NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest Highway Cary, IL 60013

LED Lamp

Model name(s): LED-8029E57-A
LED-8029M57-A
Remark : The suffix of the model name“E” stand for E26;
“M” stand for E39.

Representative (Tested) Model: LED-8029E57-A

Model Different :N/A

Test & Report By:

Jack Luo

Engineer: Jack Luo
Date: May.09,2016

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.

NVLAP LAB CODE 201011-0

U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template

Laboratory Information:

Name of Test Laboratory	Standard-Tech Co., Ltd.
Date of Test Report	May.09,2016
Test Report No.	GZE160347-C3
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8029E57-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamp	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Electrical Measurements:	**Integrating Sphere Output**	**Goniophotometer Output**	
Input Wattage	--	22.14	W
Input Current	--	0.1863	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9901	
Off-State Power	--	0	W
Photometric Characteristics			
Total Initial Lumen Output	--	2667.4	lm
Initial Lumen Efficacy	--	120.48	lm/w
Correlated color temperature / CCT	5772	--	K
Color rendering index / CRI	85.2	--	
R9 Value	16	--	
Duv	0.0011	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	183	cd
Beam angle (if applicable)		290.4	°
Zonal lumens in the 0°-60° zone		31.3	%
Zonal lumens in the 60°-90° zone		30.1	%
Zonal lumens in the 90°-120° zone		25.6	%
Zonal lumens in the 120°-180° zone		12.9	%

Test Specifications:	
Date of Receipt	: Apr.01,2016
Date of Test	: May.03,2016
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25° C ± 1° 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 Volts, 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. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C ± 1° 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 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

1. Product Information:

Brand Name	N/A
Model Number	LED-8029E57-A ,LED-8029M57-A
Luminaire Type	LED Lamp
Rated Voltage / Frequency	120~277 Vac, 50/60Hz
Nominal Power	24W
Rated Initial Lamp Lumen	--
Declared CCT	5700K
LED Manufacturer	N/A
LED Model	N/A
Sample Receipt Date	Apr.01,2016
Sample Number	GZE160347-C3(5700K)

Photo


LED-8029E57-A


LED-8029M57-A

2.1 Electrical, Photometric and Chromaticity Measurements *(Refer to Work Instruction QD25)*	**IES LM-79 2008**

Test date	2016-05-03	**Test Ambient:**	25.2 °C
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	LED-8029E57-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160347	120.0	60	0.1863	22.14	0.9901	10.12
-C3	277.0	60	0.0872	22.33	0.9242	15.90

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	85.2
R9	16
CCT (K)	5772
Chromaticity (x, y)	x=0.3265 y=0.3379
Chromaticity (u', v')	u'=0.2040 v'=0.4750
Duv	0.0011

Special Color Rendering Indices			
R1	84	R9	16
R2	92	R10	78
R3	94	R11	83
R4	83	R12	63
R5	84	R13	87
R6	86	R14	97
R7	87	R15	80
R8	70	--	--

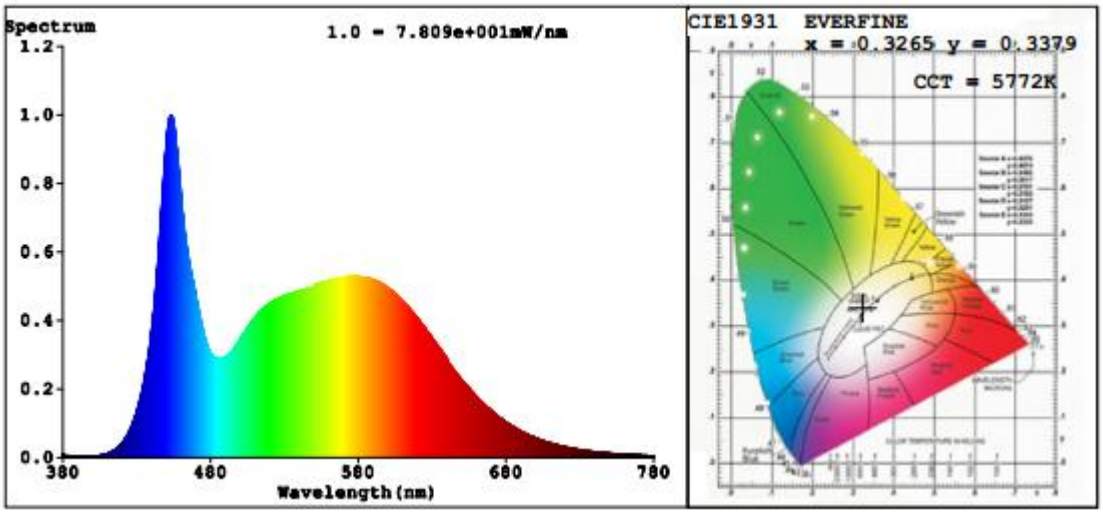
Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2667.4
Luminous Efficacy (lm/W)	120.48
Beam Angle°	290.4
Center Beam Candle Power (cd)	

Goniophotometer Methodn :

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	2625.8
Luminous Efficacy (lm/W)	117.59

Spectral Power Distribution & Chromaticity Diagram

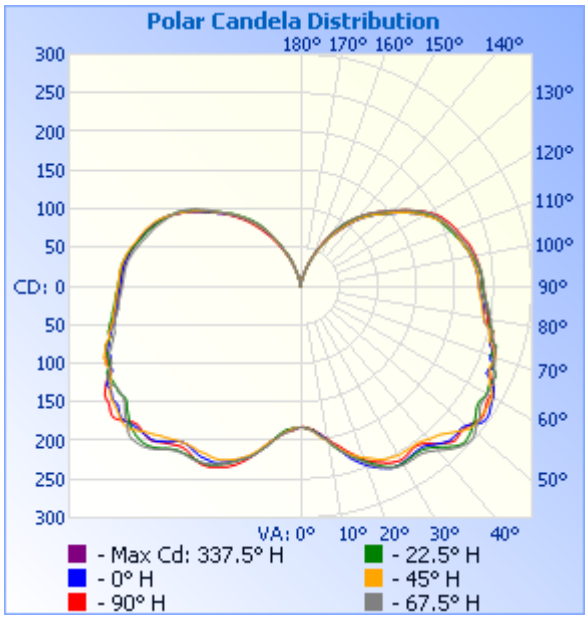


Zonal Lumen Tabulation

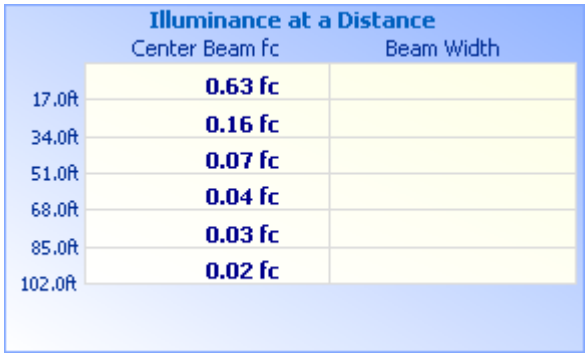
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	198.9	7.5%
0-40	363.0	13.6%
0-60	835.9	31.3%
60-90	803.4	30.1%
70-100	784.7	29.4%
90-120	682.3	25.6%
0-90	1,639.3	61.5%
90-180	1,028.3	38.5%
0-180	2,667.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	18.5	0.7%	90-100	252.6	9.5%
10-20	63.6	2.4%	100-110	231.1	8.7%
20-30	116.9	4.4%	110-120	198.6	7.4%
30-40	164.0	6.1%	120-130	152.2	5.7%
40-50	218.4	8.2%	130-140	102.9	3.9%
50-60	254.5	9.5%	140-150	60.4	2.3%
60-70	271.3	10.2%	150-160	24.9	0.9%
70-80	270.8	10.2%	160-170	5.4	0.2%
80-90	261.3	9.8%	170-180	0.2	0%

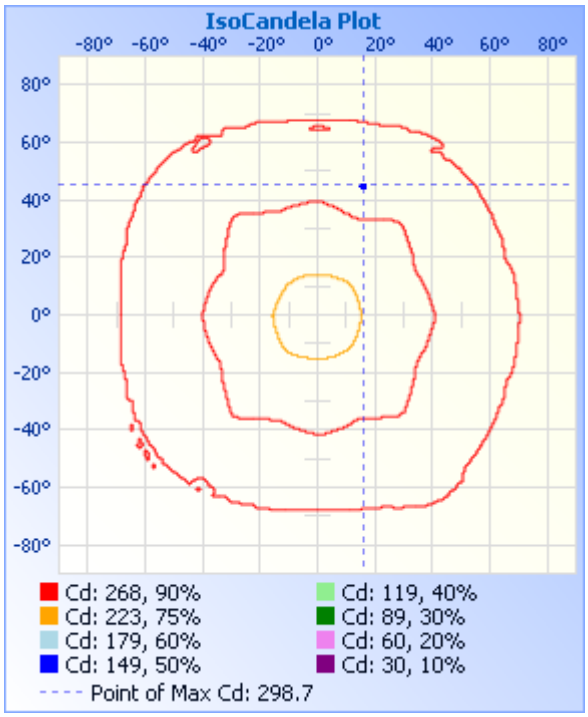
Photometric Data



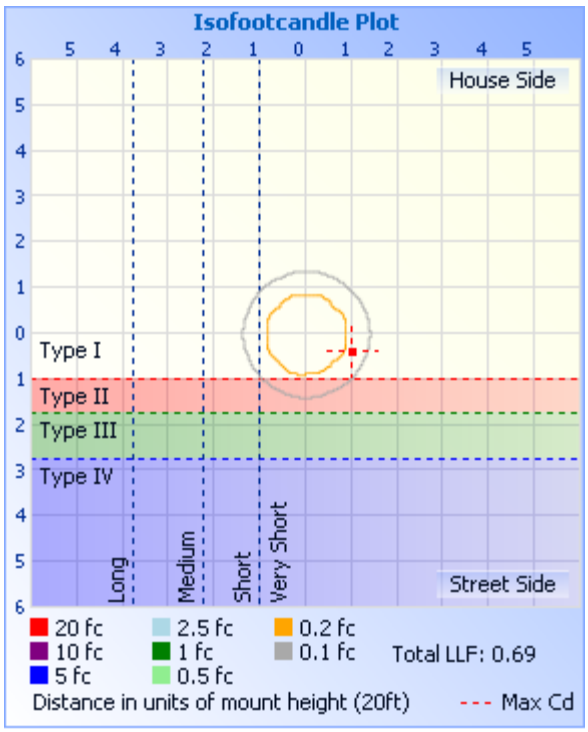
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183	183
1	183	183	183	183	182	183	182	183	183	183	183	183	184	184	184	184	183
2	184	184	184	184	183	183	183	184	184	184	184	185	186	186	186	186	184
3	185	184	185	185	184	184	185	185	185	184	185	186	187	188	188	187	185
4	186	186	187	187	185	184	186	187	186	185	186	188	188	190	191	189	186
5	188	188	189	189	187	186	188	189	187	187	188	190	189	191	193	191	188
6	191	191	192	191	189	189	190	191	189	188	190	191	191	193	196	194	191
7	192	194	195	194	192	192	194	194	192	190	192	193	193	196	199	198	192
8	195	197	199	197	194	196	198	197	195	194	196	196	196	198	201	200	195
9	199	200	201	200	198	200	201	200	199	197	200	199	199	202	203	202	199
10	203	204	203	203	200	202	204	203	202	201	203	203	202	205	206	206	203
11	208	208	208	206	205	206	206	208	207	206	205	208	205	209	210	210	208
12	212	213	211	211	208	210	209	212	211	211	209	212	209	213	213	215	212
13	216	217	215	215	211	214	211	216	215	216	213	216	214	217	216	219	216
14	221	220	218	220	215	218	215	219	219	219	218	220	220	220	219	221	221
15	226	224	223	224	219	221	218	222	224	224	222	225	224	224	222	224	226
16	231	228	226	228	223	226	221	226	228	228	225	229	229	227	225	227	231
17	235	231	228	232	227	228	224	229	231	232	229	232	234	230	228	231	235
18	239	235	231	235	231	230	227	232	234	234	232	234	238	233	231	234	239
19	243	237	234	239	235	233	229	234	237	237	235	237	242	237	233	238	243
20	246	241	236	243	239	236	231	238	239	240	238	240	246	240	235	242	246
21	250	244	238	247	242	240	233	241	242	244	240	243	249	243	237	246	250
22	252	248	240	251	245	243	235	245	245	247	243	246	252	247	239	249	252
23	255	251	243	254	247	246	237	248	248	250	244	249	254	250	241	253	255
24	258	254	245	257	250	248	239	251	250	252	246	252	256	254	244	255	258
25	260	258	248	259	252	251	241	253	252	255	248	254	258	256	247	257	260
26	262	261	249	262	254	254	243	256	254	258	249	257	261	259	249	260	262
27	264	263	250	264	257	256	244	257	255	260	250	259	262	261	250	262	264
28	264	264	251	265	258	258	244	257	255	261	250	260	263	263	251	262	264

29	264	265	252	266	259	259	245	257	255	262	249	262	264	264	251	263	264
30	264	265	253	267	260	259	245	258	256	262	250	263	264	264	252	262	264
31	264	264	253	267	260	259	246	258	256	262	250	263	263	265	253	262	264
32	263	264	253	267	259	260	246	258	255	262	251	264	262	264	253	262	263
33	262	264	253	267	257	260	247	258	254	263	251	265	260	265	254	262	262
34	262	263	253	267	256	261	247	259	253	263	251	265	260	264	254	263	262
35	261	263	253	267	255	262	247	260	253	264	251	265	259	265	255	265	261
36	261	263	253	268	255	264	248	262	253	265	252	266	259	266	256	268	261
37	261	265	254	269	257	267	250	264	253	266	254	267	259	268	257	271	261
38	262	266	255	272	259	270	251	267	255	268	255	269	261	271	258	275	262
39	265	269	257	274	262	273	254	270	259	271	257	272	264	275	260	278	265
40	268	272	259	277	266	276	257	274	263	274	259	276	266	279	262	282	268
41	271	276	260	281	270	280	259	278	267	278	261	280	269	283	264	285	271
42	273	280	262	285	274	284	261	283	271	281	263	284	272	286	266	288	273
43	276	284	263	288	277	288	263	287	274	284	265	287	275	289	269	291	276
44	278	288	266	291	281	291	266	289	277	286	268	290	278	293	272	294	278
45	279	291	269	293	283	293	268	291	278	288	271	292	279	295	275	296	279
46	279	293	273	295	282	294	271	292	278	288	274	293	279	296	277	297	279
47	279	293	276	297	281	294	275	293	279	288	276	294	278	297	281	298	279
48	278	292	280	298	281	295	279	293	280	288	280	295	278	297	284	**299**	278
49	278	291	283	297	281	295	282	292	280	287	284	294	277	296	287	**299**	278
50	281	289	286	295	282	293	285	290	282	286	288	292	278	293	288	296	281
51	284	287	288	292	284	289	285	288	283	285	290	289	280	291	289	292	284
52	289	286	289	291	287	287	285	286	286	282	291	286	284	288	288	288	289
53	294	284	289	290	289	285	284	285	288	280	291	284	288	284	286	284	294
54	295	281	288	287	290	285	282	282	288	277	290	282	294	282	285	283	295
55	296	278	288	283	290	282	280	277	287	275	288	278	296	280	284	282	296
56	295	276	288	280	288	279	279	274	285	271	287	275	296	278	283	280	295
57	293	276	288	279	286	279	280	272	283	270	286	272	294	276	282	280	293
58	291	276	288	279	285	279	281	271	283	270	285	271	292	275	282	279	291
59	289	278	288	280	284	278	281	271	284	272	285	271	291	273	283	278	289
60	288	278	286	280	284	277	282	273	283	273	284	271	291	272	286	278	288

61	286	278	284	279	286	278	282	276	281	272	283	272	290	269	287	279	286
62	283	276	279	279	284	279	276	279	280	273	279	274	287	268	284	280	283
63	281	277	275	281	279	280	271	281	283	273	276	278	283	270	279	279	281
64	273	278	273	278	275	279	270	280	279	273	275	278	280	269	272	279	273
65	266	279	270	277	272	277	268	277	272	276	272	276	275	269	268	277	266
66	266	276	268	277	269	276	266	275	267	275	270	272	269	269	267	272	266
67	272	271	266	272	268	271	267	269	269	270	270	268	268	265	269	270	272
68	269	269	268	271	270	268	269	268	268	268	272	264	271	262	270	270	269
69	263	269	268	270	268	267	268	267	264	266	271	264	270	261	268	266	263
70	262	263	268	267	267	268	267	266	263	266	271	265	268	261	267	266	262
71	263	263	266	267	267	269	265	263	265	265	269	262	267	260	264	263	263
72	261	266	262	266	265	266	262	262	263	266	266	258	266	261	260	261	261
73	256	265	260	263	261	265	260	262	260	264	264	256	265	258	258	256	256
74	256	259	254	260	260	259	259	259	259	259	261	253	260	253	255	254	256
75	254	255	254	257	257	255	253	256	257	256	257	251	256	251	253	252	254
76	254	256	252	256	256	255	251	253	253	256	256	248	256	250	251	251	254
77	253	255	252	255	256	255	249	253	254	255	254	248	255	248	250	250	253
78	247	251	247	253	251	252	247	251	248	253	250	248	252	246	248	249	247
79	243	250	243	251	247	251	245	250	246	252	249	245	249	244	245	248	243
80	241	249	241	250	246	253	245	248	244	249	246	245	246	245	241	246	241
81	241	248	240	248	246	249	242	247	243	247	246	242	244	243	240	245	241
82	240	246	238	248	244	247	240	245	241	246	244	240	243	242	239	243	240
83	240	244	237	246	244	245	240	243	240	245	243	238	242	239	238	241	240
84	238	243	236	244	242	244	239	241	239	243	242	237	241	237	236	240	238
85	237	242	236	242	241	243	238	241	238	242	241	237	240	236	236	238	237
86	235	240	234	240	240	243	237	240	237	241	240	236	238	235	235	237	235
87	234	238	233	239	239	242	237	239	237	240	240	234	237	234	233	236	234
88	233	237	232	238	238	240	236	238	236	239	239	233	236	233	232	235	233
89	232	236	231	238	237	240	235	237	235	238	238	232	235	232	231	234	232
90	231	236	231	238	236	239	234	236	234	237	237	231	234	232	230	233	231
91	231	236	231	237	236	238	234	236	233	236	236	231	234	231	230	233	231
92	231	235	230	237	235	238	234	236	233	236	236	230	233	231	230	232	231

93	230	235	230	236	235	238	234	235	232	235	236	230	233	230	230	232	230
94	230	234	230	235	235	237	233	234	232	235	235	229	232	230	229	232	230
95	229	234	229	235	234	237	233	234	231	234	235	229	232	229	228	231	229
96	228	232	228	234	232	236	232	233	231	234	234	228	231	227	227	230	228
97	227	231	227	232	233	235	232	233	230	233	233	228	230	226	226	228	227
98	226	229	226	231	232	234	230	232	229	232	232	227	230	224	226	227	226
99	226	227	226	229	231	233	229	231	228	231	231	225	228	223	225	225	226
100	224	226	225	228	230	231	227	229	227	229	230	224	227	221	224	224	224
101	223	224	223	227	229	229	226	227	226	227	229	222	226	220	222	222	223
102	222	222	222	226	227	227	225	225	225	225	227	220	224	218	221	221	222
103	220	221	220	224	226	225	224	223	223	223	225	218	223	216	220	219	220
104	218	219	218	222	225	223	222	221	221	220	224	217	221	214	218	217	218
105	217	217	217	220	223	221	220	219	219	219	221	215	220	212	217	215	217
106	215	215	215	219	221	219	218	217	218	217	220	213	218	211	216	213	215
107	214	213	214	217	219	217	216	215	216	215	218	211	217	209	215	211	214
108	213	211	213	215	218	215	215	214	215	213	217	209	216	207	214	209	213
109	212	209	212	213	216	213	213	212	214	212	216	208	214	205	212	208	212
110	210	208	210	211	215	212	212	211	212	210	214	206	212	204	210	206	210
111	208	206	209	210	213	210	210	209	211	208	212	205	210	202	207	205	208
112	206	204	207	208	211	208	208	207	208	206	210	203	207	200	205	203	206
113	204	203	205	206	209	207	206	205	207	205	208	201	205	198	202	201	204
114	202	201	203	204	208	205	204	203	204	203	206	199	203	197	200	199	202
115	200	199	200	203	205	203	202	201	202	200	203	198	201	195	198	198	200
116	197	198	197	201	204	201	200	199	200	198	200	196	199	193	195	196	197
117	195	195	194	199	201	199	197	197	197	196	197	194	196	191	193	194	195
118	192	192	191	196	198	197	194	195	194	193	194	192	193	188	190	191	192
119	188	189	188	193	195	194	191	193	191	191	191	190	190	186	187	188	188
120	185	186	185	190	191	192	187	190	187	188	187	188	187	183	184	185	185
121	182	183	181	187	187	190	184	188	183	186	184	187	183	181	181	182	182
122	178	179	178	183	184	187	180	186	180	183	180	184	180	178	177	179	178
123	173	175	173	179	180	184	176	183	176	179	176	180	176	174	173	176	173
124	170	171	170	176	175	180	173	179	172	175	173	177	172	170	170	172	170

125	167	167	167	172	171	176	170	176	168	171	169	173	169	167	166	168	167
126	162	163	162	168	168	172	166	171	164	167	165	170	165	163	162	164	162
127	158	159	158	164	163	168	161	166	160	162	161	165	160	159	158	160	158
128	153	154	155	160	159	163	157	161	156	158	158	161	156	155	155	156	153
129	150	151	151	156	155	160	154	158	152	154	155	157	152	152	152	152	150
130	146	148	147	153	151	155	150	154	148	151	150	152	149	148	147	149	146
131	143	144	143	149	148	152	147	150	145	147	147	148	145	144	143	145	143
132	140	140	140	145	144	148	143	146	141	144	143	144	141	140	139	142	140
133	136	136	136	142	141	144	140	143	138	140	139	140	138	137	136	139	136
134	133	133	134	138	137	141	136	140	135	137	136	137	134	134	133	135	133
135	130	130	130	135	134	138	132	136	132	134	133	133	130	131	129	132	130
136	126	127	126	131	131	134	128	133	128	131	129	130	127	127	125	128	126
137	122	124	123	128	127	131	125	130	125	128	126	126	123	124	122	125	122
138	118	121	119	125	124	128	122	127	122	124	122	123	119	121	118	122	118
139	114	118	115	121	120	124	119	123	118	121	119	119	115	117	115	119	114
140	111	115	111	118	117	121	116	119	115	117	115	116	111	113	111	118	111
141	106	111	107	114	113	117	112	116	111	114	111	112	107	110	107	113	106
142	102	108	103	110	109	114	108	112	107	111	108	109	103	106	102	109	102
143	98	104	98	107	105	110	104	108	103	107	103	105	99	103	97	105	98
144	93	100	94	103	100	107	100	104	99	104	99	102	94	99	93	102	93
145	89	97	90	100	96	103	96	101	95	100	95	98	90	95	88	98	89
146	85	93	86	96	92	99	92	97	91	97	91	95	86	91	84	94	85
147	81	88	81	91	88	94	87	93	87	93	88	91	81	87	80	90	81
148	77	83	77	86	84	89	84	89	83	88	84	87	77	82	76	85	77
149	74	78	73	80	80	84	80	84	79	83	80	82	74	77	72	80	74
150	70	73	69	75	75	78	76	79	75	78	76	77	70	72	68	74	70
151	65	68	65	70	71	73	71	74	71	73	69	72	65	67	64	69	65
152	61	63	60	65	66	68	67	69	66	68	67	66	61	63	60	64	61
153	57	58	57	60	62	63	63	64	62	63	62	61	57	59	56	59	57
154	53	54	53	56	57	58	58	59	58	58	57	57	54	55	52	55	53
155	50	50	49	53	54	54	55	55	54	54	53	52	49	51	50	51	50
156	45	47	45	49	49	50	51	50	50	50	49	48	46	47	46	47	45

157	41	43	42	46	45	46	47	47	46	46	45	44	42	43	42	44	41
158	37	39	38	42	41	43	44	43	43	42	42	41	39	40	37	40	37
159	34	35	34	39	37	39	41	39	41	39	38	35	35	37	34	37	34
160	30	32	31	35	33	35	37	35	37	36	35	31	32	35	30	35	30
161	27	29	29	30	31	32	33	31	34	32	31	29	28	30	29	31	27
162	25	25	26	25	27	27	28	29	29	28	28	27	26	25	25	26	25
163	22	20	21	21	22	22	24	24	24	24	24	24	21	21	21	22	22
164	18	17	17	19	19	19	21	20	21	19	20	20	17	18	18	18	18
165	15	14	15	16	16	17	18	17	18	17	17	17	15	16	16	16	15
166	12	13	13	14	14	14	16	15	16	14	15	14	14	14	13	14	12
167	11	11	10	11	12	12	13	13	14	12	12	11	11	11	11	11	11
168	8	8	9	9	9	9	9	10	10	10	10	9	9	9	8	9	8
169	7	6	6	7	7	7	8	7	8	7	7	7	6	7	7	7	7
170	5	4	4	6	5	5	6	6	6	6	6	5	5	5	5	5	5
171	3	2	3	4	4	4	4	4	4	4	4	4	4	4	3	3	3
172	2	1	2	2	2	2	3	3	3	3	3	2	2	3	3	3	2
173	1	1	1	2	1	1	2	2	2	2	1	1	2	2	2	1	1
174	1	0	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

****** END OF DATASHEET PACKAGE ******