



Report No.: STD160203NB-AA

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

### **Architectural Flood and Spot Luminaires and Industrial buildings**

Model name(s): SFL1-20

Representative (Tested) Model: SFL1-20(2700K)  
SFL1-20(5700K)

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

Test & Report By:

*Johnson Sun*

Engineer: Johnson Sun

Date: Aug.30,2016

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.

**Laboratory: Standard-Tech Co. Ltd Testing Center**

**NVLAP CODE: 201011-0**

Report Format Number STD/QR4909-A/2

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**1.1 Product Information:**

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	SFL1-20	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires and Industrial buildings	
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	Zhongshan Dongguan Star Photoelectric Techology Co.,Ltd	
LED Model	5730	
Sample Number	STD160203NB-AA1(2700K),AA2(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	Aug.20,2016
Date of Test	Aug.25,2016
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ , 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  $1\text{ }^{\circ}$  vertical intervals and  $22.5\text{ }^{\circ}$  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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . 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 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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . 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.

## 2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

<b>Test date</b>	2016-08-25	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	SFL1-20(2700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.1684	19.93	0.9865	10.39
NB-AA1	277.0	60	0.0790	19.90	0.9089	14.52
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

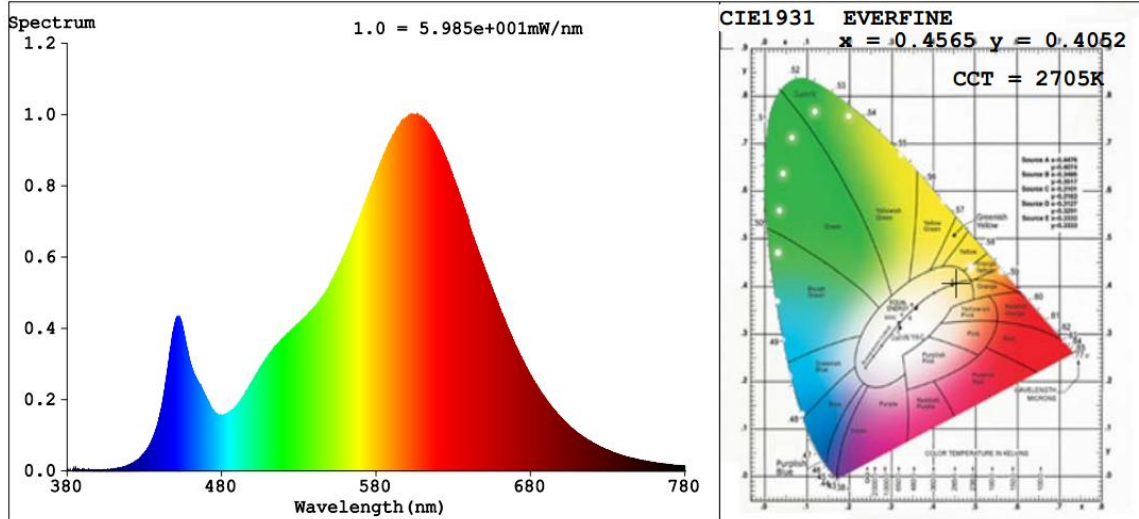
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	91	R10	81
CCT (K)	2705	R3	94	R11	76
Duv	-0.0017	R4	77	R12	74
Chromaticity (x, y)	x=0.4565 y=0.4052	R5	79	R13	82
Chromaticity (u', v')	u'=0.2628 v'=0.5248	R6	90	R14	97
Color Rendering Index (CRI)	80.0	R7	79	R15	70
R9	0	R8	52	--	--

### Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	1842.9	1819.6	>=1000(-10%)	
Luminous Efficacy (lm/W)	92.47	91.44	Standard: >= 90(-3%)	Premium: >= 110(-3%)
Zonal lumens in the 0-90 °zone (%)	100	--	>= 85(-3)	
Beam Angle ( °)	98.5	--	--	
Center Beam Candle Power (cd)	821	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

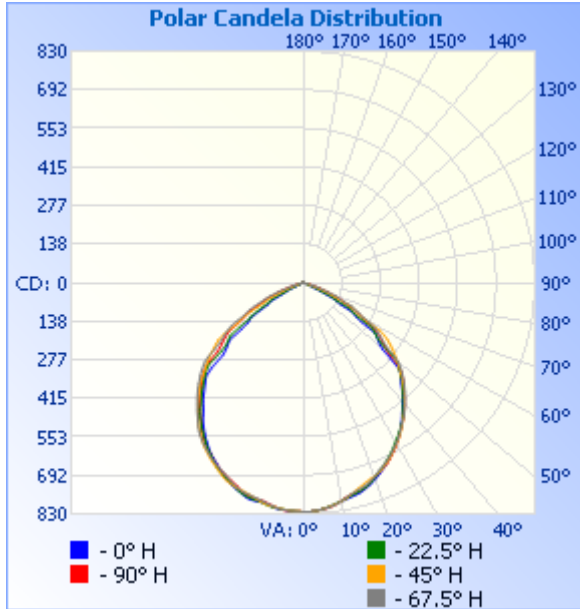


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	627.9	34.1%
0-40	1,020.3	55.4%
0-60	1,702.4	92.4%
60-90	140.0	7.6%
70-100	19.4	1.1%
90-120	0.0	0%
0-90	1,842.4	100%
90-180	0.2	0%
0-180	1,842.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	77.3	4.2%	90-100	0.0	0%
10-20	219.8	11.9%	100-110	0.0	0%
20-30	330.8	18.0%	110-120	0.0	0%
30-40	392.3	21.3%	120-130	0.0	0%
40-50	391.0	21.2%	130-140	0.0	0%
50-60	291.1	15.8%	140-150	0.0	0%
60-70	120.6	6.5%	150-160	0.0	0%
70-80	17.8	1.0%	160-170	0.0	0%
80-90	1.6	0.1%	170-180	0.0	0%

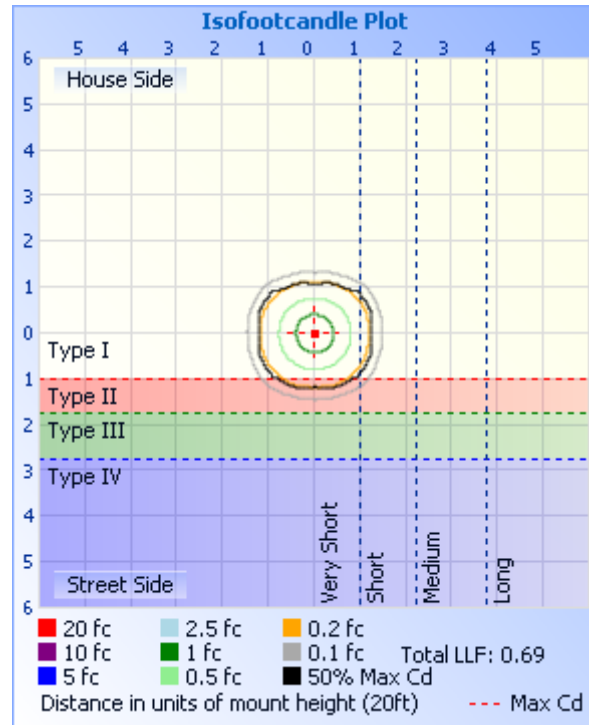
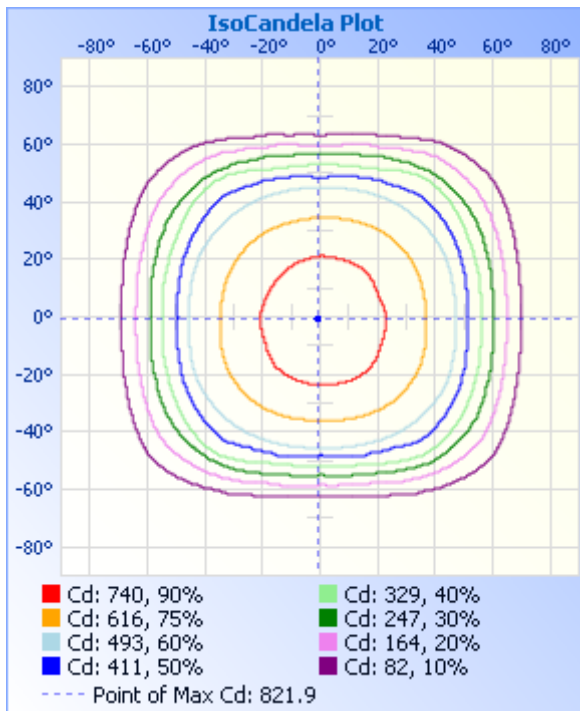
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	2.84 fc	38.4 ft	41.1 ft
34.0ft	0.71 fc	76.7 ft	82.1 ft
51.0ft	0.32 fc	115.1 ft	123.2 ft
68.0ft	0.18 fc	153.5 ft	164.3 ft
85.0ft	0.11 fc	191.8 ft	205.4 ft
102.0ft	0.08 fc	230.2 ft	246.4 ft

■ Vert. Spread: 96.9°  
■ Horiz. Spread: 100.8°



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C (DEG) \ γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	821	821	821	821	821	821	821	821	821	821	821	821	821	821	821	821
5	818	818	816	813	815	815	815	815	815	815	815	816	818	816	816	817
10	797	798	799	798	796	795	796	795	793	795	801	802	802	805	804	799
15	787	779	771	778	780	775	764	768	776	772	774	788	795	792	781	783
20	755	747	753	750	751	746	740	742	747	748	756	759	766	763	766	757
25	723	717	719	712	710	705	711	705	714	713	723	725	724	731	733	725
30	684	679	678	670	665	661	668	665	669	676	684	680	680	685	695	691
35	632	636	630	624	615	615	619	617	617	632	636	629	623	633	646	650
40	575	580	578	562	554	558	563	568	565	576	580	565	557	570	588	591
45	516	518	514	504	496	500	505	512	508	518	515	501	495	503	523	532
50	435	458	448	446	371	441	440	447	406	458	443	384	356	383	450	467
55	341	346	379	317	313	314	377	338	334	346	376	279	236	277	379	356
60	242	259	245	204	156	201	231	247	237	250	226	142	137	141	243	272
65	157	164	154	83.9	46.4	72.4	138	163	154	169	132	61.4	20.1	62.1	137	173
70	75.3	90.2	56.3	17.5	17.2	17.3	58.3	88.1	70.6	89.3	36.3	13.4	12.9	13.5	32.0	90.9
75	7.93	18.6	9.32	10.7	10.6	10.8	9.14	20.7	16.8	22.8	7.39	7.63	7.23	7.69	7.25	20.1
80	2.83	3.73	4.40	5.02	4.77	5.14	4.59	3.84	3.18	3.40	3.15	3.03	2.64	2.94	3.04	3.10
85	0.92	1.31	1.46	1.88	2.10	2.01	1.64	1.53	1.25	1.17	0.94	1.09	1.14	1.02	0.82	0.95
90	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.02	0.02	0.00	0.00	0.00	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01
105	0.01	0.02	0.02	0.01	0.00	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01
110	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01
115	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02
120	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.02	0.02	0.02
125	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.03	0.03
130	0.04	0.04	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.03	0.02	0.03	0.03	0.03
135	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.03	0.03	0.03	0.04	0.04
140	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.03	0.03	0.04	0.04
145	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
150	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
155	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
160	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.05	0.05	0.04	0.04
165	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.05	0.04	0.04
170	0.04	0.04	0.05	0.04	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
175	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.02
180	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02

## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

<b>Test date</b>	2016-08-25	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	SFL1-20(5700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.1694	20.06	0.9871	10.36
NB-AA2	277.0	60	0.0795	20.03	0.9094	14.49
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

### Chromaticity Measurement - Sphere-Spectroradiometer Method:

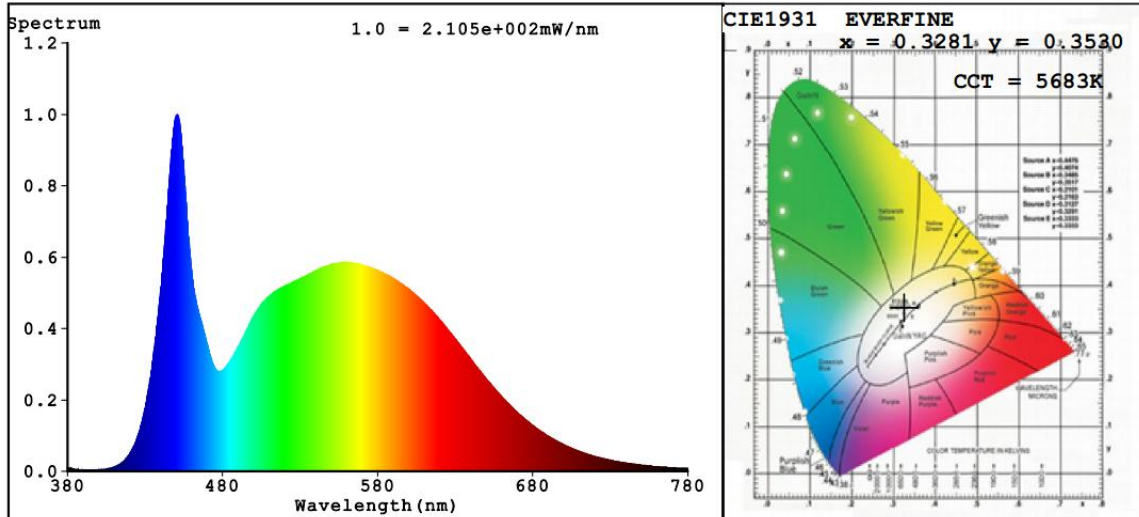
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	6
Frequency (Hz)	60	R2	87	R10	69
CCT (K)	5683	R3	93	R11	81
Duv	0.0079	R4	82	R12	62
Chromaticity (x, y)	x=0.3281 y=0.3530	R5	81	R13	81
Chromaticity (u', v')	u'=0.1994 v'=0.4828	R6	83	R14	96
Color Rendering Index (CRI)	82.7	R7	89	R15	74
R9	6	R8	69	--	--

### Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	1952	1927	>=1000(-10%)	
Luminous Efficacy (lm/W)	97.31	96.21	Standard: >= 90(-3%)	Premium: >= 110(-3%)



**Spectral Power Distribution & Chromaticity Diagram**



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### 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 \*\*\*\*\***