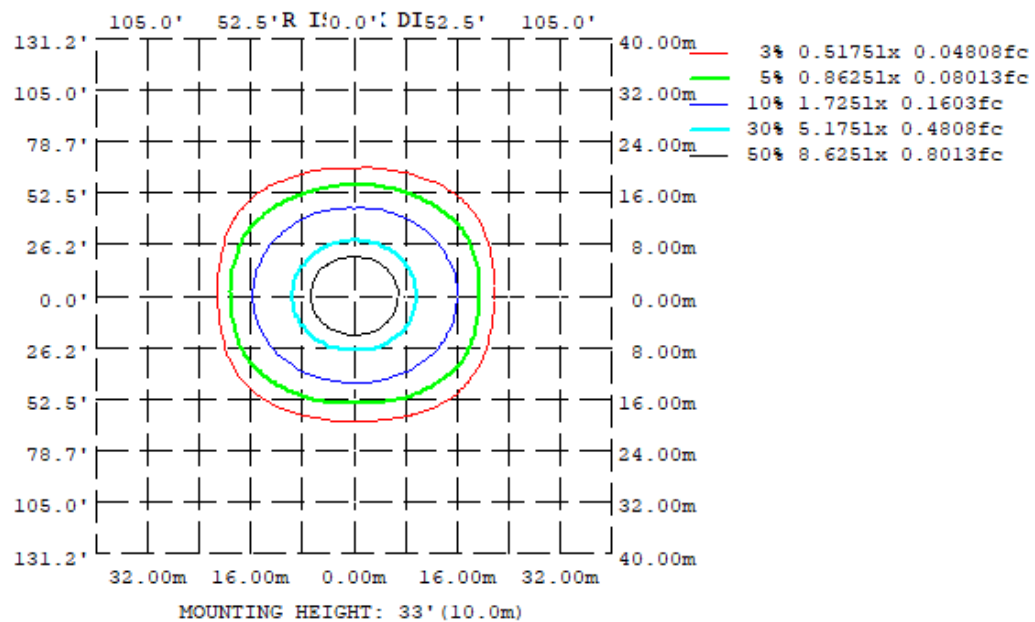
Zonal Lumen Requirement (0° - 60°)	UGR (X=4H, Y=8H, 70/50/20%)	Length (ft)	Lumen (lm/ft)
80.28%	20.2	8	989

4.2 Goniophotometer Test

Light Distribution Curve



Isolux Plot



4.2 Goniophotometer Test

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	15.5	17.2	15.9	17.5	17.8	18.1	19.7	18.5	20.1	20.4	
	3H	17.0	18.5	17.3	18.8	19.1	19.2	20.6	19.5	21.0	21.3	
	4H	17.4	18.8	17.8	19.1	19.5	19.4	20.8	19.8	21.2	21.6	
	6H	17.6	18.9	18.0	19.2	19.6	19.4	20.7	19.8	21.1	21.5	
	8H	17.6	18.8	18.0	19.2	19.6	19.4	20.6	19.8	21.0	21.4	
	12H	17.6	18.8	18.0	19.2	19.6	19.4	20.6	19.8	20.9	21.4	
4H	2H	16.7	18.1	17.1	18.4	18.8	18.6	20.0	19.0	20.3	20.7	
	3H	18.3	19.5	18.7	19.9	20.3	19.8	21.0	20.2	21.4	21.8	
	4H	18.8	19.9	19.3	20.3	20.8	20.2	21.2	20.6	21.6	22.1	
	6H	19.1	20.0	19.6	20.5	20.9	20.2	21.1	20.7	21.6	22.0	
	8H	19.1	20.0	19.6	20.4	20.9	20.2	21.0	20.6	21.5	21.9	
	12H	19.1	19.9	19.6	20.4	20.8	20.2	20.9	20.6	21.4	21.9	
8H	4H	19.1	20.0	19.6	20.4	20.9	20.3	21.2	20.8	21.6	22.1	
	6H	19.4	20.1	19.9	20.6	21.1	20.4	21.1	20.9	21.6	22.0	
	8H	19.4	20.1	19.9	20.6	21.1	20.3	21.0	20.8	21.5	22.0	
	12H	19.5	20.0	20.0	20.5	21.1	20.3	20.9	20.8	21.4	21.9	
12H	4H	19.1	19.9	19.6	20.3	20.8	20.3	21.1	20.8	21.6	22.0	
	6H	19.4	20.0	19.9	20.5	21.0	20.3	21.0	20.9	21.4	22.0	
	8H	19.4	20.0	20.0	20.5	21.1	20.3	20.9	20.9	21.4	22.0	

Maximum UGR = 22.1

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	256.01	0 - 10	256.01	3.23%
10-20	739.01	0 - 20	995.02	12.57%
20-30	1132.41	0 - 30	2127.43	26.88%
30-40	1382.18	0 - 40	3509.61	44.34%
40-50	1465.40	0 - 50	4975.01	62.85%
50-60	1380.27	0 - 60	6355.28	80.28%
60-70	1028.19	0 - 70	7383.47	93.27%
70-80	462.21	0 - 80	7845.68	99.11%
80-90	58.77	0 - 90	7904.45	99.86%
90-100	1.19	0 - 100	7905.64	99.87%
100-110	1.25	0 - 110	7906.89	99.89%
110-120	1.56	0 - 120	7908.45	99.91%
120-130	1.77	0 - 130	7910.22	99.93%
130-140	1.78	0 - 140	7912.00	99.95%
140-150	1.63	0 - 150	7913.63	99.97%
150-160	1.27	0 - 160	7914.90	99.99%
160-170	0.76	0 - 170	7915.66	100.00%
170-180	0.24	0 - 180	7915.90	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*****