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उत्पाद मैन्युअल
PROTECTION OF ARMS AND HANDS PART 6
PROTECTIVE GLOVES AGAINST MECHANICAL RISKS
IS 6994 (Part 6): 2021 के अनुसार

PRODUCT MANUAL
FOR PROTECTION OF ARMS AND HANDS PART 6
PROTECTIVE GLOVES AGAINST
MECHANICAL RISKS ACCORDINGTO
IS 6994 (Part 6): 2021

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.**	:	6994 (Part 6): 2021
	शीर्षक **Title**	:	FOR PROTECTION OF ARMS AND HANDS PART 6 PROTECTIVE GLOVES AGAINST MECHANICAL RISKS
	संशोधनों की संख्या **No. of amendments**	:	0
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चामाल** **Raw material**	:	Materials used in the manufacture of gloves shall conform to the requirement of innocuousness as per Cl. 4.2 of ISO 21420:2020. Conformity of materials to the requirement of the specification may be established through either of the following or a combination of the same: Test report from a laboratory recognized by the Bureau/ Government laboratories empanelled by the Bureau/NABL accredited laboratories/ Material supplier's test certificate/ In house factory test report.

			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**	:	*25 Pairs* 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.	**एक दिन में संभावित परीक्षण** **Possible tests in a day**		
	All tests are possible in a day, provided that conditioned samples are available. 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 6994 (Part 6): 2021 with the following scope:		
	Name of the product		FOR PROTECTION OF ARMS AND HANDS PART 6 PROTECTIVE GLOVES AGAINST MECHANICAL RISKS
	Material		Woven Fabric, Knitted Fabric, leather or other materials (To be declared)
	Layer		Single layer/Multilayer (no. of layers to be specified in case of multilayer)
	Bonding		Bonded/Unbonded
	Size		4/5/6/7/8/9/10/11/12/13/Free size
	Level of performance (Abrasion resistance, Blade cut resistance, Tearing resistance and Puncture resistance) or Level of performance for material (Cut Resistance)		Level 1/Level 2/Level 3/Level 4/Level 5 (Performance Parameters to be declared) Or Level A/Level B/Level C/Level D/Level E/Level F
	Additional/ Optional Requirement		With/Without Electrostatic properties With/Without Impact Protection

ANNEX-A

GROUPING GUIDELINES

I. Gloves may be made of Woven Fabric, Knitted Fabric, leather or other materials.

II. Based on the level of performance of the protective gloves (Table-1 of IS 6994 (PART 6): 2021), they have been categorized as below:

Abrasion Resistance	Level 1/Level 2/Level 3/Level 4
Blade cut resistance	Level 1/Level 2/Level 3/Level 4/Level 5
Tear Resistance	Level 1/Level 2/Level 3/Level 4
Puncture Resistance	Level 1/Level 2/Level 3/Level 4

III. Gloves have also been categorized in 6 Levels, based on level of performance of the material (Table-2 of IS 6994 (PART 6): 2021):

Cut Resistance	Level A/Level B/Level C/Level D/Level E/Level F

IV. Furthermore, categorization has been done based on the additional/optional properties (i.e. Impact Protection and Electrostatic properties), no. of layers, bonding and reusability.

Considering the above, following grouping guidelines for GoL/ CSoL have been developed:

a) The material of the glove, whether Woven Fabric, Knitted Fabric, leather or other is to be declared and separate sample of gloves made of each type of material shall be tested to include that particular material in the scope of licence.

b) Single layer gloves and Multilayer gloves are to be tested separately in order to be included in the scope of the lcence.

c) Bonded and Unbonded protective gloves are to be tested separately In order to be included in the scope of the lcence.

d) Samples of the gloves with largest size shall be tested to cover all smaller sizes in the scope of licence (in case hand sizes other than that given in Annex B of ISO 21420:2020 are to be covered, manufacturer shall declare the hand circumference and hand length for such sizes of gloves). In case, free size protective gloves are to be included in the scope, the same shall be tested separately.

e) A protective glove against mechanical risks shall have performance level of 1 or above for at least one of the properties (abrasion, blade cut, tear and puncture) Table 1 of IS 6994: PART 6: 2021 or at least level A of the cut test of ISO 13997:1999 (e.g. TDM) in Table 2 of IS 6994: PART 6: 2021.

f) Protective gloves of each level of performance (Table-1) shall be tested to cover that particular level in the scope of licence.

g) Similarly, gloves of each level of performance of the material (Table-2) shall be tested to cover that particular level in the scope of licence.

h) If gloves with Additional property (Electrostatic properties) are intended to be covered in the scope of licence, samples above shall be tested for Electrostatic properties

i) If gloves with Additional property (Impact Protection) are intended to be covered in the scope of licence, samples above shall be tested for Impact Protection.

j) Scope of licence shall be restricted based on the manufacturing and testing facilities available.

k) 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	Sizing and measurementof gloves, 5.1	Arrangement for freely suspending the glove with the middle finger on a vertical graduated ruler having a rounded tip so as to fit the shape of the finger tip of the glove. Calipers, measuring tape, measurement scale
2	Dexterity, 5.1	Five solid, centreless ground stainless steel test pins arerequired, each 40 mm ± 1 mm long and of diameter respectively of 5 mm, 6,5 mm, 8 mm, 9,5 mm, 11 mm (diameter tolerance ±0,2 mm). flat surface, e.g. a table top
3	Water vapour behavior,5.1	Apparatus for testing leather materials (as per ISO14268) • Containers, in the form of jars or bottles, with aneck of internal diameter 30 mm ± 3 mm fitted with a screw top with a circular opening whose diameter is equal to the internal diameter of theneck. • Test machine • Vertically mounted turntable • Fan, mounted in front of the mouths of the containers, consisting of three flat blades inplanes that are inclined 120° to one another • Self-indicating silica gel desiccant • Balance, weighing to 0.001 g • Stop clock, reading to 1 min • Vernier callipers, reading to 0.1 mm and capable of measuring the internal diameter of the necks ofthe containers • Press knife, as specified in ISO 2419, capable of cutting circular test pieces of a suitable size to allow a good seal at the open end of the container • Beeswax or other suitable inert sealant • Abrasive paper, grade P180 • Flex machine, as specified in ISO 5402-1, if testpieces are to be subjected to flexing prior to test • Standard laboratory apparatus Apparatus for textile materials (as per IS 17276:2020/ISO11092:2014) • Measuring unit, with temperature and watersupply control • Thermal guard with temperature control • Test enclosure

4	Water vapour absorption,5.1	Apparatus of testing water vapour absorption of leathermaterials (as per IS 15298 (Part 1) : 2015/ ISO 20344 :2011) • Circular metal container (volume 100 cm3) and anupper ring, between which the impermeable material and the test piece are clamped • Balance, capable of weighing to the nearest 0.001g. • Stopwatch.
5	Abrasion resistance, clause 4.1 & Table 1	Abradant Double-sided adhesive tape Martindale testing apparatus ((9,0 ± 0,2) kPa.) as per ISO 12947-1
6	Blade cut resistance, clause 4.1 & Table 1	The coupe test equipment as per clause 6.2.2 of IS 6994: Part 6: 2021. Control specimen as per clause 6.2.4 of IS 6994: Part 6: 2021.
7	Tear resistance, clause 4.1 & Table 1	Tensile testers of at least Class 2 according to ISO 7500-1, equipped with low inertia force measurement systems shall be used.
8	Puncture resistance, clause 4.1 & Table 1	Resistance test apparatus as per clause 6.5.2 of IS 6994: Part 6: 2021.
9	Cut resistance method, clause 4.1 & Table 2	Cut resistance test apparatus as per clause 6.2 of IS 17466: 2020.
10	Impact test, clause 4.2	Test equipment as per clause 5 of EN 1621-1.

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 differenttests 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 protective gloves with same no. of layers, type of bonding, size, level of performances (i.e. abrasion resistance, blade cut resistance, tear resistance, puncture resistance, cut resistance, electrostatic property and impact protection) and no. of use, made with same raw material and under similar conditions of manufacturing in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommendedlevels 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 requirementsof 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 housetesting 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 givenbelow. 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 perIS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testingfacility 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 facilitiesor get testing done from BIS recognized/empaneled laboratory or any other laboratory having validNABL accreditation as per IS/ISO/IEC 17025.

2.3 **Large Scale manufacturers shall maintain an in-house laboratory equipped at least withtest facilities for routine tests (indicated as “R” in Column 2 of Table 1)**, where

different testsgiven 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 theprovisions 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 commoncluster 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 laboratoryor 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 each protective glove and its packaging, 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 additionalrequirement on each protective glove and its packaging:

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, m2016.

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
		Clause	Reference				
Cl. 4.1	**General**						
i)	Glove design and construction — General	4.1	ISO 21420:2020	R	Firm to have adequate in- process controls to check compliance of this parameteras per the Indian Standard. However, appropriate records shall be maintained by the manufacturer forevidence of conformity		
ii)	Innocuousness of protective gloves	4.2	ISO 21420:2020	S	One	Once in six months (and whenever there is a change in the raw material for manufacturing the product)	Conformity of materials to the requirement of the specification may be established through either of the following or a combination of the same: Test report from a laboratory recognized by the Bureau/ Government laboratories empanelled by the Bureau/NABL accredited laboratories; Material supplier’s test

							certificate; In house factory test report.
iii)	Electrostatic properties (Optional)	4.4	ISO 21420:2020	S	One	Once in six months	
iv)	Sizing and measurement of gloves	5.1	ISO 21420:2020	R	Firm to have adequate in- process controls to check compliance of this parameteras per the Indian Standard. However, appropriate records shall be maintained by the manufacturer forevidence of conformity		
v)	Dexterity	5.2	ISO 21420:2020	R	Firm to have adequate in- process controls to check compliance of this parameteras per the Indian Standard. However, appropriate records shall be maintained by the manufacturer forevidence of conformity		
vi)	Water vapour transmission	5.3.1	ISO 21420:2020	S	One	Once in six months (and whenever there is a change in the raw material for manufacturing the product)	
vii)	Water vapour absorption	5.3.2	ISO 21420:2020	S	One	Once in six months	
Cl. 4.1 & Table 1	Abrasion resistance	6.1	6994 (Part 6)	R	One	Each Control Unit	
Cl. 4.1 & Table 1	Blade cut resistance	6.2	6994 (Part 6)	R	One	Each Control Unit	
Cl. 4.1 & Table 1	Tear resistance	6.4	6994 (Part 6)	R	One	Each Control Unit	
Cl. 4.1 & Table 1	Puncture resistance	6.5	6994 (Part 6)	R	One	Each Control Unit	
Cl. 4.1 & Table 2	Cut resistance method	--	ISO 13997	R	One	Each Control Unit	

Cl. 4.2	Impact test (Optional)	6.6	EN 13594	R	One	Each Control Unit	