



Report No.: STD160711NB-BC

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): CNL1-30

Representative (Tested) Model: CNL1-30(2700K)  
CNL1-30(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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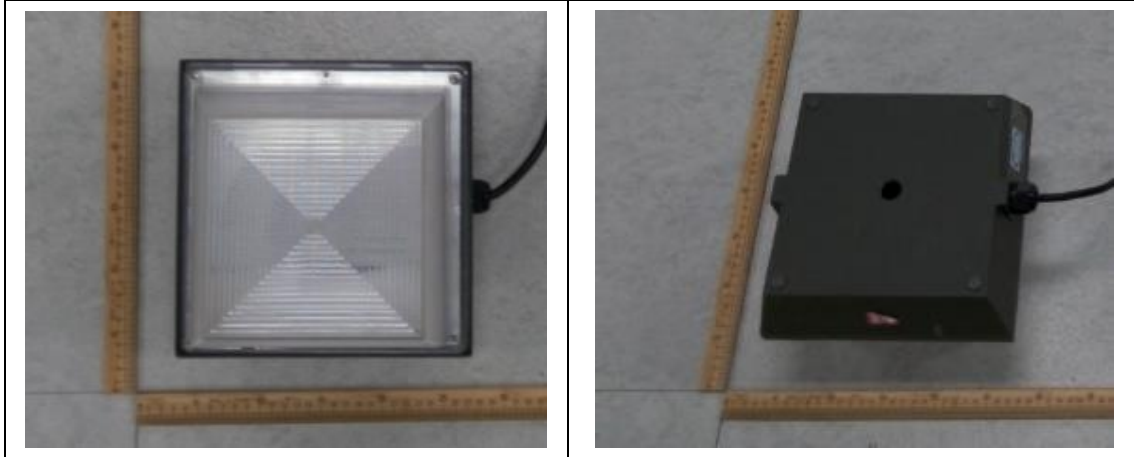
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**1.1 Product Information:**

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA/EAEC	
Model Number	CNL1-30	
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	30W	
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-BC1(2700K),BC2(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>	CNL1-30(2700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	0.2404	28.62	0.9921	9.48
NB-BC1	277.0	60	0.1133	28.50	0.9079	14.17
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

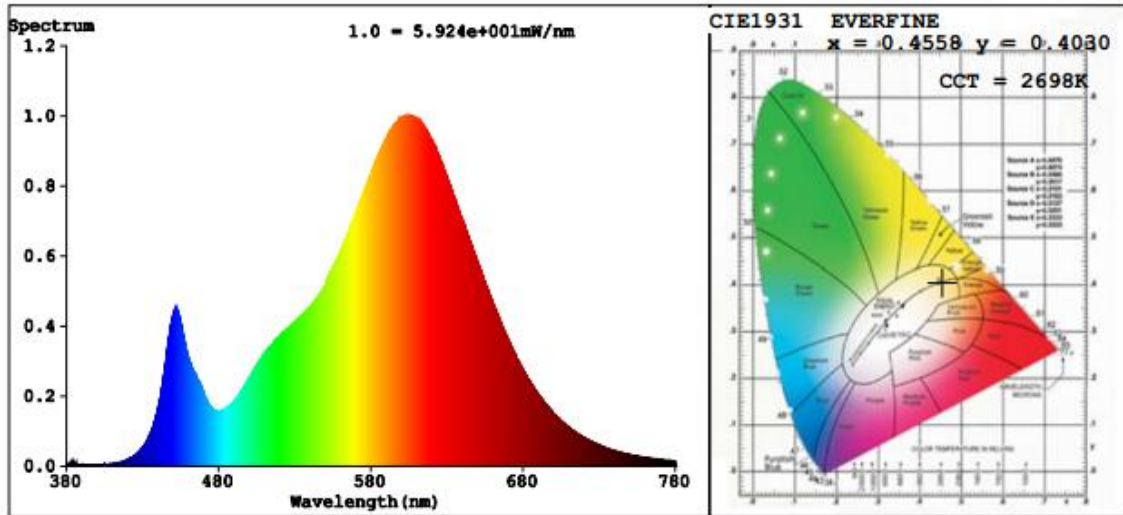
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	92	R10	81
CCT (K)	2698	R3	93	R11	75
Duv	-0.0025	R4	76	R12	75
Chromaticity (x, y)	x=0.4558 y=0.4030	R5	79	R13	82
Chromaticity (u', v')	u'=0.2633 v'=0.5238	R6	90	R14	97
Color Rendering Index (CRI)	80.1	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)	3148.1	3105.3	2000-5000(-10%)	
Luminous Efficacy (lm/W)	110.00	108.96	Standard: >= 90(-3%)	Premium: >= 110(-3%)
Zonal lumens in the 0-40 °zone (%)	40.7	--	>= 40(-3)	
Zonal lumens in the 40-70 °zone (%)	41.2	--	>= 40(-3)	
Beam Angle (°)	101.2	--	--	
Center Beam Candle Power (cd)	983	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

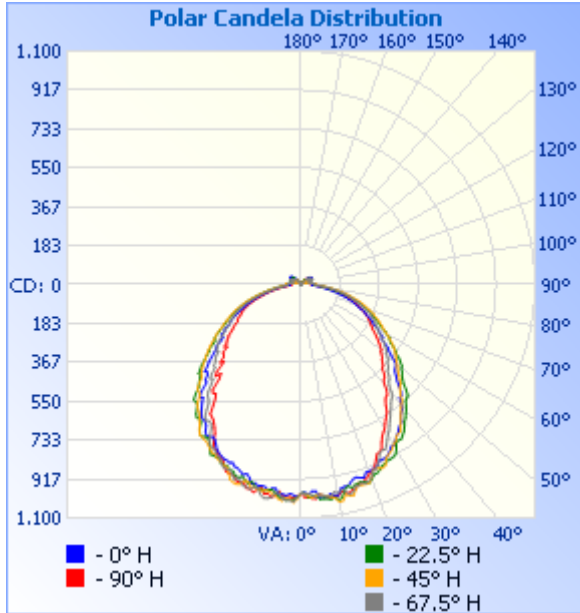


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	788.6	25.1%
0-40	1,281.0	40.7%
0-60	2,215.4	70.4%
60-90	712.8	22.6%
70-100	413.5	13.1%
90-120	148.9	4.7%
0-90	2,928.2	93%
90-180	219.8	7%
0-180	3,148.0	100%

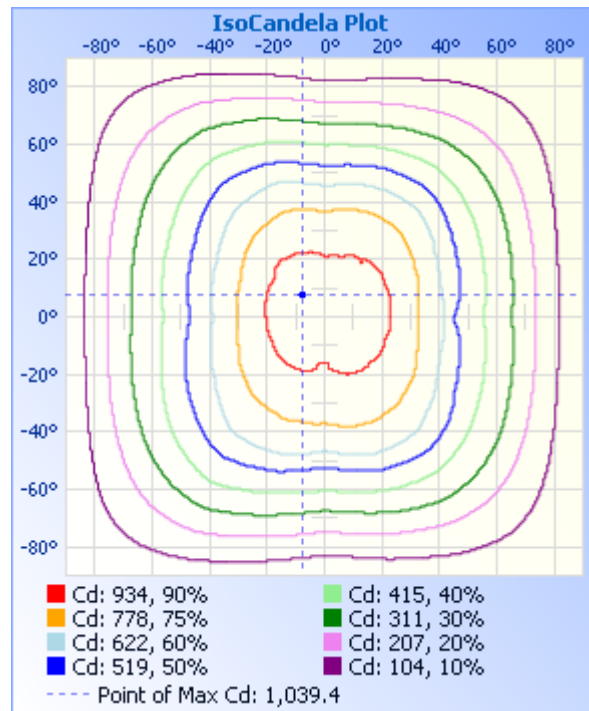
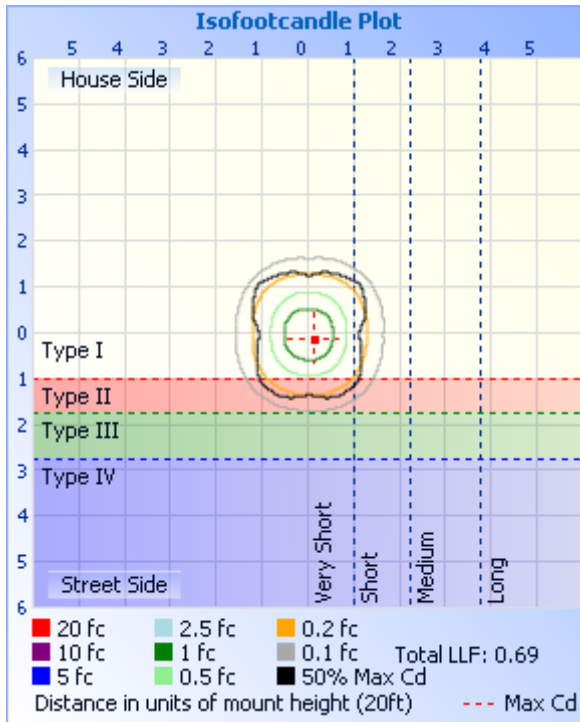
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	95.3	3.0%	90-100	62.1	2%
10-20	276.0	8.8%	100-110	41.0	1.3%
20-30	417.2	13.3%	110-120	45.8	1.5%
30-40	492.4	15.6%	120-130	40.3	1.3%
40-50	490.3	15.6%	130-140	21.1	0.7%
50-60	444.1	14.1%	140-150	6.9	0.2%
60-70	361.3	11.5%	150-160	2.1	0.1%
70-80	241.6	7.7%	160-170	0.3	0%
80-90	109.8	3.5%	170-180	0.1	0%

**Photometric Data**



	Center Beam fc	Beam Width	
17.0ft	3.40 fc	45.7 ft	36.9 ft
34.0ft	0.85 fc	91.4 ft	73.8 ft
51.0ft	0.38 fc	137.1 ft	110.7 ft
68.0ft	0.21 fc	182.8 ft	147.6 ft
85.0ft	0.14 fc	228.5 ft	184.5 ft
102.0ft	0.09 fc	274.2 ft	221.4 ft

■ Vert. Spread: 106.7°  
■ Horiz. Spread: 94.7°



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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	983	983	983	983	983	983	983	983	983	983	983	983	983	983	983	983	983
1	980	982	987	989	1003	1008	1007	1001	1001	1005	1009	1000	995	977	970	967	980
2	989	1005	999	986	1003	1016	1013	1000	993	1012	1028	1023	1009	986	989	977	989
3	974	998	1005	993	1008	1018	1004	1002	985	1014	1012	1019	1001	984	1001	977	974
4	975	994	996	1007	1010	1020	1005	1006	996	1018	1009	1019	1002	985	981	980	975
5	1005	1015	994	994	993	1003	1004	996	992	1008	1022	1014	1001	997	973	1009	1005
6	1004	1014	999	997	1000	986	1002	996	995	1006	1016	987	979	986	993	1012	1004
7	1005	1016	1002	1006	1009	1009	985	975	968	990	1003	986	1003	977	1010	1003	1005
8	995	1022	1009	1007	1012	1033	992	975	970	975	991	1014	1011	990	993	1009	995
9	1005	1014	1017	989	1009	1006	983	988	980	978	985	1020	997	993	984	1004	1005
10	1007	1030	1039	998	1012	1004	986	986	969	985	983	1021	1002	976	1009	1006	1007
11	978	1020	1037	986	993	991	987	978	964	983	990	1007	976	993	1013	1010	978
12	973	986	1011	993	1002	984	984	975	969	983	988	981	987	983	1006	995	973
13	974	974	1020	1014	1009	997	988	957	960	973	981	977	1004	982	1006	982	974
14	961	986	1023	1008	995	1003	987	956	968	956	982	994	992	999	1012	975	961
15	947	977	996	985	996	977	968	957	941	969	962	987	993	991	983	961	947
16	944	974	983	986	974	967	963	939	927	957	960	988	972	987	957	935	944
17	952	970	986	976	975	952	974	936	937	946	984	973	973	994	963	932	952
18	957	977	988	984	970	953	997	944	924	955	988	960	975	972	968	938	957
19	935	987	987	979	957	948	981	938	915	953	986	968	961	979	970	960	935
20	936	974	967	966	943	939	950	933	913	935	977	951	949	968	949	963	936
21	931	958	939	942	935	923	928	918	899	934	951	935	951	957	944	940	931
22	934	957	933	937	924	916	915	910	905	925	928	937	948	946	939	942	934
23	924	947	938	922	899	900	912	915	898	923	925	936	927	945	939	927	924
24	906	934	946	902	876	899	910	911	898	924	920	922	905	935	946	936	906
25	907	933	939	875	870	878	906	901	890	905	915	905	897	916	934	925	907
26	908	923	911	868	863	854	892	895	882	906	908	898	891	893	912	913	908
27	900	924	901	871	834	852	871	894	872	905	894	886	875	886	901	909	900
28	888	922	894	855	811	850	872	889	853	907	896	874	872	885	897	908	888
29	873	915	883	834	796	830	877	850	837	885	884	873	851	875	902	892	873

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30	872	896	870	815	786	817	863	840	828	859	873	865	811	870	890	893	872
31	860	866	862	804	765	794	848	840	837	846	865	833	789	838	878	879	860
32	845	866	845	784	750	789	850	839	839	846	861	797	774	810	878	868	845
33	836	866	837	766	736	782	833	834	828	854	854	778	759	797	868	858	836
34	821	855	835	751	723	762	824	820	799	851	853	775	751	773	840	844	821
35	809	843	815	733	694	739	801	801	789	834	835	782	746	778	830	837	809
36	802	827	798	720	674	726	784	782	786	802	813	769	704	765	816	821	802
37	777	808	778	702	662	705	768	782	779	792	796	739	671	741	797	815	777
38	765	797	763	690	658	687	761	780	764	797	777	706	651	706	791	802	765
39	757	781	747	680	638	674	751	768	743	785	766	692	658	683	786	778	757
40	732	769	734	663	607	662	743	745	725	762	758	685	649	670	761	765	732
41	705	752	722	632	591	641	722	735	704	744	746	666	587	665	747	750	705
42	704	735	699	616	588	632	708	734	714	744	716	633	564	634	724	738	704
43	689	730	682	609	572	625	698	726	689	740	700	607	590	608	693	716	689
44	661	721	668	595	548	610	697	686	639	714	696	616	572	606	684	710	661
45	638	697	663	573	544	589	673	671	638	680	689	597	513	602	676	681	638
46	622	669	642	570	534	585	655	663	613	667	664	562	529	566	663	664	622
47	604	654	628	560	519	574	650	644	604	652	639	562	499	558	632	646	604
48	595	638	612	545	513	562	642	640	610	637	633	542	490	549	620	620	595
49	589	629	600	541	501	556	624	630	583	639	621	534	488	525	606	604	589
50	582	615	590	530	489	545	614	613	568	618	606	521	454	525	582	596	582
51	562	611	579	517	487	542	602	596	542	603	593	499	465	497	566	589	562
52	537	593	565	509	470	533	593	572	519	575	573	505	444	498	553	575	537
53	516	579	558	498	461	517	580	553	500	558	562	496	437	486	544	552	516
54	505	554	547	486	447	506	569	545	492	535	546	483	424	476	529	529	505
55	482	543	536	476	436	495	555	521	462	527	530	475	416	466	515	517	482
56	455	524	523	464	423	479	543	501	443	499	515	464	399	463	505	502	455
57	460	500	512	450	409	468	522	490	448	484	501	441	384	438	491	468	460
58	443	491	495	434	396	453	510	489	440	481	480	429	375	425	475	464	443
59	426	485	481	422	389	441	499	470	416	469	468	415	360	410	455	456	426
60	418	460	466	414	381	431	482	453	414	447	457	401	344	397	444	433	418
61	397	453	451	405	373	425	470	438	382	435	435	385	342	380	424	421	397

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62	382	429	436	397	365	415	456	417	381	410	419	382	335	376	406	398	382
63	371	415	426	390	356	406	443	413	369	402	408	371	321	365	392	381	371
64	359	402	412	381	349	396	431	397	352	390	390	360	314	355	380	368	359
65	342	389	404	372	336	387	421	383	337	371	383	352	310	346	366	355	342
66	330	376	389	360	331	375	405	372	326	358	367	339	300	335	349	339	330
67	322	364	375	352	318	367	394	358	315	347	351	329	290	325	337	328	322
68	301	354	368	336	306	351	380	342	292	332	340	317	277	312	325	320	301
69	287	337	353	322	293	337	368	325	282	314	328	304	268	299	313	304	287
70	276	324	340	312	283	324	348	316	271	303	311	288	253	284	297	290	276
71	263	309	324	300	271	309	336	300	256	291	297	276	239	272	286	278	263
72	251	297	313	290	257	296	319	284	241	274	282	259	228	257	270	264	251
73	232	281	298	275	245	280	305	272	229	258	266	241	208	239	254	248	232
74	222	266	285	262	231	267	287	253	209	243	250	227	192	224	240	233	222
75	208	251	267	249	220	251	268	241	197	228	229	211	181	209	221	221	208
76	189	239	251	236	206	235	254	224	184	214	216	196	168	197	209	203	189
77	177	220	238	222	195	222	237	208	168	196	200	183	157	183	194	191	177
78	160	203	222	206	181	207	224	195	155	181	183	167	141	168	179	175	160
79	148	190	210	195	167	193	207	179	144	169	170	155	126	155	167	163	148
80	133	173	193	179	155	178	194	167	132	154	155	140	116	141	152	149	133
81	122	160	179	167	141	165	177	152	121	142	144	128	105	130	141	133	122
82	109	144	163	152	130	149	159	137	109	128	130	119	96	119	128	123	109
83	97	130	147	137	116	134	146	127	98	116	118	107	85	107	117	112	97
84	88	120	135	124	101	120	131	114	90	107	109	98	74	99	109	104	88
85	77	107	118	108	90	105	118	104	79	96	98	87	67	89	98	93	77
86	70	97	106	96	76	93	103	91	71	88	90	78	60	82	89	84	70
87	60	84	92	84	67	81	89	80	63	79	83	73	55	75	82	77	60
88	55	74	82	77	62	75	82	74	58	73	78	69	52	70	78	71	55
89	53	70	78	73	58	71	77	69	55	71	75	66	49	68	76	69	53
90	51	67	73	65	50	63	71	66	53	69	73	64	48	66	73	66	51
91	50	65	70	63	48	62	68	64	53	67	72	62	47	64	72	65	50
92	50	63	68	62	48	61	67	63	53	66	70	61	46	63	70	64	50
93	50	62	67	61	48	60	66	63	52	66	69	60	46	62	69	63	50

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94	49	61	65	60	47	58	64	61	52	64	67	59	46	61	67	62	49
95	48	59	63	59	46	57	62	60	51	63	65	58	45	60	65	61	48
96	48	58	60	57	45	56	59	58	50	61	62	56	45	58	62	60	48
97	47	56	58	55	45	54	56	57	50	59	58	54	44	57	59	58	47
98	47	55	54	54	44	53	53	57	50	59	54	53	43	55	55	56	47
99	47	53	50	52	45	51	48	55	51	57	50	50	42	53	50	54	47
100	46	50	44	50	44	48	44	53	51	55	44	48	41	49	46	52	46
101	43	47	40	48	42	46	38	51	49	52	39	45	39	47	40	49	43
102	42	44	35	45	41	43	33	48	49	50	35	43	38	45	36	46	42
103	39	40	29	43	39	42	28	46	47	48	29	42	37	43	31	43	39
104	37	38	25	42	37	41	23	43	45	46	26	41	36	43	26	40	37
105	37	36	26	41	36	40	25	42	44	44	28	41	36	43	27	39	37
106	36	34	30	40	35	38	30	38	43	39	33	40	35	42	32	36	36
107	33	31	36	38	33	36	36	32	42	34	39	39	34	41	36	33	33
108	30	30	43	36	31	36	40	30	33	32	43	38	33	41	42	31	30
109	29	31	46	37	28	37	45	36	30	37	45	40	32	42	44	31	29
110	30	35	46	41	28	42	44	40	35	42	44	44	32	45	43	35	30
111	34	38	44	46	31	46	43	43	41	45	42	47	35	50	41	38	34
112	41	41	43	50	36	50	41	47	47	48	41	51	39	53	39	42	41
113	47	44	41	54	39	55	39	49	50	49	40	54	43	56	37	45	47
114	51	45	41	59	44	58	39	49	53	50	38	56	46	58	36	46	51
115	54	43	41	60	50	59	39	48	56	49	39	54	50	57	36	45	54
116	55	41	42	59	54	58	40	45	58	46	40	53	51	55	38	43	55
117	53	39	41	59	56	58	40	42	58	44	40	52	51	54	38	41	53
118	51	39	41	58	56	57	40	41	55	43	40	52	50	53	38	41	51
119	51	39	41	57	55	56	40	40	54	43	39	51	50	52	38	41	51
120	52	38	41	56	55	55	40	40	54	43	39	50	49	51	38	41	52
121	52	40	40	55	55	54	40	41	54	43	38	49	49	50	38	41	52
122	52	43	40	53	54	53	40	42	54	46	38	47	48	48	37	45	52
123	54	44	40	52	54	52	40	45	55	48	38	46	47	47	37	47	54
124	58	44	40	51	53	51	39	47	56	49	38	45	47	45	36	47	58
125	59	43	39	50	52	49	39	48	60	49	37	44	46	44	36	46	59

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126	58	43	36	49	52	48	38	48	62	49	37	43	46	43	35	46	58
127	58	42	33	47	51	47	37	48	61	49	35	42	45	43	31	47	58
128	57	42	30	46	50	46	33	48	60	49	30	42	44	42	25	47	57
129	56	42	23	45	49	45	25	47	59	49	21	41	43	41	17	46	56
130	55	42	15	44	48	43	17	46	58	48	14	39	42	40	10	46	55
131	54	42	8	42	47	42	6	44	56	47	4	38	41	39	2	45	54
132	52	41	2	40	45	40	1	43	54	45	1	36	40	37	1	44	52
133	51	38	5	38	43	38	1	42	53	44	1	34	39	35	2	43	51
134	49	34	9	37	42	36	2	40	51	42	2	33	37	34	6	38	49
135	47	27	13	35	40	34	5	34	49	37	5	32	36	31	11	32	47
136	39	20	17	30	38	30	10	28	46	30	11	27	34	26	22	24	39
137	33	11	23	24	37	23	22	20	41	23	24	22	33	18	30	17	33
138	23	4	29	14	34	12	26	13	33	15	27	12	29	10	29	8	23
139	13	1	27	3	27	2	23	5	27	8	25	4	22	2	27	2	13
140	5	3	23	1	19	1	19	1	18	1	23	1	14	1	24	1	5
141	1	8	20	1	6	1	17	1	11	1	20	1	5	1	22	4	1
142	3	15	17	1	1	1	15	4	3	2	17	1	1	1	19	10	3
143	7	22	14	1	1	1	14	10	1	6	14	1	1	3	16	15	7
144	13	28	12	7	1	8	13	16	1	10	13	9	1	11	15	23	13
145	18	28	11	14	1	14	12	24	4	16	12	16	1	16	14	27	18
146	23	26	10	13	4	11	10	25	10	21	10	14	9	14	12	25	23
147	22	24	9	10	13	8	9	23	15	21	9	11	14	11	11	24	22
148	21	23	8	7	12	5	8	21	20	20	8	8	13	9	10	22	21
149	19	21	7	3	8	2	7	19	19	19	7	6	10	6	9	20	19
150	18	19	6	1	5	1	5	17	18	17	5	2	8	3	8	19	18
151	16	17	5	1	3	1	3	15	17	15	3	1	5	1	6	17	16
152	15	16	2	1	1	1	1	14	16	13	1	1	2	1	5	15	15
153	13	14	1	1	1	1	1	11	14	12	1	1	1	1	2	14	13
154	12	11	1	1	1	1	1	9	12	10	1	1	1	1	1	12	12
155	10	10	1	1	1	1	1	8	11	8	1	1	1	1	1	10	10
156	8	8	1	1	1	1	1	6	9	6	1	1	1	1	1	8	8
157	7	6	1	1	1	1	1	3	8	4	1	1	1	1	1	7	7

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158	5	2	1	1	1	1	1	1	1	6	1	1	1	1	1	1	4	5
159	3	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	3
160	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
161	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
162	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
163	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
164	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
165	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
166	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
167	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
168	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
169	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
170	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
171	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
172	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
173	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
174	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
175	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
176	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
177	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
179	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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## 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>	CNL1-30(5700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	0.2424	28.88	0.9927	9.17
NB-BC2	277.0	60	0.1144	28.69	0.9053	14.36
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

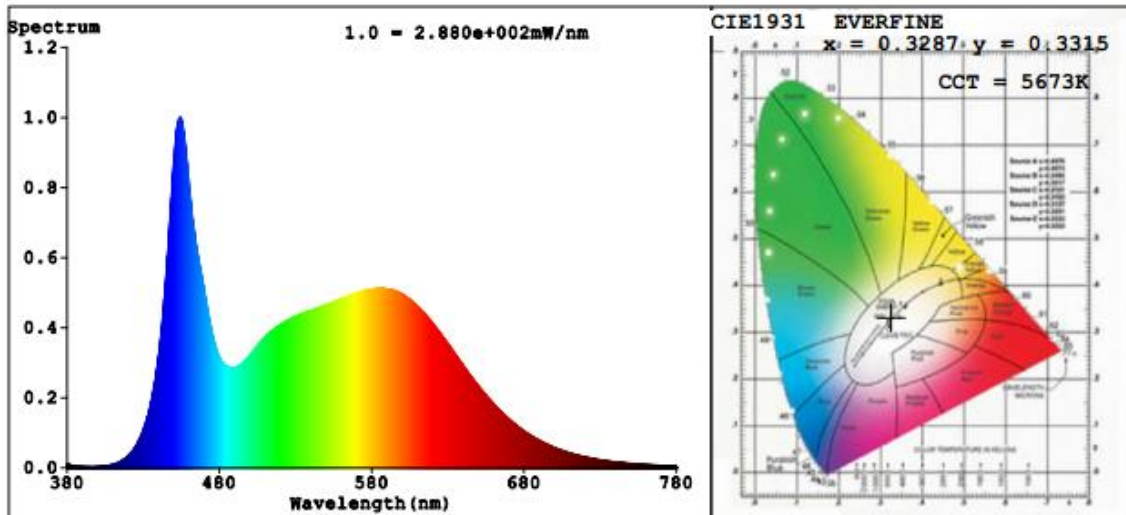
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	88	R9	29
Frequency (Hz)	60	R2	95	R10	85
CCT (K)	5673	R3	95	R11	85
Duv	-0.0033	R4	85	R12	66
Chromaticity (x, y)	x=0.3287 y=0.3315	R5	87	R13	91
Chromaticity (u', v')	u'=0.2080 v'=0.4720	R6	89	R14	98
Color Rendering Index (CRI)	87.3	R7	87	R15	85
R9	29	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)	3314	3243	2000-5000(-10%)	
Luminous Efficacy (lm/W)	114.75	113.04	Standard: >= 90(-3%)	Premium: >= 110(-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 \*\*\*\*\***