

WZ-407/B-1, Basai Dara Pur,  
Near Ramesh Nagar Metro Station,  
New Delhi-110015 (India)

Mob.: 91 9821974769|011-25106978  
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## TEST CERTIFICATE

Report No.: PEL/ED/17402218A	QUALITY REPORT	Page 1 of 14
Dated: 29/06/2018		

### TEST REPORT

IS 16102 (Part 1):2012+A1:2015+A2:2015/IES LM 79-08

### Solid State Lighting Tests

Test Report No.	PEL/ED/17402218A
Date of Issue	29/06/2018
No. of Pages	14
Testing Laboratory Name Address	PLANET ELECTRO LABS WZ-407/B-1, First Floor, Basai Darapur, Near Ramesh Nagar Metro Station, New Delhi-110015 (INDIA)
Manufacturer's Name Address	M/S RAJ ENTERPRISES. 6/5-4 Kirti Nagar Indl. Area, New Delhi – 110015 (India)
TRF No.:	PEL/ED/17402218A
TRF Originator:	PLANET ELECTRO LABS
Test Item Description	LED LAMPS
Trade Mark	
Applicant	M/S RAJ ENTERPRISES.
Model(if applicable)	NIL
Rating	Input Voltage: 197-273VAC, 50 Hz, Wattage: 9W, >6000K, PF>0.9

#### PART B - SUPPLEMENTARY INFORMATION

- Deviations from the test methods as per relevant specification/ work instructions, if any: NIL
- Details of the drawings, graphs, tables, sketches or photographs as referred in the test report, if any: NIL

#### Notes:

- This report is not to be reproduced wholly or in part without our special permission in writing.
- This report refers only to the particular sample detailed above and solely for Quality purpose.
- The results reported in this certificate are valid at the time of and under the stipulated conditions of measurement.
- Sample will be disposed off after 30 days of issue of test report if no any further information is received.
- Any recognition claim in the test report is solely for promotional/advertising purpose and has no relation with the content of the report.
- All test are certified except one with astrisk.

Tested By	Approved by	Issued By
		
Testing Engineer	Dy. Technical Manager	Proprietor
Date: 29/06/2018	Date: 29/06/2018	Date: 29/06/2018



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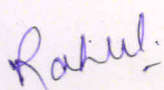
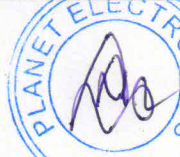
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### Marking Plate



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Testing Engineer	Dy. Technical Manager



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Table – List of Attachments

Attachment No.	Attachment Description	No. of pages in Attachment
Attachment – 1	Spatial Color Distribution Report	1
Attachment – 2	Spectral Power Distribution	>1
Attachment - 3	Photographs	1

**Possible test case verdicts:**

- test case does not apply to the test object.. : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement.. : F (Fail)

Testing..... :

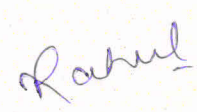

Date of receipt of test item..... : 23/06/2018

Date (s) of performance of tests..... : 25/06/2018 to 29/06/2018

Laboratory conditions..... :

Ambient Temperature..... : (25±3)°C

Ambient Humidity..... : (60±15)%RH

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Testing Engineer	Dy. Technical Manager



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S. No.	Test Parameter	Requirement ( As per IS/IEC standard)	Test result / observation
1).	Marking Cl.5 of IS 16102 (Part 1):2012	1) Lamps shall be clearly and durably marked with the following mandatory marking:-	Complies
		a) Mark of Origin (this may take the form of trade-mark, the manufacturer's name or the name of responsible vendor);	MICOLUX
		b) Rated voltage or voltage range (marked 'V' or 'volt')	197-273VAC
		c) Rated Wattage (marked 'W' or 'Watt')	9W
		d) Rated Lumen	810lm
		e) Rated Frequency (marked in Hz)	50Hz
		f) country of manufacture and	India
		g) Mark of symbol on High temperature	Marked
		2) Instructions and symbols shall be as per Cl.5.2	Complies
2).	Interchangeability Cl.6 of IS 16102 (Part 1):2012	3) The durability of the marking is checked by trying to remove it by rubbing lightly for 15 s with the piece of cloth soaked with water and, after drying, for a further 15 s with a piece of cloth soaked with hexane. The marking shall be legible after the test.	Marking is durable and legible after test
		4) The Self ballasted LED lamps may also be marked with the standard mark.	Not marked
3).	Protection Against Accidental Contact With Live Parts Cl.7 of IS 16102 (Part 1):2012	Interchangeability shall be ensured by the use of caps through Go & No-Go Gauges.	Complies
		The Lamp Construction shall withstand externally applied axial pull and bending moment.	0.081Nm (Withstood)
4).	Insulation Resistance and Electric Strength after Humidity Treatment Cl. 8 of IS 16102 (Part 1):2012	The lamp shall be so constructed that, without any additional enclosure in the form of a luminaire, no internal metal parts, basic insulated external metal parts or live metal parts of the lamp cap or of the lamp itself are accessible when the lamp is installed in a lampholder.	No live metal part becomes accessible.  10 N forced applied with test finger, No damage no hazards.
		Humidity Resistance The lamp shall be conditioned for 48 h in a cabinet conditioning air with a relative humidity between 91 to 95 % RH. The temperature of the air is maintained within 1°C of any convenient value between 25°C and 35°C.	Humidity: 93% Temp: 28°C Time : 48 hours
		Insulation Resistance Insulation resistance shall be measured after humidity	More than 100MΩ



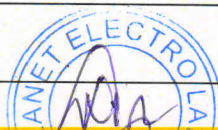
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S. No.	Test Parameter	Requirement ( As per IS/IEC standard)	Test result / observation
		cabinet with a d.c. voltage of approximately 500 V for 1 min after application of the voltage.	
		Electric Strength Immediately after the insulation resistance test the insulation of the lamp shall withstand the high voltage No flashover or breakdown shall occur during the test.	Reinforced insulation (4U+2750V) = 3670V (withstood)
5).	Mechanical Strength Cl.9 of IS 16102 (Part 1):2012	Torsion resistance of unused lamps Torsion of ..... Nm is applied to the lamp Torsion resistance of lamps after a defined time of usage After mechanical strength test the sample shall comply with the protection against accidental contact with live parts.	3.0Nm forced applied (withstood) -----
6).	Cap Temperature Rise Cl.10 of IS 16102 (Part 1):2012	The surface temperature rise of lampholder fitted to the lamp shall not be higher than that of lamp type which is being replaced by the lamp. The cap temperature rise of A t <sub>s</sub> of the complete lamp shall not exceed 120 K	28.76K
7).	Resistance To Heat Cl.11 of IS 16102 (Part 1):2012	The lamp shall be sufficiently resistance to heat. External parts of insulating material providing protection against electric shock, and part of insulating material retaining live parts in position shall be sufficiently resistant to heat, compliance is checked by the subjecting the parts to ball pressure test. The diameter of the impression shall be measured, shall not exceed 2 mm.	thermoplastic part of lamp At 125°C for 1 hour Less than 2mm
8).	Resistance To Flame And Ignition Cl.12 of IS 16102 (Part 1):2012	Parts of insulating material retaining live parts in position and external parts of insulating material providing protection against electric shock are subject to glow wire test.	thermoplastic part of lamp at 650°C.
9).	Fault Condition Cl.13 of IS 16102 (Part 1):2012	Lamp shall not impair safety when operated under fault conditions, which may occur during intended use.	Short circuited (C3) Unit shut down immediately
10).	Creepage Distance And Clearances Cl.14 of IS 16102 (Part 1):2012	Clearance	Line – Neutral = 3.41mm
		Creepage	Line – Neutral= 5.73mm





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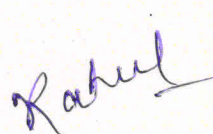

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### PART 2 : Details of Tests Performed and Result

Sl	Test Parameters	
1	Input RMS AC Voltage	IS 10322/IES LM79/CI.No.:8.0
2	Input RMS AC Current	IS 10322/IES LM79/CI.No.:8.0
3	Input AC Power	IS 10322/IES LM79/CI.No.:8.0
4	Power factor	IS 10322/IES LM79/CI.No.:8.0
5	Frequency	IS 10322/IES LM79/CI.No.:8.0
6	Total Luminous Flux*	IES LM79/CI.No.:9.0
7	Luminous Efficacy*	IES LM79/CI.No.:11.0
8	Chromaticity Coordinates*	IES LM79/CI.No.:12.0
9	Correlated Color Temperature*	IES LM79/CI.No.:12.0
10	Color Rendering Index*	IES LM79/CI.No.:12.0

#### General remarks:

1. The test results presented In this report relate only to the object tested.
2. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

Tested By	Approved by
	
Testing Engineer	Dy. Technical Manager



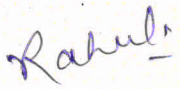

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Clause No.	Test / Requirement Name	Test Result / Observation
8.0	Electrical Instrumentation The Electrical Characteristics measured for AC Powered SSL Products are	
	1. Input RMS AC Voltage	230.20V
	2. Input RMS AC Current	0.039A
	3. Input AC Power	8.67W
	4. Power Factor	0.9580
	5. Frequency	49.98Hz
9.0	Total Luminous Flux*	840.11Lm
10.0	Spatial Color Distribution Report*	Attached as attachment-1
11.0	Luminous Efficacy*	97.36lm/W
12.0	Color Characteristics*	
	1. Chromaticity Coordinates	x: 0.3177, y: 0.3514 u': 0.1931, v': 0.4805
	2. Peak Wavelength (nm)	441.8
	3. Dominant Wavelength (nm)	507.7
	4. Half Width Wavelength (nm)	23.0

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<b>Testing Engineer</b>	<b>Dy. Technical Manager</b>



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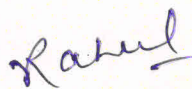
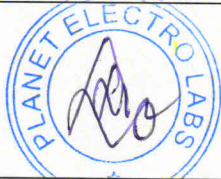
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5. Purity (%)*	3.245
6. Correlated Color Temperature*	6132K
7. Color Rendering Index*	82.4
8. Color Rendering Index (R1)	73.9
9. Color Rendering Index (R2)	85.6
10. Color Rendering Index (R3)	89.5
11. Color Rendering Index (R4)	87.4
12. Color Rendering Index (R5)	82.2
13. Color Rendering Index (R6)	77.3
14. Color Rendering Index (R7)	88.8
15. Color Rendering Index (R8)	72.2
16. Color Rendering Index (R9)	-25.4
17. Color Rendering Index (R10)	54.4
18. Color Rendering Index (R11)	85.7
19. Color Rendering Index (R12)	48.1
20. Color Rendering Index (R13)	79.9
21. Color Rendering Index (R14)	89.4
22. Color Rendering Index (R15)	64.7

### Supplementary Information:

1. The sample is tested according to IES LM79-08.
2. Photometric parameters are obtained using LPCE3 CCD Spectroradiometer.
3. The sample has been operated at 197-273VAC.
4. The sample has been operated for 45 minutes prior to measurement for a stable condition.
5. The orientation (burning position) of SSL product during test is its normal burning position.
6. Total Spectral Radiant Flux Lamp, SLS- 100W calibrated (NIM traceable) has been used Standard Lamp

Tested By	Approved by
	
Testing Engineer	Dy. Technical Manager



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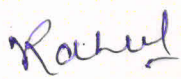

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### Attachment – 1 Spatial Color Distribution Report

CIE x, y	u', v'	CCT (K)	Ra	du 'v'
0.3290, 0.3420	0.1964, 0.4674	6046	69.9	0.0093
0.3317, 0.3639	0.1980, 0.4885	5524	74.6	0.0227
0.3350, 0.3673	0.1990, 0.4905	5415	77.5	0.0243
0.3497, 0.3800	0.2037, 0.4988	4935	73.4	0.0325
0.3367, 0.3611	0.2035, 0.4862	5336	71.2	0.0200
0.3278, 0.3425	0.2032, 0.4776	5705	66.3	0.0113
0.3223, 0.3333	0.2028, 0.4720	5984	79.8	0.0057
0.3186, 0.3272	0.2026, 0.4683	6196	60.2	0.0020
0.3172, 0.3249	0.2025, 0.4668	6287	-28.4	0.0005
0.3169, 0.3241	0.2026, 0.4663	6311	39.4	0.0000
0.3168, 0.3242	0.2026, 0.4663	6314	71.7	0.0000
0.3181, 0.3263	0.2026, 0.4677	6220	43.1	0.0014
0.3210, 0.3312	0.2028, 0.4707	6056	69.9	0.0044
0.3264, 0.3401	0.2031, 0.4762	5772	87.4	0.0099
0.3349, 0.3547	0.2034, 0.4847	5406	64.7	0.0184
0.3482, 0.2782	0.2036, 0.4975	4976	81.3	0.0312
0.3449, 0.3812	0.2004, 0.4982	5091	89.5	0.0321
0.3413, 0.3749	0.2003, 0.4950	5198	80.2	0.0286
0.2834, 0.2676	0.2008, 0.4267	11183	84.1	0.0396
0.2602, 0.2265	0.2003, 0.3922	82500	89.3	0.0741
0.3250, 0.3534	0.1973, 0.4826	5809	72.5	0.0171
0.3265, 0.3541	0.1980, 0.4831	5748	82.9	0.0174
0.3449, 0.3774	0.2017, 0.4967	5082	80.9	0.0304
0.3506, 0.3851	0.2027, 0.5009	4922	80.4	0.0346
0.3436, 0.3725	0.2027, 0.4943	5112	81.6	0.0280
0.3351, 0.2574	0.2025, 0.4860	5401	83.4	0.0197
0.2265, 0.2419	0.2025, 0.4771	5765	75.3	0.0106
0.3198, 0.3297	0.2025, 0.4967	6124	86.9	0.0034
0.3169, 0.3241	0.2026, 0.4663	6311	87.6	0.0000
0.3163, 0.3229	0.2027, 0.4656	6351	77.8	0.0007

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<b>Testing Engineer</b>	<b>Dy. Technical Manager</b>



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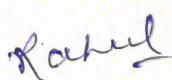

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		0.3172, 0.3244	0.2027, 0.4665	6290	87.6	0.0002		
		0.3243, 0.3367	0.2030, 0.4741	5877	76.0	0.0078		
		0.3425, 0.3676	0.2037, 0.4919	5142	82.3	0.0256		
		0.3436, 0.3725	0.2026, 0.4943	5115	81.2	0.0280		
		0.3313, 0.3588	0.1995, 0.4861	5550	82.4	0.0200		
		0.3286, 0.2560	0.1987, 0.4844	5660	82.7	0.0185		
		0.3248, 0.3528	0.1973, 0.4823	5823	82.7	0.0169		
		0.3294, 0.3401	0.1981, 0.4406	6021	64.8	0.0261		



Tested By	Approved by
	
Testing Engineer	Dy. Technical Manager



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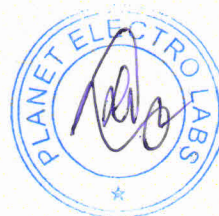
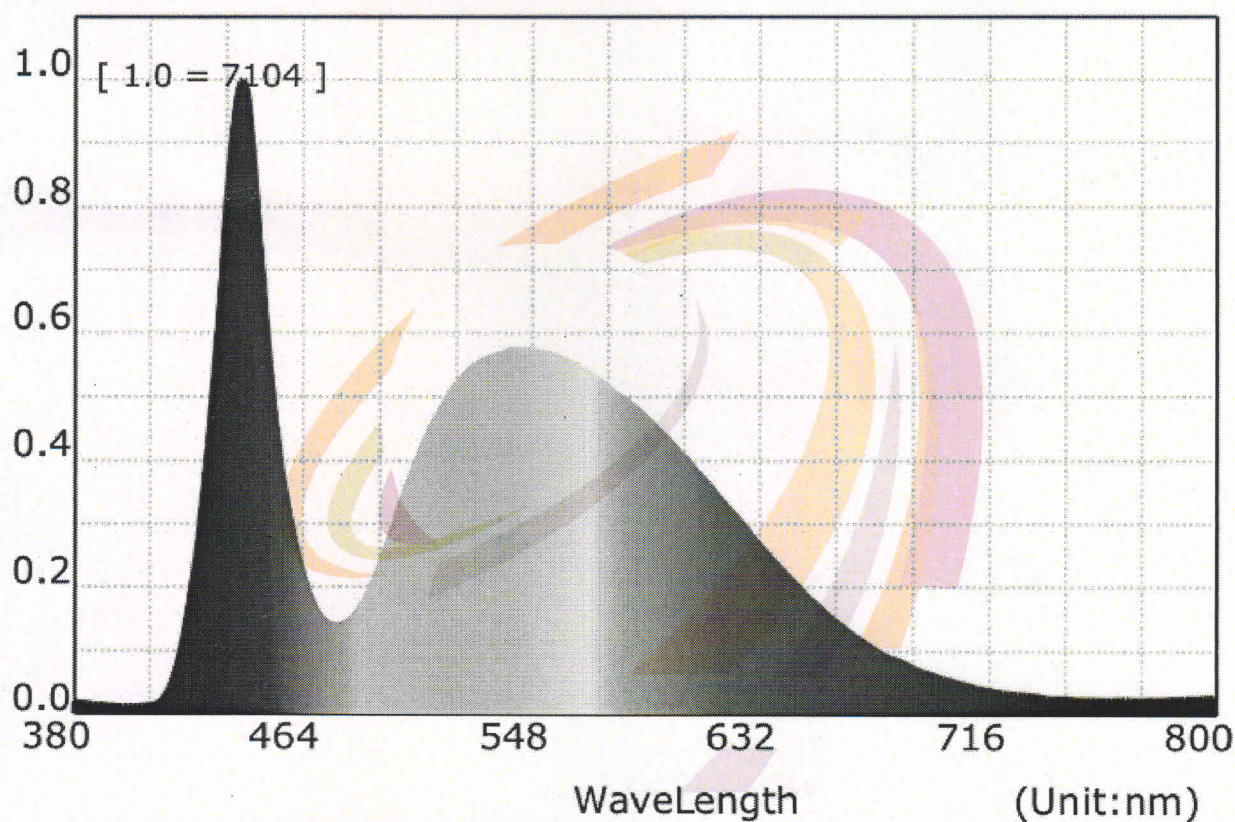
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### Attachment – 2

### Spectral Power Distribution



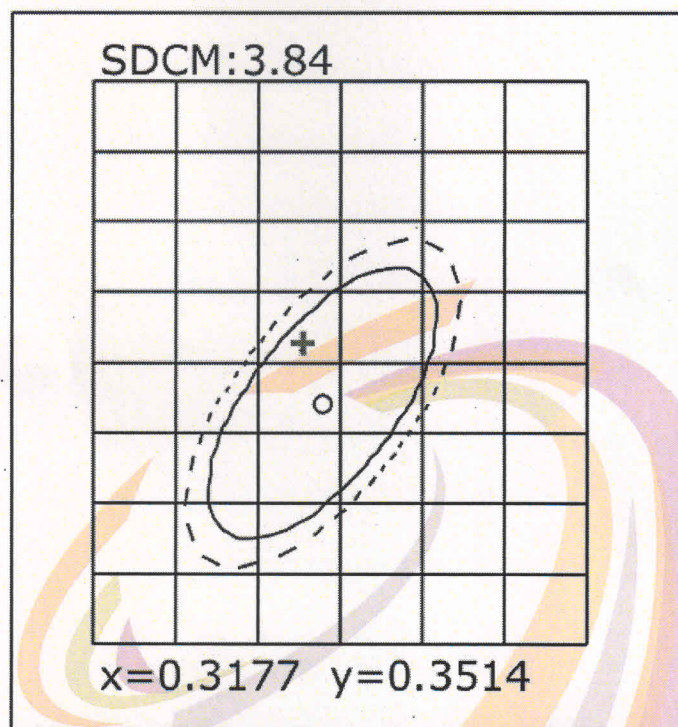


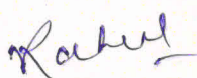
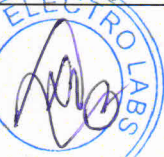
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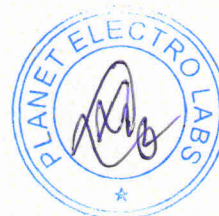
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WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0200	0.2255	525	0.5423	6.1278	670	0.1138	1.2856
385	0.0161	0.1815	530	0.5558	6.2806	675	0.1008	1.1390
390	0.0136	0.1535	535	0.5647	6.3812	680	0.0894	1.0107
395	0.0124	0.1399	540	0.5726	6.4704	685	0.0804	0.9089
400	0.0114	0.1287	545	0.5714	6.4563	690	0.0705	0.7967
405	0.0122	0.1383	550	0.5694	6.4342	695	0.0635	0.7174
410	0.0153	0.1724	555	0.5656	6.3915	700	0.0559	0.6315
415	0.0389	0.4391	560	0.5556	6.2777	705	0.0499	0.5636
420	0.1140	1.2881	565	0.5462	6.1714	710	0.0441	0.4980
425	0.2555	2.8866	570	0.5330	6.0228	715	0.0395	0.4466
430	0.4719	5.3325	575	0.5187	5.8615	720	0.0354	0.3995
435	0.7490	8.4629	580	0.5003	5.6531	725	0.0325	0.3675
440	0.9780	11.0514	585	0.4855	5.4863	730	0.0305	0.3447
445	0.9213	10.4104	590	0.4659	5.2645	735	0.0283	0.3203
450	0.6351	7.1767	595	0.4447	5.0243	740	0.0255	0.2879
455	0.4198	4.7432	600	0.4239	4.7893	745	0.0252	0.2847
460	0.2923	3.3027	605	0.4012	4.5328	750	0.0239	0.2698
465	0.2060	2.3272	610	0.3773	4.2630	755	0.0237	0.2673
470	0.1566	1.7693	615	0.3512	3.9687	760	0.0231	0.2614
475	0.1395	1.5766	620	0.3259	3.6827	765	0.0242	0.2739
480	0.1449	1.6377	625	0.3019	3.4110	770	0.0227	0.2566
485	0.1690	1.9099	630	0.2759	3.1173	775	0.0241	0.2729
490	0.2116	2.3910	635	0.2510	2.8361	780	0.0241	0.2721
495	0.2696	3.0458	640	0.2270	2.5653	785	0.0246	0.2777
500	0.3342	3.7768	645	0.2042	2.3078	790	0.0257	0.2906
505	0.3929	4.4391	650	0.1835	2.0736	795	0.0271	0.3059
510	0.4466	5.0458	655	0.1642	1.8552	800	0.0283	0.3193
515	0.4859	5.4899	660	0.1467	1.6577			
520	0.5194	5.8687	665	0.1293	1.4614			





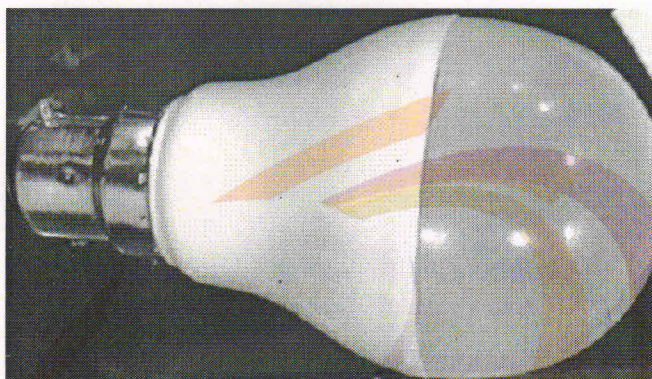
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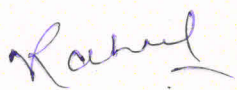
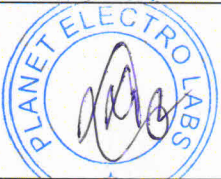
## TEST CERTIFICATE

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### PHOTOGRAPHS



\*\*\*END OF TEST REPORT\*\*\*

Tested By	Approved by
	
Testing Engineer	Dy. Technical Manager