



**Textiles - Protective clothing for use
in welding and allied processes**

IS 16655: 2017 के अनुसार

**PRODUCT MANUAL
FOR Textiles - Protective clothing for use
in welding and allied processes
ACCORDING TO IS 16655: 2017**

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.	:	IS 16655 : 2017/ ISO 11611:2015
	शीर्षक Title	:	Textiles - Protective clothing for use in welding and allied processes
	संशोधनों की संख्या No. of amendments	:	02
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Raw material used for the construction of pockets and flaps shall confirm to the requirement of clause 4.5(a) & (c). <i>Compliance to the above requirements may be established by supplier test certificate/test report from BIS recognized lab/empanelled lab or any other lab having accreditation as per IS/ISO/IEC17025 or in-house testing/combination thereof.</i> 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 pairs + 2metre 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)
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.	सैंपलिंग के लिए दिशा-निर्देश Guidelines for sampling during surveillance		Out of the market and factory samples tested in one year, One Factory Sample(FS) will be tested for all requirements of IS 16655:2017 and remaining samples will be tested for all requirements excluding Garment Design as per Cl. 4 & Heat Transfer (Radiation) as per Cl. 6.9 of IS 16655:2017.
6.	एक दिन में संभावित परीक्षण Possible tests in a day		Size designation and fit, Tensile strength, Tear strength, Burst strength of knitted materials and seams, Seam strength, Limited flame spread, Impact of spatter (small splashes of molten metal), Heat transfer (radiation), Fat content of leather- considering availability of 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.
7.	लाइसेंस का दायरा/Scope of the Licence:		“Licence is granted to use Standard Mark as per IS 16655 : 2017/ ISO 11611:2015 with the following scope:
	Name of the product		Textiles - Protective clothing for use in welding and allied processes
	Class		1. Class 1 (protection against less hazardous welding techniques and situations, causing lower levels of spatter and radiant heat.) 2. Class 2 (protection against more hazardous welding techniques and situations, causing higher levels of spatter and radiant heat)
	Type		Single garment/two-piece garment
	Variety		Single Use/Reusable (number of cleaning cycles to be specified in case of reusable)
	Additional protective garments		With/Without Additional protective garments such as Hoods, Aprons, Gaiters or others (to be specified)
	Materials		Leather/textile/other (specify)
	Limited flame spread category		A1 or A1+A2

ANNEX-A

GROUPING GUIDELINES

The following grouping guidelines shall apply for Grant of Licence (GoL)/Change in Scope of Licence (CSoL):

- i. Sample of each class intended to be covered in the scope of licence (i.e. Class 1 and Class 2) shall be tested.
- ii. Sample of each type intended to be covered in the scope of licence shall be tested.
- iii. To cover reusable garment in the scope of licence, the sample shall be tested after subjecting it to the declared number of cleaning cycles. If the number of cleaning cycles is not specified, the tests shall be carried out after five cleaning cycles (a cleaning cycle is one wash and one dry cycle)
- iv. If sample with additional protective garments is tested then without additional protective garments may also be covered in the scope of licence.
- v. Samples shall be so selected and tested such that each material being used to make the product is tested.
- vi. For limited flame spread, in case A1+A2 category 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).
- vii. Scope of licence shall be restricted based on the manufacturing and testing facilities available.
- viii. 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/Chemical
1)	Size designation and fit, Cl. 4.3, Pockets and flap closures, Cl. 4.5, Closures and seams, Cl. 4.6	Measuring Scale, Measuring steel Tape, Vernier caliper, Angle protractor
2)	Tensile strength, Cl. 6.2	Digital tensile testing machine with variable speed drive, thickness gauge
3)	Tear strength, Cl. 6.3	Digital tensile testing machine with variable speed drive and with tear attachment , thickness gauge, press knife
4)	Burst strength of knitted materials and seams, Cl. 6.4	Burst test apparatus
5)	Seam strength, Cl. 6.5	Digital tensile testing machine with variable speed drive, thickness gauge
6)	Dimensional change of textile materials, Cl. 6.6	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
7)	Limited flame spread, Cl. 6.7	Limited flame spread test set up with specimen holder, supporting pins, spacer stubs, gas burner, mounting frame, templates, timing devices
8)	Impact of spatter (small splashes of molten metal), Cl. 6.8	Apparatus comprising of Device for producing molten drops, Drop guide, Sensor for measuring the temperature linked to a recording device, holding frame for the test specimen, and steel rods (as per ISO 9150)
9)	Heat transfer (radiation), Cl. 6.9	Radiant heat test set up consisting of 6 silicon carbide heating rod, copper disc calorimeter, specimen holder and data logger and indicator, test frame
10)	Electrical resistance, Cl. 6.10	Apparatus in accordance with the test method specified in EN 1149-2
11)	Fat content of leather, Cl. 6.11	Soxhlet extraction apparatus, Filter paper thimbles, of suitable sizes, or suitable glass filter bells, Oven, capable of being maintained at (102 ± 2) °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

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 the same class (Class 1/2), type (single garment/two piece garment), variety (Single use/reusable), Limited flame spread category (A1/(A1 + A2)) & manufactured from the same consignment of fabric/hardwares under similar conditions.

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 Methods			No. of Sample	Frequency	Remarks
4	General and design requirements	Clause	Reference				
4.1	General requirements		ISO 13688	R	Firm to have adequate in-process controls to check compliance of this parameter as per the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.Garments of Each size to be checked for conformity in rotation.		
4.2	Protective clothing	4.2	IS 16655				
4.3	Size designation and fit		ISO 13688				
4.4	Additional protective garments (optional)	4.4	IS 16655				
4.5	Pockets and flap closures	4.5	IS 16655				
4.6	Closures and seams	4.6	IS 16655				
4.7	Hardware	4.7	IS 16655				
6	General performance requirements						
6.2	Tensile strength	--	IS 1969 (Part 1)/ ISO 13934-1 (woven outer materials IS 5914/ ISO 3376 (leather outer materials)				
6.3	Tear strength	--	IS 6489 (Part 2)/ISO 13937-2,				
					One		

6.4	Burst strength of knitted materials and seams	--	IS 1966 (Part 1) : 2009 Textiles — Bursting properties/ISO 13938-1 or IS 1966 (Part 2)/ISO 13938-2	R		Each Control Unit	
6.5	Seam strength	--	IS/ISO 13935-2,				
6.6	Dimensional change of textile materials	--	IS 9/ISO 5077				
6.7	Limited flame spread	--	IS 15758 (Part 4)/ISO 15025, Procedure A and Procedure B (code letter A2) (optional)	S	It shall be carried out once for existing raw material and whenever there is a change in the raw material for manufacturing the product.		
6.8	Impact of spatter (small splashes of molten metal)	--	ISO 9150				
6.9	Heat transfer (radiation)	--	IS 15758 (Part 2)/ISO 6942, Method B				
6.10	Electrical resistance	--	EN 1149-2				
6.11	Fat content of leather	--	ISO 4048:2008				