

LM-79-08 Test Report

For

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

188 S. Northwest Highway Cary, IL60013

LED LuminairesModel name(s): LED-8024M57-A
LED-8024-DL-E40-A

Representative (Tested) Model: LED-8024M57-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

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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Revision Details

Report No.Revision	Revised Item: model name	Revised Reason	Issue date
GZE1706117-H-D	N/A	As manufacturer request	Jul.07,2017
GZE1706117-H-D-R	Add alternate model No. LED-8024-DL-E40-A		Oct.12, 2017

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8024M57-A, LED-8024-DL-E40-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-D1	
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-8024M57-A		

Electrical Measurement :

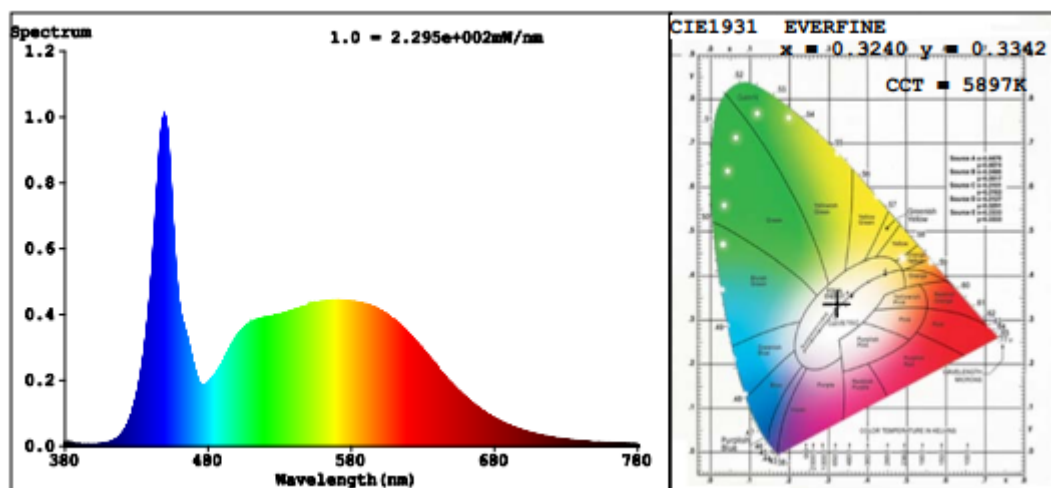
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD%
GZE170611	120.0	60	0.3874	46.08	0.9911	9.38
7-H-D1	277.0	60	0.1733	44.82	0.9335	19.58

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	16
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	5897	R3	91	R11	86
Duv	0.0003	R4	86	R12	64
Chromaticity (x, y)	x=0.3240 y=0.3342	R5	85	R13	85
Chromaticity (u', v')	u'=0.2037 v'=0.4728	R6	83	R14	95
Color Rendering Index (CRI)	84.6	R7	88	R15	79
R9	16	R8	72	--	--

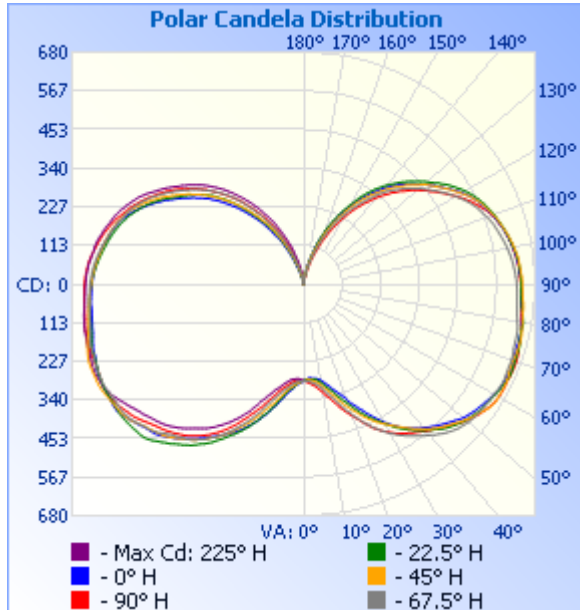
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6632.2	6563.6
Luminous Efficacy (lm/W)	143.93	146.44
Beam Angle (°)	279.7	--
Center Beam Candle Power (cd)	285	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

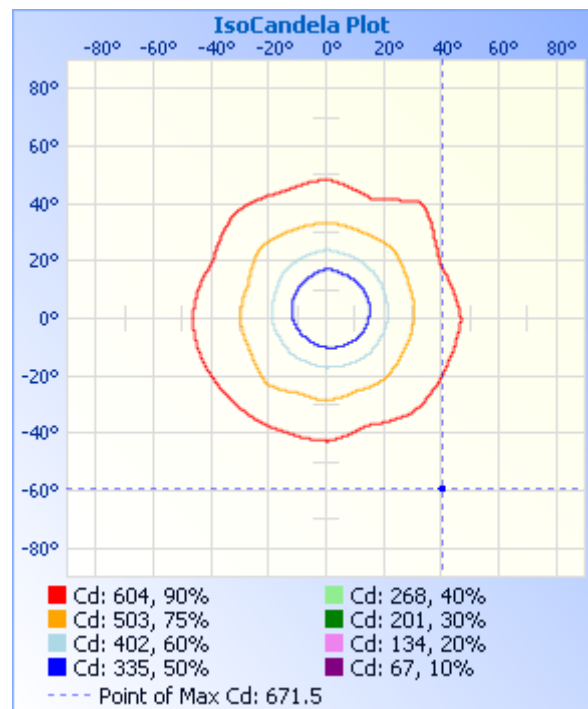
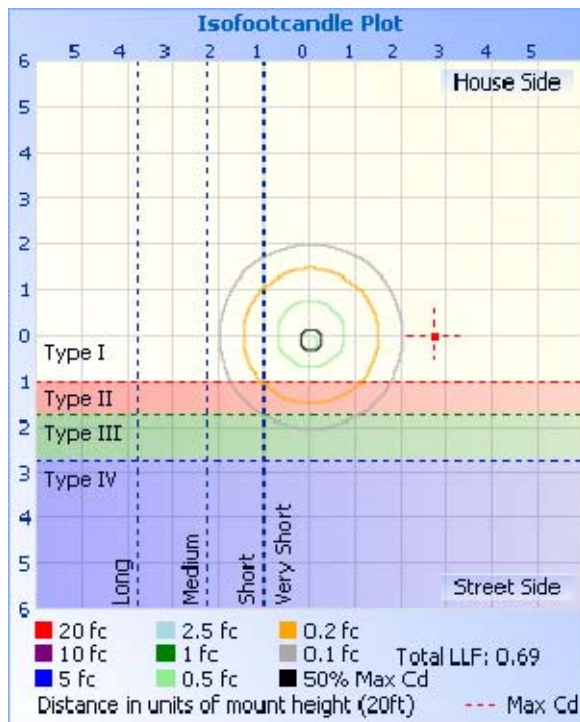
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	340.6	5.1%
0-40	681.0	10.3%
0-60	1,730.0	26.1%
60-90	2,042.0	30.8%
70-100	2,071.3	31.2%
90-120	1,862.7	28.1%
0-90	3,772.0	56.9%
90-180	2,860.6	43.1%
0-180	6,632.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	28.5	0.4%	90-100	683.2	10.3%
10-20	101.8	1.5%	100-110	633.3	9.5%
20-30	210.3	3.2%	110-120	546.2	8.2%
30-40	340.4	5.1%	120-130	427.0	6.4%
40-50	469.6	7.1%	130-140	300.1	4.5%
50-60	579.4	8.7%	140-150	176.5	2.7%
60-70	653.8	9.9%	150-160	75.9	1.1%
70-80	690.2	10.4%	160-170	17.5	0.3%
80-90	697.9	10.5%	170-180	1.0	0%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.99 fc	
34.0ft	0.25 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	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285	285
1	281	282	283	284	285	288	288	288	287	285	286	285	283	283	280	280	281
2	279	280	282	284	287	290	291	290	290	287	287	285	283	281	279	278	279
3	276	279	281	285	290	294	295	294	293	290	290	287	283	281	278	276	276
4	276	279	282	288	293	297	298	297	296	294	293	288	283	282	279	277	276
5	278	280	283	290	296	301	304	303	302	300	297	290	285	283	279	278	278
6	279	281	285	293	300	305	310	308	309	306	301	294	288	285	280	279	279
7	279	282	289	296	304	309	314	314	314	310	305	299	292	287	282	280	279
8	280	284	292	300	309	318	322	323	320	315	312	304	295	290	285	281	280
9	283	288	297	305	315	325	331	332	327	322	318	309	301	294	289	284	283
10	286	293	301	310	322	331	337	340	336	332	325	315	305	297	293	287	286
11	291	299	309	318	330	338	345	350	346	342	333	321	310	302	298	292	291
12	296	306	315	325	337	350	352	358	356	351	341	327	317	306	303	299	296
13	302	313	321	332	343	359	361	367	366	362	351	335	323	312	310	304	302
14	308	320	330	342	353	369	373	379	374	373	361	345	333	321	316	313	308
15	316	325	337	350	361	378	382	389	385	383	369	353	341	327	322	320	316
16	324	335	346	361	372	389	393	401	397	395	377	363	350	336	331	328	324
17	330	344	357	370	381	399	402	411	405	403	387	373	359	344	339	338	330
18	337	352	365	382	390	407	410	419	416	415	398	387	371	357	347	346	337
19	346	362	376	394	401	417	419	430	426	426	410	399	382	370	357	356	346
20	355	370	385	403	409	425	426	438	434	436	420	409	392	381	366	364	355
21	368	380	394	415	419	434	434	447	445	447	432	422	403	394	380	375	368
22	379	392	402	425	428	442	441	455	452	456	441	432	412	404	391	384	379
23	388	402	413	437	439	452	449	465	463	467	451	445	425	414	405	398	388
24	399	413	423	446	448	461	456	473	470	476	460	454	436	425	415	412	399
25	409	423	431	457	460	471	461	483	479	486	471	466	448	436	426	422	409
26	421	434	441	468	470	480	469	492	486	494	483	478	461	449	438	433	421
27	431	442	449	477	478	488	476	499	493	505	491	488	470	459	447	442	431
28	444	453	458	487	487	498	484	509	501	515	501	499	482	473	458	455	444

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29	454	461	465	496	494	506	491	517	507	524	509	508	492	484	466	465	454
30	466	471	474	505	502	515	500	526	516	536	519	518	502	496	477	477	466
31	476	481	481	512	508	522	509	534	522	544	525	525	510	505	485	486	476
32	487	491	490	522	516	531	519	543	530	553	535	535	521	516	494	498	487
33	496	502	497	529	522	539	530	552	539	560	543	543	528	525	502	507	496
34	506	510	505	537	528	546	538	559	546	569	550	550	536	535	511	517	506
35	514	520	515	543	534	554	549	567	555	577	558	558	544	543	517	526	514
36	522	528	522	551	539	560	556	573	561	583	564	564	551	552	523	536	522
37	531	537	531	557	544	566	566	579	569	591	570	570	558	559	529	544	531
38	537	544	538	564	550	574	575	585	575	596	576	573	563	568	537	552	537
39	544	553	547	572	556	579	582	592	582	604	582	578	569	574	545	562	544
40	549	559	554	578	562	584	590	597	589	611	589	583	574	582	551	568	549
41	556	567	563	586	568	588	596	602	596	616	595	587	579	590	559	577	556
42	562	574	569	592	573	593	604	607	602	624	601	593	584	596	564	585	562
43	569	582	577	599	580	599	612	613	608	630	606	598	588	604	571	595	569
44	574	589	583	605	585	604	618	618	615	637	610	607	593	610	576	602	574
45	581	596	590	611	591	610	624	625	620	644	613	614	596	616	582	609	581
46	586	601	595	616	596	615	628	629	622	649	617	619	600	620	585	614	586
47	593	606	601	621	604	621	633	635	625	652	622	623	605	623	589	620	593
48	598	612	607	624	610	626	638	639	628	653	625	626	610	626	593	624	598
49	605	616	614	627	617	632	641	642	633	654	630	631	615	632	597	630	605
50	611	621	619	631	621	636	644	644	638	656	635	636	622	637	601	635	611
51	615	625	626	633	628	638	646	643	642	657	641	640	627	642	606	641	615
52	619	629	632	636	633	640	649	643	647	658	647	644	632	645	609	645	619
53	623	632	635	637	639	641	651	645	651	659	651	646	635	649	614	649	623
54	627	635	641	638	644	643	654	646	656	660	654	649	639	652	619	653	627
55	629	637	647	639	647	644	656	648	660	661	656	651	643	654	625	655	629
56	633	639	653	641	652	644	659	649	662	660	657	651	647	656	630	656	633
57	636	642	657	642	655	647	661	651	663	659	659	651	651	656	634	657	636
58	640	645	660	644	659	650	663	653	662	659	660	651	653	657	640	658	640
59	643	646	661	645	661	652	664	655	661	659	662	651	656	657	645	657	643
60	647	649	661	646	662	654	664	656	661	660	664	652	658	657	651	656	647

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61	650	651	661	648	663	655	664	655	661	660	666	654	660	657	654	656	650
62	653	654	662	650	663	655	664	655	660	661	669	656	661	657	657	657	653
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65	656	661	661	652	663	654	661	654	660	659	671	657	658	662	663	661	656
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67	658	663	656	651	664	656	660	652	658	657	671	657	656	664	667	661	658
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79	652	655	654	641	651	641	646	642	633	637	644	640	655	650	656	661	652
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82	649	650	650	633	646	638	643	640	628	634	637	635	649	643	652	654	649
83	649	648	650	632	645	637	643	640	627	633	636	634	648	641	650	654	649
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86	643	642	646	628	641	636	642	638	626	630	631	631	647	635	645	649	643
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88	640	640	644	628	640	635	640	635	624	628	628	630	646	634	643	645	640
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91	639	638	642	625	637	632	636	630	621	622	623	626	643	632	640	642	639
92	638	638	642	624	636	630	634	628	619	620	621	624	641	631	639	642	638

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93	636	637	639	622	635	628	633	626	618	618	619	623	640	630	638	641	636
94	635	637	638	621	635	626	631	624	616	615	617	620	638	629	637	640	635
95	634	636	637	619	633	624	628	622	614	612	615	619	637	627	635	639	634
96	633	635	636	617	632	621	626	619	612	609	613	616	634	625	633	637	633
97	631	633	635	615	630	618	623	615	610	606	610	614	632	623	630	636	631
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99	627	629	630	610	626	614	619	609	605	599	604	607	624	619	625	632	627
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101	623	623	625	605	622	608	612	603	600	593	599	600	618	614	622	626	623
102	619	620	622	602	619	605	609	600	596	590	597	598	614	610	619	623	619
103	617	618	619	599	617	602	606	596	592	586	594	594	610	607	615	620	617
104	613	615	616	595	613	600	603	592	590	583	592	591	607	603	611	617	613
105	611	612	612	592	611	596	598	587	587	579	589	588	602	600	609	613	611
106	606	609	609	589	607	593	594	583	583	576	585	584	598	596	604	609	606
107	603	606	605	587	603	590	589	579	579	571	581	581	593	593	600	606	603
108	599	603	602	583	599	585	584	575	575	567	578	576	589	590	595	602	599
109	596	599	598	579	595	581	578	571	570	562	574	573	584	587	593	599	596
110	592	596	594	574	590	575	571	565	565	557	568	568	577	584	589	595	592
111	587	592	589	569	584	570	565	560	559	553	564	564	572	580	584	590	587
112	583	588	585	565	579	563	557	554	551	546	559	559	566	576	580	587	583
113	578	584	580	560	571	557	549	548	545	541	554	555	561	570	574	582	578
114	574	580	576	555	565	549	541	540	536	534	546	550	555	566	569	578	574
115	568	575	570	549	557	543	533	534	529	529	540	544	549	561	563	573	568
116	564	570	564	544	551	535	524	526	519	521	532	538	542	557	557	569	564
117	557	565	557	537	542	528	517	519	512	515	525	533	536	552	552	562	557
118	551	560	550	530	534	519	507	509	503	507	516	526	529	547	546	558	551
119	544	554	542	523	525	510	498	502	495	500	509	520	522	541	538	552	544
120	536	547	534	515	517	502	491	493	485	491	499	512	515	536	531	546	536
121	529	540	527	509	507	492	481	483	477	484	492	504	507	529	523	540	529
122	520	532	518	500	498	485	474	476	467	474	483	497	501	523	513	533	520
123	512	525	511	493	490	476	465	467	457	464	473	488	494	517	507	527	512
124	503	518	502	484	481	468	457	459	449	457	465	481	487	509	499	518	503

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125	496	510	495	477	473	459	448	450	439	447	455	472	478	503	492	511	496
126	488	501	486	468	463	452	440	443	431	440	447	465	471	495	483	502	488
127	481	494	479	461	455	442	430	433	420	432	437	455	462	488	476	495	481
128	472	484	471	452	445	435	422	425	413	425	429	448	454	479	467	486	472
129	464	475	464	445	438	425	412	416	402	416	419	439	444	471	460	478	464
130	455	468	454	436	428	417	401	408	394	409	410	432	436	462	451	470	455
131	446	459	444	427	420	407	393	398	384	400	400	423	427	454	444	461	446
132	439	451	436	420	410	397	382	387	375	392	391	415	418	445	436	453	439
133	430	442	425	410	400	390	372	378	363	382	381	406	408	436	427	443	430
134	423	434	418	403	392	379	361	368	354	374	369	396	399	429	419	436	423
135	413	425	407	392	381	371	352	358	342	362	360	388	388	419	410	426	413
136	406	417	399	384	373	359	341	346	330	350	348	377	376	412	401	419	406
137	396	407	388	375	361	350	331	336	320	340	338	369	367	402	390	410	396
138	387	397	379	367	352	338	320	324	308	328	326	358	355	394	381	403	387
139	376	388	368	355	341	328	310	314	298	317	316	348	346	384	371	393	376
140	368	378	357	346	331	315	298	301	285	304	304	337	334	375	362	383	368
141	357	370	347	334	320	303	286	288	274	291	295	327	326	364	350	375	357
142	345	358	336	322	307	292	277	276	261	277	282	313	314	352	340	364	345
143	335	348	327	311	297	279	264	263	249	267	273	302	304	342	328	355	335
144	323	336	315	299	285	269	254	252	239	253	260	288	291	328	316	341	323
145	313	327	305	289	275	256	241	239	227	239	247	274	279	317	306	330	313
146	302	313	293	276	263	245	229	228	216	229	237	263	268	303	294	316	302
147	292	303	284	267	252	232	216	215	202	216	225	250	255	292	284	305	292
148	280	289	271	255	239	220	202	201	191	207	215	239	244	278	271	291	280
149	267	275	258	242	225	210	192	191	177	196	203	226	231	267	261	280	267
150	257	264	247	232	215	197	178	178	166	183	189	213	221	253	247	266	257
151	244	251	234	219	202	186	168	168	157	173	178	202	209	240	235	253	244
152	235	241	223	209	192	172	156	153	146	160	164	189	197	229	226	242	235
153	222	227	210	197	179	159	143	142	136	148	155	178	186	215	214	228	222
154	209	214	198	183	166	148	132	128	123	133	144	164	173	205	204	217	209
155	198	204	188	174	156	136	119	116	110	120	131	153	162	192	191	205	198
156	186	191	176	161	143	126	110	106	99	112	120	140	150	179	177	192	186

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

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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>

157	177	180	166	150	133	113	100	96	86	99	107	126	139	170	166	182	177
158	163	167	152	135	120	103	91	87	77	90	99	114	130	158	153	170	163
159	149	153	138	122	108	91	79	74	67	79	90	102	119	148	143	160	149
160	140	142	127	111	99	80	68	64	57	67	78	92	108	133	132	147	140
161	128	127	114	101	89	73	59	55	49	59	69	81	96	118	122	132	128
162	117	116	105	93	80	64	49	44	40	51	60	71	85	108	112	120	117
163	105	103	95	82	71	56	41	37	33	43	52	62	77	96	99	108	105
164	93	92	85	72	60	43	35	26	25	34	45	53	68	87	90	96	93
165	84	82	76	64	52	36	27	17	21	27	38	46	60	78	79	87	84
166	73	70	65	54	43	30	22	12	14	19	31	38	51	68	71	78	73
167	65	62	57	46	37	24	16	7	10	15	25	33	44	58	65	70	65
168	56	52	49	39	30	21	12	5	7	10	19	26	37	48	54	57	56
169	45	43	40	32	25	16	9	3	4	7	14	21	31	42	45	48	45
170	36	37	33	27	19	12	7	2	2	6	10	17	24	36	38	41	36
171	27	30	27	22	15	9	5	2	2	4	7	12	18	27	32	32	27
172	18	23	22	16	12	6	3	2	2	3	5	9	14	21	26	25	18
173	13	20	16	13	8	4	2	2	2	2	4	5	11	17	19	20	13
174	9	15	12	10	6	3	2	2	2	2	2	3	7	12	14	15	9
175	6	11	9	6	4	2	2	2	2	2	2	3	4	8	8	9	6
176	6	8	7	4	2	2	2	2	2	2	2	2	2	5	5	6	6
177	5	5	3	2	2	2	2	2	2	2	2	2	2	3	3	5	5
178	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3	4	3
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 *******