



उत्पाद मैनुअल
व्यक्तिगत फॉल अरेस्ट प्रणाली - विशिष्ट
भाग 9 नीचे उतरने के यंत्र
IS 3521 (Part 9):2021 के अनुसार

PRODUCT MANUAL
Personal Fall Arrest Systems – Specification
Part 9: Descending Devices
ACCORDING TO IS 3521 (Part 9):2021

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने 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 लाइसेंस/प्रमाणपत्र 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 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.	उत्पाद Product	:	IS 3521 (Part 9) : 2021/ ISO 22159 : 2007
	शीर्षक Title	:	Personal Fall Arrest Systems – Specification Part 9: Descending Devices
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Materials of all components including descent lines shall conform to the requirements as per Cl 4.1 and 4.2 of IS 3521 (Part 9)

b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex-A
c)	नमूने का आकार Sample Size	:	Approximately 4-8 samples may be required without considering optional requirements. However actual Sample Size shall be decided as per the applicability of the tests accordance with Table-01 of IS 3521 Part 9
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex-B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex-C
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	Since testing facility is not available in any BIS/BIS recognized lab, complete testing has to be carried out in the Factory for Certification and during surveillance. 4 days inspection required for complete testing with a gap on 4th day because of the conditioning.		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	"Licence is granted to use Standard Mark as per IS 3521 (Part 9) : 2021 with the followingscope:		
	Name of the product	Specification for Personal Fall Arrest System: Part 9 Descending Devices	
	Type	Type-1, Type-2, Type-3, Type-4, Type-5, Type-6	
	Class (In Case of Type-1 & Type-2 only)	Class-A, Class-B, Class-C, Class-D	
	Suitability of travel with user (For Type 2 to Type 6 Descending Devices only)	Descending devices that normally travel with the user / Descending devices that normally do not travel with the user	
	Rated Load	Maximum & Minimum Rated Loads (To be declared by the Manufacturer for each type and class of descending devices)	
	Descent Height	Maximum Descent Height (To be declared by the Manufacturer for each type and class of descending devices)	
	Material of Descent Line	Textile Descent Line/Wire Rope Descent Line	
	Suitability for wet and cold and very cold conditions (optional requirement)	Suitable to be used in a Temperature range of -4°C to +2°C and/or suitable to be used in a Temperature less than -4°C (lowest Temperature in °C to be declared by manufacturer)	

ANNEX – A

GROUPING GUIDELINES

1. For the purpose of Grant of Licence/Change in Scope of Licence, the following grouping guidelines shall apply

a) Samples of descending devices of each type i.e. Type-1, Type-2, Type-3, Type-4, Type-5, Type-6 shall be tested

b) In case of type 1 and type 2 samples, if sample of the highest class is tested, lower classes can be covered in the scope on that basis **except for class D** i.e. in case type 1 class A sample is tested, type 1 class B, C can also be covered in the scope on that basis. **However, sample of class D shall be tested separately.**

c) In case Descending devices that normally travel with the user are intended to be covered in the scope of the licence, the samples shall be tested for Holding load test for descending devices that normally travel with the user. Similarly, in case Descending devices that normally do not travel with the user are intended to be covered in the scope of the licence, the samples shall be tested for Holding load test for descending devices that normally do not travel with the user.

d) If the descending devices of Higher Class having Higher Maximum rated load and Maximum descent Height (as declared by the manufacturer) is tested then the descending devices of lower Class having lower maximum rated load and lower maximum descent Height of same type will be covered in the scope of the License.

e) Samples of descending devices of each type of descent line material i.e. Textile Descent Line and Wire Rope Descent Line, intended to be covered in the scope, shall be tested separately.

f) In case descending devices Suitable to be used in a Temperature range of -4°C to +2°C (wet and cold) and/or suitable to be used in a Temperature less than -4°C (Very cold) are intended to be covered in the scope of licence, the samples shall be conditioned and tested as per the applicable additional requirements specified (optional requirement)

2. The manufacturer shall submit a list of models of descending devices to BIS indicating the applicable type/class/rated load etc. (as per the scope of the licence) for each model. The list shall be updated by the manufacturer as and when there is any change (an undertaking to this effect shall be submitted to BIS).

3. The scope of the licence shall be restricted based on the manufacturing and testing facilities available.

3. During the operation of the licence, samples of all varieties covered in the scope of licence shall be drawn in rotation, to the extent possible.

ANNEX-B

LIST OF TEST EQUIPMENTS

Major test equipment required to test as per the Indian Standard

Sr. No.	Test Equipment	Tests used in with Clause Reference
1	• Tensile Test Machine with Appropriate Fixtures • Measuring Tape	Descent line Residual Static strength Clause 4.4
2	• Tensile Test Machine with Appropriate Fixtures • Digital Temperature & Humidity Indicator • Measuring Tape • Stop Watch	Static strength Test Clause 4.7
3	• Test Structure (testing tower) • Stop Watch • Measuring Tape • Quick-release Device • Maximum Rated Load 100 kg • Digital Temperature & Humidity Indicator • Water container	Dynamic Performance Test Clause 4.8
4	• Descent Energy testing setup • Digital Temperature & Humidity Indicator • Maximum Rated Load 100 kg • Load Cell	Descent Energy Test Clause 4.9
5	• Descent Energy testing setup • Digital Temperature & Humidity Indicator • Water container • Load Cell • Maximum Rated Load as declared by the manufacturer in kg • Minimum Rated Load as declared by the manufacturer in kg	Descent Velocity Test Clause 4.10
6	• Infrared Thermometer	Temperature Rise test Clause 4.11
7	• Descent Energy testing setup • Digital Temperature & Humidity Indicator • Water container • Load Cell • Maximum Rated Load 100 kg • Minimum Rated Load 30 kg	Function test Clause 4.13

8	Salt Spray Test Chamber as per ISO 9227	Corrosion Resistance Test Clause 4.14
9	- Anchor Point as per Fig7/Fig8 of IS 3521 Part 9:2021. - Force Measuring Device - Puller for applying the required load - Measuring Tape	Holding Load Clause 4.6.1,4.6.2 & 4.6.3
10	Conditioning (CI 4.15)	Conditioning chamber(s) suitable for conditioning descending device and descent line at i) A temperature of 10 +0/-1% humidity ii) A temperature of -4 +0/-2°C (If the manufacturer claims that the descending device and descent line can be used in the temperature range between -4 °C and +2 °C) iii) Temperature less than -4 °C (temperature as specified by the manufacturer)(If the manufacturer claims that the descending device and descent line can be used in temperatures less than -4 °C) Immersion tank, insulating blanket

The least count and range of test equipment should match value/ parameters/ tolerances mentioned in the Indian Standard.

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

ANNEX C

SCHEME OF INSPECTION AND TESTING

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

1.1 The manufacturer shall prepare and implement a calibration plan for the test equipment.

2. **TEST RECORD-** The manufacturer shall maintain test records for the tests carried out to establish conformity.

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

3.1 Each Descending Device and their Packing shall be clearly and indelibly marked to give the information as per clause 6 of IS 3521 (Part 9). In addition, the following details shall be marked legibly and indelibly:

The BIS license number

b) BIS website details i.e. – “For details of BIS certification please visit www.bis.gov.in” (in case of space constraints, may be marked only on the package).

3.2 In addition, for each descending device, the manufacturer shall supply instructions for use, for maintenance, for periodic detailed inspection and (where appropriate) for repair, including the descent line where the descent line is integrated with the descending device as per Cl. 7 of IS 3521 (Part 9)

3.3 Manufacturers should take all reasonable care to ensure that descending devices (and other accompanying components) are packaged to prevent damage and deterioration during transportation. Where severe environmental conditions exist, or special conditions of supply are specified (e.g. for long-term storage or transportation requirements), arrangements should be specified by the purchaser and agreed by the manufacturer.

4. **CONTROL UNIT-** The manufacturer shall submit a list of models of descending devices to BIS indicating the applicable type/class/rated load etc. (as per the scope of the license) for each model. For the purpose of this scheme, All the descending devices of the same model in the quantity of 100 nos. or Fortnight production, whichever is earlier manufactured from the same consignment of the raw materials constitute a control unit

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

5.1 All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark.

6. **REJECTION** - 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
LEVELS OF CONTROL

Test Details				Levels of Control			
Cl.	Requirement	Test Methods		Test equipment requirement R: required (or) S: Sub-contracting permitted	No. of Sample s	Frequency	Remark s
		Clause	Reference				
4.1	General						
4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.8	Material, Workmanship & Finish	4.1.3 & 4.1.4	IS 3521 Part9:2021	R*	All	Each Control Unit	*For establishing conformity of material, no testing is required if material is accompanied by supplier's test certificate or test report of an NABL accredited lab
4.1.9	Connectors (when Supplied with Descending device)	4.1.9	IS 3521 Part9:2021	R*	All	Each Consignme nt	*no testing is required if material is accompanied by supplier's test certificate or test report of an NABL accredited lab
4.2	Descent Line Basic Requirements						
4.2.1	General	4.2.1	IS 3521 Part9:2021	R	All	Each Control Unit	
4.2.2	Textile Descent Lines	4.2.2	IS 3521 Part9:2021	R*	All	Each Consignme nt	*For establishing conformity of material, no testing is required if material is accompanied by
4.2.3	Wire Rope Descent Lines	4.2.3	IS 3521 Part9:2021	R*	All		

							supplier's test certificate or test report of an NABL accredited lab
4.3	Descent Line Stopper	4.3	IS 3521 Part9:2021	R	All	Each Control Unit	Visual
4.4	Descent Line Residual Static Strength	5.5.5	IS 3521 Part9:2021	R	01 Sample	Each Control Unit	
4.5	Rated Load	4.5.1 & 4.5.2	IS 3521 Part9:2021	R	All	Each Control Unit	
4.6	Holding Load						
4.6.1	Hands-free locking position: types 2, 3 and 4 descending devices	5.5.2	IS 3521 Part9:2021	R	01 Sample	Each Control Unit	
4.6.2	Panic locking position: types 2 and 3 descending devices	5.5.2					
4.6.3	Types 5 and 6 descending devices	5.5.2	IS 3521 Part9:2021	R	01 Sample	Each Control Unit	
4.7	Static Strength						
4.7.1	All types and classes of descending device except class D	5.5.3	IS 3521 Part9:2021	R	01 Sample	Each Control Unit	
4.7.2	Descending devices class D						
4.8	Dynamic performance	5.6	IS 3521 Part 9 :2021	R	02 Samples	Each Control Unit	
4.9	Descent energy	5.7.2	IS 3521 Part 9 :2021	R	01 Sample	Each Control Unit	
4.10	Descent Velocity	5.7.3	IS 3521 Part 9 :2021	R	02 Samples	Each Control Unit	
4.11	Temperature Rise	5.7.4	IS 3521 Part 9:2021	R	01 Sample	Each Control Unit	

4.12	Special requirements for descending devices class D	4.12.1 & 4.12.2	IS 3521 Part 9 :2021	R	All	Each Control Unit	Visual
4.13	Function						
4.13.1	Types 1 and 2 descending devices	5.8.1	IS 3521 Part 9 :2021	R	02 Samples	Each Control Unit	
4.13.2	Types 2, 3, 4, 5 and 6 descending devices (which Travel with the user)	5.8.2	IS 3521 Part 9 :2021	R	02 Sample	Each Control Unit	
4.13.2	Types 2, 3, 4, 5 and 6 descending devices (which do not Travel with the user)	5.8.3	IS 3521 Part 9 :2021	R	02 Sample	Each Control Unit	
4.14	Corrosion resistance	5.9	IS 3521 Part 9 :2021	R	01 Sample	Each Control Unit	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. 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.