

LM-79-08 Test Report

For

SHENZHEN SUNPER OPTO CO.,LTD

(Brand Name: SUNPER)

5/F,BLOK C,SANMIN INDUSTRIAL PARK,SHIYAN STREET,
BAO'AN DISTRICT,SHENZHEN 518108,GUANGDONG,CHINA

High-Bay Luminaires for Commercial and Industrial buildings

Model name(s):SP-HB-150WA

Representative (Tested) Model: SP-HB-150WA(4000K)
SP-HB-150WA(5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Sean Zhuo

Engineer: Sean Zhuo

Date: Dec.17,2014

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-A/2

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

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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	Dec.17,2014
Test Report No.	GZE141129-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	SHENZHEN SUNPER OPTO CO.,LTD		
Brand Name	SUNPER		
Model Number	SP-HB-150WA(4000K)		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay Luminaires for Commercial and Industrial buildings		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

Integrating Sphere

Goniophotometer

Electrical Measurements:

Output

Output

Input Wattage	--	151.6	W
Input Current	--	1.2684	A
Input Voltage (ac)	--	120.1	V
Power Factor	--	0.9952	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	12565	lm
Initial Lumen Efficacy	--	82.88	lm/w
Correlated color temperature / CCT	4252	--	K
Color rendering index / CRI	74.8	--	
R9 Value	0	--	
Duv	-0.0024	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	7673	cd
Beam angle (if applicable)		73.6	°
Zonal lumens in the 0 °-60 °zone		95.9	%
Zonal lumens in the 60 °-90 °zone		4	%
Zonal lumens in the 90 °-120 °zone		0	%
Zonal lumens in the 120 °-180 °zone		0.1	%

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Product Information:

Organization Name	SHENZHEN SUNPER OPTO CO.,LTD		
Brand Name	SUNPER		
Model Number	SP-HB-150WA(5700K)		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay Luminaires for Commercial and Industrial buildings		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

	Integrating Sphere	Goniophotometer
Electrical Measurements:	Output	Output

Input Wattage	152.3	--	W
Input Current	1.2732	--	A
Input Voltage (ac)	120.1	--	V
Power Factor	0.9960	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	13931.0	--	lm
Initial Lumen Efficacy	91.47	--	lm/w
Correlated color temperature / CCT	5588	--	K
Color rendering index / CRI	70.1	--	
R9 Value	0	--	
Duv	0.0016	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	--	cd
Beam angle (if applicable)		--	°
Zonal lumens in the 0 °-60 °zone		--	%
Zonal lumens in the 60 °-90 °zone		--	%
Zonal lumens in the 90 °-120 °zone		--	%
Zonal lumens in the 120 °-180 °zone		--	%

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Test Specifications:	
Date of Receipt	: Dec.08,2014
Date of Test	: Dec.10,2014
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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.

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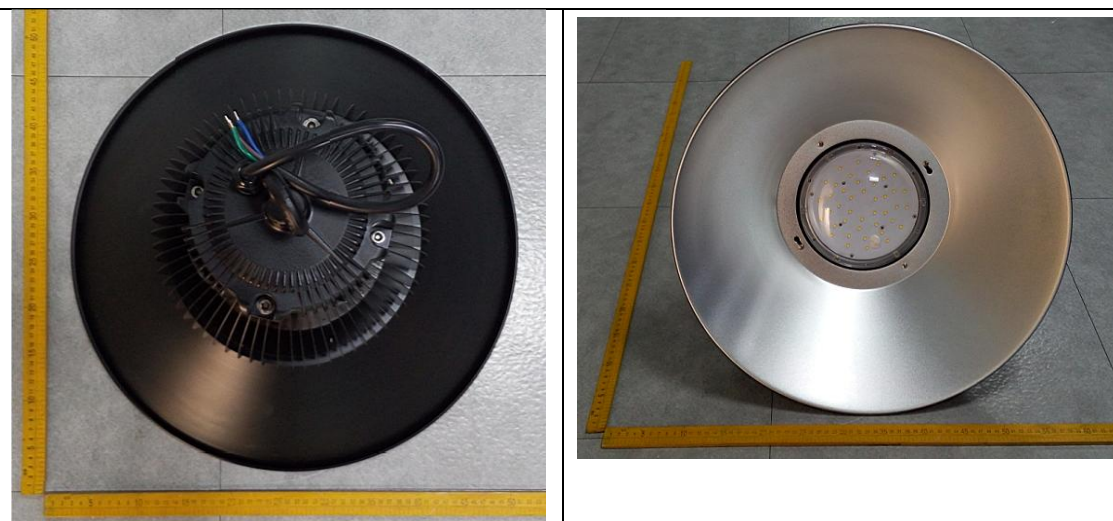
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1. Product Information:

Brand Name	SUNPER
Model Number	SP-HB-150WA
Luminaire Type	High-Bay Luminaires for Commercial and Industrial buildings
Rated Voltage / Frequency	100 ~ 277Vac, 50/60 Hz
Nominal Power	150W
Rated Initial Lamp Lumen	--
Declared CCT	4000K,4500K,5000K,5700K
LED Manufacturer	CREE
LED Model	Xlamp XT-E
Sample Receipt Date	Dec.08,2014
Sample Number	141129-3(4000K),-4(5700K)

Photo



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

Test date	2014-12-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SP-HB-150WA(4000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
141129-3	120.1	60	1.2684	151.6	0.9952	5.58
	277.0	60	0.5835	151.2	0.9356	12.13

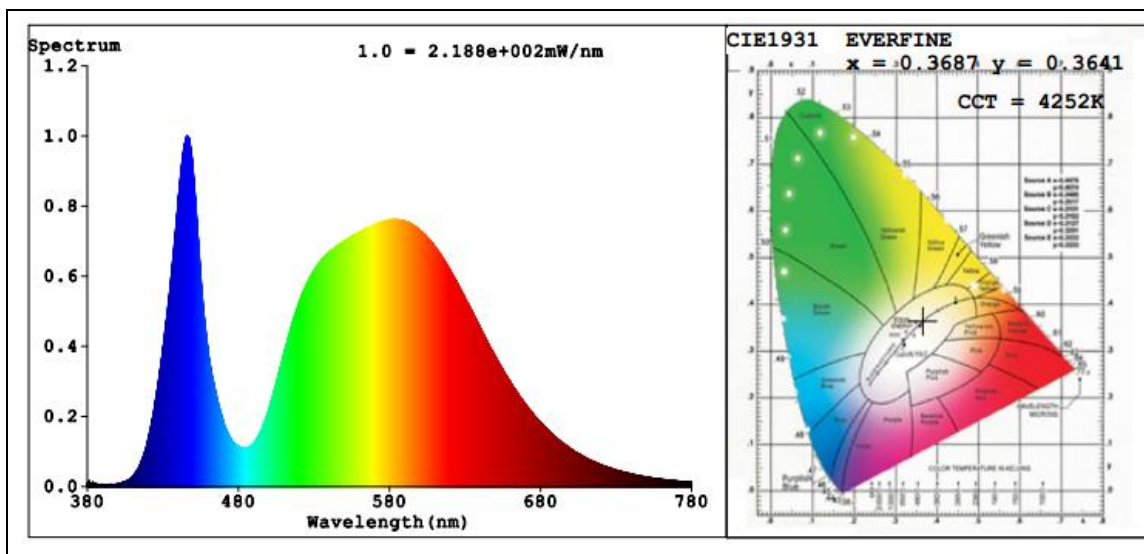
Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.1	R1	74	R9	0
Frequency (Hz)	60	R2	79	R10	49
Color Rendering Index (CRI)	74.8	R3	81	R11	73
R9	0	R4	76	R12	46
CCT (K)	4252	R5	73	R13	74
Chromaticity (x, y)	x=0.3687 y=0.3641	R6	70	R14	89
Chromaticity (u', v')	u'=0.2224 v'=0.4941	R7	82	R15	70
Duv	-0.0024	R8	63	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.1
Frequency (Hz)	60
Total Luminous (lm)	12565
Luminous Efficacy (lm/W)	82.88
Beam Angle °	73.6
Center Beam Candle Power (cd)	7673
S/MH(C0/180)	1.05
S/MH(C90/270)	0.92

Spectral Power Distribution Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary			
Zone	Lumens	% Lamp	% Luminaire
0-30	5,212.4	41.5%	41.5%
0-40	7,769.9	61.8%	61.9%
0-60	12,042.3	95.8%	95.9%
60-90	502.7	4%	4%
70-100	14.9	0.1%	0.1%
90-120	1.4	0%	0%
0-90	12,544.9	99.8%	99.9%
90-180	17.5	0.1%	0.1%
0-180	12,562.5	100%	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	711.9	5.7%	90-100	0.0	0%
10-20	1,945.6	15.5%	100-110	0.3	0%
20-30	2,554.9	20.3%	110-120	1.1	0%
30-40	2,557.5	20.4%	120-130	2.1	0%
40-50	2,370.9	18.9%	130-140	2.9	0%
50-60	1,901.4	15.1%	140-150	3.5	0%
60-70	487.9	3.9%	150-160	3.7	0%
70-80	11.0	0.1%	160-170	2.8	0%
80-90	3.8	0.0%	170-180	1.1	0%

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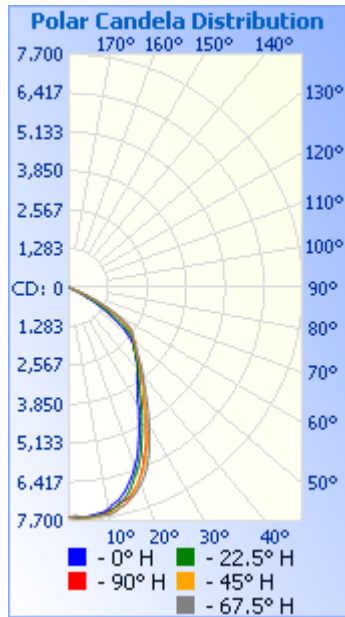
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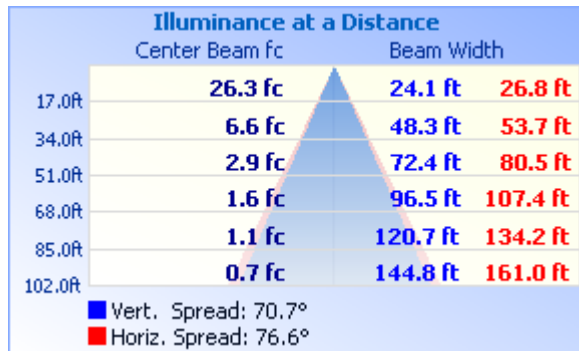
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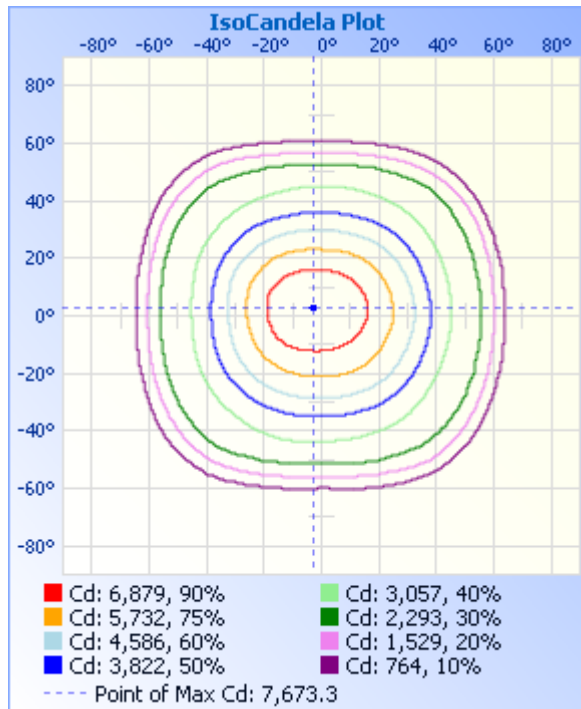
Photometric Data



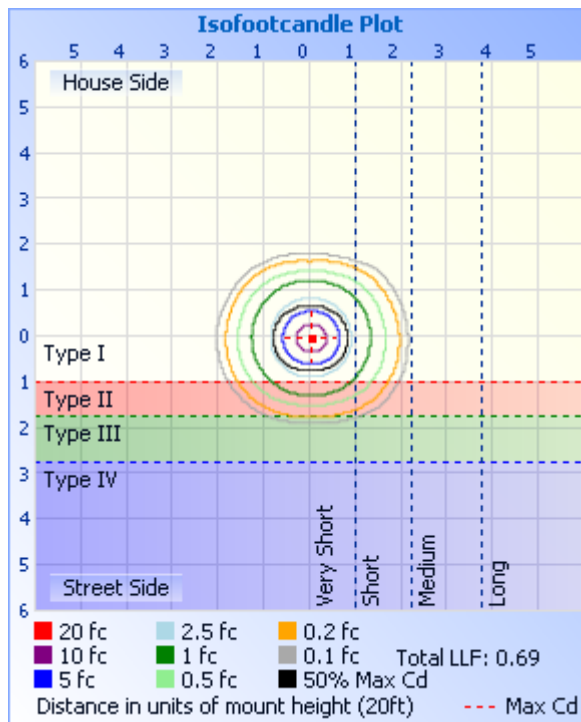
Illuminance Plots



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	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597	7597
1	7584	7596	7619	7627	7618	7600	7577	7597	7549	7567	7543	7542	7581	7595	7595	7612	7584
2	7583	7621	7641	7655	7617	7596	7559	7549	7494	7522	7526	7516	7551	7554	7600	7615	7583
3	7614	7634	7637	7654	7610	7587	7546	7504	7461	7474	7479	7478	7528	7539	7591	7626	7614
4	7621	7633	7648	7637	7619	7584	7539	7456	7397	7406	7446	7451	7520	7547	7570	7624	7621
5	7603	7640	7673	7645	7614	7565	7497	7429	7337	7354	7385	7412	7505	7535	7585	7604	7603
6	7582	7615	7654	7623	7600	7548	7460	7384	7297	7302	7329	7365	7462	7540	7563	7569	7582
7	7558	7602	7643	7612	7600	7508	7401	7322	7242	7256	7296	7334	7413	7496	7531	7560	7558
8	7534	7590	7636	7624	7588	7467	7336	7257	7185	7178	7239	7297	7380	7440	7496	7541	7534
9	7511	7591	7601	7622	7548	7450	7273	7201	7114	7096	7180	7221	7309	7390	7430	7512	7511
10	7448	7542	7594	7634	7517	7416	7240	7120	7038	7055	7099	7161	7266	7366	7398	7434	7448
11	7346	7477	7570	7618	7481	7363	7180	7028	6949	6977	7003	7093	7226	7323	7369	7357	7346
12	7287	7419	7536	7561	7424	7329	7118	6925	6851	6861	6936	7031	7163	7231	7305	7302	7287
13	7230	7347	7475	7480	7361	7251	7030	6807	6758	6755	6835	6960	7104	7146	7234	7224	7230
14	7126	7274	7451	7435	7301	7195	6941	6718	6629	6637	6753	6895	7013	7094	7165	7139	7126
15	7021	7193	7392	7378	7269	7133	6872	6637	6508	6541	6666	6798	6923	7010	7050	7031	7021
16	6900	7085	7288	7301	7228	7048	6774	6539	6382	6423	6546	6682	6832	6936	6938	6924	6900
17	6767	6946	7168	7233	7133	6939	6650	6389	6258	6296	6430	6555	6744	6830	6826	6780	6767
18	6628	6791	7044	7147	7015	6823	6499	6274	6111	6164	6286	6424	6640	6720	6702	6659	6628
19	6499	6630	6901	7031	6906	6676	6349	6114	5953	6022	6155	6274	6530	6599	6582	6507	6499
20	6331	6500	6782	6903	6771	6543	6210	5973	5794	5883	6022	6156	6393	6477	6459	6350	6331
21	6172	6362	6658	6809	6634	6402	6055	5814	5657	5724	5880	6019	6276	6328	6331	6213	6172
22	6024	6199	6511	6682	6470	6276	5898	5634	5504	5593	5755	5899	6145	6199	6164	6059	6024
23	5834	6043	6353	6540	6287	6098	5773	5502	5345	5431	5621	5749	5983	6054	5986	5888	5834
24	5636	5858	6195	6367	6108	5944	5613	5333	5184	5287	5465	5571	5832	5902	5820	5710	5636
25	5451	5651	6015	6198	5955	5755	5467	5184	5026	5134	5336	5424	5683	5738	5662	5529	5451
26	5265	5473	5844	6029	5796	5572	5306	5041	4859	4974	5144	5263	5530	5550	5496	5361	5265
27	5082	5308	5624	5830	5631	5407	5155	4909	4710	4845	4991	5112	5373	5395	5339	5202	5082
28	4912	5124	5422	5663	5434	5256	5001	4765	4549	4705	4846	4983	5221	5233	5175	4990	4912
29	4753	4948	5258	5466	5241	5092	4849	4612	4440	4544	4724	4831	5070	5079	5023	4843	4753

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30	4597	4790	5086	5280	5074	4914	4708	4479	4312	4380	4579	4673	4883	4930	4874	4670	4597
31	4403	4630	4924	5106	4893	4756	4578	4328	4200	4253	4464	4536	4732	4746	4695	4513	4403
32	4270	4494	4749	4937	4711	4591	4441	4181	4090	4144	4343	4427	4606	4580	4542	4366	4270
33	4155	4318	4576	4773	4538	4462	4307	4082	3981	4032	4225	4280	4460	4451	4405	4240	4155
34	4057	4174	4418	4613	4393	4342	4179	3988	3857	3904	4096	4160	4319	4306	4271	4121	4057
35	3949	4041	4283	4444	4264	4200	4058	3867	3738	3815	3985	4032	4206	4143	4139	4014	3949
36	3825	3944	4177	4285	4162	4066	3924	3752	3655	3724	3835	3921	4058	3999	4014	3894	3825
37	3728	3814	4036	4159	4052	3957	3820	3648	3567	3633	3708	3795	3922	3903	3913	3775	3728
38	3645	3721	3938	4023	3929	3876	3724	3554	3489	3529	3593	3674	3790	3787	3796	3678	3645
39	3570	3628	3831	3880	3803	3774	3601	3449	3402	3438	3483	3552	3650	3671	3708	3563	3570
40	3505	3538	3719	3786	3674	3648	3491	3340	3325	3320	3400	3439	3542	3550	3585	3490	3505
41	3432	3463	3591	3672	3543	3516	3390	3264	3235	3232	3318	3331	3412	3438	3471	3429	3432
42	3345	3389	3503	3574	3422	3379	3285	3218	3144	3144	3227	3226	3307	3337	3375	3358	3345
43	3244	3291	3391	3460	3315	3279	3192	3150	3054	3058	3137	3121	3212	3247	3256	3276	3244
44	3171	3197	3285	3333	3215	3191	3100	3081	3001	3007	3047	3017	3134	3138	3168	3174	3171
45	3104	3093	3175	3244	3115	3103	3008	3013	2939	2953	2954	2908	3046	3056	3108	3074	3104
46	3048	3002	3086	3137	3016	3015	2952	2934	2901	2884	2892	2840	2948	2985	3012	3003	3048
47	2961	2920	2998	3051	2945	2922	2900	2833	2846	2814	2853	2789	2871	2898	2931	2911	2961
48	2869	2884	2930	2979	2875	2834	2853	2761	2750	2762	2760	2705	2811	2830	2872	2854	2869
49	2800	2851	2876	2914	2781	2758	2802	2665	2574	2693	2646	2656	2742	2773	2766	2792	2800
50	2663	2808	2827	2803	2708	2730	2718	2593	2392	2608	2546	2568	2663	2713	2638	2749	2663
51	2524	2730	2786	2698	2659	2684	2632	2480	2324	2494	2489	2479	2599	2645	2572	2667	2524
52	2387	2627	2701	2664	2610	2639	2542	2352	2155	2326	2443	2416	2551	2562	2541	2576	2387
53	2267	2483	2632	2614	2566	2546	2490	2292	1945	2243	2383	2400	2479	2446	2476	2448	2267
54	2047	2336	2534	2572	2517	2473	2455	2109	1760	2075	2313	2357	2383	2385	2422	2320	2047
55	1888	2205	2442	2519	2443	2418	2390	1889	1614	1895	2239	2313	2309	2306	2351	2169	1888
56	1686	1957	2368	2473	2347	2334	2203	1703	1398	1670	2067	2170	2229	2240	2246	1884	1686
57	1516	1775	2310	2348	2287	2203	2099	1566	1171	1528	1909	2002	2048	2091	2174	1723	1516
58	1347	1595	2115	2241	2138	2072	1868	1363	1032	1268	1720	1778	1938	1951	1855	1534	1347
59	1089	1416	1974	2081	1950	1834	1685	1124	825	1066	1625	1590	1750	1825	1630	1346	1089
60	986	1237	1815	1887	1720	1681	1499	983	650	940	1284	1339	1501	1568	1441	1157	986
61	691	1029	1582	1716	1577	1369	1274	752	502	786	1053	1172	1251	1310	1252	990	691

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62	494	877	1347	1491	1357	1211	1044	544	309	602	883	862	1001	1052	1047	732	494
63	305	610	1113	1265	1170	1042	847	395	148	364	700	733	866	803	804	557	305
64	157	465	952	1038	927	854	757	270	64	232	527	570	725	694	615	398	157
65	59	266	727	836	713	670	481	144	39	144	361	405	480	433	406	233	59
66	35	139	603	623	631	474	349	42	34	37	178	232	284	286	283	107	35
67	29	44	333	459	401	319	194	32	27	29	82	84	118	116	104	37	29
68	23	32	226	304	214	126	91	25	24	23	26	26	37	35	35	28	23
69	20	23	84	130	110	35	31	20	22	19	20	20	22	22	25	22	20
70	19	18	29	35	27	23	23	18	21	16	14	12	14	15	17	18	19
71	17	15	20	22	19	16	16	17	20	15	11	9	9	11	13	16	17
72	16	14	14	13	13	12	13	16	19	15	10	8	8	9	12	15	16
73	16	13	10	9	9	9	11	15	18	14	9	7	7	8	11	14	16
74	15	12	9	7	7	8	11	14	17	13	9	6	6	8	10	13	15
75	14	12	8	6	7	8	10	13	16	12	8	6	5	7	9	12	14
76	13	11	8	6	6	7	9	12	15	11	7	5	5	6	8	12	13
77	12	10	7	5	5	6	8	12	15	11	7	5	4	5	8	11	12
78	12	9	7	4	5	5	8	11	14	10	6	4	4	5	7	10	12
79	11	9	6	4	4	5	7	10	13	10	6	4	3	4	6	10	11
80	10	8	5	4	3	5	6	10	12	9	5	3	3	4	6	9	10
81	10	8	5	3	3	4	6	9	12	9	5	3	2	3	5	8	10
82	9	7	4	3	2	3	5	8	11	8	4	2	2	3	5	8	9
83	9	7	4	1	2	3	4	8	11	8	4	2	1	3	4	7	9
84	8	6	4	2	2	2	4	7	10	7	3	1	1	2	4	6	8
85	7	6	3	2	1	2	3	7	9	6	3	1	1	2	3	6	7
86	6	5	3	1	1	2	3	6	7	5	2	1	1	1	2	5	6
87	5	4	2	1	1	1	2	4	5	3	1	0	0	1	1	4	5
88	4	3	2	1	0	1	1	3	3	2	0	0	0	0	1	2	4
89	4	3	1	0	0	0	0	1	0	0	0	0	0	0	0	3	4
90	2	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
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

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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
96	0	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	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	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	0
102	0	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	0
104	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
105	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0
106	0	0	0	0	1	1	1	0	0	0	1	1	0	0	0	0	0
107	0	0	0	0	1	1	1	0	0	1	1	1	0	0	0	0	0
108	0	0	0	0	1	1	1	1	0	1	1	1	0	0	0	0	0
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111	0	0	0	0	1	1	1	1	1	1	1	2	0	0	0	0	0
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113	0	0	0	0	2	2	1	1	1	1	2	2	1	1	0	0	0
114	0	0	0	0	2	2	2	1	1	1	2	2	1	1	0	0	0
115	0	0	0	0	2	2	2	1	1	2	2	2	1	1	0	0	0
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117	0	0	0	1	2	2	2	2	2	2	2	2	1	1	0	0	0
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119	1	1	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1
120	1	1	1	1	3	3	2	2	2	2	2	3	2	1	1	1	1
121	1	1	1	1	3	3	2	2	2	3	2	3	2	2	1	1	1
122	1	1	1	1	3	3	2	2	3	3	2	3	2	2	1	1	1
123	1	1	1	1	3	3	3	3	3	3	3	3	2	2	1	1	1
124	1	1	1	1	3	3	3	3	3	3	3	3	2	2	1	1	1
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126	2	2	2	2	3	3	3	3	3	3	3	3	2	2	2	2	2
127	2	2	2	2	4	3	3	3	3	3	3	3	3	2	2	2	2
128	2	2	2	2	4	3	3	3	3	3	3	3	3	2	2	2	2
129	2	2	2	2	4	4	3	3	4	4	3	4	3	3	2	2	2
130	2	2	2	2	4	4	4	4	4	4	4	4	3	3	2	3	2
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143	5	4	4	4	6	6	6	6	6	6	6	6	4	4	4	4	5
144	5	4	4	4	6	6	6	6	7	7	7	7	5	4	4	5	5
145	5	5	4	4	7	7	6	7	7	7	7	7	5	5	4	5	5
146	5	5	4	4	7	7	6	7	7	7	7	7	5	5	4	5	5
147	5	5	5	4	7	7	7	7	8	7	7	7	5	5	5	5	5
148	6	5	5	5	8	7	7	7	8	8	8	8	5	5	5	5	6
149	6	5	5	5	8	7	7	8	8	8	8	8	5	5	5	5	6
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152	7	6	6	6	9	9	8	9	9	9	9	9	6	6	6	6	7
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156	7	7	7	6	9	9	9	10	10	10	10	10	6	7	7	7	7
157	8	7	7	7	9	10	10	10	10	11	10	10	6	7	7	7	8

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158	8	7	7	7	9	10	10	10	11	11	10	10	6	7	7	7	8
159	8	8	7	7	9	10	10	10	11	11	11	10	7	8	7	8	8
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168	10	10	9	9	12	12	12	12	12	13	12	12	10	10	10	10	10
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176	12	12	11	11	12	12	12	12	12	13	12	12	11	11	11	11	12
177	12	12	11	11	11	11	12	12	12	12	12	12	11	11	11	11	12
178	12	12	11	11	11	11	12	12	12	12	12	12	11	11	11	11	12
179	12	12	11	11	11	11	12	12	12	12	12	12	11	11	11	11	12
180	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

2.2 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2014-12-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	SP-HB-150WA(5700K)		

Electrical Measurement:

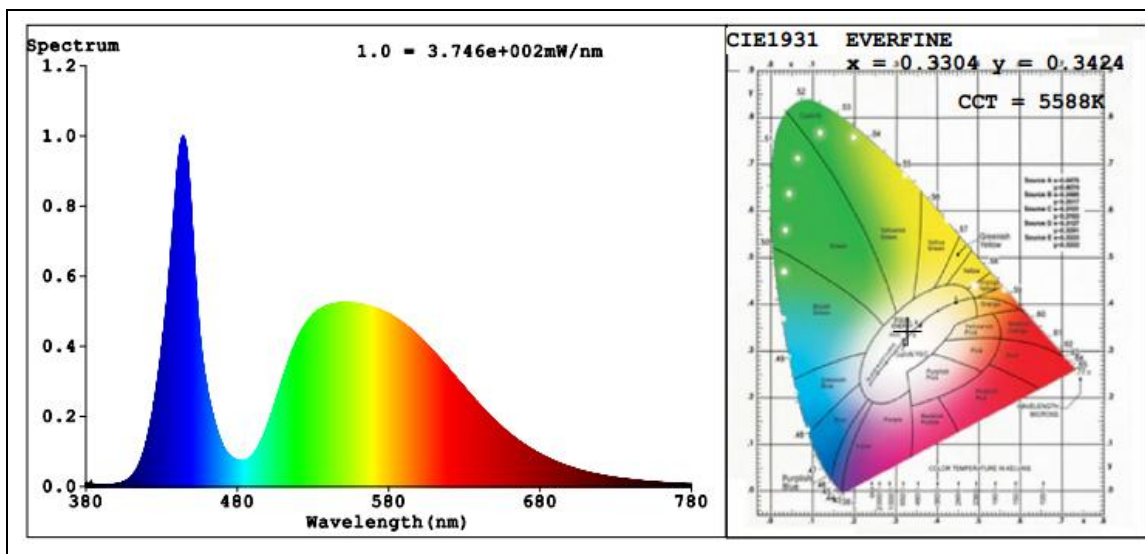
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
141129-4	120.1	60	1.2732	152.3	0.9960	5.72
	277.0	60	0.5796	151.1	0.9413	12.05

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.1
Frequency (Hz)	60
Color Rendering Index (CRI)	60
R9	0
CCT (K)	5588
Chromaticity (x, y)	x=0.3304 y=0.3424
Chromaticity (u', v')	u'=0.2050 v'=0.4779
Duv	0.0016
Total Luminous (lm)	13931.0
Luminous Efficacy (lm/W)	91.47

Special Color Rendering Indices			
R1	70	R9	0
R2	72	R10	34
R3	73	R11	72
R4	72	R12	42
R5	71	R13	69
R6	64	R14	85
R7	77	R15	65
R8	61	--	--

Spectral Power Distribution & Chromaticity Diagram



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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2014-07-01	2015-06-30
ST-R-331	Spectral analysis system HAAS-2000	2014-07-01	2015-06-30
D204	Standard Lamp	2014-07-01	2015-06-30
PF2010	Power Meter for Integrating Sphere	2014-07-01	2015-06-30
EE-09	Goniophotometer system	2014-07-01	2015-06-30
D908S	Standard Lamp	2014-07-01	2015-06-30
PF210	Power Meter for Goniophotometer	2014-07-01	2015-06-30
ST-R-181A	Temperature Tester	2014-07-01	2015-06-30

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