

**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-8024E40-A  
LED-8024-CW-E27-A

Representative (Tested) Model: LED-8024E40-A

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

Test &amp; 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-A	N/A	As manufacturer request	Jul.07,2017
GZE1706117-H-A-R	Add alternate model No. LED-8024-CW-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-8024E40-A, LED-8024-CW-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	4000K	
LED Manufacturer	SAMSUNG	
LED Model	SPMWHT541MXXXXXXXXX	
Sample Number	GZE1706117-H-A1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
<b>Photo</b>		
		

## 1.2 Test Specifications:

Date of Receipt	Jun 27,2017
Date of Test	Jun 28,2017
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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-8024E40-A		

**Electrical Measurement :**

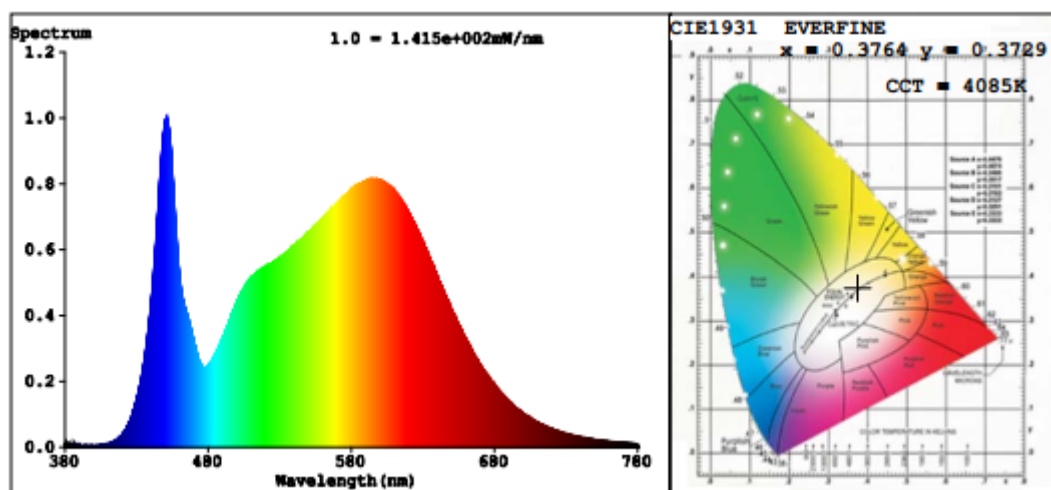
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD%
GZE170611	120.0	60	0.3989	47.49	0.9921	9.54
7-H-A1	277.0	60	0.1775	46.14	0.9383	19.32

**Chromaticity Measurement - Sphere-Spectroradiometer Method :**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	14
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	4085	R3	96	R11	84
Duv	-0.0006	R4	84	R12	66
Chromaticity (x, y)	x=0.3764 y=0.3729	R5	84	R13	85
Chromaticity (u', v')	u'=0.2239 v'=0.4993	R6	87	R14	98
Color Rendering Index (CRI)	84.7	R7	87	R15	77
R9	14	R8	67	--	--

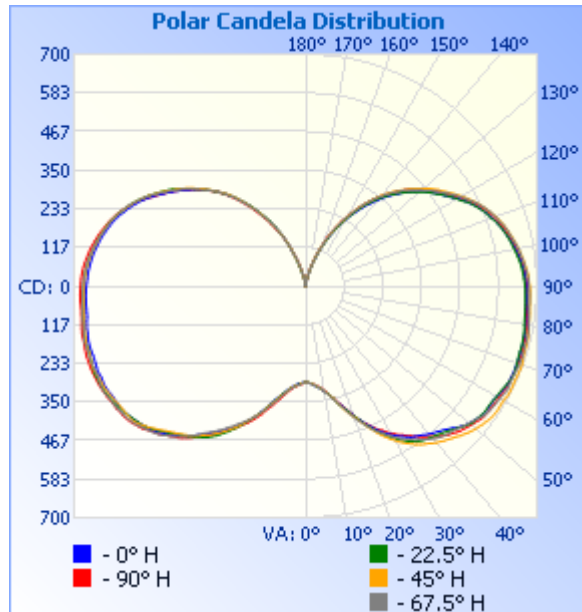
**Photometric Measurement – Goniophotometer Method :**

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6924.4	6840.1
Luminous Efficacy (lm/W)	145.81	148.25
Beam Angle (°)	281.3	--
Center Beam Candle Power (cd)	290	--

**Spectral Power Distribution & Chromaticity Diagram**

**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	349.8	5.1%
0-40	700.2	10.1%
0-60	1,781.4	25.7%
60-90	2,137.9	30.9%
70-100	2,181.6	31.5%
90-120	1,963.0	28.3%
0-90	3,919.2	56.6%
90-180	3,005.6	43.4%
0-180	6,924.9	100%

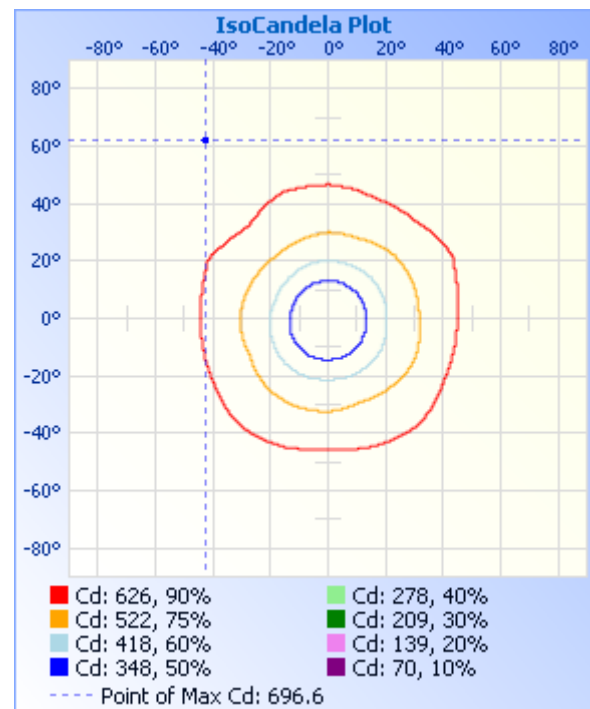
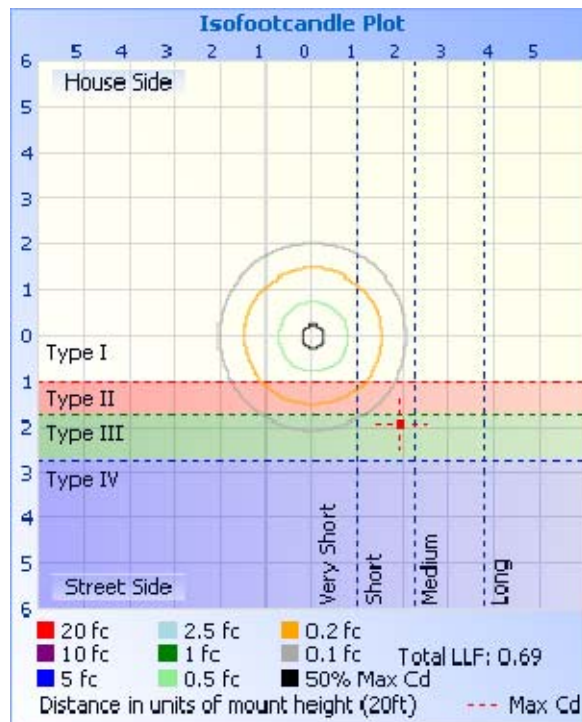
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.3	0.4%	90-100	722.4	10.4%
10-20	104.1	1.5%	100-110	667.6	9.6%
20-30	216.5	3.1%	110-120	573.0	8.3%
30-40	350.3	5.1%	120-130	446.1	6.4%
40-50	483.2	7.0%	130-140	314.2	4.5%
50-60	598.0	8.6%	140-150	185.3	2.7%
60-70	678.6	9.8%	150-160	79.2	1.1%
70-80	723.6	10.4%	160-170	17.1	0.2%
80-90	735.7	10.6%	170-180	0.7	0%

**Photometric Data**


**Illuminance at a Distance**

	Center Beam fc	Beam Width
17.0ft	<b>1.00 fc</b>	<b>8.3 ft</b>
34.0ft	<b>0.25 fc</b>	<b>16.6 ft</b>
51.0ft	<b>0.11 fc</b>	<b>25.0 ft</b>
68.0ft	<b>0.06 fc</b>	<b>33.3 ft</b>
85.0ft	<b>0.04 fc</b>	<b>41.6 ft</b>
102.0ft	<b>0.03 fc</b>	<b>49.9 ft</b>

■ Beam Spread: 27.5°



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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	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290	290
1	291	291	292	291	291	290	290	290	291	291	291	291	293	292	292	291	291
2	292	292	292	293	293	291	291	291	292	293	293	294	295	293	294	292	292
3	294	294	294	295	294	292	292	293	293	294	295	297	298	294	295	293	294
4	297	296	296	297	295	294	293	295	295	298	298	299	300	299	297	296	297
5	301	300	299	300	299	297	296	298	298	299	301	301	302	300	300	300	301
6	306	304	303	303	303	300	300	300	301	303	303	304	305	304	304	303	306
7	308	307	306	306	305	302	303	303	304	307	307	307	309	307	308	309	308
8	312	311	311	310	309	307	306	309	310	309	309	312	314	312	314	311	312
9	317	315	314	315	313	310	312	312	314	315	315	316	320	319	319	317	317
10	322	321	321	321	320	315	316	319	320	321	322	322	327	322	324	325	322
11	328	329	327	328	326	323	324	325	327	327	328	331	335	330	330	329	328
12	334	333	335	336	333	330	333	331	332	333	336	337	340	337	339	337	334
13	343	342	343	343	341	338	340	338	340	340	342	345	351	347	346	344	343
14	352	349	350	353	349	347	347	345	348	350	351	354	359	356	352	354	352
15	360	362	362	362	358	356	354	354	356	358	360	362	369	363	362	363	360
16	370	374	373	373	368	365	362	362	366	367	368	373	378	374	372	371	370
17	379	383	385	382	377	376	372	371	375	377	379	381	386	382	383	381	379
18	390	393	398	395	389	384	379	383	386	387	389	391	397	393	395	390	390
19	400	401	407	407	399	395	392	392	397	400	401	400	410	405	403	404	400
20	412	414	418	418	412	405	404	405	408	409	411	411	419	414	414	414	412
21	425	424	428	433	425	417	413	414	420	420	420	421	430	425	422	427	425
22	435	436	442	442	436	430	424	425	429	431	431	429	438	435	432	438	435
23	446	451	453	454	448	440	433	435	440	441	440	439	448	446	441	448	446
24	459	463	467	464	456	454	445	444	449	453	451	446	456	455	453	460	459
25	468	475	479	476	467	464	455	453	460	463	461	455	465	465	462	470	468
26	480	486	492	487	477	478	466	461	471	475	472	462	475	473	471	482	480
27	490	499	506	496	487	488	476	472	479	486	481	471	483	483	481	491	490
28	501	508	515	506	493	501	488	481	489	497	490	481	493	493	488	503	501
29	509	519	528	515	504	510	499	493	497	506	501	489	501	501	498	512	509

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30	518	528	537	525	513	522	507	501	506	517	509	500	512	510	507	522	518
31	525	540	548	533	520	531	517	512	513	527	519	508	519	518	518	532	525
32	535	549	557	543	529	541	525	520	522	535	526	517	528	526	528	541	535
33	541	558	567	550	536	550	534	531	529	545	536	525	536	533	538	550	541
34	549	566	575	559	544	559	541	540	538	552	543	534	546	542	547	558	549
35	557	571	584	566	552	567	548	548	548	559	551	542	556	548	558	566	557
36	561	579	591	573	561	573	556	556	555	563	560	554	564	557	566	572	561
37	566	584	597	579	569	579	561	563	565	569	566	565	573	564	575	580	566
38	571	589	603	587	578	585	568	571	572	576	573	574	582	574	584	586	571
39	577	592	610	595	585	591	574	579	580	581	578	584	590	580	590	594	577
40	582	595	617	601	593	597	583	585	589	587	584	592	598	588	597	600	582
41	588	598	622	608	601	602	589	592	596	592	590	601	602	596	604	606	588
42	592	602	628	612	609	609	596	597	603	599	595	610	609	602	613	611	592
43	598	606	633	617	616	613	603	604	610	606	601	617	616	611	620	618	598
44	603	612	638	620	623	621	608	612	618	612	608	625	624	616	627	623	603
45	610	616	643	623	628	629	615	618	624	619	616	632	631	618	629	628	610
46	617	623	651	625	635	635	621	625	631	626	622	637	635	621	633	634	617
47	626	628	655	630	640	642	629	630	636	633	630	642	641	625	637	640	626
48	633	635	661	634	644	648	635	635	640	639	638	647	648	629	642	644	633
49	640	642	666	639	649	655	640	639	644	645	644	652	655	635	646	647	640
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51	649	653	674	648	656	667	647	647	653	652	656	662	663	641	654	652	649
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53	657	657	682	660	665	675	653	658	660	659	663	669	672	646	661	660	657
54	660	659	686	666	668	679	654	662	663	663	665	672	675	650	662	665	660
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56	664	661	690	672	670	679	657	671	668	669	666	677	678	657	668	670	664
57	663	662	691	673	671	680	659	675	670	673	667	679	681	662	671	672	663
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60	667	667	692	679	674	686	664	685	672	681	674	683	685	674	674	678	667
61	670	669	693	681	676	687	667	688	673	683	676	685	687	677	674	680	670

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62	673	670	696	684	678	688	668	690	676	685	679	688	689	680	675	685	673
63	676	673	696	686	680	688	670	692	677	686	681	689	690	682	676	689	676
64	679	676	696	685	681	688	670	691	678	687	682	689	692	684	677	690	679
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76	679	677	691	689	683	689	669	689	678	687	685	690	692	687	677	686	679
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81	674	670	685	684	677	681	663	683	670	680	678	682	686	682	670	680	674
82	672	669	683	683	675	681	662	681	667	678	676	682	684	679	669	679	672
83	670	668	683	681	674	680	661	680	667	678	675	679	684	678	666	678	670
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86	669	666	680	679	671	677	659	679	666	675	673	677	684	676	665	675	669
87	669	666	680	679	671	677	658	679	666	675	673	676	683	676	665	675	669
88	668	665	679	678	671	676	657	677	665	675	672	675	683	675	664	674	668
89	667	665	679	677	671	676	656	676	664	673	671	675	682	674	664	673	667
90	667	663	678	676	669	675	656	675	663	672	670	674	681	673	663	672	667
91	666	662	676	675	668	674	655	674	662	671	669	673	680	671	662	670	666
92	665	660	675	674	667	673	655	673	660	670	669	672	679	670	660	669	665
93	663	660	674	672	666	673	653	673	660	669	667	670	678	669	659	667	663

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94	662	658	671	669	664	671	651	671	659	667	667	668	676	667	656	665	662
95	659	656	669	666	663	669	648	670	657	666	664	666	675	664	654	663	659
96	656	653	666	664	660	666	646	668	655	663	662	665	671	663	652	660	656
97	654	651	663	662	656	663	644	664	653	661	660	662	669	659	649	658	654
98	651	648	660	659	653	660	642	661	651	658	657	659	666	657	646	655	651
99	648	644	657	657	650	658	639	659	648	655	655	656	663	654	643	651	648
100	645	640	653	653	647	655	637	656	645	652	652	653	660	651	640	647	645
101	641	637	651	650	644	652	634	653	642	649	648	650	657	647	637	644	641
102	637	635	647	646	642	648	630	650	639	647	645	647	653	643	634	642	637
103	633	632	644	642	638	644	627	647	636	643	642	643	648	640	630	640	633
104	629	628	640	638	633	641	624	642	633	639	639	639	645	635	627	636	629
105	625	624	635	635	630	637	620	639	628	635	636	634	640	631	623	632	625
106	620	620	632	631	626	634	616	635	625	632	631	631	636	627	619	626	620
107	616	616	627	627	622	628	613	631	620	628	627	627	631	623	613	620	616
108	611	611	623	622	617	623	609	626	616	623	623	623	627	619	610	616	611
109	607	605	618	617	613	619	605	622	611	620	618	618	621	615	604	612	607
110	601	599	614	613	608	613	599	618	606	613	614	614	616	609	599	607	601
111	595	594	607	607	603	609	594	612	601	608	608	608	610	604	593	601	595
112	590	589	601	602	596	602	588	607	594	602	603	604	603	598	587	596	590
113	583	583	595	595	591	597	582	601	590	597	596	597	597	591	581	590	583
114	577	576	589	589	584	589	575	595	583	590	590	592	590	584	574	585	577
115	570	569	583	581	577	583	568	588	577	584	583	585	583	577	568	578	570
116	563	562	575	574	569	574	560	581	569	577	577	576	574	571	560	570	563
117	554	555	568	565	561	567	554	573	564	571	569	570	567	562	554	563	554
118	547	545	560	557	554	557	546	564	556	562	563	562	557	556	546	555	547
119	538	535	552	549	545	548	537	557	548	556	554	555	549	547	537	547	538
120	530	528	543	540	537	541	529	548	539	547	547	546	538	539	530	537	530
121	520	520	536	532	527	531	520	540	531	539	539	538	530	530	521	530	520
122	510	512	527	523	520	524	512	530	522	531	530	528	521	521	514	521	510
123	503	503	518	515	511	516	504	523	512	522	522	520	514	513	504	513	503
124	494	495	511	505	505	508	497	514	505	515	512	510	505	505	497	504	494
125	487	485	502	497	496	500	489	506	496	506	504	502	497	495	488	496	487

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

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126	478	478	495	487	488	493	482	496	488	499	494	493	489	485	481	486	478
127	472	470	486	479	479	483	473	489	479	488	487	483	479	478	472	476	472
128	463	462	478	469	471	475	463	478	471	480	477	475	471	468	463	468	463
129	456	451	468	460	464	465	456	468	462	469	470	465	461	459	456	459	456
130	446	442	460	452	454	458	447	460	454	460	460	457	453	450	447	449	446
131	435	434	449	443	446	448	440	449	445	449	451	447	444	442	439	439	435
132	427	425	442	435	437	438	429	441	438	438	441	438	435	431	429	429	427
133	415	417	431	426	429	429	421	430	429	429	432	426	425	423	421	419	415
134	406	406	419	418	418	418	410	420	420	419	422	418	416	413	410	412	406
135	394	397	410	407	408	409	402	409	410	410	411	408	407	402	401	400	394
136	385	386	399	397	397	397	391	399	400	398	402	399	397	394	390	389	385
137	374	378	390	387	386	387	382	388	391	389	390	389	389	383	378	380	374
138	364	367	379	376	377	375	371	378	380	378	381	377	376	373	368	369	364
139	352	356	369	366	365	365	362	366	371	369	371	367	366	361	357	360	352
140	340	346	357	354	355	353	350	357	358	357	361	355	353	352	347	349	340
141	329	334	346	345	342	343	337	345	348	348	348	345	342	340	335	339	329
142	316	324	333	332	333	330	327	332	334	336	337	331	328	329	325	326	316
143	306	311	321	322	319	316	314	322	323	323	323	320	317	316	312	315	306
144	293	301	310	309	309	305	304	310	310	313	311	307	303	303	301	300	293
145	282	287	297	298	296	291	290	299	299	300	297	297	292	292	288	289	282
146	269	275	286	284	285	280	279	286	286	288	284	283	278	279	276	274	269
147	259	261	272	271	272	266	265	274	273	274	273	271	263	268	263	261	259
148	247	247	260	259	257	255	254	261	261	262	259	257	253	254	249	249	247
149	234	236	245	246	247	241	241	247	247	249	247	243	239	242	238	236	234
150	223	223	232	235	233	229	228	235	236	238	233	232	228	228	224	225	223
151	210	208	221	221	223	216	218	221	222	225	219	217	214	214	213	212	210
152	199	198	207	210	211	203	205	209	212	211	208	206	200	204	199	199	199
153	184	185	195	197	198	191	195	196	198	199	195	194	190	191	186	188	184
154	171	175	180	183	187	177	180	183	185	185	184	180	177	181	176	176	171
155	161	161	169	173	174	165	167	172	174	171	171	170	167	167	163	166	161
156	149	148	158	157	162	151	156	158	161	158	159	155	154	153	152	152	149
157	138	137	143	142	146	138	145	144	146	142	147	140	142	142	139	137	138

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158	124	123	131	131	132	127	132	133	132	129	132	128	128	129	128	125	124
159	111	114	118	119	122	114	121	119	116	114	120	116	114	119	117	112	111
160	102	103	106	111	110	103	109	109	103	98	106	108	105	105	105	103	102
161	90	91	96	100	101	94	98	98	94	85	92	95	95	93	95	91	90
162	81	82	84	86	90	82	84	89	82	71	82	84	84	83	84	80	81
163	72	71	77	77	78	74	75	77	68	62	70	72	74	71	72	72	72
164	62	62	64	65	68	63	67	65	55	51	62	60	63	62	64	60	62
165	53	52	56	58	59	52	58	56	47	42	49	52	54	53	52	50	53
166	44	44	47	48	52	45	48	43	38	36	41	44	46	42	43	40	44
167	38	37	40	39	41	39	39	35	32	31	31	37	37	33	31	31	38
168	30	30	33	33	33	31	31	27	28	27	21	27	31	24	20	24	30
169	23	25	26	27	29	24	25	20	25	20	12	20	24	17	13	17	23
170	19	19	20	22	22	20	19	15	21	15	7	15	18	12	7	14	19
171	13	14	16	16	16	14	16	13	15	10	4	9	13	7	4	10	13
172	10	11	11	12	13	10	11	10	11	7	3	5	8	5	2	8	10
173	7	8	8	9	8	8	8	7	7	5	3	2	4	3	2	6	7
174	5	5	6	6	5	5	5	5	4	4	3	2	2	2	2	3	5
175	3	4	4	4	3	4	4	3	2	2	2	2	2	2	2	2	3
176	2	2	3	3	2	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 \*\*\*\*\***