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

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

Model name(s): LWP2-30

Representative (Tested) Model: LWP2-30(2700K)
LWP2-30(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

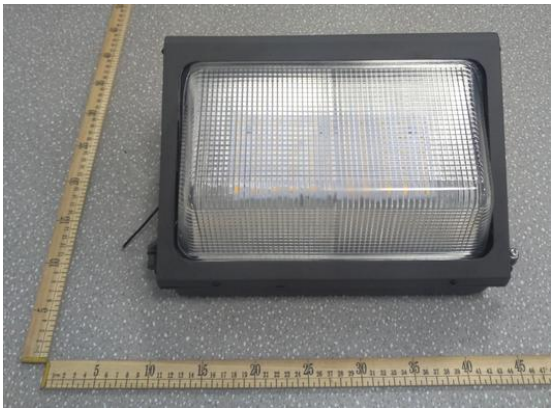
Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA EAEC	
Model Number	LWP2-30	
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	30W	
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-A1(2700K), A2(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 °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 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 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 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 ºC ±1 ºC. 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 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LWP2-30(2700K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD161215	120.0	60	0.2345	27.91	0.9918	9.22
NB-A1	277.0	60	0.1123	28.10	0.9034	13.62
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method :

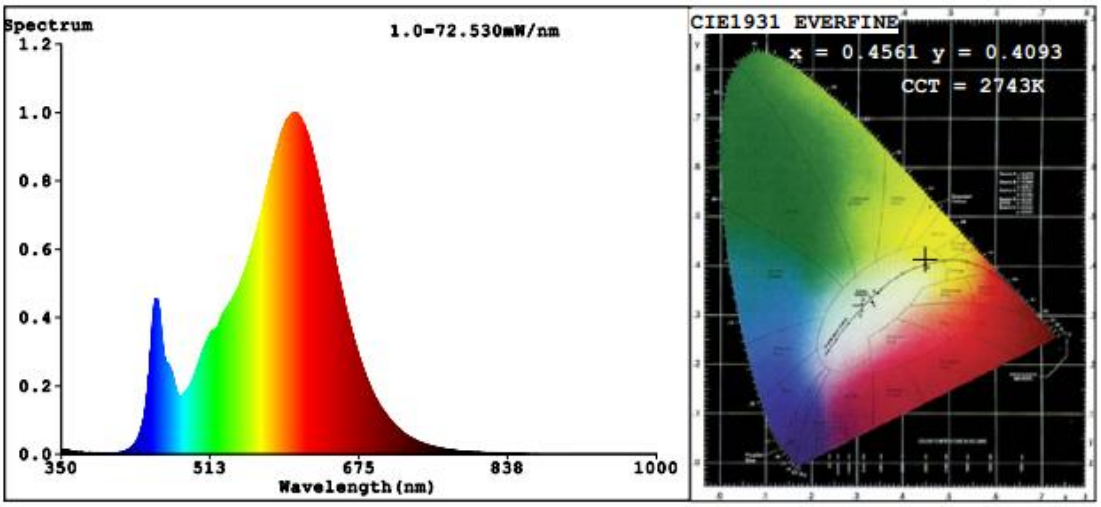
Parameter	Result
Test Voltage (V)	120.0V
Frequency (Hz)	60
CCT (K)	2743
Duv	-0.0002
Chromaticity (x, y)	x=0.4561 y=0.4093
Chromaticity (u', v')	u'=0.2607 v'=0.5263
Color Rendering Index (CRI)	80.1
R9	0

Special Color Rendering Indices			
R1	79	R9	0
R2	92	R10	81
R3	93	R11	75
R4	77	R12	72
R5	79	R13	82
R6	91	R14	97
R7	79	R15	70
R8	52	--	--

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)	3423.1	3430.3	>=300-5000 (±10%)	
Luminous Efficacy (lm/W)	122.65	122.07	--	
Total Luminous (lm)(0 °-90 °zone)	2753.9	2759.3	--	
Luminous Efficacy (lm/W) (0 °-90 ° zone)	98.67	98.20	Standard: >= 90(-3%)	Premium: >= 110(-3%)
Zonal lumens in the 80-90 °zone (%) (0-90 °zone)	12.48	--	<=10(+3)	
Beam Angle (°)	97.7	--	--	
Center Beam Candle Power (cd)	602	--	--	

Spectral Power Distribution & Chromaticity Diagram

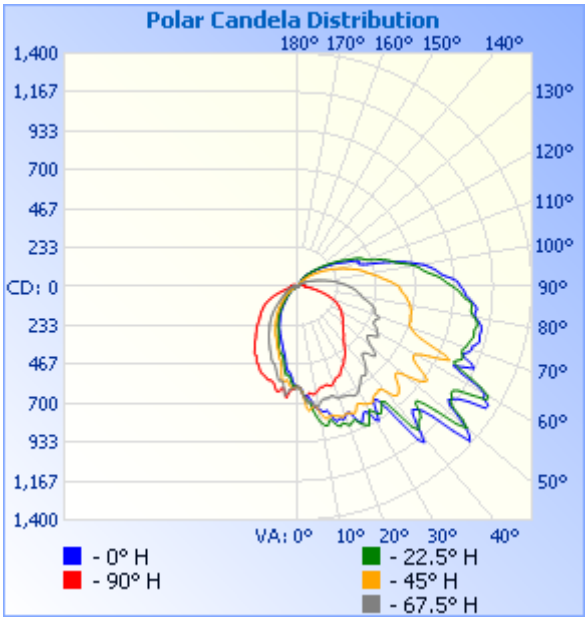


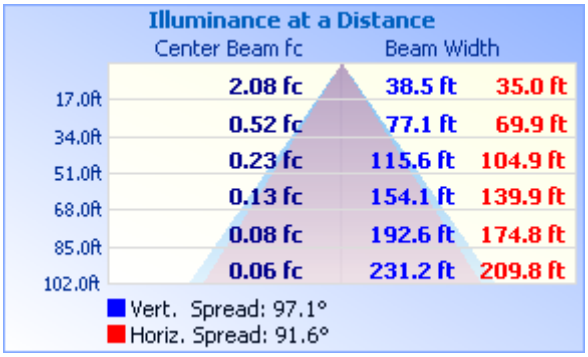
Zonal Lumen Tabulation

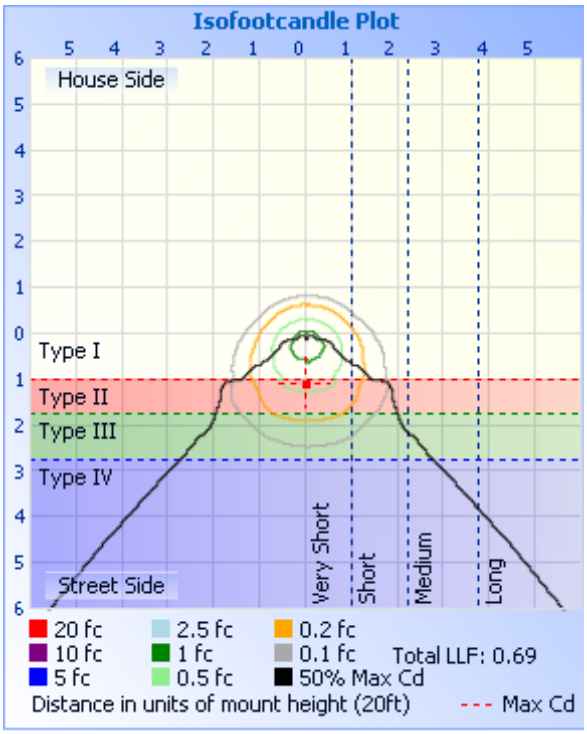
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	494.6	14.4%
0-40	817.0	23.9%
0-60	1,613.0	47.1%
60-90	1,140.9	33.3%
70-100	998.6	29.2%
90-120	564.7	16.5%
0-90	2,753.9	80.4%
90-180	670.6	19.6%
0-180	3,424.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	61.1	1.8%	90-100	271.3	7.9%
10-20	172.8	5.0%	100-110	182.5	5.3%
20-30	260.6	7.6%	110-120	111.0	3.2%
30-40	322.4	9.4%	120-130	61.0	1.8%
40-50	376.9	11.0%	130-140	29.3	0.9%
50-60	419.1	12.2%	140-150	12.5	0.4%
60-70	413.6	12.1%	150-160	2.9	0.1%
70-80	383.6	11.2%	160-170	0.2	0%
80-90	343.7	10.0%	170-180	0.1	0%

Photometric Data







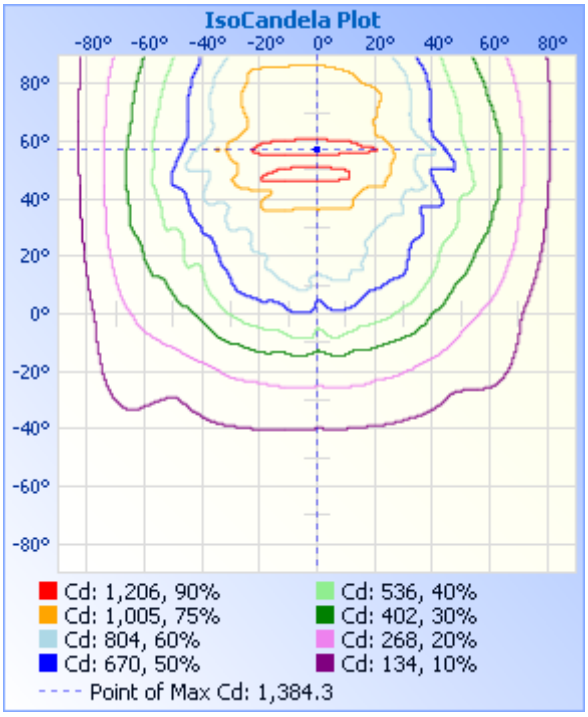


Table--1 UNIT: cd

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	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	602	
5	641	663	683	682	659	689	747	700	652	649	636	564	527	550	591	623	
10	634	694	735	748	748	832	768	721	643	610	551	507	441	480	563	571	
15	590	682	780	842	820	849	798	691	615	530	451	406	363	411	441	512	
20	574	656	787	842	829	882	817	714	614	483	375	344	309	345	369	464	
25	547	667	778	897	902	910	821	719	588	425	332	289	265	280	318	403	
30	497	666	781	816	917	854	815	723	541	369	280	236	217	239	269	350	
35	452	655	754	886	831	874	796	658	490	319	235	191	174	193	224	298	
40	393	615	724	1008	1139	1120	820	631	424	270	191	150	127	144	182	255	
45	352	556	806	991	1052	994	853	561	380	222	154	110	95.4	105	141	206	
50	302	519	696	1210	1307	1320	817	584	349	171	122	81.5	78.4	81.0	106	156	
55	272	504	860	1112	1176	1118	925	509	327	133	91.7	63.3	60.3	62.3	79.7	118	
60	238	474	677	1238	1292	1314	812	544	298	106	69.0	50.8	47.3	47.4	61.3	93.7	
65	195	468	849	983	1160	1047	973	500	265	89.4	53.3	37.3	33.7	33.6	48.2	79.1	
70	142	454	627	995	1106	1065	717	501	224	74.8	40.8	19.8	13.7	16.5	33.6	66.4	
75	93.0	408	596	1011	1124	1090	695	467	166	62.7	26.4	0.67	0.75	0.59	16.7	53.8	
80	61.2	361	576	991	1080	1075	682	399	110	52.0	13.7	0.78	0.90	0.73	8.07	44.0	
85	45.5	301	541	947	1046	1034	647	357	70.3	42.5	10.6	0.97	1.17	0.96	5.63	36.0	
90	38.6	243	496	847	973	929	606	308	46.8	37.5	8.26	1.11	1.31	1.12	4.06	31.0	
95	36.9	181	431	753	860	817	518	253	38.0	32.0	6.03	1.17	1.31	1.18	2.89	25.9	
100	36.3	131	374	654	761	715	443	199	34.9	26.8	4.50	1.20	1.31	1.18	2.01	20.8	
105	34.1	92.3	322	530	572	584	385	145	33.2	22.3	3.23	1.17	1.29	1.18	1.26	15.5	
110	29.6	68.2	258	436	394	471	315	106	30.7	17.1	2.50	1.17	1.29	1.18	1.35	10.5	
115	24.2	51.3	204	367	368	405	256	79.8	26.9	11.9	2.06	1.14	1.23	1.12	1.40	7.39	
120	19.1	38.4	153	289	286	317	200	59.3	22.8	8.15	1.42	0.91	1.09	1.09	1.18	5.44	
125	14.1	28.7	117	215	222	247	152	42.7	17.8	5.58	1.14	0.81	0.95	0.87	0.76	3.83	
130	9.53	19.5	87.3	153	172	186	114	31.7	12.6	3.76	0.75	0.81	0.89	0.87	0.67	2.78	
135	6.04	12.4	63.2	114	134	140	84.2	21.8	8.35	2.57	0.70	0.81	0.87	0.87	0.67	1.72	
140	3.86	6.88	45.3	84.4	106	102	61.0	13.5	5.31	1.76	0.70	0.81	0.87	0.84	0.67	1.14	
145	2.49	4.23	28.1	64.5	80.4	74.9	42.1	5.92	3.40	1.23	0.78	0.81	0.87	0.84	0.76	0.64	
150	1.54	2.46	13.7	39.7	57.3	47.7	22.1	3.06	1.95	0.81	0.75	0.81	0.84	0.84	0.76	0.56	
155	0.81	1.23	3.38	16.9	26.2	20.1	8.74	1.45	0.95	0.61	0.75	0.81	0.84	0.84	0.76	0.56	
160	0.53	0.42	0.31	4.84	9.14	6.82	0.12	0.36	0.67	0.61	0.78	0.81	0.81	0.84	0.76	0.56	
165	0.53	0.36	0.33	0.14	0.22	0.11	0.06	0.19	0.67	0.61	0.78	0.78	0.78	0.79	0.78	0.56	
170	0.53	0.50	0.36	0.25	0.20	0.25	0.20	0.22	0.67	0.61	0.78	0.78	0.78	0.70	0.56	0.56	
175	0.53	0.67	0.50	0.42	0.34	0.42	0.36	0.33	0.67	0.56	0.75	0.78	0.81	0.65	0.53	0.53	
180	0.53	0.75	0.72	0.50	0.45	0.39	0.42	0.33	0.67	0.53	0.75	0.64	0.50	0.39	0.39	0.42	

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-12-19	Test Ambient:	25.2 ºC
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LWP2-30(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD161215 NB-A2	120.0	60	0.2357	28.13	0.9945	9.63
	277.0	60	0.1118	28.64	0.9252	13.24
				DLC Pass Criteria	>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5471
Duv	-0.0023
Chromaticity (x, y)	x=0.3330 y=0.3371
Chromaticity (u', v')	u'=0.2088 v'=0.4756
Color Rendering Index (CRI)	86.5
R9	25

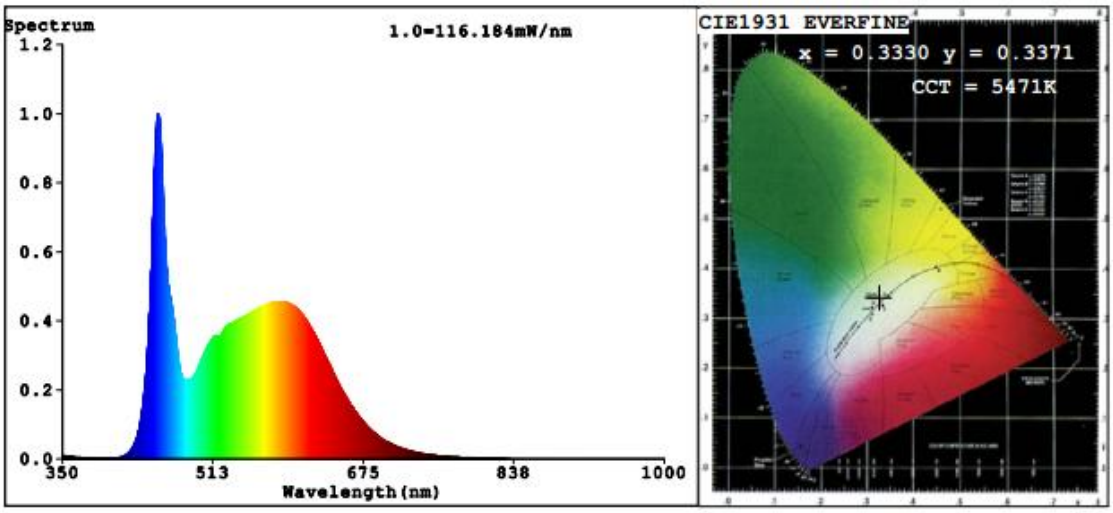
Special Color Rendering Indices			
R1	87	R9	25
R2	93	R10	83
R3	94	R11	84
R4	85	R12	62
R5	86	R13	89
R6	88	R14	98
R7	87	R15	83
R8	72	--	--

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)	3540.0	3586.0	5000-10000 (±10%)	
Luminous Efficacy (lm/W)	125.84	125.21	--	
Total Luminous (lm) (0 °-90 ° zone)	2846.2	2883.1	--	
Luminous Efficacy (lm/W) (0 °-90 °zone)	101.18	100.67	Standard: >= 95(-3%)	Premium: >= 115(-3%)

* These values are calculated assuming ZLD of 0 °-90 °zone is 80.4% (see "Zonal Lumen Tabulation" on page 5).

Spectral Power Distribution & Chromaticity Diagram



2.3 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
LWP2-30(2700K)	2700K	3423.1	27.91	122.65
LWP2-30(3000K)	3000K	3442.6	28.02	122.86
LWP2-30(3500K)	3500K	3462.1	28.02	123.56
LWP2-30(4000K)	4000K	3481.6	28.02	124.25
LWP2-30(4500K)	4500K	3501.0	28.02	124.95
LWP2-30(5000K)	5000K	3520.5	28.02	125.64
LWP2-30(5700K)	5700K	3540.0	28.13	125.84

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

3442.6= (3540.0-3423.1)/6+3423.1

3462.1= (3540.0-3423.1)/6+3442.6

3481.6= (3540.0-3423.1)/6+3462.1

3501.0= (3540.0-3423.1)/6+3481.6

3520.5= (3540.0-3423.1)/6+3501.0

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

28.02= (27.91+28.13)/2

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

122.86=3442.6/28.02

123.56=3462.1/28.02

124.25=3481.6/28.02

124.95=3501.0/28.02

125.64=3520.5/28.02

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 ********