

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): SFL1-200

Representative (Tested) Model: SFL1-200(2700K)
SFL1-200(5700K)

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

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Date: Aug.31,2016

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	SFL1-200	
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	200W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K, 5700K	
LED Manufacturer	Zhongshan Dongguan Star Photoelectric Technology Co.,Ltd	
LED Model	5730	
Sample Number	STD160203NB-AG1(2700K),AG2(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	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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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)

Test date	2016-08-25	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SFL1-200(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	1.503	175.9	0.9756	7.24
NB-AG1	277.0	60	0.6851	172.0	0.9063	12.36
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	1
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2730	R3	94	R11	77
Duv	-0.0020	R4	78	R12	74
Chromaticity (x, y)	x=0.4541 y=0.4039	R5	80	R13	83
Chromaticity (u', v')	u'=0.2618 v'=0.5239	R6	91	R14	97
Color Rendering Index (CRI)	80.9	R7	79	R15	72
R9	1	R8	54	--	--

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)	18567	17995	>=1000(-10%)	
Luminous Efficacy (lm/W)	105.55	104.62	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.9	--	>= 85(-3)	
Beam Angle (°)	103.3	--	--	
Center Beam Candle Power (cd)	7552	--	--	

Laboratory: Standard-Tech Co. Ltd Testing Center

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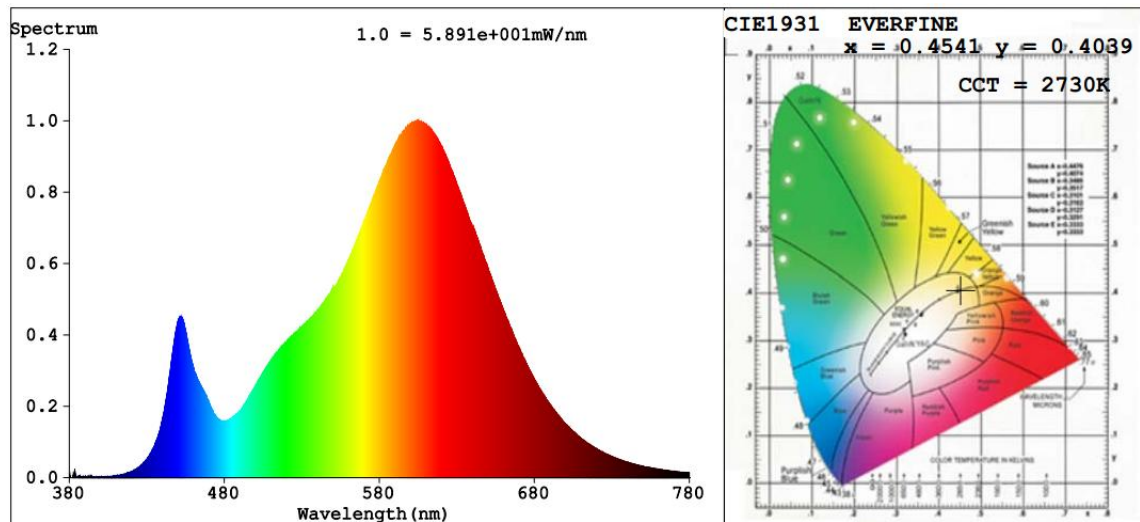
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Spectral Power Distribution & Chromaticity Diagram

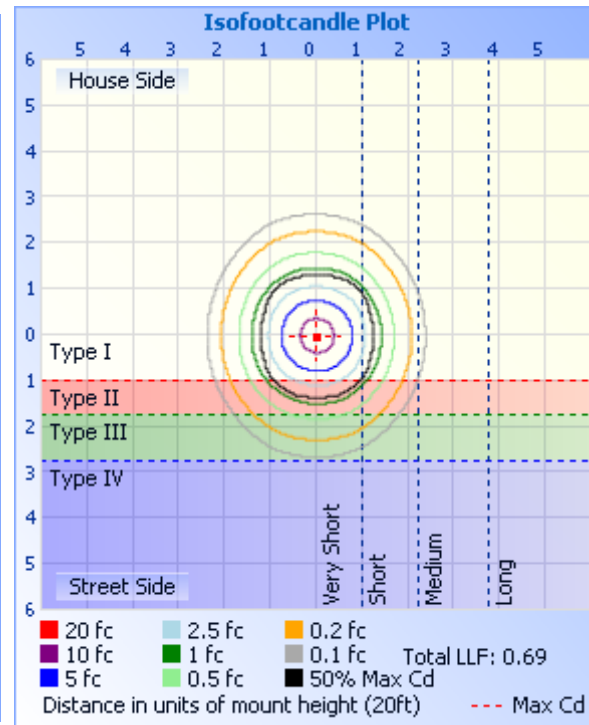
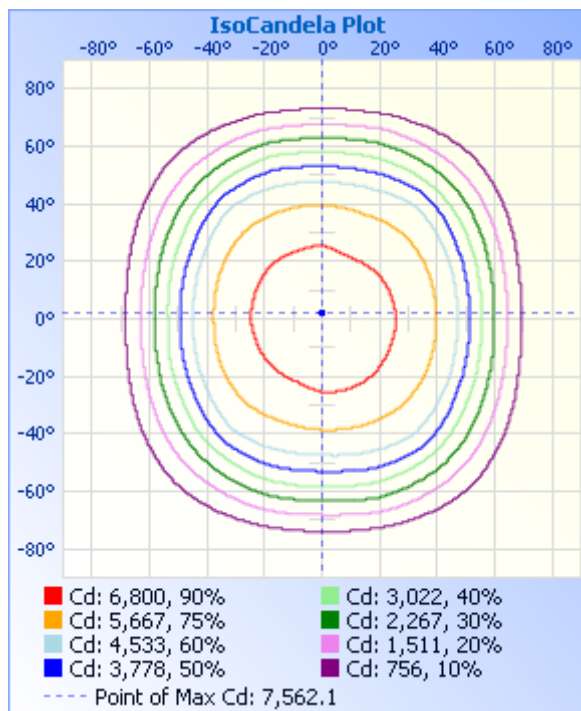
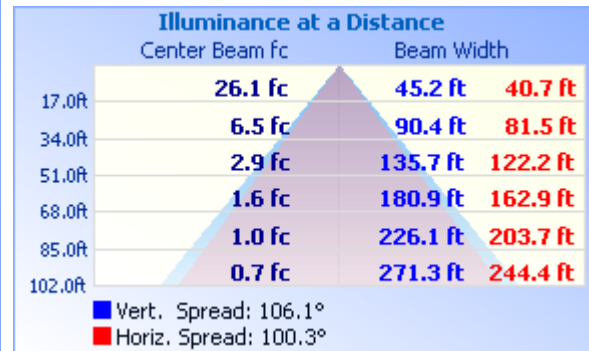
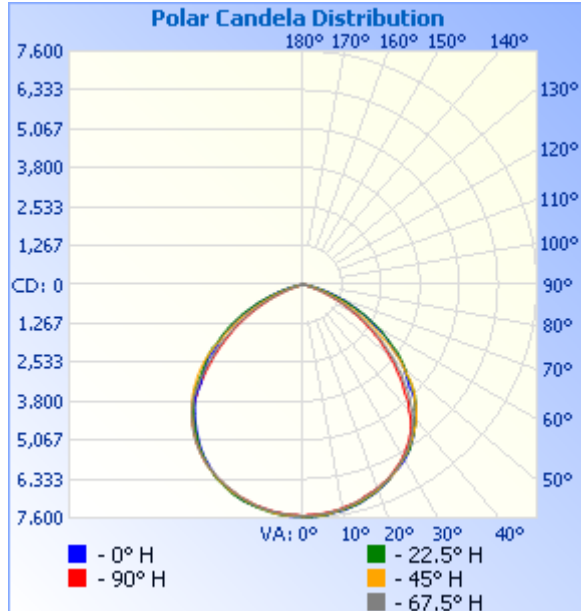


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,887.9	31.7%
0-40	9,681.0	52.1%
0-60	16,410.5	88.4%
60-90	2,138.4	11.5%
70-100	495.2	2.7%
90-120	5.8	0%
0-90	18,548.9	99.9%
90-180	16.7	0.1%
0-180	18,565.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	710.3	3.8%	90-100	2.3	0%
10-20	2,045.6	11.0%	100-110	1.6	0%
20-30	3,132.0	16.9%	110-120	1.9	0%
30-40	3,793.0	20.4%	120-130	2.2	0%
40-50	3,774.4	20.3%	130-140	2.4	0%
50-60	2,955.1	15.9%	140-150	2.4	0%
60-70	1,645.5	8.9%	150-160	2.0	0%
70-80	440.9	2.4%	160-170	1.3	0%
80-90	52.0	0.3%	170-180	0.5	0%

Photometric Data



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552	7552
1	7559	7562	7541	7524	7499	7477	7444	7390	7547	7545	7527	7512	7504	7476	7446	7387	7559
2	7559	7560	7537	7515	7496	7476	7437	7383	7550	7540	7524	7504	7491	7469	7443	7387	7559
3	7552	7552	7525	7505	7488	7461	7430	7380	7551	7540	7521	7507	7492	7469	7446	7387	7552
4	7544	7552	7517	7502	7484	7441	7421	7379	7539	7539	7517	7508	7495	7463	7441	7383	7544
5	7537	7543	7521	7493	7476	7432	7409	7381	7523	7532	7515	7494	7480	7451	7431	7366	7537
6	7527	7528	7510	7478	7460	7428	7397	7367	7499	7521	7507	7472	7461	7447	7420	7346	7527
7	7501	7501	7487	7457	7447	7415	7378	7342	7484	7511	7498	7462	7454	7433	7405	7333	7501
8	7482	7473	7464	7444	7432	7399	7362	7310	7461	7486	7470	7445	7433	7417	7388	7315	7482
9	7468	7456	7437	7427	7413	7381	7339	7292	7437	7459	7435	7419	7408	7394	7359	7299	7468
10	7459	7444	7421	7409	7377	7366	7320	7265	7406	7442	7413	7403	7386	7374	7332	7296	7459
11	7440	7425	7396	7377	7352	7330	7292	7238	7390	7418	7393	7379	7362	7356	7307	7285	7440
12	7412	7401	7369	7342	7329	7293	7262	7212	7372	7393	7359	7357	7341	7325	7292	7264	7412
13	7388	7382	7345	7319	7309	7266	7240	7193	7349	7360	7323	7320	7307	7299	7264	7232	7388
14	7364	7356	7313	7285	7276	7239	7201	7177	7335	7336	7303	7278	7273	7262	7242	7210	7364
15	7336	7320	7285	7247	7241	7205	7157	7146	7307	7319	7273	7250	7236	7233	7216	7175	7336
16	7291	7282	7240	7212	7185	7168	7123	7112	7273	7287	7227	7220	7213	7187	7188	7139	7291
17	7252	7235	7202	7167	7150	7119	7085	7081	7223	7247	7191	7179	7176	7149	7147	7097	7252
18	7216	7202	7177	7141	7118	7080	7058	7038	7183	7205	7161	7127	7131	7108	7098	7062	7216
19	7183	7164	7148	7107	7090	7040	7024	7000	7132	7169	7137	7090	7091	7078	7061	7022	7183
20	7128	7122	7097	7056	7049	7003	6974	6946	7089	7114	7083	7037	7050	7026	7010	6992	7128
21	7081	7071	7044	7016	6996	6955	6933	6897	7041	7057	7031	6997	7013	6981	6964	6936	7081
22	7026	7015	6988	6972	6954	6905	6886	6860	6986	7000	6977	6945	6964	6947	6909	6888	7026
23	6982	6973	6953	6932	6921	6868	6846	6808	6941	6967	6939	6906	6911	6904	6866	6825	6982
24	6922	6916	6911	6883	6865	6812	6783	6753	6875	6907	6886	6856	6873	6862	6817	6772	6922
25	6857	6844	6855	6827	6811	6759	6716	6679	6817	6843	6819	6803	6821	6800	6767	6707	6857
26	6791	6772	6801	6768	6743	6694	6664	6622	6735	6761	6766	6745	6757	6754	6706	6658	6791
27	6752	6725	6728	6720	6670	6642	6616	6555	6669	6705	6694	6687	6704	6696	6638	6592	6752
28	6703	6667	6666	6647	6620	6569	6544	6491	6580	6640	6637	6640	6638	6644	6590	6537	6703
29	6653	6599	6604	6577	6556	6507	6478	6400	6518	6541	6567	6573	6581	6580	6520	6495	6653

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30	6597	6546	6522	6518	6469	6444	6396	6327	6448	6464	6502	6510	6499	6506	6453	6430	6597
31	6522	6487	6462	6442	6398	6364	6334	6247	6359	6381	6438	6430	6430	6451	6369	6370	6522
32	6447	6439	6399	6372	6304	6301	6266	6183	6282	6315	6345	6371	6345	6363	6305	6292	6447
33	6363	6367	6307	6289	6225	6208	6180	6089	6177	6214	6266	6282	6279	6285	6225	6225	6363
34	6259	6261	6227	6183	6140	6125	6107	6003	6081	6123	6192	6201	6197	6193	6159	6131	6259
35	6186	6161	6160	6105	6032	6020	6007	5925	5976	6015	6100	6119	6099	6121	6095	6052	6186
36	6089	6086	6069	6001	5949	5914	5903	5818	5894	5932	6021	6021	6019	6020	6017	5945	6089
37	5971	5985	5975	5887	5826	5826	5813	5726	5783	5844	5909	5938	5910	5935	5949	5862	5971
38	5875	5890	5898	5789	5693	5727	5726	5617	5687	5735	5819	5824	5820	5843	5861	5781	5875
39	5781	5793	5821	5666	5539	5595	5621	5530	5587	5642	5715	5724	5699	5730	5772	5667	5781
40	5670	5681	5709	5564	5365	5493	5530	5415	5469	5528	5626	5605	5599	5644	5657	5567	5670
41	5585	5582	5611	5417	5217	5330	5405	5324	5377	5431	5507	5508	5467	5521	5570	5442	5585
42	5463	5462	5479	5199	5098	5151	5291	5193	5266	5310	5404	5380	5340	5410	5453	5359	5463
43	5357	5363	5368	5081	4857	4968	5148	5095	5165	5214	5306	5262	5169	5273	5348	5244	5357
44	5215	5240	5227	4921	4698	4858	5041	5010	5006	5129	5175	5131	4973	5162	5248	5144	5215
45	5063	5138	5122	4730	4563	4709	4926	4891	4814	5009	5069	4928	4848	4968	5110	5014	5063
46	4801	4993	5000	4529	4396	4467	4779	4770	4616	4903	4927	4765	4625	4786	4991	4902	4801
47	4666	4847	4840	4412	4201	4334	4653	4570	4504	4706	4813	4598	4451	4615	4837	4753	4666
48	4547	4642	4707	4257	4057	4173	4498	4399	4403	4513	4664	4419	4283	4448	4707	4499	4547
49	4419	4454	4487	4022	3907	3976	4363	4275	4268	4355	4551	4193	4094	4261	4568	4365	4419
50	4316	4350	4312	3898	3679	3826	4175	4148	4163	4243	4391	4059	3900	4077	4441	4215	4316
51	4181	4203	4145	3696	3568	3673	3968	4040	4043	4104	4259	3837	3751	3913	4275	4119	4181
52	4056	4094	3996	3515	3338	3471	3848	3890	3923	3994	4091	3670	3558	3689	4129	3988	4056
53	3835	3947	3794	3365	3203	3300	3648	3787	3683	3887	3907	3527	3388	3558	3956	3879	3835
54	3640	3821	3600	3174	3075	3158	3447	3640	3524	3746	3746	3301	3205	3332	3717	3717	3640
55	3514	3640	3439	3024	2849	2928	3217	3481	3382	3591	3511	3162	3018	3185	3515	3532	3514
56	3375	3435	3150	2854	2715	2815	3055	3290	3263	3347	3269	2944	2842	3022	3243	3352	3375
57	3273	3284	2979	2670	2503	2576	2875	3135	3163	3225	3068	2800	2688	2815	3063	3195	3273
58	3115	3119	2801	2503	2384	2462	2695	3019	3021	3073	2920	2629	2524	2699	2895	3090	3115
59	2928	3003	2603	2340	2182	2250	2552	2855	2818	2948	2736	2481	2344	2493	2754	2947	2928
60	2711	2845	2451	2166	2054	2130	2345	2725	2663	2800	2602	2278	2140	2290	2580	2816	2711
61	2598	2663	2281	2017	1875	1925	2229	2512	2551	2668	2401	2138	1999	2145	2418	2602	2598

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62	2467	2446	2105	1827	1721	1807	2006	2359	2415	2455	2256	1937	1815	1939	2176	2458	2467
63	2314	2316	1916	1702	1567	1624	1827	2211	2250	2335	2005	1756	1662	1796	2005	2314	2314
64	2097	2175	1738	1520	1402	1482	1679	2083	2066	2188	1828	1615	1485	1608	1817	2172	2097
65	1992	2010	1587	1343	1261	1331	1534	1915	1925	2059	1682	1436	1352	1458	1645	1982	1992
66	1852	1778	1443	1217	1102	1204	1390	1741	1819	1838	1523	1296	1182	1288	1522	1802	1852
67	1665	1663	1299	1062	980	1044	1228	1572	1623	1688	1386	1129	1051	1157	1311	1694	1665
68	1532	1485	1118	944	835	921	1096	1455	1503	1555	1185	1001	887	994	1169	1497	1532
69	1417	1319	1006	798	724	777	955	1263	1374	1350	1065	844	731	829	1028	1340	1417
70	1232	1173	874	686	596	643	847	1116	1195	1225	924	691	616	702	910	1206	1232
71	1140	1047	756	554	500	546	706	1001	1102	1063	802	572	476	557	748	1002	1140
72	966	886	625	458	384	437	617	847	943	930	661	445	375	456	652	911	966
73	875	746	513	352	302	355	506	747	852	794	546	347	258	339	521	740	875
74	735	645	424	272	209	265	419	617	715	660	448	241	179	253	415	644	735
75	601	515	338	189	169	204	336	520	620	551	349	170	151	166	329	525	601
76	507	437	268	152	154	153	259	420	513	444	276	138	137	138	246	429	507
77	403	342	199	139	140	142	208	347	413	368	200	125	127	127	187	332	403
78	329	278	153	126	130	127	157	269	341	282	141	115	115	114	131	265	329
79	252	207	116	116	117	115	126	216	261	224	111	103	104	102	105	194	252
80	191	162	103	104	106	105	107	162	206	166	97	90	90	91	94	140	191
81	128	120	93	89	91	91	96	120	141	121	88	80	76	78	81	107	128
82	90	89	80	78	76	80	84	95	107	95	76	67	65	67	72	80	90
83	77	74	70	65	65	67	72	77	82	75	65	57	52	55	60	68	77
84	63	61	58	53	50	56	62	67	69	65	55	44	41	41	48	55	63
85	51	51	48	38	38	42	50	55	57	52	45	33	30	32	38	43	51
86	36	38	33	27	25	28	39	42	43	40	32	24	19	20	25	33	36
87	23	24	19	15	14	18	25	32	27	29	22	14	12	13	15	20	23
88	11	13	9	7	8	9	12	17	14	14	10	7	5	5	6	10	11
89	4	3	3	2	2	4	5	7	6	6	5	4	3	3	4	5	4
90	3	3	2	2	2	2	3	3	5	5	4	3	3	3	3	4	3
91	3	3	2	2	2	2	2	3	4	4	4	3	3	3	3	4	3
92	3	2	2	2	2	2	2	3	4	4	3	3	2	2	3	3	3
93	2	2	2	1	1	2	2	2	3	3	3	3	2	2	2	3	2

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94	2	2	2	1	1	2	2	2	3	3	3	2	2	2	2	3	2
95	2	2	1	1	1	1	2	2	3	3	3	2	2	2	2	2	2
96	2	2	1	1	1	1	2	2	3	3	2	2	2	2	2	2	2
97	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
98	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
99	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
100	1	1	1	1	1	1	1	2	2	2	2	2	2	1	2	2	1
101	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	1
102	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	1
103	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	1
104	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	1
105	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	2	1
106	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	2	1
107	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	2	1
108	1	1	2	1	1	1	1	1	2	2	2	2	2	1	2	2	1
109	1	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	1
110	2	2	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
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126	3	2	2	2	2	2	2	2	3	3	3	3	3	2	3	3	3
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158	5	5	4	4	5	5	4	4	5	4	4	5	5	4	4	5	5
159	5	5	4	4	5	5	4	4	5	4	4	5	5	4	4	5	5
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179	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
180	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-08-25	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SFL1-200(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	1.490	174.6	0.9768	7.08
NB-AG2	277.0	60	0.6814	171.3	0.9075	12.21
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

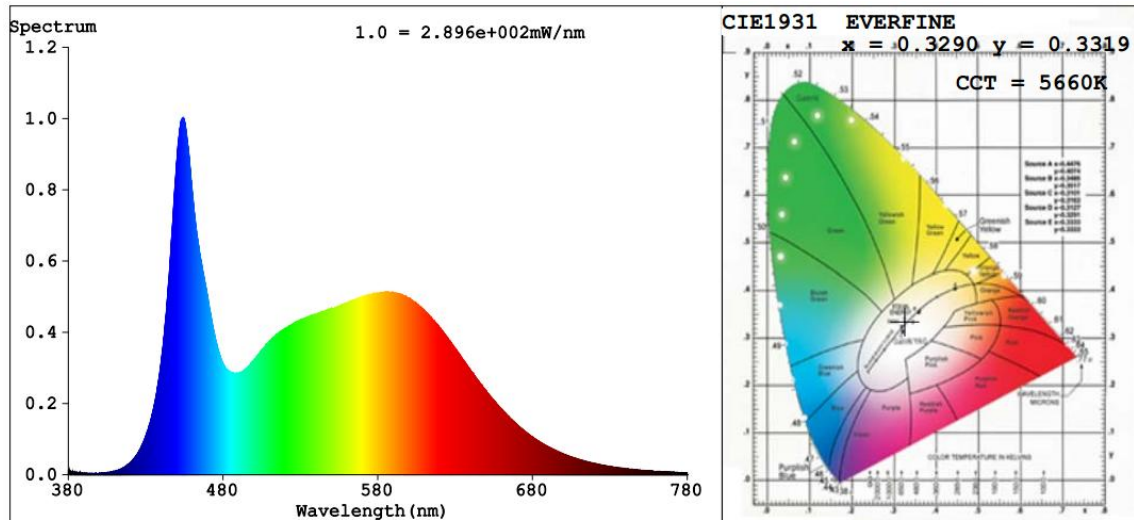
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	88	R9	29
Frequency (Hz)	60	R2	95	R10	85
CCT (K)	5660	R3	95	R11	85
Duv	-0.0032	R4	85	R12	66
Chromaticity (x, y)	x=0.3290 y=0.3319	R5	87	R13	91
Chromaticity (u', v')	u'=0.2080 v'=0.4723	R6	89	R14	98
Color Rendering Index (CRI)	87.3	R7	87	R15	85
R9	29	R8	73	--	--

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)	19493	18893	>=1000(-10%)	
Luminous Efficacy (lm/W)	111.64	110.29	Standard: >= 100(-3%)	Premium: >= 120(-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 *******

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