NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

CEA GROUP INTERNATIONAL CO.,LTD

(Brand Name: CEA EAEC)

Sanjiali Industrial Zone Zhucheng Road Panshi North baixiang Yueqing
Zhejiang China

Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires

Model name(s): MFL1-20

Representative (Tested) Model: MFL1-20 (2700K)
MFL1-20 (5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Jamie Lin

Engineer: Jamie Lin

Date: Jul.14,2016

Review By:

Tommy Liang

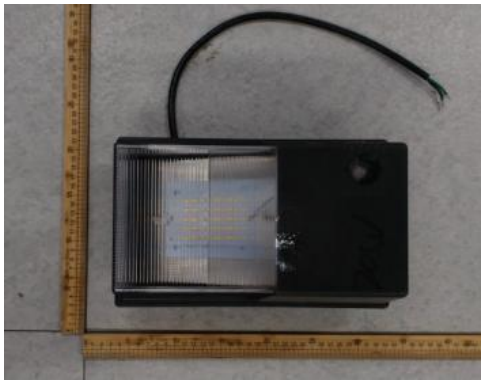
Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA EAEC	
Model Number	MFL1-20	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	20W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K, 5700K	
LED Manufacturer	Chuang Te LED	
LED Model	CT-5730	
Sample Number	STD150803NB-Y1(2700K), Y2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	Jul.09,2016
Date of Test	Jul.10,2016
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ±1 °C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 °vertical intervals and 22.5 °horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 ºC ±1 ºC. 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.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25 ºC ±1 ºC. 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.

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-07-10	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	MFL1-20(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD150803	120.0	60	0.1663	19.69	0.9869	8.63
NB-Y1	277.0	60	0.0798	19.92	0.9013	15.77
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

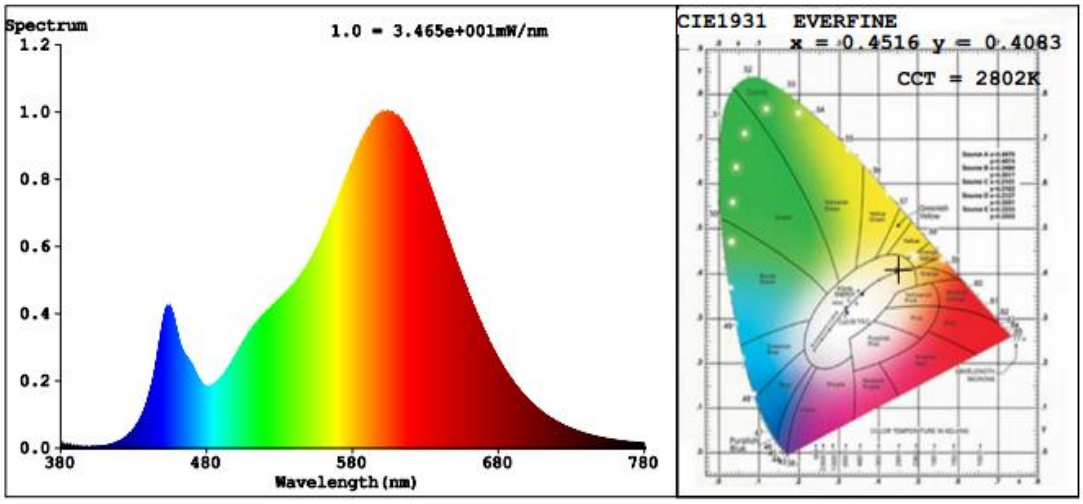
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2802
Duv	-0.0001
Chromaticity (x, y)	x=0.4516 y=0.4083
Chromaticity (u', v')	u'=0.2582 v'=0.5252
Color Rendering Index (CRI)	80.6
R9	0

Special Color Rendering Indices			
R1	79	R9	0
R2	91	R10	81
R3	94	R11	76
R4	77	R12	73
R5	79	R13	82
R6	90	R14	97
R7	80	R15	71
R8	54	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V3.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	1609.1	1594.0	--	
Luminous Efficacy (lm/W)	81.72	80.02	--	
Total Luminous (lm)(0-90 °zone)	1411.1	1397.7	300-5000(-10%)	
Luminous Efficacy (lm/W) (0-90 °zone)	71.67	70.17	Standard: >= 65(-3%)	Premium: >= 100(-3%)
Zonal lumens in the 80-90 °zone (%) (0-90 °zone)	12.40	--	<= 10(+3)	
Beam Angle ( )	106.7	--	--	
Center Beam Candle Power (cd)	337	--	--	

Spectral Power Distribution & Chromaticity Diagram

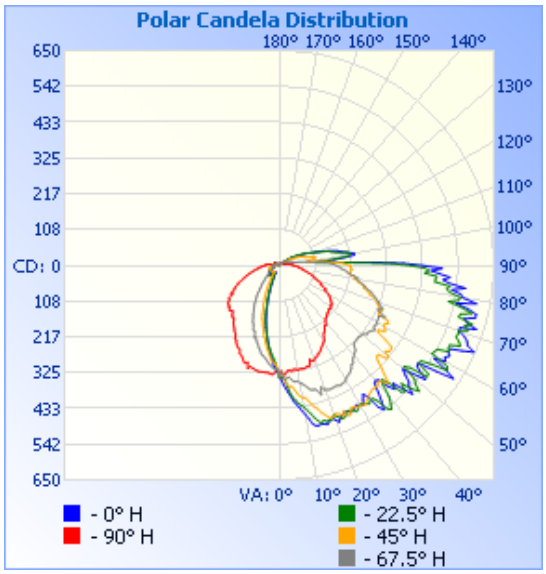


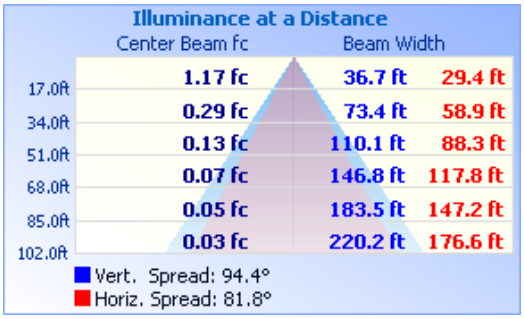
Zonal Lumen Tabulation

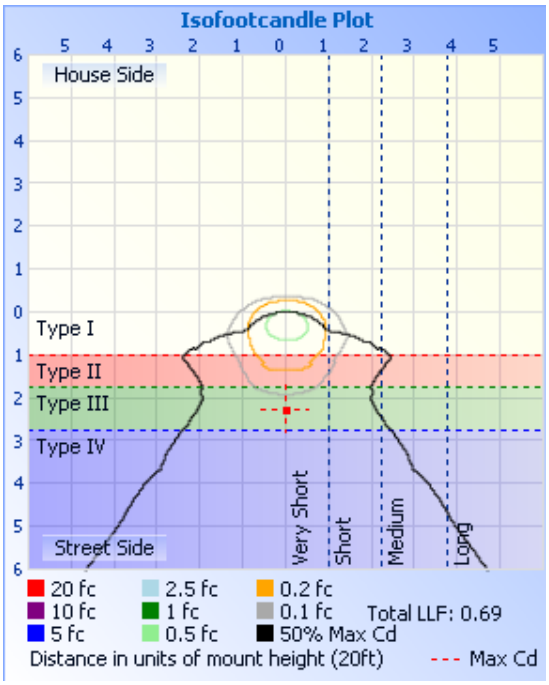
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	252.0	15.7%
0-40	412.1	25.6%
0-60	803.4	49.9%
60-90	607.7	37.8%
70-100	472.5	29.4%
90-120	173.2	10.8%
0-90	1,411.1	87.7%
90-180	197.6	12.3%
0-180	1,608.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	31.1	1.9%	90-100	86.6	5.4%
10-20	90.0	5.6%	100-110	56.1	3.5%
20-30	130.9	8.1%	110-120	30.5	1.9%
30-40	160.1	10.0%	120-130	13.9	0.9%
40-50	183.4	11.4%	130-140	6.0	0.4%
50-60	207.8	12.9%	140-150	2.8	0.2%
60-70	221.8	13.8%	150-160	1.5	0.1%
70-80	210.8	13.1%	160-170	0.2	0%
80-90	175.0	10.9%	170-180	0.0	0%

Photometric Data







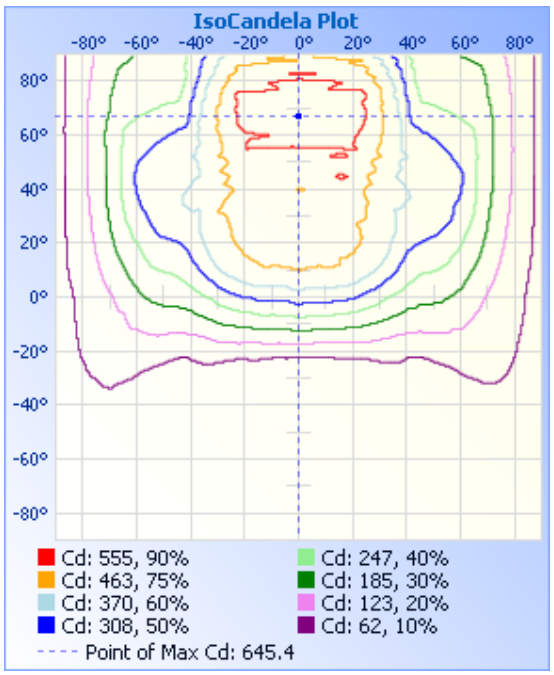


Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	337	
5	329	348	372	375	397	390	369	339	318	294	285	271	278	268	286	303	
10	327	373	407	436	460	437	407	363	321	272	238	207	214	213	238	278	
15	321	399	460	482	496	494	448	390	318	255	192	157	152	157	192	249	
20	311	402	483	472	498	482	486	401	308	210	152	96.9	83.5	94.2	143	214	
25	282	399	488	489	487	487	502	403	290	188	102	46.9	31.1	43.8	98.4	189	
30	260	392	484	480	490	487	488	402	269	159	63.9	27.0	24.6	26.6	59.6	154	
35	236	368	448	489	523	492	476	381	241	125	32.1	29.6	33.8	29.9	31.0	121	
40	212	339	447	497	455	518	463	353	218	92.0	24.6	37.9	39.8	38.3	24.7	88.7	
45	199	324	411	537	528	539	437	326	206	67.3	24.3	42.4	37.5	41.7	24.5	63.5	
50	195	330	402	531	488	534	430	326	203	47.6	27.0	41.9	35.5	39.9	27.5	44.9	
55	185	345	368	544	515	516	393	344	192	33.8	28.0	40.0	31.8	37.7	28.3	32.5	
60	170	345	363	543	581	534	366	341	172	23.8	28.7	36.8	26.7	35.5	28.5	23.2	
65	139	332	348	583	612	570	331	340	138	19.9	29.5	31.1	20.5	29.1	29.2	19.8	
70	115	312	324	609	579	578	317	320	118	19.5	31.0	26.5	17.0	25.4	30.5	19.5	
75	91.3	275	275	595	615	568	265	274	95.0	20.3	30.3	22.4	13.2	22.1	29.7	20.3	
80	72.1	239	239	571	566	557	232	237	71.0	21.0	27.1	17.0	8.28	16.5	26.5	21.1	
85	56.1	204	221	504	498	475	215	205	58.5	21.2	23.3	12.2	4.75	12.3	23.3	21.1	
90	43.3	169	206	393	434	397	215	173	43.8	18.7	18.5	7.88	1.67	8.05	18.2	18.2	
95	35.3	114	116	126	120	114	135	118	34.5	14.6	12.9	3.72	0.68	3.67	12.4	14.1	
100	23.8	51.2	100	215	220	217	96.1	58.7	24.9	13.6	7.38	4.40	0.68	4.70	7.25	12.5	
105	17.2	34.1	90.0	172	170	161	98.2	40.6	16.5	13.0	4.77	5.08	0.52	5.06	5.17	11.4	
110	12.7	27.9	73.3	121	118	120	75.9	33.0	13.9	11.9	7.08	4.03	0.47	4.15	7.36	10.8	
115	10.9	25.7	55.3	86.6	83.7	85.1	56.4	26.3	11.4	12.9	8.44	3.56	0.47	3.19	7.78	12.0	
120	16.9	23.9	36.3	54.8	54.0	55.4	37.1	24.9	16.0	12.7	6.81	3.09	0.47	2.66	6.97	11.8	
125	13.0	17.7	22.9	31.8	22.8	32.7	24.4	19.0	13.7	9.98	5.56	3.04	0.42	2.77	5.33	9.93	
130	9.46	14.0	18.8	17.7	12.2	18.8	17.1	15.3	9.53	7.14	5.40	2.88	0.31	2.34	4.74	6.66	
135	6.77	12.8	11.2	11.9	8.74	11.6	9.98	14.2	7.08	5.83	4.72	2.73	0.16	1.97	4.47	5.05	
140	5.88	10.8	6.93	10.7	3.66	10.3	7.79	10.6	5.97	4.99	3.77	2.46	0.00	1.43	3.51	4.78	
145	4.88	7.10	9.06	4.50	0.73	7.25	7.94	7.68	4.19	3.73	3.41	1.99	0.00	0.00	2.82	3.60	
150	3.62	6.41	7.97	0.68	0.73	0.32	8.21	6.93	3.77	2.94	3.14	1.05	0.00	0.00	2.45	3.01	
155	3.46	6.31	7.70	7.49	0.00	2.49	8.10	5.80	2.88	2.78	2.78	0.36	0.00	0.00	0.63	2.74	
160	2.68	4.68	0.79	4.83	0.00	5.64	4.70	5.00	2.10	2.00	2.09	0.00	0.00	0.00	0.37	1.22	
165	0.79	0.01	0.31	1.05	0.00	1.07	0.00	1.46	0.78	0.73	0.00	1.04	0.00	0.00	0.00	0.11	
170	0.41	0.37	0.37	0.00	0.00	0.00	0.70	0.63	0.42	0.58	0.63	0.37	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	

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-07-10	Test Ambient:	25.2 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	MFL1-20(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD150803	120.0	60	0.1645	19.45	0.9853	8.76
NB-Y1	277.0	60	0.0794	19.80	0.9007	15.94
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5671
Duv	-0.0039
Chromaticity (x, y)	x=0.3288 y=0.3304
Chromaticity (u', v')	u'=0.2085 v'=0.4715
Color Rendering Index (CRI)	88.4
R9	35

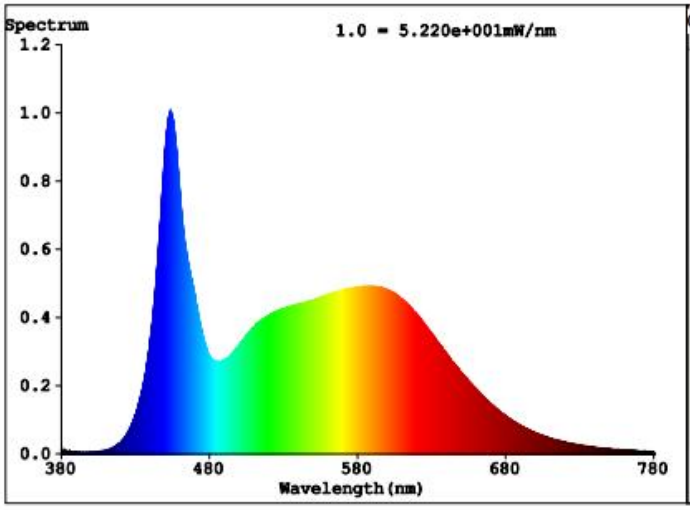
Special Color Rendering Indices			
R1	89	R9	35
R2	95	R10	85
R3	95	R11	87
R4	87	R12	66
R5	89	R13	92
R6	89	R14	98
R7	88	R15	87
R8	76	--	--

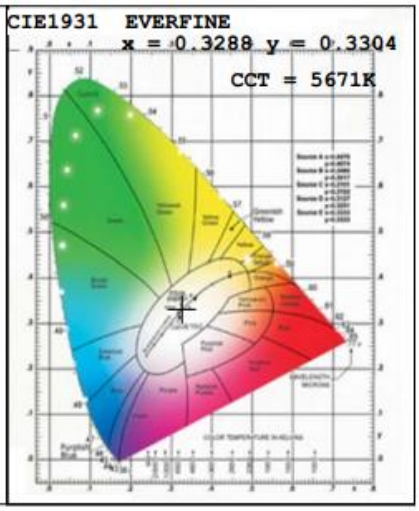
Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V3.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	1743	1761	--	
Luminous Efficacy (lm/W)	89.61	88.94	--	
Total Luminous (lm) (0 °-90 °zone)	1529*	1544*	300-5000(-10%)	
Luminous Efficacy (lm/W) (0 °-90 °zone)	78.61	77.98	Standard: >= 65(-3%)	Premium: >= 100(-3%)

* These values are calculated assuming ZLD of 0 °-90 °zone is 87.7% (see "Zonal Lumen Tabulation" on page 5).

Spectral Power Distribution & Chromaticity Diagram





3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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