

LM-79-08 Test Report

For

Revolution Lighting Technologies, Inc(Brand Name:  Revolution Lighting)

2280 Ward Ave. Simi Valley, CA. 93065

**Outdoor Pole/Arm-Mounted Area and Roadway
Luminaires**

Model name(s): 113XS3-3LT

Remark: 113 represents Area Light Type, X represents Standard Housing Color. S represents Sensor Options, can be 1=N/A; 2=photocell& motion sensor. 3 represents 150W(AC100-277V). L represents Lens Type, can be 3=TYPEIII, 5= TYPEV. T represents CCT, can be 2=4000K,4=5000K. This is a multiple list report, the original report NO. is GZE1708002-C-R.

Representative (Tested) Model: 113023-332 [113013-332]
113023-334 [113013-334]

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

Test & Report By:

Jack Luo

Engineer: Jack Luo

Date: Aug.11,2017

Update: Nov.13,2017(Updating model numbers)

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

Review By:

Tommy Liang

Manager: Tommy Liang

Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2


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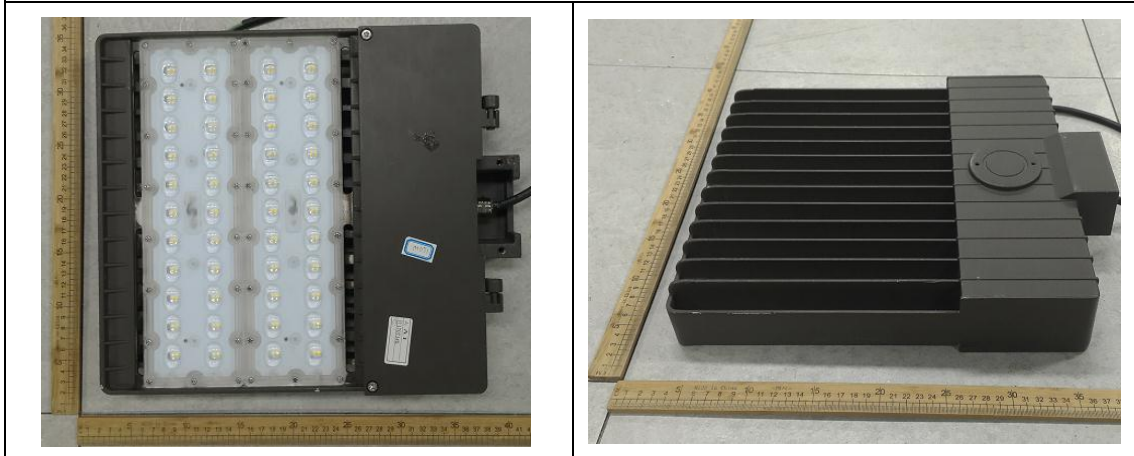
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc	
Brand Name		
Model Number	113XS3-3LT	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Pole/Arm-Mounted Area and Roadway Luminaires	
Rated Voltage / Frequency	100-277 Vac, 50/60 Hz	
Nominal Power	150W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Lumileds	
LED Model	L130-3080003000W2C	
Sample Number	GZE1708002-C1(4000K),C2(5000K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	Aug.04,2017
Date of Test	Aug.05,2017
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	2017-08-05	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	113023-332 [113013-332]		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170800	120.0	60	1.244	148.9	0.9974	4.97
2-C1	277.0	60	0.5495	147.2	0.9670	5.10
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

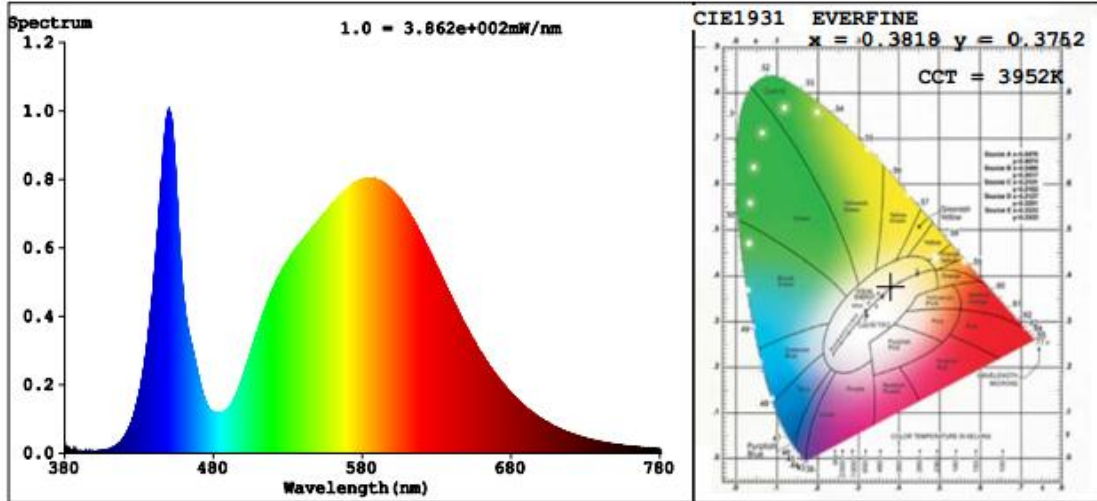
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	72	R9	0
Frequency (Hz)	60	R2	81	R10	53
CCT (K)	3952	R3	87	R11	68
Duv	-0.0011	R4	73	R12	44
Chromaticity (x, y)	x=0.3818 y=0.3752	R5	71	R13	73
Chromaticity (u', v')	u'=0.2266 v'=0.5011	R6	72	R14	92
Color Rendering Index (CRI)	74.3	R7	82	R15	67
R9	0	R8	56	--	--

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)	18130	17986	≥1000 (-10%)	
Luminous Efficacy (lm/W)	121.76	122.19	Standard: ≥100(-3%)	Premium: ≥120(-3%)
Most Worst Luminous/Highest Watts	120.79			
Zonal lumens in the 0-90 °zone (%)	99.8	--	≥ 100(-1)	
Zonal lumens in the 80-90 °zone (%)	1.7	--	≤ 10(+3)	
Beam Angle (°)	134.3	--	--	
Center Beam Candle Power (cd)	4223	--	--	

Spectral Power Distribution & Chromaticity Diagram

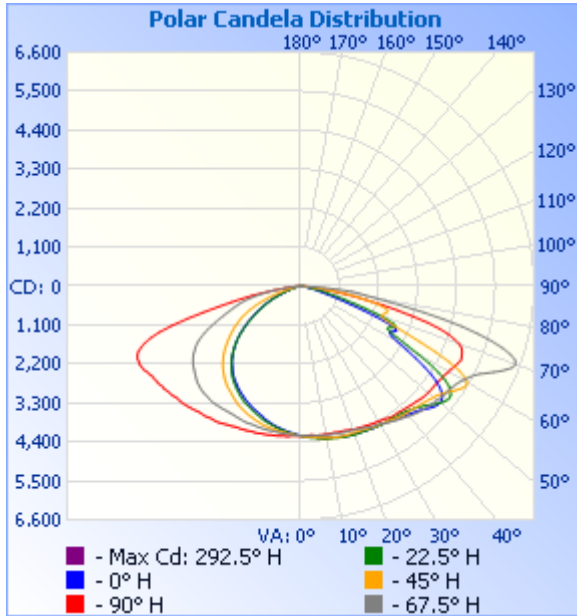


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,525.6	19.5%
0-40	6,129.4	33.8%
0-60	12,814.9	70.7%
60-90	5,270.3	29.1%
70-100	2,193.6	12.1%
90-120	14.6	0.1%
0-90	18,085.3	99.8%
90-180	39.2	0.2%
0-180	18,124.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	403.0	2.2%	90-100	3.4	0%
10-20	1,191.6	6.6%	100-110	4.7	0%
20-30	1,930.9	10.7%	110-120	6.4	0%
30-40	2,603.8	14.4%	120-130	6.8	0%
40-50	3,178.4	17.5%	130-140	6.0	0%
50-60	3,507.1	19.4%	140-150	5.0	0%
60-70	3,080.2	17.0%	150-160	3.6	0%
70-80	1,883.8	10.4%	160-170	2.3	0%
80-90	306.3	1.7%	170-180	1.0	0%

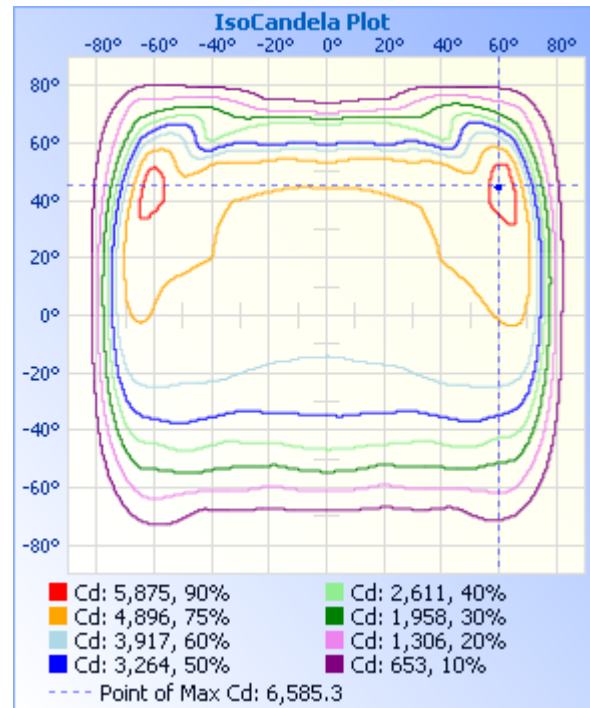
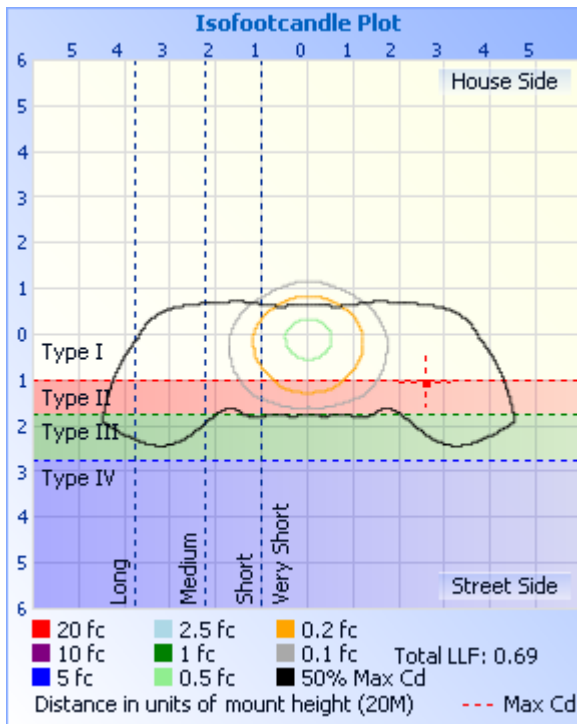
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
20.0M	0.98 fc	47.0 M	120.6 M
40.0M	0.25 fc	93.9 M	241.2 M
60.0M	0.11 fc	140.9 M	361.8 M
80.0M	0.06 fc	187.9 M	482.5 M
100.0M	0.04 fc	234.9 M	603.1 M

■ Vert. Spread: 99.2°
 ■ Horiz. Spread: 143.3°



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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	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	4223	
5	4256	4237	4293	4311	4280	4296	4288	4240	4219	4203	4162	4138	4122	4139	4166	4191	
10	4280	4278	4356	4375	4353	4370	4357	4268	4245	4166	4094	4033	4019	4041	4119	4168	
15	4306	4327	4378	4417	4403	4419	4392	4291	4260	4142	4024	3921	3886	3931	4060	4159	
20	4347	4394	4417	4436	4442	4461	4401	4322	4305	4120	3944	3785	3730	3790	3964	4139	
25	4382	4433	4465	4475	4474	4482	4453	4412	4349	4121	3835	3652	3587	3661	3852	4122	
30	4465	4543	4519	4508	4518	4519	4499	4493	4412	4123	3716	3485	3425	3492	3715	4099	
35	4526	4682	4622	4559	4581	4547	4580	4640	4500	4105	3558	3282	3242	3295	3543	4112	
40	4591	4825	4707	4657	4718	4621	4675	4783	4540	4087	3357	3024	2999	3043	3354	4086	
45	4692	4943	4815	4851	4921	4811	4748	4918	4614	3993	3102	2717	2715	2728	3114	4035	
50	4769	5078	4941	5179	5130	5136	4895	5014	4695	3879	2811	2324	2335	2331	2801	3891	
55	4854	5180	5216	5288	4692	5187	5173	5113	4728	3687	2469	1859	1871	1845	2437	3717	
60	4950	5385	5439	3935	3204	3847	5430	5302	4831	3480	2091	1372	1391	1340	2046	3432	
65	5049	5917	3842	2759	2992	2757	3737	5806	4993	3033	1663	933	931	895	1584	2899	
70	4690	6585	2429	2323	1508	2280	2437	6460	4768	2399	1055	479	441	461	981	2228	
75	2834	5372	2537	909	548	904	2512	5177	3260	1851	459	241	225	234	410	1689	
80	1102	2292	1615	332	229	327	1413	2530	1288	1085	189	111	89.5	105	171	948	
85	213	775	207	71.6	45.2	69.8	217	1062	221	224	52.1	22.6	12.0	19.8	45.8	177	
90	6.59	8.88	4.07	1.02	0.36	0.63	3.62	9.30	6.46	5.72	1.88	0.09	0.00	0.26	2.59	6.51	
95	6.19	4.95	1.75	0.25	0.00	0.04	1.41	4.81	5.52	6.42	2.70	1.05	0.22	1.02	3.08	7.29	
100	7.52	4.32	1.48	0.04	0.00	0.00	1.20	4.15	6.44	8.19	3.85	2.06	1.35	2.33	4.36	8.30	
105	9.35	4.76	1.70	0.39	0.35	0.26	1.62	4.97	8.18	9.54	5.68	3.63	2.88	3.60	5.81	9.08	
110	11.2	6.37	2.57	1.00	0.96	0.83	2.46	6.59	8.92	10.2	7.64	4.67	4.23	4.69	7.38	8.86	
115	12.6	7.46	3.44	1.79	1.70	1.49	3.16	7.99	9.81	11.6	7.98	5.55	5.49	5.45	8.04	10.0	
120	12.6	8.15	4.10	3.44	3.40	3.29	3.96	8.30	9.75	11.3	8.16	7.60	7.84	7.94	8.08	10.3	
125	11.5	8.45	4.58	4.62	4.52	4.37	4.57	8.34	9.79	10.4	7.28	7.99	9.18	8.50	7.47	10.2	
130	11.1	8.00	5.19	5.32	4.96	5.08	5.09	7.96	9.65	8.67	7.46	8.60	9.40	9.10	7.99	8.21	
135	9.61	7.50	5.65	6.45	6.34	6.30	5.24	7.66	8.78	8.72	7.33	8.93	9.18	8.98	8.04	9.04	
140	9.56	7.28	5.93	7.12	6.47	6.83	5.32	7.86	8.80	8.67	7.46	8.83	9.13	8.76	7.43	8.82	
145	9.46	7.11	6.80	7.33	8.65	7.54	6.15	7.90	8.69	8.23	7.57	8.70	9.36	8.87	7.78	7.98	
150	8.39	6.85	7.93	7.44	8.68	7.63	7.55	7.21	8.04	7.93	7.47	8.60	9.40	8.89	8.19	7.16	
155	7.04	6.98	8.13	7.97	8.64	7.67	8.22	7.00	6.83	7.50	7.46	8.08	8.05	8.06	7.91	7.22	
160	8.00	7.19	8.19	8.09	8.36	7.95	8.24	7.08	7.46	7.45	7.80	7.99	8.14	7.84	7.29	7.28	
165	7.91	7.86	9.09	7.95	8.14	8.19	8.22	7.22	7.79	7.72	7.95	7.95	7.23	7.27	6.99	7.64	
170	9.43	8.88	10.1	10.5	10.1	9.73	9.97	7.99	10.4	10.3	9.60	10.7	11.5	10.9	10.1	10.7	
175	10.2	9.75	10.4	10.6	10.8	9.99	10.3	8.73	10.6	10.6	10.00	10.5	11.2	11.3	10.2	10.8	
180	9.78	10.0	9.87	10.4	10.6	9.13	10.2	8.56	9.74	9.71	9.77	9.91	10.2	10.7	9.32	9.95	

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2.2 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2017-08-05	Test Ambient:	25.2 °C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	113023-334 [113013-334]		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170800	120.0	60	1.242	148.4	0.9959	5.03
2-C2	277.0	60	0.5523	147.8	0.9661	5.84
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

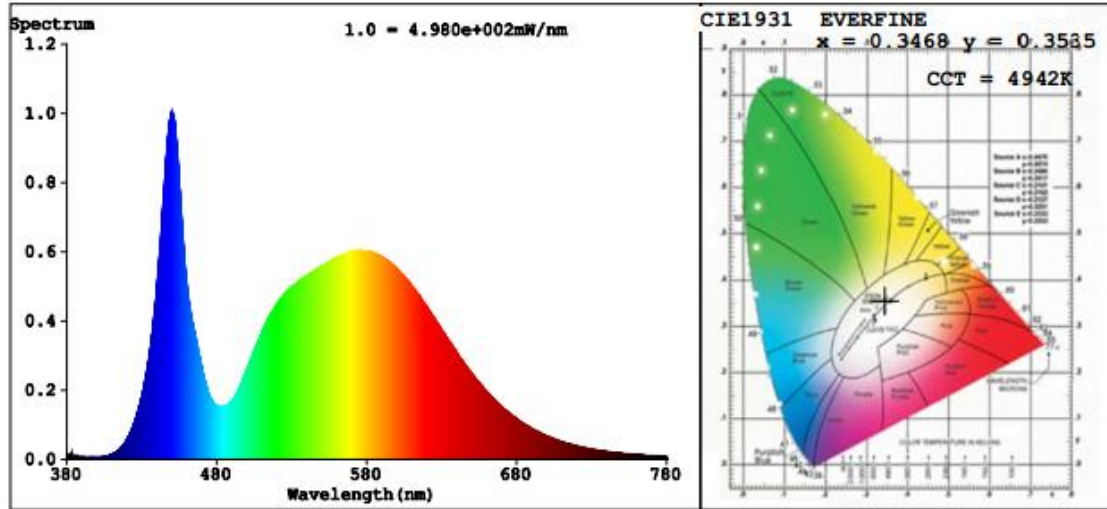
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	75	R9	0
Frequency (Hz)	60	R2	82	R10	57
CCT (K)	4942	R3	87	R11	73
Duv	0.0003	R4	76	R12	47
Chromaticity (x, y)	x=0.3468 y=0.3535	R5	75	R13	76
Chromaticity (u', v')	u'=0.2118 v'=0.4858	R6	74	R14	92
Color Rendering Index (CRI)	76.9	R7	85	R15	70
R9	0	R8	62	--	--

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)	18265	18305	≥1000 (-10%)	
Luminous Efficacy (lm/W)	123.08	123.85	Standard: ≥	Premium: ≥
Most Worst Luminous/Highest Watts	123.08		100(-3%)	120(-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-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 *******