

LM-79-08 Test Report

For

Green Logic LED Electrical Supply Inc.

(Brand Name: Builders Pack)

ShenFuBao Industry Park, Bonded area, Futian District,
Shenzhen, 518057, China

2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces

Model name(s): 44-6012-50W-xxK-TR2-D-S-B

Remark: where the first XX represent for CCT, it can be 35 for 3500K, 40 for 4000K,
45 for 4500K, 50 for 5000K; the second X may be N stands for without Sensor, or S
stands for with Sensor;

Representative (Tested) Model: 44-6012-50W-35K-TR2-D-S-B
44-6012-50W-50K-TR2-D-S-B

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

Test & Report By:

Jack Luo

Engineer: Jack Luo

Date: Dec.18,2017

Review By:

Univ Xie

Manager: Univ Xie

Note: 1. The results contained in this report pertain only to the rested samples.

2. 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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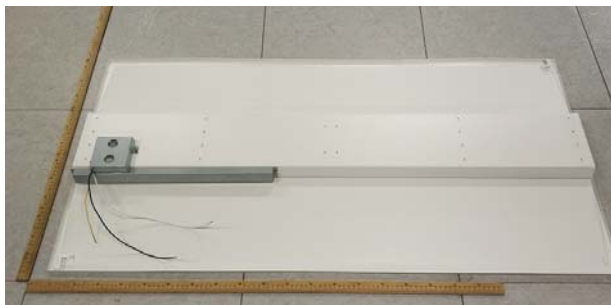
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	Green Logic LED Electrical Supply Inc.	
Brand Name	Builders Pack	
Model Number	44-6012-50W-xxK-TR2-D-S-B	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces	
Rated Voltage / Frequency	120-277 Vac, 50/60 Hz	
Nominal Power	50W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K,4000K,4500K,5000K	
LED Manufacturer	Everlight Electronics Co., LTD	
LED Model	67-21S Series	
Sample Number	GZE1711045-B1(3500K),B2(5000K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	Nov.16,2017
Date of Test	Nov.17,2017
Test item	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 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

1.3 Test Methods

<p>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° C ± 1° 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° vertical intervals and 22.5° horizontal intervals.</p>
<p>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° C ± 1° 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.</p>
<p>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° C ± 1° 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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-11-17	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	44-6012-50W-40K-TR2-D-S-B		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171104	120.0	60	0.4257	50.00	0.9787	7.63
5-B1	277.0	60	0.1813	48.89	0.9734	9.12
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

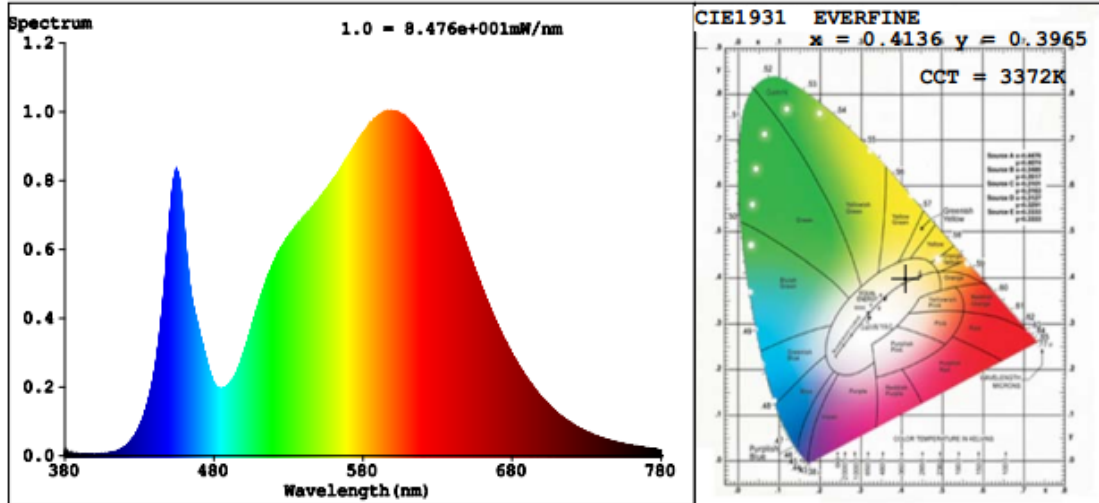
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	11
Frequency (Hz)	60	R2	89	R10	72
CCT (K)	3372	R3	94	R11	77
Duv	0.0008	R4	80	R12	57
Chromaticity (x, y)	x=0.4136 y=0.3965	R5	79	R13	82
Chromaticity (u', v')	u'=0.2387 v'=0.5149	R6	84	R14	97
Color Rendering Index (CRI)	81.8	R7	86	R15	75
R9	11	R8	63	--	--

Photometric Measurement –Goniophotometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	6275.1	6235.9	>=3000(-10%)	
Luminous Efficacy (lm/W)	125.50	127.55	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	124.72		100(-3%)	125(-3%)
Zonal lumens in the 0-60° zone (%)	78.3	--	>= 75(-3)	
SC: 0-180° (if applicable)	1.23	--	1.0-2.0(±0.1)	
SC: 90-270° (if applicable)	1.20	--	1.0-2.0(±0.1)	
Beam Angle (°)	105.8	--	--	
Center Beam Candle Power (cd)	2310	--	--	

Spectral Power Distribution & Chromaticity Diagram

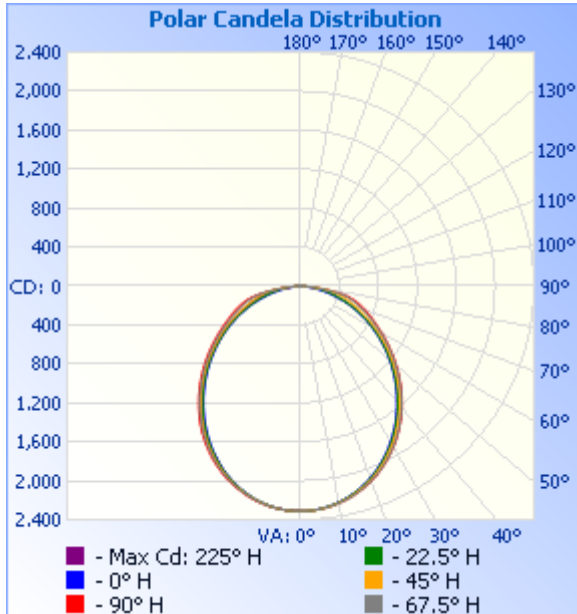


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,763.1	28.1%
0-40	2,851.8	45.5%
0-60	4,912.6	78.3%
60-90	1,359.4	21.7%
70-100	618.7	9.9%
90-120	1.5	0%
0-90	6,272.0	100%
90-180	2.5	0%
0-180	6,274.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	218.1	3.5%	90-100	0.6	0%
10-20	620.0	9.9%	100-110	0.5	0%
20-30	924.9	14.7%	110-120	0.4	0%
30-40	1,088.8	17.4%	120-130	0.2	0%
40-50	1,096.2	17.5%	130-140	0.2	0%
50-60	964.6	15.4%	140-150	0.2	0%
60-70	741.3	11.8%	150-160	0.2	0%
70-80	484.1	7.7%	160-170	0.1	0%
80-90	134.0	2.1%	170-180	0.1	0%

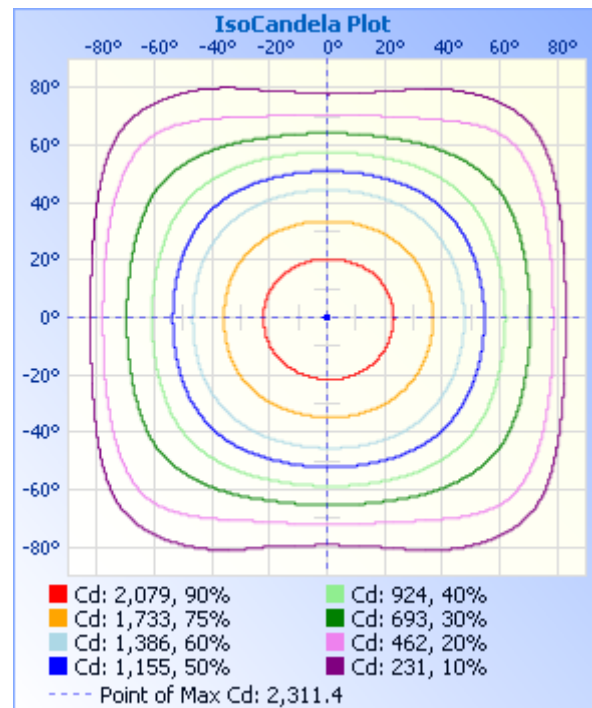
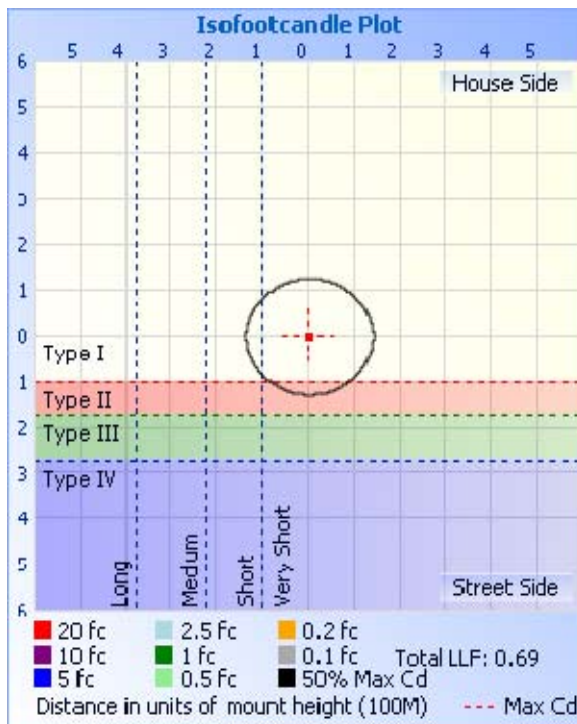
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
4.0M	13.41 fc	10.1 M	11.1 M
8.0M	3.35 fc	20.2 M	22.2 M
12.0M	1.49 fc	30.2 M	33.3 M
16.0M	0.84 fc	40.3 M	44.4 M
20.0M	0.54 fc	50.4 M	55.5 M

■ Vert. Spread: 103.1°
■ Horiz. Spread: 108.4°



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Table--1

UNIT: cd

C (DEG) y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	2310	
5	2300	2300	2299	2296	2294	2297	2298	2299	2298	2298	2295	2297	2297	2300	2298	2299	
10	2267	2265	2263	2256	2254	2256	2259	2263	2263	2262	2257	2256	2260	2259	2263	2264	
15	2212	2208	2203	2189	2185	2189	2196	2206	2207	2204	2196	2191	2194	2197	2202	2205	
20	2134	2128	2117	2098	2094	2100	2112	2125	2128	2123	2114	2103	2104	2109	2118	2125	
25	2036	2027	2010	1987	1979	1989	2006	2025	2028	2022	2009	1992	1991	1999	2014	2025	
30	1918	1904	1884	1858	1848	1859	1879	1905	1908	1904	1886	1862	1861	1870	1890	1902	
35	1781	1766	1742	1710	1700	1713	1736	1767	1771	1767	1745	1718	1714	1727	1749	1765	
40	1630	1612	1586	1553	1541	1554	1583	1614	1619	1616	1590	1560	1555	1568	1594	1612	
45	1468	1446	1420	1384	1374	1387	1417	1451	1457	1454	1424	1393	1389	1402	1430	1449	
50	1301	1277	1246	1212	1202	1214	1247	1282	1290	1284	1252	1218	1217	1229	1258	1281	
55	1135	1108	1071	1036	1027	1039	1074	1114	1124	1115	1078	1044	1041	1052	1083	1113	
60	974	945	899	860	851	863	904	951	964	952	909	867	864	876	913	951	
65	830	794	735	686	675	689	743	799	821	799	746	695	688	701	748	799	
70	705	665	581	518	501	523	593	670	698	669	595	528	514	534	596	671	
75	581	546	456	362	332	369	466	546	577	547	466	374	345	379	469	549	
80	377	376	332	227	178	235	342	376	381	384	345	238	191	243	348	384	
85	104	107	115	110	58.6	117	122	109	107	116	131	123	67.5	127	133	116	
90	1.15	1.21	1.36	1.36	0.86	0.98	1.31	1.36	0.92	0.93	0.92	0.71	1.33	1.22	0.97	0.92	
95	0.31	0.36	0.46	0.72	0.56	0.62	0.59	0.57	0.31	0.38	0.21	0.31	1.34	0.67	0.31	0.21	
100	0.17	0.21	0.35	0.74	0.72	0.59	0.52	0.36	0.21	0.29	0.21	0.39	1.64	0.61	0.36	0.25	
105	0.10	0.21	0.40	0.76	1.16	0.59	0.52	0.36	0.36	0.34	0.21	0.41	1.39	0.53	0.40	0.24	
110	0.46	0.33	0.52	0.67	1.13	0.62	0.54	0.52	0.36	0.31	0.10	0.41	1.07	0.42	0.39	0.23	
115	0.47	0.39	0.67	0.51	0.92	0.45	0.57	0.62	0.35	0.31	0.10	0.05	0.51	0.20	0.37	0.22	
120	0.47	0.47	0.79	0.00	0.10	0.00	0.66	0.65	0.29	0.31	0.10	0.00	0.00	0.00	0.36	0.17	
125	0.48	0.50	0.76	0.00	0.05	0.00	0.65	0.67	0.31	0.29	0.10	0.00	0.00	0.00	0.31	0.15	
130	0.50	0.48	0.73	0.00	0.05	0.00	0.63	0.61	0.34	0.27	0.10	0.04	0.05	0.00	0.15	0.17	
135	0.51	0.45	0.42	0.00	0.05	0.00	0.62	0.58	0.40	0.34	0.10	0.18	0.14	0.00	0.00	0.19	
140	0.46	0.42	0.05	0.00	0.05	0.00	0.21	0.55	0.50	0.35	0.10	0.30	0.31	0.10	0.00	0.21	
145	0.41	0.31	0.00	0.00	0.05	0.08	0.00	0.47	0.46	0.36	0.10	0.46	0.51	0.26	0.05	0.18	
150	0.38	0.24	0.00	0.20	0.23	0.18	0.00	0.36	0.42	0.27	0.21	0.51	0.65	0.57	0.31	0.18	
155	0.31	0.16	0.00	0.33	0.41	0.30	0.05	0.28	0.44	0.31	0.21	0.51	0.81	0.82	0.52	0.24	
160	0.26	0.05	0.20	0.46	0.41	0.38	0.05	0.18	0.46	0.35	0.21	0.51	0.93	0.83	0.68	0.27	
165	0.26	0.05	0.29	0.57	0.51	0.44	0.29	0.05	0.47	0.36	0.26	0.51	0.95	0.85	0.71	0.46	
170	0.38	0.10	0.36	0.61	0.72	0.78	0.39	0.31	0.45	0.41	0.34	0.51	0.97	0.86	0.74	0.57	
175	0.48	0.26	0.43	0.66	0.79	0.85	0.41	0.41	0.42	0.45	0.41	0.46	0.87	0.80	0.76	0.47	
180	0.47	0.36	0.41	0.66	0.77	0.98	0.46	0.26	0.42	0.47	0.31	0.41	0.67	0.77	0.83	0.47	

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-11-17	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	44-6012-50W-50K-TR2-D-S-B		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE171104	120.0	60	0.4276	50.19	0.9781	7.95
5-B2	277.0	60	0.1822	49.07	0.9722	9.73
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

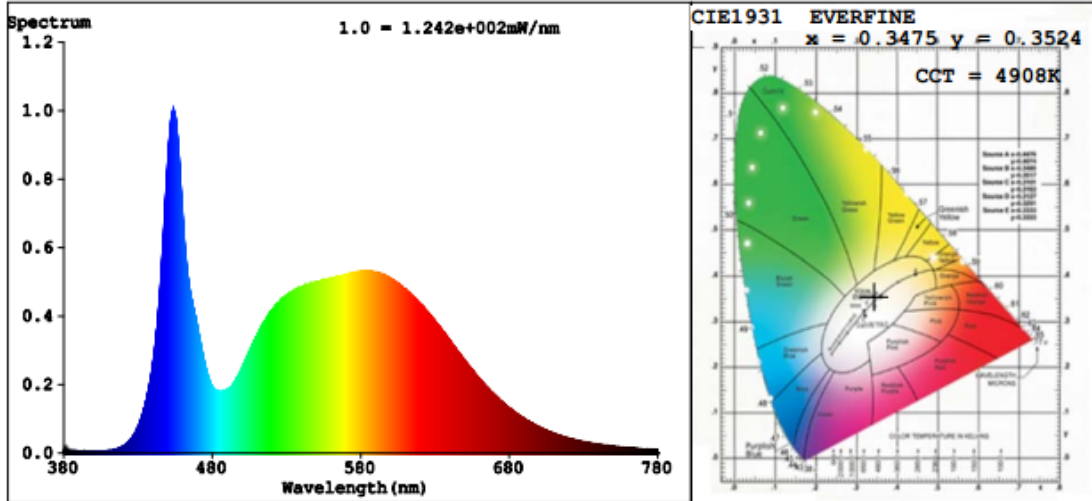
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	17
Frequency (Hz)	60	R2	89	R10	71
CCT (K)	4908	R3	91	R11	78
Duv	-0.0006	R4	81	R12	50
Chromaticity (x, y)	x=0.3475 y=0.3524	R5	81	R13	84
Chromaticity (u', v')	u'=0.2128 v'=0.4854	R6	82	R14	95
Color Rendering Index (CRI)	82.9	R7	88	R15	79
R9	17	R8	70	--	--

Photometric Measurement –Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	6455	6390	>=3000(-10%)	
Luminous Efficacy (lm/W)	128.61	130.22	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	127.32		100(-3%)	125(-3%)

Spectral Power Distribution & Chromaticity Diagram



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2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
44-6012-35W-40K-TR2-D-S-B	3500K	6275.1	50.00	125.50
44-6012-40W-40K-TR2-D-S-B	4000K	6335 ^{*1}	50.10 ^{*2}	126.45 ^{*3}
44-6012-45W-40K-TR2-D-S-B	4500K	6395 ^{*1}	50.10 ^{*2}	127.64 ^{*3}
44-6012-50W-40K-TR2-D-S-B	5000K	6455	50.19	128.61

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

$$6335=(6455-6275.1)/3*1+6275.1$$

$$6395=(6455-6275.1)/3*2+6275.1$$

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

$$50.10=(60.19+50.00)/2$$

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

$$126.45=6335/50.10$$

$$127.64=6395/50.10$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06

Expand Uncertainty:
Photometric Measurement (Sphere):2.04%, k=2
Chromaticity Measurement(Sphere):28.8K, k=2
Photometric Measurement(Goniophotometer):2.36%, k=2

******* END OF REPORT *******

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