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उत्पाद मैनुअल

संपीड़ित वायु रबड़ होज़ वस्त्रादी प्रबलित — विशिष्टि

IS 446 : 2025 के अनुसार

PRODUCT MANUAL

Rubber Hoses, Textile-Reinforced, for Compressed Air — Specification

ACCORDING TO IS 446 : 2025

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 446 : 2025
	शीर्षक Title	:	Rubber Hoses, Textile-Reinforced, for Compressed Air — Specification
	संशोधनों की संख्या No. of amendments	:	NIL
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	Not applicable
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer ANNEX –A
c)	नमूने का परिमाण Sample Quantity	:	10 meter

d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	Name of the product Type Class Category Sizes 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	
	(i) Construction (ii) Dimensions (iii) Tensile Strength & Elongation at break (iv) Proof Pressure (v) Change in length at proof pressure (vi) Minimum burst pressure (vii) Adhesion between components	
6.	लाइसेंस का दायरा /Scope of the Licence:	
	"Licence is granted to use Standard Mark as per IS 446 : 2025 with the following scope:	
	Name of the product	Rubber Hoses, Textile-Reinforced, for Compressed Air
	Type	Type 1 and/or Type 2 and/or Type 3
	Class	A and/or B and/or C
	Category	N-T and/or L-T
	Sizes	Inside diameter

**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN,9, BAHADUR SHAH ZAFAR MARG,
NEW DELHI-110002**

ANNEX-A
Grouping Guidelines

1. Rubber Hoses, Textile-Reinforced, for General-Purpose Water Applications as per IS 444 : 2025 are classified as follows: -

Type	Type 1, Type 2 and Type 3
Class	Class A, B, C
Category	Category N-T and/or L-T
Hose Size	4,5,6.3,8,10,12.5,16,19,20,25,31.5,38,40,51,63,76,80,100 & 102

2. To cover the various sizes & types, classes and categories in the scope of the licence, the following guidelines of grouping based on their pressure rating & internal diameter for grant of licence/inclusion of new variety in the licence :-

Types	Class	Category	Sizes		
			Group-1	Group-2	Group-3
Type 1	A/ B/ C	N-T and/or L-T	4 to 20 mm	25 to 51 mm	63 to 102mm
Type 2	A/ B/ C	N-T and/or L-T	4 to 20 mm	25 to 51 mm	63 to 102mm
Type 3	A/ B/ C	N-T and/or L-T	4 to 20 mm	25 to 51 mm	63 to 102mm

3. One sample of each type, class and category from each size group (preferably the highest size) shall be tested for all the requirements of the specification in order to cover the specified range of sizes of that type, class and category. It shall however be ensured and recorded that applicant/licensee has got complete manufacturing as well as testing facilities for the type, class and category and sizes required to be covered as per grouping.
4. During the operation of the Licence, BO shall ensure that hoses of all sizes & type, class and category covered in the Licence are 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
1	Dimensions (Clause 6)	– Air conditioner – Thermometer – Plug gauges – Tapered gauges – Micrometer – Vernier slide calipers or – Internal caliper dial gauge with rounded feet – Go-No Go plugs – Steel scale – Measuring tape
2	Tensile strength & elongation at break (Clause 7.1 & Table 2)	– Tensile Testing machine – Dies and cutters – Thickness gauge – Cone gauge – Vernier Calipers
3	Resistance to ageing (Clause 7.1 & table 2)	– Hot air oven with count hour meter – Tensile Testing machine – Dies and cutters – Thickness gauge – Cone gauge – Vernier Calipers
4	Resistance to liquids (Clause 7.1 & table 2)	– Total immersion apparatus – a stoppered glass bottle or tube – Apparatus for testing one surface only {Fig.1 of IS 3400 (Part 6):2012} – Balance, accurate to 1 mg. – micrometer dial gauge – scale graduated in divisions of 0.01 mm – test liquid as per table A.1 of Annex-A of IS 3400 (Part 6):2017
5	Proof pressure (Clause 7.2 & Table 3)	– Air conditioner – Thermometer – Hydrostatic pressure testing apparatus with pressure measuring device – End plugs
6	Change in length & diameter at max working pressure (Clause 7.2 & table 3)	– Sliding Vernier Calipers or micrometer, – Length measuring tape, – circumferential measuring tape (pi tape)
7	Minimum burst pressure (Clause 7.2 & Table 3)	– Hydrostatic pressure testing apparatus with pressure measuring device – End plugs
8	Adhesion between components (Clause 7.2 & Table 3)	– 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
9	Flexibility at 23 °C (Clause 7.2 & Table 3)	– Air conditioner – Thermometer – Flexibility test equipment

ANNEX B

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:

Rubber Air Hose: All rubber hoses of the same type, class, category and size manufactured from a rubber compound masticated and vulcanized at a time shall constitute a control unit.

Rubber Compound: Rubber compound from mixing made in one cycle of mixing

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 each length of Rubber AIR Hose 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 each consumer pack of on each length of Rubber AIR Hose.

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				
5	Material and Construction	5	IS 446	R	5	Each Control Unit	Visual
6	Dimension	Appropriate record shall be maintained					
6.1	Internal diameters and tolerances		IS 15913	R	5	Each Control Unit	
6.2	Concentricity		-do-	R	5	Each Control Unit	
6.3	Tolerance of length		-do-	R	5	Each Control Unit	
6.4	Minimum thickness of lining and cover		-do-	R	5	Each Control Unit	
7	Physical properties						
7.1 & Table 2	Rubber compound						In case any of the samples fail to meet the relevant requirements the entire material in the central it shall be considered unfit for the purpose of marking. In case of any failure each control unit shall be tested till 5 consecutive control units are found to be satisfactory and only then frequency suggested in this table may be followed.

(i)	Minimum tensile strength		IS 3400 (Part1)	R	2	Each Control Unit	
(ii)	Minimum elongation at break		IS 3400 (Part 1)	R	2	Each Control Unit	
(iii)	Resistance to ageing: Change in tensile strength from original value (max). Change in elongation at break from original value (max)		IS 3400 (Part 1) & IS 3400 (Part 4)	R	1	Every Fifth Control unit	In case any of the samples fail to meet the relevant requirements the entire material in the control unit shall be considered unfit for the purposes of marking. In case of any failure each control unit shall be tested till 5 consecutive control units are found to be passing. Thereafter, frequency suggested in this table may be followed.
	Resistance to liquids Increase in volume		-	R	3	Each Control Unit	
	Increase in volume (max.) (Class B only)		IS 3400 (Part 6)	R	3	-do-	
	Increase in volume (max.) (Class C only)		-do-	R	3	-do-	
7.2 & Table 3	Finished hose						
(i)	Proof pressure		IS 443 (Pt 3)	R	1	Each Control Unit	

(ii)	Change in length at maximum working pressure		IS 443 (Pt 3)	R	1	Each Control Unit	
(iii)	Change in diameter at maximum working pressure		IS 443 (Pt 3)	R	1	---do---	
(iii)	Minimum burst pressure		IS 443 (Pt 3)	R	1	Each Control Unit	
(iv)	Adhesion between component		IS 3400 (Pt 24)	R	3	Each Control Unit	
(v)	Ozone resistance		ISO 7326	S	1	Once in six months	The testing of Resistance to Ozone shall be carried out once in six months and also at the time of any change in composition and/or source of raw material.
(vi)	Flexibility at 23°C		IS 12656	R	2	Each Control Unit	
(vii)	Low-temperature flexibility		IS 12657	S	1	Once in six months	The testing of low temperature flexibility shall be carried out once in six months and also at the time of any change in composition and/or source of raw material.

APPENDIX-1

XYZ COMPANY (REGISTERED OFFICE ADDRESS AND WORKS ADDRESS)

TEST CERTIFICATE NO. _____ DATED

SUPPLIED TO M/s _____ (Name and Address of Consignee)

It is certified that the material described below fully conforms to IS 446 : 2025.

The properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks License No. CM/L _____ are as indicated below against each order no. etc.

TEST RESULT

Order No. and date	Name of the material	Test	Requirement	Observed value	Control Unit/ Batch Number	Month and Year of manufacture	Quantity	Remarks
		Dimensions						
		Tensile strength & elongation at break						
		Resistance to ageing						
		Resistance to liquids						
		Proof pressure						
		Change in length & diameter at max working pressure						
		Minimum burst pressure						
		Adhesion between components						
		Flexibility						

Remarks: The material supplied conforms to requirement of IS 446 :2025

Tank Car/Tank Truck/Container Ship No.

Signature (XYZ Company)

TABLE 2
RECORD OF REPACKING OF Rubber Hoses

[illegible]