



NVLAP LAB CODE 201011-0

Report No.: STD1602034NB-C

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): CSFL-50X

Remark: The letter 'X' in the model name stand for different mounting arm. It could be blank, stand for large u-shaped iron. It could be "A", stand for rocker arm.

Representative (Tested) Model: CSFL-50(2700K)
CSFL-50(5700K)

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

Test & Report By:

Peeta Cao

Engineer: Peeta Cao

Date: Mar.10,2016

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-C/2

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Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
CSFL-50	2700K	4163.6	47.46	87.73
CSFL-50	3000K	4204* ¹	47.81* ²	87.93* ³
CSFL-50	3500K	4244* ¹	47.81* ²	88.77* ³
CSFL-50	4000K	4284* ¹	47.81* ²	89.60* ³
CSFL-50	4500K	4324* ¹	47.81* ²	90.44* ³
CSFL-50	5000K	4364* ¹	47.81* ²	91.28* ³
CSFL-50	5700K	4405	48.17	91.44

*1: This value is calculated and the calculation formula is as below:

$$4204 = (4405 - 4163.6) / 6 + 4163.6$$

$$4244 = (4405 - 4163.6) / 6 + 4204$$

$$4284 = (4405 - 4163.6) / 6 + 4244$$

$$4324 = (4405 - 4163.6) / 6 + 4284$$

$$4364 = (4405 - 4163.6) / 6 + 4324$$

*2: This value is calculated and the calculation formula is as below:

$$47.81 = (48.17 + 47.46) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$87.93 = 4204 / 47.81$$

$$88.77 = 4244 / 47.81$$

$$89.60 = 4284 / 47.81$$

$$90.44 = 4324 / 47.81$$

$$91.28 = 4364 / 47.81$$



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U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template

Laboratory Information:

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	Mar.10,2016
Test Report No.	STD1602034NB-C
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	CSFL-50(2700K)	
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	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere

Goniophotometer

Electrical Measurements:

Output

Output

Input Wattage	--	47.46	W
Input Current	--	0.4045	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9778	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	4163.6	lm
Initial Lumen Efficacy	--	87.73	lm/w
Correlated color temperature / CCT	2788		K
Color rendering index / CRI	80.1		
R9 Value	0		
Duv	-0.0025		

Luminous Intensity Distribution

Center beam candlepower (if applicable)	-----	1682	cd
Beam angle (if applicable)		105.2	°
Zonal lumens in the 0 °-60 ° zone		89.1	%
Zonal lumens in the 60 °-90 ° zone		10.8	%
Zonal lumens in the 90 °-120 ° zone		0	%
Zonal lumens in the 120 °-180 ° zone		0.1	%

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Date of Test Report	Mar.10,2016
Test Report No.	STD1602034NB-C
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	CSFL-50(5700K)	
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	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Integrating Sphere

Goniophotometer

Electrical Measurements:

Output

Output

Input Wattage	48.17	--	W
Input Current	0.4091	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9812	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	4405	--	lm
Initial Lumen Efficacy	91.44	--	lm/w
Correlated color temperature / CCT	5626	--	K
Color rendering index / CRI	85.5	--	
R9 Value	16	--	
Duv	0.0022	--	

Luminous Intensity Distribution

Center beam candlepower (if applicable)	-----	cd
Beam angle (if applicable)		°
Zonal lumens in the 0 °-60 ° zone		%
Zonal lumens in the 60 °-90 ° zone		%
Zonal lumens in the 90 °-120 ° zone		%
Zonal lumens in the 120 °-180 ° zone		%

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Test Specifications:	
Date of Receipt	:Dec.17,2015
Date of Test	:Dec.19,2015
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution 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 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. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric 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 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

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1. Product Information:

Brand Name	CEA/EAEC
Model Number	CSFL-50X
Luminaire Type	Architectural Flood and Spot Luminaires and Industrial buildings
Rated Voltage / Frequency	100~ 277Vac, 50/60Hz
Nominal Power	50W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K,5700K
LED Manufacturer	Chuang Te LED
LED Model	CT-5730
Sample Receipt Date	Dec.17,2015
Sample Number	STD1602034NB-C1(2700K),C2(5700K)

Photo

CSFL-50



CSFL-50A



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
--	-----------------------

Test date	2015-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CSFL-50(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.4045	47.46	0.9778	10.38
4NB-C1	277.0	60	0.1899	47.58	0.9043	13.22

Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	0
Frequency (Hz)	60	R2	93	R10	86
Color Rendering Index (CRI)	80.1	R3	90	R11	75
R9	0	R4	76	R12	76
CCT (K)	2788	R5	80	R13	83
Chromaticity (x, y)	x=0.4488 y=0.4014	R6	93	R14	95
Chromaticity (u', v')	u'=0.2594 v'=-0.5221	R7	77	R15	71
Duv	-0.0025	R8	51	--	--

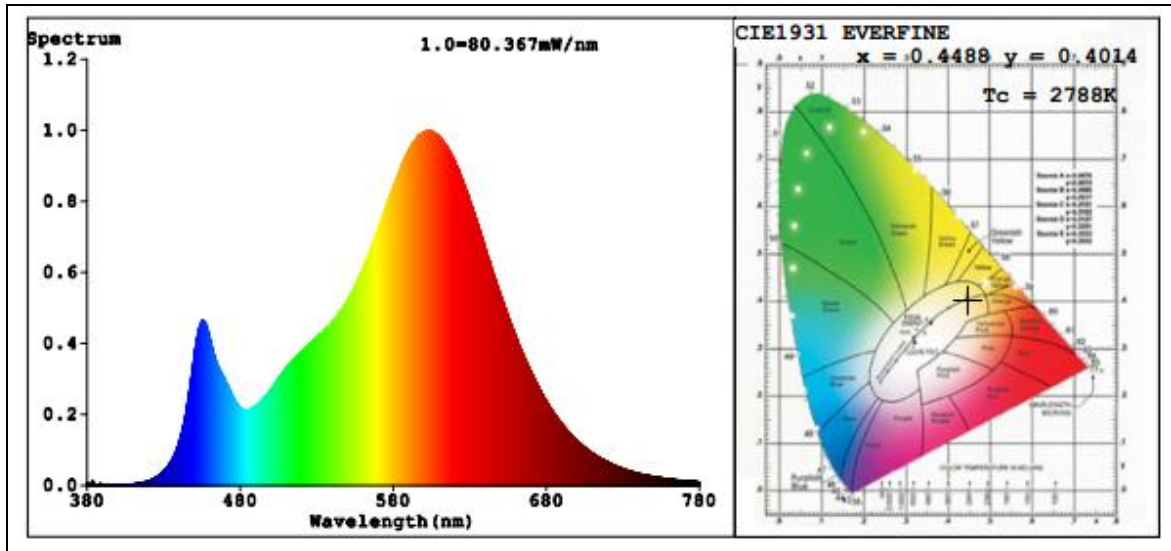
Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	4163.6
Luminous Efficacy (lm/W)	87.73
Beam Angle °	105.2
Center Beam Candle Power (cd)	1682

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	4162.4
Luminous Efficacy (lm/W)	87.48

Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,329.1	31.9%
0-40	2,167.1	52.1%
0-60	3,708.9	89.1%
60-90	449.9	10.8%
70-100	63.1	1.5%
90-120	0.1	0%
0-90	4,158.8	99.9%
90-180	4.3	0.1%
0-180	4,163.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	159.7	3.8%	90-100	0	0%
10-20	463.1	11.1%	100-110	0.0	0%
20-30	706.3	17.0%	110-120	0.1	0%
30-40	838.0	20.1%	120-130	0.7	0%
40-50	842.5	20.2%	130-140	1.0	0%
50-60	699.3	16.8%	140-150	1.0	0%
60-70	386.8	9.3%	150-160	0.8	0%
70-80	61.3	1.5%	160-170	0.5	0%
80-90	1.8	0.0%	170-180	0.2	0%

Laboratory: Standard-Tech Co. Ltd Testing Center

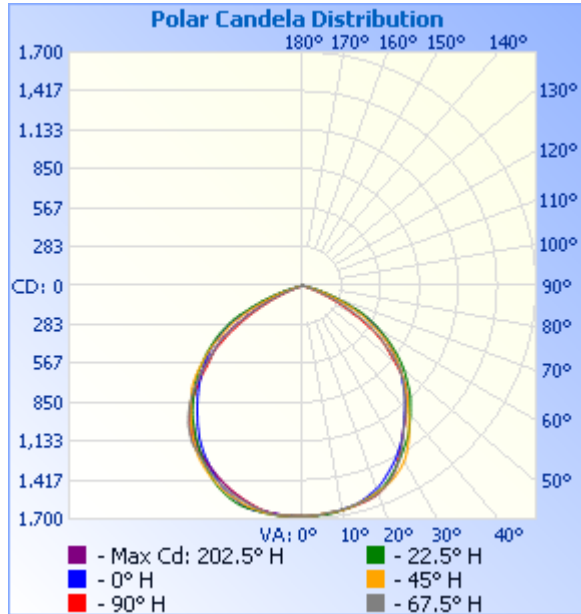
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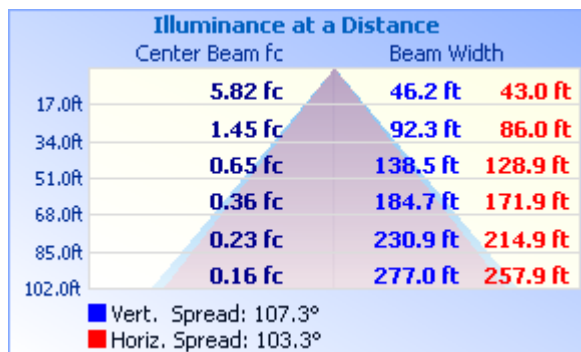
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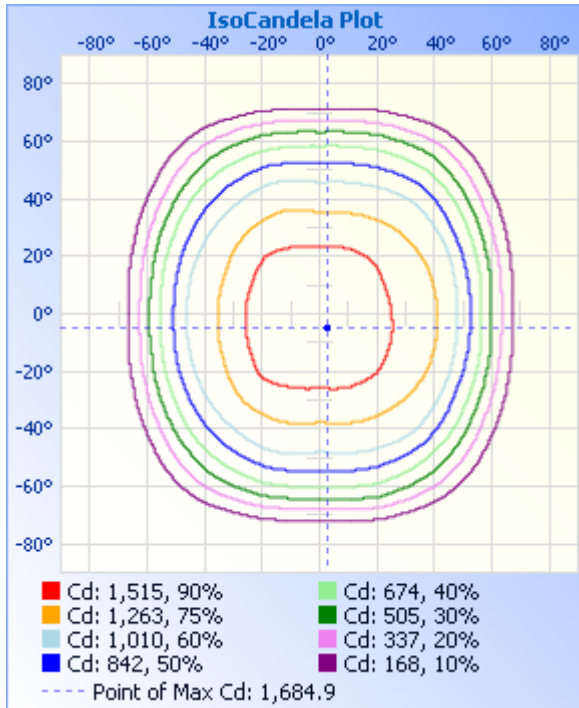
Photometric Data



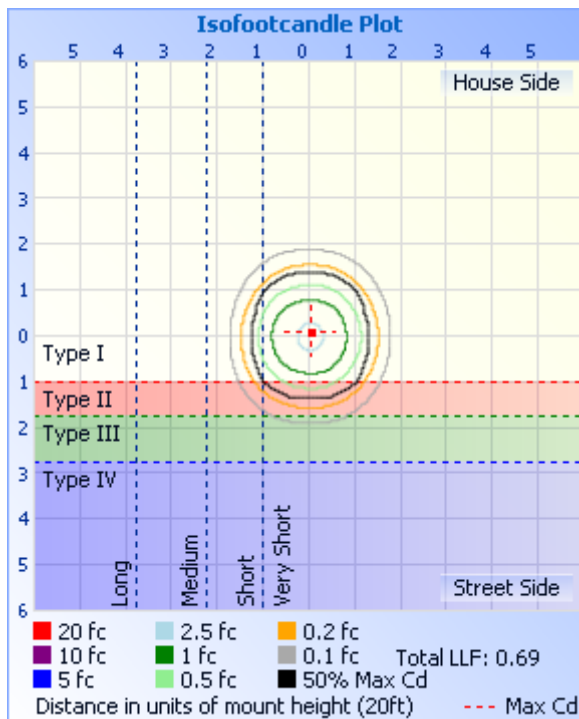
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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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	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682	1682
1	1681	1681	1681	1680	1680	1681	1681	1682	1681	1681	1681	1681	1682	1682	1681	1680	1681
2	1679	1680	1680	1679	1678	1681	1681	1682	1679	1681	1680	1680	1682	1682	1679	1678	1679
3	1677	1679	1677	1677	1677	1682	1681	1683	1678	1681	1680	1681	1682	1682	1678	1677	1677
4	1674	1678	1674	1673	1674	1682	1681	1684	1678	1683	1682	1681	1681	1681	1678	1677	1674
5	1672	1675	1669	1670	1672	1679	1680	1684	1678	1685	1683	1682	1680	1677	1676	1677	1672
6	1668	1674	1665	1666	1670	1676	1679	1683	1676	1684	1682	1682	1679	1674	1673	1676	1668
7	1666	1673	1664	1663	1667	1673	1677	1680	1673	1682	1680	1681	1677	1672	1671	1675	1666
8	1664	1670	1664	1661	1665	1669	1674	1677	1672	1681	1679	1677	1674	1670	1671	1672	1664
9	1661	1665	1663	1658	1663	1666	1672	1674	1672	1680	1678	1671	1668	1667	1670	1669	1661
10	1656	1659	1660	1655	1660	1664	1671	1670	1672	1677	1674	1665	1662	1662	1667	1664	1656
11	1652	1655	1655	1652	1656	1663	1668	1666	1673	1674	1669	1659	1654	1658	1662	1660	1652
12	1648	1651	1650	1648	1652	1660	1664	1665	1673	1670	1665	1652	1645	1650	1654	1656	1648
13	1643	1646	1646	1643	1650	1656	1660	1664	1670	1669	1661	1645	1637	1641	1644	1652	1643
14	1637	1641	1640	1640	1646	1651	1656	1662	1666	1668	1655	1637	1628	1631	1635	1645	1637
15	1629	1634	1633	1637	1641	1645	1652	1657	1658	1666	1648	1629	1619	1621	1626	1637	1629
16	1619	1628	1626	1633	1637	1642	1647	1652	1648	1662	1640	1621	1609	1613	1619	1628	1619
17	1608	1620	1620	1630	1633	1638	1641	1646	1637	1654	1631	1615	1600	1603	1611	1620	1608
18	1597	1613	1614	1626	1629	1634	1637	1639	1625	1645	1623	1606	1589	1593	1601	1612	1597
19	1586	1605	1606	1619	1621	1629	1631	1631	1612	1636	1616	1595	1579	1581	1590	1604	1586
20	1574	1597	1599	1609	1611	1624	1625	1622	1600	1624	1609	1586	1568	1570	1579	1595	1574
21	1561	1586	1591	1598	1601	1614	1617	1610	1587	1612	1601	1577	1557	1558	1567	1583	1561
22	1546	1574	1584	1587	1588	1603	1609	1597	1572	1599	1589	1566	1547	1546	1556	1570	1546
23	1528	1560	1576	1573	1571	1589	1600	1583	1556	1586	1576	1556	1535	1533	1545	1555	1528
24	1509	1544	1567	1557	1554	1572	1593	1567	1540	1570	1563	1545	1524	1520	1536	1537	1509
25	1491	1525	1555	1539	1537	1556	1584	1550	1521	1552	1552	1532	1513	1506	1525	1516	1491
26	1473	1507	1542	1520	1518	1538	1573	1531	1502	1533	1540	1518	1501	1493	1513	1495	1473
27	1454	1488	1528	1498	1493	1520	1560	1513	1483	1513	1527	1505	1489	1481	1499	1476	1454
28	1436	1470	1513	1476	1467	1501	1545	1496	1464	1494	1512	1491	1475	1468	1483	1456	1436
29	1415	1450	1497	1451	1440	1477	1527	1478	1445	1476	1497	1479	1462	1455	1465	1437	1415

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30	1394	1431	1478	1423	1412	1450	1509	1462	1427	1456	1481	1464	1452	1442	1448	1416	1394
31	1374	1412	1457	1396	1383	1425	1489	1445	1405	1436	1465	1449	1442	1429	1429	1395	1374
32	1353	1393	1432	1367	1357	1400	1467	1426	1384	1415	1447	1435	1431	1414	1412	1374	1353
33	1330	1376	1405	1337	1331	1370	1443	1404	1365	1393	1426	1424	1420	1397	1394	1356	1330
34	1305	1358	1377	1310	1305	1341	1419	1382	1342	1373	1404	1413	1407	1380	1373	1335	1305
35	1279	1339	1349	1285	1280	1311	1393	1358	1318	1353	1382	1400	1387	1363	1352	1312	1279
36	1254	1316	1318	1259	1259	1283	1364	1334	1293	1331	1358	1381	1369	1346	1331	1287	1254
37	1229	1292	1288	1233	1238	1257	1336	1311	1269	1308	1336	1360	1351	1327	1309	1263	1229
38	1205	1267	1258	1210	1215	1234	1309	1290	1243	1287	1313	1339	1328	1306	1284	1240	1205
39	1182	1244	1228	1187	1191	1212	1281	1269	1218	1268	1289	1319	1302	1286	1260	1215	1182
40	1160	1221	1198	1162	1168	1185	1248	1245	1193	1246	1265	1294	1279	1266	1237	1191	1160
41	1138	1198	1170	1137	1148	1157	1214	1221	1169	1222	1243	1268	1256	1244	1213	1169	1138
42	1117	1174	1142	1112	1130	1129	1182	1199	1146	1197	1220	1239	1226	1219	1190	1148	1117
43	1092	1153	1114	1089	1112	1105	1153	1175	1122	1172	1196	1210	1192	1195	1166	1128	1092
44	1066	1129	1085	1067	1089	1083	1123	1151	1097	1146	1171	1179	1156	1166	1139	1105	1066
45	1039	1103	1059	1045	1065	1063	1094	1127	1074	1122	1146	1143	1115	1136	1111	1080	1039
46	1014	1075	1032	1022	1038	1042	1066	1102	1050	1095	1124	1107	1072	1103	1085	1053	1014
47	990	1048	1005	998	1007	1016	1039	1080	1025	1072	1103	1066	1034	1068	1061	1025	990
48	969	1019	977	970	971	990	1011	1058	1000	1050	1077	1024	994	1029	1035	1000	969
49	946	992	949	941	930	963	979	1033	975	1025	1045	982	951	989	1010	976	946
50	920	966	921	908	888	932	948	1003	950	997	1011	940	909	951	984	953	920
51	891	939	894	870	848	895	919	973	923	967	978	897	874	913	957	928	891
52	862	909	867	829	812	852	892	941	899	936	944	856	846	870	927	897	862
53	834	879	840	790	778	808	867	908	874	906	910	823	816	826	896	869	834
54	808	847	809	754	746	771	837	877	848	878	871	795	782	790	865	838	808
55	782	814	779	719	714	734	806	847	824	852	835	765	722	760	834	809	782
56	753	784	748	690	665	700	771	819	796	821	799	726	682	730	800	781	753
57	725	754	716	658	631	669	736	787	768	788	761	664	641	692	766	752	725
58	696	721	680	609	580	626	703	757	738	757	718	631	570	632	731	720	696
59	669	686	645	580	520	588	666	723	705	729	674	576	539	602	693	690	669
60	639	654	607	527	490	548	630	688	671	697	636	516	476	546	652	661	639
61	605	623	570	473	424	484	590	652	636	660	605	485	435	494	607	630	605

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62	572	590	535	437	392	450	547	614	599	623	573	417	383	456	570	592	572
63	543	553	505	377	332	390	511	572	561	592	514	387	339	397	537	554	543
64	501	518	468	343	300	355	482	531	494	553	474	325	288	365	502	521	501
65	444	485	427	288	245	297	442	489	461	507	433	296	254	307	452	489	444
66	414	447	387	255	217	264	399	422	410	444	381	242	199	274	412	429	414
67	356	384	334	210	171	215	347	385	366	410	341	202	163	230	363	393	356
68	319	351	303	168	128	180	313	336	323	349	290	168	127	184	320	350	319
69	273	294	252	138	98	149	261	297	279	317	246	124	89	151	275	297	273
70	241	258	215	100	68	106	230	244	234	258	210	84	50	113	240	265	241
71	195	211	179	67	40	72	178	209	205	226	157	46	19	78	185	219	195
72	164	182	134	41	18	46	136	171	161	182	116	18	13	42	153	180	164
73	131	141	98	19	14	22	105	134	121	140	79	13	11	15	115	152	131
74	96	109	66	13	12	16	73	105	87	105	51	11	10	10	83	116	96
75	66	83	43	11	10	13	48	77	55	72	25	10	8	9	54	84	66
76	41	57	22	9	9	11	29	51	29	41	11	8	7	8	31	56	41
77	20	32	11	8	7	9	15	27	11	20	9	7	6	7	13	33	20
78	8	16	8	6	6	8	12	12	8	9	8	6	5	6	7	14	8
79	7	7	6	6	5	7	10	9	7	7	6	5	4	5	6	8	7
80	6	5	7	4	4	6	8	8	6	6	5	4	4	4	5	6	6
81	4	4	5	4	3	4	6	6	5	5	4	3	3	3	4	5	4
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87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CSFL-50(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160203	120.0	60	0.4091	48.17	0.9812	10.29
4NB-C2	277.0	60	0.1957	49.08	0.9055	13.67

Sphere-Spectroradiometer Method:

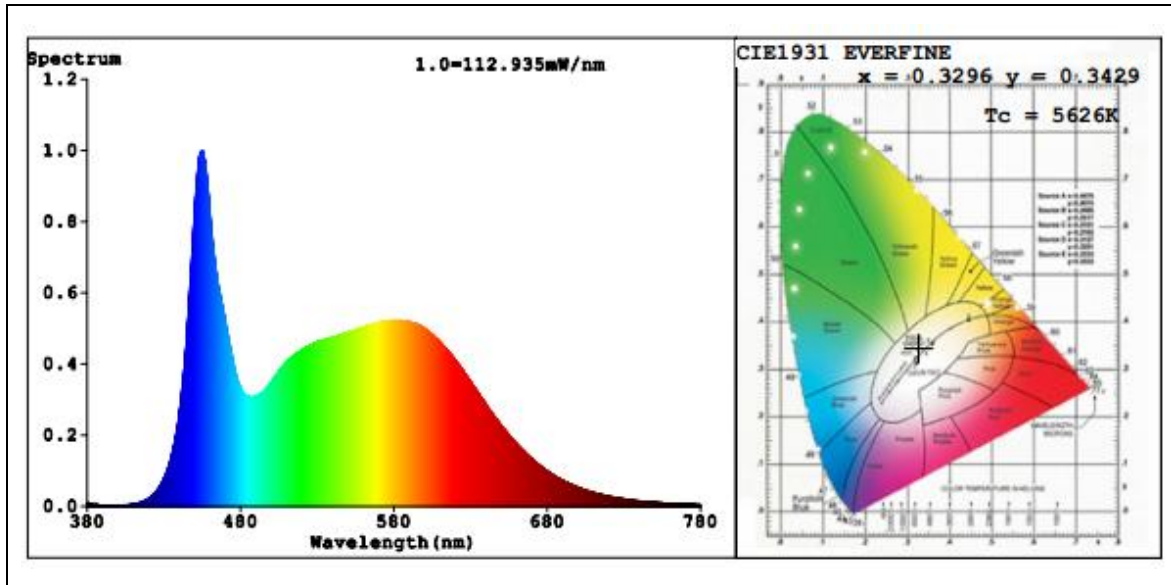
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	85.5
R9	16
CCT (K)	5626
Chromaticity (x, y)	x=0.3296 y=0.3429
Chromaticity (u', v')	u'=0.2042 v'=0.4780
Duv	0.0022
Total Initial Lumen Output(lm)	4405
Initial Lumen Efficacy(lm/w)	91.44

Special Color Rendering Indices			
R1	85	R9	16
R2	94	R10	84
R3	95	R11	82
R4	82	R12	63
R5	85	R13	88
R6	89	R14	98
R7	86	R15	80
R8	69	--	--

Sphere-Spectroradiometer Method for 277V:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Initial Lumen Output(lm)	4401
Initial Lumen Efficacy(lm/w)	89.67

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	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF DATASHEET PACKAGE *******