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): SFL1-100

Representative (Tested) Model: SFL1-100(2700K)
SFL1-100(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

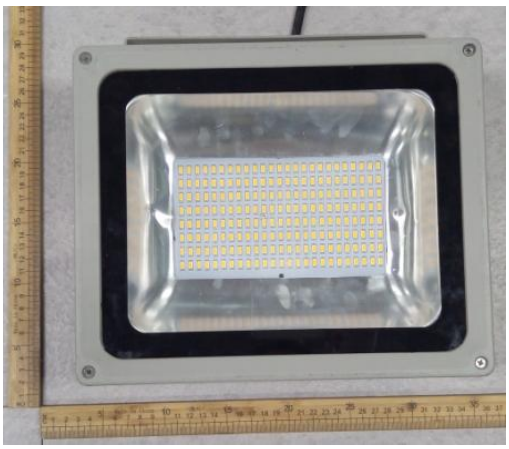
Manager: Tommy Liang

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	SFL1-100	
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	100W	
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-AF1(2700K),AF2(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 °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	2016-08-25	Test Ambient:	25.2 ℃
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SFL1-100(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.7989	95.03	0.9912	10.26
NB-AF1	277.0	60	0.3780	94.56	0.9031	13.85
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

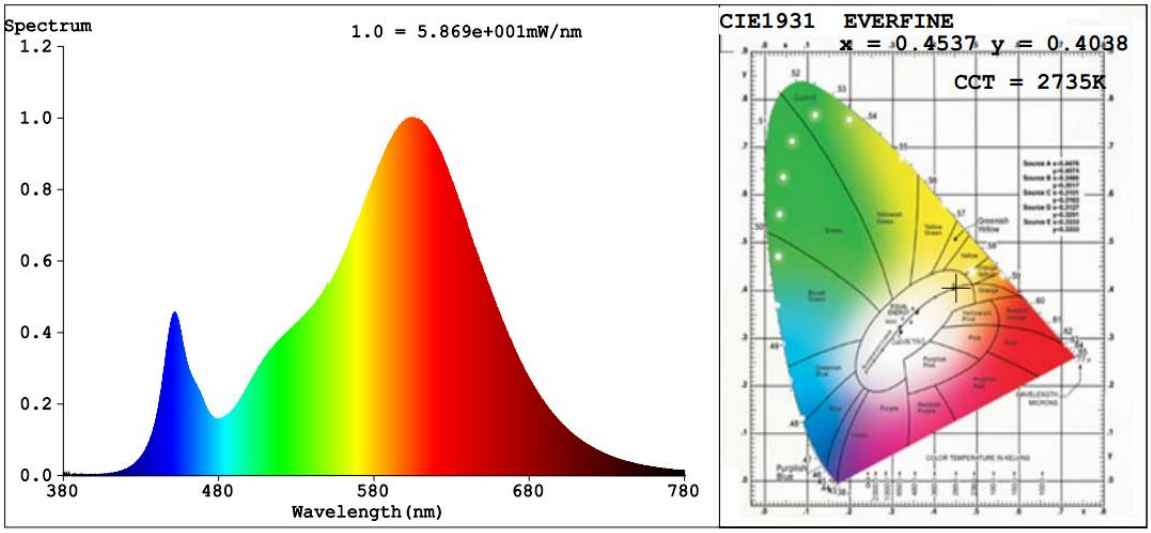
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2735
Duv	-0.0020
Chromaticity (x, y)	x=0.4537 y=0.4038
Chromaticity (u', v')	u'=0.2615 v'=0.5238
Color Rendering Index (CRI)	80.8
R9	1

Special Color Rendering Indices			
R1	80	R9	1
R2	92	R10	81
R3	94	R11	77
R4	78	R12	74
R5	80	R13	83
R6	90	R14	97
R7	79	R15	72
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)	10216	9828.7	>=1000(-10%)	
Luminous Efficacy (lm/W)	107.50	103.94	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.9	--	>= 85(-3)	
Beam Angle ( )	99.2	--	--	
Center Beam Candle Power (cd)	4700	--	--	

Spectral Power Distribution & Chromaticity Diagram

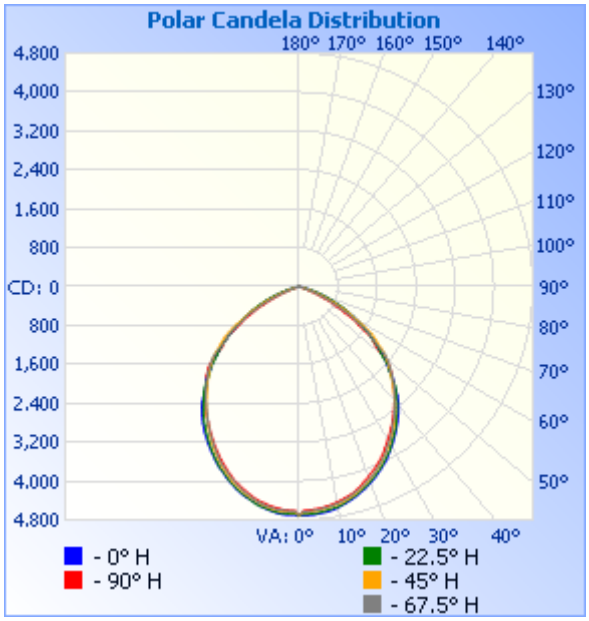


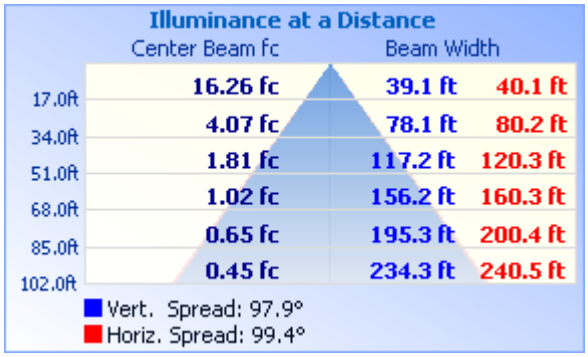
Zonal Lumen Tabulation

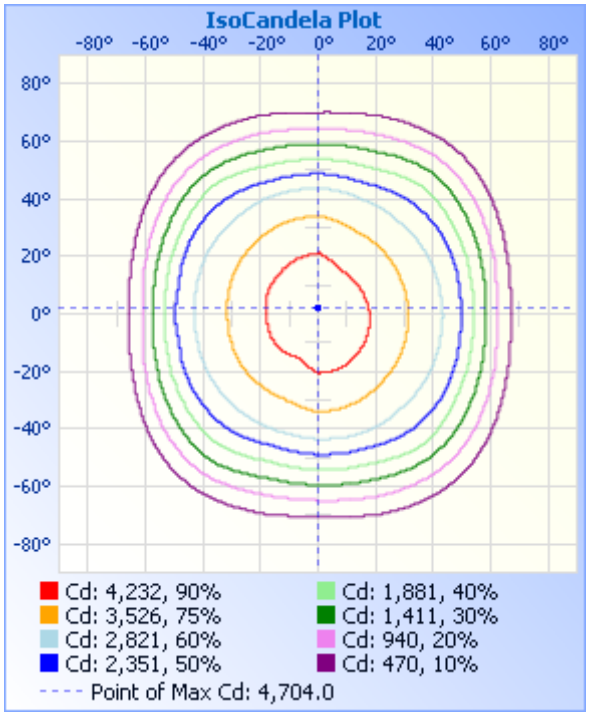
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,477.7	34%
0-40	5,571.8	54.5%
0-60	9,234.2	90.4%
60-90	970.9	9.5%
70-100	165.9	1.6%
90-120	3.0	0%
0-90	10,205.1	99.9%
90-180	9.9	0.1%
0-180	10,215.0	100%

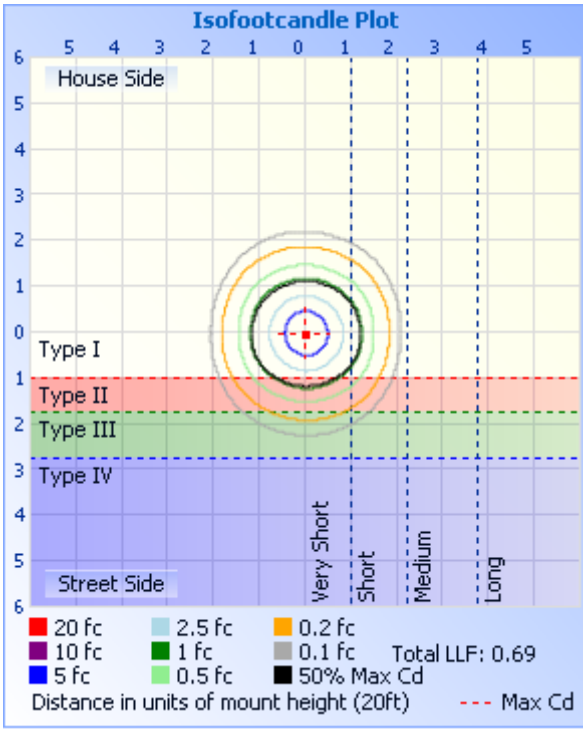
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	435.9	4.3%	90-100	1.1	0%
10-20	1,231.0	12.1%	100-110	0.8	0%
20-30	1,810.9	17.7%	110-120	1.1	0%
30-40	2,094.1	20.5%	120-130	1.3	0%
40-50	2,055.5	20.1%	130-140	1.5	0%
50-60	1,606.9	15.7%	140-150	1.5	0%
60-70	806.1	7.9%	150-160	1.3	0%
70-80	152.3	1.5%	160-170	0.9	0%
80-90	12.6	0.1%	170-180	0.3	0%

Photometric Data









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	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700	4700
1	4704	4682	4646	4630	4610	4574	4551	4522	4698	4676	4643	4625	4609	4573	4548	4522	4704
2	4704	4681	4643	4628	4604	4568	4547	4520	4697	4676	4642	4623	4608	4573	4548	4519	4704
3	4699	4677	4637	4619	4596	4562	4537	4517	4699	4672	4639	4619	4606	4569	4543	4517	4699
4	4698	4671	4626	4614	4588	4557	4537	4513	4695	4668	4636	4615	4599	4562	4539	4510	4698
5	4687	4664	4617	4602	4582	4549	4536	4511	4687	4665	4630	4608	4585	4550	4536	4499	4687
6	4675	4647	4607	4590	4568	4539	4526	4503	4671	4658	4615	4602	4569	4540	4519	4490	4675
7	4669	4634	4588	4576	4553	4524	4514	4484	4647	4638	4600	4584	4556	4524	4505	4479	4669
8	4653	4620	4574	4562	4539	4510	4494	4466	4632	4619	4584	4568	4537	4506	4493	4469	4653
9	4640	4608	4560	4546	4518	4496	4472	4440	4608	4598	4561	4546	4510	4488	4480	4454	4640
10	4613	4595	4546	4525	4498	4471	4456	4421	4586	4583	4539	4517	4494	4466	4466	4434	4613
11	4585	4569	4530	4505	4476	4454	4438	4394	4553	4563	4508	4498	4465	4445	4437	4404	4585
12	4561	4539	4505	4481	4448	4432	4411	4369	4524	4528	4482	4464	4437	4410	4409	4396	4561
13	4530	4506	4481	4456	4429	4410	4388	4344	4492	4494	4451	4432	4399	4377	4369	4360	4530
14	4507	4482	4450	4425	4402	4386	4354	4309	4469	4452	4422	4393	4368	4337	4343	4338	4507
15	4471	4448	4422	4390	4371	4353	4325	4285	4441	4425	4384	4360	4326	4310	4304	4308	4471
16	4442	4416	4384	4364	4329	4321	4285	4246	4403	4389	4347	4324	4294	4277	4269	4277	4442
17	4403	4376	4349	4323	4296	4283	4254	4205	4369	4352	4301	4277	4252	4229	4233	4238	4403
18	4374	4349	4302	4290	4241	4252	4214	4174	4323	4308	4268	4239	4212	4195	4188	4207	4374
19	4334	4311	4266	4248	4197	4206	4180	4141	4285	4270	4231	4188	4173	4161	4152	4163	4334
20	4296	4275	4228	4212	4157	4167	4136	4093	4235	4227	4175	4147	4116	4120	4102	4129	4296
21	4249	4223	4178	4166	4110	4118	4097	4050	4194	4169	4131	4095	4071	4067	4059	4088	4249
22	4212	4184	4137	4129	4070	4079	4045	3996	4140	4126	4077	4049	4011	4025	4007	4037	4212
23	4163	4136	4085	4074	4026	4027	4004	3958	4095	4087	4036	4004	3967	3966	3966	3997	4163
24	4119	4095	4044	4027	3971	3976	3944	3907	4054	4041	3975	3957	3912	3916	3921	3947	4119
25	4068	4050	3988	3968	3929	3917	3897	3866	3999	3982	3923	3891	3863	3854	3873	3902	4068
26	4027	3994	3926	3923	3873	3871	3849	3820	3949	3935	3856	3837	3799	3801	3812	3847	4027
27	3975	3939	3879	3875	3823	3824	3790	3764	3889	3870	3802	3768	3745	3738	3765	3805	3975
28	3908	3894	3830	3810	3753	3760	3742	3708	3843	3818	3747	3719	3694	3690	3702	3746	3908

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31	3742	3715	3643	3637	3586	3571	3557	3548	3671	3633	3552	3538	3523	3515	3534	3569	3742
32	3675	3648	3593	3568	3521	3516	3503	3500	3621	3579	3496	3470	3459	3449	3477	3516	3675
33	3619	3591	3527	3507	3465	3457	3435	3435	3570	3523	3423	3414	3408	3392	3407	3448	3619
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36	3439	3401	3335	3316	3290	3252	3250	3261	3375	3327	3230	3217	3241	3196	3208	3259	3439
37	3370	3325	3268	3244	3218	3194	3192	3191	3318	3266	3168	3161	3177	3142	3132	3186	3370
38	3314	3264	3189	3188	3161	3138	3114	3128	3244	3191	3092	3092	3124	3075	3068	3127	3314
39	3241	3189	3126	3120	3095	3063	3037	3056	3181	3130	3034	3038	3058	3021	2991	3070	3241
40	3179	3134	3045	3064	3044	3006	2977	2993	3101	3051	2956	2985	3007	2967	2933	2996	3179
41	3099	3054	2981	2991	2973	2931	2913	2920	3002	2983	2891	2917	2938	2897	2857	2935	3099
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51	2175	2151	2284	2304	2124	2261	2159	2062	2135	2139	2246	2264	2119	2252	2210	2086	2175
52	2091	2090	2205	2224	2006	2178	2095	1959	2057	2062	2169	2119	1999	2162	2099	2025	2091
53	2013	1990	2117	2012	1932	2080	2020	1876	1981	1964	2053	1945	1938	2017	2017	1914	2013
54	1928	1889	2000	1882	1867	1854	1947	1816	1854	1860	1983	1840	1863	1834	1941	1830	1928
55	1807	1804	1937	1801	1778	1770	1829	1697	1775	1784	1908	1767	1800	1748	1882	1756	1807
56	1744	1734	1855	1722	1609	1698	1758	1620	1697	1700	1839	1709	1616	1693	1777	1680	1744
57	1636	1605	1772	1649	1456	1636	1684	1544	1581	1587	1725	1613	1487	1617	1690	1566	1636
58	1548	1540	1648	1443	1399	1520	1609	1451	1518	1527	1616	1444	1407	1514	1606	1490	1548
59	1467	1452	1525	1342	1278	1339	1491	1360	1405	1426	1495	1333	1335	1327	1543	1409	1467
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61	1285	1279	1246	1165	1034	1198	1260	1184	1237	1268	1247	1200	1051	1191	1234	1255	1285
62	1193	1188	1177	990	885	1007	1126	1109	1139	1157	1166	1029	996	1072	1156	1146	1193
63	1106	1110	1089	941	775	929	1051	1019	1064	1103	1102	941	810	931	1054	1088	1106
64	996	1025	949	775	698	849	976	947	972	997	931	832	748	860	991	986	996
65	930	942	834	701	556	689	864	864	891	938	832	703	622	714	866	907	930
66	830	839	763	598	489	615	744	784	807	838	767	641	521	636	755	832	830
67	750	776	629	495	367	494	663	718	727	779	677	504	432	519	680	744	750
68	664	688	554	398	290	419	559	630	637	694	566	444	343	435	587	688	664
69	596	615	466	316	208	308	471	565	553	606	495	313	242	339	488	602	596
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74	241	247	116	70	66	69	137	235	246	261	144	71	71	72	151	246	241
75	179	180	84	61	57	60	107	177	188	198	101	64	63	63	105	195	179
76	132	140	56	54	51	52	70	139	133	150	64	56	56	55	77	144	132
77	82	93	49	47	43	46	50	92	93	115	53	50	49	49	51	103	82
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81	34	30	23	22	20	22	24	31	34	33	28	25	25	25	26	31	34
82	27	23	18	17	15	17	18	24	28	27	22	21	20	20	20	26	27
83	22	18	13	12	10	12	14	19	22	21	17	16	15	15	16	19	22
84	15	13	9	8	7	9	9	13	17	17	13	11	11	12	11	14	15
85	11	9	6	5	4	6	7	9	12	12	9	8	8	8	8	10	11
86	7	6	4	3	3	4	4	6	8	8	6	5	5	5	6	7	7
87	4	4	2	2	2	2	3	3	5	5	4	4	3	3	4	4	4
88	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	2
89	2	2	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2
90	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	1
91	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	2	1
92	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	1

93	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
94	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
95	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
96	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
97	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
98	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
99	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
101	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1
102	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
103	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
104	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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123	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1
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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 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SFL1-100(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.8096	96.27	0.9909	10.22
NB-AF2	277.0	60	0.383	95.79	0.9028	13.81
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

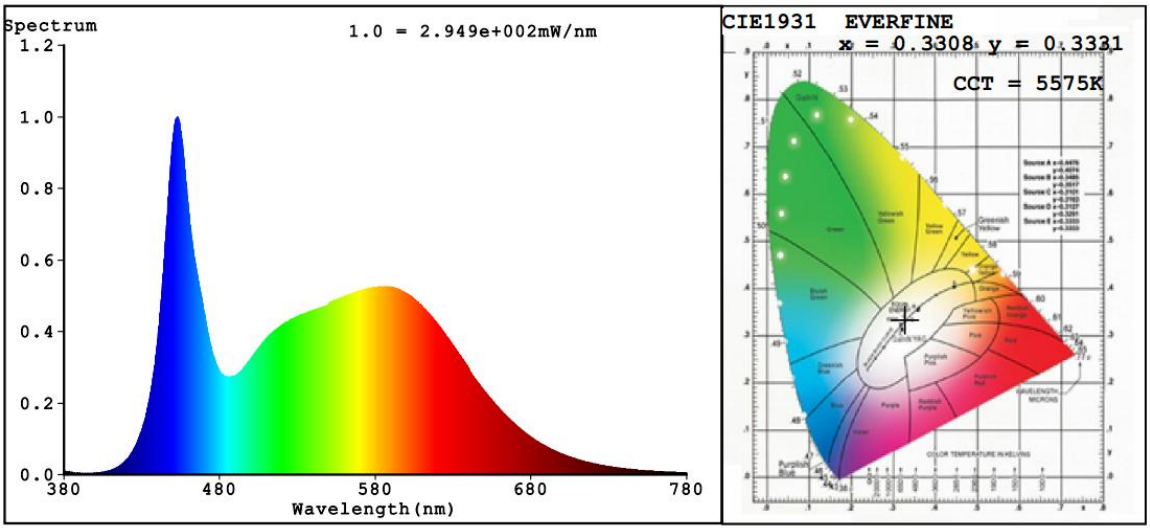
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5575
Duv	-0.0034
Chromaticity (x, y)	x=0.3308 y=0.3331
Chromaticity (u', v')	u'=0.2088 v'=0.4732
Color Rendering Index (CRI)	86.5
R9	24

Special Color Rendering Indices			
R1	86	R9	24
R2	93	R10	81
R3	94	R11	85
R4	85	R12	66
R5	87	R13	89
R6	87	R14	97
R7	87	R15	83
R8	72	--	--

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)	10704	10298	>=1000(-10%)	
Luminous Efficacy (lm/W)	111.19	107.51	Standard: >= 100(-3%)	Premium: >= 120(-3%)

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 ********