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उत्पाद मैनुअल

Protective clothing –

Clothing to Protect Against Heat and Flame
– Minimum performance requirements

IS 15748: 2022 के अनुसार

PRODUCT MANUAL

FOR Protective clothing –

Clothing to Protect Against Heat and Flame
– Minimum performance requirements

ACCORDING TO

IS 15748: 2022

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	मानक संख्या IS No.	:	Protective clothing – Clothing to Protect Against Heat and Flame – Minimum performance requirements
	शीर्षक Title	:	IS 15748:2022/ISO 11612:2015
	संशोधनों की संख्या No. of amendments	:	03
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirement Note: This section indicates the requirements for raw material(if specified in the IS)for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer to Annex-A

c)	नमूने का परिमाण Sample Quantity	:	2 pair + 2m fabric material Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	:	i. Type of garment ii. Limited flame spread iii. Convective heat iv. Radiant heat v. Molten aluminum splash vi. Molten iron splash vii. Molten iron splash viii. Contact heat ix. Optional requirement: - With or without Heat resistance at a temperature of $(260 \pm 5) ^\circ\text{C}$ - With or without Whole garment test against fire exposure on thermal manikin - With/Without additional protective garments (e.g. neck curtain, hoods, sleeves, apron, and gaiters) Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	Size Designation and fit, Heat resistance, Limited flame spread, Tensile strength, Tear strength, Convective heat, Radiant heat and contact heat (considering availability of pre conditioned samples). Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	लाइसेंस का दायरा/Scope of the Licence:		
	Licence is granted to use Standard Mark as per IS 15748:2022 with the following scope:		
	Name of the product	Protective clothing – Clothing to Protect Against Heat and Flame– Minimum performance requirements	
	Type of garment	Single garment/Two-piece garment	
	Limited flame spread	A1 or A1+A2	
	Convective heat	B1, B2, B3	
	Radiant heat	C1, C2, C3, C4	
	Molten aluminum	D1, D2, D3	

	splash	
	Molten iron splash	E1, E2, E3
	Contact heat	F1, F2, F3
	Optional requirement	– With or without Heat resistance at a temperature of $(260 \pm 5) ^\circ\text{C}$ – With or without Whole garment test against fire exposure on thermal manikin – With/Without additional protective garments (e.g. neck curtain, hoods, sleeves, apron, and gaiters)

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ANNEX-A

GROUPING GUIDELINES

1. Samples of each variety Protective clothing – Clothing to Protect Against Heat and Flame of shall be tested considering the following:
 - i. Single garment/Two-piece garment
 - ii. Limited flame spread (A1 or A1+A2)
 - iii. Convective heat (B1, B2, B3)
 - iv. Radiant heat (C1, C2, C3, C4)
 - v. Molten aluminum splash (D1, D2, D3)
 - vi. Molten iron splash (E1, E2, E3)
 - vii. Contact heat (F1, F2, F3)
 - viii. With or without Heat resistance at a temperature of $(260 \pm 5) ^\circ\text{C}$
 - ix. With or without Whole garment test against fire exposure on thermal manikin
 - x. With/Without additional protective garments (e.g. neck curtain, hoods, sleeves, apron, and gaiters)
2. The following relaxation may be given when a variety is tested for all the requirements:
 - i. Each type of garment shall be tested separately to cover in the scope of licence.
 - ii. For limited flame spread as per Cl. 6.3, in case A1+A2 variety is to be covered in the scope of licence, sample shall be tested as per both procedure A (code letter A1) and procedure B (code letter A2).
 - iii. If higher performance levels (i.e. having higher min. HTI 24 value.) in convective heat test B(X) is tested than lower performance levels may be covered.
 - iv. If higher performance levels in radiant heat test C(X) (i.e. having higher min. RHTI 24 value.) is tested than lower performance levels may be covered.
 - v. If higher performance levels in molten aluminum splash test D(X) (i.e. having higher min. molten aluminium splash value) is tested than lower performance levels may be covered.
 - vi. If higher performance levels in molten iron splash test E(X) (i.e. having higher min. molten iron splash value) is tested than lower performance levels may be covered.
 - vii. If higher performance levels in contact heat test F(X) (i.e. having higher min. threshold time value) is tested than lower performance levels may be covered.
 - viii. If optional requirement of Heat resistance at a temperature of $(260 \pm 5) ^\circ\text{C}$ is intended to be covered in the scope of licence, sample shall also be tested for this requirement.
 - ix. Similarly, if optional requirement of Whole garment test against fire exposure on thermal manikin is intended to be covered in the scope of licence, sample shall also be tested for this requirement.
 - x. If with additional protective garments is tested, then without additional protective garments may also be covered. The additional protective garments are to be declared by the applicant and the same are to be mentioned in the scope of licence.
3. Scope of licence shall be restricted based on the manufacturing and testing facilities available.
4. During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible

ANNEX-B

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests used in with Clause Reference	Test Equipment/Chemicals
1	Size designation and fit, Clause 4.2	Measuring Scale, Measuring steel Tape, Vernier caliper, Angle protractor
2	Sampling and Pretreatment, , Clause 5	Front loading horizontal drum washing machine as per requirement given in IS 15370, ECE reference detergent A and B as per requirement given in IS 15370, Conditioning chamber, Test Device as per Annex A of IS 15748 for Mechanical pre-treatment for metallized materials
3	Heat resistance, Clause 6.2	Forced air circulating oven, Rigid square templates, Ruler, Stop Watch
4	Limited flame spread, Clause 6.3	Limited flame spread test set up with specimen holder, supporting pins, spacer stubs, gas burner, mounting frame, templates, timing devices
5	Dimensional change of textiles materials, Clause 6.4	Indelible ink marker, Smooth flat surface, Measuring Scale, Measuring steel Tape, Vernier caliper, Automatic Washing Machine, Tumble Dryer or heated flat bed press or drying racks or drying dripline
6	Tensile strength and tear strength and seam strength, Clause 6.5.1, 6.5.2 and 6.5.4	Digital tensile testing machine with variable speed drive and with tear attachment , thickness gauge, press knife
7	Burst strength for knitted materials and seams, Clause 6.5.3	Burst test apparatus
8	Fat Content of Leather, Clause 6.6	Soxhlet extraction apparatus, Filter paper thimbles, of suitable sizes, or suitable glass filter bells, Oven, capable of being maintained at $(102 \pm 2) ^\circ\text{C}$, Analytical balance, capable of weighing to an accuracy of 0,1 mg., Desiccator, Glass wool or cotton wad, or something equivalent. Reagents: Dichloromethane, CAS No. 75-09-2, diethyl ether, ethanol, sodium hydroxide, phenolphthalein,

9	Convective heat, Clause 7.2	Convective heat test set up consisting of gas burner, copper disc calorimeter, specimen support frame, calorimeter location plate and support stand with data logger and indicator, Template
10	Radiant heat, Clause 7.3	Radiant heat test set up consisting of 6 silicon carbide heating rod, copper disc calorimeter, specimen holder and data logger and indicator, test frame
11	Molten aluminum splash, Clause 7.4	Aluminum, Furnace with temperature probe (UP TO 1650 C to an accuracy of ± 10 °C) , pouring apparatus, balance, template,
12	Molten Iron splash, Clause 7.5	IRON, Furnace with temperature probe (probe (UP TO 1650 C to an accuracy of ± 10 °C), pouring apparatus, balance, template,
13	Contact heat, Clause 7.6	Contact heat test set up consisting of heating cylinder, Calorimeter and data logger and indicator

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: entire quantity of garments of one type/variety (A1 or A1 + A2, B(X), C(X), D(X), E(X), F(X)) manufactured from the same consignment of fabric and hardware.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on the garment and/or on its label provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 Additional Marking requirements: The material shall also be marked with the following additional requirement on the garment and/or on its label:

a) “For BIS certification details please visit www.bis.gov.in”

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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
(ONLY FOR GUIDANCE PURPOSE)

(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				
4.1	General		ISO 13688	R	1	Each control unit	
4.2	Size designation and fit	4.2.2, 4.2.3	ISO 13688, IS 15748	R	1	Each control unit	
4.3	Pockets and Closures	6.2, 6.3	IS 15748	R	1	Each control unit	
4.4	Hardware	4.4	IS 15748	R	1	Each control unit	
4.5	Additional design requirements for molten splash protective garments (Optional)	4.5	IS 15748	R	1	Each control unit	
6.2.1	Heat resistance at a temperature of (180 ± 5) °C		IS 17468 : 2020 /ISO 17493	R	1	Each consignment of material and hardware OR Each control unit (garment and/or component assembly)	As per 6.2.1 materials can be either tested separately or as assembled in the garment and/or component assembly.

6.2.2	Optional requirement — Heat resistance at a temperature of (260 ± 5) °C		IS 17468 : 2020 /ISO 17493	S	1	Each consignment of material or hardware OR Each control unit (garment and/or component assembly) (or as agreed between purchaser and supplier)	
6.3	Limited flame spread		IS 15758 (Part 4) : 2020/ISO 15025	R	1	Each Control Unit	
6.4	Dimension al change of textile materials		ISO 5077	R	1	Each Control Unit	
6.5.1	Tensile strength		IS 1969 (Part 1) : 2018/ISO 13934-1/ ISO 3376	R	1	Each Control Unit	
6.5.2	Tear strength		IS 6489 (Part 2) : 2011/ISO 13937- 2/ ISO 3377-1	R	1	Each Control Unit	
6.5.3	Burst strength for knitted materials and seams		IS 1966 (Part 1): 2022/ISO 13938-1/ ISO 13938-2	R	1	Each Control Unit	
6.5.4	Seam strength		IS 1966 (Part 1): 2022/ISO 13935-2/	R	1	Each Control Unit	
6.6	Fat content of leather		ISO 4048	R	1	Each Control Unit	

7.2	Convective heat		IS 15758 (Part 1): 2020/ISO 9151	R	1	Each Control Unit	
7.3	Radiant heat		IS 15758 (Part 2): 2007/ISO 6492	R	1	Each Control Unit	
7.4	Molten aluminum splash		IS 15758 (Part 2): 2007/ISO 9185	S	1	Each Control Unit	
7.5	Molten Iron splash		IS 15758 (Part 2): 2007/ISO 9185	S	1	Each Control Unit	
7.6	Contact Heat		IS 17462 (Part 1): 2020/ISO 12127-1	R	1	Each Control Unit	
9	Whole garment test against fire exposure on thermal manikin (optional test)		IS 17462 (Part 1): 2020/ISO 13506	S	1	Each Control Unit	