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-8029E30-A
LED-8029M30-A
Remark : The suffix of the model name“E” stand for E26;
“M” stand for E39.

Representative (Tested) Model: LED-8029E30-A

Model Different :N/A

Test & Report By:

Jack Luo

Engineer: Jack Luo
Date: Apr.28,2016

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	Apr.28,2016
Test Report No.	GZE160347-C
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8029E30-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	--	23.22	W
Input Current	--	0.1951	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9917	
Off-State Power	--	0	W
Photometric Characteristics			
Total Initial Lumen Output	--	2362.4	lm
Initial Lumen Efficacy	--	101.74	lm/w
Correlated color temperature / CCT	2965	--	K
Color rendering index / CRI	82.6	--	
R9 Value	8	--	
Duv	0.0002	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	162	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	: Apr.24,2016
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-8029E30-A,LED-8029M30-A
Luminaire Type	LED Lamp
Rated Voltage / Frequency	120~277 Vac, 50/60Hz
Nominal Power	24W
Rated Initial Lamp Lumen	--
Declared CCT	3000K
LED Manufacturer	N/A
LED Model	N/A
Sample Receipt Date	Apr.01,2016
Sample Number	GZE160347-C(3000K)
Photo	
	
LED-8029E30-A	
	
LED-8029M30-A	

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

Test date	2016-04-24	**Test Ambient:**	25.2 °C
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	LED-8029E30-A		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160347	120.0	60	0.1951	23.22	0.9917	10.98
-C1	277.0	60	0.0916	23.55	0.9279	15.74

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	82.6
R9	8
CCT (K)	2965
Chromaticity (x, y)	x=0.4398 y=0.4057
Chromaticity (u', v')	u'=0.2518 v'=0.5224
Duv	0.0002

Special Color Rendering Indices			
R1	81	R9	8
R2	91	R10	80
R3	96	R11	79
R4	80	R12	71
R5	81	R13	83
R6	89	R14	99
R7	83	R15	74
R8	59	--	--

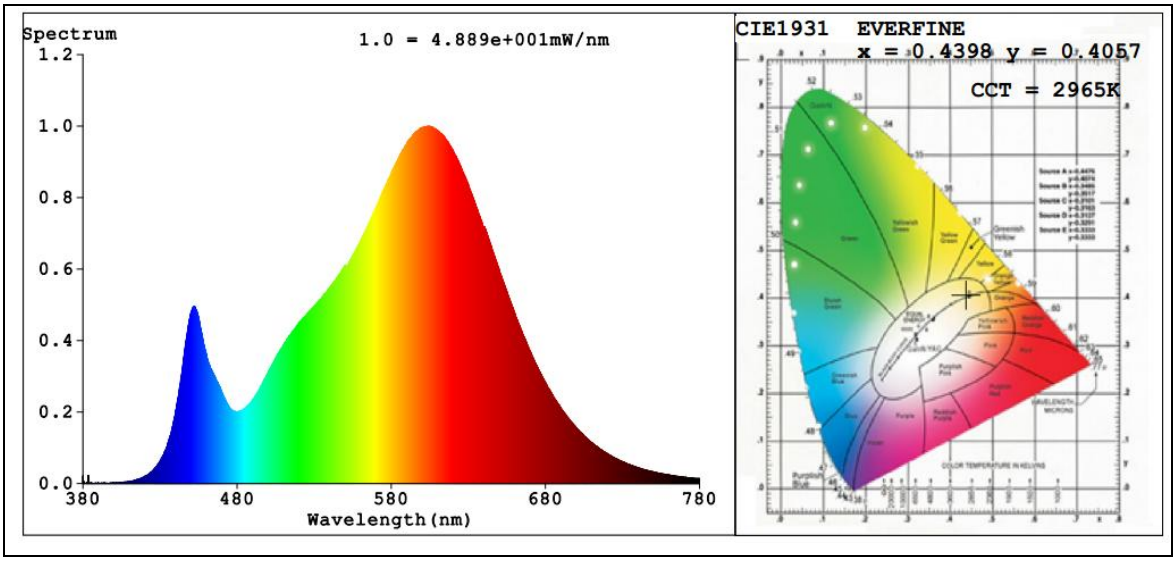
Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	2362.4
Luminous Efficacy (lm/W)	101.74
Beam Angle°	290.4
Center Beam Candle Power (cd)	162

Goniophotometer Methodn :

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	2364.7
Luminous Efficacy (lm/W)	100.41

Spectral Power Distribution & Chromaticity Diagram

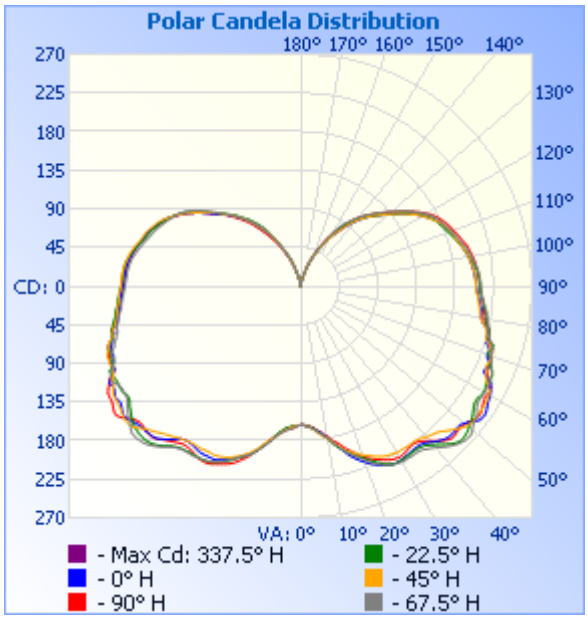


Zonal Lumen Tabulation

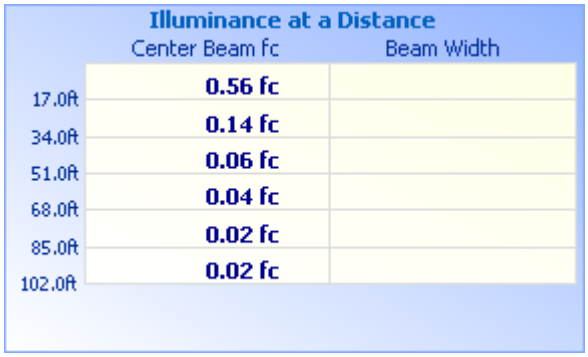
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	176.2	7.5%
0-40	321.5	13.6%
0-60	740.3	31.3%
60-90	711.6	30.1%
70-100	695.0	29.4%
90-120	604.3	25.6%
0-90	1,451.9	61.5%
90-180	910.7	38.5%
0-180	2,362.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	16.4	0.7%	90-100	223.7	9.5%
10-20	56.3	2.4%	100-110	204.7	8.7%
20-30	103.5	4.4%	110-120	175.9	7.4%
30-40	145.3	6.1%	120-130	134.8	5.7%
40-50	193.4	8.2%	130-140	91.1	3.9%
50-60	225.4	9.5%	140-150	53.5	2.3%
60-70	240.3	10.2%	150-160	22.1	0.9%
70-80	239.9	10.2%	160-170	4.8	0.2%
80-90	231.4	9.8%	170-180	0.2	0%

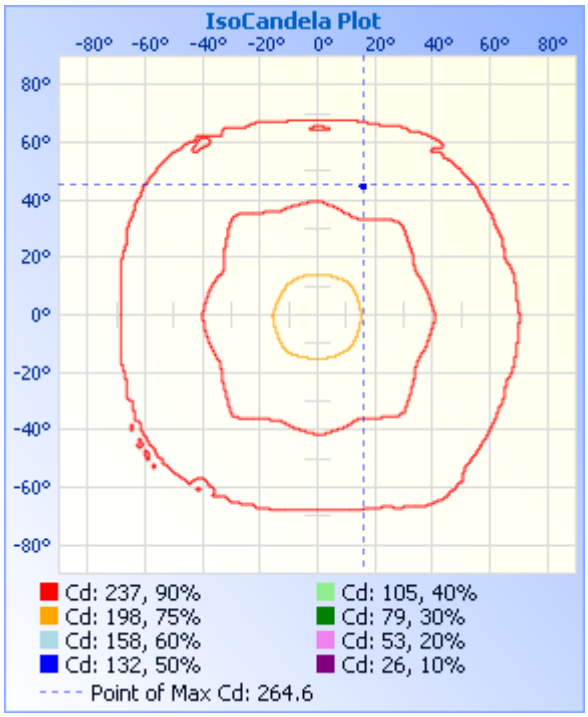
Photometric Data



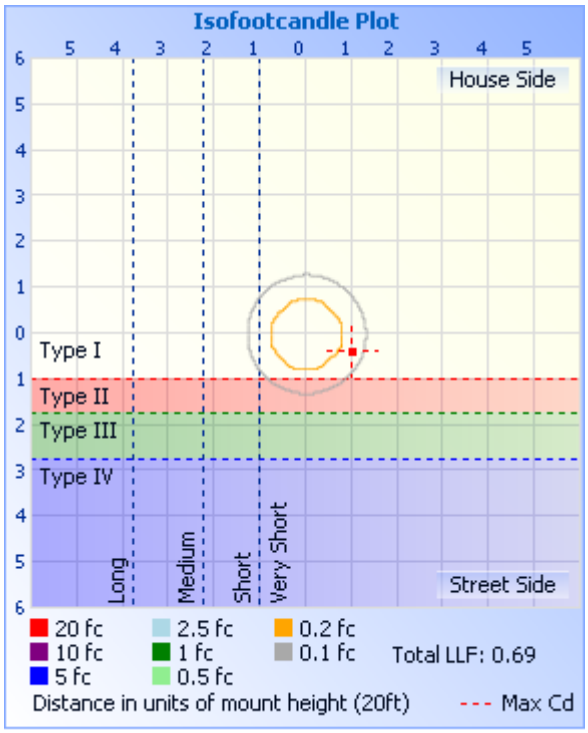
Illuminance Plots



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	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
1	162	162	162	162	161	162	162	162	162	162	162	162	163	163	163	163	162
2	163	163	163	163	162	162	162	163	163	163	163	164	164	165	165	164	163
3	164	163	164	164	163	163	163	164	164	163	164	165	166	166	167	166	164
4	165	165	165	165	164	163	165	165	164	164	165	167	167	168	169	168	165
5	166	166	168	167	165	165	166	167	165	165	166	168	167	169	171	169	166
6	169	169	170	169	167	167	169	169	167	167	168	169	169	171	174	172	169
7	170	172	173	172	170	170	172	172	170	169	170	171	171	174	176	175	170
8	173	174	176	174	172	173	175	175	172	171	173	173	173	176	178	177	173
9	176	177	178	177	176	177	178	177	176	175	177	177	176	178	180	179	176
10	179	181	180	180	178	179	181	180	179	178	179	180	179	181	183	182	179
11	184	185	184	182	181	182	183	184	183	183	182	184	182	185	186	186	184
12	188	189	187	187	185	186	185	188	187	187	185	188	185	189	189	190	188
13	192	192	190	191	187	190	187	192	190	191	188	192	190	193	191	194	192
14	196	195	193	195	190	193	190	194	194	194	193	195	195	195	194	196	196
15	200	198	197	198	194	196	193	197	198	198	196	199	199	198	196	199	200
16	205	202	200	202	198	200	196	200	202	202	200	202	203	201	199	201	205
17	208	205	202	206	201	202	199	203	205	205	203	206	207	204	202	205	208
18	212	208	204	208	204	204	201	205	207	208	206	208	211	207	204	207	212
19	215	210	207	212	208	206	203	207	210	210	208	210	214	210	207	211	215
20	218	213	209	215	212	209	205	211	212	213	211	212	218	213	208	214	218
21	221	216	211	219	214	213	207	214	214	216	213	216	221	216	210	218	221
22	224	220	213	222	217	215	208	217	217	219	215	218	223	219	212	221	224
23	226	222	215	225	219	217	210	220	219	221	216	221	225	222	214	224	226
24	228	225	217	227	221	220	212	222	221	224	218	223	227	225	216	226	228
25	230	228	219	230	223	222	214	224	224	226	219	225	229	227	219	228	230
26	232	231	221	232	225	225	215	226	225	228	220	227	231	229	220	230	232
27	234	233	222	234	227	227	216	228	226	230	221	229	232	232	222	232	234
28	234	234	222	235	229	228	217	228	226	231	221	231	233	233	222	232	234

29	234	234	223	236	230	229	217	228	226	232	221	232	234	234	223	232	234
30	234	235	224	236	230	229	217	228	226	232	221	233	234	234	223	232	234
31	234	234	224	237	230	229	218	228	226	232	222	233	233	234	224	232	234
32	233	234	224	237	229	230	218	228	226	232	222	234	232	234	224	232	233
33	232	234	224	237	228	230	218	229	225	233	222	234	231	234	225	232	232
34	232	233	224	237	227	231	219	230	224	233	222	234	230	234	225	233	232
35	231	233	224	237	226	232	219	230	224	234	223	235	229	234	225	235	231
36	231	233	224	237	226	234	220	232	224	234	223	235	229	236	226	237	231
37	231	234	225	238	227	236	221	234	224	236	225	237	230	238	227	240	231
38	232	236	226	241	229	239	223	236	226	237	226	238	231	240	228	243	232
39	235	238	227	243	232	242	225	239	229	240	227	241	234	243	230	247	235
40	237	241	229	246	236	245	227	243	233	243	229	245	236	247	232	250	237
41	240	244	230	249	239	248	229	247	236	246	231	248	238	250	234	252	240
42	242	248	232	252	242	252	231	251	240	249	233	251	241	254	236	255	242
43	244	252	233	255	246	255	233	254	243	252	235	254	244	256	238	258	244
44	246	255	236	258	249	258	235	256	245	253	237	257	246	259	241	260	246
45	247	258	239	260	250	259	238	258	246	255	240	259	247	261	243	262	247
46	247	259	242	262	250	260	240	259	247	255	242	260	247	262	246	263	247
47	247	260	244	263	249	261	244	259	247	255	245	261	247	263	249	264	247
48	246	259	248	264	249	261	247	259	248	255	248	261	246	263	251	**265**	246
49	246	258	251	263	249	261	250	258	248	254	251	261	245	263	254	**265**	246
50	249	256	254	262	250	259	252	257	249	254	255	259	246	260	255	262	249
51	252	254	255	259	252	256	253	255	251	252	257	256	248	257	256	258	252
52	256	253	256	257	254	254	252	253	253	250	257	253	251	255	255	255	256
53	260	251	256	257	256	253	251	252	255	248	257	252	255	252	253	252	260
54	262	249	255	254	257	252	250	250	255	245	256	249	260	250	253	250	262
55	262	246	255	251	257	250	248	245	254	244	255	247	263	248	252	249	262
56	261	245	255	248	255	247	247	243	252	240	254	244	262	246	251	248	261
57	259	244	255	247	254	247	248	241	250	239	254	241	261	244	250	248	259
58	258	245	255	247	252	247	249	240	251	239	253	240	259	243	250	247	258
59	256	246	255	248	251	246	249	240	252	241	253	240	258	242	251	246	256
60	255	247	254	248	252	246	250	242	250	242	252	240	258	241	253	246	255

61	254	246	252	247	253	246	249	244	249	241	250	241	257	239	254	247	254
62	251	244	247	247	251	247	244	247	248	241	247	243	254	238	251	248	251
63	249	245	243	249	247	248	240	249	250	242	245	247	251	239	247	247	249
64	241	246	241	246	243	247	239	248	247	242	243	246	248	239	241	247	241
65	236	247	239	246	240	245	238	246	241	244	241	245	243	238	238	245	236
66	236	244	237	245	238	245	235	244	236	244	239	241	239	238	236	241	236
67	241	240	236	241	237	240	237	238	239	239	239	237	238	235	238	239	241
68	238	238	237	240	239	237	238	237	237	237	241	234	240	232	239	239	238
69	233	238	238	239	238	236	237	237	234	236	240	234	239	231	237	236	233
70	232	233	238	236	237	237	237	236	232	236	240	235	237	231	236	236	232
71	233	233	235	237	236	238	235	233	235	235	238	232	236	231	234	233	233
72	231	236	232	235	235	236	232	232	233	236	236	228	236	231	231	231	231
73	227	235	230	233	231	235	230	232	230	234	234	227	234	228	229	227	227
74	227	229	225	230	230	229	230	230	229	230	231	224	231	224	226	225	227
75	225	226	225	228	228	226	224	226	228	227	227	223	227	222	224	223	225
76	225	227	223	226	227	225	222	224	224	227	227	220	227	221	222	223	225
77	224	226	223	226	226	226	220	224	225	226	225	220	226	220	221	222	224
78	219	222	219	224	222	223	219	222	219	224	222	219	224	218	220	220	219
79	216	221	216	222	219	222	217	222	218	223	220	217	220	216	217	220	216
80	214	220	214	222	218	224	217	220	216	221	218	217	218	217	214	218	214
81	213	220	212	219	218	220	214	218	215	219	218	214	216	215	212	217	213
82	213	218	211	220	216	219	213	217	214	218	217	213	216	214	212	215	213
83	212	216	210	217	216	217	213	215	213	217	215	211	214	212	211	213	212
84	211	215	209	216	214	216	212	214	212	215	214	210	213	210	209	212	211
85	210	214	209	214	213	215	211	213	211	214	213	210	212	209	209	211	210
86	209	212	208	213	213	215	210	213	210	214	213	209	211	208	208	210	209
87	208	211	207	212	212	214	210	212	210	213	212	207	210	207	207	209	208
88	206	210	205	211	211	213	209	211	209	212	211	207	209	206	206	208	206
89	205	209	205	211	210	212	208	210	208	211	210	206	208	206	205	207	205
90	205	209	204	210	209	211	208	209	207	210	210	205	207	205	204	207	205
91	205	209	204	210	209	211	207	209	206	209	209	204	207	205	204	206	205
92	204	209	204	210	208	211	207	209	206	209	209	204	207	204	204	206	204

93	204	208	204	209	208	210	207	208	206	208	209	203	207	204	203	205	204
94	203	207	204	208	208	210	207	208	205	208	208	203	206	203	203	205	203
95	203	207	203	208	207	210	206	207	205	208	208	203	205	202	202	205	203
96	202	206	202	207	206	209	206	207	205	207	208	202	205	201	201	204	202
97	201	204	201	206	206	208	205	206	204	207	207	201	204	200	200	202	201
98	200	203	200	204	205	207	204	205	203	206	206	201	203	198	200	201	200
99	200	201	200	203	204	206	202	204	202	204	204	200	202	197	199	200	200
100	199	200	199	202	203	205	201	203	201	203	204	198	201	196	198	198	199
101	198	198	198	201	202	203	200	201	200	201	202	197	200	195	197	197	198
102	196	197	196	200	201	201	199	199	199	199	201	195	199	193	196	196	196
103	195	195	195	198	200	199	198	198	198	197	200	194	197	191	194	194	195
104	193	194	193	196	199	197	196	196	196	195	198	192	196	190	193	192	193
105	192	192	192	195	198	196	195	194	194	194	196	190	195	188	192	191	192
106	191	190	191	194	196	194	193	192	193	192	195	189	193	187	191	189	191
107	189	189	190	192	194	192	191	191	191	190	193	187	192	185	190	187	189
108	188	187	189	190	193	191	190	189	190	189	192	185	191	183	189	185	188
109	188	185	188	189	191	189	189	188	190	188	191	184	189	181	188	184	188
110	186	184	186	187	190	188	187	187	188	186	189	183	188	180	186	183	186
111	184	182	185	186	189	186	186	185	186	185	188	182	186	179	184	181	184
112	183	181	183	184	187	184	184	183	185	183	186	180	184	177	181	180	183
113	181	179	181	182	186	183	182	182	183	181	184	178	182	176	179	178	181
114	179	178	179	181	184	181	181	180	181	179	182	176	180	174	177	176	179
115	177	176	177	179	182	180	179	178	179	177	180	175	178	173	175	175	177
116	175	175	175	178	180	178	177	176	177	176	178	173	176	171	173	173	175
117	173	173	172	176	178	176	174	174	175	173	175	172	174	169	171	171	173
118	170	170	169	174	175	174	172	173	172	171	172	170	171	167	168	169	170
119	166	168	166	171	172	172	169	171	169	169	169	168	168	164	166	166	166
120	163	165	164	168	169	170	166	169	166	167	166	167	165	162	163	163	163
121	161	162	160	165	166	168	163	166	162	164	163	165	162	160	160	161	161
122	157	159	157	162	163	166	160	164	160	162	160	163	159	157	156	158	157
123	154	155	154	159	159	163	156	162	156	158	156	160	156	154	153	155	154
124	150	152	151	156	155	160	154	158	152	155	153	157	152	151	150	152	150

125	148	148	148	152	152	156	150	156	149	151	150	153	149	148	147	149	148
126	144	145	144	149	148	152	147	152	146	148	146	150	146	145	144	146	144
127	140	141	140	145	145	149	142	147	142	144	142	146	142	141	140	141	140
128	136	137	137	142	141	145	139	143	138	140	140	142	138	137	137	138	136
129	133	133	133	138	137	141	136	140	135	137	137	139	135	134	134	135	133
130	130	131	130	136	134	138	133	136	131	133	133	135	132	131	130	132	130
131	126	127	127	132	131	134	130	133	128	130	130	131	128	128	126	129	126
132	124	124	124	128	128	131	126	130	125	127	127	128	125	124	123	125	124
133	121	121	121	125	125	128	124	127	122	124	124	124	122	121	121	123	121
134	118	118	118	122	122	125	121	124	120	121	120	121	119	118	118	120	118
135	115	115	115	119	119	122	117	121	117	118	118	118	116	116	115	117	115
136	112	113	112	116	116	119	114	118	114	116	114	115	112	113	111	114	112
137	108	110	109	114	113	116	111	115	111	113	111	112	109	110	108	111	108
138	105	108	105	111	110	113	108	112	108	110	108	109	105	107	105	108	105
139	101	105	102	107	107	110	105	109	105	107	105	105	102	103	102	106	101
140	98	102	99	104	103	107	102	106	102	104	102	102	99	100	98	104	98
141	94	99	95	101	100	104	99	102	99	101	99	99	95	97	95	100	94
142	90	95	91	98	96	101	96	99	95	98	95	96	91	94	90	96	90
143	86	92	87	94	93	97	92	96	91	95	92	93	87	91	86	93	86
144	82	89	83	92	89	95	88	93	88	92	88	90	84	88	82	90	82
145	79	86	79	88	85	91	85	89	84	89	84	87	80	84	78	87	79
146	75	82	76	85	81	87	81	86	80	86	81	84	76	81	75	83	75
147	72	78	72	81	78	84	77	83	77	82	78	80	72	77	71	79	72
148	68	74	68	76	74	79	74	79	73	78	74	77	68	73	67	75	68
149	65	69	65	71	70	74	71	75	70	74	71	72	65	68	64	71	65
150	62	65	61	66	66	69	67	70	67	69	68	68	62	64	60	66	62
151	58	60	57	62	62	64	63	66	63	65	61	63	58	59	57	61	58
152	54	56	54	57	59	60	59	61	59	60	60	59	54	56	53	56	54
153	51	52	50	54	55	56	55	57	55	56	55	54	51	52	49	52	51
154	47	48	47	50	51	52	52	52	52	52	51	50	48	48	46	49	47
155	44	45	43	47	48	48	49	48	48	48	47	46	44	45	44	45	44
156	40	42	40	44	44	45	45	45	44	44	43	42	40	42	41	42	40

157	36	38	37	41	40	41	42	41	41	41	40	39	37	38	37	39	36
158	33	35	34	37	36	38	39	38	38	38	37	36	34	35	33	36	33
159	30	31	31	34	33	34	36	35	36	35	34	31	31	33	30	33	30
160	27	29	28	31	29	31	32	31	33	32	31	28	28	31	27	31	27
161	24	26	25	26	27	28	30	28	30	29	28	25	25	26	26	28	24
162	22	22	23	22	24	24	25	25	26	25	25	24	23	22	22	23	22
163	20	18	18	19	20	20	21	21	21	21	21	21	18	18	19	19	20
164	16	15	15	17	17	17	18	17	18	17	18	17	15	16	16	16	16
165	13	13	13	14	14	15	16	15	16	15	15	15	14	14	14	14	13
166	11	11	11	13	12	13	14	13	14	13	13	12	12	13	11	12	11
167	9	9	9	10	10	11	11	11	12	11	11	10	10	10	10	10	9
168	7	7	8	8	8	8	8	9	9	9	8	8	8	8	7	8	7
169	6	6	6	6	6	6	7	6	7	6	6	6	6	6	6	6	6
170	4	3	4	5	5	5	6	5	6	5	5	5	4	5	4	4	4
171	3	2	2	3	3	3	4	4	4	4	4	4	3	3	3	3	3
172	2	1	2	2	2	2	3	2	3	2	2	2	2	2	2	2	2
173	1	0	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1
174	1	0	0	0	1	0	1	1	1	1	0	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 ******