



उत्पाद मानुयल
जल के बहाव और खिंचाव हेतु रबड़ होज़ और होज़ समुच्चय — विशिष्टि
IS 3549:2023/ISO 4641:2016 के अनुसार

PRODUCT MANUAL FOR
RUBBER HOSES AND HOSE ASSEMBLIES
FOR WATER SUCTION AND DISCHARGE - SPECIFICATION
ACCORDING TO IS 3549:2023/ISO 4641:2016

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग 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 3549:2023/ISO 4641:2016
	शीर्षक Title	:	जल के बहाव और खिंचाव हेतु रबड़ होज़ और होज़ समुच्चय Rubber Hoses and Hose Assemblies for Water Suction and Discharge
	संशोधन संख्या No. of Amendments	:	Nil
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	Manufacturer to submit declaration/ undertaking in compliance for Lining, reinforcement and cover as per Clause 61, 6.2 and 6.3 of IS 3549:2023/ ISO 4641:2016
b)	समूहिकरण दिशा निर्देश Grouping guidelines	:	कृपया Annex-ए देखें Please see Annex – A
c)	नमूनेका परिमाण Sample Size	:	5m Hose + 02 No Slab 150x150x2mm
d)	Additional information	:	Hydrostatic-pressure requirements (proof pressure test) as per Cl. 8.2.1 is to be done on full lengths of finished hose and on hose assemblies and shall be done in the factory itself.
3.	परीक्षण उपकरणों की सूची	:	कृपया Annex-B देखें

	List of Test Equipment		Please refer ANNEX – B
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-C देखें Please refer ANNEX – C
5.	एक दिन में संभावित परीक्षण Possible tests in a day :		
	(i) Materials and construction (ii) Dimensions (iii) Tensile strength of rubber lining and cover (iv) Elongation at break of rubber lining and cover (v) Proof pressure test (vi) Burst test (vii) Adhesion (viii) Resistance to suction flattening		
6.	लाइसेन्स का कार्यक्षेत्र / Scope of the Licence:		
	IS 3549:2023/ISO 4641:2016 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per IS 3549:2023/ISO 4641:2016 with the following scope:-		
	उत्पाद का नाम Name of the product	जल के बहाव और खिंचाव हेतु रबड़ होज़ और होज़ समुच्चय Rubber Hoses and Hose Assemblies for Water Suction and Discharge	
	प्रकार Type	Type 1 or/and Type 2 and/or Type 3	
	आकार Sizes	Nominal size of Hose.....mm	

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ANNEX -A
PRODUCT MANUAL FOR
RUBBER HOSES AND HOSE ASSEMBLIES FOR WATER SUCTION AND DISCHARGE
ACCORDING TO IS 3549:2023/ISO 4641:2016

Grouping Guidelines

1. Rubber Hoses and Hose Assemblies for Water Suction and Discharge as per IS 3549:2023/ ISO 4641:2016 are classified as follows: -

Group	Group 1	Group 2
Type	Type 1, Type 2 and Type 3	Type 1, Type 2 and Type 3
Nominal Size i.e. Bore (inside diameter)	16,20,25,31.5,40,	50, 63,80,100,125,150,160,200,250 & 315 mm

2. To cover the various sizes & types in the scope of the licence, the following guidelines of grouping based on their operating duty requirements for grant of licence/inclusion of new variety in the licence :-

For Group 1: Two samples, one each of highest and lowest sizes from each type shall be tested for all the requirements of the specification in order to cover the complete range of size & type in this group.

For Group-2: Three samples, one each of highest, lowest and any intermediate size from each type shall be tested for all the requirements of the specification in order to cover the complete range of size & type in this group.

It shall however be ensured and recorded that applicant/licensee has got complete manufacturing as well as testing facilities for the sizes & types required to be covered as per grouping.

3. During the operation of the Licence, BO shall ensure that all Sizes & types covered in the Licence are tested in rotation, to the extent possible.

ANNEX-B
PRODUCT MANUAL FOR
RUBBER HOSES AND HOSE ASSEMBLIES FOR WATER SUCTION AND DISCHARGE
ACCORDING TO IS 3549:2023/ISO 4641:2016

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.	Materials and construction, (Cl.6)	-Visual
2.	Dimensions and tolerances,(Cl.7)	-Air conditioner -Thermometer -Plug gauges -Tapered gauges -Micrometer -Vernier slide calipers or - internal calliper dial gaugewith rounded feet -Go-No Go plugs -Steel scale -Measuring tape
3.	Tensile strength and elongation at break of rubber lining and cover, (Cl.8.1.2)	-Tensile Testing machine - Dies and cutters -Thickness gauge -Cone gauge -Vernier Calipers
4.	Resistance to ageing, (Cl.8.1.3) (i) Change in tensile strength from original value (ii) Change in elongation at break from originalvalue	-Hot air oven with count hourmeter -Tensile Testing machine - Dies and cutters -Thickness gauge -Cone gauge -Vernier Calipers
5.	Hydrostatic-pressure requirements (proof pressure test), (Cl.8.2.1)	-Hydrostatic pressure testingapparatus with pressure measuring device -End plugs -Sliding Vernier Callipersor micrometer, -length measuring tape, -circumferential measuring tape (pi tape)

6.	Burst test, (Cl. 8.2.2)	-Hydrostatic pressure testing apparatus with pressure measuring device
7.	Resistance to bending (minimum bend radius as a function of nominal size) (Cl. 8.2.3)	<u>Method A1</u> The apparatus shall consist of two guides, A and B, guide A being fixed in a plane and guide B being movable in that plane, parallel to and in line with, guide A (Figure 1a of ISO 10619-1) OR <u>Method A2</u> The apparatus shall consist of two guides, A and B, guide A being fixed in a plane and guide B being movable in that plane, parallel to and in line with, guide A, and attached to a series of pulleys and weights (Figure 2 of ISO 10619-1) OR <u>Method B</u> The apparatus shall consist of a mandrel, having an outside diameter equal to twice the minimum bend radius specified for the hose, with an arc of at least 180° (Figure 3 of ISO 10619-1) However, if the minimum bend radius is not specified, the mandrel shall have an outside diameter of equal to 12 times the nominal bore of the hose. OR <u>Method C1 / Method C2</u> Hose test pieces, whose ends are connected to suitable tensioning device capable of bending the hose to its minimum bend radius and placed on three support trolleys. The trolleys would be placed underneath the hose at either end and at the middle of the hose sample (Figure 4 of ISO 10619-1)
8.	Resistance to suction flattening, (Cl. 8.2.4)	-Vacuum pump -Smooth, solid ball, with a diameter equal to 0.9 times the bore of the hose
9	Low-temperature flexibility, (Cl. 8.2.5)	<u>Method B</u> - Mandrel, having an outside diameter equal to twice the minimum bend radius specified for the hose, with an arc of at least 180° (Figure 3 of ISO 10619-1). However, if the minimum bend radius is not specified, the mandrel shall

		have an outside diameter of equal to 12 times the nominal bore of the hose. - Conditioning chamber
10	Adhesion, (Cl. 8.2.6)	-Adhesion Test machine capable of maintaining a substantially constant rate of traverse of the moving head during the test and fitted with an autographic recorder - Grips - Mandrel

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

ANNEX-C
PRODUCT MANUAL FOR
RUBBER HOSES AND HOSE ASSEMBLIES FOR WATER SUCTION AND DISCHARGE
ACCORDING TO IS 3549:2023/ ISO 4641:2016

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 and implement 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. PACKING AND MARKING** – The Standard Mark, as given in the Schedule of the licence, shall be marked on each piece of Rubber hose, provided always that the products marked conform to every requirements of the specification.
- 3.1 PACKING** - The material shall be packed and stored as per provisions of clause 12 of IS 3549:2023/ ISO 4641:2016.
- 3.2 MARKING** - The information as mentioned under clause 10.1 of IS 3549:2023/ ISO 4641:2016 shall be legibly and indelibly marked on each hose and the information as mentioned under clause 10.2 of IS 3549:2023/ ISO 4641:2016 shall be legibly and indelibly marked on each hose assembly. In addition, the following shall be incorporated on each hose/hose assembly:
 - i) BIS Licence No. (CM/L.....)
 - ii) For details of BIS certification details please visit www.bis.gov.in.
- 4. CONTROL UNIT** – For the purpose of the Scheme, the control unit shall be as follows:-
 - 4.1 Rubber Hose** – Rubber hose of the same type manufactured under similar condition of production and from the same type of rubber compound masticated and vulcanized at a time, shall constitute a control unit.
 - 4.2 Rubber Compound** – Rubber compound of the same type made in one cycle of mixing under similar conditions, shall constitute a control unit.
- 5. LEVELS OF CONTROL** - The tests as indicated in column 1 of Table 1 and the level 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.
- 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 LEVELS OF CONTROL
(Scheme of Inspection and Testing)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub- contracting permitted	Levels of Control		
Clause	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
7	Dimension and tolerances						
7.1 Table 3	Bore (Inside diameter)	7.1	IS 3549:2017	R	5	Each control unit	
7.2	Enlarged ends	7.2	IS 3549:2017	R	5	-do-	
7.3	Unit lengths	-	ISO 1307:2006 Table 2	R	5	-do-	
7.4	Lining	-	ISO 4671 Table 4	R	5	-do-	
7.5	Cover	-	- do-	R	5	-do-	
8	Physical Properties						
8.1.1 Table 1	Rubber Compounds	-	ISO 2393	R	2	Every fifth control unit	
8.1.2 Table 1	Tensile strength and elongation at break of rubber lining and cover	-	ISO 37	R	2	Each Control Unit	
8.1.2 Table 1	Elongation at break of rubber lining and cover	-	ISO 37	R	2	-do-	
8.1.3	Resistance to ageing- i) Change in tensile strength from original value ii) Change in elongation at break	-	ISO 188/ ISO 37	R	2	Every three months	

	from original value						
8.2	Performance requirements for hoses and hose assemblies						
8.2.1 Table 2 & Table 4	Hydrostatic-pressure requirements (proof pressure test) -Variation in length at max. working pressure -variation in O.D. at max. working pressure	-	ISO 1402	R	1	Each Control Unit	
8.2.2	Burst test	-	-do-	R	1	Every three months	
8.2.3 Table 3	Resistance to bending (minimum bend radius as a function of nominal size)	-	IS 443 (Part 10) : 2023/ISO 10619-1 : 2017	R	1	Every three months	
8.2.4	Resistance to suction flattening	-	ISO 7233	R	1	Each Control Unit	
8.2.5	Low-temperature flexibility	Method B	IS 443 (Part 11) : 2023/ISO 10619-2 : 2021	R	1	Every three months	
8.2.6 Table 4	Adhesion	-	ISO 8033	R	1	Each Control Unit	
8.2.7 Table 4	Ozone resistance of the cover	Method 2	ISO 7326:2006	R	1	Every three months	

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