

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): 113XS8-3LT

Remark: 113 represents Area Light Type, X represents Standard Housing Color. S represents Sensor Options, can be 1=N/A; 2=photocell& motion sensor. 8 represents 150W(AC200-480V). 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 GZE1709137-F.

Representative (Tested) Model: 113028-332 [113018-332]
113028-334 [113018-334]

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

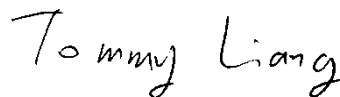
Test & Report By:



Engineer: Garman Mo

Date: Oct.26,2017

Review By:



Manager: Tommy Liang

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

Tel: 8620-3229 0320

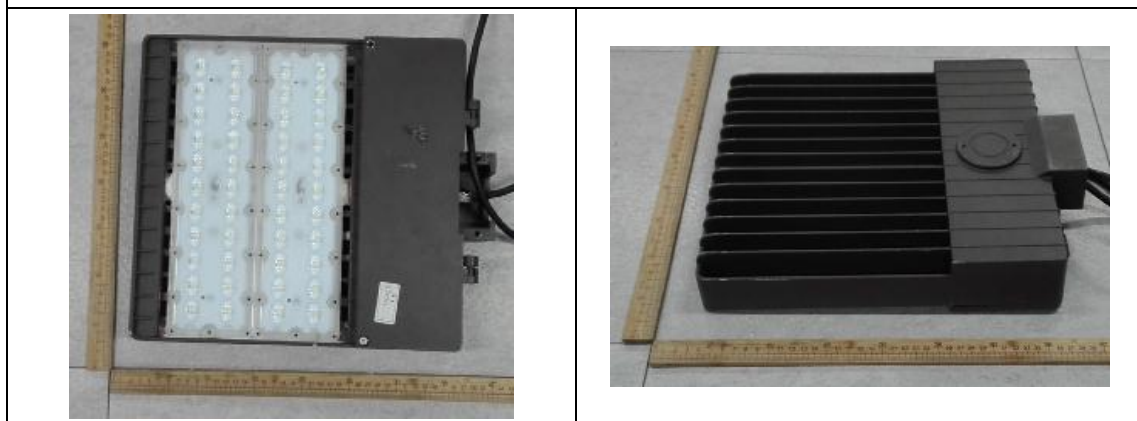
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc	
Brand Name		
Model Number	113XS8-3LT	
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	200 -480Vac, 50/60 Hz	
Nominal Power	150W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	GZE1709137-F1(4000K),F2(5000K)	
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	Oct.22,2017
Date of Test	Oct.23,2017
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 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.</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 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.</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 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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-10-23	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	113028-332 [113018-332]		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170913	277.0	60	0.5522	151.6	0.9911	10.67
7-F1	480.0	60	0.3278	151.7	0.9642	10.21
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

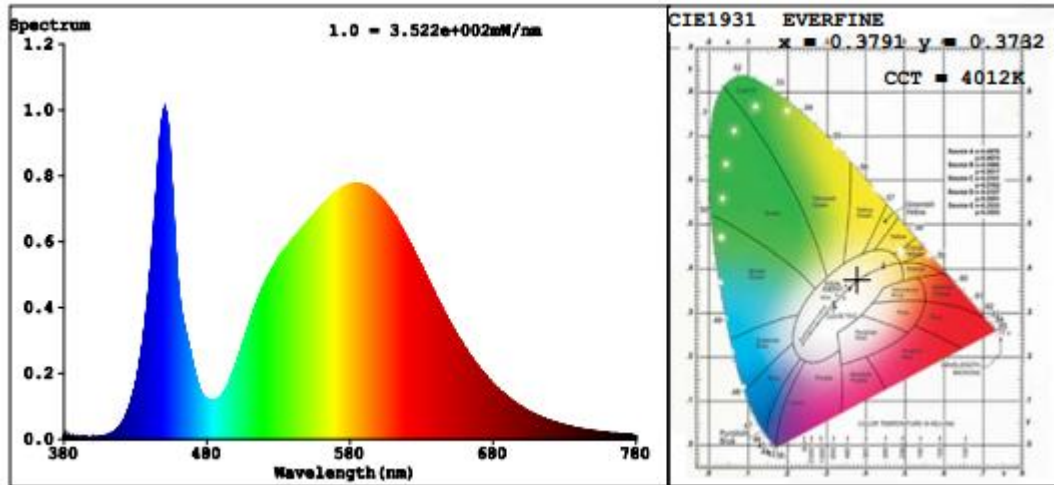
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	72	R9	0
Frequency (Hz)	60	R2	81	R10	54
CCT (K)	4012	R3	87	R11	68
Duv	-0.0013	R4	73	R12	44
Chromaticity (x, y)	x=0.3791 y=0.3732	R5	71	R13	74
Chromaticity (u', v')	u'=0.2256 v'=0.4998	R6	72	R14	92
Color Rendering Index (CRI)	74.5	R7	82	R15	67
R9	0	R8	57	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	277.0	480.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	18468	18360	>=1000(-10%)	
Luminous Efficacy (lm/W)	121.82	121.03	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	121.03		100(-3%)	120(-3%)
Zonal lumens in the 0-90 °zone (%)	99.8	--	>=100(-1)	
Zonal lumens in the 80-90 °zone (%)	1.6	--	<=10(+3)	
Beam Angle (°)	134.4	--	--	
Center Beam Candle Power (cd)	4250	--	--	

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,547.6	19.2%
0-40	6,189.1	33.5%
0-60	13,048.3	70.7%
60-90	5,373.6	29.1%
70-100	2,214.9	12%
90-120	18.4	0.1%
0-90	18,421.9	99.8%
90-180	44.8	0.2%
0-180	18,466.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	405.0	2.2%	90-100	4.6	0%
10-20	1,197.9	6.5%	100-110	6.3	0%
20-30	1,944.7	10.5%	110-120	7.6	0%
30-40	2,641.5	14.3%	120-130	7.6	0%
40-50	3,257.4	17.6%	130-140	6.5	0%
50-60	3,601.9	19.5%	140-150	5.2	0%
60-70	3,163.3	17.1%	150-160	3.8	0%
70-80	1,913.4	10.4%	160-170	2.3	0%
80-90	296.8	1.6%	170-180	0.9	0%

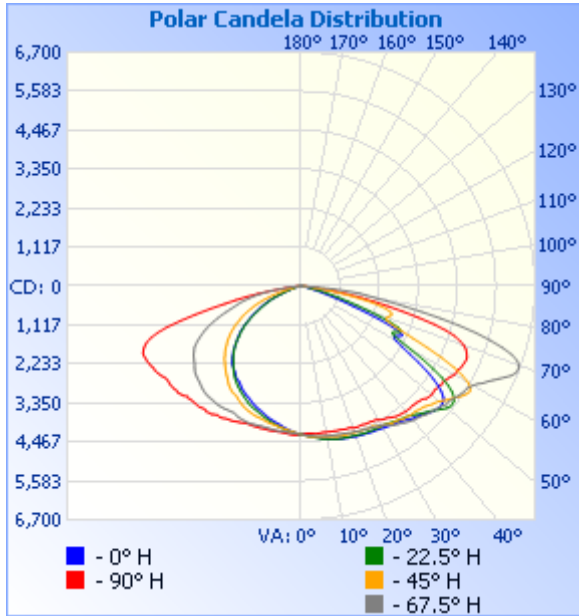
Laboratory: Standard-Tech Co. Ltd Testing Center
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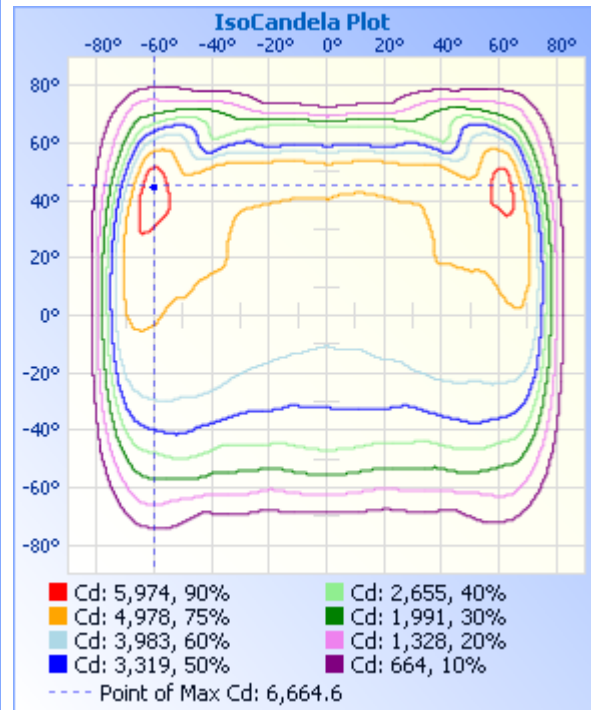
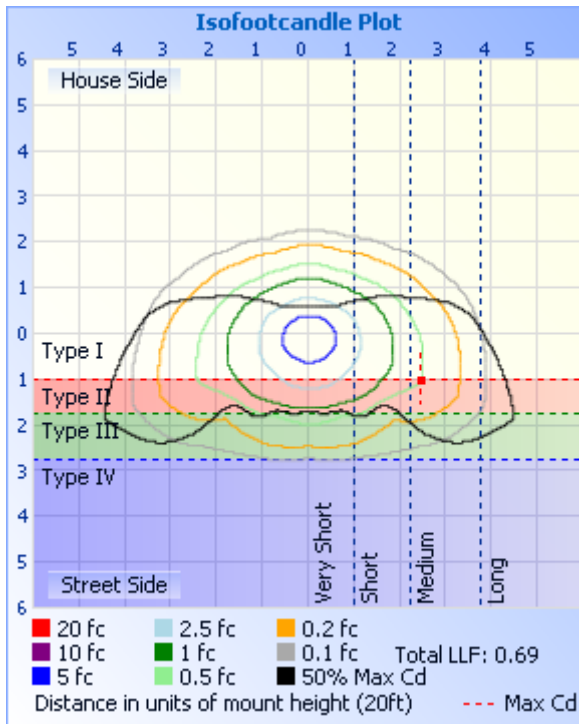
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	14.7 fc	43.6 ft	103.0 ft
34.0ft	3.68 fc	87.1 ft	205.9 ft
51.0ft	1.63 fc	130.7 ft	308.9 ft
68.0ft	0.92 fc	174.3 ft	411.9 ft
85.0ft	0.59 fc	217.8 ft	514.8 ft
102.0ft	0.41 fc	261.4 ft	617.8 ft

■ Vert. Spread: 104.1°
■ Horiz. Spread: 143.5°



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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	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250
5	4250	4297	4308	4325	4341	4349	4333	4313	4241	4208	4196	4131	4134	4163	4149	4206
10	4223	4347	4359	4394	4440	4447	4379	4357	4248	4177	4111	4022	3986	4050	4062	4190
15	4227	4358	4411	4438	4522	4512	4441	4389	4261	4189	4041	3916	3849	3917	3992	4172
20	4229	4396	4449	4453	4581	4552	4464	4440	4327	4222	3959	3766	3701	3783	3932	4197
25	4293	4476	4497	4495	4631	4596	4510	4507	4360	4203	3852	3632	3539	3647	3838	4171
30	4372	4603	4576	4544	4695	4627	4616	4598	4422	4196	3739	3431	3388	3466	3669	4124
35	4483	4748	4658	4608	4778	4718	4718	4828	4580	4187	3610	3234	3230	3281	3552	4153
40	4525	4946	4750	4750	4954	4839	4833	5012	4676	4208	3412	2997	3029	3021	3324	4129
45	4555	5050	4897	4992	5133	5100	4924	5155	4705	4219	3209	2713	2763	2736	3089	4053
50	4656	5156	5008	5314	5269	5440	5136	5311	4866	4147	2934	2385	2392	2397	2835	3940
55	4686	5247	5320	5271	4619	5276	5532	5487	4907	3960	2591	1977	2004	1975	2515	3743
60	4836	5458	5421	3620	3142	3639	5525	5687	5069	3793	2241	1509	1521	1467	2128	3532
65	4908	5928	3545	3000	3145	3113	3542	6272	5169	3387	1811	1062	1051	999	1669	3068
70	4705	6526	2502	2035	1298	2046	2623	6645	4960	2725	1246	550	511	522	1106	2422
75	3130	5293	2542	730	396	735	2525	5192	3488	2065	545	265	250	255	470	1791
80	1253	2406	1245	231	147	233	1129	2541	1413	1276	211	123	108	123	189	1054
85	224	742	161	17.2	5.46	18.3	152	922	222	307	67.0	42.9	28.3	43.3	61.8	222
90	9.86	11.4	4.86	1.06	0.33	0.85	3.82	11.3	9.44	8.18	2.56	0.31	0.00	0.53	3.42	8.98
95	9.28	6.92	2.62	0.41	0.00	0.25	1.95	6.33	7.83	8.50	3.25	1.01	0.27	1.11	3.79	9.35
100	10.6	6.38	2.42	0.42	0.11	0.21	1.99	5.83	8.66	9.92	5.08	2.93	1.84	3.11	5.58	10.7
105	12.9	7.75	2.93	1.15	0.89	0.99	2.73	6.53	10.4	11.5	6.91	3.92	3.21	4.37	7.42	12.3
110	14.5	9.44	3.77	1.98	1.79	1.73	3.52	8.24	10.6	12.0	8.27	5.74	5.15	5.69	8.63	13.0
115	14.7	10.6	4.91	2.40	2.57	2.13	4.46	9.19	10.4	11.6	8.79	6.89	6.94	6.53	8.57	12.2
120	14.6	10.8	6.06	4.16	3.61	3.67	5.20	9.56	10.1	10.7	8.70	8.67	8.37	8.53	8.49	11.0
125	14.2	11.2	6.29	5.37	5.52	5.10	5.57	9.93	9.40	10.4	8.06	8.51	9.46	8.79	8.41	10.6
130	13.6	10.8	6.12	6.26	6.35	6.10	5.77	9.42	9.23	9.12	7.95	8.75	9.78	9.11	8.33	9.93
135	12.1	9.71	6.23	7.41	8.61	7.26	5.81	8.69	8.94	8.71	7.17	8.82	9.14	9.16	7.94	8.77
140	11.4	9.22	6.28	7.82	7.05	7.73	5.52	8.77	8.85	8.70	6.44	8.75	8.96	9.00	7.42	8.29
145	10.6	8.34	6.85	8.04	8.20	7.77	5.68	7.81	8.78	8.29	6.44	8.79	9.11	9.24	7.64	8.15
150	9.76	7.70	8.27	8.10	8.98	9.80	7.26	7.75	8.71	8.18	7.03	8.82	9.45	9.31	9.73	8.02
155	8.72	7.65	9.31	8.19	8.99	9.70	8.62	7.70	7.20	8.09	6.90	8.19	8.56	8.78	8.72	7.38
160	8.19	7.74	9.40	8.01	8.88	8.93	8.78	7.65	7.66	7.33	6.82	7.66	7.97	8.08	7.83	7.01
165	8.71	7.86	9.48	7.52	8.42	8.26	8.89	7.73	8.36	7.66	7.22	7.64	7.78	7.92	7.21	7.50
170	9.39	8.70	10.4	9.81	9.66	9.78	9.78	8.07	9.45	9.34	9.37	9.71	10.0	9.79	8.94	10.2
175	9.78	9.65	10.5	10.1	10.3	9.81	10.0	8.77	9.81	9.92	9.78	9.71	9.93	10.5	9.57	10.3
180	9.03	9.60	9.73	9.66	10.4	9.37	10.00	8.66	9.03	9.34	9.42	9.87	9.57	10.2	9.21	9.99

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2017-10-23	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	113028-334 [113018-334]		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE170913	277.0	60	0.5572	152.3	0.9867	10.99
7-F2	480.0	60	0.3310	152.5	0.9598	10.68
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

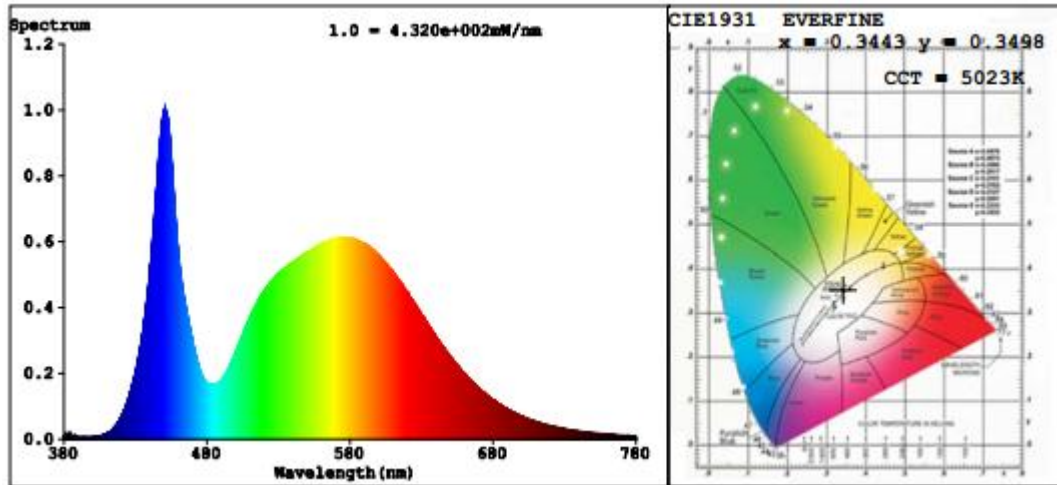
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	75	R9	0
Frequency (Hz)	60	R2	83	R10	58
CCT (K)	5023	R3	87	R11	75
Duv	-0.0006	R4	77	R12	53
Chromaticity (x, y)	x=0.3443 y=0.3498	R5	76	R13	77
Chromaticity (u', v')	u'=0.2116 v'=0.4837	R6	75	R14	92
Color Rendering Index (CRI)	77.4	R7	84	R15	71
R9	0	R8	62	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	277.0	480.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	18823	18738	>=1000(-10%)	
Luminous Efficacy (lm/W)	123.59	122.87	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	122.87		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 *******

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