

LM-79-08 Test Report

For

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

188 S. Northwest Highway Cary, IL60013

LED LuminairesModel name(s): LED-8024E57-A
LED-8024-DL-E27-A

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

Model Different: The models are identical except the model No..

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Jul.07,2017

Updated: Oct.12, 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

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Revision Details

Report No.Revision	Revised Item: model name	Revised Reason	Issue date
GZE1706117-H-B	N/A	As manufacturer request	Jul.07,2017
GZE1706117-H-B-R	Add alternate model No. LED-8024-DL-E27-A		Oct.12, 2017

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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	SPMWHT541MXXXXXXXXX	
Sample Number	GZE1706117-H-B1	
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	Jun 27,2017
Date of Test	Jun 28,2017
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

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 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.

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 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.

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 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.

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

Test date	2017-06-28	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8024E57-A		

Electrical Measurement :

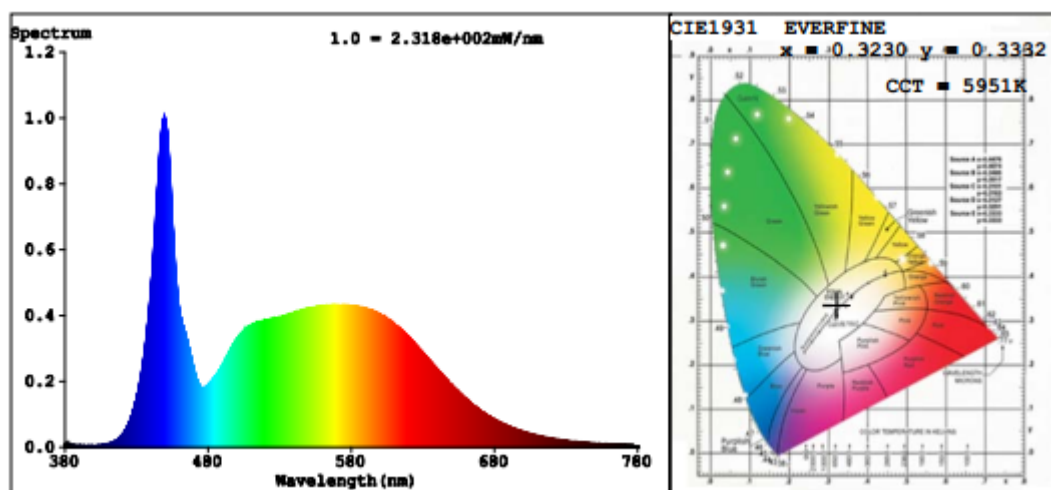
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD%
GZE170611	120.0	60	0.4029	45.84	0.9481	9.62
7-H-B1	277.0	60	0.1726	44.57	0.9324	19.97

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	18
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	5951	R3	91	R11	87
Duv	0.0003	R4	86	R12	64
Chromaticity (x, y)	x=0.3230 y=0.3332	R5	85	R13	85
Chromaticity (u', v')	u'=0.2034 v'=0.4721	R6	84	R14	95
Color Rendering Index (CRI)	84.8	R7	88	R15	80
R9	18	R8	73	--	--

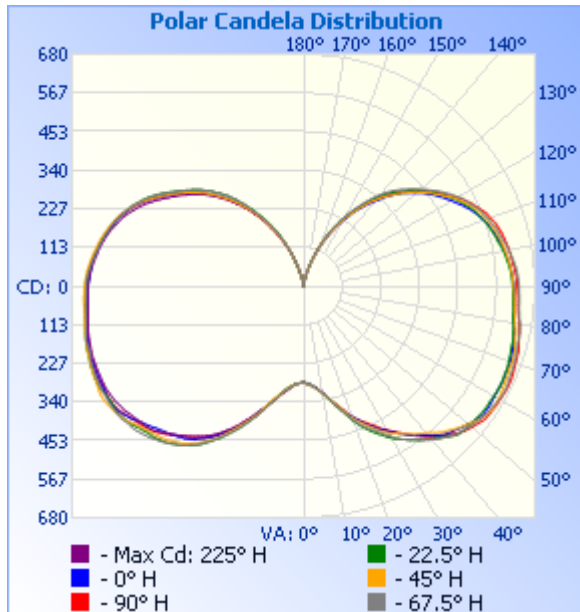
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6619.3	6515.6
Luminous Efficacy (lm/W)	144.40	146.19
Beam Angle (°)	279	--
Center Beam Candle Power (cd)	282	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

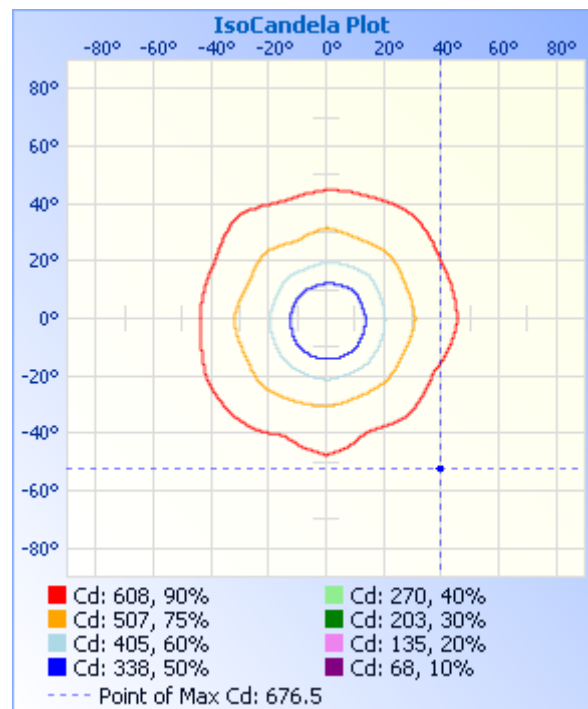
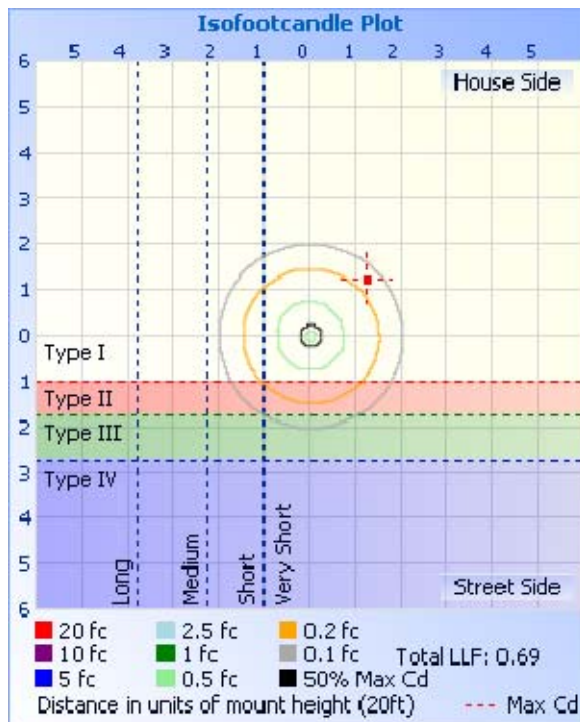
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	342.9	5.2%
0-40	686.7	10.4%
0-60	1,743.3	26.3%
60-90	2,032.7	30.7%
70-100	2,057.3	31.1%
90-120	1,851.3	28%
0-90	3,776.0	57%
90-180	2,843.7	43%
0-180	6,619.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	28.6	0.4%	90-100	678.0	10.2%
10-20	102.1	1.5%	100-110	628.5	9.5%
20-30	212.3	3.2%	110-120	544.8	8.2%
30-40	343.8	5.2%	120-130	425.8	6.4%
40-50	473.7	7.2%	130-140	299.4	4.5%
50-60	582.9	8.8%	140-150	175.4	2.6%
60-70	653.4	9.9%	150-160	75.0	1.1%
70-80	687.3	10.4%	160-170	16.1	0.2%
80-90	692.0	10.5%	170-180	0.7	0%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.98 fc	
34.0ft	0.24 fc	
51.0ft	0.11 fc	
68.0ft	0.06 fc	
85.0ft	0.04 fc	
102.0ft	0.03 fc	



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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	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282	282
1	283	285	284	284	284	281	282	282	283	284	284	284	284	283	283	283	283
2	284	286	286	288	287	282	284	283	284	284	285	285	285	283	284	284	284
3	286	288	289	290	289	285	285	284	286	285	286	286	286	284	286	286	286
4	289	290	292	293	291	289	287	286	288	287	288	288	288	287	288	289	289
5	292	294	295	296	294	290	289	289	290	288	290	291	292	290	290	294	292
6	296	298	298	299	297	294	293	293	293	292	293	293	293	294	294	298	296
7	300	302	303	304	301	299	297	297	297	295	296	298	297	296	298	301	300
8	306	308	308	308	305	303	301	301	301	300	301	303	303	301	304	306	306
9	311	313	313	313	311	309	307	307	305	304	306	307	308	307	309	312	311
10	318	320	320	319	318	315	312	310	310	310	310	315	314	314	314	319	318
11	323	327	325	326	324	321	319	318	317	316	315	318	320	322	319	325	323
12	332	334	332	333	333	330	325	325	323	322	324	325	326	328	326	330	332
13	340	344	339	340	340	336	333	331	330	328	330	335	335	338	333	340	340
14	347	352	348	351	350	346	341	342	339	339	337	343	341	345	339	348	347
15	355	363	356	364	359	357	348	350	348	350	344	352	350	354	348	356	355
16	364	371	363	372	366	365	359	361	355	358	353	359	358	364	358	366	364
17	374	382	374	383	375	377	370	372	366	367	365	370	370	373	367	373	374
18	386	394	387	391	383	385	378	380	375	378	375	381	382	385	376	385	386
19	396	405	396	402	394	397	389	394	385	391	387	393	392	394	384	395	396
20	405	418	408	414	405	407	399	402	394	404	400	406	404	406	395	407	405
21	412	428	416	425	413	418	410	413	407	415	410	416	413	418	405	416	412
22	422	441	427	437	423	429	421	424	419	429	423	429	425	427	416	427	422
23	431	450	436	445	429	437	430	433	429	439	433	440	435	439	427	438	431
24	441	459	444	455	437	448	442	445	441	453	445	453	446	449	437	447	441
25	450	470	453	462	444	455	450	453	451	463	455	465	454	461	449	457	450
26	457	478	461	471	453	464	460	464	463	474	468	475	465	470	459	466	457
27	467	487	472	479	460	472	468	472	472	484	480	488	475	482	470	477	467
28	475	495	480	489	469	482	476	484	485	498	492	497	484	491	479	485	475

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29	483	506	489	499	479	490	485	494	496	510	505	509	494	502	490	497	483
30	490	514	496	507	486	500	492	504	505	520	515	519	502	512	498	507	490
31	499	523	503	519	496	510	500	515	515	532	526	530	511	522	508	518	499
32	506	529	509	527	503	518	506	524	522	541	534	540	518	533	517	526	506
33	516	536	517	536	513	528	514	534	532	552	544	551	526	540	524	536	516
34	523	543	523	543	521	535	521	543	539	561	554	561	534	549	532	544	523
35	532	551	530	551	531	543	529	553	548	570	562	568	540	555	538	552	532
36	541	557	536	558	540	550	536	562	556	578	571	577	547	563	546	560	541
37	548	565	544	566	550	558	544	569	561	584	577	585	554	568	551	566	548
38	557	572	550	573	558	565	554	577	568	591	584	592	559	575	559	572	557
39	563	578	556	581	568	571	561	583	570	597	589	597	566	579	565	577	563
40	571	585	562	587	577	578	570	591	576	603	595	604	573	585	572	584	571
41	579	592	569	595	586	585	577	597	580	609	601	610	580	591	576	588	579
42	589	598	579	601	593	591	585	604	584	614	605	615	586	597	583	593	589
43	596	604	587	607	600	598	594	611	588	618	609	621	594	603	590	597	596
44	603	613	595	614	607	601	600	615	592	622	613	625	599	610	597	604	603
45	607	621	599	620	614	605	607	619	597	625	616	631	606	618	603	609	607
46	611	628	606	625	622	608	613	622	600	626	619	636	613	623	611	616	611
47	616	630	612	629	629	613	621	627	606	629	623	639	616	630	615	620	616
48	621	633	619	632	635	618	627	632	612	633	627	644	621	636	618	623	621
49	626	634	624	636	640	622	632	636	617	636	631	648	625	643	620	626	626
50	630	636	630	641	645	626	638	640	622	641	637	651	629	648	622	627	630
51	636	638	636	643	649	629	641	643	628	647	641	653	632	652	626	630	636
52	639	639	642	647	653	632	644	647	635	650	648	655	635	654	629	632	639
53	643	640	648	650	657	635	648	649	641	653	653	658	639	656	632	634	643
54	646	641	653	652	661	636	651	651	645	656	657	661	643	656	634	635	646
55	648	642	658	654	662	639	656	652	653	659	661	662	648	655	639	637	648
56	649	643	659	656	663	639	660	651	655	662	665	664	653	654	641	638	649
57	649	644	661	658	664	641	664	651	659	662	667	665	656	653	644	641	649
58	649	643	662	659	665	644	668	650	661	660	670	666	658	652	646	643	649
59	648	645	662	662	666	645	669	649	662	660	672	666	659	652	649	645	648
60	647	646	662	663	666	647	669	649	663	661	675	665	660	653	650	647	647

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61	647	646	661	666	667	650	669	650	662	662	676	665	660	654	652	649	647
62	647	647	660	667	668	652	668	653	661	664	677	666	661	655	653	652	647
63	648	647	658	667	669	654	667	655	660	667	675	667	661	655	654	653	648
64	647	647	656	666	669	656	665	656	658	669	673	667	661	655	654	651	647
65	647	647	655	664	669	655	663	655	659	671	671	666	662	654	654	649	647
66	647	645	654	663	669	654	662	654	659	670	670	665	662	654	654	647	647
67	646	645	653	661	667	653	661	654	660	669	670	665	661	655	654	647	646
68	646	645	652	661	665	653	662	651	659	669	669	664	661	654	654	646	646
69	646	644	652	660	664	654	662	650	659	668	668	664	662	653	654	646	646
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71	645	641	652	658	662	653	660	649	660	665	665	662	660	650	654	643	645
72	644	639	650	657	660	649	658	647	659	664	664	660	660	648	654	642	644
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79	631	628	634	647	646	641	646	640	649	653	655	652	652	641	645	633	631
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81	626	623	628	642	641	636	641	635	645	649	651	647	646	639	641	630	626
82	625	622	627	640	637	635	640	634	643	647	649	646	645	637	639	630	625
83	624	621	624	639	635	633	639	633	640	645	649	644	643	635	639	629	624
84	623	620	623	637	634	632	637	631	638	644	649	644	642	633	637	627	623
85	622	618	622	636	632	631	636	631	637	643	648	643	641	632	637	625	622
86	621	617	621	635	632	630	636	630	636	642	648	641	640	632	636	624	621
87	621	616	620	635	631	630	635	629	635	641	648	641	640	631	635	624	621
88	620	616	619	634	630	629	635	628	635	640	645	640	640	631	635	624	620
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90	618	614	617	633	628	628	633	626	633	639	644	639	638	629	634	622	618
91	617	614	617	632	627	627	632	625	632	638	643	639	637	627	633	620	617
92	616	613	615	631	627	626	631	625	630	637	641	638	635	625	631	618	616

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93	615	611	614	630	625	625	630	623	629	636	639	635	633	624	630	618	615
94	613	610	612	628	623	623	627	621	627	634	637	633	631	622	628	616	613
95	611	608	611	626	622	621	626	618	626	632	635	630	629	621	626	614	611
96	609	606	609	623	619	619	624	616	625	629	633	628	627	618	623	611	609
97	607	603	608	621	618	617	622	613	622	626	630	624	625	615	620	609	607
98	604	601	606	617	616	615	620	609	621	624	627	621	623	612	617	605	604
99	602	599	603	615	615	611	618	607	617	621	625	619	621	608	614	602	602
100	599	596	601	612	613	608	616	604	615	617	621	615	617	606	612	599	599
101	596	593	599	609	611	604	613	601	612	614	618	613	614	603	608	596	596
102	593	590	597	606	609	601	611	597	609	610	616	609	611	600	606	594	593
103	591	586	595	601	607	598	609	595	606	607	612	606	608	596	602	590	591
104	588	584	592	599	604	595	606	591	602	604	609	603	604	593	599	588	588
105	584	580	589	595	603	592	603	588	600	601	605	601	601	590	595	584	584
106	581	578	587	593	599	589	599	585	595	597	601	597	597	588	591	581	581
107	576	574	583	589	597	586	596	582	593	593	598	594	593	584	586	578	576
108	573	571	581	585	594	583	592	578	588	589	593	590	589	579	581	573	573
109	569	568	577	581	589	580	588	575	584	586	589	587	585	576	577	570	569
110	564	565	574	578	585	575	583	570	580	581	584	582	581	572	572	566	564
111	560	560	569	574	580	571	579	567	576	577	580	578	575	569	568	563	560
112	554	555	565	569	577	567	574	562	570	571	573	573	570	564	561	557	554
113	549	552	561	566	569	563	569	558	564	566	566	568	564	560	555	553	549
114	542	547	555	560	564	558	562	553	559	562	562	562	558	554	547	547	542
115	537	543	550	555	556	552	557	548	554	556	554	556	552	549	542	543	537
116	529	536	543	548	551	545	550	542	546	550	548	550	545	542	534	537	529
117	523	530	537	543	544	539	543	534	538	543	539	543	537	536	526	531	523
118	515	525	529	537	536	532	535	529	530	538	532	537	530	531	519	524	515
119	508	520	523	532	529	524	527	521	521	530	522	530	521	522	511	517	508
120	502	512	515	524	520	517	520	516	514	523	515	524	514	516	503	511	502
121	494	505	507	516	512	510	511	507	504	514	505	515	505	508	494	502	494
122	489	499	498	509	502	503	504	500	497	507	498	506	496	501	486	494	489
123	481	490	488	500	496	495	494	491	487	498	488	498	489	491	476	485	481
124	474	483	481	493	487	488	486	484	480	489	481	488	480	484	469	478	474

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125	467	475	472	485	480	478	476	476	469	481	471	480	472	475	460	468	467
126	459	468	464	478	471	471	468	468	459	471	461	470	462	467	453	460	459
127	451	459	454	468	462	462	457	459	451	463	453	463	454	456	445	451	451
128	444	452	447	460	454	454	449	450	441	454	444	454	444	447	436	443	444
129	435	442	437	450	445	445	440	442	434	447	438	447	435	440	429	435	435
130	425	435	429	443	436	437	430	432	425	437	428	439	425	430	420	426	425
131	418	426	419	434	426	430	422	425	417	430	419	432	417	423	413	419	418
132	409	417	409	426	417	421	411	417	407	421	409	423	407	414	402	410	409
133	401	409	401	417	407	412	402	410	399	414	401	415	400	406	393	404	401
134	390	400	391	408	397	403	392	400	388	404	390	405	389	397	384	394	390
135	381	392	382	400	387	395	383	392	379	396	382	395	378	390	375	387	381
136	370	383	371	391	376	384	371	382	368	386	371	386	369	379	364	376	370
137	361	375	362	383	366	375	361	373	359	376	358	375	358	369	352	368	361
138	349	364	351	372	353	363	350	362	349	367	349	366	348	360	344	357	349
139	336	355	341	362	344	354	340	351	339	355	338	355	335	349	333	346	336
140	326	344	330	349	332	342	328	341	327	346	329	346	325	339	324	337	326
141	314	332	320	340	322	328	317	328	315	332	317	333	312	327	312	325	314
142	304	321	308	327	310	317	307	317	306	321	307	322	302	318	303	315	304
143	291	308	296	313	300	303	294	304	294	308	294	308	290	305	290	303	291
144	282	297	286	302	288	292	284	293	284	297	284	297	281	294	280	292	282
145	270	283	273	288	278	279	272	279	272	284	272	284	268	281	268	279	270
146	260	272	262	277	266	269	262	269	262	273	260	269	255	267	255	268	260
147	247	258	249	264	252	256	251	256	249	260	249	258	245	256	245	256	247
148	234	246	239	253	242	244	241	244	237	247	237	245	233	243	232	243	234
149	224	236	226	240	230	233	228	234	228	237	226	234	223	232	222	232	224
150	211	224	214	227	221	220	214	222	215	224	212	220	210	219	209	219	211
151	202	213	204	216	208	210	202	212	205	213	199	206	196	208	196	209	202
152	189	199	191	203	195	197	188	199	192	200	189	196	185	195	187	197	189
153	176	186	180	192	184	187	177	187	178	188	176	183	173	182	174	184	176
154	165	176	167	179	172	174	164	177	168	177	165	172	162	172	164	175	165
155	153	164	156	166	162	161	153	164	155	163	153	159	150	160	151	161	153
156	143	154	145	156	149	150	144	151	145	150	144	145	137	150	142	150	143

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

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157	131	140	134	142	137	136	132	138	130	135	132	133	127	137	131	137	131
158	120	127	122	130	128	123	119	125	119	118	118	120	115	123	120	123	120
159	110	116	112	117	116	113	109	115	108	107	107	107	105	113	110	113	110
160	98	103	99	105	102	102	97	103	93	92	94	98	93	101	97	101	98
161	89	94	90	96	93	94	89	95	83	77	84	87	83	91	88	90	89
162	79	82	80	86	83	83	79	84	69	64	72	79	74	79	77	80	79
163	69	72	70	77	76	70	70	70	59	52	64	66	64	68	67	69	69
164	61	65	63	65	66	61	60	63	49	43	53	56	54	59	59	60	61
165	52	53	52	55	54	54	49	52	40	35	41	46	46	46	47	50	52
166	45	47	45	49	47	47	43	43	35	31	30	39	38	35	39	43	45
167	37	39	39	40	42	37	36	32	30	27	23	31	33	28	28	33	37
168	30	31	33	33	35	30	28	27	27	23	15	24	25	19	19	24	30
169	25	25	26	27	27	25	24	20	23	19	10	19	20	14	13	18	25
170	19	19	20	21	22	19	19	16	17	13	6	12	15	9	7	12	19
171	13	15	17	16	17	15	15	13	14	11	4	7	9	6	4	10	13
172	11	12	13	13	13	12	11	9	10	7	3	4	6	4	3	7	11
173	7	8	9	9	10	9	9	6	7	5	2	2	3	3	2	5	7
174	5	6	6	7	6	6	5	4	4	4	2	2	2	2	2	4	5
175	4	4	4	5	4	4	4	3	3	2	2	2	2	2	2	3	4
176	2	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2
177	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
178	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
179	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
180	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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 *******