Ningbo TengLi Testing Co., Ltd

2nd floor, Block B, Ningbo Testing and Certification Base, No. 66
Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang
Tel: 86574-8783 6802
Fax: 86574-8783 5902

NVLAP TESTING
NVLAP LAB CODE 600149-0

LM-79-08 Test Report

For

CEA ELECTRIC CO.,LTD

(Brand Name: CEA EAEC)

55TH DINGDA ROAD,FUYANG INDUSTRIAL ZONE, YINGQUAN DISTRICT, FUYANG,ANHUI,CHINA 236000

Model name(s): DFL1A-30XX-Y DFL1-30XX-Y

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Architectural Flood and Spot Luminaires
Report Date:	2017-09-01
Prepared By:	Ningbo TengLi Testing Co., Ltd 2nd floor, Block B, Ningbo Testing and Certification Base, No. 66 Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang

Test & Report By:

Mark Liu

Engineer: Mark Liu

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:		
Model Number	DFL1A-30XX-Y,DFL1-30XX-Y	
Remark	DFL1-30XXY stand for large u-shaped iron. DFL1A-30XXY stand for rocker arm. "XX" means CCT, can be two digital, “27”=2700K, “30”=3000K, “35”=3500K, “40”=4000K, “45”=4500K, “50”=5000K, “57”=5700K. "Y" means housing color, can be any alphabet or Blank.	
Representative (Tested) Model	DFL1-3027-Y, DFL1-3057-Y	
Model Difference	All construction and rating are the same, except CCT and the mounting arm.	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Architectural Flood and Spot Luminaires	
LED Manufacturer	Guangzhou Hongli Opto-Electronic Co., Ltd.	
LED Model	HL-AT-2835DW-S1-08-PCT-HR3	
Dimming	N/A	
Sample Number	STD170629NB-B1(2700K),B2(5700K)	
Date of Receipt	Aug.28, 2017	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	110-130 Vac, 50/60 Hz
Nominal Power	30W
Rated Initial Lamp Lumen	--
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K, 5700K

1.3 Test Specifications:

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 C78.377-2015 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

1.4 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 ℃ ± 1 ℃, 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 Summary of Test Result

Criteria Item	Measured Value			Compliance	Requirement (DLC V4.2)	
Power (W)	2700K	120V	32.91	N/A	N/A	
	5700K	120V	33.16			
Power Factor	2700K	120V	0.9745	Pass	>= 0.9(-3%)	
	5700K	120V	0.9764			
THD %	2700K	120V	22.03	Pass	<= 20(+5)	
	5700K	120V	22.11			
CRI	2700K	80.6		Pass	>= 80(-2)	
	5700K	80.6				
CCT (K)	2700K	2716		Pass	<=5700K	
	5700K	5332				
Luminous Intensity Distribution	Zonal lumens in the 0-90 °		99.9	Pass	>= 85%(-3%)	
Total Luminous	2700K	120V	3035.5	Pass	>=1000lm(-10%)	
	5700K	120V	3347			
Luminous Efficacy	2700K	120V	92.22	Pass	Standard: >= 90(-3%)	Premium: >= 110(-3%)
	5700K	120V	100.93			

2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2017-08-30	**Test Ambient:**	25.2 ℃
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	DFL1-3027-Y		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD170629 NB-B1	120.0	60	0.2814	32.91	0.9745	22.03
	110.0	60	0.2843	31.44	0.9852	16.02
	130.0	60	0.2681	34.88	0.9626	20.14

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2716
Duv	0.0029
Chromaticity (x, y)	x=0.4635 y=0.4193
Chromaticity (u', v')	u'=0.2610 v'=0.5312
Color Rendering Index (CRI)	80.6
R9	0

Special Color Rendering Indices			
R1	79	R9	0
R2	91	R10	80
R3	95	R11	78
R4	78	R12	74
R5	79	R13	81
R6	90	R14	98
R7	80	R15	69
R8	53	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	3035.5
Luminous Efficacy (lm/W)	92.24
Zonal lumens in the 0-90 °zone (%)	99.9
Beam Angle (°)	107.4
Center Beam Candle Power (cd)	1157

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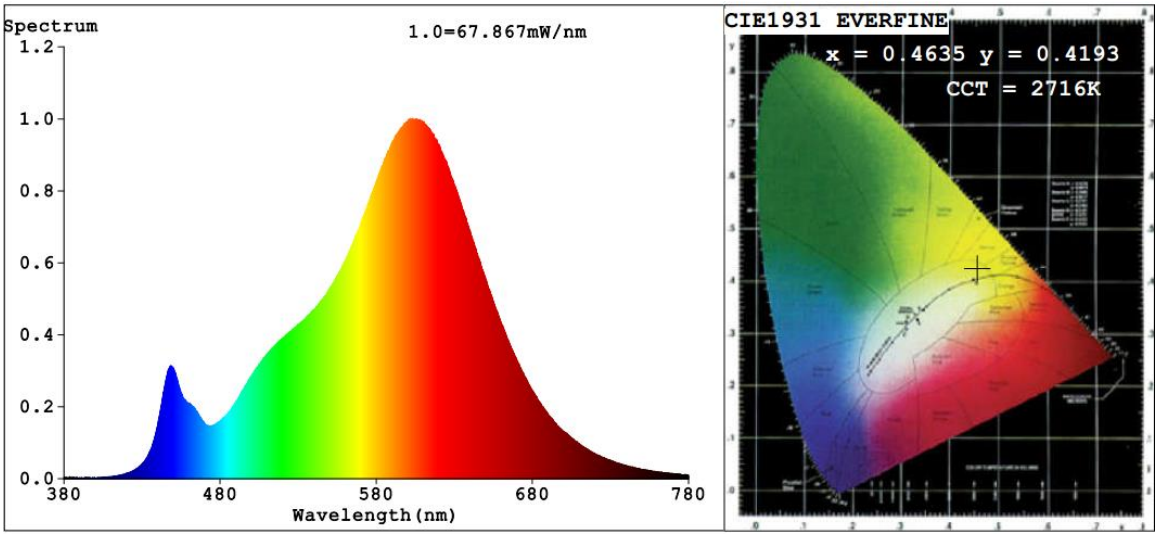
Spectral Power Distribution & Chromaticity Diagram

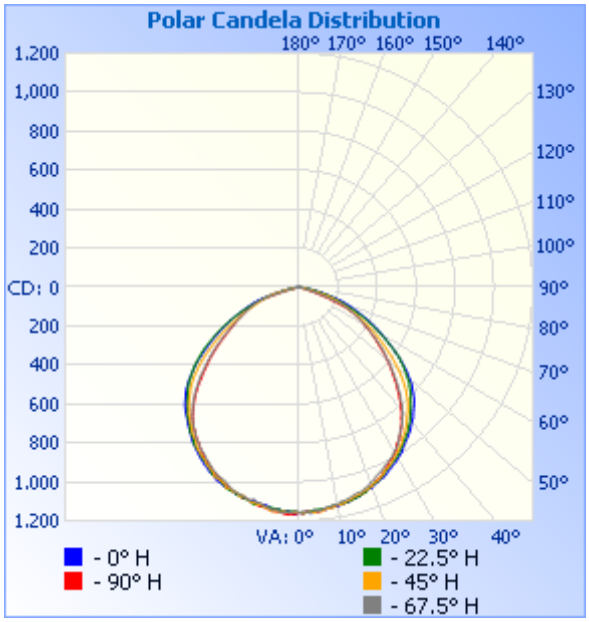


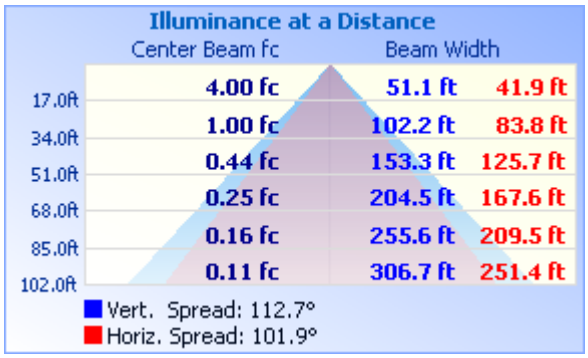
Zonal Lumen Tabulation

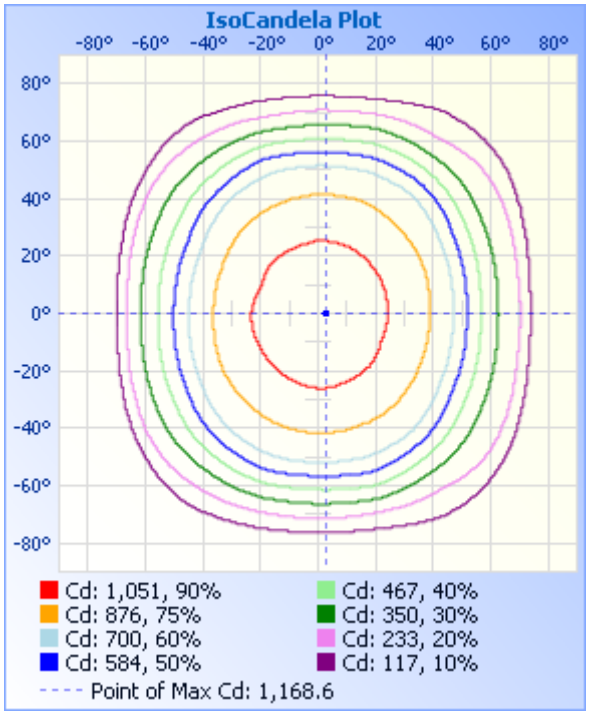
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	905.7	29.8%
0-40	1,491.1	49.1%
0-60	2,591.9	85.4%
60-90	439.6	14.5%
70-100	114.4	3.8%
90-120	0.4	0%
0-90	3,031.5	99.9%
90-180	3.3	0.1%
0-180	3,034.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	109.4	3.6%	90-100	0.0	0%
10-20	314.8	10.4%	100-110	0.1	0%
20-30	481.6	15.9%	110-120	0.3	0%
30-40	585.3	19.3%	120-130	0.5	0%
40-50	599.9	19.8%	130-140	0.6	0%
50-60	500.9	16.5%	140-150	0.7	0%
60-70	325.2	10.7%	150-160	0.6	0%
70-80	109.7	3.6%	160-170	0.4	0%
80-90	4.7	0.2%	170-180	0.2	0%

Photometric Data







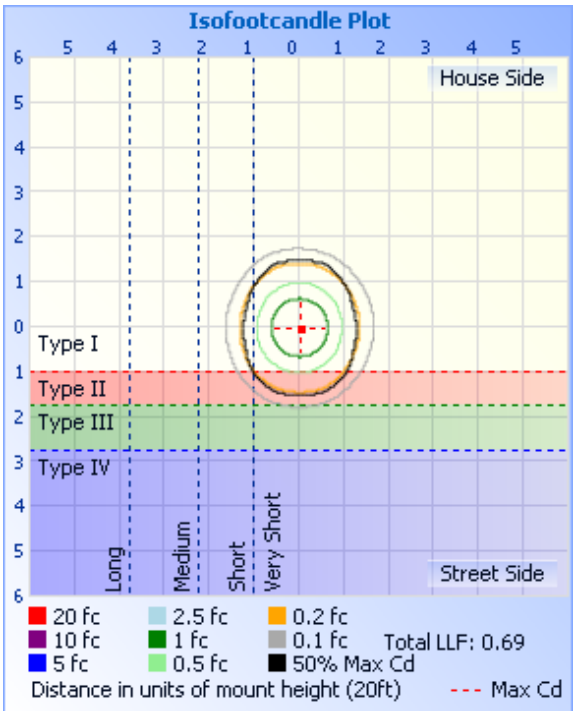


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Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	
0	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	
5	1153	1147	1152	1153	1157	1154	1140	1147	1148	1147	1159	1159	1156	1163	1146	1151	
10	1144	1134	1137	1132	1136	1141	1125	1135	1132	1135	1134	1127	1142	1143	1130	1143	
15	1119	1120	1110	1101	1117	1115	1106	1113	1113	1117	1108	1110	1121	1115	1108	1123	
20	1096	1088	1089	1069	1085	1076	1074	1087	1096	1095	1096	1077	1084	1086	1090	1090	
25	1059	1045	1038	1024	1036	1038	1036	1049	1057	1058	1045	1037	1045	1042	1048	1061	
30	1013	1007	992	975	984	981	984	994	1012	1004	998	982	988	995	1002	1013	
35	958	950	932	903	908	915	927	940	957	948	941	926	926	936	943	959	
40	901	885	862	823	814	835	860	881	892	883	875	852	850	870	874	899	
45	836	809	780	715	706	727	776	809	827	812	797	752	741	769	799	828	
50	746	726	672	602	596	614	673	721	738	729	698	628	614	641	714	737	
55	625	625	544	495	487	502	551	611	614	625	567	506	496	522	591	629	
60	494	486	424	391	390	395	427	481	488	502	436	393	389	398	452	502	
65	375	361	309	299	295	297	306	359	370	372	313	303	306	305	322	383	
70	263	236	212	160	120	157	203	237	260	242	214	233	234	230	214	260	
75	142	126	93.3	11.0	8.60	9.88	86.7	126	140	130	139	78.3	61.4	98.6	138	139	
80	42.4	40.8	4.86	3.86	3.60	2.71	3.49	32.2	38.6	40.4	8.40	7.12	7.46	7.43	27.6	42.5	
85	1.88	1.82	1.32	1.53	1.51	0.88	0.55	1.66	1.74	2.44	2.87	3.68	3.88	3.88	2.90	2.90	
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.16	0.05	0.00	0.00	0.00	0.08	0.14	
110	0.30	0.35	0.16	0.00	0.00	0.00	0.16	0.27	0.38	0.30	0.17	0.11	0.11	0.08	0.19	0.35	
115	0.33	0.43	0.33	0.11	0.19	0.27	0.30	0.43	0.54	0.54	0.30	0.24	0.25	0.22	0.33	0.54	
120	0.60	0.49	0.35	0.30	0.30	0.30	0.30	0.60	0.76	0.62	0.46	0.35	0.38	0.36	0.41	0.60	
125	0.73	0.68	0.44	0.46	0.52	0.44	0.46	0.68	0.82	0.76	0.57	0.49	0.58	0.58	0.52	0.68	
130	0.82	0.73	0.46	0.68	0.74	0.74	0.60	0.76	0.90	0.87	0.65	0.65	0.74	0.77	0.62	0.76	
135	1.11	0.76	0.65	0.76	0.74	0.74	0.71	0.76	0.90	0.90	0.76	0.76	0.85	0.79	0.71	0.76	
140	1.14	0.76	0.79	0.79	0.90	0.77	0.79	0.97	0.90	0.98	0.95	0.87	1.01	0.90	0.84	0.90	
145	1.14	0.81	1.09	0.95	1.15	0.82	1.14	1.17	0.87	1.11	1.12	1.06	1.21	1.07	1.03	1.03	
150	0.98	1.22	1.23	1.14	1.20	1.15	1.22	1.17	0.90	1.20	1.25	1.19	1.23	1.15	1.25	1.17	
155	1.14	1.20	1.23	1.19	1.21	1.15	1.33	1.25	1.20	1.20	1.26	1.22	1.21	1.20	1.25	1.14	
160	1.31	1.25	1.28	1.19	1.23	1.23	1.38	1.22	1.44	1.25	1.34	1.33	1.21	1.29	1.30	1.17	
165	1.55	1.30	1.47	1.36	1.42	1.42	1.44	1.39	1.58	1.52	1.39	1.44	1.34	1.42	1.41	1.39	
170	1.55	1.39	1.64	1.63	1.67	1.61	1.63	1.58	1.61	1.60	1.64	1.76	1.67	1.81	1.69	1.69	
175	1.60	1.60	1.80	1.79	2.00	1.94	1.71	1.66	1.71	1.66	1.64	2.01	1.84	2.05	1.93	1.77	
180	1.60	1.58	1.94	1.82	2.05	1.97	1.74	1.68	1.71	1.60	1.61	1.93	1.84	2.00	1.93	1.77	

2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2017-08-30	**Test Ambient:**	25.2 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	DFL1-3057-Y		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD170629 NB-B2	120.0	60	0.2830	33.16	0.9764	22.11
	110.0	60	0.2902	31.56	0.9887	16.13
	130.0	60	0.2794	34.97	0.9629	20.25

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5332
Duv	0.0023
Chromaticity (x, y)	x=0.3366 y=0.3490
Chromaticity (u', v')	u'=0.2066 v'=0.4821
Color Rendering Index (CRI)	80.6
R9	0

Special Color Rendering Indices			
R1	79	R9	0
R2	84	R10	63
R3	88	R11	82
R4	82	R12	61
R5	80	R13	80
R6	79	R14	94
R7	85	R15	73
R8	66	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	3347
Luminous Efficacy (lm/W)	100.93

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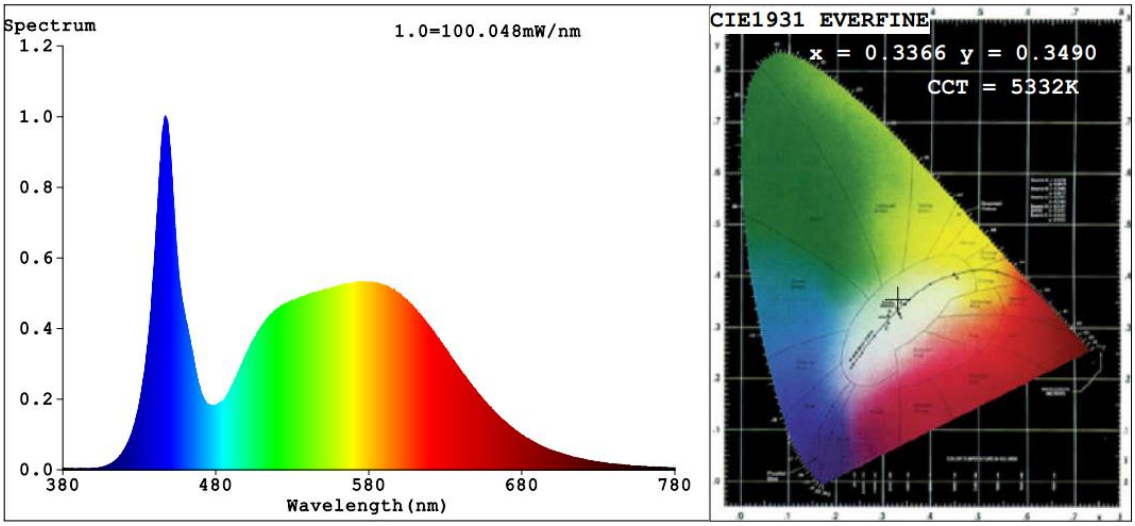
Spectral Power Distribution & Chromaticity Diagram



2.4 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
DFL1-3027-Y	2700K	3035.5	32.91	92.24
DFL1-3030-Y	3000K	3087.4*1	33.04*2	93.46*3
DFL1-3035-Y	3500K	3139.3*1	33.04*2	95.03*3
DFL1-3040-Y	4000K	3191.3*1	33.04*2	96.60*3
DFL1-3045-Y	4500K	3243.2*1	33.04*2	98.17*3
DFL1-3050-Y	5000K	3295.1*1	33.04*2	99.75*3
DFL1-3057-Y	5700K	3347	33.16	100.93

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

3087.4= (3347-3035.5)/6+3035.5

3139.3= (3347-3035.5)/6+3087.4

3191.3= (3347-3035.5)/6+3139.3

3243.2= (3347-3035.5)/6+3191.3

3295.1= (3347-3035.5)/6+3243.2

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

33.04= (32.91+33.16)/2

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

93.46= 3087.4/33.04

95.03= 3139.3/33.04

96.60= 3191.3/33.04

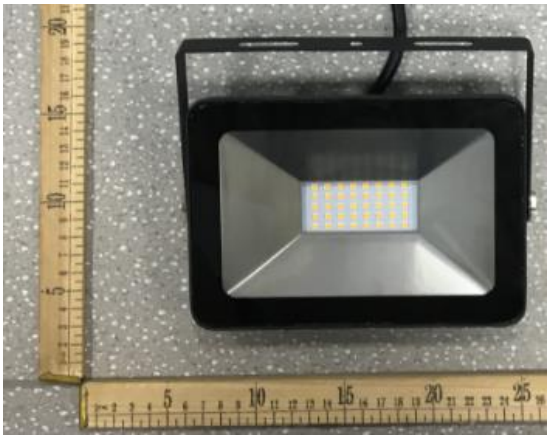
98.17= 3243.2/33.04

99.75= 3295.1/33.04

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-2000	Verified by D204 standard lamp	
D204	Standard Lamp	2017-02-09	2018-02-08
ST-R-704	Power Meter for Integrating Sphere	2017-01-08	2018-01-07
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
D908S	Standard Lamp	2017-02-14	2018-02-13
ST-R-711	Power Meter for Goniophotometer	2017-01-08	2018-01-07
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

4. Product Photo



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