

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

Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires

Model name(s): LWP2-75

Representative (Tested) Model: LWP2-75(2700K)
LWP2-75(5700K)

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

Test & Report By:

Charman Chen

Engineer: Charman Chen

Date: Dec.21,2016

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

1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA EAEC	
Model Number	LWP2-75	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-Mounted Area Luminaires	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	75W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K,5700K	
LED Manufacturer	Zhongshan Dongguan Star Photoelectric Technology Co.,Ltd.	
LED Model	5730	
Sample Number	STD161215NB-C1(2700K), C2(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	Dec.18,2016
Date of Test	Dec.19,2016
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 C78.377-2008 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

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 277 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 277 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 277 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)

Test date	2016-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LWP2-75(2700K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD161215	120.0	60	0.5754	68.09	0.9862	9.27
NB-C1	277.0	60	0.2569	65.05	0.9142	16.54
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0V	R1	80	R9	1
Frequency (Hz)	60	R2	92	R10	83
CCT (K)	2722	R3	94	R11	77
Duv	-0.0005	R4	78	R12	73
Chromaticity (x, y)	x=0.4573 y=0.4087	R5	80	R13	83
Chromaticity (u', v')	u'=0.2617 v'=0.5262	R6	91	R14	97
Color Rendering Index (CRI)	81.1	R7	79	R15	72
R9	1	R8	54	--	--

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)	8980.9	8582.9	>=5000-10000 (±10%)	
Luminous Efficacy (lm/W)	131.90	131.94	--	
Total Luminous (lm)(0 °-90 °zone)	7328.7	7007.6	--	
Luminous Efficacy (lm/W) (0 °-90 ° zone)	107.63	107.73	Standard: >= 90(-3%)	Premium: >= 115(-3%)
Zonal lumens in the 80-90 °zone (%) (0-90 °zone)	12.27	--	<=10(+3)	
Beam Angle (°)	94.2	--	--	
Center Beam Candle Power (cd)	1796	--	--	

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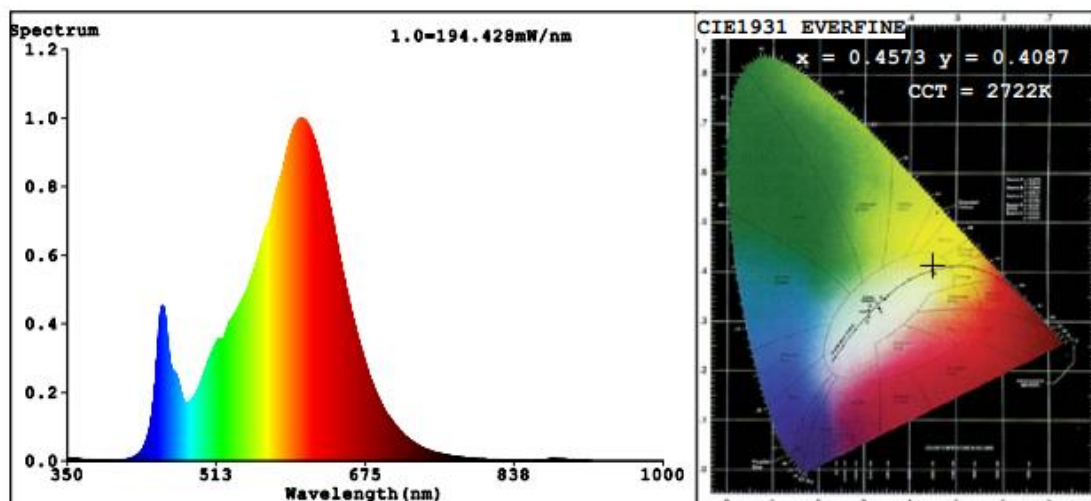
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Spectral Power Distribution & Chromaticity Diagram

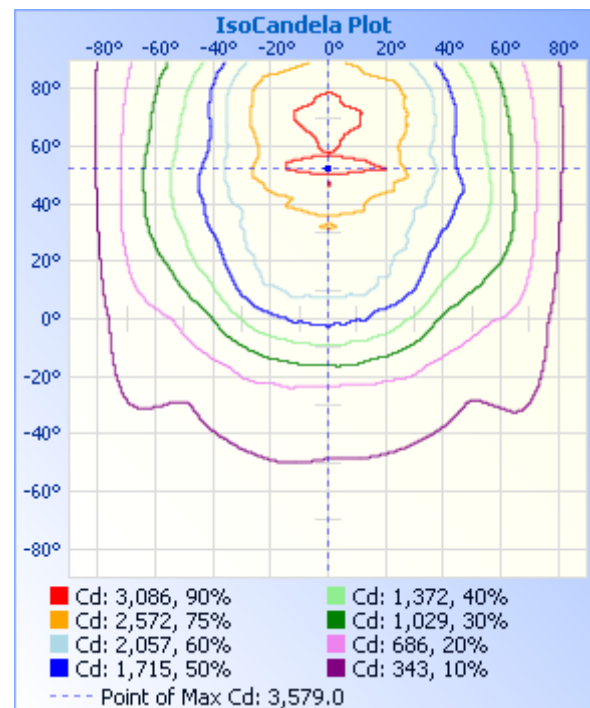
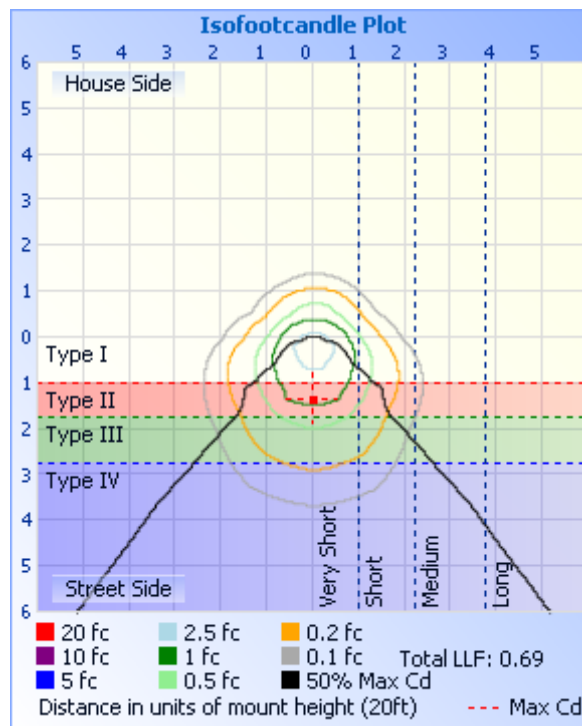
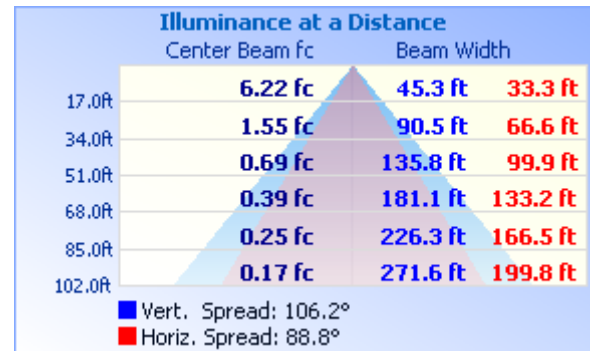
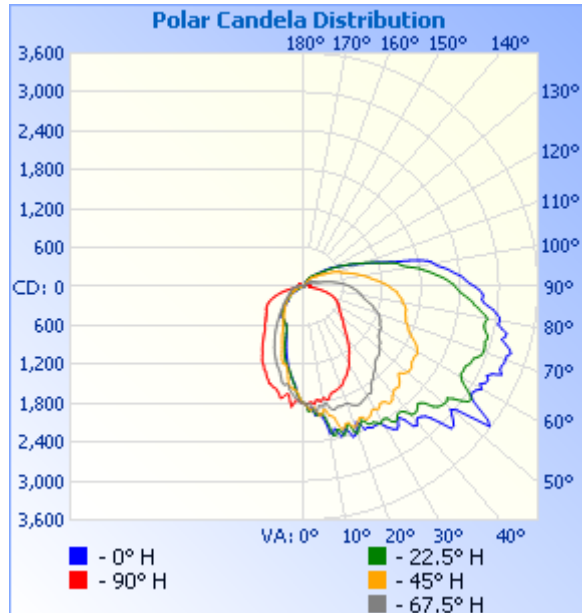


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,336.1	14.9%
0-40	2,200.6	24.5%
0-60	4,274.5	47.6%
60-90	3,054.2	34%
70-100	2,650.0	29.5%
90-120	1,399.2	15.6%
0-90	7,328.7	81.6%
90-180	1,657.4	18.4%
0-180	8,986.1	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	167.1	1.9%	90-100	695.2	7.7%
10-20	475.8	5.3%	100-110	449.5	5%
20-30	693.1	7.7%	110-120	254.5	2.8%
30-40	864.5	9.6%	120-130	139.8	1.6%
40-50	980.8	10.9%	130-140	70.5	0.8%
50-60	1,093.2	12.2%	140-150	35.0	0.4%
60-70	1,099.4	12.2%	150-160	11.4	0.1%
70-80	1,055.5	11.7%	160-170	1.3	0%
80-90	899.4	10.0%	170-180	0.2	0%

Photometric Data



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Table--1 UNIT: cd

C (DEG) γ (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	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	
5	1802	1857	1846	1945	1992	1970	1884	1921	1822	1698	1666	1582	1539	1560	1600	1704	
10	1704	1738	1983	2131	2286	2156	1939	1828	1739	1573	1403	1352	1323	1302	1432	1524	
15	1637	1877	2227	2452	2348	2373	2279	1925	1687	1427	1237	1113	1056	1138	1231	1406	
20	1582	1846	2268	2396	2365	2410	2297	1920	1635	1271	1030	851	780	834	991	1249	
25	1425	1921	2181	2290	2399	2338	2265	2005	1527	1123	823	671	650	653	791	1073	
30	1292	1839	2123	2355	2484	2393	2175	1936	1385	936	667	625	611	615	636	903	
35	1113	1713	2153	2489	2513	2495	2168	1806	1212	760	588	600	583	573	549	739	
40	959	1604	2040	2603	2696	2578	2141	1690	1036	612	521	556	537	523	471	592	
45	858	1538	2035	2548	2967	2532	2080	1573	871	498	455	456	413	425	412	480	
50	767	1475	2085	2882	2944	2813	2058	1519	763	414	380	367	317	335	352	401	
55	708	1454	2029	3217	3298	3088	2021	1414	673	338	310	294	298	269	290	330	
60	673	1406	2035	2743	3157	2791	2013	1343	613	287	250	238	205	234	236	277	
65	610	1343	1809	2794	3191	2819	1827	1295	559	251	195	180	137	171	183	240	
70	512	1227	1765	2897	3296	2939	1687	1218	494	223	159	109	105	106	144	220	
75	378	1034	1718	2836	3146	2925	1615	1080	384	205	126	65.2	53.0	62.6	120	209	
80	225	929	1661	2739	3056	2864	1554	922	237	182	71.4	19.5	8.57	15.8	73.2	185	
85	114	816	1544	2480	2773	2594	1458	828	119	142	36.0	3.45	3.61	4.16	42.5	143	
90	85.0	675	1374	2261	2636	2327	1317	715	87.4	110	26.7	3.62	4.00	3.54	29.7	109	
95	86.3	540	1147	1988	2338	2051	1117	580	87.2	92.5	20.9	3.93	4.34	3.54	22.1	91.5	
100	92.4	410	958	1668	2035	1705	949	414	95.3	77.2	16.2	4.02	4.39	3.54	18.5	78.8	
105	91.4	282	768	1381	1503	1422	781	262	96.4	65.1	12.7	3.99	4.22	3.54	15.3	66.1	
110	90.0	202	612	1047	1067	1088	637	199	91.7	53.1	10.1	3.73	4.03	3.51	12.4	54.0	
115	83.1	165	485	787	806	828	547	166	83.9	40.2	7.97	3.56	3.74	3.26	9.85	40.5	
120	69.1	143	379	610	632	626	408	143	71.0	29.5	6.20	3.16	3.35	2.95	7.67	28.9	
125	50.8	119	304	472	498	473	337	119	54.5	21.0	4.65	2.63	2.81	2.61	5.83	19.8	
130	33.0	94.6	228	333	367	339	252	97.6	39.1	15.5	3.85	2.60	2.76	2.47	4.50	13.7	
135	21.2	66.9	194	252	270	268	216	72.5	26.5	11.6	2.93	2.38	2.42	2.35	3.14	9.48	
140	13.9	40.8	172	207	218	218	186	48.6	18.9	8.63	2.40	2.38	2.42	2.41	2.15	6.46	
145	9.27	20.5	124	167	169	181	138	27.4	13.0	6.41	2.40	2.41	2.51	2.47	2.16	4.33	
150	6.15	8.96	72.8	128	143	142	89.0	12.5	8.18	4.85	2.48	2.57	2.54	2.64	2.33	2.96	
155	3.93	4.77	30.3	76.7	100.0	88.8	35.9	6.25	5.05	3.62	2.59	2.69	2.62	2.64	2.44	2.19	
160	2.50	2.43	3.63	31.8	46.8	34.2	8.76	2.69	3.03	2.87	2.74	2.86	2.65	2.64	2.49	2.25	
165	2.36	1.98	1.78	1.80	9.90	2.70	1.28	1.54	2.78	2.99	3.02	3.03	2.65	2.64	2.49	2.25	
170	2.69	2.51	2.09	1.78	1.61	1.59	1.47	1.79	2.75	2.90	3.04	3.05	2.65	2.64	2.49	2.22	
175	2.72	2.90	2.59	2.15	2.11	1.87	1.90	2.17	2.72	2.65	3.04	3.05	2.65	2.60	2.35	2.22	
180	2.67	2.96	2.59	2.35	2.17	2.13	1.96	2.17	2.72	2.65	2.87	2.63	2.34	2.18	2.21	1.99	

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-12-19	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LWP2-75(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD161215	120.0	60	0.5782	68.98	0.9941	10.54
NB-C2	277.0	60	0.2615	67.82	0.9364	16.75
DLC Pass Criteria					$\geq 0.9(-3\%)$	$\leq 20(+5)$

Chromaticity Measurement - Sphere-Spectroradiometer Method:

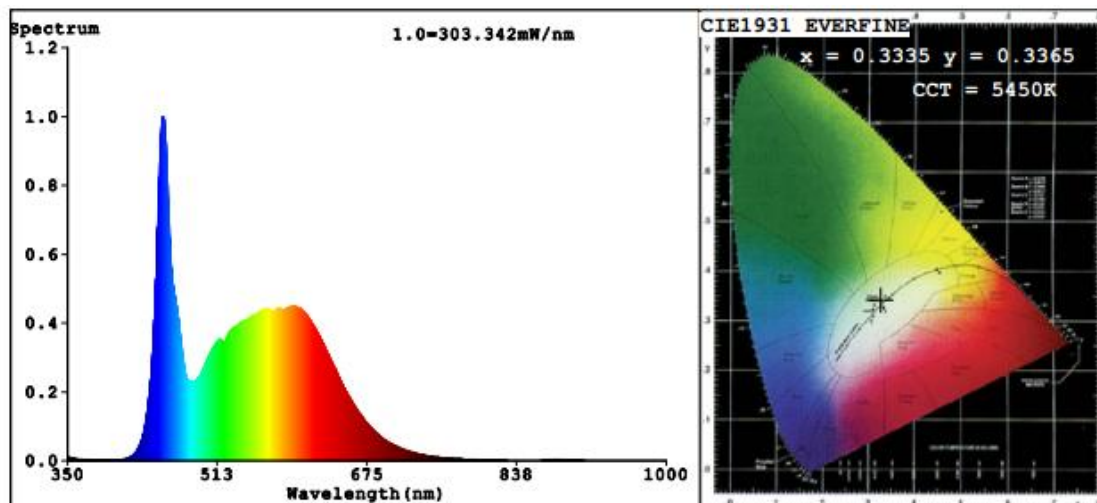
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	88	R9	30
Frequency (Hz)	60	R2	94	R10	84
CCT (K)	5450	R3	95	R11	85
Duv	-0.0028	R4	86	R12	63
Chromaticity (x, y)	x=0.3335 y=0.3365	R5	87	R13	90
Chromaticity (u', v')	u'=0.2094 v'=0.4754	R6	88	R14	98
Color Rendering Index (CRI)	87.3	R7	88	R15	85
R9	30	R8	74	--	--

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)	9364	9172	5000-10000 ($\pm 10\%$)	
Luminous Efficacy (lm/W)	135.75	135.24	--	
Total Luminous (lm) (0 °-90 ° zone)	7641.0	7484.4	--	
Luminous Efficacy (lm/W) (0 °-90 ° zone)	110.77	110.36	Standard: $\geq 95(-3\%)$	Premium: $\geq 115(-3\%)$

* These values are calculated assuming ZLD of 0 °-90 ° zone is 81.6% (see “Zonal Lumen Tabulation” on page 5).

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)
LWP2-75(2700K)	2700K	8980.9	68.09	131.9
LWP2-75(3000K)	3000K	9044.8	68.54	131.97
LWP2-75(3500K)	3500K	9108.6	68.54	132.90
LWP2-75(4000K)	4000K	9172.5	68.54	133.84
LWP2-75(4500K)	4500K	9236.3	68.54	134.77
LWP2-75(5000K)	5000K	9300.2	68.54	135.70
LWP2-75(5700K)	5700K	9364	68.98	135.75

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

$$9044.8 = (9364 - 8980.9) / 6 + 8980.9$$

$$9108.6 = (9364 - 8980.9) / 6 + 9044.8$$

$$9172.5 = (9364 - 8980.9) / 6 + 9108.6$$

$$9236.3 = (9364 - 8980.9) / 6 + 9172.5$$

$$9300.2 = (9364 - 8980.9) / 6 + 9236.3$$

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

$$68.54 = (68.09 + 68.98) / 2$$

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

$$131.97 = 9044.8 / 68.54$$

$$132.90 = 9108.6 / 68.54$$

$$133.84 = 9172.5 / 68.54$$

$$134.77 = 9236.3 / 68.54$$

$$135.75 = 9300.2 / 68.54$$

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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