PRODUCT MANUAL FOR TUBULAR FLUORESCENT LAMPS FOR GENERAL LIGHTING SERVICE - PERFORMANCE REQUIREMENTS ACCORDING TO IS 2418 (Part 2): 2018

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	**Product**	:	IS 2418 (Part 2): 2018
	Title	:	Tubular Fluorescent Lamps for General Lighting Service - Performance Requirements
	No. of Amendments	:	Nil
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	---
b)	**Grouping guidelines**	:	Please refer ANNEX-A
c)	**Sample Size**	:	40 Nos.
3.	**List of Test Equipment**	:	Please refer ANNEX – B
4.	**Scheme of Inspection and Testing**	:	Please refer ANNEX – C
5.	**Possible tests in a day**	:	Please refer ANNEX - D
6.	**Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS 2418 (Part 2): 2018 with the following scope:		
	Name of the product	Tubular Fluorescent Lamps for General Lighting Service - Performance Requirements	
	Rating	----- W, ----- Hz	
	Colour Temperature		
	Cathode Type		
	Operated on ac mains frequency/ high frequency		
	With/ without Starter		

ANNEX-A

Grouping Guidelines

1) Samples of each of the following variety of Lamps shall be drawn for GoL/CSoL:

    a) Rated Wattage
    b) Colour Temperature Rating
    c) Lamps to be used with Starter/Without Starter
    d) Lamps for operation on ac mains frequency/Lamps for operation on high frequency.
    e) Cathode Type (Preheated/ Preheated high resistance/ Preheated low resistance/ Non-Preheated)

2) Other parameters remaining the same, to cover a range of rated wattages, lamps of the lowest and highest wattage shall be tested. However, the following relaxations may be permitted:
    i. One Lamp of each colour temperature rating shall be tested to cover all three in the scope.
    ii. For lamps operated on ac mains with starter, at least one lamp of each cathode type (preheated/ non-preheated) shall be tested to cover both in the range
    iii. For lamps operated on ac mains without starter, at least one lamp of each cathode type shall be tested to cover both (Preheated high resistance/ Preheated low resistance) in the range
    iv. For high frequency lamps, at least one lamp of each cathode type (preheated/ non-preheated) shall be tested to cover both in the range

3) For covering High Lumen variety (HL), separate sample shall be drawn for considering GoL

4) The firm shall declare the varieties of Lamps they intend to cover in the licence. The scope of the licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

5) During the operation of the licence, BO shall ensure that all the varieties covered in the licence are tested in rotation, to the extent possible.

ANNEX-B

List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Visual Examination and Marking (Cl. 6 & 7.3 of IS 2418: Part 2: 2018 and Cl. 4.2 of IS 2418: Part 1: 2018)	Stop Watch
2	Torsion Tests for Unused Lamps (Cl. 4.3.1.1 (a) & Cl. 4.3.1.1 (b) of IS 2418: Part 1: 2018)	Torsion Test Apparatus, Heating Oven
3	Dimensions of Caps (Cl. 4.3.2 of IS 2418: Part 1: 2018)	Go/No-Go Gauges
4	Insulation Resistance (Cl. 4.4 of IS 2418: Part 1: 2018)	Megger
5	Electric Strength (Cl. 4.5 of IS 2418: Part 1: 2018)	HV Tester
6	Parts which can become accidently live (Cl. 4.6 of IS 2418: Part 1: 2018)	Standard Test Fingers
7	Overall Length (Cl. 4.10 of IS 2418: Part 1: 2018)	Measuring Tape
8	Creepage Distance for Caps (Cl. 4.8 of IS 2418: Part 1: 2018)	Vernier Callipers
9	Lamp Cap Temperature Rise (Cl. 4.9 & Annex B of IS 2418: Part 1: 2018)	Temperature Rise Test Apparatus
10	Resistance to Heat & Fire (Cl. 4.7 of IS 2418: Part 1: 2018)	Heating Oven, Glow Wire Test Apparatus
11	Burning Test (Cl. 7.4 of IS 2418: Part 2: 2018)	Voltmeter
12	Mechanical and Physical Requirements (Cl. 5.1 of IS 2418: Part 2: 2018)	Go/No-Go Gauges, Vernier Callipers
13	Starting Requirements (Cl. 7.5 of IS 2418: Part 2: 2018)	Stop Watch, Voltmeter, Ammeter, Transformer, HF Generator
14	Test for Electrical, luminous characteristics & Colour Characteristics (Cl. 7.6 of IS 2418: Part 2: 2018)	Voltmeter, Wattmeter, Ammeter, Colorimeter, Equipment for measuring luminous flux, Test Setup for ageing
15	Life Test (Cl. 7.8 of IS 2418: Part 2: 2018)	Voltmeter, Test setup for ageing of lamps, Equipment for measuring luminous flux.
16	Maintenance of Room Temperature	Air Conditioner, Room Heater

The above list is indicative only and may not be treated as exhaustive.

ANNEX-C

Scheme of Inspection And Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING AND MARKING – As per the requirement of IS 2418 (Part 2): 2018.

4. CONTROL UNIT – Lamps of the same type (Rated Electrical Characteristics, Physical Dimensions, Photometric Ratings and Colour Characteristics) manufactured in a day shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1

(1)				(2)	(3)		
Test Details				**Test equipment requirement R: required (or) S: Sub-contracting permitted**	**Levels of Control**		
Cl.	**Requirement**	**Test Method**			**No. of Sample**	**Frequency**	**Remarks**
		Clause	**Reference**				
4.2 (except 4.2.2)	Marking	4.2	IS 2418 (Part 1)	R	Each lamp		In case of any failure, marking shall be stopped and sample size shall be doubled for subsequent control units. The original frequency may be restored if samples from three consecutive control units pass.
4.2.2	Marking	4.2.2	IS 2418 (Part 1)	R	Twenty	Each Control Unit	
4.3.1.1(a)	Torsion Test for unused lamps	4.3.1.1 (a)	IS 2418 (Part 1)	R	Twenty	Each Control Unit	
4.3.2	Dimension of Caps	4.3.2	IS 2418 (Part 1)	R	Twenty	Each Control Unit	
4.4	Insulation Resistance	4.4	IS 2418 (Part 1)	R	Five	Each Control Unit	
4.5	Electric Strength	4.5	IS 2418 (Part 1)	R	Twenty	Each Control Unit	
4.6	Parts which can become accidentally live	4.6	IS 2418 (Part 1)	R	Twenty	Each Control Unit	
4.10	Overall Length	4.10	IS 2418 (Part 1)	R	Twenty	Each Control Unit	
4.7	Resistance to Heat & Fire	4.7	IS 2418 (Part 1)	S	One	Once in Six Months for each type	In case of any failure, marking shall be stopped and samples from every control unit shall be tested. The original frequency may be restored if samples from three consecutive control units pass.
4.3.1.1(b)	Torsion Test at 2000 h	4.3.1.1 (b)	IS 2418 (Part 1)	S	One		
4.8	Creepage Distance for Caps	4.8	IS 2418 (Part 1)	S	One		
4.9	Lamp Cap Temperature Rise	4.9 & Annex B	IS 2418 (Part 1)	S	Five		
7.3	Visual Examination and Checking for Marking	6 & 7.3	IS 2418 (Part 2)	R	Each lamp		In case of any failure, marking shall be stopped and action shall be taken to rectify the defects. The improved sample shall be tested and the marking shall be resumed if the sample passes.
7.4	Burning Test	7.4	IS 2418 (Part 2)	R	Each Lamp	---	

5.1.1	Glass Tubing	5.1.1	IS 2418 (Part 2)	R	Twenty	Each Control Unit	In case of any failure, marking shall be suspended and sample size shall be doubled for subsequent control units. The original frequency may be restored if samples from three consecutive control units pass.
5.1.2	Caps	5.1.2	IS 2418 (Part 2)	R			
5.1.3	Dimensions	5.1.3	IS 2418 (Part 2)	R			
7.5	Starting Requirements	5.2, 7.5 & Annex-A	IS 2418 (Part 2)	R	Twenty	Once in a week for each type	In case of any failure, marking shall be suspended and samples from every control unit shall be tested. The original frequency may be restored if samples from three consecutive control units pass.
7.6	Test for Electrical, Luminous characteristics	7.6 & Annex B	IS 2418 (Part 2)	R	Fifteen		
	Colour Characteristics	7.6 & Annex C	IS 2418 (Part 2)	R	Three		
7.8	Life Test	7.8	IS 2418 (Part 2)	S	Ten	Once in a year for each type	---

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

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ANNEX-D

Possible Tests in a Day

a) Visual Examination and Marking (Cl. 6 & 7.3 of IS 2418: Part 2: 2018 and Cl. 4.2 of IS 2418: Part 1: 2018)
b) Torsion Tests for Unused Lamps (Cl. 4.3.1.1 (a) of IS 2418: Part 1: 2018)
c) Dimensions of Caps (Cl. 4.3.2 of IS 2418: Part 1: 2018)
d) Insulation Resistance (Cl. 4.4 of IS 2418: Part 1: 2018)
e) Electric Strength (Cl. 4.5 of IS 2418: Part 1: 2018)
f) Parts which can become accidently live (Cl. 4.6 of IS 2418: Part 1: 2018)
g) Overall Length (Cl. 4.10 of IS 2418: Part 1: 2018)
h) Creepage Distance for Caps (Cl. 4.8 of IS 2418: Part 1: 2018)
i) Lamp Cap Temperature Rise (Cl. 4.9 & Annex B of IS 2418: Part 1: 2018)
j) Burning Test (Cl. 7.4 of IS 2418: Part 2: 2018)
k) Glass Tubing, Caps and Dimensions (Cl. 5.1.1, 5.1.2, 5.1.3 of IS 2418: Part 2: 2018)