



Report No.: STD160711NB-BH

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): STL1-150

Representative (Tested) Model: STL1-150(2700K)  
STL1-150(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.

**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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<http://www.standard-tech.com>

**1.1 Product Information:**

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	STL1-150	
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	150W	
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-BH1(2700K),BH2(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>	STL1-150(2700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.232	146.0	0.9872	9.03
NB-BH1	277.0	60	0.5681	141.1	0.8967	15.57
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

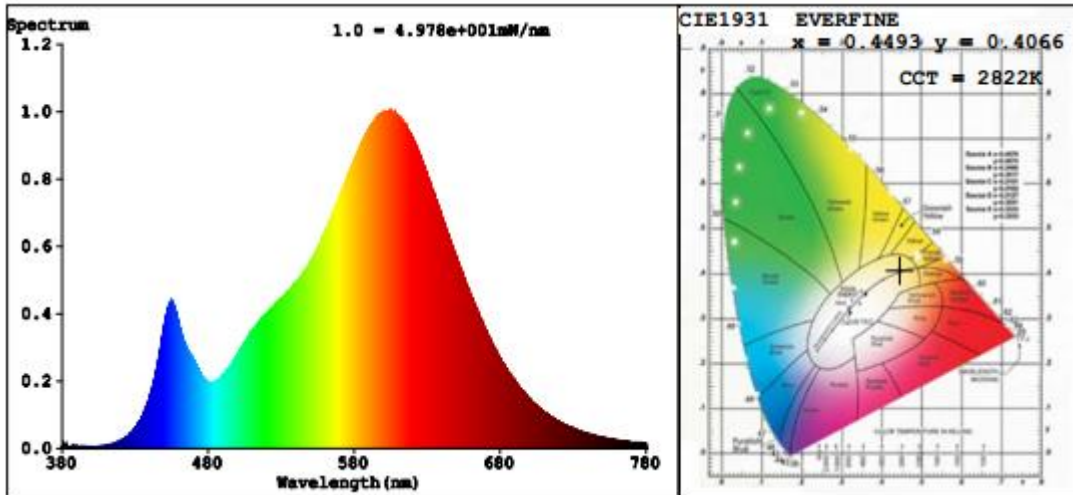
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2822	R3	94	R11	76
Duv	-0.0005	R4	77	R12	73
Chromaticity (x, y)	x=0.4493 y=0.4066	R5	79	R13	82
Chromaticity (u', v')	u'=0.2575 v'=0.5242	R6	90	R14	97
Color Rendering Index (CRI)	80.5	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)	14185	13866	>=10000(-10%)	
Luminous Efficacy (lm/W)	97.16	98.27	Standard: >= 100(-3%)	Premium: >= 120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.8	--	>= 100(-1)	
Zonal lumens in the 80-90 °zone (%)	0.3	--	<=10(+3)	
Beam Angle (°)	105.6	--	--	
Center Beam Candle Power (cd)	5643	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

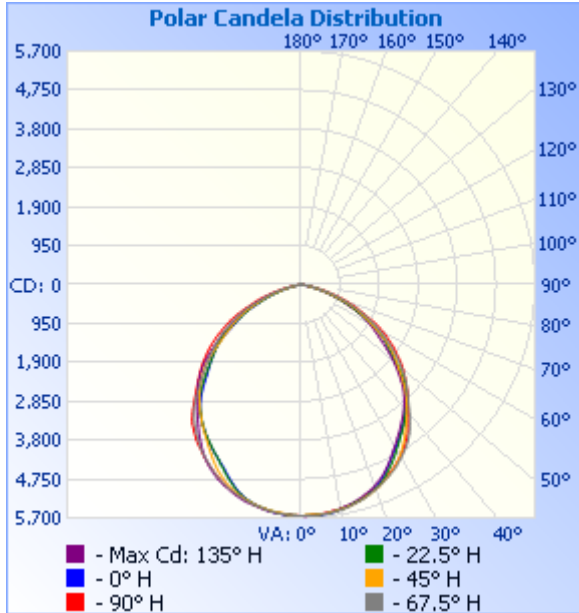


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	4,359.2	30.7%
0-40	7,078.4	49.9%
0-60	12,076.3	85.1%
60-90	2,079.8	14.7%
70-100	591.1	4.2%
90-120	5.5	0%
0-90	14,156.1	99.8%
90-180	26.4	0.2%
0-180	14,182.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	534.5	3.8%	90-100	0.4	0%
10-20	1,531.3	10.8%	100-110	1.7	0%
20-30	2,293.5	16.2%	110-120	3.4	0%
30-40	2,719.2	19.2%	120-130	4.8	0%
40-50	2,718.2	19.2%	130-140	4.9	0%
50-60	2,279.7	16.1%	140-150	4.4	0%
60-70	1,489.1	10.5%	150-160	3.5	0%
70-80	551.4	3.9%	160-170	2.3	0%
80-90	39.2	0.3%	170-180	1.0	0%

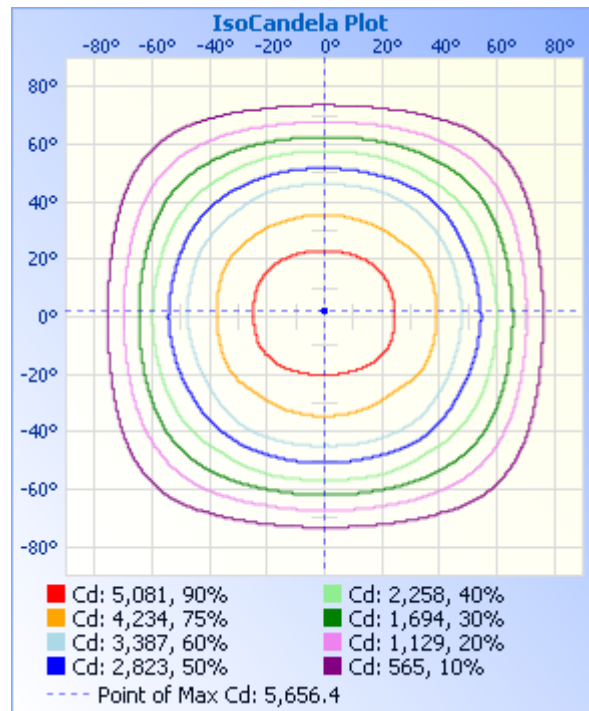
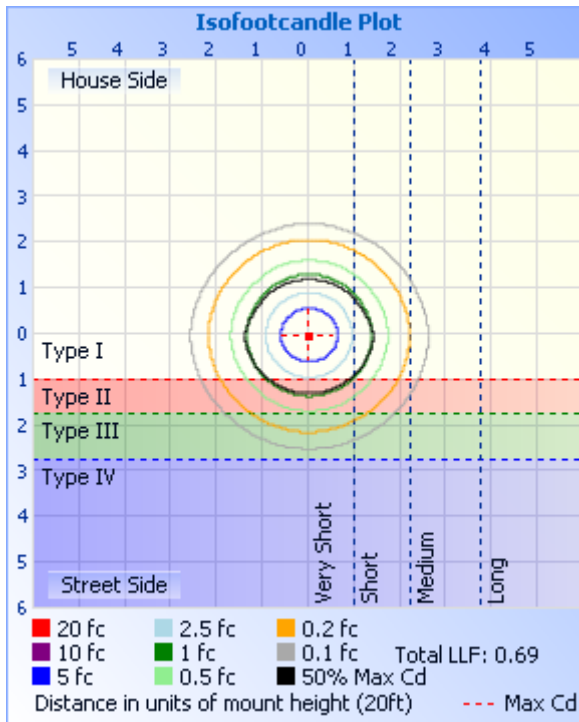
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	19.53 fc	42.4 ft	47.3 ft
34.0ft	4.88 fc	84.7 ft	94.6 ft
51.0ft	2.17 fc	127.1 ft	141.9 ft
68.0ft	1.22 fc	169.5 ft	189.2 ft
85.0ft	0.78 fc	211.8 ft	236.5 ft
102.0ft	0.54 fc	254.2 ft	283.8 ft

■ Vert. Spread: 102.5°  
■ Horiz. Spread: 108.6°



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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	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643	5643
1	5650	5639	5636	5649	5638	5636	5656	5643	5646	5639	5646	5641	5635	5636	5645	5647	5650
2	5648	5629	5631	5649	5630	5632	5648	5639	5641	5639	5640	5641	5634	5636	5643	5648	5648
3	5643	5635	5623	5651	5627	5632	5643	5637	5637	5630	5632	5633	5624	5632	5638	5640	5643
4	5641	5636	5628	5647	5625	5628	5638	5633	5631	5622	5609	5624	5627	5623	5626	5643	5641
5	5639	5632	5619	5634	5617	5623	5632	5632	5622	5611	5593	5617	5611	5609	5620	5631	5639
6	5633	5625	5618	5627	5611	5612	5616	5623	5613	5594	5588	5608	5601	5601	5605	5628	5633
7	5627	5623	5606	5622	5604	5600	5603	5600	5599	5581	5578	5590	5590	5597	5598	5617	5627
8	5619	5603	5596	5611	5579	5585	5589	5581	5585	5564	5562	5577	5573	5587	5591	5602	5619
9	5596	5589	5590	5595	5576	5566	5569	5562	5563	5551	5547	5555	5549	5569	5571	5589	5596
10	5577	5570	5569	5589	5564	5552	5550	5540	5537	5525	5525	5529	5531	5538	5551	5580	5577
11	5551	5558	5558	5572	5543	5538	5524	5529	5508	5505	5504	5511	5509	5524	5525	5559	5551
12	5531	5537	5541	5555	5521	5517	5503	5491	5477	5487	5480	5490	5486	5505	5512	5531	5531
13	5506	5508	5524	5524	5507	5496	5480	5470	5446	5445	5457	5470	5461	5485	5494	5508	5506
14	5484	5475	5499	5501	5482	5467	5451	5436	5408	5416	5430	5448	5438	5470	5475	5481	5484
15	5459	5462	5473	5477	5453	5438	5421	5393	5368	5377	5394	5420	5405	5439	5453	5453	5459
16	5433	5443	5447	5459	5415	5400	5390	5348	5317	5329	5369	5384	5375	5413	5424	5427	5433
17	5400	5406	5415	5424	5375	5374	5352	5300	5262	5279	5324	5361	5358	5387	5389	5404	5400
18	5354	5369	5390	5388	5352	5361	5313	5238	5202	5223	5292	5330	5331	5355	5354	5368	5354
19	5333	5341	5354	5354	5314	5315	5277	5183	5130	5155	5249	5297	5294	5312	5317	5335	5333
20	5284	5296	5322	5320	5281	5277	5228	5117	5060	5087	5203	5258	5259	5278	5280	5299	5284
21	5231	5259	5292	5284	5247	5237	5178	5045	4986	5021	5154	5222	5214	5236	5251	5241	5231
22	5166	5211	5243	5248	5213	5198	5124	4981	4917	4950	5095	5179	5180	5199	5206	5184	5166
23	5099	5155	5201	5205	5169	5163	5067	4910	4844	4872	5035	5134	5128	5155	5168	5129	5099
24	5031	5089	5157	5166	5130	5134	5003	4843	4788	4813	4972	5088	5084	5114	5124	5065	5031
25	4954	5021	5108	5123	5083	5084	4934	4774	4733	4737	4904	5036	5038	5064	5069	4992	4954
26	4880	4950	5061	5083	5038	5025	4861	4713	4678	4677	4831	4987	4984	5020	5014	4920	4880
27	4804	4877	5010	5041	4992	4979	4784	4655	4625	4626	4758	4930	4938	4973	4959	4847	4804
28	4733	4806	4948	4988	4940	4930	4706	4600	4577	4565	4678	4879	4886	4915	4898	4772	4733
29	4656	4734	4889	4928	4884	4870	4631	4544	4519	4511	4606	4826	4840	4857	4834	4705	4656

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30	4603	4652	4820	4883	4833	4816	4559	4489	4465	4456	4529	4771	4788	4810	4758	4628	4603
31	4543	4585	4747	4826	4777	4748	4492	4438	4410	4406	4455	4718	4725	4753	4679	4554	4543
32	4480	4508	4666	4767	4719	4688	4423	4378	4354	4350	4387	4653	4677	4698	4600	4484	4480
33	4413	4439	4590	4707	4655	4622	4355	4321	4298	4295	4320	4576	4628	4638	4516	4414	4413
34	4351	4371	4508	4639	4584	4548	4294	4256	4238	4238	4257	4513	4568	4577	4436	4349	4351
35	4292	4318	4420	4569	4505	4472	4226	4200	4182	4180	4186	4443	4503	4517	4357	4282	4292
36	4228	4243	4335	4495	4419	4389	4161	4135	4118	4114	4122	4373	4441	4453	4262	4216	4228
37	4160	4185	4258	4403	4318	4294	4098	4074	4054	4047	4049	4299	4372	4388	4181	4151	4160
38	4102	4111	4175	4311	4222	4190	4035	4009	3984	3983	3985	4225	4308	4317	4107	4088	4102
39	4034	4045	4089	4213	4130	4079	3969	3938	3912	3915	3926	4142	4228	4243	4027	4025	4034
40	3958	3977	4007	4116	4047	3970	3898	3873	3832	3844	3847	4061	4125	4162	3951	3950	3958
41	3891	3910	3919	4017	3973	3860	3827	3799	3738	3769	3780	3965	4025	4082	3865	3881	3891
42	3816	3840	3837	3918	3887	3752	3752	3710	3640	3690	3706	3858	3912	3994	3786	3812	3816
43	3738	3765	3757	3828	3816	3655	3671	3612	3530	3599	3633	3750	3806	3891	3718	3741	3738
44	3660	3691	3665	3741	3743	3560	3589	3513	3420	3498	3555	3632	3705	3779	3637	3662	3660
45	3566	3609	3575	3658	3661	3467	3501	3395	3309	3384	3479	3514	3609	3649	3568	3578	3566
46	3459	3517	3472	3578	3572	3378	3393	3276	3198	3269	3404	3405	3517	3539	3494	3493	3459
47	3348	3421	3367	3497	3489	3288	3285	3158	3107	3154	3310	3295	3431	3423	3412	3391	3348
48	3235	3317	3267	3411	3409	3197	3177	3061	3021	3049	3216	3186	3343	3310	3324	3283	3235
49	3125	3204	3164	3315	3328	3107	3069	2971	2938	2946	3122	3089	3269	3210	3235	3167	3125
50	3016	3089	3073	3221	3246	3021	2958	2885	2857	2858	3018	2995	3185	3105	3144	3057	3016
51	2916	2974	2981	3120	3165	2937	2847	2799	2778	2775	2896	2905	3098	3005	3039	2942	2916
52	2827	2865	2893	3023	3078	2856	2735	2709	2692	2687	2763	2814	3012	2904	2926	2831	2827
53	2741	2758	2805	2918	2984	2764	2620	2627	2613	2602	2633	2725	2920	2806	2806	2735	2741
54	2655	2661	2709	2809	2883	2677	2504	2541	2517	2520	2505	2636	2834	2713	2681	2645	2655
55	2559	2565	2609	2701	2799	2582	2396	2453	2421	2432	2385	2549	2743	2608	2558	2555	2559
56	2471	2480	2499	2597	2704	2494	2297	2358	2304	2338	2273	2460	2649	2509	2435	2459	2471
57	2373	2385	2383	2496	2599	2405	2204	2252	2172	2239	2171	2372	2552	2420	2321	2361	2373
58	2268	2285	2262	2393	2499	2315	2111	2127	2034	2125	2076	2282	2454	2328	2201	2264	2268
59	2147	2182	2142	2288	2402	2219	2021	1986	1921	1994	1987	2182	2346	2233	2089	2165	2147
60	2017	2070	2030	2187	2299	2118	1930	1856	1827	1862	1898	2086	2238	2134	1986	2057	2017
61	1894	1950	1926	2087	2196	2019	1840	1749	1742	1747	1812	1989	2133	2031	1895	1933	1894

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62	1785	1809	1829	1984	2090	1922	1748	1651	1653	1649	1724	1891	2035	1931	1799	1806	1785
63	1691	1692	1742	1876	1965	1815	1651	1554	1561	1557	1631	1795	1933	1823	1705	1701	1691
64	1598	1575	1646	1771	1820	1710	1546	1458	1455	1465	1535	1693	1830	1723	1614	1597	1598
65	1505	1458	1551	1651	1695	1577	1418	1355	1311	1364	1422	1592	1716	1625	1523	1493	1505
66	1394	1361	1456	1530	1590	1436	1294	1228	1189	1247	1288	1489	1584	1526	1415	1399	1394
67	1267	1267	1346	1409	1489	1316	1190	1090	1103	1100	1167	1363	1451	1428	1298	1294	1267
68	1148	1159	1227	1311	1377	1204	1100	991	1021	985	1071	1213	1344	1289	1179	1165	1148
69	1054	1036	1108	1201	1273	1098	1009	910	932	902	986	1094	1247	1158	1074	1033	1054
70	967	933	1000	1102	1178	999	917	830	804	823	906	989	1149	1043	982	927	967
71	863	845	891	1004	1075	909	793	726	713	732	818	896	1043	943	894	842	863
72	748	763	795	890	968	822	676	621	643	619	688	799	921	848	806	747	748
73	664	657	707	781	834	734	595	554	552	550	583	700	810	755	683	643	664
74	583	567	601	665	745	620	524	479	464	481	513	603	718	642	580	562	583
75	485	499	520	580	655	534	447	390	403	389	446	524	631	558	504	488	485
76	419	412	448	502	550	446	358	337	318	335	357	449	530	476	429	404	419
77	337	345	368	420	463	359	301	259	267	260	290	355	446	392	348	341	337
78	277	276	290	339	386	294	228	210	204	214	231	286	368	312	283	270	277
79	211	218	230	268	306	233	181	159	150	159	177	225	295	254	217	213	211
80	144	158	175	205	241	170	128	112	107	113	128	175	225	191	169	156	144
81	75	107	126	154	179	122	92	78	71	78	92	121	169	139	120	92	75
82	27	53	89	108	123	84	63	49	44	50	62	86	114	99	82	42	27
83	13	18	58	71	83	55	40	28	23	28	39	52	76	62	44	15	13
84	7	10	28	45	51	33	23	16	16	17	22	30	45	37	16	8	7
85	2	4	11	25	29	18	13	12	11	12	12	16	26	21	8	3	2
86	1	1	5	13	14	10	8	6	5	7	8	9	12	10	2	1	1
87	0	1	1	6	6	5	4	1	1	1	4	4	4	3	1	0	0
88	0	0	1	1	1	1	0	0	0	0	0	0	1	1	0	0	0
89	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
93	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0

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94	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
95	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0
96	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0
97	0	0	0	0	1	1	0	0	0	0	1	1	1	1	0	0	0
98	0	0	0	0	1	1	0	0	0	1	1	1	1	1	0	0	0
99	0	0	0	1	1	1	0	1	1	1	1	1	1	1	0	0	0
100	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
101	0	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	0
102	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1
103	1	1	1	1	2	1	1	1	1	1	1	1	2	2	1	1	1
104	1	1	1	2	2	2	1	1	1	1	1	2	2	2	1	1	1
105	1	1	1	2	2	2	1	1	1	1	1	2	3	2	1	1	1
106	1	1	2	2	2	2	2	2	1	2	2	2	3	2	2	1	1
107	2	2	2	2	2	2	2	2	2	2	2	2	3	3	2	2	2
108	2	2	2	2	3	2	2	2	2	2	2	3	3	3	2	2	2
109	2	2	2	3	3	2	2	2	2	2	2	3	4	3	2	2	2
110	2	2	2	3	3	3	2	2	2	2	2	3	4	3	2	2	2
111	2	2	3	3	3	3	2	2	2	2	2	3	4	4	3	2	2
112	2	2	3	3	3	3	3	2	3	2	2	3	4	4	3	2	2
113	2	2	3	4	4	3	3	2	3	2	3	3	5	4	3	2	2
114	2	2	3	4	4	3	3	2	3	2	3	4	5	4	3	2	2
115	3	5	3	4	4	4	3	2	3	3	3	4	5	4	4	2	3
116	3	3	4	4	4	4	3	2	3	3	3	4	6	5	4	2	3
117	3	3	4	5	4	4	4	2	3	3	3	4	6	5	4	2	3
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119	3	3	4	5	4	4	4	3	4	3	4	4	6	5	5	3	3
120	4	4	4	5	5	5	4	4	4	4	4	4	6	6	5	4	4
121	4	4	5	6	5	5	4	4	4	4	4	4	7	6	5	4	4
122	5	4	5	6	5	5	4	4	4	4	4	4	7	6	5	5	5
123	5	5	5	6	5	5	4	4	5	4	4	5	7	7	5	5	5
124	5	5	5	7	5	5	4	4	5	4	4	5	8	7	5	5	5
125	6	5	5	7	5	6	4	5	5	5	4	5	8	7	5	5	6

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NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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126	6	6	5	7	6	6	4	5	5	5	4	5	8	7	5	6	6
127	6	6	5	7	6	6	4	5	5	5	4	5	8	7	5	6	6
128	6	6	5	7	6	6	4	5	6	5	4	6	9	8	5	6	6
129	6	6	5	7	6	6	4	5	6	5	4	6	9	8	5	6	6
130	6	6	5	7	6	6	5	5	6	5	4	6	9	8	5	6	6
131	6	6	5	7	6	6	5	5	6	5	4	6	9	8	5	6	6
132	6	6	5	7	7	6	5	6	6	6	4	6	9	8	5	6	6
133	6	6	5	7	7	6	5	6	6	6	4	6	9	8	5	6	6
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137	7	7	5	7	7	7	5	6	6	6	5	6	9	8	6	7	7
138	7	7	5	7	7	7	5	6	6	6	5	6	9	8	6	7	7
139	7	7	5	7	7	7	5	6	6	6	5	7	9	8	6	7	7
140	7	7	5	8	7	7	5	6	6	6	5	7	9	8	6	7	7
141	7	7	5	8	7	7	5	6	6	6	5	7	9	8	6	7	7
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146	7	7	6	7	8	7	6	6	7	7	6	7	9	7	7	7	7
147	8	7	6	7	8	7	6	7	7	7	6	7	9	7	7	7	8
148	8	7	6	8	8	8	6	7	7	7	7	9	7	8	7	8	8
149	8	8	6	8	8	8	6	7	8	7	7	9	7	8	7	8	8
150	8	7	6	8	8	8	6	7	8	7	8	9	7	8	7	8	8
151	8	7	7	8	8	8	6	7	8	7	7	9	7	9	8	8	8
152	8	8	7	8	10	8	6	7	8	7	7	9	7	9	8	8	8
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155	8	8	8	8	7	8	6	7	8	7	7	8	7	9	8	8	8
156	8	8	8	8	7	8	6	7	8	7	7	8	7	9	8	8	8
157	9	8	8	8	7	8	7	7	8	7	7	8	7	9	8	9	9

Laboratory: Standard-Tech Co. Ltd Testing Center

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158	9	8	8	8	7	8	7	7	8	7	7	7	8	7	9	8	9
159	9	8	8	8	7	7	7	7	7	7	7	7	8	7	9	8	9
160	9	8	8	8	7	7	7	7	7	7	7	7	8	7	9	8	9
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162	9	8	8	8	8	7	8	8	7	8	7	7	8	7	9	9	9
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164	9	8	9	7	8	7	8	8	7	8	7	7	9	8	9	9	9
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166	9	9	8	7	8	8	8	8	7	8	7	8	9	8	10	9	9
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169	10	10	10	8	9	9	9	10	9	9	9	9	10	9	10	10	10
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175	11	11	10	9	10	10	10	10	11	11	10	10	10	10	11	11	11
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178	11	11	10	9	10	10	10	10	10	11	10	10	10	11	10	11	11
179	11	10	10	9	10	10	10	10	10	11	10	10	10	11	10	10	11
180	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11

## 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>	STL1-150(5700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.249	147.8	0.9863	9.63
NB-BH2	277.0	60	0.5722	142.5	0.8991	15.29
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

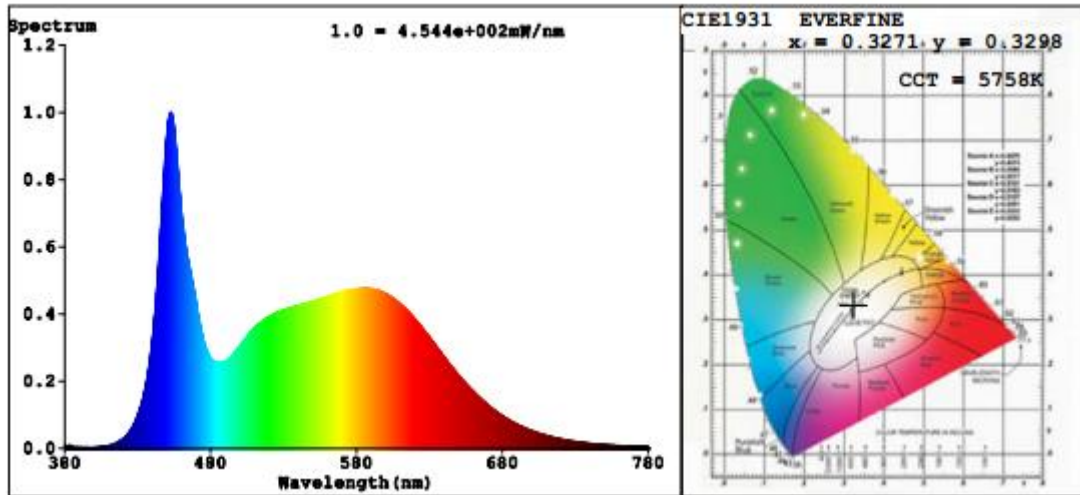
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	88	R9	30
Frequency (Hz)	60	R2	94	R10	83
CCT (K)	5758	R3	94	R11	86
Duv	-0.0034	R4	87	R12	65
Chromaticity (x, y)	x=0.3271 y=0.3298	R5	88	R13	90
Chromaticity (u', v')	u'=0.2076 v'=0.4709	R6	88	R14	97
Color Rendering Index (CRI)	87.5	R7	88	R15	85
R9	30	R8	74	--	--

### 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)	15048	14471	>=10000(-10%)	
Luminous Efficacy (lm/W)	101.81	101.55	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 \*\*\*\*\***