Test Report

Certificate No.: T-2233

Verification Services

Project No.: 6012-003504-01

Report No.: 6012-003504-01-01

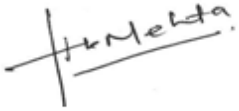
Report Issued Date:26.12.2012

Customer Company & Address:			
SAHASRA ELECTRONICS PVT. LTD. 129G,NSEZ, NOIDA, U.P. 201305, INDIA			
Contact Person:	HUSN AFROZ		
Telephone:	+91-120-2462782, Exn. 213	**Fax:**	+91 120 2563119

Manufacturer:	SAHASRA ELECTRONICS PVT. LTD.	
Country of Origin:	INDIA	
Country of Export:	INDIA	
Product Description:	LED STREET LIGHT	
Model Number:	100WSL	
Electrical Specification:	Rated Voltage (V)	230
	Frequency (Hz)	50 - 60
	Rated Power(W)	100

Test Laboratory & Address:			
UL India Private Limited, Plot No. 413, Sector 8, IMT Manesar, Gurgaon, Haryana 122050, India			
Telephone:	+91 124-2290196	**Fax:**	N.A.

Condition of samples on receipt:	Good.		
Receipt of Test Samples:	11.12.2012	**Test Period:**	12.12.2012 to 21.12.2012

Test Personnel Name & Sign:		Hari Om
Approver Name & Sign:		Abhay Mehta

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Statement of Results

Test Flow	Test Method	Sample ID (Lab)	Sample Serial No	Pass/Fail/NA
1	Electrical and Photometric measurements as per LM-79-08.	6012-003504-01-01	SD04-1212-SEIN-00001	Evaluate by customer
2	Colorimetric measurements as per LM-79-08.			Evaluate by customer
3	Degree of protection against Dust (IP 6X) as per clause No.13.5 of IS:10322-Part 5-Sec 3-1987 & Clause No. 2.1.2 of IS:10322 Part-4-1984			Pass
4	Degree of protection against water jets (IP X5) as per clause No.13.5 of IS:10322-Part 5-Sec 3-1987 & Clause No.2.1.6 of IS:10322 Part-4-1984			Pass

Deviation from Test Method (*if any*)

N.A.

Remark *(if any)*

N.A.

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Test No.1 Electrical and Photometric measurements as per LM-79-08 using Goniophotometer.

Environmental conditions:

Temperature (°C)	**25.3**

Test equipment:

Sr. No.	Equipment ID	Equipment name	Last calibration date	Next calibration date
1	GON01	Goniophotometer	Before use	Before use
2	SL04	Measured standard lamp	03.08.2012	03.08.2013
3	PM03	Digital Power Meter	03.10.2012	03.10.2013

Test sample:

6012-003504-01-01

Test method

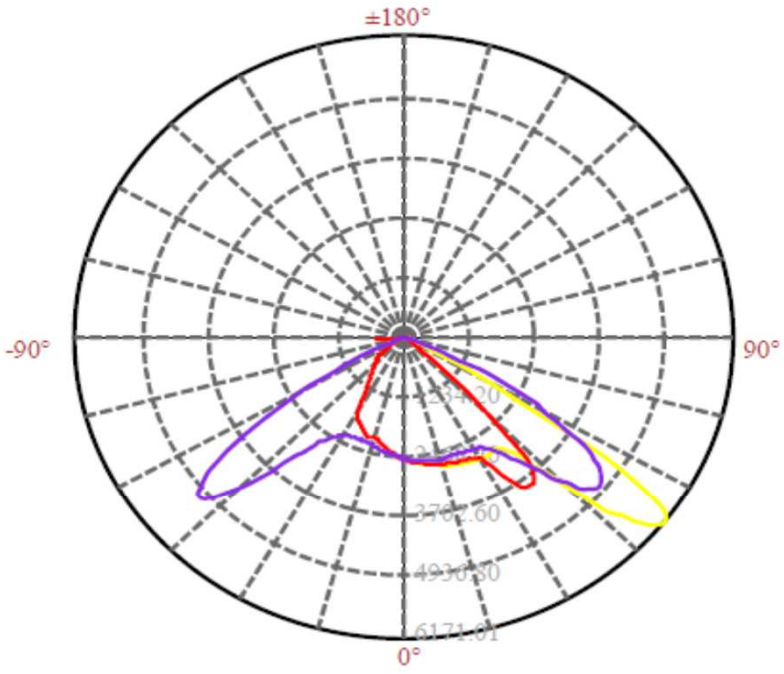
- The sample was tested according to the IES LM-79-2008.
- The condition of the sample tested was new. Stabilization time before testing was 120 minutes.
- Orientation (burning position) of SSL product during testing was its normal burning position i.e. at zero degree inclination to horizontal.
- Electrical measurements were obtained with a Yokogawa WT210 digital power meter.
- Photometric parameters were obtained using a Type-C Goniophotometer and software. Photometric distance was 8.7 meters.
- The ambient temperature was maintained at (25 ± 1) ° C during testing.
- The sample was operated at 230 Volts AC. It was stabilized before measurement. Luminous flux, luminaries efficacy, zonal lumen were calculated from the software taken at 5.0° vertical intervals and 22.5° horizontal intervals.

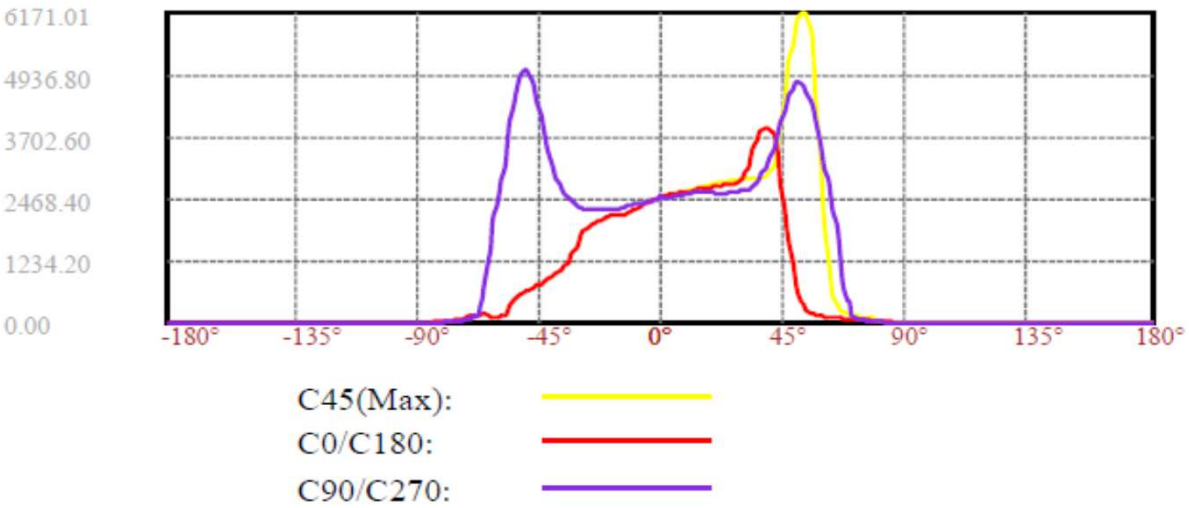
Test Results

Input				
Voltage (V)	**Frequency (Hz)**	**Current (A)**	**Power (W)**	**Power Factor**
229.970	50	0.47	104.430	0.967

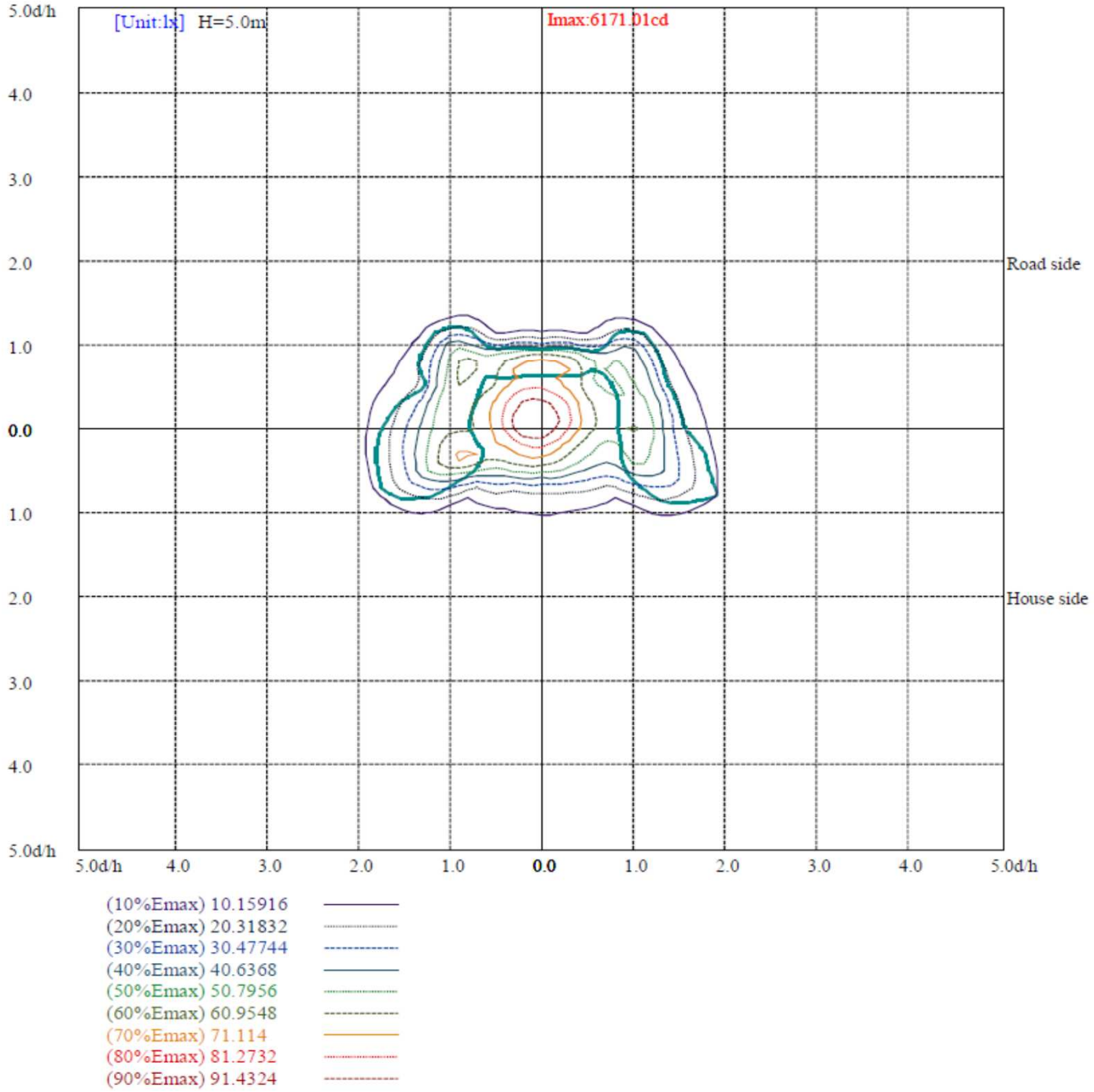
Output	
Flux (lm)	**Efficacy (lm/W)**
8723.70	83.54

Light Distribution Curve:[Unit : cd]





Isolux Plot :


[Unit:lx] H=5.0m
Imax:6171.01cd
5.0d/h
4.0
3.0
2.0
1.0
0.0
Road side
House side
(10%Emax) 10.15916
(20%Emax) 20.31832
(30%Emax) 30.47744
(40%Emax) 40.6368
(50%Emax) 50.7956
(60%Emax) 60.9548
(70%Emax) 71.114
(80%Emax) 81.2732
(90%Emax) 91.4324

Zonal Lumen Tabulation:

Zonal Lumen Summary			
Zone	Lumens	%Lamp	%Fixt
0-30	2021.3	N.A.	23.2%
0-40	3592.8	N.A.	41.2%
0-60	7917.8	N.A.	90.8%
0-90	8719.2	N.A.	99.9%
90-120	1.0	N.A.	0.0%
90-130	1.8	N.A.	0.0%
90-150	3.4	N.A.	0.0%
90-180	4.5	N.A.	0.1%
0-180	8723.7	N.A.	100.0%

ZONAL LUMEN SUMMARY	
0-10	235.2
10-20	682.9
20-30	1103.2
30-40	1571.5
40-50	2239.4
50-60	2085.7
60-70	694.6
70-80	92.4
80-90	14.5
90-100	0.1
100-110	0.3
110-120	0.6
120-130	0.8
130-140	0.9
140-150	0.8
150-160	0.6
160-170	0.4
170-180	0.1

Intensity data(cd):

γ/C(°)	0	22.5	45	67.5	90	112.5	135	157.5
0	2496.26	2487.93	2469.76	2472.04	2466.74	2509.88	2501.55	2501.55
5	2574.22	2580.27	2562.86	2548.48	2521.99	2503.83	2444.79	2402.40
10	2615.85	2630.23	2632.50	2620.39	2559.08	2496.26	2377.42	2290.38
15	2685.48	2705.92	2706.67	2693.05	2611.30	2435.70	2287.35	2169.28
20	2716.51	2792.96	2777.07	2700.62	2584.06	2363.04	2193.50	2207.12
25	2764.96	2841.40	2827.78	2711.22	2590.87	2396.35	2253.29	2079.96
30	2880.76	2863.35	2874.71	2771.77	2631.74	2736.95	2279.78	1884.68
35	3652.80	3234.23	2864.87	2929.96	2795.23	3147.19	2210.90	1329.95
40	3820.07	3770.12	3020.03	3338.69	3292.51	4085.75	2058.77	923.72
45	2288.87	3460.55	4349.90	4249.24	4159.17	5224.88	1324.50	745.32
50	650.93	1155.03	6006.00	4408.19	4782.85	5830.40	811.40	613.77
55	193.24	240.24	5732.00	2637.80	4381.69	5688.86	628.83	424.77
60	128.07	142.68	1970.21	1995.95	3058.63	4081.20	477.76	106.50
65	106.50	108.62	312.75	1136.86	1600.84	1457.03	201.87	85.06
70	80.31	99.08	157.21	389.80	169.32	362.56	85.51	62.75
75	64.56	98.32	122.47	108.24	52.15	74.93	37.19	45.04
80	49.88	52.23	53.44	38.22	23.09	14.99	17.81	26.51
85	16.05	44.88	12.13	5.62	5.37	1.73	2.38	1.45
90	0.48	0.61	0.70	0.67	0.84	0.19	0.13	0.10
95	0.04	0.04	0.04	0.05	0.03	0.26	0.13	0.08
100	0.05	0.04	0.07	0.16	0.06	0.33	0.21	0.08
105	0.06	0.05	0.13	0.42	0.19	0.46	0.39	0.08
110	0.08	0.08	0.22	0.76	0.43	0.76	0.56	0.11
115	0.12	0.11	0.32	1.04	0.76	1.14	0.78	0.23
120	0.17	0.17	0.41	1.22	1.07	1.35	0.82	0.41
125	0.23	0.23	0.50	1.28	1.23	1.48	1.01	0.64
130	0.31	0.33	0.59	1.31	1.32	1.51	1.29	0.92
135	0.42	0.42	0.65	1.30	1.41	1.51	1.53	1.18
140	0.53	0.52	0.70	1.21	1.41	1.55	1.65	1.42
145	0.64	0.61	0.72	1.03	1.20	1.51	1.62	1.57
150	0.74	0.70	0.74	0.87	0.98	1.49	1.58	1.61
155	0.83	0.78	0.76	0.79	0.86	1.52	1.60	1.59
160	0.88	0.84	0.80	0.78	0.82	1.62	1.67	1.59
165	0.91	0.89	0.89	0.84	0.84	1.70	1.72	1.57
170	0.98	0.96	1.01	1.01	0.96	1.69	1.67	1.51
175	1.08	1.07	1.14	1.19	1.17	1.62	1.57	1.43
180	1.21	1.22	1.29	1.37	1.44	1.48	1.39	1.28

Intensity data(cd):

γ/C(°)	180	202.5	225	247.5	270	292.5	315	337.5
0	2496.26	2487.93	2469.76	2472.04	2550.75	2509.88	2501.55	2501.55
5	2384.99	2369.10	2365.31	2372.12	2399.37	2494.74	2518.21	2556.81
10	2248.75	2221.50	2229.07	2292.65	2366.07	2444.79	2492.47	2565.89
15	2127.65	2060.28	2075.42	2160.19	2279.78	2456.90	2503.07	2590.87
20	2095.10	2010.33	1936.91	2058.01	2243.45	2401.64	2538.64	2602.22
25	1950.53	1905.12	1947.50	2001.24	2254.05	2363.80	2512.15	2654.45
30	1615.22	1783.26	1932.37	2061.80	2310.82	2428.14	2507.61	2708.19
35	1146.93	1348.49	1819.59	2115.54	2570.43	2550.75	2560.59	3203.96
40	913.96	993.96	1642.47	2514.42	3196.39	2861.84	2691.54	3759.52
45	765.15	765.60	1193.25	3509.74	4377.91	3623.28	3633.88	3399.99
50	625.96	645.48	831.30	4747.28	5012.19	4588.33	4684.45	1124.00
55	328.80	432.64	667.66	5440.60	3983.56	3546.83	4959.21	213.07
60	113.91	131.78	472.76	4666.29	2323.68	1746.93	1618.25	137.15
65	180.07	95.48	202.85	2588.60	490.70	1264.78	384.51	98.02
70	146.38	64.96	85.88	660.55	86.91	473.82	126.71	90.37
75	68.73	43.98	40.47	133.87	47.16	135.56	106.42	90.37
80	35.99	28.23	21.98	25.86	17.37	47.99	88.86	47.99
85	4.39	8.72	4.38	2.93	2.16	9.36	18.51	35.07
90	0.09	0.10	0.11	0.19	0.14	1.04	0.88	0.69
95	0.08	0.08	0.11	0.21	0.25	0.04	0.03	0.04
100	0.08	0.08	0.18	0.30	0.46	0.11	0.05	0.03
105	0.08	0.09	0.37	0.41	0.67	0.29	0.09	0.05
110	0.09	0.13	0.58	0.61	0.99	0.60	0.17	0.07
115	0.15	0.28	0.89	0.95	1.35	0.94	0.29	0.11
120	0.31	0.47	1.01	1.21	1.54	1.25	0.43	0.17
125	0.56	0.71	1.11	1.42	1.63	1.44	0.62	0.24
130	0.85	0.96	1.25	1.49	1.63	1.56	0.79	0.33
135	1.11	1.20	1.45	1.53	1.62	1.62	0.93	0.45
140	1.36	1.39	1.58	1.60	1.60	1.57	1.01	0.58
145	1.54	1.51	1.59	1.63	1.59	1.36	1.02	0.69
150	1.60	1.55	1.56	1.58	1.54	1.13	0.95	0.78
155	1.57	1.55	1.57	1.57	1.54	0.99	0.87	0.83
160	1.54	1.57	1.60	1.61	1.60	0.92	0.84	0.84
165	1.50	1.55	1.60	1.61	1.60	0.94	0.89	0.89
170	1.42	1.48	1.55	1.55	1.57	1.05	1.03	1.01
175	1.35	1.39	1.46	1.50	1.53	1.24	1.22	1.14
180	1.21	1.22	1.29	1.37	1.44	1.48	1.39	1.28

Test No.2 Colorimetric measurements as per LM-79-08 using Thermostatic integrating sphere.

Environmental conditions:

Temperature (°C)	**25.3**

Test equipment:

Sr. No.	Equipment ID	Equipment name	Last calibration date	Next calibration date
1	TIS 02	Integrating Sphere	Before use	Before use
2	WSL03	Measured standard lamp	12.07.2012	11.07.2013

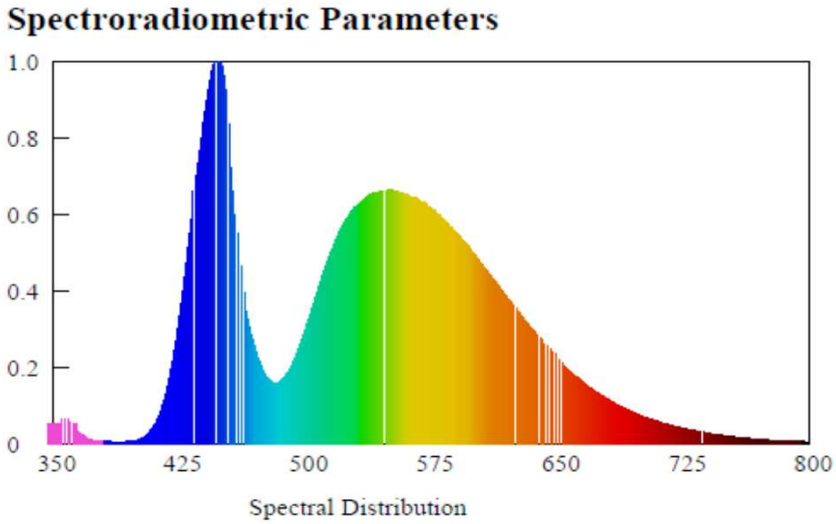
Test sample:

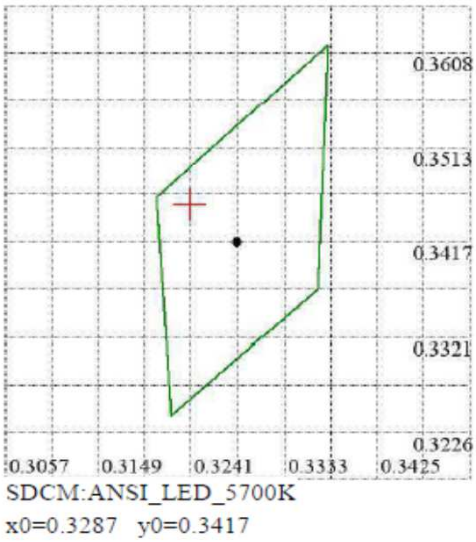
6012-003504-01-01

Test method:

- The sample was tested according to the IES LM-79-2008.
- Orientation (burning position) of SSL product during testing was its normal burning position i.e. at zero degree inclination to horizontal.
- Colorimetric parameters were measured using an integrating sphere, a spectroradiometer and software. 4π geometry was used.
- The ambient temperature condition inside the sphere was maintained at (25 ± 1)° C.
- The sample measurements were made using a spectroradiometer connected by a fibre optic cable and detector through the detector port of the integrating sphere. The sample was operated at 230 Volts AC. It was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 350 to 800nm.

Test results:





Spectral Distribution

Chromaticity Coordinates: x=0.3240 y=0.3455 u'=0.1995 v'=0.4785

Correlated Color Temperature: 5870 K

Dominant Wavelength: 510.0 nm (E)

Purity: 0.0292

Chromaticity Difference: +0.00607Duv

Peak Wavelength: 449.3nm

Color Ratio: Kr=29.4% Kg=61.1% Kb=9.5%

Bandwidth: 28.2nm

Radiant Flux: 20.99 W

Rendering Index: Ra=71.8

R1=69 R2=75 R3=79 R4=73 R5=70 R6=66 R7=81 R8=61

R9=-26 R10=40 R11=70 R12=44 R13=70 R14=87 R15=65

Photos of sample:

Bottom View

Top View

Sample ID:

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Test No.3 Degree of protection for the first characteristic numeral (6X)

Environmental conditions:

Temperature (°C)	21.5	Relative Humidity %	48.3

Test equipment:

Sr. No.	Equipment ID	Equipment name	Last calibration date	Next calibration date
1	DC 01	Dust Chamber with Barometer	13.12.2012	12.12.2013
2	LCT01	Leakage Current High Tester	27.08.2012	26.08.2013
3	IWT01	Digital Automatic Insulation/Withstanding Hitester	27.08.2012	26.08.2013

Test sample:

6012-003504-01-01

Test method:

(1) The sample was tested according to the clause number 2.1.2 of IS:10322 Part-4-1984

(2) The sample shall be in a clean and new condition, with all parts in place.

(3) The sample was kept as in normal use inside the test chamber. The required amount of talcum powder was maintained in suspension throughout the test

(4) The test was continued for 8 hrs by maintaining the following test sequence

Sr. No.	Luminaire Condition	Test Chamber Condition	Time in Hours
1	Luminaire -ON	OFF	3 hrs
2	Luminaire-OFF	ON	2 hrs 30 minutes
3	Luminaire -ON	ON	3 hrs
3	Luminaire-OFF	ON	2 hrs 30 minutes

(5) The Electrical Strength was measured as per clause number 13.6 of IS: 10322-Part 5-sec 3-1987 after completion of this test.

Test Results:

Observation: The protection was satisfactory on inspection, as no talcum powder was accumulated inside lamp and controlgear compartment.
Electric Strength: The test was conducted at 1.46kV at Power frequency (50 Hz) for a period of one minute. During the test no breakdown was observed.

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Test No.4 Degree of protection against water jets (IP X5)

Environmental conditions:

Temperature (°C)	**22.3**	**Relative Humidity %**	**47.6**
Fresh Water Temperature (°C)	**21.8**		

Test equipment:

Sr. No.	Equipment ID	Equipment name	Last calibration date	Next calibration date
1	PG01	Pressure Gauge	26.03.2012	25.03.2013
2	HN01	Hose Nozzle	26.03.2012	25.03.2013
3	LCT01	Leakage Current High Tester	27.08.2012	26.08.2013
4	IWT01	Digital Automatic Insulation/Withstanding Hitester	27.08.2012	26.08.2013

Test sample:

6012-003504-01-01

Test method:

(1) The sample was tested according to the clause number 2.1.6 of IS:10322 Part-4-1984

(2) The sample shall be in a clean and new condition, with all parts in place and mounted in the manner stated by the manufacturer.

(3) The luminaire was operated at 230 VAC until it reached operating temperature.

4) The luminaire was shut off and immediately subjected to a water jet spray with hose nozzle held 3 m away from the sample for 15 minutes in all directions. The water delivery rate was 12.5 l/min + 5% (Approximately 0.30 kg/cm2) with the 6.3 mm diameter nozzle.

5) Test was conducted with fresh water. During the test the water temperature not differ by more than 5 K from the temperature of the sample under the test.

6) The Electrical Strength was measured as per clause number 13.6 of IS: 10322-Part 5-sec 3-1987 after completion of this test.

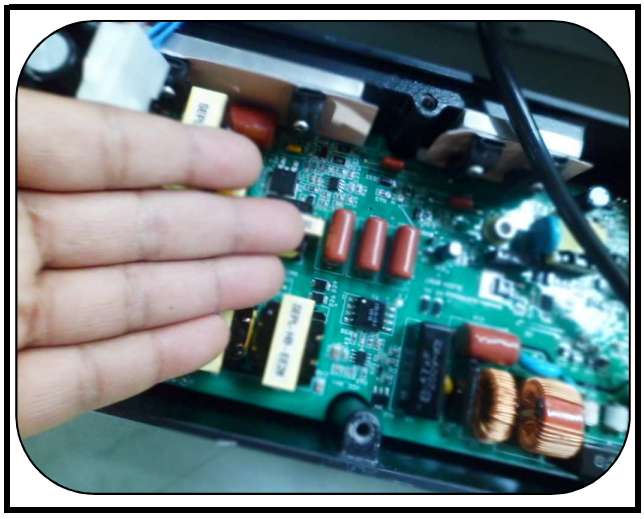
Test Results:

Observation: The protection was satisfactory on inspection as no water droplets/water was found inside lamp and controlgear compartment.
Electric Strength: The test was conducted at 1.46kV at Power frequency (50 Hz) for a period of one minute. During the test no breakdown was observed.

Photos of sample:

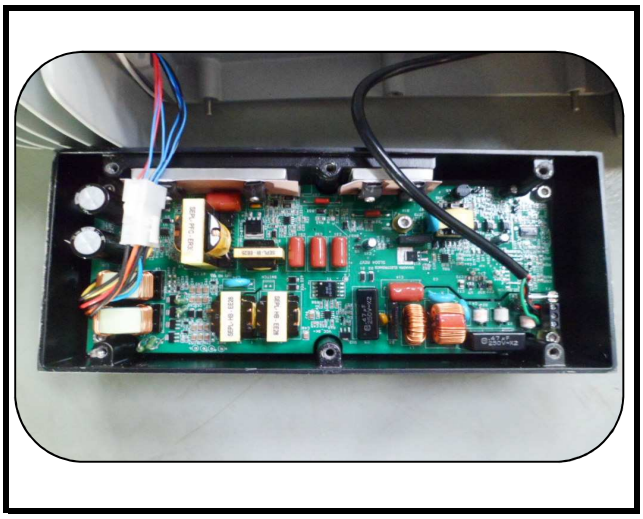
Before IP 6X test

After IP 6X test

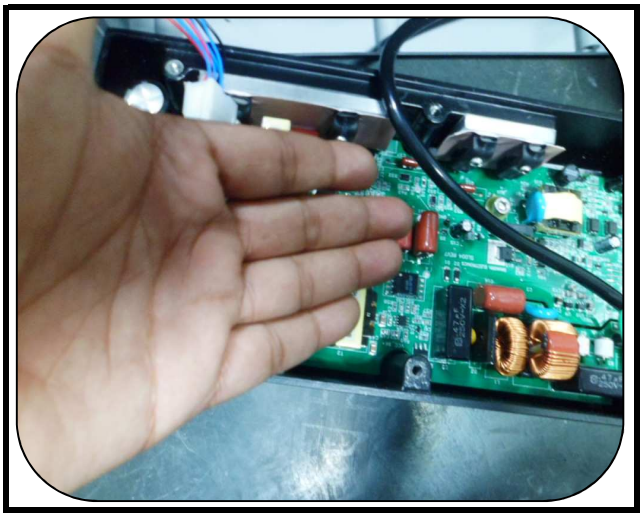


Photos of sample:

Before IP X5 test



After IP X5 test



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