



Photometric Test Report

Relevant Standards

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

Prepared For

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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		5932
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	133.6
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		44.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	8.88%
		20.00%	277V	13.78%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.994
		0.9	277V	0.942
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3045±175	2962
		4 step	3045±100	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		11
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	≥40%		70.86%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22		25.4

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2021/9/10	VEKM-L41F/VHO/830	N1
2	Goniophotometer Test	2021/9/10	VEKM-L41F/VHO/830	N1

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.

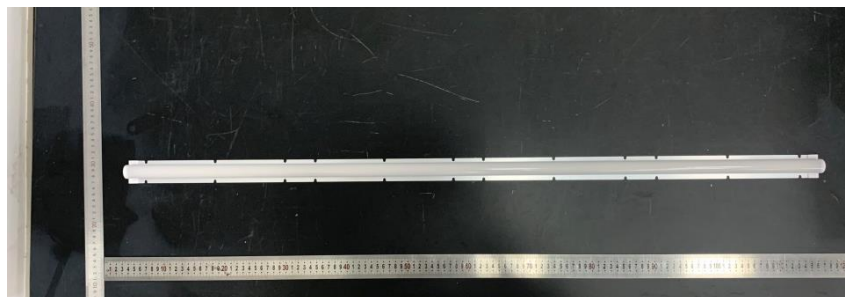
3.0 Production Description

Tested Model: VEKM-L41F/VHO/830

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-L41F/VHO/830	Sample ID.	N1
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

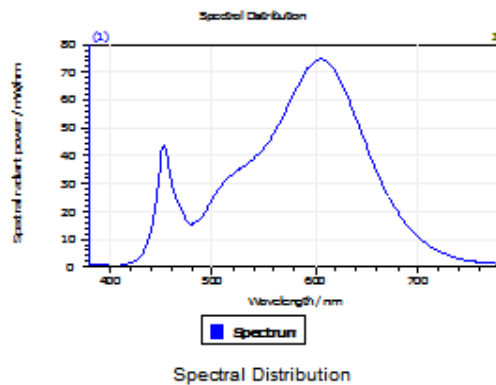
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.05	60	0.370	44.13	0.994	8.88%
276.98	60	0.170	44.30	0.942	13.78%

CCT (K)	CRI	R9	Duv	Light Output (lm)	Efficacy (lm/W)
2962	83.8	11.0	0.002	6057	136.7

Rf	Rg	IES Rcs,h1
86	96	-11%

4.1 Integrating Sphere Test

Results



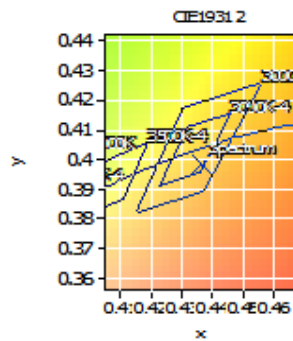
Spectral values

DominantWavelength 583.73 nm
Purity 0.508
PeakWavelength 605.19 nm
Radiant Power 10.96 W
Width50%:

Color Coordinates

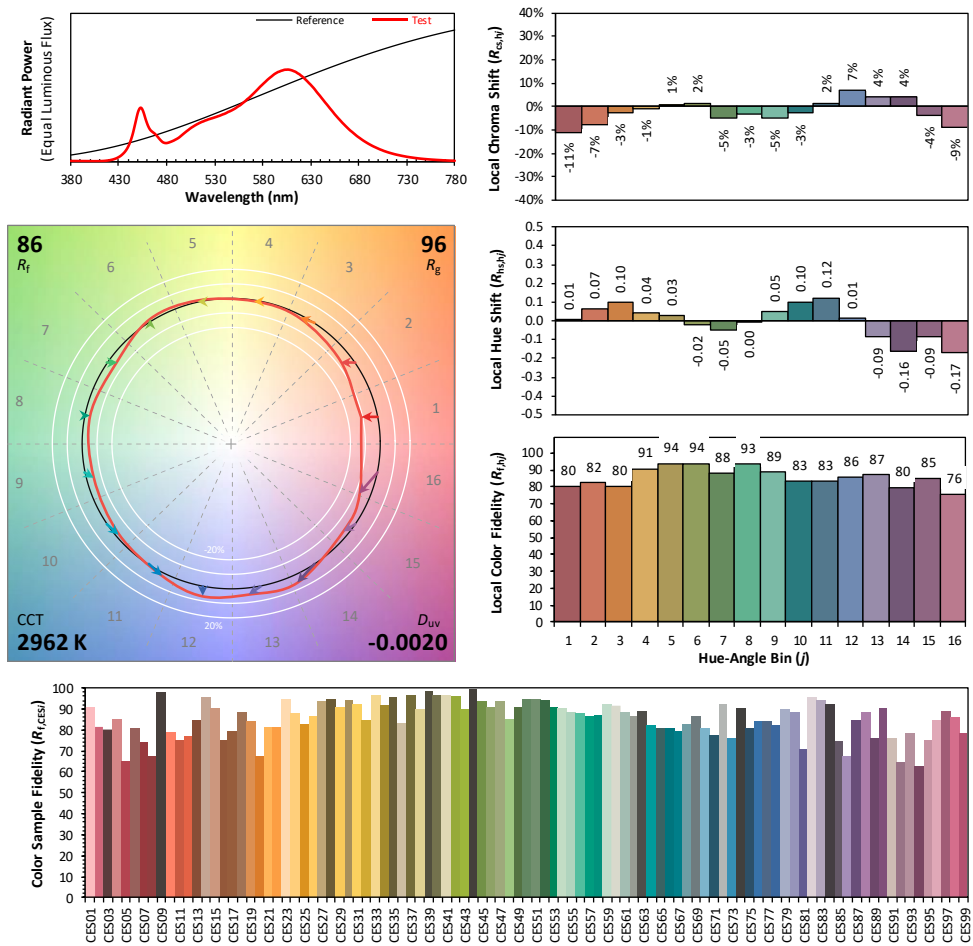
Correlated Color Temporal 2962 K
x: 0.4367 u: 0.2526 u': 0.2526
y: 0.3990 v: 0.3462 v': 0.5193

CRI01	83.4	CRI09	11.0
CRI02	93.8	CRI10	86.1
CRI03	93.9	CRI11	82.2
CRI04	81.7	CRI12	76.4
CRI05	84.0	CRI13	86.2
CRI06	92.9	CRI14	97.4
CRI07	81.2	CRI15	75.5
CRI08	59.1	CRI16	72.1
ResultsCRI	83.8		



PlankDistance 2.0E-003

4.1 Integrating Sphere Test



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

x 0.4367
 y 0.3990
 u' 0.2526
 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-L41F/VHO/830	Sample ID.	N1
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	277.08	60	0.170	44.4	0.942

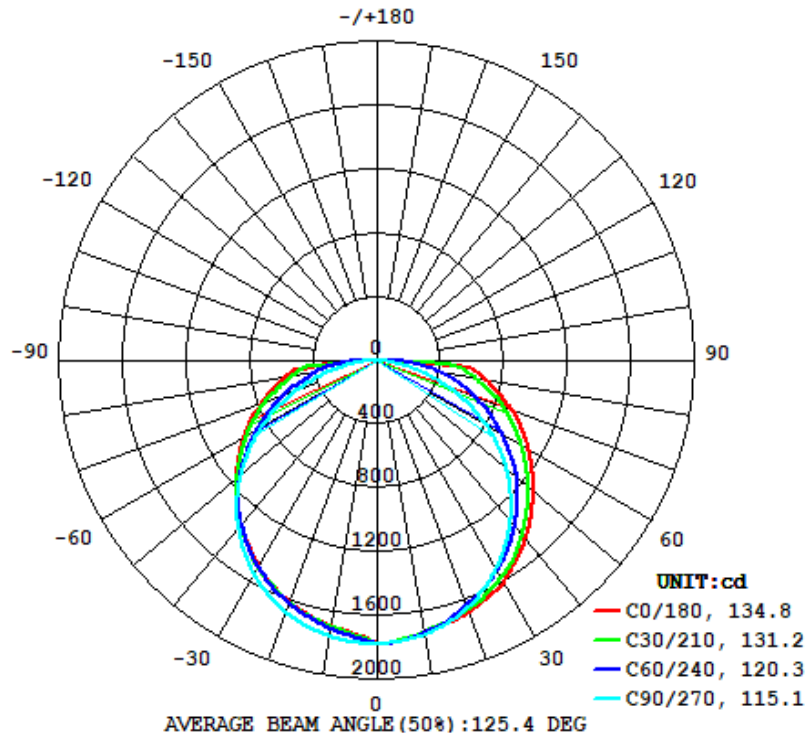
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
5932	172.5	160.4	134.8	115.1	133.6

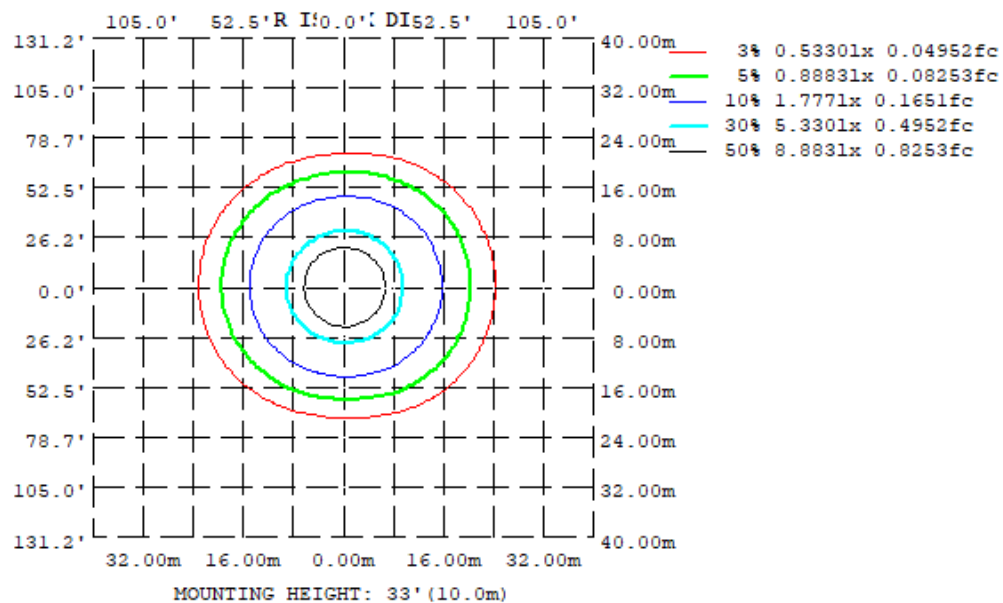
Zonal Lumen Requirement (0° - 60°)	UGR (X=4H, Y=8H, 70/50/20%)	Length (ft)	Lumen (lm/ft)
70.86%	25.4	4	1483

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	1725	1730	1741	1689	1692	1698	1756	1738
20	1680	1650	1653	1604	1613	1620	1681	1667
30	1600	1544	1506	1474	1492	1497	1550	1568
40	1458	1403	1311	1303	1339	1341	1360	1432
50	1289	1201	1071	1100	1159	1140	1123	1245
60	1103	985.5	786.4	884.7	971.2	920.9	846.3	1032
70	903.3	767.5	468.0	679.4	768.0	682.3	537.2	815.8
80	693.7	524.0	153.8	451.4	582.8	481.1	216.3	587.5
90	4.194	2.229	0.4314	0.6345	0.4945	0.6734	0.9245	12.54
100	1.432	0.7023	0.5967	1.030	0.5497	0.6857	0.5627	0.5582
110	0.7132	0.8011	0.6484	0.6525	0.8373	0.7656	0.7232	0.7262
120	0.6994	0.7773	0.6967	0.6478	0.6357	0.8443	0.7819	0.4823
130	0.7721	0.9197	0.7798	0.7048	0.8521	0.8867	0.8845	0.8159
140	0.7814	0.9808	0.8566	0.7829	1.092	1.028	1.014	1.130
150	0.7493	0.9890	0.8733	0.7923	1.165	1.140	0.9817	1.083
160	0.8012	0.8896	0.9282	0.7434	0.9853	1.047	0.9422	0.9094
170	0.7338	0.9236	0.9531	0.7587	0.8851	0.7764	0.8139	0.8898
180	0.9293	0.9499	0.9030	0.8940	0.9390	0.9065	0.8976	0.8929
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											
X=2H	UGR Viewed Crosswise					UGR Viewed Endwise					
Y=2H	17.0	18.8	17.4	19.1	19.4	17.9	19.6	18.2	19.9	20.2	
3H	18.8	20.4	19.2	20.7	21.1	20.5	22.1	20.8	22.4	22.7	
4H	19.5	21.0	19.9	21.3	21.7	21.7	23.3	22.1	23.6	24.0	
6H	19.9	21.3	20.3	21.6	22.0	23.1	24.5	23.5	24.9	25.3	
8H	19.9	21.3	20.4	21.7	22.1	23.8	25.2	24.3	25.6	26.0	
12H	20.0	21.3	20.4	21.7	22.1	24.4	25.7	24.8	26.1	26.5	
4H	2H	18.0	19.5	18.4	19.9	20.3	18.6	20.1	19.0	20.4	20.8
	3H	20.2	21.5	20.6	21.9	22.3	21.5	22.8	21.9	23.2	23.5
	4H	21.0	22.2	21.4	22.6	23.0	22.9	24.1	23.4	24.5	25.0
	6H	21.6	22.6	22.0	23.0	23.5	24.5	25.6	25.0	26.0	26.5
	8H	21.7	22.7	22.2	23.1	23.6	25.4	26.4	25.8	26.8	27.3
	12H	21.8	22.7	22.3	23.1	23.6	26.0	26.9	26.5	27.4	27.8
8H	4H	21.9	22.9	22.4	23.3	23.8	23.4	24.4	23.9	24.8	25.3
	6H	22.8	23.6	23.3	24.1	24.5	25.2	26.1	25.7	26.6	27.0
	8H	23.1	23.8	23.6	24.3	24.8	26.3	27.0	26.8	27.5	28.0
	12H	23.2	23.9	23.7	24.4	24.9	27.1	27.7	27.6	28.2	28.8
12H	4H	22.2	23.1	22.6	23.5	24.0	23.5	24.4	23.9	24.8	25.3
	6H	23.2	24.0	23.7	24.4	24.9	25.4	26.1	25.9	26.6	27.1
	8H	23.6	24.3	24.1	24.8	25.3	26.5	27.2	27.0	27.7	28.2

Maximum UGR = 28.8

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	166.00	0 - 10	166.00	2.80%
10-20	475.82	0 - 20	641.82	10.82%
20-30	732.77	0 - 30	1374.59	23.17%
30-40	906.16	0 - 40	2280.75	38.45%
40-50	978.56	0 - 50	3259.31	54.95%
50-60	943.98	0 - 60	4203.29	70.86%
60-70	818.14	0 - 70	5021.43	84.65%
70-80	619.03	0 - 80	5640.46	95.09%
80-90	286.20	0 - 90	5926.66	99.91%
90-100	1.06	0 - 100	5927.72	99.93%
100-110	0.71	0 - 110	5928.43	99.94%
110-120	0.72	0 - 120	5929.15	99.95%
120-130	0.68	0 - 130	5929.83	99.97%
130-140	0.70	0 - 140	5930.53	99.98%
140-150	0.61	0 - 150	5931.14	99.99%
150-160	0.44	0 - 160	5931.58	99.99%
160-170	0.24	0 - 170	5931.82	100.00%
170-180	0.08	0 - 180	5931.90	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*****