

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-8024E40C-A

Representative (Tested) Model: LED-8024E40C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Apr.13,2017

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

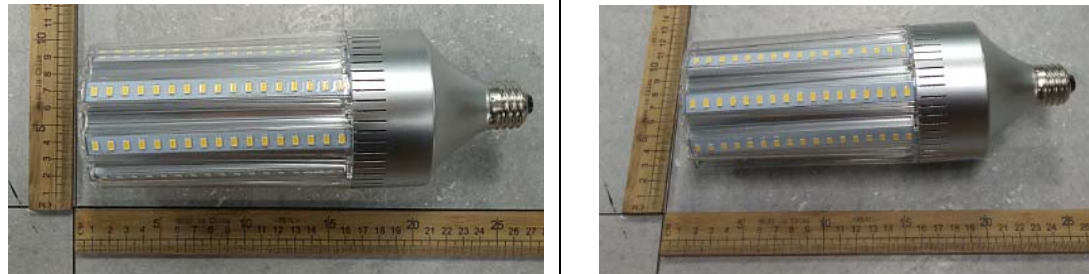
Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8024E40C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	220-347Vac, 50/60 Hz	
Nominal Power	45W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-BA1	
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**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-8024E40C-A		

Electrical Measurement :

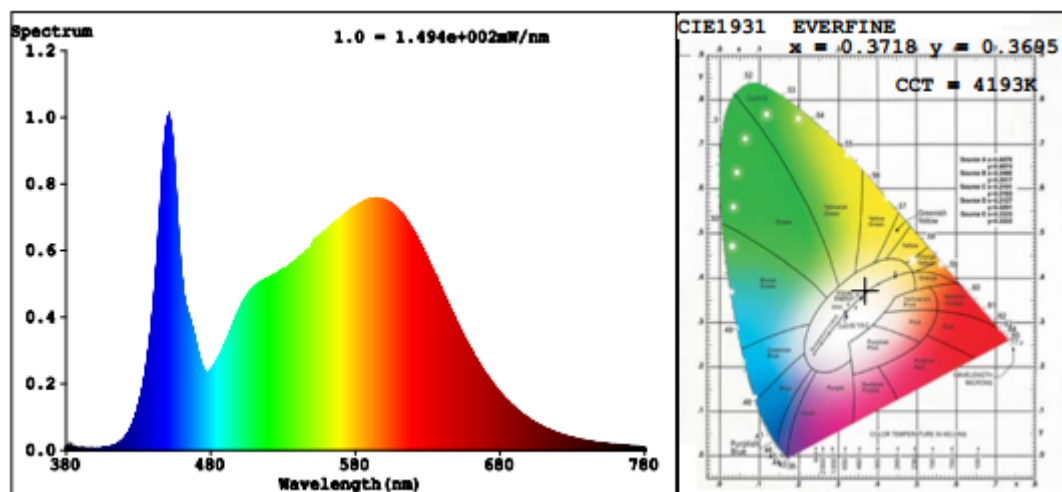
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.1679	44.44	0.9553
BA1	347.0	60	0.1346	44.20	0.9461

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	83	R9	14
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	4193	R3	95	R11	83
Duv	-0.0008	R4	84	R12	65
Chromaticity (x, y)	x=0.3718 y=0.3695	R5	84	R13	85
Chromaticity (u', v')	u'=0.2223 v'=0.4971	R6	87	R14	98
Color Rendering Index (CRI)	84.6	R7	87	R15	78
R9	14	R8	67	--	--

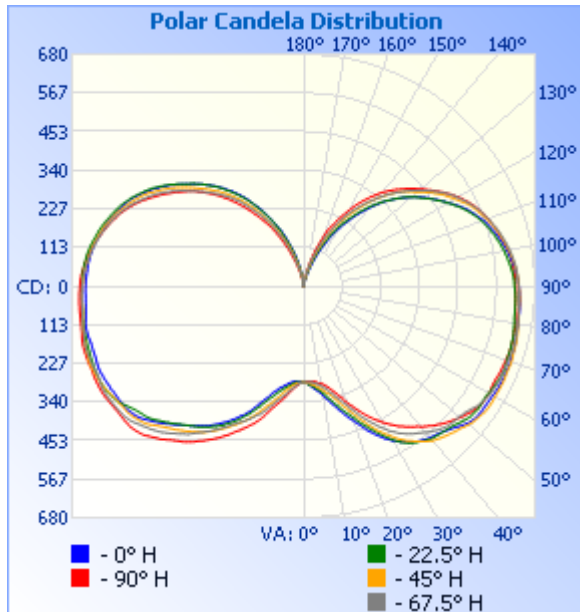
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	6600.0	6527.4
Luminous Efficacy (lm/W)	148.51	147.68
Beam Angle (°)	282.2	--
Center Beam Candle Power (cd)	281	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	332.2	5%
0-40	663.9	10.1%
0-60	1,687.7	25.6%
60-90	2,030.8	30.8%
70-100	2,074.2	31.4%
90-120	1,872.5	28.4%
0-90	3,718.5	56.3%
90-180	2,881.9	43.7%
0-180	6,600.5	100%

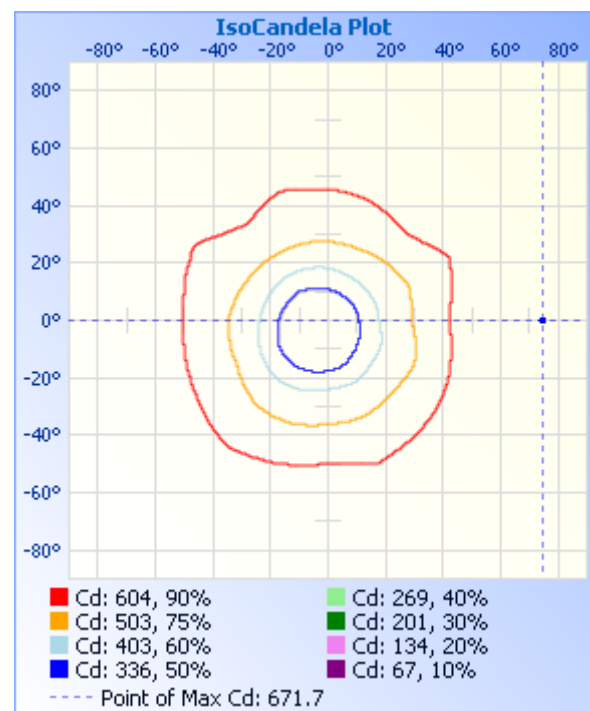
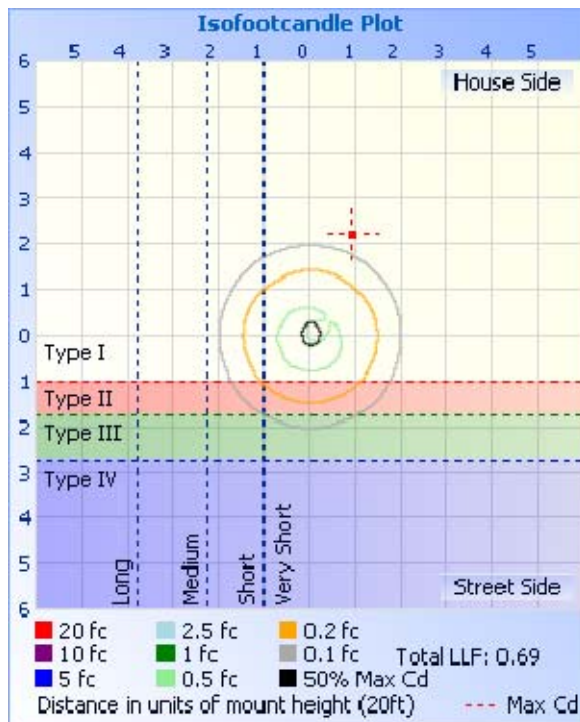
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	28.3	0.4%	90-100	687.5	10.4%
10-20	99.4	1.5%	100-110	636.0	9.6%
20-30	204.5	3.1%	110-120	549.0	8.3%
30-40	331.7	5.0%	120-130	430.3	6.5%
40-50	456.6	6.9%	130-140	301.5	4.6%
50-60	567.2	8.6%	140-150	178.8	2.7%
60-70	644.1	9.8%	150-160	78.9	1.2%
70-80	686.7	10.4%	160-170	19.0	0.3%
80-90	700.0	10.6%	170-180	1.0	0%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	0.97 fc	34.0 ft	21.5 ft
34.0ft	0.24 fc	68.0 ft	43.1 ft
51.0ft	0.11 fc	102.0 ft	64.6 ft
68.0ft	0.06 fc	136.0 ft	86.1 ft
85.0ft	0.04 fc	170.0 ft	107.6 ft
102.0ft	0.03 fc	204.0 ft	129.2 ft

■ Vert. Spread: 90.0°
■ Horiz. Spread: 64.7°



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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	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281	281
1	284	283	283	282	280	279	279	279	280	282	282	283	283	283	284	283	284
2	285	286	284	282	280	278	278	278	281	283	284	286	284	287	287	285	285
3	289	289	286	282	280	277	278	277	282	283	285	287	289	290	290	289	289
4	293	291	287	282	280	276	275	276	281	283	286	292	293	296	295	295	293
5	298	294	289	283	280	276	273	276	280	284	289	296	298	301	301	300	298
6	302	299	292	285	281	276	275	278	282	286	292	301	304	306	306	306	302
7	307	302	296	288	283	277	278	280	284	291	297	306	311	313	313	311	307
8	312	307	299	290	285	278	281	281	286	294	301	312	317	318	320	317	312
9	318	311	303	293	289	280	281	284	289	298	307	320	326	327	328	326	318
10	325	318	309	297	290	283	282	288	294	302	314	325	333	335	335	333	325
11	333	323	313	303	293	286	285	291	298	306	320	331	341	343	343	342	333
12	341	332	319	307	297	289	289	295	302	312	328	339	351	352	353	351	341
13	350	341	323	312	302	293	293	298	306	318	335	344	356	361	363	361	350
14	358	348	329	321	307	299	299	302	312	324	342	355	366	372	374	371	358
15	368	358	339	327	315	303	302	310	319	332	353	362	376	380	383	380	368
16	378	366	347	336	323	310	309	317	325	338	360	371	386	391	394	391	378
17	387	376	357	345	330	317	318	325	334	345	367	381	399	402	405	401	387
18	398	387	369	353	339	326	324	331	344	354	378	389	411	410	414	413	398
19	409	395	377	363	347	334	331	340	352	364	387	398	420	421	425	424	409
20	417	405	388	372	360	342	338	349	363	375	398	404	430	429	434	433	417
21	428	414	398	384	370	351	347	358	373	384	409	412	437	439	444	444	428
22	438	427	410	394	379	360	358	369	385	395	416	420	446	448	453	453	438
23	451	439	424	407	391	369	366	377	397	407	426	426	453	455	461	464	451
24	464	449	435	419	400	380	376	388	407	415	434	434	463	463	470	475	464
25	473	461	449	430	411	390	385	397	418	425	443	440	470	469	476	483	473
26	485	472	460	442	422	403	397	406	424	436	451	448	480	477	486	493	485
27	495	485	474	452	431	415	408	417	435	444	459	455	490	482	494	502	495
28	506	495	485	465	443	425	416	425	443	453	468	463	498	490	503	512	506

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29	514	508	496	475	451	438	426	435	453	460	476	473	508	497	512	519	514
30	523	520	506	486	461	447	435	442	461	470	484	480	516	503	523	528	523
31	531	529	518	496	469	460	445	451	468	477	492	490	524	510	533	536	531
32	539	539	529	505	478	470	454	458	478	485	502	498	532	516	542	542	539
33	545	547	538	514	486	482	464	466	485	491	508	507	541	523	553	550	545
34	552	555	548	521	496	492	472	476	494	499	517	515	548	530	560	556	552
35	558	560	555	529	502	503	481	483	500	504	523	524	557	538	569	564	558
36	563	566	563	535	510	513	491	492	506	510	528	531	565	545	575	569	563
37	568	570	570	541	516	520	497	498	512	517	536	541	573	552	582	574	568
38	572	576	578	547	523	529	505	508	520	521	541	551	579	558	589	579	572
39	576	580	585	553	529	535	512	515	527	527	548	558	584	566	598	584	576
40	579	584	591	559	538	543	520	523	533	532	553	566	591	573	606	588	579
41	582	586	596	566	545	548	525	531	541	539	560	573	597	582	615	593	582
42	585	588	600	571	551	554	533	537	547	545	566	582	606	587	618	597	585
43	588	590	603	577	559	559	539	544	555	552	571	588	614	590	621	602	588
44	592	592	608	581	565	563	544	551	562	560	578	596	620	594	625	606	592
45	598	595	611	586	572	569	551	558	571	565	583	603	627	597	629	613	598
46	602	598	616	590	578	573	557	564	579	573	591	609	633	603	634	616	602
47	608	601	619	592	584	578	564	570	585	579	599	615	641	607	637	618	608
48	615	605	622	594	589	584	570	578	594	587	607	620	646	610	641	621	615
49	621	609	628	594	595	590	577	584	600	593	614	626	649	613	644	624	621
50	627	613	632	597	600	597	583	591	608	599	619	631	653	617	647	627	627
51	631	618	637	600	606	602	589	598	616	603	624	637	655	620	649	629	631
52	635	621	639	602	610	607	595	607	621	606	628	643	657	623	650	631	635
53	637	624	642	607	615	613	600	612	625	610	632	647	657	626	651	633	637
54	638	625	644	612	618	620	607	618	628	615	635	650	658	630	653	635	638
55	639	627	647	617	623	624	613	623	632	621	637	652	658	633	654	636	639
56	639	626	649	621	626	628	616	629	634	627	638	654	659	636	655	638	639
57	639	625	650	625	627	632	620	636	634	635	639	655	660	639	654	639	639
58	640	625	650	628	628	635	622	641	636	641	642	657	662	641	654	642	640
59	641	626	650	631	628	639	624	647	637	645	644	659	664	644	656	645	641
60	642	627	649	632	629	642	624	650	638	649	647	660	666	646	657	649	642

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61	643	629	649	634	628	645	625	654	639	652	650	661	667	648	659	651	643
62	645	632	650	635	627	648	625	654	641	655	653	662	669	649	660	651	645
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74	645	635	646	642	635	650	635	656	647	658	666	665	672	649	654	643	645
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81	639	627	639	638	632	645	631	656	648	656	657	658	663	641	647	636	639
82	639	626	638	637	631	644	629	656	646	656	655	657	663	641	647	635	639
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87	637	624	636	633	624	639	625	651	642	653	652	653	660	637	644	631	637
88	636	623	635	632	623	639	624	651	642	652	651	653	660	636	643	630	636
89	634	621	634	632	623	638	624	651	641	652	650	652	659	634	642	628	634
90	633	620	633	632	623	637	624	650	641	651	650	651	658	633	640	626	633
91	631	619	632	631	623	636	624	650	641	651	649	650	657	631	638	624	631
92	630	618	630	629	622	636	624	649	639	651	648	648	656	630	636	622	630

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93	628	617	629	629	621	636	623	649	639	650	647	647	654	628	633	620	628
94	625	614	627	628	620	635	623	648	638	649	645	645	651	626	631	618	625
95	623	612	625	627	618	634	621	648	637	648	643	643	649	624	627	616	623
96	620	609	623	624	617	632	620	647	636	647	641	640	647	621	624	613	620
97	617	606	620	622	616	632	618	646	635	645	639	638	644	618	621	610	617
98	613	604	618	620	614	631	617	645	634	644	637	636	641	614	617	606	613
99	610	601	614	617	612	629	615	643	632	642	635	632	637	611	613	603	610
100	606	598	611	615	610	627	614	641	629	639	633	630	633	607	609	599	606
101	603	594	607	611	606	624	612	638	627	636	629	626	629	603	605	596	603
102	599	591	605	608	603	622	609	635	624	633	627	624	625	599	601	591	599
103	595	587	602	604	600	619	606	633	622	630	623	620	621	594	596	587	595
104	590	584	598	601	596	616	604	629	619	626	620	617	616	590	592	583	590
105	587	580	595	598	594	613	601	627	616	624	617	612	612	585	587	577	587
106	582	576	590	594	591	609	598	624	612	620	614	608	607	580	583	573	582
107	577	572	587	590	588	607	596	621	610	616	610	604	603	575	577	567	577
108	573	567	583	586	584	603	592	618	607	613	605	599	598	571	573	563	573
109	568	562	579	582	580	600	589	614	601	608	600	595	593	565	567	558	568
110	563	557	573	578	577	596	585	611	597	604	596	589	588	559	561	553	563
111	557	552	568	574	573	592	582	607	593	599	592	585	583	554	556	546	557
112	550	547	563	569	569	588	578	603	590	596	586	580	578	548	550	539	550
113	544	540	558	565	564	585	575	598	585	590	581	575	571	542	543	533	544
114	537	534	554	559	559	580	570	594	581	586	575	567	565	534	535	525	537
115	531	527	548	553	555	575	565	590	575	581	570	562	558	527	527	519	531
116	523	520	543	548	549	571	560	586	572	574	563	555	551	521	519	511	523
117	516	513	535	541	544	565	553	580	566	569	558	547	543	513	510	502	516
118	507	505	527	535	537	559	548	575	560	562	550	540	536	506	503	494	507
119	498	497	520	528	531	552	542	568	553	556	545	532	527	497	494	485	498
120	491	488	512	521	524	546	537	562	547	548	537	526	519	489	486	479	491
121	482	481	506	516	516	539	530	554	539	543	530	517	510	479	477	470	482
122	475	472	498	507	509	533	524	547	531	535	521	510	503	470	468	462	475
123	466	464	491	500	500	526	515	538	525	528	513	501	494	462	460	452	466
124	458	457	483	491	493	519	508	529	516	519	506	493	486	452	451	442	458

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125	450	448	474	483	484	510	499	522	509	512	496	483	476	444	444	434	450
126	442	440	467	474	477	503	493	513	500	502	488	475	469	435	436	424	442
127	434	431	457	464	468	494	483	505	493	495	479	464	459	424	429	416	434
128	425	423	449	456	460	486	476	495	482	485	470	456	450	416	419	406	425
129	417	414	439	446	452	476	467	487	475	477	460	445	442	406	409	399	417
130	407	406	430	437	443	466	457	477	466	467	452	434	434	397	400	389	407
131	396	398	423	427	436	458	451	469	458	457	441	426	426	387	390	378	396
132	387	387	414	419	427	448	441	459	448	449	432	415	414	379	381	369	387
133	376	379	407	408	420	441	432	451	440	441	421	407	405	368	370	359	376
134	367	368	397	398	411	431	422	440	432	431	412	397	394	358	361	350	367
135	356	357	389	389	402	423	414	432	424	424	402	389	384	349	350	340	356
136	347	349	379	379	395	412	406	422	413	414	393	378	372	339	338	329	347
137	335	337	368	370	385	403	398	414	406	403	382	370	362	330	328	320	335
138	323	328	358	359	377	392	388	403	396	396	375	360	350	319	315	307	323
139	313	315	347	347	368	384	379	395	388	385	364	351	340	309	305	297	313
140	299	307	337	337	360	373	369	384	377	376	355	341	327	297	291	284	299
141	288	295	324	326	349	364	361	375	369	364	342	332	316	285	278	273	288
142	276	283	313	316	338	353	350	363	357	354	333	320	303	275	266	259	276
143	265	273	300	304	328	343	342	353	349	343	322	311	292	262	252	245	265
144	252	260	287	295	316	331	331	341	337	334	312	298	278	251	242	236	252
145	239	248	277	283	306	322	321	331	327	321	300	288	268	238	229	224	239
146	229	238	264	273	294	310	310	319	315	312	289	274	255	227	217	214	229
147	216	226	253	263	285	300	301	309	304	300	276	264	244	217	206	202	216
148	203	217	241	251	272	287	289	296	290	290	265	251	231	205	192	191	203
149	194	205	229	242	260	277	278	286	277	276	252	242	221	195	182	182	194
150	181	192	220	228	250	264	264	274	267	265	237	230	209	183	168	171	181
151	170	182	208	217	237	254	254	264	257	251	225	220	200	171	155	161	170
152	157	169	198	203	227	242	241	251	243	241	211	207	187	161	146	146	157
153	142	159	185	190	215	231	231	241	230	227	200	196	173	148	135	131	142
154	131	148	171	180	203	219	220	226	219	217	189	183	161	138	127	120	131
155	118	135	160	169	195	209	211	215	206	203	179	169	146	126	113	108	118
156	109	124	145	157	185	195	199	202	196	193	166	159	136	112	99	97	109

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

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157	98	112	134	146	175	183	187	189	183	180	155	147	125	102	90	89	98
158	89	102	122	134	159	170	176	179	174	165	143	137	116	91	78	80	89
159	81	91	110	126	143	158	163	164	160	153	134	122	102	79	69	72	81
160	69	81	100	112	132	149	153	153	151	140	122	112	89	71	61	61	69
161	59	76	93	99	118	134	140	139	137	131	108	101	81	61	51	51	59
162	53	64	82	91	108	122	129	127	123	117	97	89	71	55	44	45	53
163	43	53	69	82	95	109	116	114	112	107	87	76	63	46	37	38	43
164	35	45	60	73	83	99	106	103	101	94	79	67	55	38	30	29	35
165	29	40	54	62	72	87	93	95	92	85	69	60	48	32	25	25	29
166	23	34	44	53	60	78	82	83	81	73	61	51	39	25	19	19	23
167	19	25	34	48	49	66	73	74	73	63	52	44	33	18	15	16	19
168	14	21	30	39	40	53	60	62	62	55	43	36	28	15	11	11	14
169	11	17	24	30	30	43	52	55	54	46	37	30	21	11	8	8	11
170	8	12	17	24	22	31	41	45	45	38	30	23	17	8	5	5	8
171	5	9	14	17	18	23	33	38	36	28	23	19	12	5	3	3	5
172	4	7	10	11	11	15	24	29	26	21	17	13	9	4	2	2	4
173	3	4	7	9	9	11	19	19	13	13	11	8	6	3	2	2	3
174	2	2	5	5	5	8	12	13	7	8	6	6	3	2	2	2	2
175	2	2	3	3	3	4	7	8	3	4	5	5	2	2	2	2	2
176	2	2	2	2	2	2	5	6	2	4	4	3	2	2	2	2	2
177	2	2	2	2	1	2	3	3	2	3	3	2	1	2	2	2	2
178	2	2	2	2	1	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 *******