



Report No.: STD160711NB-BD

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

### Fuel Pump Canopy Luminaires

Model name(s): CNL1-50

Representative (Tested) Model: CNL1-50(2700K)  
CNL1-50(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

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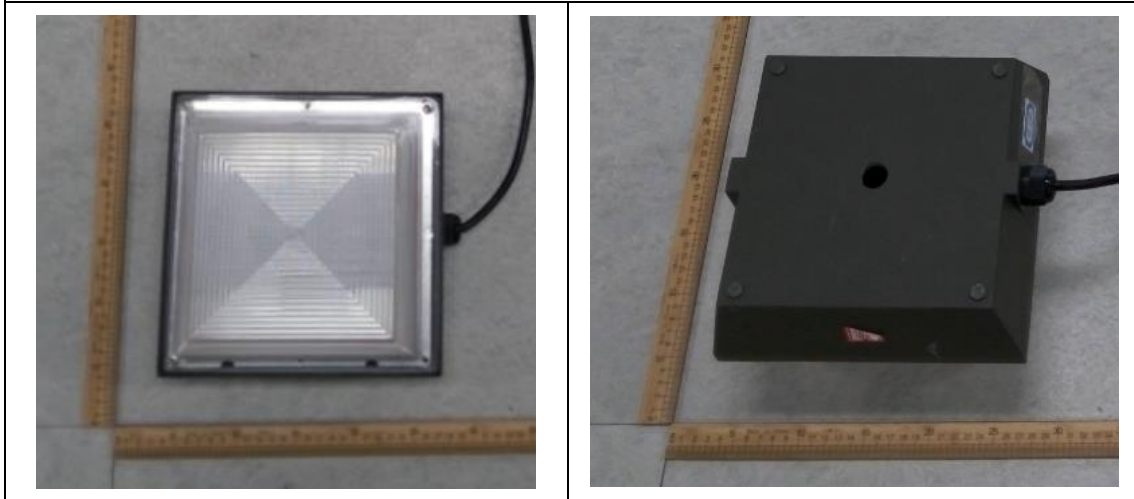
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**1.1 Product Information:**

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	CNL1-50	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Fuel Pump Canopy Luminaires	
Rated Voltage / Frequency	100-277Vac, 50/60 Hz	
Nominal Power	50W	
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-BD1(2700K),BD2(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>	CNL1-50(2700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	0.4318	50.93	0.9829	9.37
NB-BD1	277.0	60	0.2011	49.99	0.8976	11.95
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

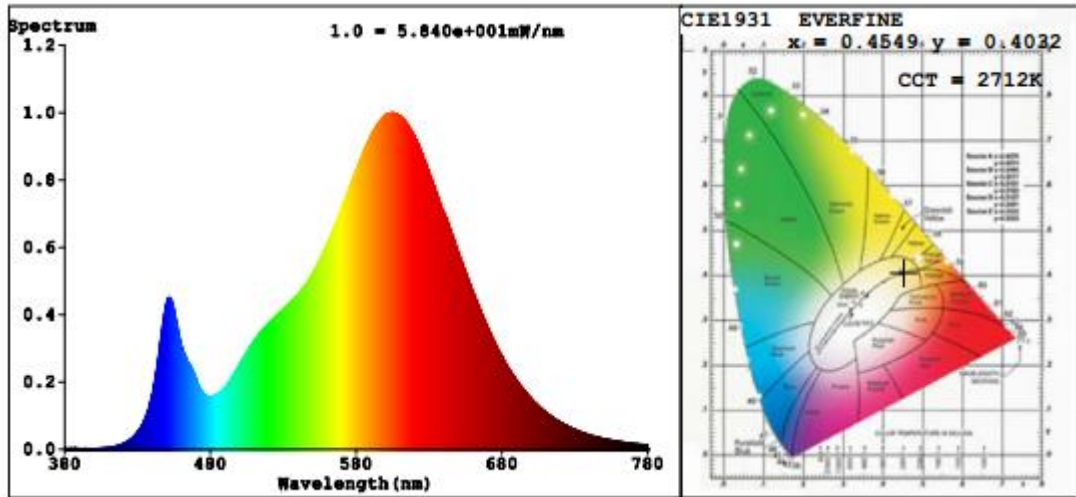
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	2821	R3	93	R11	76
Duv	-0.0032	R4	77	R12	75
Chromaticity (x, y)	x=0.4452 y=0.3986	R5	80	R13	82
Chromaticity (u', v')	u'=0.2583 v'=0.5205	R6	90	R14	97
Color Rendering Index (CRI)	79	R7	79	R15	71
R9	0	R8	53	--	--

### 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)	4942.0	4760.9	5000-10000(-10%)	
Luminous Efficacy (lm/W)	97.04	95.24	Standard: >= 95(-3%)	Premium: >= 115(-3%)
Zonal lumens in the 0-40 °zone (%)	41.1	--	>= 40(-3)	
Zonal lumens in the 40-70 °zone (%)	41.3	--	>= 40(-3)	
Beam Angle (°)	101.6	--	--	
Center Beam Candle Power (cd)	1572	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

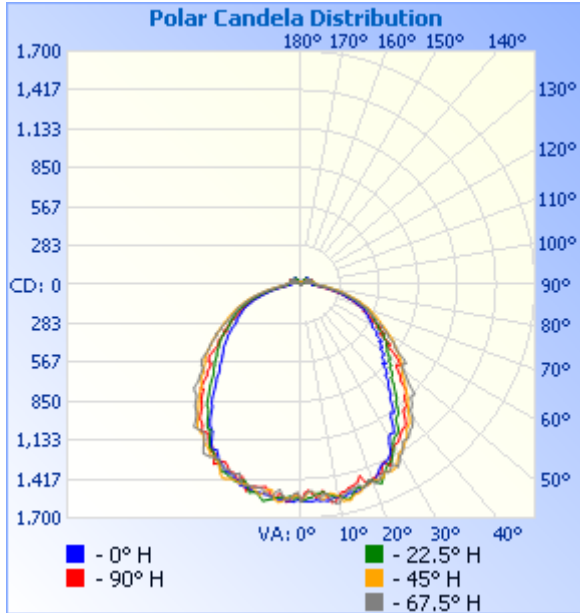


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,247.4	25.2%
0-40	2,034.5	41.2%
0-60	3,513.4	71.1%
60-90	1,121.6	22.7%
70-100	657.5	13.3%
90-120	219.2	4.4%
0-90	4,635.0	93.8%
90-180	306.9	6.2%
0-180	4,941.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	147.9	3.0%	90-100	99.5	2%
10-20	432.1	8.7%	100-110	64.9	1.3%
20-30	667.5	13.5%	110-120	54.7	1.1%
30-40	787.1	15.9%	120-130	40.2	0.8%
40-50	776.9	15.7%	130-140	28.6	0.6%
50-60	702.0	14.2%	140-150	14.2	0.3%
60-70	563.6	11.4%	150-160	4.2	0.1%
70-80	382.4	7.7%	160-170	0.5	0%
80-90	175.5	3.6%	170-180	0.2	0%

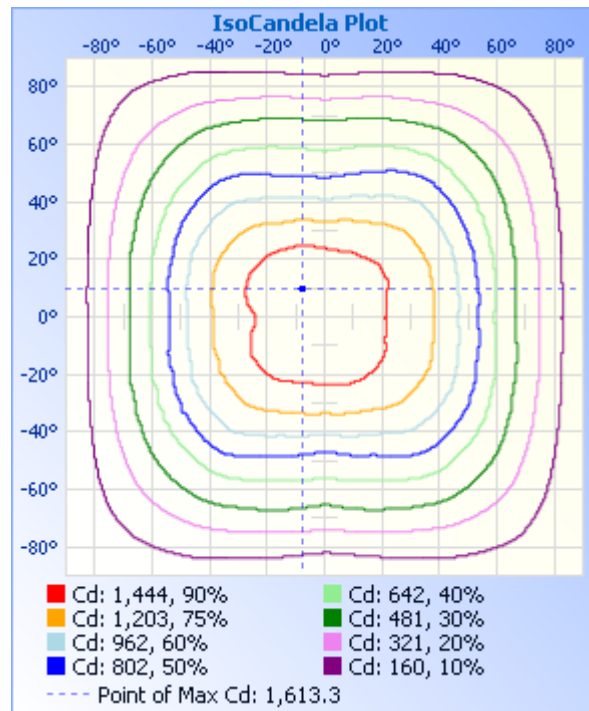
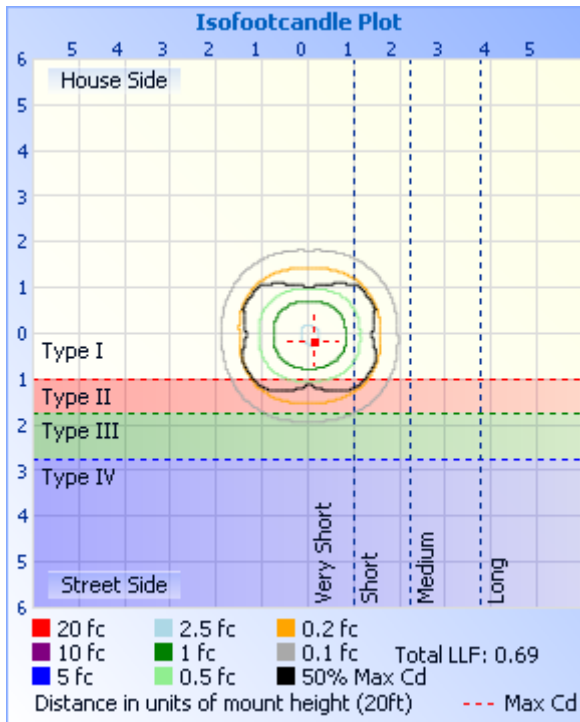
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	5.44 fc	38.5 ft	46.8 ft
34.0ft	1.36 fc	77.0 ft	93.6 ft
51.0ft	0.60 fc	115.5 ft	140.4 ft
68.0ft	0.34 fc	153.9 ft	187.2 ft
85.0ft	0.22 fc	192.4 ft	234.0 ft
102.0ft	0.15 fc	230.9 ft	280.8 ft

■ Vert. Spread: 97.1°  
■ Horiz. Spread: 108.0°



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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	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572
1	1577	1569	1552	1533	1518	1508	1515	1521	1567	1553	1527	1514	1519	1524	1529	1536	1577
2	1578	1553	1510	1508	1500	1474	1492	1524	1585	1563	1542	1527	1542	1543	1510	1521	1578
3	1582	1551	1509	1506	1526	1504	1505	1496	1575	1545	1558	1557	1578	1552	1549	1526	1582
4	1573	1524	1531	1538	1557	1561	1514	1499	1578	1554	1560	1575	1587	1542	1573	1519	1573
5	1581	1527	1563	1564	1538	1557	1549	1493	1568	1553	1584	1545	1547	1526	1576	1539	1581
6	1580	1518	1574	1539	1509	1516	1552	1500	1571	1559	1594	1500	1531	1499	1562	1545	1580
7	1587	1537	1549	1534	1552	1520	1541	1520	1560	1565	1577	1525	1572	1533	1496	1564	1587
8	1578	1546	1532	1585	1602	1561	1536	1530	1560	1578	1513	1564	1553	1575	1497	1578	1578
9	1568	1564	1545	1612	1599	1577	1538	1543	1551	1589	1507	1549	1519	1540	1533	1582	1568
10	1568	1559	1564	1613	1568	1569	1558	1547	1550	1599	1530	1531	1495	1510	1573	1543	1568
11	1576	1573	1606	1569	1541	1559	1577	1535	1544	1574	1562	1510	1503	1507	1558	1519	1576
12	1575	1599	1604	1556	1541	1537	1583	1489	1544	1549	1545	1510	1509	1509	1533	1518	1575
13	1554	1599	1611	1539	1522	1534	1552	1482	1545	1550	1525	1512	1508	1515	1504	1532	1554
14	1563	1567	1580	1534	1515	1515	1535	1497	1532	1561	1512	1512	1534	1510	1521	1537	1563
15	1557	1538	1574	1530	1508	1510	1514	1538	1532	1514	1509	1509	1554	1526	1507	1510	1557
16	1559	1535	1571	1516	1491	1526	1519	1529	1525	1485	1508	1523	1509	1519	1528	1505	1559
17	1544	1549	1541	1546	1456	1517	1505	1526	1525	1493	1518	1504	1460	1464	1532	1548	1544
18	1541	1528	1540	1536	1514	1459	1506	1560	1498	1509	1506	1444	1502	1436	1526	1541	1541
19	1530	1512	1535	1500	1535	1498	1503	1551	1489	1508	1500	1461	1461	1467	1549	1517	1530
20	1515	1517	1522	1531	1507	1517	1508	1512	1469	1496	1503	1471	1454	1460	1548	1508	1515
21	1516	1541	1519	1547	1502	1488	1510	1485	1467	1484	1515	1447	1458	1466	1481	1482	1516
22	1487	1562	1529	1527	1489	1489	1470	1448	1466	1477	1521	1446	1426	1471	1468	1476	1487
23	1457	1528	1528	1497	1493	1486	1483	1451	1445	1476	1500	1452	1407	1449	1489	1461	1457
24	1435	1492	1494	1495	1447	1501	1508	1449	1421	1458	1457	1430	1408	1424	1491	1466	1435
25	1432	1468	1498	1509	1425	1465	1506	1435	1417	1412	1425	1413	1434	1430	1451	1418	1432
26	1427	1448	1509	1490	1470	1442	1477	1392	1378	1420	1412	1406	1453	1440	1442	1395	1427
27	1408	1447	1504	1466	1436	1488	1459	1397	1352	1390	1404	1408	1381	1437	1423	1400	1408
28	1388	1413	1484	1503	1390	1477	1432	1372	1357	1371	1403	1419	1379	1404	1426	1420	1388
29	1321	1383	1451	1476	1371	1417	1422	1351	1349	1369	1380	1418	1336	1380	1410	1387	1321

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30	1277	1336	1423	1436	1351	1406	1428	1322	1298	1330	1362	1420	1340	1376	1389	1336	1277
31	1264	1308	1410	1432	1350	1364	1406	1282	1249	1291	1358	1381	1304	1345	1384	1299	1264
32	1272	1298	1404	1397	1340	1341	1377	1252	1234	1244	1339	1326	1275	1320	1382	1276	1272
33	1230	1288	1381	1360	1318	1342	1368	1236	1217	1248	1308	1291	1280	1298	1371	1277	1230
34	1165	1263	1363	1359	1299	1346	1338	1235	1183	1220	1302	1283	1292	1305	1358	1265	1165
35	1139	1199	1345	1363	1285	1326	1334	1208	1139	1185	1291	1291	1250	1319	1328	1229	1139
36	1151	1186	1302	1338	1286	1320	1300	1163	1096	1146	1283	1293	1233	1304	1291	1173	1151
37	1100	1178	1293	1320	1265	1319	1265	1144	1082	1123	1248	1293	1224	1267	1266	1176	1100
38	1048	1137	1279	1313	1226	1278	1246	1116	1050	1113	1215	1243	1186	1248	1243	1163	1048
39	1037	1093	1255	1290	1180	1242	1233	1072	1010	1080	1193	1209	1144	1222	1238	1101	1037
40	997	1083	1209	1266	1174	1197	1196	1033	973	1044	1160	1190	1124	1188	1203	1071	997
41	963	1048	1188	1212	1167	1203	1165	1011	940	1017	1135	1175	1106	1174	1172	1055	963
42	951	1013	1154	1201	1126	1177	1147	990	919	988	1110	1146	1074	1146	1156	1030	951
43	897	987	1135	1182	1101	1154	1119	964	872	957	1084	1113	1038	1135	1127	1005	897
44	900	940	1108	1148	1098	1143	1089	939	848	920	1048	1099	1051	1101	1100	982	900
45	873	938	1076	1145	1075	1134	1064	904	839	897	1025	1095	1008	1112	1074	942	873
46	821	917	1046	1149	1005	1083	1042	886	807	885	1014	1081	947	1062	1061	941	821
47	843	877	1030	1082	990	1034	1018	858	786	858	995	1016	936	1008	1039	914	843
48	789	883	996	1043	958	1017	991	842	770	846	956	994	888	994	1006	891	789
49	790	841	973	1011	921	974	969	827	751	820	938	954	870	940	986	878	790
50	784	842	959	971	907	961	952	802	737	799	920	930	876	928	971	854	784
51	739	822	937	949	932	957	912	788	727	789	898	934	865	937	924	845	739
52	748	794	927	942	900	967	897	768	700	769	891	915	850	925	919	825	748
53	728	784	901	955	859	937	873	750	685	748	869	909	799	904	899	800	728
54	702	770	881	923	807	887	853	731	662	737	847	864	743	851	884	790	702
55	715	755	859	866	753	837	831	715	653	718	828	817	732	804	864	775	715
56	664	760	831	824	785	814	821	698	627	703	791	804	721	790	834	776	664
57	655	719	813	813	734	815	791	682	608	678	776	779	679	763	809	745	655
58	656	708	791	793	676	752	764	659	588	663	755	745	636	719	790	726	656
59	605	699	777	736	705	714	735	636	560	629	730	713	657	698	749	705	605
60	593	657	750	729	684	739	702	609	541	608	700	719	621	703	723	675	593
61	593	644	723	710	628	676	682	596	535	591	681	664	599	646	710	661	593

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62	571	634	696	666	655	678	659	583	527	583	658	657	579	644	689	641	571
63	561	613	677	663	579	630	628	571	507	567	626	616	554	604	649	625	561
64	539	596	644	609	585	612	616	555	492	550	618	593	527	589	639	613	539
65	537	583	635	602	550	589	593	531	477	534	588	562	503	551	609	592	537
66	515	570	607	575	538	578	573	518	466	520	574	550	488	546	592	574	515
67	512	557	594	561	492	538	555	503	453	506	552	529	460	521	570	558	512
68	494	545	566	521	494	527	528	490	434	486	532	505	450	500	545	542	494
69	479	523	548	521	489	527	514	467	414	461	514	497	441	495	527	522	479
70	452	499	532	513	444	497	498	447	389	437	494	483	413	478	515	503	452
71	433	477	512	478	421	460	477	425	375	420	473	450	390	450	499	474	433
72	416	456	486	450	405	445	451	408	359	405	443	435	372	430	468	458	416
73	399	441	458	443	392	428	433	387	333	382	428	415	355	415	450	441	399
74	368	412	445	416	355	398	408	366	311	358	404	388	324	380	427	418	368
75	339	384	416	380	342	375	381	341	288	333	379	366	304	364	404	386	339
76	318	357	391	367	319	355	359	316	268	311	351	345	293	339	373	358	318
77	300	333	362	342	302	332	332	297	249	287	329	322	266	317	345	336	300
78	287	320	340	322	272	300	312	276	231	269	305	297	244	291	325	318	287
79	259	295	318	295	246	278	287	257	209	245	278	274	224	268	299	301	259
80	239	273	300	274	224	253	267	232	187	222	260	252	204	250	281	275	239
81	216	248	273	248	198	231	242	215	171	204	240	230	185	226	257	255	216
82	195	230	247	226	181	206	221	193	153	184	215	208	166	208	231	232	195
83	182	210	227	204	161	188	197	177	140	172	195	186	151	186	214	213	182
84	167	194	207	185	148	169	179	164	128	156	181	170	135	167	195	199	167
85	149	177	194	173	132	153	166	147	112	139	163	156	121	156	181	180	149
86	130	155	174	157	117	139	150	133	100	127	150	142	108	139	164	163	130
87	109	140	158	144	106	126	137	123	93	115	134	127	97	128	145	143	109
88	92	119	141	129	94	114	126	113	84	108	123	118	92	116	131	120	92
89	84	107	125	117	88	108	118	107	80	100	117	113	87	109	120	111	84
90	80	103	119	112	84	103	114	103	76	96	111	108	85	105	116	105	80
91	78	100	115	108	81	100	110	101	75	95	109	105	83	102	113	103	78
92	77	98	112	106	80	98	108	100	74	93	106	102	83	100	111	101	77
93	77	96	110	103	78	95	106	98	73	92	104	100	81	98	109	100	77

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94	75	95	108	100	77	93	104	98	73	92	103	98	80	96	108	99	75
95	75	95	107	98	75	91	102	97	73	91	100	94	77	93	106	98	75
96	75	94	104	95	74	88	100	97	73	90	97	91	75	89	104	97	75
97	75	93	102	91	73	85	97	95	73	89	94	86	73	85	100	97	75
98	76	92	98	86	70	81	94	94	73	88	90	79	71	81	97	96	76
99	75	91	94	80	68	75	89	93	73	87	86	74	67	74	92	94	75
100	75	90	89	74	64	70	84	91	73	85	80	67	63	70	87	92	75
101	76	88	83	68	61	64	79	88	73	83	75	60	60	63	82	91	76
102	74	85	78	60	58	57	74	85	72	80	71	53	55	55	75	87	74
103	73	82	73	55	54	52	68	81	70	76	67	46	51	49	71	83	73
104	71	77	68	48	51	47	63	77	68	73	64	41	49	42	66	80	71
105	69	74	65	44	50	42	60	74	67	70	61	37	45	37	62	75	69
106	66	70	62	40	47	39	58	71	66	68	58	38	41	33	59	71	66
107	63	68	59	38	43	36	54	69	65	66	55	43	38	34	56	68	63
108	62	65	56	40	41	39	52	66	64	63	52	52	41	41	53	65	62
109	61	62	52	47	41	44	48	64	63	61	51	59	46	46	49	63	61
110	60	60	50	54	43	51	46	61	62	59	50	68	54	53	46	60	60
111	59	58	47	62	51	60	44	58	61	58	48	76	62	60	44	57	59
112	58	56	45	70	60	66	43	56	61	55	46	81	71	65	43	55	58
113	58	54	44	77	67	74	42	52	59	51	43	81	77	69	42	52	58
114	56	49	42	81	74	76	40	47	55	47	41	81	82	69	40	50	56
115	52	44	40	80	80	75	38	44	52	43	39	80	83	68	39	45	52
116	49	41	39	79	83	74	39	39	49	40	40	79	82	67	38	41	49
117	45	36	39	78	82	73	41	36	45	37	41	77	81	65	40	37	45
118	42	34	42	77	81	72	43	32	42	33	42	75	80	64	42	33	42
119	39	30	44	76	79	70	45	29	39	29	42	74	78	62	44	30	39
120	35	27	45	74	78	68	47	26	36	26	43	72	76	60	45	28	35
121	33	25	46	73	75	65	48	23	33	24	44	69	72	58	46	25	33
122	31	23	47	70	73	63	48	23	30	24	44	67	70	56	46	24	31
123	29	23	49	67	70	60	47	24	28	26	44	63	67	54	47	23	29
124	27	25	49	65	67	57	46	27	27	29	44	60	64	51	45	24	27
125	28	28	49	62	64	55	44	30	30	33	45	56	61	48	44	27	28

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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126	31	31	48	59	61	52	44	33	33	36	45	53	58	46	42	31	31
127	34	35	48	56	58	48	43	36	37	41	45	48	54	42	42	34	34
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130	46	47	47	44	48	36	35	45	49	51	40	35	42	31	37	44	46
131	50	50	44	40	44	33	32	46	53	53	40	30	39	27	35	47	50
132	55	51	42	36	41	28	29	47	56	56	39	26	34	23	33	49	55
133	58	53	40	32	36	26	28	50	58	59	38	22	30	19	33	49	58
134	60	55	39	28	33	22	27	52	58	62	37	17	27	16	32	51	60
135	60	58	38	25	29	19	26	54	60	63	36	14	23	13	32	53	60
136	61	60	37	20	25	16	25	53	63	62	34	8	18	9	31	56	61
137	63	61	36	15	23	12	24	51	64	60	33	5	15	6	30	57	63
138	65	59	35	11	19	8	23	49	64	58	32	2	11	4	29	57	65
139	65	57	34	6	15	6	22	47	62	55	30	2	8	2	28	56	65
140	63	55	33	4	11	3	21	45	59	53	29	2	4	2	27	53	63
141	61	53	31	2	8	2	20	43	56	51	28	2	2	2	26	52	61
142	58	51	30	2	5	2	19	41	54	49	27	2	2	2	25	50	58
143	56	49	29	2	2	2	18	38	51	46	25	2	2	2	24	48	56
144	54	47	28	2	2	2	16	36	49	43	24	2	2	2	23	46	54
145	51	45	27	2	2	2	15	34	46	40	22	2	2	2	22	44	51
146	49	43	25	2	2	2	14	31	44	37	21	2	2	2	21	42	49
147	47	41	24	2	2	2	12	29	41	35	19	2	2	2	19	40	47
148	44	40	23	2	2	2	10	27	38	32	17	2	2	2	17	38	44
149	42	38	21	2	2	2	7	25	36	30	15	2	2	2	15	36	42
150	40	35	19	2	2	2	2	24	33	28	13	2	2	2	13	34	40
151	38	34	17	2	2	2	2	22	31	26	11	2	2	2	8	32	38
152	36	32	14	2	2	2	2	19	29	24	5	2	2	2	3	30	36
153	33	30	12	2	2	2	2	17	27	21	2	2	2	2	2	28	33
154	31	27	3	2	2	2	2	14	24	19	2	2	2	2	2	25	31
155	28	23	2	2	2	2	2	12	21	16	2	2	2	2	2	22	28
156	24	21	2	2	2	2	2	7	18	13	2	2	2	2	2	17	24
157	21	16	2	2	2	2	2	2	15	8	2	2	2	2	2	14	21

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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158	16	10	2	2	2	2	2	2	2	12	2	2	2	2	2	2	5	16
159	9	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	9
160	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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178	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
179	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
180	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

## 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>	CNL1-50(5700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	0.4358	51.27	0.9803	9.47
NB-BD2	277.0	60	0.2018	50.14	0.8969	11.81
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

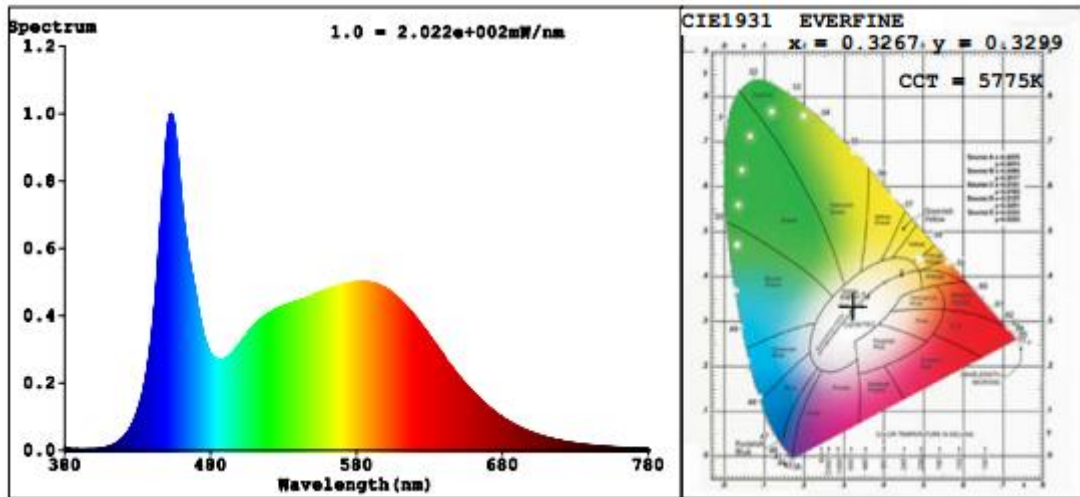
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	87	R9	26
Frequency (Hz)	60	R2	93	R10	82
CCT (K)	5775	R3	94	R11	85
Duv	-0.0032	R4	86	R12	65
Chromaticity (x, y)	x=0.3267 y=0.3299	R5	87	R13	89
Chromaticity (u', v')	u'=0.2072 v'=0.4709	R6	87	R14	97
Color Rendering Index (CRI)	86.8	R7	87	R15	84
R9	26	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)	5220	5032	5000-10000(-10%)	
Luminous Efficacy (lm/W)	101.81	100.36	Standard: >= 95(-3%)	Premium: >= 115(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



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NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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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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