

LM-79-08 Test Report

For

L-TECH CORPORTION (Brand Name: L-TECH CORP)

Shaogangtou District, Qiaotou Town
Dongguan City, Guangdong, China

LED Lamp

Model name(s): CLED4A/P/R-15 WITH TCLD415HZ-5080
(CLKT415)

Model differences: N/A

Test & Report By:

Review By:

Engineer: Johnson Sun

Manager: Tommy Liang

Date:Dec.11, 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: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, 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	Dec.11, 2015
Test Report No.	GZE151229-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	L-TECH CORPORTION		
Brand Name	L-TECH CORP		
Model Number	CLED4A/P/R-15 WITH TCLD415HZ-5080 (CLKT415)		
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	--	16.49	W
Input Current	--	0.1387	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9906	
Off-State Power	--	0	W

Photometric Characteristics			
Total Initial Lumen Output	--	1043.5	lm
Initial Lumen Efficacy	--	63.28	lm/w
Correlated color temperature / CCT	5146	--	K
Color rendering index / CRI	86.0	--	
R9 Value	28	--	
Duv	0.0007	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	--	697	cd
Beam angle (if applicable)	--	126.8	°
Zonal lumens in the 0°-60° zone	--	89.7	%
Zonal lumens in the 60°-90° zone	--	10.3	%
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	: Dec.08,2015
Date of Test	: Dec.10,2015
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.

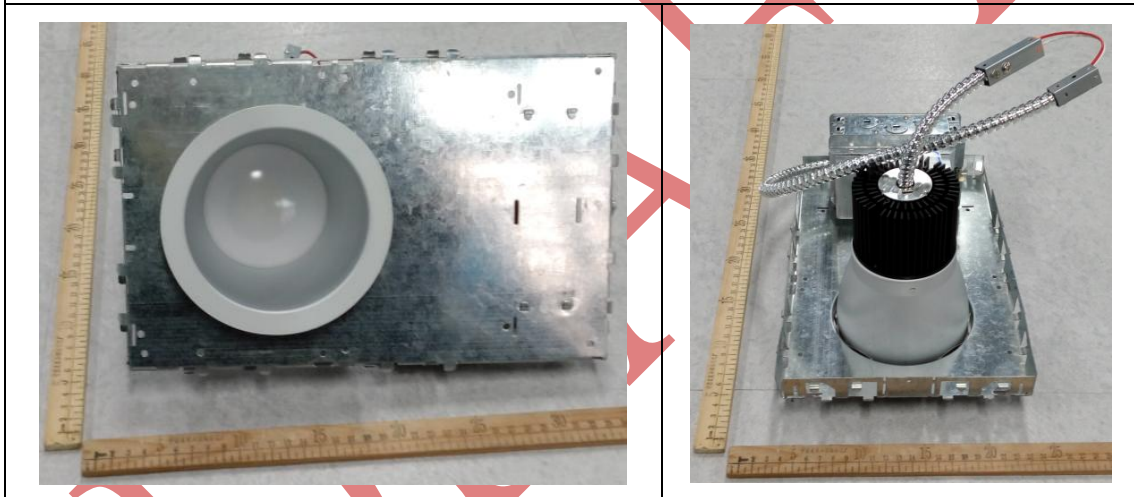
2. Photometric and Electrical Measurements – Integrating Sphere Method:

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	CLED4A/P/R-15 WITH TCLD415HZ-5080 (CLKT415)
Luminaire Type	LED Lamp
Rated Voltage / Frequency	120/277Vac, 60Hz
Nominal Power	16W
Rated Initial Lamp Lumen	N/A
Declared CCT	5000K
LED Manufacturer	Seoul Semiconductor Co.,Ltd
LED Model	STWxC2SB
Sample Receipt Date	Dec.08,2015
Sample Number	GZE151229-B1

Photo



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-12-10	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	CLED4A/P/R-15 WITH TCLD415HZ-5080 (CLKT415)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE151229 -B1	120.0	60	0.1387	16.49	0.9906

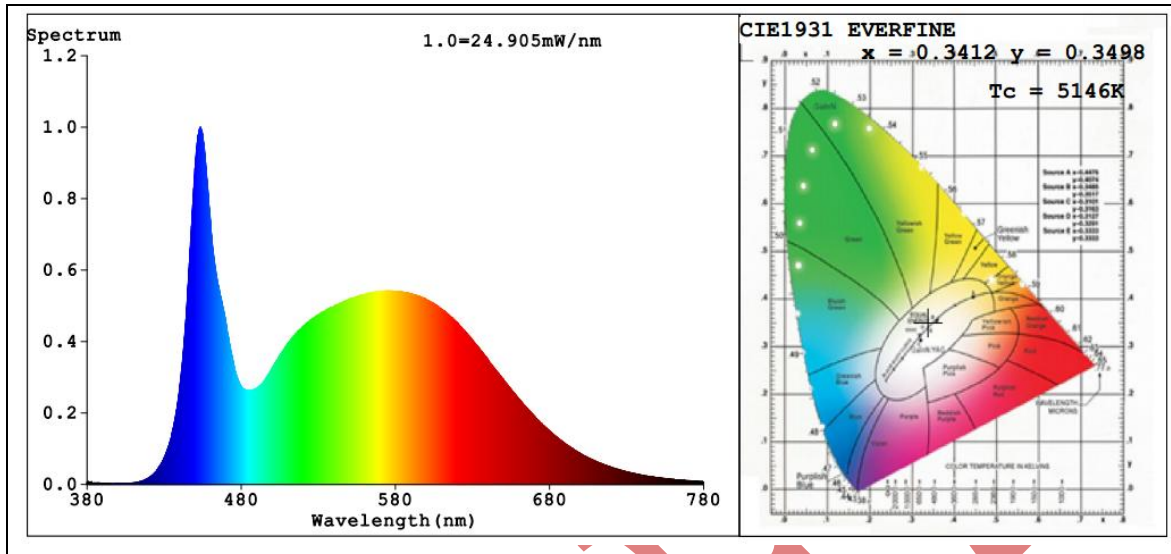
Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	28
Frequency (Hz)	60	R2	92	R10	79
Color Rendering Index (CRI)	86.0	R3	94	R11	83
R9	28	R4	84	R12	62
CCT (K)	5146	R5	85	R13	87
Chromaticity (x, y)	x=0.3412 y=0.3498	R6	87	R14	97
Chromaticity (u', v')	u'=0.2095 v'=0.4832	R7	88	R15	82
Duv	0.0007	R8	73	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	1043.5
Luminous Efficacy (lm/W)	63.28
Beam Angle °	126.8
Center Beam Candle Power (cd)	697

Spectral Power Distribution & Chromaticity Diagram



DRAFT

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Zonal Lumen Tabulation:

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	493.1	47.3%
0-40	704.0	67.5%
0-60	935.9	89.7%
60-90	107.3	10.3%
70-100	43.8	4.2%
90-120	0.0	0%
0-90	1,043.3	100%
90-180	0.1	0%
0-180	1,043.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	65.6	6.3%	90-100	0.0	0%
10-20	182.5	17.5%	100-110	0.0	0%
20-30	245.0	23.5%	110-120	0.0	0%
30-40	211.0	20.2%	120-130	0.0	0%
40-50	137.8	13.2%	130-140	0.0	0%
50-60	94.1	9.0%	140-150	0.0	0%
60-70	63.5	6.1%	150-160	0.0	0%
70-80	34.9	3.3%	160-170	0.0	0%
80-90	8.9	0.9%	170-180	0.0	0%

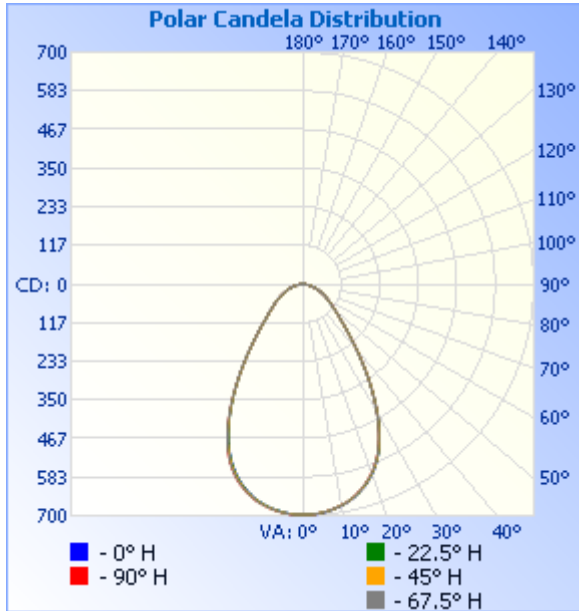
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Photometric Data



Illuminance Plots

	Center Beam fc	Beam Width	
17.0ft	2.41 fc	23.3 ft	23.4 ft
34.0ft	0.60 fc	46.7 ft	46.7 ft
51.0ft	0.27 fc	70.0 ft	70.1 ft
68.0ft	0.15 fc	93.4 ft	93.5 ft
85.0ft	0.10 fc	116.7 ft	116.9 ft
102.0ft	0.07 fc	140.0 ft	140.2 ft

■ Vert. Spread: 68.9°
■ Horiz. Spread: 69.0°

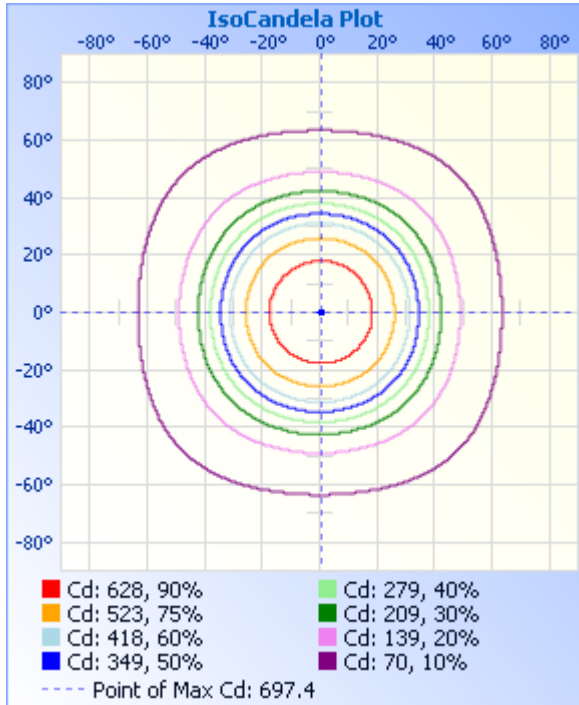
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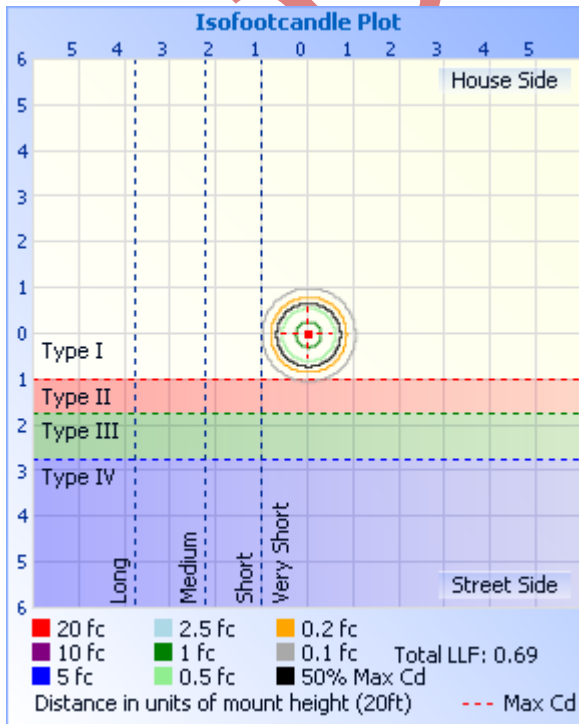
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ISOCANDELA DIAGRAM



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	697	697	697	697	697	697	697	697	697	697	697	697	697	697	697	697	697
1	697	697	697	697	697	696	696	697	697	696	697	697	697	697	697	697	697
2	696	696	697	696	697	695	696	696	697	696	697	697	697	696	697	696	696
3	696	696	696	696	695	694	695	694	695	694	695	696	696	695	695	695	696
4	695	694	694	693	694	693	694	693	693	693	694	694	694	693	694	694	695
5	693	692	692	692	693	691	691	691	691	691	692	693	692	692	693	693	693
6	691	691	690	690	690	689	689	689	689	689	690	690	691	690	691	691	691
7	689	688	688	688	687	686	686	686	686	686	687	688	688	688	688	689	689
8	686	685	685	684	684	683	683	683	684	683	684	685	685	685	686	685	686
9	683	682	682	682	681	679	680	679	680	680	681	682	682	682	683	682	683
10	680	678	678	678	678	676	676	676	676	676	677	678	678	678	679	679	680
11	675	675	674	674	674	672	672	671	671	672	673	674	674	674	675	675	675
12	671	670	670	669	669	667	667	666	666	667	668	670	670	670	671	670	671
13	666	665	665	664	664	661	661	660	660	661	662	664	664	664	666	666	666
14	660	659	659	658	658	655	654	654	653	654	656	658	658	658	660	660	660
15	654	653	652	651	651	648	647	646	646	647	649	651	651	652	654	654	654
16	647	646	646	644	644	640	640	638	638	639	642	644	644	645	646	647	647
17	639	638	637	636	635	633	631	630	630	631	633	636	636	637	639	639	639
18	631	630	629	627	627	624	622	621	621	622	625	628	628	629	630	631	631
19	622	621	620	618	618	615	612	611	611	611	615	618	618	619	621	622	622
20	612	611	610	608	608	604	602	600	600	601	604	607	608	609	611	612	612
21	601	600	599	597	597	593	590	588	589	589	592	595	596	598	600	601	601
22	589	588	588	585	585	581	578	576	576	577	579	583	583	585	588	589	589
23	576	576	575	572	572	568	565	562	562	562	565	569	569	572	574	576	576
24	562	562	561	558	558	553	550	548	547	548	550	554	554	557	559	561	562
25	547	546	545	543	543	538	535	532	531	532	534	538	537	540	543	546	547
26	530	530	528	526	526	522	518	515	514	514	516	519	520	522	526	528	530
27	511	511	510	508	509	504	500	497	496	495	498	501	500	503	507	510	511
28	493	493	492	490	490	486	482	478	477	476	477	481	480	483	487	490	493

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29	472	473	472	470	471	466	462	459	457	456	457	461	459	463	467	470	472
30	452	452	452	449	451	446	442	438	437	435	436	440	438	441	446	449	452
31	430	431	431	429	430	425	421	418	415	414	415	418	416	420	424	427	430
32	408	409	409	408	409	405	400	397	394	393	394	396	394	398	402	405	408
33	387	388	388	386	388	383	379	376	373	372	372	375	373	376	380	384	387
34	365	367	367	365	367	363	359	355	352	351	352	353	351	355	359	363	365
35	344	346	346	344	346	342	338	335	332	330	331	333	330	334	338	342	344
36	323	325	325	324	326	322	318	315	311	310	311	312	310	313	318	321	323
37	304	305	305	304	306	302	299	295	292	291	291	293	290	294	298	301	304
38	285	286	286	285	286	283	280	276	273	272	272	274	272	275	279	282	285
39	266	268	268	266	268	264	261	258	256	255	255	256	254	257	261	264	266
40	249	250	250	249	250	247	244	241	239	238	238	239	237	240	244	247	249
41	233	234	234	233	234	231	228	225	223	222	222	224	222	225	228	231	233
42	218	218	218	217	218	215	213	210	208	207	208	209	208	210	213	216	218
43	204	204	204	203	204	202	200	197	196	195	195	197	194	197	200	202	204
44	191	191	191	189	191	189	187	185	183	183	183	185	182	184	187	189	191
45	179	179	179	178	178	176	174	172	171	170	171	172	171	173	176	178	179
46	169	169	168	167	168	165	164	162	161	160	161	162	161	163	166	167	169
47	159	159	158	157	158	156	154	153	152	151	152	153	152	154	156	158	159
48	150	150	149	148	150	148	146	145	144	143	144	145	144	145	148	149	150
49	142	142	141	141	142	140	139	137	137	136	136	137	137	138	140	141	142
50	135	135	134	134	135	133	132	131	130	130	130	131	130	131	133	134	135
51	128	128	128	127	128	127	126	125	124	124	124	124	123	125	126	127	128
52	122	122	122	121	122	121	120	119	119	118	118	118	117	118	120	121	122
53	116	116	116	116	117	116	115	114	114	113	113	113	112	113	114	115	116
54	110	110	110	110	112	111	110	109	109	108	108	108	107	107	109	110	110
55	105	105	106	106	107	106	105	104	104	103	103	103	102	103	104	104	105
56	100	101	101	101	102	101	100	100	99	99	99	99	98	98	99	100	100
57	96	96	97	96	97	96	96	95	94	94	94	94	94	94	95	95	96
58	92	92	92	92	93	92	91	90	90	90	90	90	89	90	91	91	92
59	88	88	88	87	88	87	87	86	86	85	86	86	85	86	86	87	88

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60	84	84	84	84	84	83	83	82	81	81	81	82	81	82	83	83	84	
61	80	80	80	80	80	79	78	78	77	77	77	78	78	78	79	80	80	
62	76	76	76	76	76	75	74	74	74	73	74	74	74	74	75	76	76	
63	73	73	72	72	72	71	71	70	70	70	70	70	70	71	72	72	73	
64	69	69	69	68	68	68	67	66	66	66	66	67	67	67	68	69	69	
65	65	65	65	65	65	64	63	63	63	62	63	63	63	64	64	65	65	
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67	59	58	58	58	58	57	56	56	56	56	56	56	56	57	58	58	59	
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69	52	52	52	51	51	50	50	49	49	49	49	50	50	50	51	52	52	
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83	13	13	13	12	12	12	11	11	11	11	11	11	11	12	13	13	13	
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86	7	7	6	6	6	5	5	5	5	5	5	5	5	5	6	6	7	
87	5	5	4	4	4	4	3	3	3	3	3	3	3	3	4	4	5	
88	3	3	3	2	2	2	2	1	1	1	1	1	1	1	2	2	3	3
89	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	
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	0
154	0	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	0
156	0	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	0
158	0	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	0
160	0	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	0
162	0	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	0
164	0	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	0
166	0	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	0
168	0	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	0
170	0	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	0
172	0	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	0
174	0	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	0
176	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
178	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
180	0	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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