



Report No.:GZE151143-C

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

L-TECH CORPORTION

(Brand Name: L-TECH CORP)

SHAOGANGTOU DISTRICT.QIAOTOU TOWN.DONGGUAN
CITY.GUANGDONG PROVINCE,CHINA

LED Lamp

Model name(s): LRKT643/644-4090

Model differences: N/A

Test & Report By:

Review By:

Engineer: Johnson Sun

Manager: Tommy Liang

Date:Nov.19, 2015

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: 8th floor, Block B, No. 11 Caipin Road, Guangzhou Science City, Tianhe, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

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	Nov.19, 2015
Test Report No.	GZE151143-C
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	L-TECH CORPORTION	
Brand Name	L-TECH CORP	
Model Number	LRKT643/644-4090	
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	Goniophotometer	
	Output	Output	
Input Wattage	--	16.00	W
Input Current	--	0.1339	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9954	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	1256.2	lm
Initial Lumen Efficacy	--	78.51	lm/w
Correlated color temperature / CCT	4003	--	K
Color rendering index / CRI	91.6	--	
R9 Value	54	--	
Duv	-0.0001	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	--	527	cd
Beam angle (if applicable)	--	100.2	°
Zonal lumens in the 0°-60° zone	--	86.7	%
Zonal lumens in the 60°-90° zone	--	13.3	%
Zonal lumens in the 90°-120° zone	--	0	%
Zonal lumens in the 120°-180° zone	--	0	%

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Test Specifications:	
Date of Receipt	: Nov.10,2015
Date of Test	: Nov.18,2015
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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, 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 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.

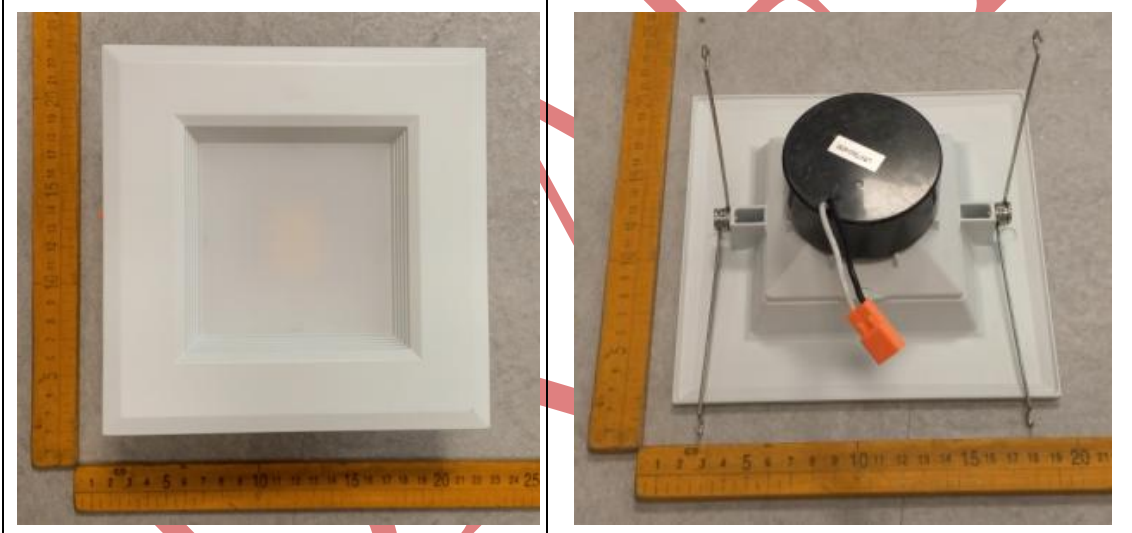
2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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 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	L-TECH CORP
Model Number	LRKT643/644-4090
Luminaire Type	LED Lamp
Rated Voltage / Frequency	120Vac, 60Hz
Nominal Power	17W
Rated Initial Lamp Lumen	N/A
Declared CCT	4000K
LED Manufacturer	N/A
LED Model	N/A
Power Supply:	N/A
Sample Receipt Date	Nov.10,2015
Sample Number	GZE151143-C1

Photo



2.1 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2015-11-18	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LRKT643/644-4090		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE151143 -C1	120.0	60	0.1339	16.00	0.9954

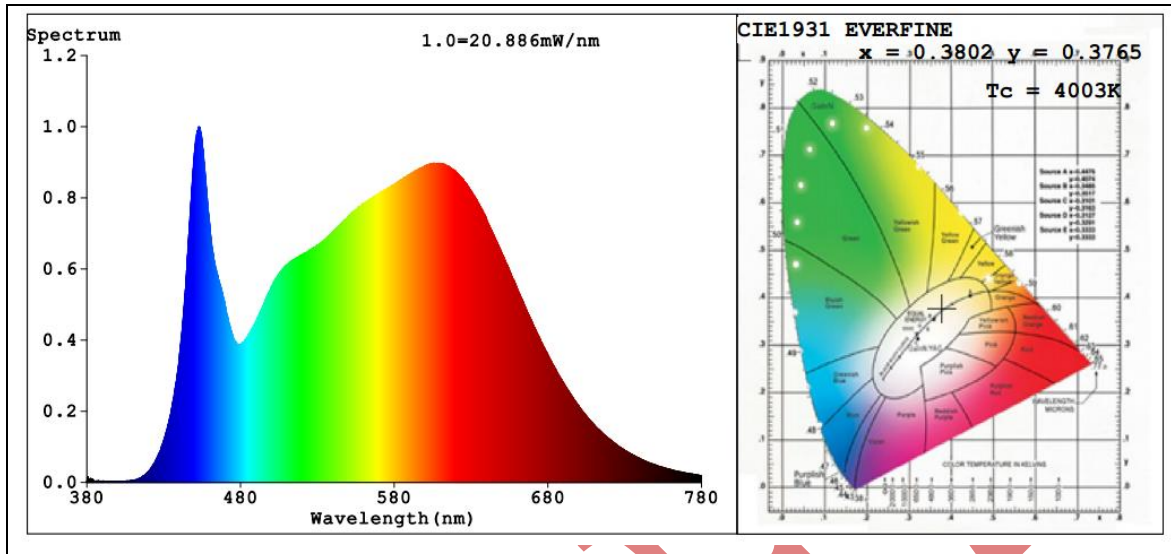
Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	92	R9	54
Frequency (Hz)	60	R2	96	R10	91
Color Rendering Index (CRI)	91.6	R3	98	R11	91
R9	54	R4	90	R12	73
CCT (K)	4003	R5	91	R13	93
Chromaticity (x, y)	x=0.3802 y=0.3765	R6	94	R14	99
Chromaticity (u', v')	u'=0.2251 v'=0.5014	R7	91	R15	88
Duv	-0.0001	R8	81	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1256.2
Luminous Efficacy (lm/W)	78.51
Beam Angle °	100.2
Center Beam Candle Power (cd)	527

Spectral Power Distribution & Chromaticity Diagram



DRAFT

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Zonal Lumen Tabulation:

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	402.3	32%
0-40	648.1	51.6%
0-60	1,088.7	86.7%
60-90	167.3	13.3%
70-100	45.1	3.6%
90-120	0.0	0%
0-90	1,256.0	100%
90-180	0.0	0%
0-180	1,256.1	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	49.8	4.0%	90-100	0.0	0%
10-20	141.5	11.3%	100-110	0.0	0%
20-30	211.0	16.8%	110-120	0.0	0%
30-40	245.8	19.6%	120-130	0.0	0%
40-50	241.5	19.2%	130-140	0.0	0%
50-60	199.1	15.8%	140-150	0.0	0%
60-70	122.2	9.7%	150-160	0.0	0%
70-80	39.3	3.1%	160-170	0.0	0%
80-90	5.8	0.5%	170-180	0.0	0%

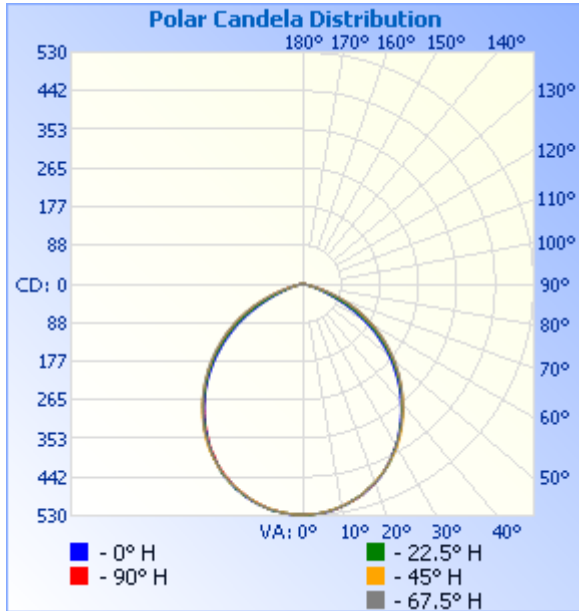
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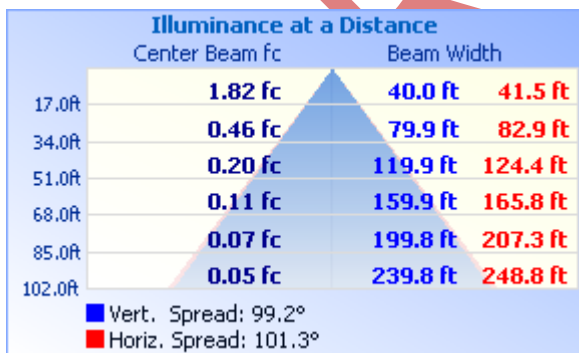
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Photometric Data



Illuminance Plots



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	1.82 fc	40.0 ft	41.5 ft
34.0ft	0.46 fc	79.9 ft	82.9 ft
51.0ft	0.20 fc	119.9 ft	124.4 ft
68.0ft	0.11 fc	159.9 ft	165.8 ft
85.0ft	0.07 fc	199.8 ft	207.3 ft
102.0ft	0.05 fc	239.8 ft	248.8 ft

- Vert. Spread: 99.2°
- Horiz. Spread: 101.3°

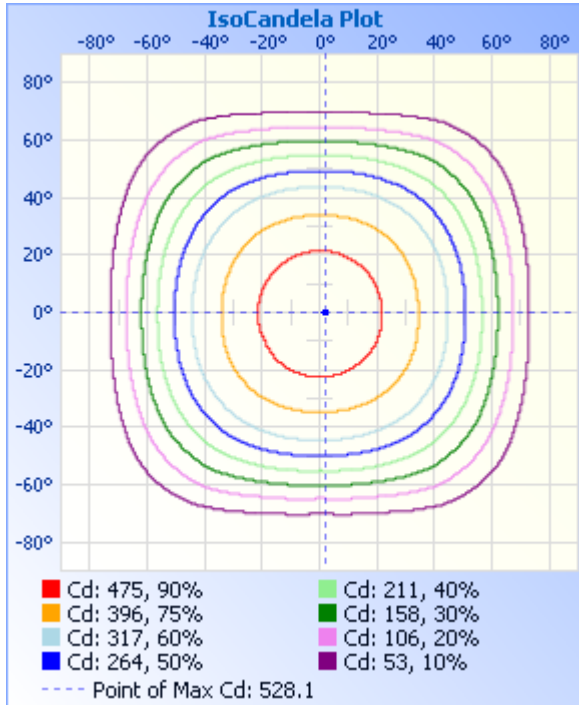
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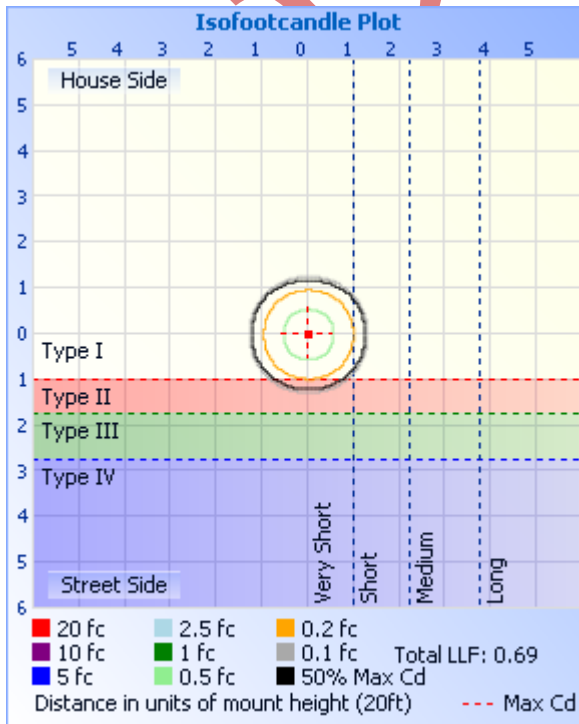
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ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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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	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527
1	528	528	527	527	528	525	527	528	527	527	528	528	527	527	527	526	528
2	526	528	526	528	526	527	527	527	527	528	527	527	528	527	527	527	526
3	526	526	526	527	526	526	526	526	527	526	526	528	526	526	526	526	526
4	526	526	526	526	526	525	526	525	526	525	524	524	526	525	526	525	526
5	525	525	525	526	526	522	524	525	525	525	525	525	524	523	525	525	525
6	524	523	523	523	523	523	524	524	523	523	523	524	523	522	522	523	524
7	522	522	521	523	522	522	522	522	522	522	520	522	520	521	521	519	522
8	521	520	519	521	521	520	520	519	521	521	519	520	521	517	519	519	521
9	518	517	518	518	519	518	519	518	519	518	519	519	518	517	518	518	518
10	516	516	515	516	517	515	517	516	517	516	516	516	514	513	516	515	516
11	514	514	513	514	513	514	514	514	514	514	513	514	513	512	513	513	514
12	513	511	510	511	511	512	512	510	512	511	511	512	510	510	510	510	513
13	507	508	508	508	509	509	509	510	509	509	507	508	508	506	508	508	507
14	506	504	505	505	506	506	506	506	506	504	505	504	504	504	504	505	506
15	502	502	502	502	503	502	503	503	503	502	501	502	500	502	502	501	502
16	500	499	498	499	500	500	499	500	499	500	497	498	497	496	499	499	500
17	496	495	494	495	495	495	496	496	496	495	495	495	494	493	494	495	496
18	491	491	490	490	491	492	492	491	493	493	489	491	490	490	491	491	491
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24	464	465	464	465	463	463	465	465	465	465	464	464	462	462	464	463	464
25	458	459	459	458	459	459	460	460	459	458	460	458	457	458	458	459	458
26	452	454	453	453	452	454	455	454	452	453	453	452	450	452	453	452	452
27	447	447	448	446	447	447	450	448	447	447	448	447	443	446	448	447	447
28	440	441	442	440	440	443	444	442	441	441	442	441	437	440	441	442	440

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29	432	434	437	435	432	436	438	436	434	435	436	434	432	433	437	433	432
30	427	428	430	428	428	429	433	430	427	428	431	428	425	426	430	427	427
31	420	421	424	421	421	423	427	422	420	421	424	421	418	420	424	422	420
32	413	415	418	414	415	417	420	414	413	414	417	414	411	413	418	414	413
33	405	407	410	408	407	409	413	408	405	407	411	408	404	406	411	407	405
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35	391	392	396	393	393	396	398	393	391	392	396	394	389	392	395	393	391
36	383	385	389	386	386	388	390	386	383	385	388	387	381	385	388	385	383
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38	368	370	373	372	371	373	375	370	367	369	373	372	367	370	373	369	368
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40	351	354	356	356	354	358	360	354	350	353	357	356	351	356	356	354	351
41	342	346	350	348	347	351	351	347	342	345	349	349	343	348	349	346	342
42	334	337	342	340	339	343	344	337	333	336	340	340	335	339	340	337	334
43	325	330	333	333	331	334	334	329	325	328	333	332	327	331	332	329	325
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45	307	313	317	316	314	319	318	312	307	311	315	316	310	316	315	312	307
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47	289	295	300	301	298	302	301	294	288	293	298	298	293	298	298	295	289
48	280	286	291	292	289	294	292	285	278	284	290	290	285	289	290	286	280
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51	251	259	265	266	263	267	265	257	249	256	263	264	258	264	264	258	251
52	241	249	256	257	254	259	257	248	239	246	254	255	249	255	255	248	241
53	231	239	247	248	246	250	248	237	229	236	245	246	239	245	246	238	231
54	221	229	238	239	237	241	239	228	218	227	236	237	231	237	237	229	221
55	210	220	230	230	228	232	230	218	208	217	227	228	222	228	228	219	210
56	200	210	220	222	219	223	221	208	197	206	218	219	213	218	218	208	200
57	190	200	212	213	209	214	211	198	186	196	208	210	203	209	209	199	190
58	179	190	202	203	200	204	202	187	176	186	199	200	194	200	200	188	179
59	168	179	193	194	191	195	193	176	165	175	190	191	185	191	191	177	168

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60	157	168	183	185	181	186	184	166	154	165	181	182	175	182	181	167	157
61	145	158	175	176	172	177	174	155	142	154	172	173	165	172	172	155	145
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86	3	3	3	4	5	4	3	3	3	3	3	4	4	4	3	3	3
87	2	2	2	3	3	3	2	2	2	2	2	2	2	2	2	2	2
88	1	1	1	1	2	1	1	1	0	0	1	1	1	1	1	1	1
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	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
177	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
179	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

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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 *******

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