

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-8024M57C-A

Representative (Tested) Model: LED-8024M57C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Mar.22,2017

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

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8024M57C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	277-347Vac, 50/60 Hz	
Nominal Power	45W	
Rated Initial Lamp Lumen	--	
Declared CCT	5700K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-O1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo

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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**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 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

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-8024M57C-A		

Electrical Measurement :

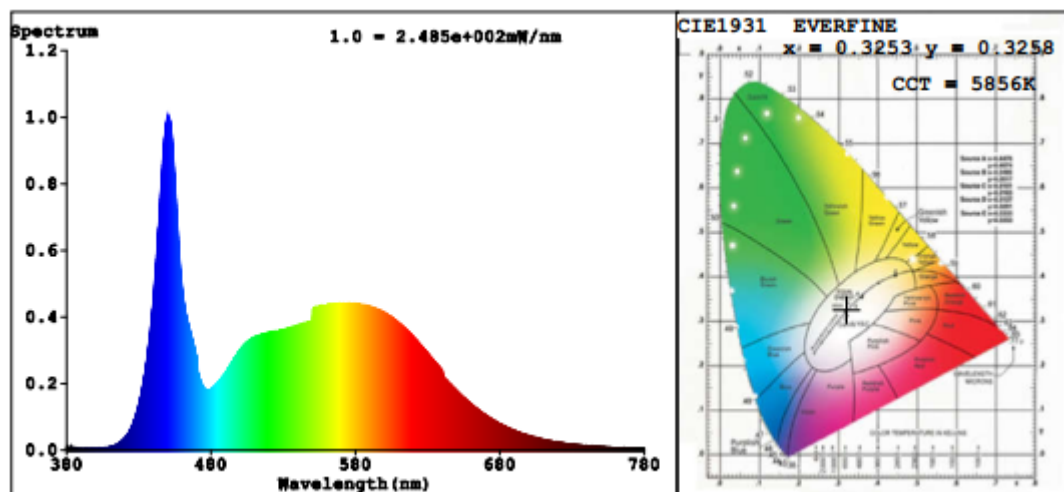
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.1752	46.30	0.9540
O1	347.0	60	0.1410	46.22	0.9450

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	85	R9	19
Frequency (Hz)	60	R2	89	R10	74
CCT (K)	5856	R3	91	R11	86
Duv	-0.0047	R4	86	R12	64
Chromaticity (x, y)	x=0.3253 y=0.3258	R5	86	R13	86
Chromaticity (u', v')	u'=0.2078 v'=0.4685	R6	84	R14	95
Color Rendering Index (CRI)	85.0	R7	87	R15	82
R9	19	R8	72	--	--

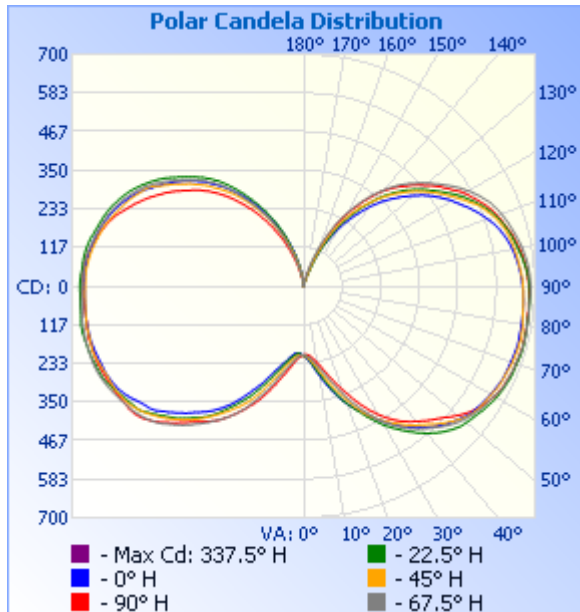
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	6817.5	6763.5
Luminous Efficacy (lm/W)	147.25	146.33
Beam Angle (°)	283.4	--
Center Beam Candle Power (cd)	209	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

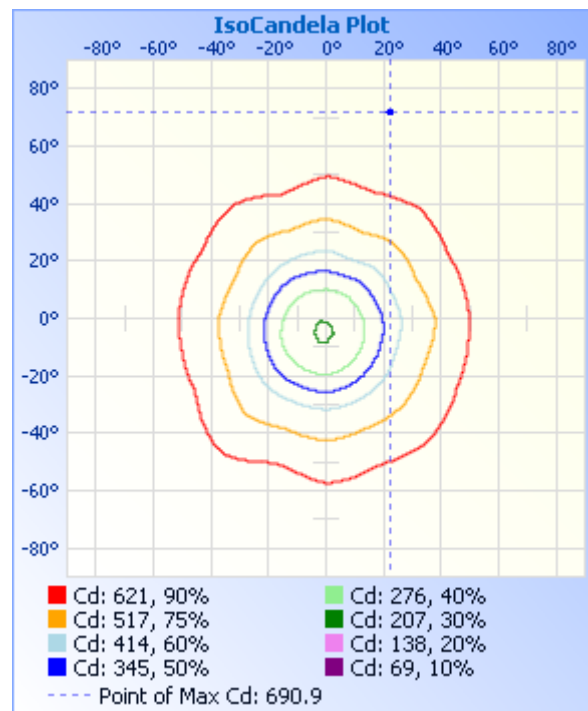
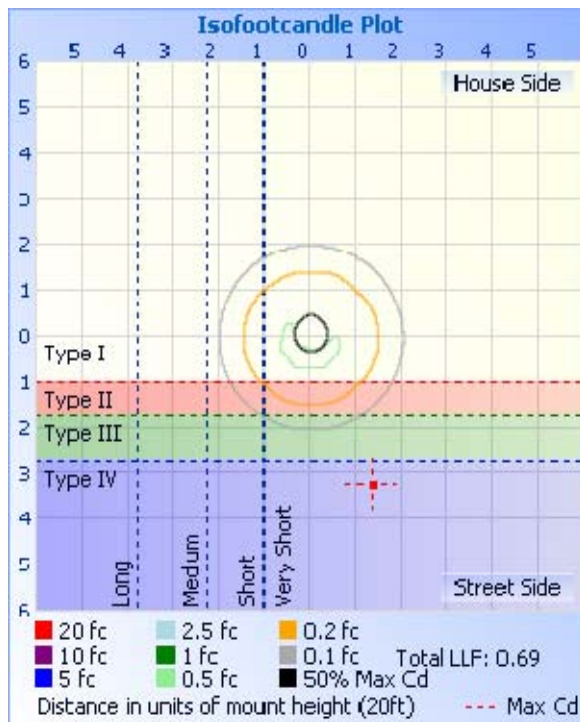
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	288.0	4.2%
0-40	601.7	8.8%
0-60	1,624.7	23.8%
60-90	2,113.7	31%
70-100	2,179.6	32%
90-120	1,994.0	29.2%
0-90	3,738.4	54.8%
90-180	3,079.5	45.2%
0-180	6,817.9	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	21.6	0.3%	90-100	727.4	10.7%
10-20	82.8	1.2%	100-110	677.8	9.9%
20-30	183.7	2.7%	110-120	588.8	8.6%
30-40	313.6	4.6%	120-130	465.2	6.8%
40-50	450.1	6.6%	130-140	329.5	4.8%
50-60	572.9	8.4%	140-150	193.1	2.8%
60-70	661.5	9.7%	150-160	80.0	1.2%
70-80	715.9	10.5%	160-170	16.7	0.2%
80-90	736.2	10.8%	170-180	1.0	0%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.72 fc	
34.0ft	0.18 fc	
51.0ft	0.08 fc	
68.0ft	0.05 fc	
85.0ft	0.03 fc	
102.0ft	0.02 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	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209
1	213	211	210	209	206	207	207	206	208	208	209	210	210	212	215	215	213
2	217	214	212	210	207	206	206	204	206	207	208	209	211	215	219	219	217
3	220	217	216	213	208	206	205	203	204	205	209	210	214	219	222	222	220
4	225	223	219	215	209	206	205	201	203	204	209	213	216	223	226	226	225
5	232	227	224	218	212	208	205	201	203	205	211	217	221	228	232	231	232
6	237	235	229	222	215	210	206	202	203	206	214	221	226	234	237	238	237
7	245	242	235	228	219	211	208	203	205	209	218	226	231	240	244	246	245
8	255	249	242	235	224	214	211	205	207	213	222	231	239	248	252	254	255
9	263	259	250	240	228	219	215	208	212	216	226	238	247	256	260	265	263
10	271	267	256	247	235	222	218	212	216	220	232	243	253	264	269	275	271
11	284	276	266	254	241	226	222	215	220	227	237	250	262	276	277	284	284
12	293	287	274	262	247	232	225	220	226	231	244	257	271	285	287	296	293
13	305	296	284	269	257	239	232	225	232	236	251	265	278	294	298	305	305
14	314	308	295	279	265	246	238	234	237	244	259	275	288	305	306	318	314
15	325	320	304	288	275	253	245	240	243	251	269	283	298	315	318	332	325
16	336	329	315	299	286	262	252	247	251	260	278	294	310	328	327	342	336
17	345	342	325	308	295	272	260	257	258	270	289	307	319	337	339	356	345
18	357	353	337	320	305	284	270	265	266	278	298	317	330	349	351	366	357
19	365	365	346	334	315	295	282	275	273	289	309	329	342	359	360	379	365
20	376	375	360	345	328	309	292	285	284	299	319	340	352	370	371	389	376
21	386	386	370	360	338	320	303	299	294	311	333	353	364	382	381	402	386
22	394	395	383	371	351	334	313	310	306	321	347	363	375	391	393	412	394
23	403	406	396	385	362	345	325	323	318	335	356	377	386	403	401	423	403
24	411	415	406	395	376	358	335	333	328	345	369	389	394	412	412	434	411
25	421	427	420	408	387	371	348	346	340	358	380	402	405	425	420	446	421
26	430	439	430	420	400	380	358	358	350	371	391	414	416	435	430	454	430
27	441	449	440	434	412	392	371	368	362	381	400	424	425	447	439	465	441
28	450	462	448	445	425	402	383	381	373	393	411	436	437	457	449	474	450

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29	460	472	459	458	435	415	392	392	387	403	420	445	445	470	458	485	460
30	469	484	467	469	447	425	404	405	399	415	430	456	456	480	469	496	469
31	479	493	477	481	456	438	413	415	412	425	441	465	465	492	478	505	479
32	487	505	484	491	468	448	425	428	424	439	449	475	475	501	489	515	487
33	497	513	493	502	477	461	434	442	433	450	459	483	484	513	498	524	497
34	506	524	500	510	487	472	445	452	445	462	468	492	491	521	510	533	506
35	516	532	509	521	495	482	454	465	454	474	479	502	499	532	520	541	516
36	525	543	517	529	505	495	464	476	464	484	487	510	505	540	532	551	525
37	534	552	526	539	512	505	472	488	473	494	498	520	513	551	541	559	534
38	541	563	532	545	520	516	481	496	482	502	507	528	519	558	551	568	541
39	550	570	541	554	526	525	490	506	489	511	517	538	528	567	559	574	550
40	557	581	547	560	534	534	497	515	498	519	526	546	535	575	568	582	557
41	565	588	555	568	540	541	506	524	505	528	533	556	545	583	575	588	565
42	571	596	562	576	548	550	512	534	515	536	543	564	554	590	582	595	571
43	580	604	571	583	554	560	521	542	524	546	550	572	564	598	589	600	580
44	585	611	580	591	561	567	527	552	532	555	559	579	574	604	594	606	585
45	593	617	586	598	567	576	535	560	541	560	567	588	582	609	601	611	593
46	600	624	595	606	575	584	541	570	549	568	575	597	593	616	607	618	600
47	604	629	601	612	581	592	549	577	558	575	582	604	601	622	614	624	604
48	610	635	609	618	591	599	557	586	565	584	589	611	610	628	618	628	610
49	614	639	616	624	600	607	564	593	575	590	596	616	617	633	622	635	614
50	621	641	623	628	607	615	573	602	584	599	603	622	625	639	625	638	621
51	626	645	629	634	616	621	580	611	590	606	610	627	631	643	628	642	626
52	632	647	635	638	623	628	588	618	596	615	616	631	636	647	631	646	632
53	635	651	638	642	631	632	595	627	599	622	622	635	640	650	634	650	635
54	639	654	642	646	637	637	602	634	603	626	627	639	643	654	637	654	639
55	641	658	645	651	643	640	610	639	608	628	632	642	645	657	640	660	641
56	643	661	647	654	648	643	617	642	615	631	637	645	645	661	643	663	643
57	646	664	649	656	654	645	625	643	621	635	640	648	646	664	645	668	646
58	649	667	651	659	658	647	631	644	627	638	642	651	648	668	648	671	649
59	651	671	652	661	662	650	637	645	632	641	644	654	649	672	649	674	651
60	653	673	655	665	665	651	642	646	636	646	647	657	651	675	651	675	653

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61	655	675	657	669	669	654	646	648	641	649	648	660	652	677	653	677	655
62	658	677	660	673	672	657	650	650	644	655	650	663	654	678	655	678	658
63	660	679	663	676	675	662	652	652	647	659	652	666	655	680	657	680	660
64	662	680	664	678	677	665	655	656	649	663	652	668	656	680	658	683	662
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66	665	684	666	680	679	672	656	663	653	669	653	673	659	683	662	686	665
67	666	685	667	681	681	674	657	665	654	670	656	675	661	685	663	687	666
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69	667	685	671	683	683	675	661	667	656	672	660	677	664	686	665	689	667
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72	669	688	673	685	685	680	665	673	660	677	666	678	666	688	666	691	669
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74	671	689	675	687	687	680	667	676	662	679	667	678	666	690	666	691	671
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77	670	688	676	689	686	681	669	678	665	682	666	679	669	688	667	688	670
78	670	687	674	689	686	682	668	678	665	683	666	678	667	688	666	689	670
79	670	687	674	687	685	684	668	679	665	683	667	678	667	687	665	688	670
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83	668	686	668	686	683	680	671	679	665	679	665	676	665	685	665	685	668
84	668	686	668	685	684	680	670	679	665	678	664	675	665	684	665	685	668
85	667	685	667	685	683	680	669	678	664	678	663	674	666	684	664	684	667
86	666	685	667	686	683	680	669	677	664	677	663	673	666	683	664	684	666
87	665	685	666	686	682	679	667	677	664	677	663	673	667	683	663	684	665
88	665	685	665	687	682	679	667	676	663	677	662	672	668	682	662	683	665
89	663	684	665	687	682	679	668	676	663	677	662	671	668	681	661	682	663
90	662	683	664	687	681	679	668	675	663	677	661	671	669	680	660	681	662
91	661	682	663	686	680	678	669	675	663	677	661	670	670	679	659	680	661
92	660	680	662	685	679	679	669	675	663	675	661	669	670	678	657	677	660

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93	658	679	660	684	678	678	669	675	663	674	661	669	670	676	655	676	658
94	656	676	658	683	677	678	669	675	663	673	660	668	669	675	653	673	656
95	654	674	656	682	675	678	668	674	662	672	659	667	667	672	651	671	654
96	652	671	655	680	672	677	667	673	661	672	657	666	666	669	648	668	652
97	650	668	653	678	670	676	666	672	660	671	656	664	664	666	645	665	650
98	647	665	651	676	668	674	665	670	658	670	653	662	662	662	642	661	647
99	645	661	650	673	665	672	664	668	657	669	651	660	658	659	639	658	645
100	642	659	648	671	663	670	662	666	654	667	649	657	655	655	636	655	642
101	639	655	646	668	659	667	660	664	652	665	646	654	651	652	632	651	639
102	635	652	643	665	656	664	658	661	650	662	643	651	648	648	628	648	635
103	631	649	641	661	652	661	656	659	648	659	640	649	644	645	625	645	631
104	627	646	638	658	649	659	654	656	646	655	638	646	640	641	620	642	627
105	622	642	635	655	645	656	651	654	643	652	635	644	636	638	616	638	622
106	617	638	632	651	640	653	648	650	640	649	632	641	631	635	611	634	617
107	612	634	627	648	636	650	646	646	636	646	629	638	627	630	607	630	612
108	606	629	623	645	632	648	643	643	633	643	625	635	621	627	601	625	606
109	600	625	618	641	628	644	639	640	629	641	620	632	617	622	596	621	600
110	592	619	614	637	623	641	635	636	625	637	616	628	610	616	591	615	592
111	586	613	607	633	619	638	631	633	621	634	612	625	604	612	584	610	586
112	578	607	600	628	614	635	626	629	617	630	607	621	597	606	578	604	578
113	571	600	595	623	608	630	621	626	613	626	603	617	588	601	570	597	571
114	563	594	588	619	602	626	616	623	607	621	598	612	582	594	564	592	563
115	556	586	581	612	595	621	612	619	602	617	594	607	574	588	556	584	556
116	547	579	571	605	589	616	605	612	596	612	589	603	568	581	546	578	547
117	539	570	561	599	582	611	600	608	591	607	585	597	559	573	539	570	539
118	532	562	553	591	574	605	593	602	584	603	580	592	553	567	530	562	532
119	523	555	543	584	569	599	587	597	578	597	574	586	544	559	521	555	523
120	517	545	535	575	561	592	578	590	571	590	568	580	537	553	514	545	517
121	509	537	525	566	554	586	569	585	564	583	564	573	528	544	504	536	509
122	500	527	516	559	544	577	562	577	555	577	559	566	520	536	497	525	500
123	492	517	509	549	535	569	554	571	546	569	551	558	511	528	487	516	492
124	483	509	499	541	527	560	547	564	540	562	542	551	504	518	478	506	483

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125	475	499	491	530	518	553	538	557	531	554	529	542	495	510	471	496	475
126	465	491	481	522	511	543	532	548	524	547	519	532	487	500	461	488	465
127	456	481	473	512	502	533	523	541	516	538	509	525	478	493	453	479	456
128	446	473	463	502	494	525	515	532	508	531	500	514	468	484	443	472	446
129	435	463	454	494	484	515	506	522	500	521	489	507	460	474	434	462	435
130	425	453	446	484	474	508	498	514	493	510	481	497	450	466	423	451	425
131	414	445	436	475	466	498	489	505	483	502	471	489	442	456	412	443	414
132	405	435	427	465	456	491	481	498	476	492	463	479	433	448	404	431	405
133	393	426	416	455	447	480	471	487	466	484	452	471	425	436	392	421	393
134	381	414	405	447	436	472	461	479	458	475	443	461	414	425	383	408	381
135	372	402	396	436	426	463	453	470	447	467	432	453	406	415	371	396	372
136	360	392	385	427	419	455	442	462	440	457	423	443	394	403	359	384	360
137	351	379	375	415	408	445	432	452	429	449	411	433	385	392	349	369	351
138	338	368	363	403	398	436	421	444	417	438	399	422	373	378	337	357	338
139	326	355	353	393	386	424	410	434	408	429	390	413	363	364	327	342	326
140	315	343	341	379	377	412	396	425	396	418	378	400	350	352	315	330	315
141	301	328	328	368	364	390	386	414	386	409	369	390	339	337	304	316	301
142	289	314	318	355	350	366	369	405	374	395	357	376	326	324	291	301	289
143	275	302	305	343	337	348	359	393	364	385	347	362	313	309	277	289	275
144	264	288	295	329	323	329	342	383	351	371	334	349	303	297	266	275	264
145	251	273	281	315	311	309	332	369	341	359	323	334	289	282	253	264	251
146	238	261	268	303	293	286	316	358	328	344	310	322	279	266	243	250	238
147	226	246	257	288	281	268	305	343	318	332	299	307	266	254	230	235	226
148	210	230	243	276	267	249	288	332	304	318	285	295	254	239	215	224	210
149	195	217	230	260	251	231	276	319	293	306	274	280	240	227	204	209	195
150	184	200	216	245	240	210	262	306	280	292	260	269	228	213	189	198	184
151	170	184	202	233	223	193	249	291	269	280	249	253	214	199	176	185	170
152	160	165	191	217	209	177	233	279	256	265	236	241	203	189	165	171	160
153	148	149	175	204	190	163	223	264	245	253	224	226	190	174	152	159	148
154	136	137	160	186	172	146	207	251	232	239	209	214	176	160	142	143	136
155	125	122	143	169	156	132	193	236	221	226	199	200	166	148	129	128	125
156	107	109	125	156	137	116	177	224	206	214	185	188	155	132	115	116	107

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

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157	96	96	110	140	118	106	167	210	194	199	172	172	145	120	105	104	96
158	83	76	91	128	103	95	153	197	180	188	163	157	130	107	93	95	83
159	72	64	74	113	87	78	141	185	169	173	150	144	119	95	85	84	72
160	65	47	62	98	74	67	130	169	157	160	138	129	107	86	75	71	65
161	52	37	50	85	60	52	115	156	144	145	124	118	96	75	65	61	52
162	40	31	39	72	49	40	105	140	133	131	114	105	86	67	56	51	40
163	31	24	27	63	40	31	93	128	120	119	103	96	74	57	45	45	31
164	23	17	17	54	31	25	83	115	110	105	91	83	67	46	38	36	23
165	18	13	12	40	24	20	77	102	97	96	81	71	58	40	33	28	18
166	13	13	10	31	20	19	69	92	85	84	71	61	50	33	25	23	13
167	9	13	7	20	21	17	62	79	76	74	63	51	41	24	21	18	9
168	8	9	4	13	19	16	51	68	66	64	54	45	33	20	16	13	8
169	6	6	3	9	13	14	43	57	57	54	46	37	28	16	11	10	6
170	4	4	2	5	7	13	36	50	48	47	38	31	22	11	9	6	4
171	3	3	2	2	3	12	31	41	40	36	31	25	17	8	6	3	3
172	2	2	2	2	3	9	25	31	33	30	25	19	13	3	4	2	2
173	2	2	2	1	3	8	19	26	26	25	20	16	8	3	2	2	2
174	1	2	1	1	3	6	17	20	22	19	14	10	6	2	1	1	1
175	1	1	1	1	2	4	12	13	16	14	11	6	3	2	1	1	1
176	1	1	1	1	1	3	7	9	11	10	7	4	2	1	1	1	1
177	1	1	1	1	1	3	6	6	8	7	3	2	1	2	1	1	1
178	1	1	1	1	1	2	3	5	5	3	2	1	1	2	1	1	1
179	2	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	2
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 *******