

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): SFL1-150

Representative (Tested) Model: SFL1-150(2700K)
SFL1-150(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

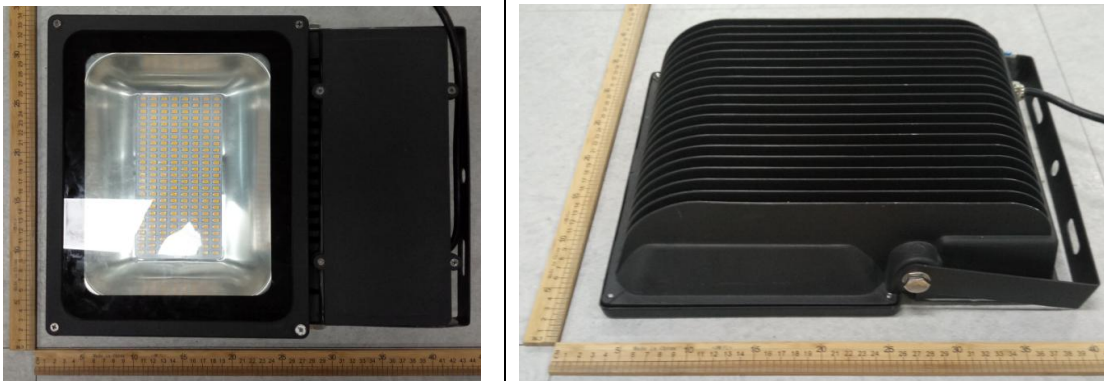
Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

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1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	SFL1-150	
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	150W	
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-AE1(2700K),AE2(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	SFL1-150(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	1.200	142.6	0.9901	8.53
NB-AE1	277.0	60	0.5483	137.8	0.9073	13.49
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	79	R9	0
Frequency (Hz)	60	R2	91	R10	81
CCT (K)	2798	R3	94	R11	76
Duv	0.0000	R4	77	R12	72
Chromaticity (x, y)	x=0.4520 y=0.4087	R5	79	R13	82
Chromaticity (u', v')	u'=0.2583 v'=0.5255	R6	90	R14	98
Color Rendering Index (CRI)	80.6	R7	80	R15	71
R9	0	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)	14917	14360	>=1000(-10%)	
Luminous Efficacy (lm/W)	104.61	104.21	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.9	--	>= 85(-3)	
Beam Angle (°)	95.6	--	--	
Center Beam Candle Power (cd)	7133	--	--	

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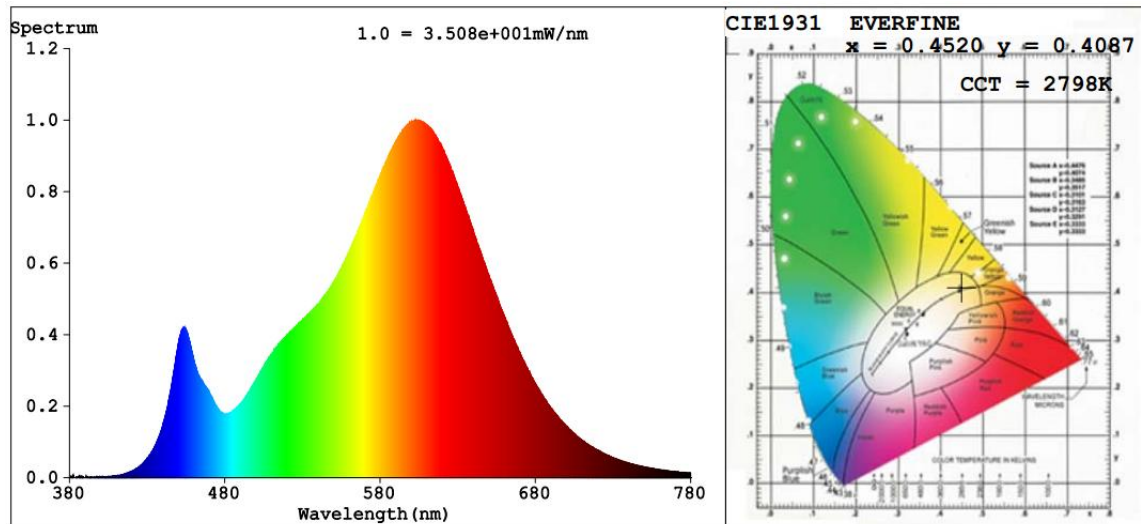
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Spectral Power Distribution & Chromaticity Diagram

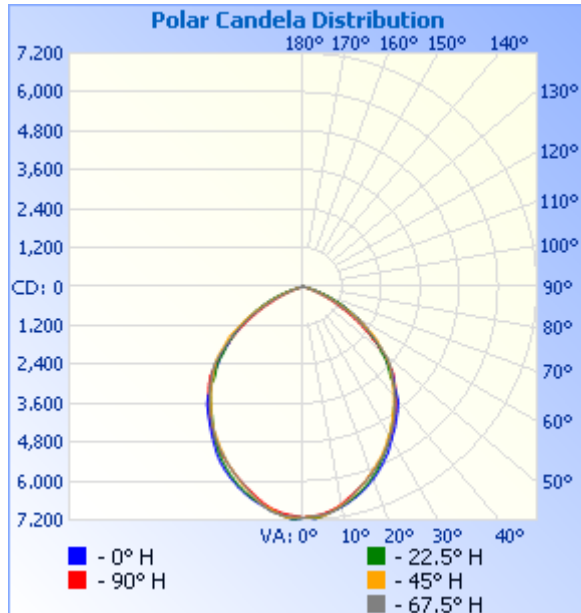


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,163.1	34.6%
0-40	8,220.9	55.1%
0-60	13,522.2	90.7%
60-90	1,380.5	9.3%
70-100	231.9	1.6%
90-120	3.9	0%
0-90	14,902.6	99.9%
90-180	13.1	0.1%
0-180	14,915.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	665.4	4.5%	90-100	1.4	0%
10-20	1,836.0	12.3%	100-110	1.1	0%
20-30	2,661.7	17.8%	110-120	1.4	0%
30-40	3,057.8	20.5%	120-130	1.7	0%
40-50	2,992.1	20.1%	130-140	2.0	0%
50-60	2,309.1	15.5%	140-150	2.0	0%
60-70	1,150.0	7.7%	150-160	1.8	0%
70-80	212.3	1.4%	160-170	1.2	0%
80-90	18.2	0.1%	170-180	0.5	0%

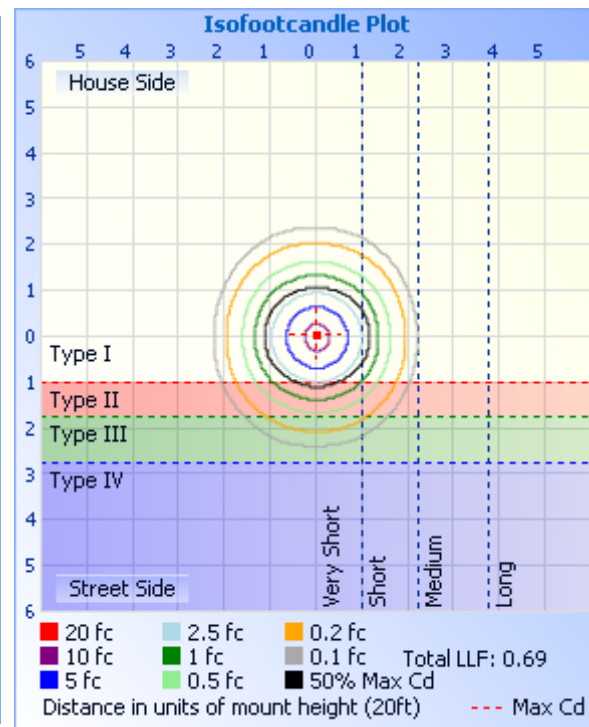
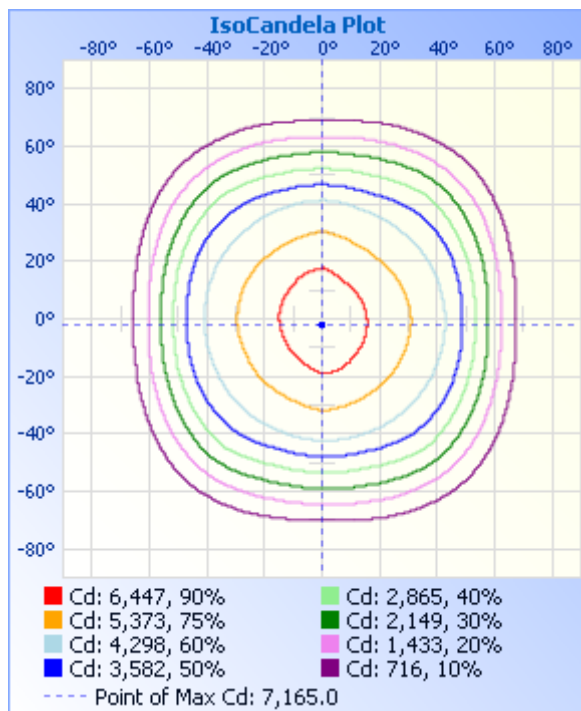
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	24.7 fc	36.9 ft	37.8 ft
34.0ft	6.2 fc	73.8 ft	75.7 ft
51.0ft	2.7 fc	110.8 ft	113.5 ft
68.0ft	1.5 fc	147.7 ft	151.3 ft
85.0ft	1.0 fc	184.6 ft	189.2 ft
102.0ft	0.7 fc	221.5 ft	227.0 ft

■ Vert. Spread: 94.7°
■ Horiz. Spread: 96.1°



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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	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133	7133
1	7129	7124	7107	7103	7087	7052	7031	7001	7149	7148	7120	7103	7086	7048	7022	6992	7129
2	7141	7136	7112	7093	7080	7054	7044	7016	7165	7161	7132	7104	7073	7037	7027	7011	7141
3	7159	7150	7116	7083	7072	7051	7050	7030	7162	7161	7137	7102	7059	7025	7030	7023	7159
4	7137	7135	7115	7073	7056	7043	7049	7024	7136	7128	7131	7091	7039	7018	7019	6994	7137
5	7093	7098	7101	7060	7032	7029	7036	6987	7091	7091	7101	7080	7019	7006	6992	6948	7093
6	7042	7043	7062	7045	6997	7008	7009	6938	7057	7055	7053	7059	6982	6989	6943	6896	7042
7	7014	7006	7009	7011	6965	6974	6958	6902	7020	7012	7009	7037	6950	6954	6895	6863	7014
8	6971	6959	6955	6977	6918	6929	6909	6865	6991	6983	6950	6996	6912	6917	6833	6822	6971
9	6932	6924	6897	6923	6870	6878	6854	6836	6946	6933	6910	6948	6859	6863	6792	6777	6932
10	6891	6873	6852	6871	6801	6821	6813	6776	6887	6878	6874	6877	6806	6812	6738	6718	6891
11	6845	6830	6791	6790	6740	6745	6756	6726	6847	6817	6816	6818	6736	6738	6699	6675	6845
12	6803	6772	6734	6719	6661	6675	6698	6677	6805	6775	6753	6749	6675	6670	6629	6635	6803
13	6745	6725	6658	6648	6601	6585	6613	6643	6762	6738	6669	6660	6596	6601	6571	6589	6745
14	6698	6658	6592	6561	6540	6517	6544	6595	6716	6681	6605	6590	6528	6530	6497	6524	6698
15	6638	6607	6506	6493	6465	6436	6479	6534	6659	6633	6526	6499	6463	6439	6433	6472	6638
16	6587	6533	6437	6410	6409	6377	6400	6486	6610	6564	6461	6430	6404	6364	6367	6417	6587
17	6517	6472	6347	6351	6337	6305	6316	6412	6550	6500	6390	6351	6343	6299	6275	6339	6517
18	6457	6396	6275	6294	6278	6243	6248	6337	6495	6440	6320	6284	6266	6219	6205	6274	6457
19	6379	6332	6190	6215	6189	6163	6165	6275	6419	6377	6227	6222	6206	6154	6114	6196	6379
20	6317	6244	6122	6148	6129	6103	6102	6201	6356	6297	6156	6157	6134	6074	6040	6131	6317
21	6237	6170	6034	6072	6054	6027	6019	6136	6296	6232	6066	6074	6075	6010	5949	6042	6237
22	6167	6092	5962	6009	5994	5956	5947	6069	6220	6145	5995	6009	5999	5927	5879	5964	6167
23	6080	5994	5878	5919	5914	5868	5882	5979	6157	6075	5925	5923	5940	5861	5807	5869	6080
24	6007	5896	5810	5849	5848	5795	5799	5909	6075	5982	5834	5854	5861	5799	5717	5797	6007
25	5910	5815	5735	5782	5762	5711	5727	5815	6004	5908	5760	5767	5802	5721	5643	5720	5910
26	5833	5728	5642	5696	5696	5642	5636	5739	5911	5808	5669	5700	5737	5654	5551	5619	5833
27	5754	5617	5570	5601	5610	5551	5564	5634	5823	5727	5600	5635	5652	5568	5475	5535	5754
28	5653	5534	5470	5524	5536	5474	5473	5548	5730	5615	5509	5548	5583	5497	5376	5430	5653

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29	5542	5426	5370	5428	5442	5399	5397	5435	5614	5517	5432	5477	5498	5405	5300	5349	5542
30	5454	5314	5290	5349	5367	5303	5303	5338	5524	5417	5343	5382	5423	5331	5209	5242	5454
31	5353	5220	5208	5257	5275	5209	5224	5220	5417	5296	5272	5306	5326	5234	5134	5146	5353
32	5270	5130	5107	5176	5177	5126	5127	5128	5329	5201	5195	5208	5250	5156	5054	5033	5270
33	5188	5023	5020	5092	5098	5025	5051	5018	5222	5086	5094	5129	5152	5078	4955	4949	5188
34	5085	4938	4911	4987	5017	4949	4948	4937	5141	4995	5014	5027	5073	4976	4878	4864	5085
35	5006	4832	4803	4908	4914	4868	4863	4850	5040	4888	4908	4944	4992	4892	4781	4758	5006
36	4905	4747	4722	4800	4827	4760	4748	4746	4954	4803	4816	4863	4888	4787	4700	4674	4905
37	4827	4644	4640	4688	4736	4672	4655	4642	4875	4718	4700	4756	4811	4703	4614	4570	4827
38	4731	4566	4528	4598	4623	4560	4542	4559	4780	4619	4614	4666	4710	4598	4504	4491	4731
39	4653	4469	4438	4508	4537	4470	4454	4460	4703	4541	4528	4558	4626	4517	4417	4390	4653
40	4539	4391	4328	4388	4430	4352	4365	4383	4590	4447	4425	4474	4528	4434	4311	4312	4539
41	4387	4289	4240	4294	4342	4256	4257	4304	4455	4366	4336	4369	4446	4323	4222	4236	4387
42	4225	4201	4130	4180	4232	4144	4149	4199	4249	4261	4225	4282	4346	4241	4116	4131	4225
43	4100	4076	4042	4070	4146	4055	4061	4056	4149	4156	4137	4177	4261	4136	4035	4006	4100
44	4015	3874	3930	3984	4039	3946	3951	3886	4047	3948	4028	4097	4173	4050	3926	3806	4015
45	3907	3774	3844	3874	3948	3860	3859	3746	3962	3823	3941	4015	4065	3941	3838	3707	3907
46	3808	3667	3756	3786	3856	3750	3746	3667	3866	3736	3833	3903	3979	3856	3731	3607	3808
47	3589	3570	3646	3697	3733	3663	3656	3565	3660	3639	3749	3817	3822	3750	3647	3526	3589
48	3472	3477	3556	3583	3512	3552	3563	3470	3516	3556	3646	3708	3643	3662	3569	3415	3472
49	3382	3326	3434	3492	3381	3456	3476	3325	3403	3397	3561	3604	3498	3565	3466	3252	3382
50	3274	3151	3338	3357	3244	3317	3355	3167	3317	3224	3471	3394	3330	3356	3374	3123	3274
51	3111	3059	3157	3148	3032	3120	3187	3053	3170	3104	3342	3274	3184	3235	3196	3013	3111
52	2947	2950	3027	3041	2912	3008	3036	2948	2985	3021	3186	3089	3015	3059	3062	2931	2947
53	2830	2847	2906	2826	2683	2788	2939	2844	2859	2902	3028	2937	2852	2902	2942	2800	2830
54	2736	2630	2812	2702	2552	2661	2826	2656	2772	2740	2933	2777	2722	2754	2852	2665	2736
55	2550	2536	2677	2495	2355	2454	2723	2529	2655	2606	2823	2646	2556	2619	2762	2531	2550
56	2423	2429	2542	2378	2211	2337	2575	2425	2483	2518	2746	2493	2394	2474	2651	2450	2423
57	2338	2302	2337	2176	2038	2138	2418	2309	2360	2406	2538	2339	2207	2311	2413	2320	2338
58	2198	2128	2193	2055	1874	2010	2225	2116	2270	2254	2353	2177	2061	2162	2267	2137	2198
59	2016	2041	2047	1870	1713	1837	2083	2034	2072	2106	2197	2030	1895	1984	2127	2048	2016
60	1930	1905	1883	1727	1546	1685	1929	1907	1966	2019	2059	1860	1738	1849	1986	1931	1930

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61	1762	1761	1696	1570	1398	1527	1734	1747	1845	1858	1900	1730	1568	1692	1794	1781	1762
62	1646	1655	1564	1432	1233	1397	1594	1643	1657	1713	1719	1552	1440	1541	1621	1674	1646
63	1522	1525	1407	1261	1112	1230	1455	1526	1572	1627	1568	1384	1271	1376	1508	1564	1522
64	1381	1393	1263	1132	959	1097	1295	1374	1399	1456	1416	1260	1111	1257	1334	1417	1381
65	1257	1294	1108	978	845	942	1139	1288	1307	1372	1260	1102	984	1100	1192	1297	1257
66	1130	1151	993	826	699	784	1038	1134	1148	1219	1113	981	837	975	1063	1180	1130
67	982	1005	839	703	590	670	871	1051	1063	1131	1004	832	726	813	934	1059	982
68	892	917	714	567	464	546	770	912	916	987	841	711	596	669	803	958	892
69	761	786	606	466	366	450	630	780	785	870	739	574	494	566	690	822	761
70	655	678	495	346	248	332	543	703	692	767	605	455	374	442	572	723	655
71	538	551	409	258	165	251	431	582	571	626	501	365	259	349	458	593	538
72	448	456	313	163	131	157	358	479	483	525	413	259	176	245	382	499	448
73	348	349	248	115	117	118	270	375	378	411	324	182	140	153	291	383	348
74	249	274	175	102	106	104	200	301	304	328	260	131	128	120	231	289	249
75	182	192	129	90	93	91	153	222	217	240	192	118	114	105	166	222	182
76	106	137	84	81	83	82	104	169	139	170	139	104	101	95	113	150	106
77	72	81	67	70	71	70	78	113	89	124	102	91	91	84	81	103	72
78	61	57	56	61	62	60	65	78	72	80	80	81	79	73	65	64	61
79	54	49	47	51	51	50	54	63	63	67	69	70	69	64	57	52	54
80	45	41	39	43	41	40	46	51	52	55	57	58	58	54	47	44	45
81	35	34	31	34	34	33	36	43	42	47	47	50	47	46	37	36	35
82	28	26	25	26	25	25	29	33	34	37	39	40	39	36	31	29	28
83	21	21	18	20	19	19	22	26	26	27	30	32	30	27	23	22	21
84	16	15	13	14	13	13	15	18	20	21	23	24	23	21	17	16	16
85	10	10	9	9	8	9	11	11	13	14	16	16	16	14	12	12	10
86	6	7	6	6	5	5	6	8	9	10	10	11	11	10	8	8	6
87	4	4	3	3	2	3	4	4	6	6	7	7	7	6	5	5	4
88	2	3	2	2	2	2	2	3	4	4	4	5	4	3	3	3	2
89	2	2	2	1	1	2	2	2	3	3	3	3	3	2	3	3	2
90	2	2	1	1	1	1	2	2	3	3	3	2	2	2	2	2	2
91	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1
92	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1

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93	1	1	1	1	1	1	1	1	2	2	2	2	2	1	2	2	1
94	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	2	1
95	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1
96	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1
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125	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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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	SFL1-150(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	1.216	144.7	0.9915	8.47
NB-AE2	277.0	60	0.5559	139.9	0.9086	13.43
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

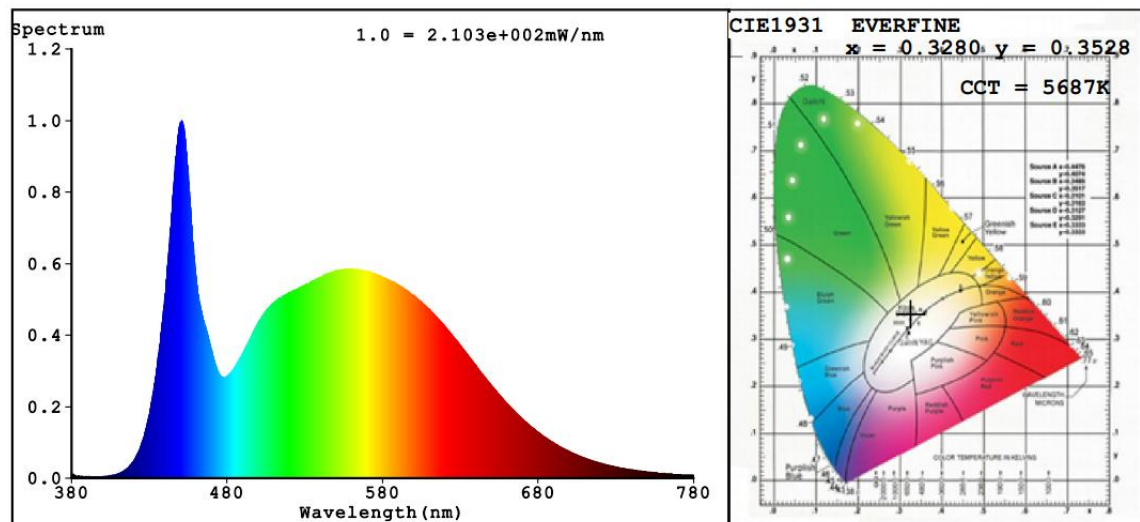
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	6
Frequency (Hz)	60	R2	87	R10	69
CCT (K)	5687	R3	93	R11	81
Duv	0.0079	R4	82	R12	62
Chromaticity (x, y)	x=0.3280 y=0.3528	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)	15663	15078	>=1000(-10%)	
Luminous Efficacy (lm/W)	108.24	107.78	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%			

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