

CEC Title 24 (CEC-400-2018-021-CMF 2019

REFERENCE APPENDICES JA8 and JA10) Test Report

For

ARTIKA FOR LIVING INC

(Brand Name: ARTIKA)

1756 50th avenue, Lachine, Québec, Canada H8T 2V5

**Model name(s):
4FM-BP-XXXXXX**

**Type of
Luminaire:**

LED Luminaires

Report Date:

2021-12-30

Ningbo TengLi Testing Co., Ltd

Prepared By:

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Test & Report By:

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Review By:

Garman Mo

Manager: Garman Mo

Note: 1. The results contained in this report pertain only to the tested samples.

2. This report does not imply product certification, approval, or endorsement by any agency of the Federal Government.

1.1 Product Information:

Model Number	4FM-BP-XXXXXX
Remark	"XXXXXX" can be A to Z and/or 0 to 9 and or/blank(commerical code)
Representative (Tested) Model	4FM-BP-MW
SKU (if available)	N/A
Type of Lamp	LED Luminaires
LED Manufacturer	Lextar Electronics Corp
LED Model	PC35H13
Dimming	Dimmable
Sample Number	STD211241NB-A1-A3

1.2 Rated Values:

Rated Voltage / Frequency	120Vac,60 Hz		
Nominal Power	12W		
Rated Initial Lamp Lumen	--		
Dimming range	10%-100%		
Target Replacement Wattage	--		
Declared CCT	3000K		
Luminaire Aperture (for Downlight Retrofits)	--	in. mm mm s	
Luminaire Length	--		
Luminaires Width	--		
Number of Units (modular products)	N/A		

Product Photo

1.3 Test Specifications:

Date of Receipt	Dec.20,2021
Date of Test	Dec.22,2021
1.Test Method according to 10 CFR 430 Appendix BB to Subpart B, Uniform Test Method for Measuring the Input Power, Lumen Output, Lamp Efficacy, Correlated Color Temperature (CCT), Color Rendering Index (CRI), Power Factor, Time to Failure, and Standby Mode Power of Integrated Light-Emitting Diode (LED) Lamps	
2.Standards used: IES LM-84-14 Approved Method for Measuring Luminous Flux and Color Maintenance of LED Downlight Retrofits, Light Engines, and Luminaires	
3.The ambient temperature during maintenance test of the DUT between photometric measurements shall be maintained at 25°C ± 5°C. Humidity: < 65 RH. Airflow shall be minimized.	
4. Supply rated input voltage (e.g. 120V) and frequency (60Hz) to the samples. Branch circuit input voltage shall be regulated to within ≤ 2% of the rated rms value. The input voltage to each DUT or driver shall be verified periodically.	
5. Conduct minimum 6000 hours life test, conduct LM-79 test measurement in 1000-hour interval.	
6. At each measurement interval, the DUT shall be taken off the test racks and measured per IES LM-79-08 for electrical, photometric, and colorimetric characteristics. After measurement, the DUT shall be placed back on the test rack for the next cycle if required.	
7. Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° 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 sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.	
8. Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25° C ± 1° C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.	
9. Off state power measurement – accordance to IEC 62301	

2.1 Summary of Test Result

Criteria Item	Requirement	Measured Value	Status
Light Source Type	LED, OLED, Fluorescent, HID, Incandescent, Other	LED	Pass
Product type	Omnidirectional lamp, Directional lamp, Decorative lamp, LED light engine, inseparable SSL luminaire, T20 lamp, other	LED Luminaires	Pass
Luminous Efficacy	≥ 45 lumens/Watt	83.06lm/W	Pass
Power Factor	≥ 0.90	0.9825	Pass
Start time	≤ 0.5 sec	152ms	Pass
Correlated Color Temperature (CCT)	≤ 4000 Kelvin	2966	Pass
Color Rendering Index (CRI)	≥ 90 for all products other than T20 lamps, ≥ 82 for T20 lamps	92.3	Pass
Color Rendering R9 (red)	≥ 50 for all products other than T20 lamps	60	Pass
Rated life	$\geq 15,000$ hours	50000	Pass
Minimum dimming level	$\leq 10\%$	1.44%	Pass
Flicker	<30% for frequencies of 200 Hz or below, at 100% and 20% light output	See Below Test Data	Pass
Audible Noise	≤ 24 dBA	14.6	Pass

2.2 Initial Electrical and Light Output Measurement (Refer to Work Instruction QD25)	[✓] IES LM-79 (2008) [✓] ANSI C82.2:2002
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Test date	2021-12-22	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	4FM-BP-MW		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD211241 NB-A1	120.1	60.01	0.1035	12.20	0.9825

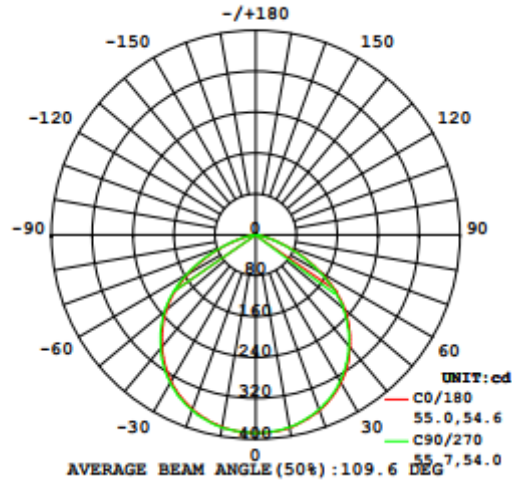
Chromaticity Measurement - Sphere-Spectroradiometer**Method (Self-absorption:1.0183)(4 π geometry):**

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2966
Duv	0.0030
Chromaticity (x, y)	x=0.4439 y=0.4140
Chromaticity (u', v')	u'=0.2508 v'=0.5262
Color Rendering Index (CRI)	92.3
R9	60

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1013.1
Luminous Efficacy (lm/W)	83.06

Zonal Lumen Tabulation



Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	304.2	30%
0-40	498.9	49.3%
0-60	869.7	85.9%
60-90	143.3	14.1%
70-100	38.3	3.8%
90-120	0.0	0%
0-90	1,012.9	100%
90-180	0.0	0%
0-180	1,012.9	100%

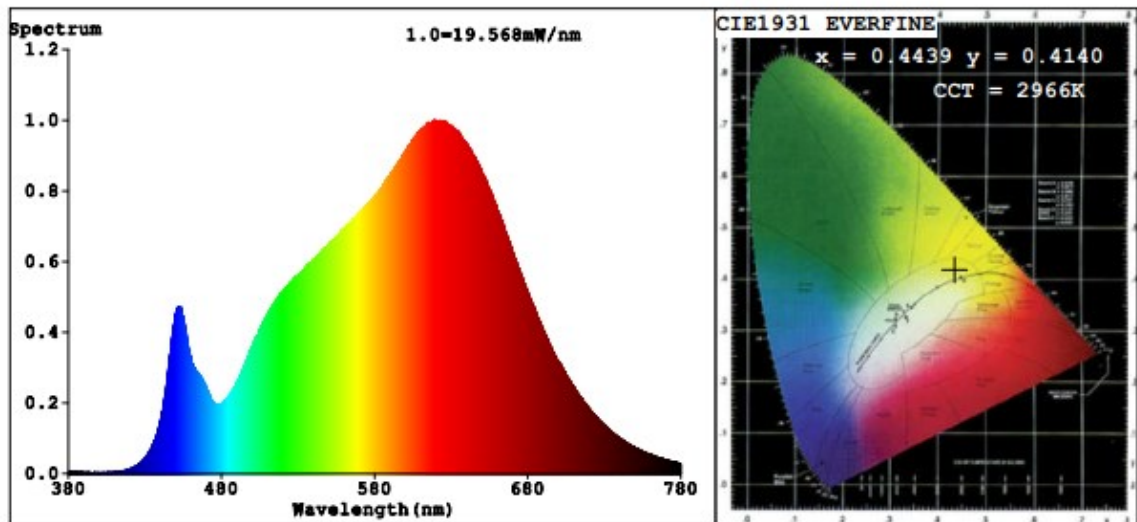
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	36.8	3.6%	90-100	0.0	0%
10-20	105.9	10.5%	100-110	0	0%
20-30	161.5	15.9%	110-120	0	0%
30-40	194.8	19.2%	120-130	0	0%
40-50	199.7	19.7%	130-140	0	0%
50-60	171.1	16.9%	140-150	0	0%
60-70	105.0	10.4%	150-160	0	0%
70-80	34.3	3.4%	160-170	0	0%
80-90	4.0	0.4%	170-180	0	0%

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	388	388	388	388	388	388	388	388	388	388	388	388	388	388	388	388			
5	387	385	381	387	386	386	387	385	386	385	387	386	386	391	388	387			
10	383	381	383	383	382	381	383	381	382	380	383	382	383	385	384	383			
15	375	375	379	375	374	376	374	373	373	373	375	375	375	378	377	375			
20	365	365	367	364	364	365	363	362	363	362	365	365	365	368	366	365			
25	352	350	353	350	349	351	348	347	349	349	352	351	352	354	353	352			
30	334	332	333	332	331	333	330	329	331	331	334	334	335	337	335	334			
35	313	310	311	310	308	312	308	307	310	311	314	314	314	316	314	313			
40	287	284	287	285	283	284	283	282	286	286	290	290	289	291	289	288			
45	259	256	259	257	255	256	255	254	259	259	263	263	263	264	263	260			
50	228	227	227	225	223	225	224	223	228	230	233	234	233	234	232	230			
55	191	189	188	187	187	188	188	189	194	196	199	200	199	198	196	194			
60	147	145	143	142	143	145	146	147	153	155	158	159	158	158	154	150			
65	102	99.5	98.2	97.1	98.1	101	102	104	110	112	114	114	114	113	110	106			
70	61.3	58.8	57.6	57.0	57.5	59.8	61.3	63.3	68.0	70.2	71.6	71.7	71.0	70.0	67.8	65.4			
75	28.1	26.4	25.4	24.9	24.8	26.1	27.7	29.5	32.9	34.7	36.0	35.9	35.5	34.7	33.4	31.5			
80	8.05	7.66	7.47	7.37	7.43	7.60	7.96	8.41	10.8	11.7	12.3	12.4	12.2	11.8	11.1	10.3			
85	2.91	2.67	2.52	2.43	2.44	2.58	2.78	3.04	3.54	3.82	4.04	4.09	4.04	3.90	3.65	3.35			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.19	0.26	0.25	0.19	0.09	0.01			
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

Spectral Power Distribution & Chromaticity Diagram



R1 =92	R2 =95	R3 =96	R4 =93	R5 =91	R6 =94	R7 =94	
R8 =83	R9 =60	R10=87	R11=94	R12=76	R13=93	R14=97	R15=88

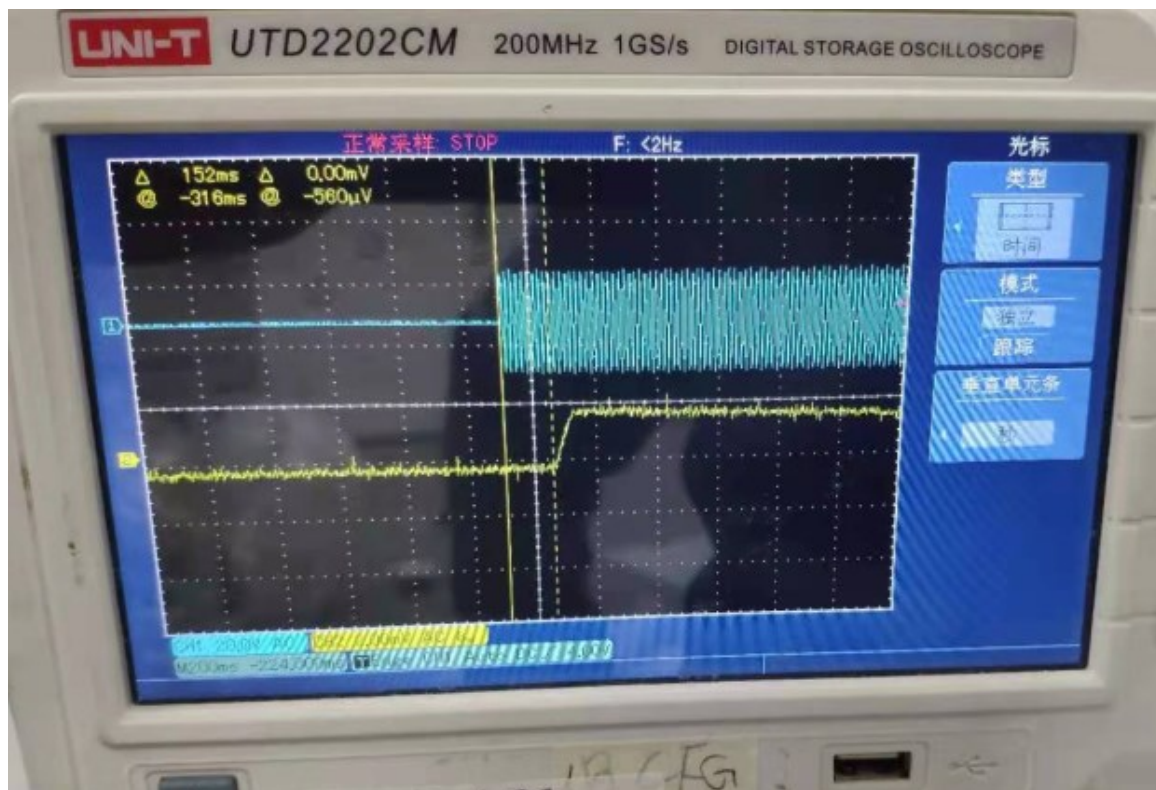
2.3 Start Time Test

Test date	2021-12-22	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	4FM-BP-MW		

Electrical Measurement:

Sample No.	Start Time (ms)
STD211241NB-A1	152
STD211241NB-A2	160
STD211241NB-A3	144
Average	152

Graph (Start Time):



2.4 In-Situ Temperature Measurement Test (ISTMT)

Test date	2021-12-22	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	4FM-BP-MW		

Electrical Measurement:

Input Vol./Frequency	120 V / 60 Hz		Output Current of Single LED(mA)	61.0mA	
Sample No.	LED Package Model	Maximum Measured LED Ts Point Temperature (°C)	Maximum LED Ts Point Temperature Limited (°C)	Maximum Measured LED Driver Td Point Temperature (°C)	Maximum LED Driver Td Point Temperature Limited (°C)
STD211241NB-A1	PC35H1 3	58.4	105	48.6	105
STD211241NB-A2		58.0		48.3	
STD211241NB-A3		58.2		48.5	

Results

Time (t) at which to estimate lumen maintenance (hours):	50,000
Lumen maintenance at time (t) (%):	78.94%
Reported L70 (hours):	>60000

2.5 Dimming, Reduced Flicker Operation and Audible Noise

Test date	2021-12-22	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	4FM-BP-MW		

Electrical Measurement:

Dimmer Model	LEVITON MFG CO INC (E31373), Cat. No. 6681		
Sample No.	Input	Dimming (100%)	Dimming (<10%)
		Luminous flux (lm)	Luminous flux (lm)
STD211241NB-A1	120.0 V / 60 Hz	1006	14.73
STD211241NB-A2	120.0 V / 60 Hz	1000	14.44
STD211241NB-A3	120.0 V / 60 Hz	1008	36.81
		Dimming (100%)	Dimming (20%)
Sample No.	Input	Peak Noise Reading (dBA)	Peak Noise Reading (dBA)
STD211241NB-A1	120.0 V / 60 Hz	14.2	14.6
STD211241NB-A2	120.0 V / 60 Hz	13.9	14.3
STD211241NB-A3	120.0 V / 60 Hz	14.1	14.5

Flicker Result:

Dimming Level	100% Dimming Level	20% Dimming Level	Nominal Dimming Level
Percent Flicker (Unfiltered)	29.465%	24.938%	10.023%
Percent Flicker (1000Hz cut-off)	28.193%	23.774%	10.051%
Percent Flicker (400Hz cut-off)	26.653%	23.988%	8.679%
Percent Flicker (200Hz cut-off)	24.173%	17.601%	6.128%
Percent Flicker (90Hz cut-off)	0.231%	0.361%	0.332%
Percent Flicker (40Hz cut-off)	0.123%	0.263%	0.171%

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-703	Standard Lamp D204	2021-02-21	2022-02-20
ST-R-704	Power Meter for Integrating Sphere	2021-01-04	2022-01-03
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2021-02-21	2022-02-20
ST-R-711	Power Meter for Goniophotometer	2021-01-04	2022-01-03
ST-R-725	LFA-3000	2021-01-04	2022-01-03
Uncertainty(K=2): Photometric Measurement (Sphere):3.94% Chromaticity Measurement(Sphere):48.2K Photometric Measurement(Goniophotometer):3.96%			

***** END OF REPORT *****