

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN**(Brand Name:N/A)**

188 S. Northwest Highway Cary, IL60013

LED Luminaires

Model name(s): LED-8024E57-A

LED-8024-DL-E27-A

Remark: The two models are the same product with two model names

Representative (Tested) Model: LED-8024E57-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Mar.29,2017

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

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320

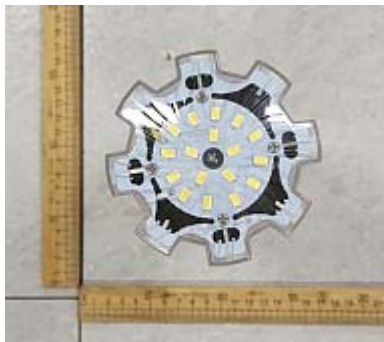
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8024E57-A, LED-8024-DL-E27-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	45W	
Rated Initial Lamp Lumen	--	
Declared CCT	5700K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-M1	
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	Jan 16,2017
Date of Test	Jan 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	2017-01-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8024E57-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	120.0	60	0.3706	44.02	0.9898
M1	277.0	60	0.1666	43.18	0.9355

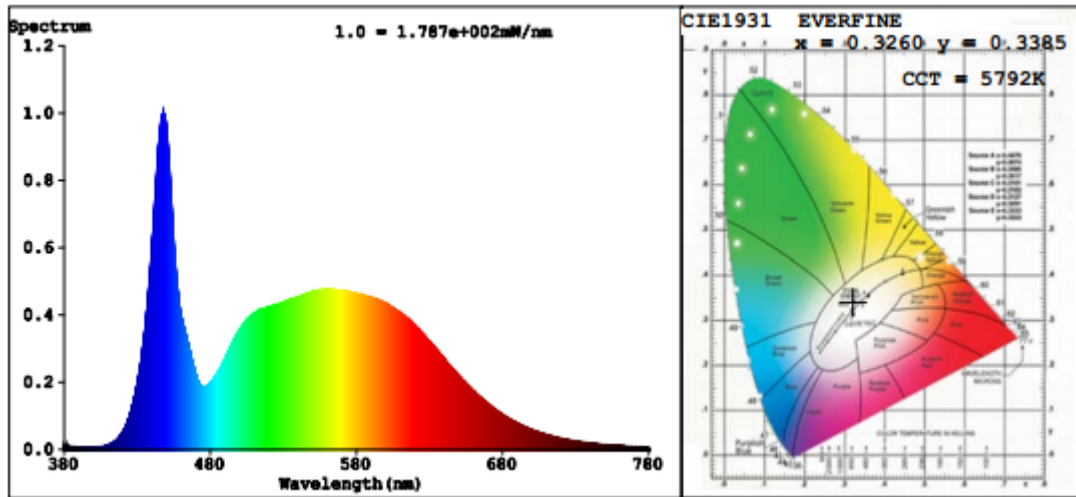
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	19
Frequency (Hz)	60	R2	87	R10	69
CCT (K)	5792	R3	89	R11	86
Duv	0.0016	R4	86	R12	65
Chromaticity (x, y)	x=0.3260 y=0.3385	R5	85	R13	84
Chromaticity (u', v')	u'=0.2034 v'=0.4753	R6	82	R14	97
Color Rendering Index (CRI)	84.0	R7	88	R15	79
R9	19	R8	73	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	5561.4	5531.6
Luminous Efficacy (lm/W)	126.34	128.11
Beam Angle (°)	283.3	--
Center Beam Candle Power (cd)	6	--

Spectral Power Distribution & Chromaticity Diagram

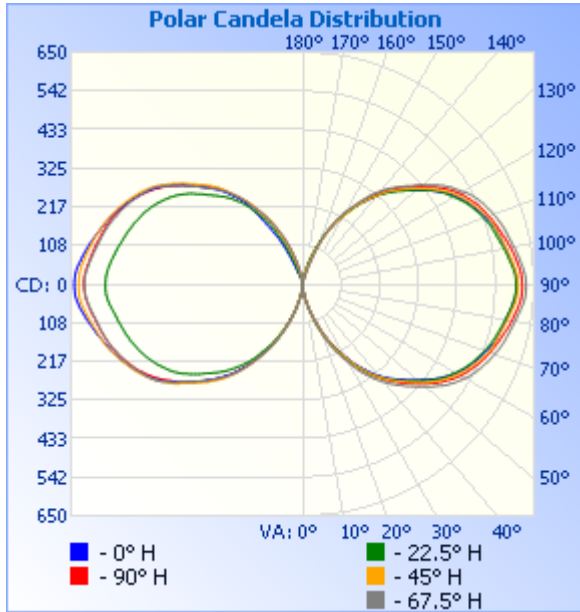


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	109.1	2%
0-40	291.9	5.2%
0-60	1,010.4	18.2%
60-90	1,786.2	32.1%
70-100	1,914.2	34.4%
90-120	1,784.5	32.1%
0-90	2,796.6	50.3%
90-180	2,765.4	49.7%
0-180	5,561.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	2.1	0.0%	90-100	654.7	11.8%
10-20	22.9	0.4%	100-110	603.1	10.8%
20-30	84.1	1.5%	110-120	526.7	9.5%
30-40	182.8	3.3%	120-130	419.1	7.5%
40-50	297.7	5.4%	130-140	294.0	5.3%
50-60	420.8	7.6%	140-150	176.2	3.2%
60-70	526.7	9.5%	150-160	75.5	1.4%
70-80	603.7	10.9%	160-170	15.4	0.3%
80-90	655.8	11.8%	170-180	0.7	0%

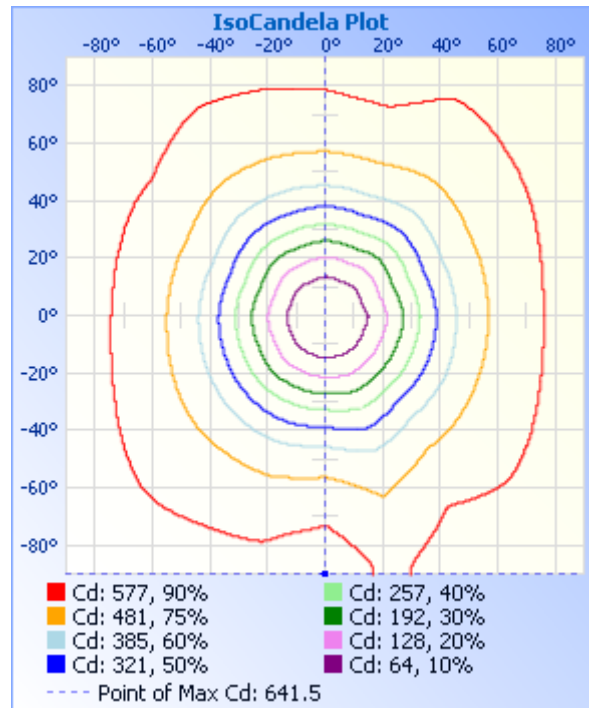
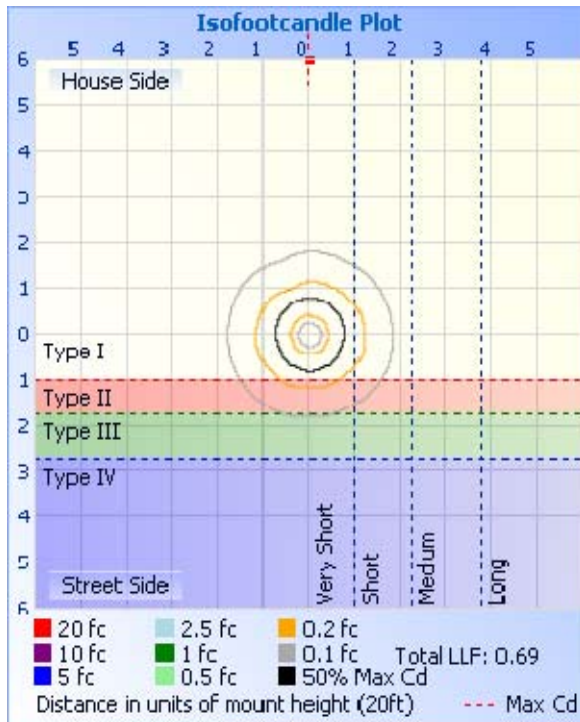
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.02 fc	42.5 ft
34.0ft	0.00 fc	85.0 ft
51.0ft	0.00 fc	127.5 ft
68.0ft	0.00 fc	170.0 ft
85.0ft	0.00 fc	212.5 ft
102.0ft	0.00 fc	255.0 ft

■ Beam Spread: 102.7°



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
1	7	8	8	8	8	7	6	6	6	6	6	6	6	6	7	7	7
2	10	10	10	10	10	9	9	8	8	8	8	7	8	8	9	10	10
3	12	12	12	12	12	11	11	10	10	10	9	9	10	10	11	11	12
4	13	14	14	14	13	13	12	12	12	11	11	11	12	12	12	13	13
5	15	16	16	16	16	15	14	14	14	13	13	13	14	14	15	15	15
6	18	20	18	20	19	18	17	17	16	16	15	16	16	17	17	18	18
7	21	23	22	23	22	22	20	21	19	19	18	20	19	21	20	22	21
8	26	28	26	28	26	26	24	25	23	24	22	23	23	26	24	26	26
9	30	35	31	34	31	31	29	30	26	28	26	29	27	32	28	32	30
10	35	40	37	40	37	38	34	35	32	34	32	36	32	38	34	38	35
11	42	48	42	48	44	45	41	42	37	39	39	42	38	47	40	46	42
12	48	55	50	56	51	53	47	49	45	47	44	49	44	53	47	54	48
13	56	63	58	64	59	60	55	56	52	54	53	56	52	63	54	62	56
14	63	70	66	74	66	70	64	65	60	61	60	65	58	72	62	70	63
15	73	80	75	82	76	81	72	73	69	70	69	75	67	80	72	78	73
16	82	90	83	93	86	90	81	82	76	79	79	83	77	91	79	89	82
17	91	98	94	102	95	98	90	92	87	86	88	93	85	99	89	99	91
18	101	109	106	114	106	111	101	100	98	96	99	101	96	110	98	108	101
19	109	119	114	126	114	120	111	112	106	105	108	113	105	120	108	119	109
20	120	129	124	135	125	130	120	122	117	115	119	124	115	132	116	128	120
21	132	138	134	147	135	142	132	131	127	123	130	133	124	143	128	139	132
22	142	149	146	158	148	151	142	142	139	133	140	144	136	152	139	149	142
23	155	162	156	171	158	164	154	152	151	144	152	153	149	164	149	162	155
24	165	173	169	182	170	175	166	165	160	153	163	167	159	175	162	175	165
25	176	186	180	195	182	187	175	175	172	165	176	180	170	189	171	185	176
26	188	194	189	207	192	199	188	186	182	174	188	190	180	202	183	197	188
27	197	205	202	217	204	208	198	198	194	185	198	201	192	211	194	206	197
28	209	214	212	229	214	220	210	207	206	195	210	210	205	223	204	217	209
29	219	226	223	238	226	229	222	218	216	203	220	221	215	232	215	227	219

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30	231	237	233	251	239	241	232	228	228	214	231	233	227	243	225	239	231
31	241	247	245	262	249	253	244	241	238	223	243	243	237	253	237	252	241
32	253	260	258	275	262	264	255	254	251	234	253	255	249	266	247	262	253
33	265	270	268	288	272	277	267	264	263	247	266	266	263	279	259	275	265
34	275	283	281	298	284	287	277	276	273	256	277	279	273	290	271	285	275
35	286	293	290	310	294	298	289	285	285	268	291	289	285	303	281	298	286
36	296	304	302	320	306	307	301	295	295	276	301	301	294	312	293	307	296
37	307	315	312	331	316	318	310	304	307	285	314	310	306	322	303	319	307
38	316	323	323	340	327	326	321	314	317	293	323	320	317	330	314	328	316
39	327	333	332	351	335	337	329	322	327	303	335	330	328	341	322	338	327
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41	346	351	350	369	356	354	348	342	346	320	354	348	347	359	341	357	346
42	353	358	359	377	363	364	357	350	356	329	363	355	357	367	350	366	353
43	363	367	368	386	373	371	364	359	364	336	371	365	364	377	358	374	363
44	370	374	376	394	381	381	374	367	374	344	381	373	373	384	367	383	370
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46	385	389	393	412	399	397	391	384	391	359	398	389	392	401	384	399	385
47	394	398	402	420	408	405	401	394	400	366	407	399	399	410	393	407	394
48	403	405	410	430	416	415	409	404	410	375	414	408	409	420	401	416	403
49	410	414	420	439	426	424	419	412	418	385	424	416	418	426	409	424	410
50	419	421	428	449	434	433	429	422	429	392	432	425	426	435	417	433	419
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53	444	447	455	474	462	459	454	448	456	417	462	456	453	462	444	459	444
54	454	457	463	484	470	465	464	456	464	425	471	466	460	471	452	468	454
55	461	463	471	493	478	473	471	464	474	431	477	478	469	478	462	476	461
56	470	472	478	500	484	480	479	470	483	438	486	486	477	486	470	485	470
57	476	478	486	508	492	487	487	477	489	444	492	494	484	491	479	491	476
58	485	485	492	514	500	494	492	483	498	450	500	500	492	498	485	499	485
59	491	490	499	521	506	500	499	490	504	455	506	507	499	504	493	507	491
60	498	497	506	527	513	507	503	495	511	460	513	512	506	511	499	512	498
61	504	502	511	534	518	513	509	502	516	466	520	515	511	516	506	519	504

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62	510	508	517	539	524	518	514	509	522	470	525	521	518	522	510	524	510
63	517	513	522	544	528	524	519	514	529	475	531	526	524	528	516	531	517
64	521	519	527	549	534	528	525	520	534	479	535	531	528	532	521	535	521
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67	536	532	542	562	548	542	537	533	550	491	551	544	544	547	534	551	536
68	540	537	548	567	553	546	542	538	555	495	556	548	549	551	538	554	540
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70	549	544	557	575	560	554	551	546	565	502	566	556	558	558	546	562	549
71	554	549	560	578	564	557	556	551	569	505	570	561	561	562	550	566	554
72	558	552	563	582	568	561	559	554	574	509	576	565	565	565	554	570	558
73	563	556	564	585	571	564	563	557	578	512	580	568	569	569	557	573	563
74	566	559	567	588	574	567	567	560	583	515	583	572	572	572	561	577	566
75	568	562	569	591	578	570	570	564	586	518	587	574	575	576	563	579	568
76	570	565	571	594	581	573	573	567	592	520	590	578	578	579	566	582	570
77	573	568	574	596	585	577	577	570	597	523	593	580	582	582	569	585	573
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79	577	575	580	602	593	583	582	576	606	529	601	586	587	587	574	590	577
80	580	577	583	605	596	585	586	579	610	531	605	588	590	590	577	593	580
81	582	581	587	608	599	588	589	583	616	534	608	592	593	592	580	596	582
82	586	584	590	612	602	592	592	587	620	538	612	595	597	596	583	599	586
83	588	587	593	616	606	595	595	591	625	541	617	599	600	599	586	602	588
84	592	590	596	619	609	598	599	594	629	545	620	602	604	602	589	605	592
85	595	593	600	622	612	601	602	597	633	548	624	606	607	605	593	608	595
86	598	595	602	624	614	603	604	600	637	551	626	609	610	608	596	611	598
87	599	597	604	627	616	605	605	602	639	553	628	610	612	610	598	613	599
88	601	599	605	627	617	606	606	603	641	554	629	612	613	612	599	615	601
89	602	600	605	628	617	606	607	603	641	554	629	613	614	613	600	616	602
90	602	600	605	628	617	606	607	603	641	554	630	613	614	614	600	617	602
91	602	600	604	627	616	606	607	603	641	553	629	613	614	613	600	617	602
92	601	598	603	626	615	605	606	602	640	553	628	612	613	613	599	616	601
93	599	597	602	624	614	603	604	600	638	552	627	610	612	611	597	614	599

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94	597	594	599	621	611	600	602	598	636	549	625	607	609	609	595	612	597
95	594	591	596	618	608	597	599	595	632	547	622	604	606	606	592	609	594
96	591	587	593	615	605	593	596	592	627	544	619	601	603	604	589	606	591
97	588	584	589	612	602	590	593	588	624	542	616	598	601	600	587	603	588
98	585	581	587	609	600	586	590	585	620	538	613	595	598	597	584	600	585
99	582	578	584	606	596	583	587	582	616	536	610	592	596	594	581	597	582
100	579	575	581	603	593	580	585	579	611	532	607	589	593	591	578	593	579
101	577	571	577	599	589	577	582	576	607	530	603	586	590	588	575	590	577
102	574	567	575	596	586	574	580	572	602	526	600	583	587	585	572	586	574
103	572	565	572	593	582	572	577	569	599	523	596	581	584	583	569	582	572
104	569	561	570	591	578	570	575	565	594	520	593	578	581	580	567	580	569
105	567	559	567	588	575	566	571	563	589	517	589	575	578	577	564	577	567
106	564	556	564	586	571	564	567	560	585	515	586	572	576	574	561	575	564
107	561	554	562	582	568	560	563	556	580	511	583	569	573	570	558	572	561
108	557	550	560	579	564	557	560	552	577	509	579	565	570	567	555	569	557
109	552	546	557	575	561	554	555	549	572	505	575	562	566	563	551	565	552
110	548	542	553	571	557	551	550	544	568	502	570	557	562	560	547	561	548
111	543	538	548	568	553	547	546	540	562	499	566	554	558	556	544	557	543
112	539	534	543	563	550	544	541	535	558	495	561	551	555	553	539	553	539
113	533	529	538	560	546	540	538	531	553	492	557	546	550	548	534	549	533
114	528	524	533	555	542	537	534	528	548	489	552	542	546	543	530	544	528
115	524	520	528	551	536	532	530	523	542	485	547	538	541	539	525	540	524
116	518	514	523	546	531	526	525	519	538	480	542	534	536	534	520	534	518
117	513	509	518	540	526	521	521	513	531	477	537	528	530	530	515	528	513
118	507	503	512	534	520	515	516	508	527	472	531	523	524	524	511	523	507
119	501	497	506	527	515	509	511	501	520	468	526	518	518	516	506	515	501
120	495	490	500	519	508	502	505	495	514	462	520	515	512	510	500	510	495
121	488	483	494	512	503	496	500	488	508	457	514	509	506	503	494	503	488
122	481	478	487	504	495	489	492	482	501	451	508	504	499	497	486	495	481
123	473	471	478	498	487	484	484	475	496	446	500	497	492	491	476	489	473
124	463	465	471	489	480	476	478	468	487	439	494	491	484	485	469	481	463
125	455	456	461	482	470	469	469	462	480	434	484	480	477	479	459	473	455

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126	446	449	453	472	462	460	462	454	470	426	476	468	467	470	452	463	446
127	438	438	444	461	452	454	452	447	462	420	467	460	459	462	443	456	438
128	428	429	436	453	442	444	445	436	452	412	459	448	449	451	433	445	428
129	421	421	426	442	433	435	435	428	442	404	449	440	441	443	425	435	421
130	411	411	416	434	423	427	426	418	432	395	441	428	432	434	415	426	411
131	402	403	409	423	416	416	416	409	421	385	430	420	422	423	408	416	402
132	395	392	399	412	406	408	408	399	413	377	420	410	414	415	398	407	395
133	387	383	391	404	399	397	398	390	402	368	412	401	404	405	391	397	387
134	378	376	382	395	389	390	391	380	393	360	402	391	397	398	381	388	378
135	371	367	373	388	380	381	381	373	383	351	394	383	388	389	371	381	371
136	362	360	366	378	373	374	371	364	375	345	385	374	380	379	364	372	362
137	354	351	356	369	363	364	363	354	366	336	377	365	370	372	355	365	354
138	344	342	348	361	355	356	353	347	358	330	367	358	363	363	347	355	344
139	335	334	336	351	343	347	345	338	347	322	359	348	353	355	336	345	335
140	323	323	323	342	331	337	332	330	337	315	347	341	343	345	323	336	323
141	311	315	314	331	321	328	323	319	325	305	336	330	331	334	314	325	311
142	302	306	302	322	310	317	311	310	313	295	323	321	318	326	303	317	302
143	291	297	293	310	301	308	302	300	304	287	313	310	308	315	294	306	291
144	282	283	282	296	289	296	291	291	291	276	302	302	296	306	284	295	282
145	271	270	273	285	280	285	283	278	277	267	290	289	287	291	275	281	271
146	262	259	261	271	267	271	271	267	258	253	281	278	275	280	263	267	262
147	250	247	248	261	254	261	258	253	238	242	269	265	264	266	250	257	250
148	236	237	237	249	243	249	248	240	215	230	258	252	251	254	240	245	236
149	226	228	225	238	230	238	234	231	197	218	245	243	241	245	226	237	226
150	214	218	213	229	218	230	223	221	180	209	234	233	227	235	214	226	214
151	203	209	205	217	209	219	211	212	164	196	221	224	216	226	205	214	203
152	194	195	193	206	197	209	200	200	151	183	209	212	207	214	194	203	194
153	182	181	183	191	185	195	191	186	134	166	199	202	195	199	185	189	182
154	171	171	168	178	173	183	177	173	119	147	188	187	186	188	172	176	171
155	157	160	155	167	159	170	165	157	98	134	176	175	171	176	158	167	157
156	146	149	145	152	148	159	153	144	78	116	160	165	157	165	149	155	146
157	137	140	132	129	133	150	141	130	62	100	145	153	148	156	138	147	137

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

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158	125	126	120	110	116	137	132	115	47	82	135	144	137	143	127	133	125
159	115	117	108	92	102	126	120	102	38	70	122	130	127	131	117	120	115
160	104	108	97	79	84	113	110	89	32	56	111	118	114	119	105	112	104
161	93	96	88	62	72	98	98	77	32	41	96	110	103	108	97	102	93
162	84	87	77	45	57	86	85	60	30	32	84	98	92	98	86	89	84
163	73	77	64	33	45	75	75	45	27	26	74	85	81	87	76	81	73
164	64	68	54	22	37	64	64	35	24	21	61	77	72	77	67	71	64
165	56	59	43	15	28	56	56	30	21	17	50	66	62	67	58	63	56
166	47	48	35	11	19	46	46	24	15	13	43	58	52	58	49	54	47
167	38	41	25	10	15	38	36	21	12	12	33	49	45	48	42	45	38
168	32	33	18	10	13	26	29	20	10	10	28	40	36	37	34	37	32
169	25	26	14	11	10	16	20	17	8	8	23	33	29	27	28	27	25
170	19	22	11	11	9	10	14	12	6	7	17	25	24	21	22	18	19
171	14	17	8	11	6	6	10	7	4	6	16	18	19	18	16	14	14
172	10	13	7	9	4	2	5	3	3	5	12	13	14	14	13	10	10
173	7	9	5	5	3	2	3	2	3	4	9	10	10	9	10	6	7
174	5	6	3	2	2	1	1	1	2	4	7	7	7	6	7	5	5
175	4	4	2	1	1	1	1	1	2	3	5	5	5	4	6	3	4
176	3	2	1	1	1	1	1	1	1	3	3	4	4	3	3	2	3
177	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1
178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
179	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06
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 *******