



Report No.: GZE150182-B

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

P.Q.L., Inc.

(Brand Name: Superior Life®)

2285 Ward Avenue
Simi Valley, CA 93065

Fuel Pump Canopy Luminaires

Model name(s): 90003

Representative (Tested) Model: 90003

Model Difference: N/A

Test & Report By:

Dendi Lin

Engineer: Dendi Lin

Date: Aug.31,2015

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-H/2

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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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	Aug.31,2015
Test Report No.	GZE150182-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	P.Q.L., Inc.	
Brand Name	Superior Life®	
Model Number	90003	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Fuel Pump Canopy Luminaires	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	

Integrating Sphere
Goniophotometer
Electrical Measurements:
Output
Output

Input Wattage	--	101.7	W
Input Current	--	0.8641	A
Input Voltage (ac)	--	120.1	V
Power Factor	--	0.9800	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	11223	lm
Initial Lumen Efficacy	--	110.35	lm/w
Correlated color temperature / CCT	5176	--	K
Color rendering index / CRI	71.7	--	
R9 Value	0	--	
Duv	0.0072	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)		4364	cd
Beam angle (if applicable)		105.9	°
Zonal lumens in the 0°-60° zone	---	86.8	%
Zonal lumens in the 60°-90° zone		13	%
Zonal lumens in the 90°-120° zone		0	%
Zonal lumens in the 120°-180° zone		0.2	%

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Date of Receipt	: Aug.25,2015
Date of Test	: Aug.30,2015
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.

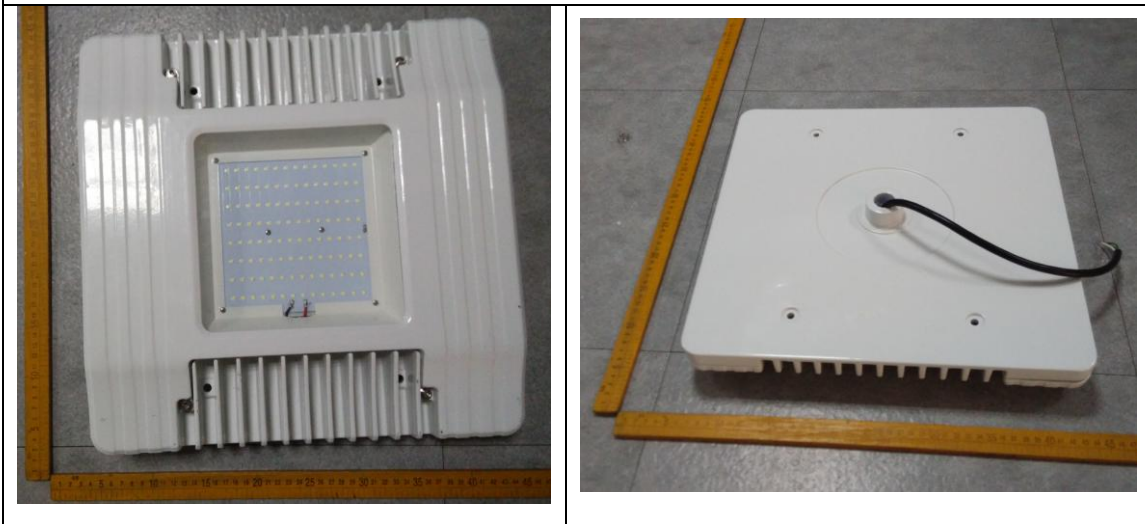
2. Photometric and Electrical Measurements – Integrating Sphere Method:

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	Superior Life®
Model Number	90003
Luminaire Type	Fuel Pump Canopy Luminaires
Rated Voltage / Frequency	100 ~ 277 Vac, 50/60Hz
Nominal Power	100W
Rated Initial Lamp Lumen	--
Declared CCT	5000K
LED Manufacturer	Nichia Corporation
LED Model	NF2L757DR
Sample Receipt Date	Aug.25,2015
Sample Number	GZE150182-B1(5000K)

Photo



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-08-30	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	90003		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150182	120.1	60	0.8641	101.7	0.9800	11.45
-B1	277.1	60	0.3911	99.96	0.9224	15.38

Color Data:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	71.7
R9	0
CCT (K)	5176
Chromaticity (x, y)	x=0.3413 y=0.3631
Chromaticity (u', v')	u'=0.2045 v'=0.4896
Duv	0.0072

Special Color Rendering Indices			
R1	68	R9	0
R2	76	R10	43
R3	82	R11	66
R4	71	R12	39
R5	69	R13	69
R6	67	R14	90
R7	83	R15	63
R8	57	--	--

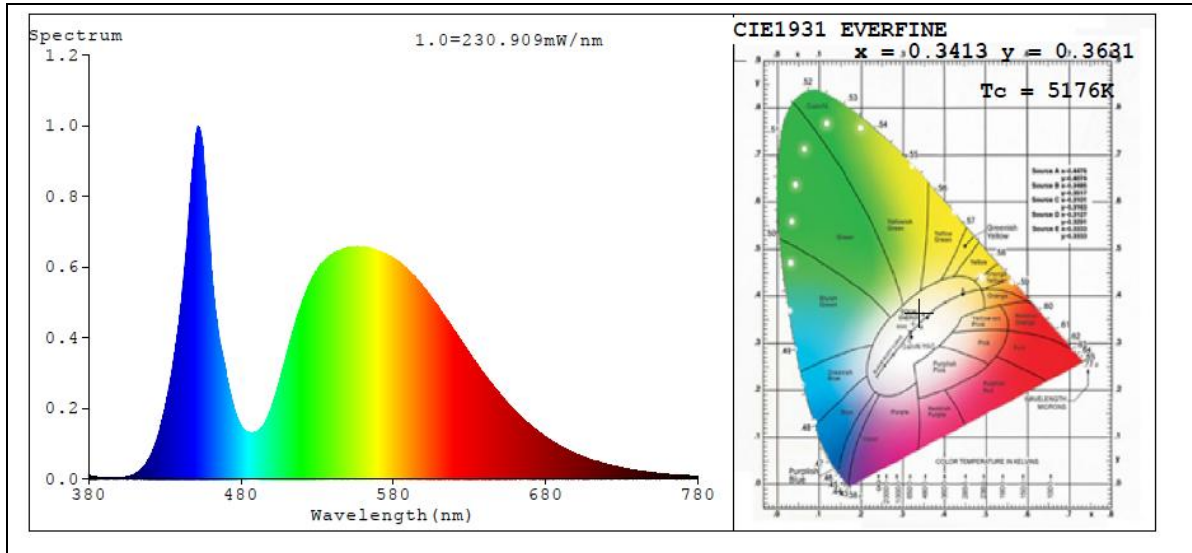
Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	11223
Luminous Efficacy (lm/W)	110.35
Beam Angle °	105.9
Center Beam Candle Power (cd)	4364

Goniophotometer Method for 277V:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	11058
Luminous Efficacy (lm/W)	110.62

Spectral Power Distribution & Chromaticity Diagram



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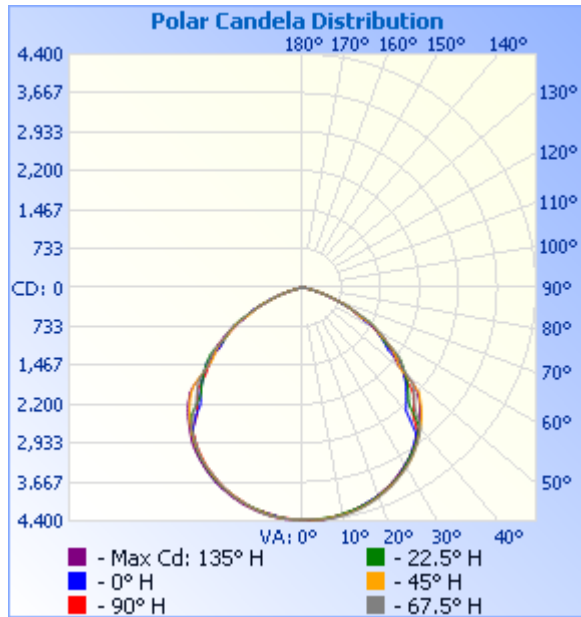
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Zonal Lumen Tabulation

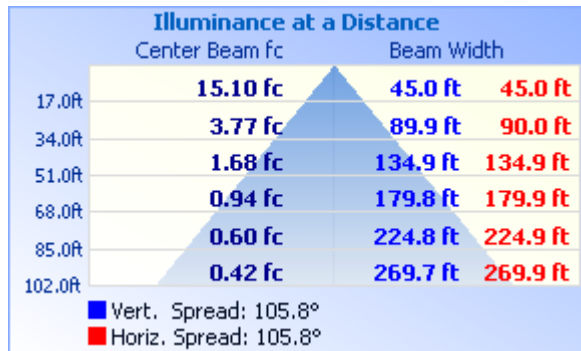
Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,460.6	30.8%
0-40	5,716.7	50.9%
0-60	9,741.0	86.8%
60-90	1,458.1	13%
70-100	379.3	3.4%
90-120	3.3	0%
0-90	11,199.1	99.8%
90-180	22.8	0.2%
0-180	11,221.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	415.5	3.7%	90-100	0.1	0%
10-20	1,199.8	10.7%	100-110	0.9	0%
20-30	1,845.3	16.4%	110-120	2.3	0%
30-40	2,256.1	20.1%	120-130	3.7	0%
40-50	2,225.5	19.8%	130-140	4.4	0%
50-60	1,798.7	16.0%	140-150	4.3	0%
60-70	1,078.8	9.6%	150-160	3.6	0%
70-80	329.9	2.9%	160-170	2.4	0%
80-90	49.3	0.4%	170-180	1.0	0%

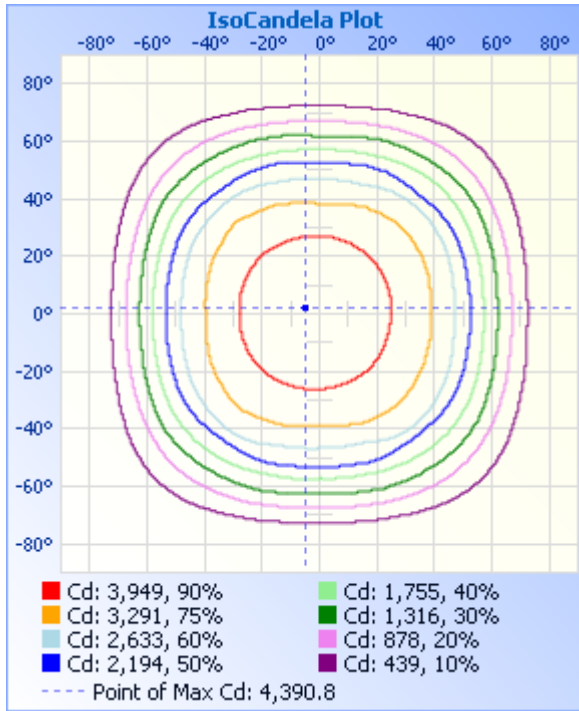
Photometric Data



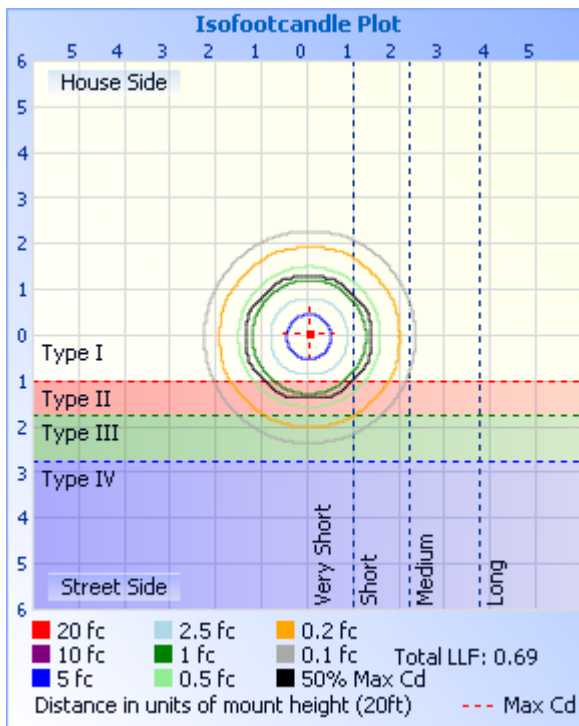
Illuminance Plots



ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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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	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364	4364
1	4365	4363	4365	4364	4367	4367	4370	4374	4369	4368	4366	4366	4361	4361	4363	4362	4365
2	4373	4365	4373	4368	4375	4371	4378	4379	4373	4369	4370	4370	4361	4361	4367	4364	4373
3	4381	4370	4382	4376	4381	4372	4385	4376	4370	4365	4372	4371	4359	4359	4374	4370	4381
4	4386	4373	4387	4384	4384	4370	4390	4374	4366	4362	4367	4368	4357	4356	4376	4375	4386
5	4382	4367	4385	4390	4379	4365	4391	4371	4357	4356	4362	4364	4354	4351	4374	4372	4382
6	4381	4364	4379	4388	4368	4363	4382	4366	4346	4348	4356	4356	4343	4344	4367	4365	4381
7	4377	4361	4369	4383	4361	4363	4372	4356	4332	4340	4348	4347	4329	4332	4358	4353	4377
8	4369	4355	4365	4374	4354	4364	4360	4345	4318	4332	4335	4342	4314	4317	4347	4340	4369
9	4358	4343	4359	4367	4349	4363	4352	4331	4305	4316	4320	4334	4300	4307	4332	4330	4358
10	4346	4329	4352	4364	4339	4358	4340	4318	4296	4296	4304	4318	4290	4298	4320	4321	4346
11	4335	4316	4343	4356	4332	4346	4324	4304	4286	4277	4288	4297	4279	4291	4308	4310	4335
12	4321	4306	4333	4343	4324	4330	4313	4292	4276	4261	4271	4274	4267	4279	4291	4299	4321
13	4306	4297	4322	4330	4308	4313	4302	4279	4258	4246	4254	4253	4250	4264	4275	4284	4306
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15	4266	4268	4294	4303	4268	4278	4268	4236	4221	4210	4211	4211	4205	4224	4242	4251	4266
16	4244	4251	4277	4284	4254	4262	4252	4212	4201	4187	4190	4192	4177	4200	4222	4229	4244
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18	4207	4217	4232	4244	4222	4226	4218	4179	4159	4145	4147	4149	4134	4152	4174	4181	4207
19	4188	4196	4214	4227	4202	4205	4196	4158	4134	4122	4121	4123	4112	4123	4151	4158	4188
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21	4149	4154	4165	4179	4163	4150	4133	4108	4088	4069	4066	4059	4061	4073	4099	4113	4149
22	4122	4128	4137	4152	4140	4122	4110	4082	4065	4042	4038	4031	4033	4050	4075	4091	4122
23	4094	4103	4110	4128	4116	4092	4086	4061	4039	4013	4010	4001	3999	4024	4048	4068	4094
24	4067	4075	4086	4104	4087	4066	4061	4033	4010	3984	3977	3966	3965	3997	4018	4042	4067
25	4039	4047	4059	4074	4053	4042	4027	4004	3981	3956	3943	3930	3931	3964	3984	4011	4039
26	4009	4017	4033	4040	4020	4016	3993	3969	3944	3923	3908	3897	3897	3932	3948	3981	4009
27	3973	3988	4002	4008	3994	3988	3960	3933	3901	3886	3875	3867	3863	3891	3916	3949	3973
28	3934	3953	3971	3978	3963	3957	3929	3903	3864	3850	3841	3841	3827	3845	3882	3913	3934
29	3896	3913	3940	3946	3926	3922	3896	3867	3829	3811	3801	3805	3790	3804	3846	3874	3896

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30	3859	3873	3906	3909	3889	3883	3861	3828	3795	3776	3764	3767	3748	3769	3808	3834	3859
31	3824	3836	3870	3873	3851	3844	3826	3786	3756	3737	3721	3724	3704	3733	3771	3791	3824
32	3787	3795	3836	3834	3811	3806	3786	3748	3712	3696	3682	3680	3662	3694	3732	3746	3787
33	3743	3752	3796	3794	3774	3764	3746	3704	3662	3652	3640	3632	3621	3655	3692	3702	3743
34	3696	3711	3752	3751	3730	3721	3704	3655	3614	3604	3599	3583	3574	3608	3649	3656	3696
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37	3542	3582	3606	3614	3579	3588	3567	3507	3462	3452	3460	3440	3431	3458	3501	3517	3542
38	3458	3526	3551	3564	3530	3539	3514	3458	3348	3401	3411	3398	3376	3413	3447	3466	3458
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41	2977	3252	3398	3364	3172	3310	3360	3209	2944	3219	3245	3146	3026	3193	3284	3129	2977
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43	2871	2925	3284	3102	3068	3075	3246	2906	2826	2840	3127	2937	2908	2952	3173	2861	2871
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47	2662	2708	3015	2862	2821	2837	2973	2648	2591	2590	2857	2701	2615	2714	2904	2646	2662
48	2601	2649	2945	2805	2659	2777	2891	2586	2534	2532	2767	2639	2468	2654	2774	2595	2601
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53	2147	2323	2213	2319	2298	2290	2175	2264	2166	2220	2079	2168	2128	2183	2115	2287	2147
54	1993	2263	2147	2250	2162	2223	2116	2192	1938	2150	2021	2102	1963	2121	2055	2215	1993
55	1927	2120	2085	2181	2025	2155	2052	2104	1861	2049	1958	2023	1887	2046	1998	2011	1927
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62	1304	1487	1465	1485	1440	1423	1445	1450	1255	1399	1330	1346	1304	1351	1319	1450	1304
63	1234	1402	1259	1382	1298	1359	1222	1356	1188	1301	1125	1277	1178	1278	1187	1338	1234
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66	1042	1026	1029	1021	1022	1023	1008	997	1004	952	944	942	917	932	980	999	1042
67	928	951	944	937	936	918	910	928	859	892	843	820	866	851	886	923	928
68	794	885	848	820	861	805	833	855	758	819	786	746	750	759	804	858	794
69	741	747	783	758	748	748	758	696	706	672	691	683	689	707	693	705	741
70	682	671	648	662	684	650	622	641	646	622	572	595	588	607	611	650	682
71	561	607	575	596	579	589	559	577	504	548	528	532	532	553	545	594	561
72	489	534	525	509	501	497	510	482	462	447	456	460	443	472	495	509	489
73	450	422	452	449	432	442	434	402	407	392	400	386	367	402	416	412	450
74	341	386	374	378	352	370	349	361	314	342	317	326	302	329	351	377	341
75	303	315	317	299	281	288	301	268	274	263	280	261	241	275	299	291	303
76	226	255	272	244	220	231	249	236	203	229	224	211	184	223	245	251	226
77	190	205	211	192	164	185	196	176	142	174	185	161	138	173	200	190	190
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81	91	94	91	90	87	89	88	88	84	86	85	86	82	86	87	92	91
82	77	80	77	77	75	76	75	75	71	73	72	72	68	73	74	78	77
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86	35	36	36	36	34	36	35	34	33	33	32	32	30	32	33	35	35
87	28	29	28	29	29	29	27	27	28	27	24	25	26	26	26	28	28
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90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	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	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

Report Format Number STD/QR4909-H/2

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94	0	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	0
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97	0	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	0
99	0	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	1	1	1	0	0	0	0	0
101	0	0	0	0	1	1	0	1	1	1	1	1	0	0	0	0	0
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103	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
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108	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1
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124	4	4	3	4	4	4	4	4	5	4	4	4	4	4	3	4	4
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126	5	4	3	4	4	4	4	5	5	4	4	5	5	5	3	4	5
127	5	4	4	4	5	5	4	5	5	5	4	5	5	5	4	5	5
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130	5	5	4	5	5	5	5	6	6	6	5	5	6	5	4	5	5
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156	9	8	8	7	8	9	8	8	8	8	9	9	6	6	8	8	9
157	9	8	8	7	8	9	8	9	8	8	9	9	7	6	8	8	9

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158	9	8	8	7	8	9	8	9	8	8	9	9	7	6	8	8	9
159	9	8	8	7	8	9	8	9	9	8	9	9	7	6	8	8	9
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164	9	9	8	7	9	9	8	9	9	9	9	9	8	7	8	8	9
165	9	8	8	7	9	9	8	9	9	9	9	9	8	7	8	8	9
166	9	9	8	7	9	9	8	9	9	9	9	9	8	7	8	8	9
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168	9	9	9	7	10	9	9	10	10	10	10	10	9	7	9	9	9
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170	10	10	9	8	10	10	9	10	11	11	11	10	9	8	9	10	10
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172	11	10	9	8	10	10	9	11	11	12	11	11	9	8	10	10	11
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176	11	11	10	9	11	11	9	11	11	12	11	11	9	9	10	10	11
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179	11	11	10	9	11	11	9	10	11	12	11	11	10	9	10	10	11
180	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11

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 *******