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 Pole/Arm-mounted Area and Roadway Luminaires

Model name(s): STL1-200

Representative (Tested) Model: STL1-200(2700K)
STL1-200(5700K)

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

Test & Report By:

Jack Luo

Engineer: Jack Luo

Date: Sept.08,2016

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	STL1-200	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-mounted Area and Roadway Luminaires	
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 Techology Co.,Ltd	
LED Model	5730	
Sample Number	STD160711NB-BI1(2700K),BI2(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 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	STL1-200(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.702	202.6	0.9919	8.42
NB-BI1	277.0	60	0.8151	199.8	0.8849	14.58
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

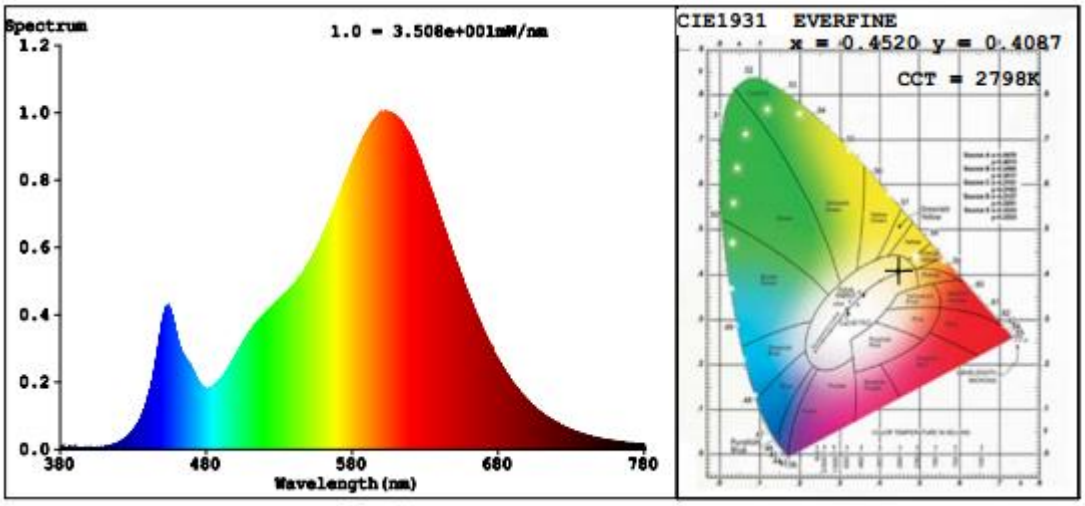
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2798
Duv	0.0000
Chromaticity (x, y)	x=0.4520 y=0.4087
Chromaticity (u', v')	u'=0.2583 v'=0.5255
Color Rendering Index (CRI)	80.6
R9	0

Special Color Rendering Indices			
R1	79	R9	0
R2	91	R10	81
R3	94	R11	76
R4	77	R12	72
R5	79	R13	82
R6	90	R14	98
R7	80	R15	71
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)	19735	19617	>=10000(-10%)	
Luminous Efficacy (lm/W)	97.41	98.18	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.8	--	>= 100(-1)	
Zonal lumens in the 80-90 °zone (%)	0.4		<=10(+3)	
Beam Angle ( )	107.1	--	--	
Center Beam Candle Power (cd)	7644	--	--	

Spectral Power Distribution & Chromaticity Diagram

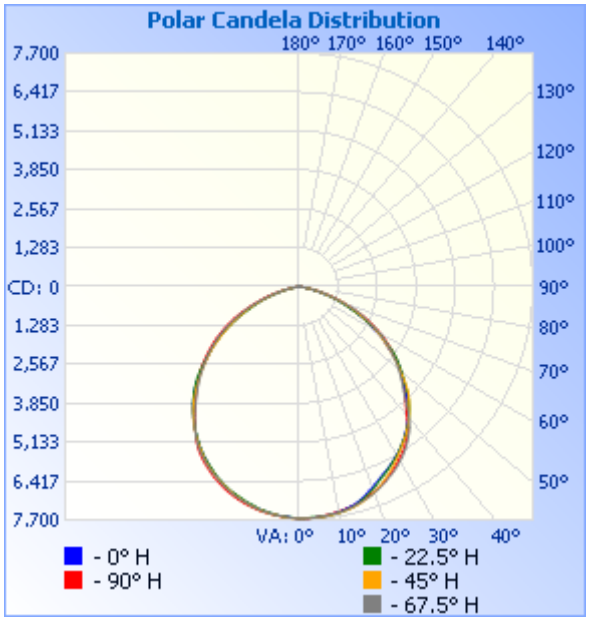


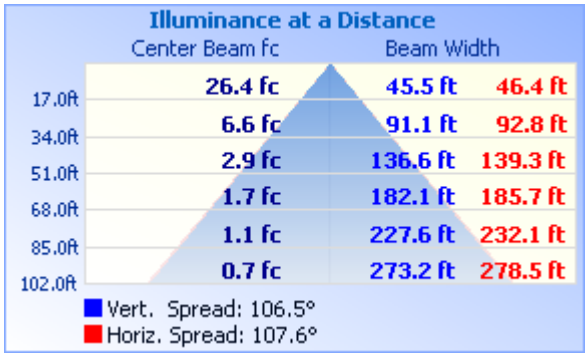
Zonal Lumen Tabulation

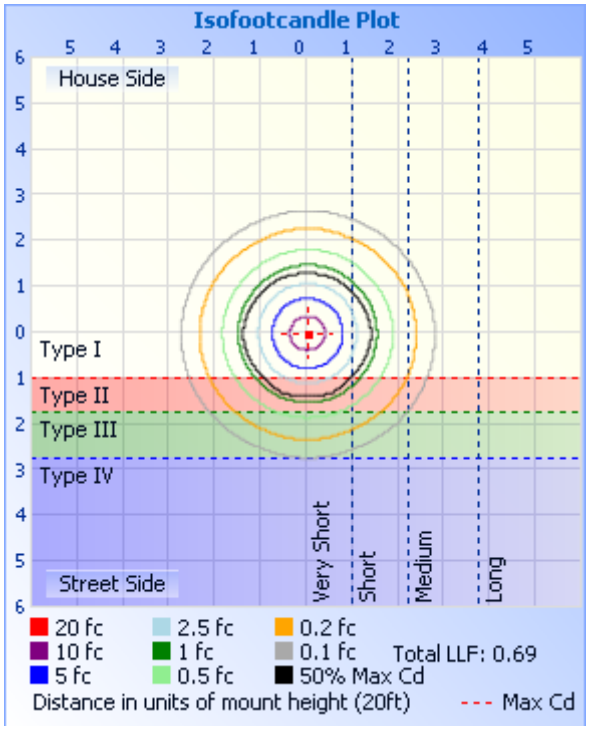
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5,929.0	30%
0-40	9,687.7	49.1%
0-60	16,673.8	84.5%
60-90	3,018.0	15.3%
70-100	895.1	4.5%
90-120	10.0	0.1%
0-90	19,691.8	99.8%
90-180	41.1	0.2%
0-180	19,732.9	100%

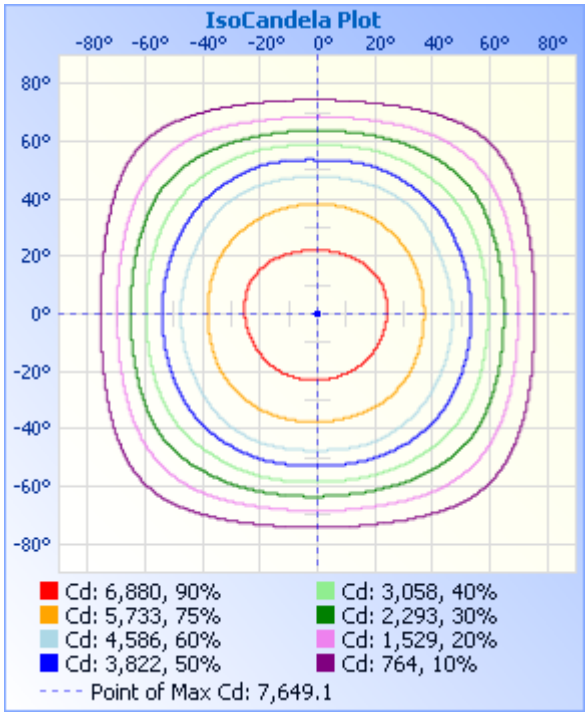
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	723.0	3.7%	90-100	1.4	0%
10-20	2,072.8	10.5%	100-110	3.2	0%
20-30	3,133.1	15.9%	110-120	5.4	0%
30-40	3,758.7	19.0%	120-130	7.3	0%
40-50	3,777.4	19.1%	130-140	7.4	0%
50-60	3,208.7	16.3%	140-150	6.4	0%
60-70	2,124.3	10.8%	150-160	5.2	0%
70-80	818.1	4.1%	160-170	3.4	0%
80-90	75.6	0.4%	170-180	1.4	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	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644	7644
1	7637	7640	7646	7649	7646	7633	7640	7646	7638	7630	7637	7638	7631	7642	7634	7644	7637
2	7644	7633	7647	7643	7644	7630	7636	7630	7621	7617	7638	7627	7631	7622	7633	7638	7644
3	7638	7620	7644	7648	7633	7619	7630	7621	7607	7610	7632	7613	7614	7616	7623	7624	7638
4	7639	7622	7644	7633	7633	7613	7609	7608	7603	7601	7618	7602	7605	7607	7612	7626	7639
5	7618	7626	7637	7631	7617	7613	7601	7597	7580	7577	7581	7581	7593	7594	7604	7622	7618
6	7622	7621	7632	7611	7605	7602	7578	7580	7562	7558	7566	7574	7580	7579	7587	7614	7622
7	7620	7613	7620	7598	7587	7579	7553	7562	7538	7532	7555	7552	7562	7563	7579	7606	7620
8	7591	7598	7606	7587	7578	7556	7526	7540	7513	7502	7531	7528	7543	7545	7561	7593	7591
9	7574	7590	7594	7579	7552	7532	7507	7506	7484	7475	7496	7507	7523	7520	7551	7580	7574
10	7552	7567	7576	7565	7535	7510	7477	7479	7460	7454	7483	7477	7502	7502	7529	7557	7552
11	7526	7550	7562	7551	7509	7499	7453	7445	7420	7411	7436	7446	7470	7475	7507	7530	7526
12	7493	7527	7536	7523	7486	7463	7427	7424	7388	7364	7410	7416	7441	7444	7481	7496	7493
13	7455	7488	7517	7499	7465	7428	7395	7383	7344	7332	7370	7373	7407	7415	7452	7461	7455
14	7423	7464	7486	7471	7434	7389	7362	7336	7311	7292	7326	7330	7379	7372	7414	7429	7423
15	7374	7415	7451	7432	7405	7345	7325	7290	7270	7243	7283	7299	7337	7342	7376	7379	7374
16	7312	7349	7416	7396	7360	7306	7288	7249	7230	7202	7237	7255	7299	7309	7344	7325	7312
17	7256	7305	7374	7358	7311	7263	7241	7208	7178	7162	7198	7211	7250	7265	7298	7260	7256
18	7182	7235	7330	7326	7269	7224	7196	7162	7134	7114	7138	7163	7206	7223	7240	7206	7182
19	7107	7175	7279	7291	7231	7181	7148	7117	7085	7068	7085	7108	7167	7174	7196	7136	7107
20	7049	7108	7217	7249	7195	7128	7092	7065	7030	7015	7044	7061	7115	7121	7134	7067	7049
21	6974	7038	7164	7193	7150	7082	7040	7001	6971	6958	6982	7001	7055	7074	7071	6997	6974
22	6913	6955	7092	7138	7106	7037	6987	6958	6909	6897	6928	6946	7001	7026	7003	6928	6913
23	6838	6884	7022	7084	7049	6974	6927	6892	6853	6838	6861	6882	6934	6973	6928	6850	6838
24	6782	6822	6953	7032	6989	6918	6872	6834	6784	6775	6807	6825	6884	6909	6843	6784	6782
25	6724	6755	6880	6969	6931	6861	6804	6765	6719	6703	6740	6765	6816	6846	6772	6713	6724
26	6665	6690	6803	6910	6869	6803	6737	6701	6650	6631	6678	6695	6746	6778	6688	6653	6665
27	6606	6628	6720	6851	6804	6735	6666	6633	6580	6567	6605	6634	6676	6723	6600	6580	6606
28	6543	6556	6636	6788	6724	6668	6586	6565	6502	6495	6535	6562	6604	6641	6513	6517	6543
29	6482	6495	6554	6722	6656	6595	6510	6486	6428	6425	6456	6487	6535	6570	6437	6447	6482

30	6419	6432	6471	6644	6574	6519	6442	6407	6349	6346	6372	6407	6452	6492	6360	6379	6419
31	6347	6359	6390	6579	6503	6440	6376	6332	6275	6264	6284	6324	6371	6412	6279	6308	6347
32	6278	6282	6312	6489	6431	6354	6286	6241	6185	6184	6203	6245	6276	6321	6198	6237	6278
33	6205	6208	6226	6405	6348	6280	6206	6155	6102	6090	6116	6146	6172	6226	6110	6171	6205
34	6130	6132	6149	6318	6264	6190	6113	6072	6017	6002	6031	6053	6060	6124	6032	6089	6130
35	6046	6058	6069	6220	6168	6105	6034	5989	5925	5913	5933	5945	5941	6010	5961	6014	6046
36	5958	5976	5991	6122	6056	6009	5947	5893	5829	5825	5841	5828	5819	5891	5886	5935	5958
37	5874	5895	5903	6019	5941	5912	5859	5791	5740	5729	5741	5714	5700	5762	5784	5848	5874
38	5791	5808	5813	5906	5816	5807	5765	5700	5641	5624	5650	5585	5583	5639	5698	5758	5791
39	5696	5714	5724	5770	5660	5690	5660	5605	5536	5538	5539	5460	5465	5509	5604	5651	5696
40	5599	5613	5622	5620	5509	5553	5566	5489	5428	5434	5430	5333	5341	5375	5504	5573	5599
41	5488	5516	5523	5463	5368	5405	5452	5393	5328	5326	5322	5208	5224	5242	5405	5474	5488
42	5368	5410	5420	5295	5250	5248	5335	5286	5219	5218	5203	5075	5109	5103	5303	5368	5368
43	5240	5304	5318	5135	5141	5103	5228	5175	5105	5113	5072	4957	4999	4971	5193	5261	5240
44	5110	5193	5208	4999	5031	4975	5119	5056	4994	5003	4940	4835	4887	4846	5070	5138	5110
45	4978	5071	5096	4872	4924	4846	5002	4939	4877	4889	4809	4734	4774	4713	4955	5007	4978
46	4845	4941	4974	4755	4825	4732	4869	4812	4750	4767	4676	4611	4664	4587	4829	4881	4845
47	4723	4796	4834	4639	4712	4618	4734	4689	4614	4640	4530	4490	4558	4480	4695	4737	4723
48	4605	4660	4683	4523	4598	4503	4582	4560	4459	4514	4398	4376	4446	4362	4561	4605	4605
49	4499	4535	4523	4408	4479	4393	4419	4418	4312	4371	4262	4246	4332	4245	4417	4479	4499
50	4384	4409	4367	4293	4364	4271	4246	4265	4158	4218	4117	4126	4219	4129	4277	4352	4384
51	4264	4291	4223	4176	4250	4153	4090	4110	4018	4061	3977	4006	4093	4019	4124	4237	4264
52	4144	4171	4082	4056	4135	4028	3946	3964	3881	3905	3847	3894	3971	3897	3970	4115	4144
53	4009	4045	3940	3935	4019	3908	3812	3818	3749	3754	3716	3769	3847	3784	3817	3999	4009
54	3813	3919	3796	3818	3894	3785	3680	3684	3617	3612	3585	3644	3722	3669	3661	3866	3813
55	3640	3793	3649	3699	3762	3657	3544	3552	3486	3477	3437	3523	3599	3547	3519	3723	3640
56	3511	3635	3508	3576	3633	3526	3389	3410	3347	3328	3290	3391	3469	3426	3386	3524	3511
57	3383	3435	3374	3443	3506	3384	3235	3268	3209	3180	3142	3260	3340	3298	3246	3366	3383
58	3257	3294	3237	3309	3366	3243	3081	3125	3070	3032	3000	3128	3209	3165	3121	3237	3257
59	3105	3160	3106	3181	3226	3102	2930	2982	2923	2880	2843	2992	3068	3027	2990	3107	3105
60	2908	3013	2976	3055	3086	2972	2785	2833	2778	2729	2695	2850	2931	2899	2867	2968	2908
61	2763	2870	2843	2915	2946	2835	2634	2680	2620	2577	2554	2700	2791	2764	2738	2792	2763

62	2632	2661	2710	2774	2799	2695	2497	2519	2457	2413	2416	2566	2655	2628	2581	2592	2632
63	2496	2478	2570	2630	2657	2548	2358	2356	2289	2254	2276	2430	2515	2498	2406	2448	2496
64	2301	2315	2383	2486	2520	2403	2217	2183	2144	2094	2135	2293	2379	2359	2266	2308	2301
65	2152	2155	2223	2351	2372	2263	2077	2005	2004	1929	2005	2155	2227	2221	2132	2141	2152
66	2019	1970	2090	2213	2212	2119	1939	1838	1864	1780	1869	2006	2066	2076	1999	1949	2019
67	1863	1806	1954	2071	2023	1969	1800	1690	1724	1648	1730	1854	1910	1918	1836	1805	1863
68	1713	1668	1811	1905	1849	1794	1661	1551	1576	1510	1592	1691	1748	1757	1698	1657	1713
69	1564	1530	1666	1724	1699	1614	1509	1418	1425	1376	1453	1537	1605	1613	1561	1508	1564
70	1415	1392	1521	1563	1562	1454	1361	1285	1279	1249	1308	1387	1463	1468	1424	1360	1415
71	1276	1276	1376	1402	1424	1308	1227	1140	1152	1106	1163	1242	1321	1324	1268	1225	1276
72	1139	1129	1221	1270	1286	1172	1098	1017	1007	977	1030	1101	1190	1189	1150	1090	1139
73	998	1010	1085	1149	1149	1045	954	888	882	856	900	971	1056	1059	1024	968	998
74	870	873	939	1019	1016	921	820	762	758	737	780	847	932	923	882	841	870
75	754	765	796	899	875	801	702	648	642	632	668	730	793	799	764	721	754
76	632	646	690	766	746	672	597	543	534	526	563	611	674	689	639	615	632
77	524	535	580	624	636	562	501	448	434	429	467	511	570	562	525	507	524
78	419	437	475	528	529	465	405	361	348	343	370	421	471	461	436	410	419
79	328	343	386	428	419	368	317	285	273	267	287	328	373	376	348	322	328
80	244	260	295	329	335	286	245	217	206	202	220	254	294	292	269	242	244
81	174	189	218	250	253	219	185	158	152	148	161	189	219	219	192	174	174
82	113	127	158	182	187	159	132	115	108	107	115	136	157	159	136	118	113
83	64	80	105	129	131	114	92	81	75	74	79	94	109	111	91	70	64
84	29	43	66	86	88	76	62	56	52	52	53	63	72	72	54	35	29
85	15	19	37	54	56	50	42	40	40	37	37	40	45	44	28	16	15
86	6	9	18	32	33	31	29	29	27	26	25	27	26	25	14	7	6
87	2	2	8	15	15	16	18	17	15	15	16	14	13	11	5	2	2
88	1	2	2	4	3	5	8	11	12	10	7	3	2	2	2	1	1
89	1	1	1	1	1	4	7	9	10	3	2	1	1	1	1	1	1
90	1	1	1	1	1	3	5	7	8	1	1	1	1	1	1	1	1
91	1	1	1	1	1	3	4	5	5	1	1	1	1	1	1	1	1
92	1	1	1	1	1	2	3	3	3	1	1	1	1	1	1	1	1
93	1	1	1	1	1	2	2	1	1	1	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	1	1	1	1	1	1	1	1	1	1	1	1	1
96	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
98	1	1	1	2	2	2	1	1	1	1	1	1	2	2	1	1	1
99	1	1	2	2	2	2	2	1	1	1	2	2	2	2	1	1	1
100	1	1	2	3	3	2	2	2	2	2	2	2	2	2	2	1	1
101	1	1	2	3	3	2	2	2	2	2	2	2	3	2	2	2	1
102	2	2	2	3	3	3	2	2	2	2	2	2	3	3	2	2	2
103	2	2	2	3	3	3	2	2	2	2	2	3	3	3	2	2	2
104	2	2	3	4	4	3	3	2	2	2	2	3	4	3	3	2	2
105	3	2	3	4	4	3	3	2	2	2	3	3	4	4	3	3	3
106	3	3	3	4	4	3	3	3	3	3	3	3	4	4	3	3	3
107	3	3	4	4	4	4	3	3	3	3	3	4	5	4	3	3	3
108	3	3	4	5	5	4	3	3	3	3	3	4	5	4	4	3	3
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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	STL1-200(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.716	204.2	0.9916	8.55
NB-BI2	277.0	60	0.8198	201.5	0.8873	14.91
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

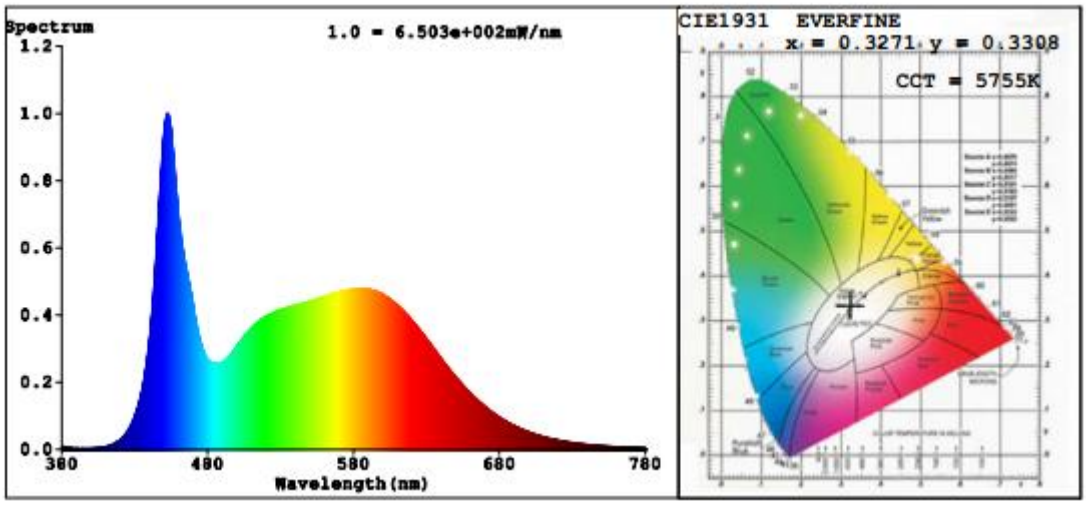
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5755
Duv	-0.0029
Chromaticity (x, y)	x=0.3271 y=0.3308
Chromaticity (u', v')	u'=0.2071 v'=0.4714
Color Rendering Index (CRI)	87.1
R9	27

Special Color Rendering Indices			
R1	87	R9	27
R2	93	R10	82
R3	94	R11	86
R4	86	R12	64
R5	87	R13	90
R6	87	R14	97
R7	88	R15	84
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)	20879	20722	>=10000(-10%)	
Luminous Efficacy (lm/W)	102.25	102.84	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 ********