POSTED UNDER POSTAL CERTIFICATE

BUREAU OF INDIAN STANDARDS

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BIS BANGALORE LABORATORY
Peenya Industrial Area
1st Stage, Tumkur Road
Bangalore – 560 058

Ref : BNBL / 13:2 / CFL

Date : 29 Aug 2006

Subject : **Tender Notice for the supply of "Test Equipment for Compact Fluorescent Lamp (CFL) as per IS 15111 : 2002".**

Dear Sir(s),

Quotation(s) is / are invited for the supply of the equipment(s) / item(s) required for testing Compact Fluorescent Lamp (CFL) as per IS 15111 : 2002.

1. The terms and conditions for submitting quotations and supply of the equipment are given in **Annexure – I** (Page 2 to 4).

2. The details of the equipment(s) / item(s) required along with specification(s) are given in **Annexure - II** (Page 5 to 25).

3. The quotation(s) should reach the undersigned latest by 1430 hours on **22 Sep 2006** at the above address.

4. The quotation(s) shall be opened at 1500 hours on **25 Sep 2006** in the presence of such tenderers or their duly authorized representatives who may like to attend.

5. Unless stated otherwise, quotation(s) shall be deemed to be for delivery at BIS Bangalore Branch Office Laboratory.

6. The tender is also posted in BIS Website – www.bis.org.in

Thanking you,

Yours faithfully,

(B.R. Narayanappa)
Director & Head BNBOL

Encl. : 1) Annexure - I
2) Annexure - II

Annexure - I

TERMS & CONDITIONS

1. **The quotation(s) shall be submitted in two parts – Technical bid & Financial bid**. The technical bid and financial bid should be sealed by the bidder in separate covers duly superscribed and both these sealed covers are to be put in a bigger cover which should also be sealed and duly superscribed "Quotations for the supply of Test Equipment for Compact Fluorescent Lamp (CFL) as per IS 15111". The financial bid will be opened after technical evaluation of technical bids. The date of opening of price bids will be informed to the bidders found suitable in technical evaluation.

2. **The offer/quotation must be strictly as per required specifications and the tender terms and conditions.**

3. The technical bid shall contain the technical leaflets/literature and complete specification of the quoted model(s) of the item. It must be ensured that the offers are strictly as per our specifications. Deviations, if any from the specifications shall be clearly brought out along with justification.

4. The financial bid should clearly give break-up of cost of each equipment as per specifications. The rates quoted should separately indicate Basic Cost, Excise Duty, Sales Tax, Packing and Forwarding Charges, Freight, Insurance, VAT, etc. In the absence of any such stipulation, it will be presumed that the prices include all such charges and no claim for the same shall be entertained.

5. The bids shall remain valid for a period of 90 days from the date of opening of quotation(s) specified.

6. Documents in support of experience, past performance, technical capability, manufacturing facilities, and financial position of the supplier as well as client-list should be furnished along with the technical bid.

7. The bids shall be accompanied with Earnest Money Deposit(EMD) for an amount of Rs 35,000/- (Rupees thirty five thousand only) by demand draft in favour of "Bureau of Indian Standards", payable at Bangalore. The sealed envelope containing EMD shall be superscribed "EMD" and stapled separately with the envelope containing Technical Bid. This will be returned to the unsuccessful bidders within 30 days of the award of the contract.

8. **The bidders shall mention in the quotation, the rate/amount of annual maintenance charges**, if BIS opts for maintenance contract after expiry of the warranty period. This is mandatory to mention.

9. **It shall be clearly mentioned in the technical bid of arrangements for after sales service.** Suppliers having the required infrastructure in or around Bangalore for providing timely and efficient service of the equipment will be preferred.

10. **The Bureau gives first preference in its purchase to goods bearing ISI Certification Mark and second preference to those which conform to the relevant Indian Standard Specification as applicable.**

11. The delivery of stores is required within 60 days of receipt of order. If however, it is not possible for you to effect delivery during working hours by that date, you should specify the date by which you can guarantee delivery of stores. Quotation(s) qualified by such vague and indefinite expressions as " subject to immediate acceptance", "subject to prior sale", etc. and incomplete quotation(s) is/are liable to be summarily rejected.

12. The equipment should be installed/commissioned and demonstrated by the supplier at BIS Bangalore Laboratory immediately, but in any case within one month after receipt of the item in the lab, and the same will be put under operation to the satisfaction of BIS technical personnel who will test the performance of the equipment. **No separate charges for installation, etc. will be paid to the party beyond the quoted prices**.

13. BIS shall pay 90% of the cost after satisfactory installation and commissioning and training, and the balance of 10% as **contract performance security** would be paid after expiry of warranty period. However other terms of payment for contract performance security can also be considered, if so stated clearly.

14. The warranty period of the equipment shall be clearly stated in the Technical Bid. The warranty period of an item/equipment shall commence from the date of receipt of the item/equipment in good working condition and satisfactory installation / commissioning / demonstration at BIS Bangalore Laboratory. The warranty period and validity of contract performance security shall be extended for the period of delay in satisfactory installation.

15. Successful tenderer shall be required to provide comprehensive maintenance guarantee for the equipment, including replacement of spares if any.

16. Successful tenderer shall be required to provide training to BIS personnel at BIS Bangalore Laboratory in the use of the equipment at the supplier's cost.

17. All goods shall be received subject to approval on inspection. The decision of our inspecting officer shall be binding. Rejected items/goods/stores shall be removed by the supplier at his own cost and risk, within 30 days of receipt of notice for the removal of such goods, and no liability, whatsoever, on the Bureau shall be attached for the rejected/disapproved goods/items/stores.

18. This Bureau reserves the right of accepting the whole or any part of the quotation(s) or portion of the quantity offered and the successful tenderer shall supply the same at the rate quoted.

19. The Bureau reserves the right to accept or reject summarily any or all quotation(s) in whole or in part without assigning any reason whatsoever.

20. The Bureau takes no responsibility for delay, loss or non-receipt of quotation(s) after dispatch.

21. In case of non-compliance with the terms and conditions of the contract, the Bureau reserves its right to :
    a) cancel/rescind/revoke the order if supply is not made in time and is not conforming to the required specifications.
    b) impose penalty up to 1% of the total value of the order for a delay of every seven days after the scheduled date subject to the ceiling of a maximum of 10% of the total value of the order.

22. All questions, disputes or differences arising under, out of or in connection with this tender enquiry shall be subject to the exclusive jurisdiction of Bangalore Courts.

23. **Bidders must furnish a compliance statement of each and every clause of the terms and conditions of the tender along with the quotation. The deviations, if any, from the terms and conditions shall be clearly brought out in the statement. One copy of the terms & conditions along with equipment specifications may be duly signed and returned with the technical bid as an acknowledgement of having read and accepted the same.**

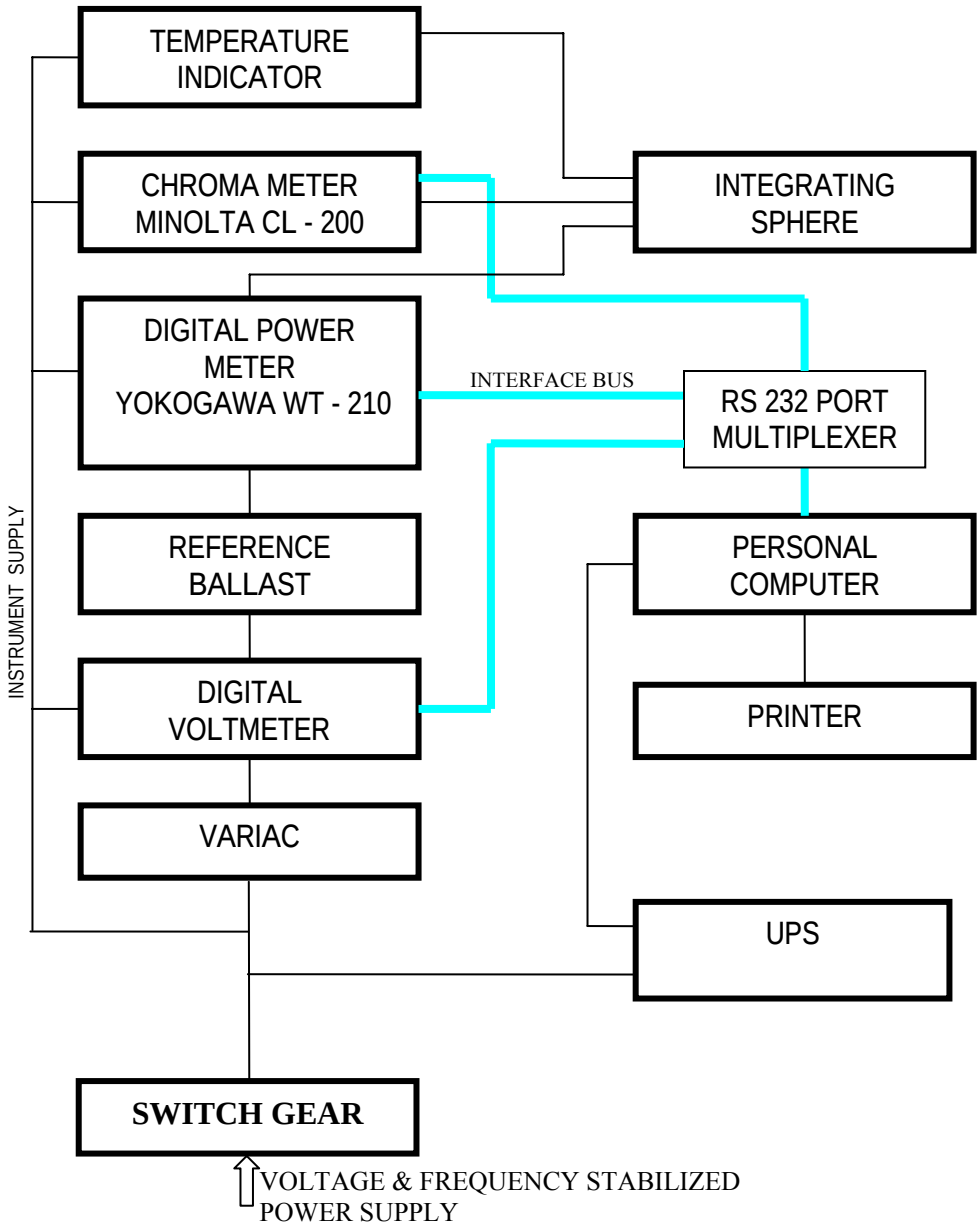
Annexure – II

LIST OF EQUIPMENT REQUIRED FOR TESTING COMPACT FLUORESCENT LAMP AS PER IS 15111

SL. NO.	EQUIPMENT / ITEM	EQUIPMENT SPECIFICATION CODE	QUANTITY
1.	Photometry test system for TFL & CFL lamps	BBE04/CBE03/CBE08/ CBE09/BBE03	01 no.
2.	Humidity chamber	CBE 07	01 no.
3.	High voltage tester	CBE 14	01 no.
4.	Laboratory electric oven	CBE 15	01 no.
5.	Ball pressure test apparatus	DBE 04	01 no.
6.	Glow-wire test apparatus	CBE 11	01 no.
7.	Apparatus for protection against electric shock test	DBE 15	01no.
8.	Life test rack for CFL	CBE 17	01no.

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**BBE04/ CBE03/ CBE08/ CBE09/ BBE03**
NAME OF THE EQUIPMENT	:	**PHOTOMETRY TEST SYSTEM FOR TFL & CFL LAMPS**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**



TYPICAL PHOTOMETRY TEST SYSTEM – BLOCK DIAGRAM

1.0 Introduction

For routine photometric measurements on lamps, the simultaneous recording of lamp voltage, lamp current, dissipated power, etc. in addition to luminous flux and color characteristics is desirable as is the calculation and printout of the photometric and colorimetric parameters. For this purpose, the photo-electric apparatus should have a digital data output for their connection to an external PC for computation, analysis and recording of measured data. By connecting a printer to the PC, hard-copy records can be printed and stored. A typical photometry test system is illustrated in the block diagram.

2.0 Scope

Covers the basic guiding requirements for the design of photometry test system required for the measurement of electrical, luminous and colour characteristics of tubular fluorescent lamps as per IS 2418(Part 1) : 1977 and compact fluorescent lamps as per IS 15111(Part 2) : 2002.

3.0 Construction

3.1 The photometry test system shall be designed and constructed suitable for the measurement of electrical, luminous and colour characteristics of tubular fluorescent lamps of the following ratings as per Cl. 6.8 of IS 2418(Part 1) : 1977:

18W / 600 × 26mm / G-13 / with starter
20W / 600 × 38mm / G-13 / with starter
36W / 1200 × 26mm / G-13 / with starter
40W / 1200 × 38mm / G-13 / with starter

The test system shall also be suitable for the measurement of electrical, luminous and colour characteristics of compact fluorescent lamps as per IS 15111(Part 2) : 2002.

3.2 The test system shall comprise of the various equipment as described in 4.0 to 5.11.

4.0 Spherical photometric integrator (Integrating sphere)

4.1 The spherical photometric integrator shall conform to the requirements specified in 4.2 to 4.11.

4.2 The general design, construction, workmanship and finish may be as per IS 2407.

4.3 Material : Fibre reinforced plasic (FRP)

4.4 Inner diameter : 2.0 metre

4.5 Opening / closing :

One half of the sphere shall be mounted on CRCA tubular frame and the other half shall be motor driven for a smooth and jerk-free opening and closing of the sphere. A control unit comprising push button switches shall be attached at a convenient location on the sphere for enabling the operator to either open or close the sphere to the extent required by pressing the push button switches. Suitable controls shall also be provided for the safe operation of the motor up on exceeding the maximum limits.

4.6 Lamp holders : Provision shall be made for testing of various types of TFL & CFL

4.7 Screen : A screen shall be provided between the lamp and detector at a distance equal to 1/6 of the sphere diameter away from the photometer head to prevent any direct light falling on the photocell from the lamp.

4.8 The integrating sphere shall be made in such a way that no stray light can enter the sphere from the outside.

4.9 The opening for mounting of the photometer head on the sphere shall be suitable for the photohead of CHROMA METER, CL – 200, MINOLTA, JAPAN.

4.10 A holder assembly for fixing the various types of TFL & CFL in the integrator shall be provided.

4.11 Inside coating :

The inside of the sphere shall have a white base coat and over the base coat a water soluble white paint shall be provided with matt finishing. The paint for the inside of the sphere should reflect sufficiently diffusely and non-selectively. It should not show any

luminescence. The paint shall be prepared by mixing 95%water + ethyl alcohol with X-ray diagnostic grade barium sulphate and the suspension shall be sprayed on to the sphere wall. As many coats necessary to produce a thickness of about 1mm shall be made.

5.0 Photometric control panel :

A control panel shall be provided for housing the various instruments and control gears. The mechanical structure of the control panel shall be fabricated out of MS sheet metal of suitable thickness and shall be powder coated. The control panel shall be fabricated like a DIN rack with provision to house all the required equipment and controls including various reference ballasts. Further, suitable means shall be provided along with the control panel for keeping the PC, printer, UPS, etc. and also working place for the operator during testing. The control panel shall also be provided with castor wheels for easy movement. The photometric control panel shall consist of the items specified in 5.1 to 5.11.

5.1 **Colorimeter – "CHROMA METER, CL – 200, MINOLTA, JAPAN",** or at least equivalent. The model to be used shall have detachable photocell suitable for mounting on the integrator. For detailed specification, please see the website – "http://www.konicaminolta.com".

Note – A test certificate/calibration certificate on "Lux, X and Y" parameters shall be furnished along with the instrument.

5.2 **Digital Power Meter – "Yokogawa WT – 210",** or at least equivalent. For detailed specification, please see the website – "http://www.yokogawa.com".

Note – A calibration certificate on "V, A, W, COSΦ, Hz, THD and Crest factor" from NABL approved lab shall be furnished along with the instrument.

5.3 **Continuously variable voltage auto transformer** : for providing adjustable voltage to the lamps : 10A, 240V/0 – 270V, 50Hz, Single phase, Air cooled. It shall be so designed for finer setting of voltage close to 0.2%.

5.4 **Personal Computer** : interfaced to the relevant instruments for computation, analysis and recording of measured data :

Desktop PC – configuration (**minimum**) : Intel Core 2 Duo Processor E6300 (1.86 GHz, 2MB Cache, 1066MHz FSB), Intel D946GZIS Mother board, Onboard graphics, sound & LAN, 512MB DDR2 RAM 533MHz, 80GB SATA HDD, CD/DVD ± R/RW dual layer writer supporting all formats, 1.44 MB FDD, Optical mouse, Keyboard, 17" CRT True Flat colour monitor, 2.1 Speakers, etc. The PC shall be preloaded with Licensed MS Windows XP Professional operating system.

Note : All the individual items mentioned above shall be of reputed make.

5.5 **Printer -** for generating hard-copy records :

HP LaserJet 1150 / 1300 Series Printer OR better

5.6 **Digital Voltmeter –** for measuring supply voltage :

True RMS Digital Voltmeter, 4-1/2 digit LED display, 0 to 300V, Accuracy: ± 0.2% of reading or better. Resolution : 0.1V. Mains supply : 230V± 10%,50Hz. The model shall be 19 inch rack mount configuration. The instrument shall be provided with a built-in standard "BCD digital data output" suitable for its connection to the PC.

Note – A calibration certificate on voltage from NABL approved lab shall be furnished along with the instrument.

5.7 **Digital Temperature Indicator –** for measurement of inside temperature of the sphere. It shall be capable of indication via one sensor mounted inside the integrating sphere. The model shall be rack mount configuration. Range of use : 0 to 50°C, Resolution : 0.1°C, Accuracy : ± 0.5% or better.

Note – A calibration certificate on temperature from NABL approved lab shall be furnished along with the instrument.

5.8 **Reference ballast :**

The test system shall be provided with one number each of reference ballast suitable for 18W/20W & 36W/40W tubular fluorescent lamps. The electrical parameters of the reference ballasts shall be as follows :

Lamp watts (TFL)	Rated Voltage	Calibration current	V/I ratio	Power factor
18W/20 W	127	0.370	270	0.12
36W/40W	220	0.430	390	0.10

The reference ballast shall have accurate and stable calibration of electrical parameters. It shall be of rugged and robust design for very low temperature rise and negligible magnetic influences. It shall be housed in a strong, steel, powder coated cabinet with carrying handles. One earthing terminal shall be provided for grounding of the reference ballast.

Note – A calibration certificate on above parameters from NABL approved lab shall be furnished along with the instrument.

5.9 **Software**

The software shall be designed to present a graphical user interface with display windows for all the digital meters connected to the PC as digital meter display. The parameters to be displayed are :

- Supply voltage – obtained from true rms voltmeter
- Lamp voltage, current, watts, power factor – obtained from WT – 210
- Lux/lumen, X and Y color co-ordinates – obtained from CL – 200
- Suitable means shall be provided for the display of Hz, THD and Crest factor

By issuing appropriate commands, the system shall read the data from the three different instruments and display it at the respective windows. The data acquired shall be stored, processed and computed. Statistical details such as mean, standard deviation, failure to reach the set limits, etc. shall also be computed. Provision for adding correction factor for X and Y values shall be provided. There shall be provision for entering the pre-selections such as Sample No., date, operator code, maximum and minimum tolerance limits, standard lamp data, individual lamp ID no., etc. which shall be as approved by BIS. Provision shall be made for instant and/or later recall and printing. The format of test reports, print-outs, and any other relevant requirements of the software shall be as specified and approved by BIS.

5.10 **UPS (OFF-LINE)**

Capacity	:	800VA / 500W (minimum)
Input voltage / frequency	:	100 – 270VAC / 47 – 53Hz
Output voltage / frequency	:	230V ± 5% / 50Hz ± 1%
Transfer time	:	Less than 5ms
Protection	:	Overload, short circuit, low battery, over charge, mains low and high input voltage
Back-up time	:	0.5 hours, min.
Overload indication	:	LED and audible alarm

Note : The UPS shall be of reputed make.

5.11 **Switch gear & control gear**

Suitable selector switches shall be provided to select various TFL & CFL and/or reference ballast and its associated measuring circuit depending up on the type of lamp fixed in the integrator. Also, all the MCBs, isolators, switches, controls, indicators etc. required for the safe and reliable operation of the system shall be of reputed make. The cables, connectors and wires shall be of adequate current rating so as to cause minimum voltage drop and temperature rise. The inside wiring shall be neat and the control panel shall have a clean appearance.

6.0 Documentation

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

7.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M.RAJU PETER	S.K. SAHANA	
DESIGNATION	STA (LAB)	JD (Elect. Lab)	
DATE			

BUREAU OF INDIAN STANDARDS
(BANGALORE BRANCH OFFICE LABORATORY)
EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 07**
NAME OF THE EQUIPMENT	:	**Humidity chamber**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**

1.0 Scope

Covers the basic guiding requirements for the design of humidity chamber required for carrying out the following tests:

- Test for insulation resistance and electric strength on CFL as per Cl.9 of IS 15111(Pt.1) : 2002

2.0 Test conditions

- To conduct the test for insulation resistance and electric strength on CFL, the lamps shall be conditioned for 48h in a cabinet containing air with a relative humidity between 91% and 95%. The temperature of the air is maintained within 1ºC of any convenient value between 20ºC and 30ºC. **Measurements shall be carried out in the humidity cabinet.**

3.0 Temperature / humidity range

The temperature and relative humidity in the working space shall be maintained as follows:

Temperature : 10ºC to 60ºC

Relative humidity : 40% to 95%

4.0 Temperature / humidity control tolerance

4.1 Microprocessor based PID controllers shall be used for the precise control of temperature and humidity with the following accuracy:

Temperature : ± 1ºC

Relative humidity : ± 3%

5.0 Working volume

The inside dimensions of the chamber shall be as follows:

24”(Width) × 24”(Depth) × 42”(Height)

6.0 Construction

6.1 Inner chamber shall be made of 16SWG(minimum) corrosion-resistant stainless steel. Outer body shall be double walled, heavy gauge steel with scratch resistant powder coated finish.

6.2 Air circulating fan shall be provided for maintaining the specified conditions uniformly.

6.3 The chamber shall be suitably and sufficiently insulated for the temperature range involved.

6.4 The front door shall be key lockable full view triple pane glass door and shall be fitted with suitable gaskets to prevent heat losses.

6.5 Three numbers of removable stainless steel wire rod shelves shall be provided which shall be adjustable along the height.

6.6 A suitable terminal panel having the following voltage /current level for making external connections with the test items inside the chamber shall be provided:
Voltage : 10kV
Current : 10A

6.7 Adequate number of fluorescent lamps with water tight fittings shall be provided for illuminating the working space. The lamps shall be recessed so as not to project in to the working space.

6.8 Castor wheels shall be provided for easy movability of the equipment.

6.9 A port hole of suitable dimension shall be provided for validation. Means shall be provided for sealing of the port hole when not in use.

7.0 Humidity, refrigeration and heating system

7.1 Provision shall be made to ensure that no condensed water from the walls and roof of the test chamber can fall on the test specimen. Also, condensed water shall be continuously drained from the chamber.

7.2 The compressor used in the cooling system shall be durable, energy efficient, CFC free and using eco-friendly refrigerant.

8.0 Instruments and controls

8.1 An instrument console shall be fitted to the chamber for ease of operation. It shall include the following:
Indicating panel consisting of mains on-off switch, mains-on indicator lamp, LED temperature indicator with 0.1ºC resolution, LED relative humidity indicator with 1% resolution, on-off switch for air circulating fan, on-off switch for chamber lights, etc.

8.2 A user programmable time switch shall be provided for automatic programming of test period.

8.3 Audible and visual temperature alarms shall be provided to alert any temperature deviation from active set point of exceeding high limit.

8.4 Non-volatile memory shall be provided in the control system to facilitate chamber to return to original set point when power is restored, in the event of a power failure.

8.5 Temperature and humidity controllers shall show two separate displays while operating: one for process and one for set point.

9.0 Safety protections

The chamber shall be provided with the following safety protections:

- Protection against supply voltage variations;
- Safety cut-outs for high temperature and for low water level;
- Safety alarm in case of chamber mal-functioning, where required;
- Provision for interlocking of fan in the heater circuit;
- Provision of a suitable earth terminal.

10.0 Documentation

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

11.0 Calibration

Calibration certificates on temperature and humidity indicators from NABL approved calibration agency shall be furnished along with the equipment.

12.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M. Raju Peter	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN CODE	:	**CBE 14**
NAME OF THE EQUIPMENT	:	**High Voltage Breakdown Tester**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**

1.0 Scope

Covers the basic guiding requirements for the design of High Voltage Breakdown Tester required for carrying out the following test:
- Test for electric strength on CFL as per Cl.9.3 of IS 15111(Part.1) : 2002.

2.0 Test conditions

Immediately after the insulation resistance test, the parts as specified shall withstand a voltage test with an ac voltage as follows:
Type HV (220V – 250V) : 4000V r.m.s.
Type BV (100V – 120V) : 2U + 1000V

3.0 Output Voltage :

R.M.S. Value : 0 – 5kV AC (minimum), resolution : 0.1kV or better

4.0 Output Frequency :

45Hz – 65Hz

5.0 Output Waveform :

The voltage wave shape shall approximate a sinusoid with both half cycles closely alike., THD < 5% (Resistive load), Crest factor = $\sqrt{2} \pm 5\%$

6.0 Leakage Current :

5 to 100mA selectable

7.0 Measurement :

Voltage : Analog / Digital meter, accuracy : Class 1.5 or better
Current : Analog / Digital meter, accuracy : Class 1.5 or better

8.0 Indicators :

HT on/off : LED/lamp
HT on : LED/lamp indication and audio buzzer
Breakdown : LED/lamp indication and audio buzzer
Test pass/fail : LED/lamp

9.0 Calibration :

Calibration certificates on voltmeter and ammeter from NABL accredited calibration agency shall be furnished along with the equipment.

10.0 Documentation :

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

11.0 Minimum Accessories :

HT probes (1.5m long)
Mains cord (10A)
Spare fuses

12.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M.RAJU PETER	S.K. SAHANA	
DESIGNATION	STA (LAB)	JD (Elect. Lab)	
DATE			

BUREAU OF INDIAN STANDARDS
(BANGALORE BRANCH OFFICE LABORATORY)
EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 15**
NAME OF THE EQUIPMENT	:	**Laboratory Electric Oven**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**

1.0 Scope

Covers the basic guiding requirements for the design of laboratory electric oven required for carrying out the following test:

- Test for resistance to heat on CFL as per Cl.12 of IS 15111(Pt.1).

2.0 Test conditions

The test is made in a heating cabinet at a temperature of 27±5ºC in excess of the operating temperature of the relevant part, with a minimum of 125ºC for parts retaining live parts in position and 80ºC for other parts. The part to be tested is placed in the heating cabinet for 10min.

3.0 Construction

3.1 The dimensions of inner chamber shall be as follows:
24”(Width) × 24”(Depth) × 24”(Height)

3.2 The inner chamber shall be made of 16SWG(minimum) corrosion resistant stainless steel.

3.3 The exterior shall be double wall, heavy gauge steel with scratch resistant powder coated finish, adjustable door latch and hinges.

3.4 Fiber glass/glass wool, minimum 3” thick shall be provided on all sides. Peripheral silicon door seal to minimize heat loss shall be provided.

3.5 Three numbers of 16SWG(minimum) stainless steel perforated trays shall be provided which shall be adjustable along the height. The design of lugs, brackets or runners for shelves shall be such that heavily laden shelves may not tilt during withdrawal.

3.6 Motorized fan shall be provided to assist the convection and bring about uniformity of temperature.

4.0 Temperature range

+5ºC above ambient to 250ºC

5.0 Temperature control

5.1 Microprocessor based PID controller shall be used for the precise control of temperature with the following accuracy:
Temperature : ± 0.5ºC

6.0 Instruments and controls

6.1 An instrument console shall be fitted to the oven for ease of operation. It shall include the following:

Indicating panel consisting of mains on-off switch, mains-on indicator lamp, LED temperature indicator with 0.1ºC resolution, on-off switch for air circulating fan, etc.

7.0 Safety protections

The oven shall be provided with the following safety protections:

- Safety cut-outs for high temperature;
- Provision for interlocking of fan in the heater circuit;
- Provision of a suitable earth terminal.

8.0 Calibration :

Calibration certificates on temperature indicator from NABL accredited calibration agency shall be furnished along with the equipment.

9.0 Documentation

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

10.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M. RAJU PETER	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

BUREAU OF INDIAN STANDARDS
(BANGALORE BRANCH OFFICE LABORATORY)
EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 04**
NAME OF THE EQUIPMENT	:	**Ball Pressure Test Apparatus**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**

1.0 Scope

Covers the basic guiding requirements for the design of Ball Pressure Test Apparatus required for carrying out the following test:

- Test for resistance to heat on CFL as per Cl.12 of IS 15111(Pt.1).

2.0 Construction

2.1 The apparatus, basically, shall consist of the following :

- A suitable platform for placing the sample to be tested.
- A ball pressure apparatus for exerting the specified force on the sample.
- A magnifier with built-in scale for measuring the impression of the steel ball created on the sample.

2.2 The platform shall be made of corrosion resistant stainless steel.

2.3 The ball pressure apparatus shall be as shown in Fig. 4 of IS 15111(Pt.1) : 2002. It shall be made of corrosion resistant stainless steel. The diameter of the steel ball shall be 5mm. The force exerted on the sample shall be 20N.

2.4 A magnifier of ×10 magnification with a built-in scale of 0 – 10mm, 0.1mm L.C. shall be provided.

2.5 A suitable carrying case shall be provided for keeping the equipment safely and free from dust.

2.6 **Calibration :**

Calibration certificates on steel ball and the force exerted from NABL accredited calibration agency shall be furnished along with the equipment.

3.0 **Documentation**

Technical documentation such as instruction, operating, maintenance/service manuals shall be supplied along with the equipment.

4.0 **Guarantee**

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE			
NAME	M. RAJU PETER	S.K. SAHANA	
DESIGNATION	STA(LAB)	JD (Elect. Lab)	
DATE			

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 11**
NAME OF THE EQUIPMENT	:	**Glow-wire test apparatus**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**

1.0 Scope

Covers the basic guiding requirements for the design of glow-wire test apparatus required for carrying out the following test:

- Test for resistance to flame and ignition on CFL as per Cl.13 of IS 15111(Part 1) : 2002.

2.0 Test conditions

The test specimen is mounted on the carriage and pressed against the glow-wire tip with a force of 1N, preferably 15mm, or more from the upper edge, in to the centre of the surface to be tested. The penetration of the glow-wire in to the specimen is mechanically limited to 7mm. The temperature of the tip of the glow-wire is 650ºC. After 30s the specimen is withdrawn from contact with the glow-wire tip.

3.0 Construction

3.1 Heating Element - Glow–wire

The glow-wire shall consist of a specified loop of a nickel/chromium (80/20) wire 4 mm in diameter; when forming the loop, care must be taken to avoid fine cracking at the tip.

3.2 Temperature Sensor – Thermocouple

A sheathed fine-wire thermocouple, having an overall diameter of 0.5 mm and wires of suitable material with the welded point located inside the sheath, shall be used for measuring the temperature of the glow-wire. The glow-wire, with the thermocouple, shall be as shown in Figure 1, page 16. of IS 11000 (Part 2 / Sec 1). The sheath shall consist of a metal resistant to a temperature of at least 96OºC. The thermocouple shall be arranged in a pocket hole, 0.6 mm in diameter, drilled in the tip of the glow-wire, as shown in detail Z of Figure 1.

3.3 Temperature Control

Micro controller based PID temperature controller - 4 Digit, 1 deg. C resolution, with ambient temperature compensation shall be used for temperature control of the glow-wire.

3.4 Temperature Range

Adjustable from ambient to 960ºC.

3.5 Time Controller

Micro controller based digital timer, 4 digit, 0.1sec resolution to measure **:**

t01 = Glow-wire application time, range : 0.1 – 999.9 sec

t02 = Test duration time, range : 0.1 – 999.9 sec

t03 = Time when sample STARTS burning after withdrawal of the glow-wire.

t04 = Time when sample STOPS burning after withdrawal of the glow-wire.

3.6 Sample Loading:

The test apparatus shall be so designed that the glow-wire is kept in a horizontal plane and that it applies a force of 0.8 N to 1.2 N to the specimen, the force being maintained at this value when the glow-wire or the specimen is moved horizontally one towards the other over a distance of at least 7 mm. An example of the test apparatus is shown in Figure 2, page 17 of IS 11000 (Part 2 / Sec 1).

3.7 Carriage:

Automatic, motorized forward and reverse motion for movement of specimen.

3.8 Mounting Tray

Adjustable stainless steel perforated tray on a trolley shall be provided to mount the test specimen.

3.9 Penetration depth

Mechanically restricted to 7mm only.

3.10 Flame height

Suitable provisions shall be made for the measurement of flame height. Further, suitable arrangement for keeping the tissue paper as specified in Cl.13 of IS 15111(Part 1) : 2002 shall also be provided.

4.0 Safety protections

Emergency Switch, MCB & Fuses

5.0 Supply

220 - 240 V AC, 50 Hz, 1 Ph

6.0 Calibration

Calibration certificates on temperature indicator and timer from NABL accredited calibration agency shall be furnished along with the equipment.

7.0 Documentation

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

8.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided at our site. The supplier of the equipment shall have the required infrastructure in Bangalore for providing timely and efficient service of the equipment.

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DESIGNATION	STA (LAB)	JD (Elect. Lab)	
DATE			

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**DBE 15**
NAME OF THE EQUIPMENT	:	**Apparatus for protection against electric shock test**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(ONE)**

1.0 Scope

Covers the basic guiding requirements for the design of apparatus for protection against electric shock test required for carrying out the following test:

- Test for protection against electric shock on CFL as per Cl.8 of IS 15111(Pt.1).

2.0 Construction

2.1 The dimensions of the test finger shall be as given in Fig.1 of IS 15111(Part 1) : 2002.

2.2 The handle of the test probe shall be made of high impact resistant insulating material.

2.3 The tip of the test probe shall be made of copper or copper alloy, in order to minimize the resistance in the indicator circuit.

2.4 A terminal shall be provided to permit connection of a low voltage supply to the test probes in order to operate an electrical indicator.

3.0 Instruments and controls

3.1 A control unit comprising audio and visual indication of contact shall be provided.

3.2 A voltage not less than 40V shall be used for electrical sensing of the contact.

3.3 A digital meter having an accuracy of at least ± 2.5% shall be provided for indication of the voltage.

4.0 Documentation

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

5.0 Calibration

Calibration certificate on voltmeter from NABL approved calibration agency and test certificate of the test finger with valid traceability shall be furnished along with the equipment.

6.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year and thereafter comprehensive service support for a minimum period of two years.

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DATE			

BUREAU OF INDIAN STANDARDS

(BANGALORE BRANCH OFFICE LABORATORY)

EQUIPMENT SPECIFICATION

EQUIPMENT SPFN. CODE	:	**CBE 17**
NAME OF THE EQUIPMENT	:	**Life Test Rack for CFL lamps**
PROPOSED FOR BIS LABS	:	**BNBOL**
TOTAL QUANTITY REQUIRED	:	**01(one)**

1.0 Scope

Covers the basic guiding requirements for the design of life test rack required for carrying out the following test:

- Test for life on CFL lamps as per Cl.13 of IS 15111(Part 2) : 2002.

2.0 Test conditions

Lamps shall be operated for 6000 hours. Life test quantity normally consists of 10 lamps.

3.0 Construction

3.1 The rack shall be designed and constructed to carry out life test on compact fluorescent lamps of the following ratings:

- a rated wattage up to and including 26W
- a rated voltage up to and including 250V

3.2 Provision shall be made to operate 240 nos. of both B22 and E27 cap lamps (up to 26W rating) alternately mounted. That means, the total number of holders to be provided on the rack is as follows:

B22d cap lamp holders : 120nos.
E27 cap lamp holders : 120 nos.

The holders shall be wired parallel supported by a single phase system.

Typical details for fabrication of the life test rack is shown in the drawing attached. There are four arms each at three levels, each arm holding 20 holders (ie. 10 B22 and 10 E27 holders).

3.3 The mechanical structure of the rack shall be fabricated out of MS square sections of suitable size and thickness so that it is sturdy and having adequate mechanical stability and shall be powder coated so as to ensure that during the long and extended use of the equipment, it shall be durable and free from rusting.

3.4 The B22 cap lamp holders shall be of plunger type porcelain and the E27 cap lamp holders shall be of porcelain the inside barrel of which shall be of copper.

3.5 The holders shall be mounted on suitable MS sections and shall be powder coated with adequate spacing(minimum 6”longitudinally and 9” laterally) between one another for easy operation and shall be wired through heat resistant fiber glass insulated copper conductors of adequate current rating. The current rating of the conductors shall be so chosen as to keep the voltage drop between the point of measurement and the holder contacts within 0.1% of the test voltage. All other wiring may also be done using fiber glass insulated copper cable.

3.6 A hinged panel of MS sheet metal of adequate thickness and powder coated shall be provided on the front side of the rack for housing switchgear, control gear and measuring instruments.

3.7 For each set of 20 lamp holders (both B22 and E27), there shall be an MCB of reputed make mounted on the front panel.

3.8 An isolator ON/OFF rotary switch of adequate current rating and reputed make shall be provided on the front panel for the set of 80 holders(both B22 and E27) at each level for connecting/disconnecting the mains supply.

3.9 Indicator lamps shall be provided on the front panel for each set of 80 holders for indicating the mains supply ON/OFF.

3.10 Three numbers of 3.5 digit digital panel meter, 0.5% accuracy, 0 – 300VAC shall be provided on the front panel for measuring the input voltage to each set of 80 lamps(both B22 and E27).

3.11 Three user programmable electronic timer(0 – 9999 hours) along with power tripping device shall be provided on the front panel for each set of 80lamps (both B22 and E27) for setting the life test period of the lamps, so that after completion of the set time, the power supply to the lamps shall be cut off automatically.

3.12 Three user programmable electronic cyclic timer(0 – 999min. ON time & 0 – 99min. OFF time) shall be provided on the front panel for switching on and switching off the lamps as per Cl.A-4.3 of IS 15111(Part 2) : 2002 for each set of 80 lamps(both B22 and E27).

3.13 Suitable provision shall be made for keeping the three Auto transformers (18A, 0-270V, oil cooled) supplying adjustable power to each set of 80lamps (both B22 and E27) inside at the bottom of the rack.

4.0 Auto transformer

Three numbers of continuously variable voltage auto transformers, oil cooled, shall be provided on the rack. The specifications of the auto transformers are as follows:

Rated output current	: 18Amperes
Rated input voltage	: 240V
Rated output voltage range	: 0 – 270V
Rated frequency	: 50Hz
Number of phases	: Single phase
Type of cooling	: Natural oil cooled

The auto transformers shall be supplied with first filling of ISI marked transformer oil.

5.0 Calibration :

Calibration certificates on the voltmeters as well as the timers from NABL accredited calibration agency shall be furnished along with the equipment. The calibration certificate on timers may be for a shorter length of time since it may not be practical to carry out the calibration check for the full range.

6.0 Documentation

Technical documentation such as instruction, operating, maintenance/service manuals containing schematic diagrams, list of component parts with performance data and list of spare parts, etc. shall be supplied along with the equipment.

7.0 Guarantee

The equipment shall be guaranteed for a minimum period of one year of satisfactory operation and thereafter comprehensive service support shall be provided.

	PREPARED BY	CHECKED BY	APPROVED BY
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DESIGNATION	STA(LAB)	JD (Elect. Lab)	
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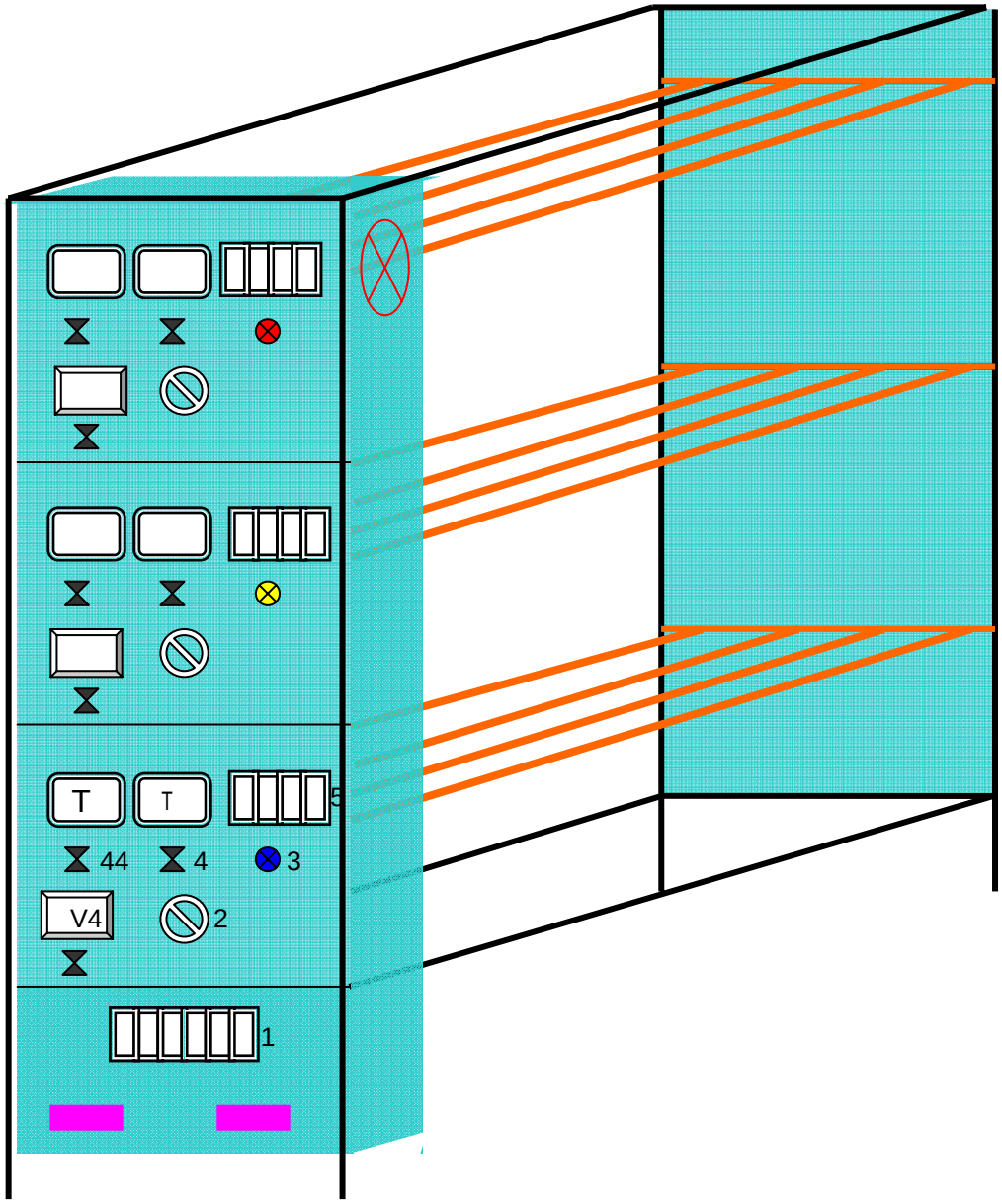
LIFE TEST RACK FOR CFL LAMPS



1 – DOUBLE POLE MCB, TYPE D, 25A – 03nos.
2 – ISOLATOR ROTARY SWITCH, 32A
3 – INDICATOR LAMP
4 – ON-OFF SWITCH FOR METER/TIMER
5 – SINGLE POLE MCB, TYPE B, 16A – 04nos.
V – VOLTMETER(DPM), 0 – 300V, 3.5 digit, 0.5% accuracy
T – PROGRAMMABLE TIMER
⊗ **- COOLING FAN**