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SPECIFICATION FOR AIR HOSE OF RUBBER, HEAVY DUTY, WITH WOVEN REINFORCEMENT

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

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SPECIFICATION FOR AIR HOSE OF RUBBER, HEAVY DUTY, WITH WOVEN REINFORCEMENT

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 16 October 1965, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

0.2 Air hose of rubber is used for general purposes of conveying compressed air, in pneumatic tool services, rock drilling and mining operations. These hoses are built on mandrels. Depending on the material and nature of construction, it is possible to design this type of hose for light duty or heavy duty purposes.

0.3 At the time of revising IS : 446-1955*, the Rubber Products Sectional Committee responsible for the preparation of this standard felt that the requirements of heavy duty air hose are not covered by the same and decided that a separate standard be formulated on the subject. The present standard is recommended as suitable for working pressures upto 20 kg/cm^2.

0.4 Taking into consideration the views of producers, consumers, and technologists, the Sectional Committee felt that it should be related to the manufacturing and trade practices followed in this field and other overseas standards. Bore sizes, tolerances on internal and external diameters and length of hoses in this standard have also been brought in line with the draft proposal on hoses of the International Organization for Standardization.

0.5 The clauses **4.1** and **4.2** contained in this standard permit the purchaser to use his option regarding marking and packing. Further, clause **6.1** calls for agreement between the purchaser and the supplier, if tests are to be carried out on samples beyond three months from the date of supply.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Specification for air hose for pneumatic tools.

†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for air hose of rubber, heavy duty, with woven fabric reinforcement for compressed air including pneumatic-tool service, rock drill and mining. This hose in built on mandrels.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in **2** of IS : 443-1963* shall apply.

3. REQUIREMENTS

3.1 Construction — The hose shall be constructed of the following.

3.1.1 *Rubber Lining* — The rubber lining shall be reasonably uniform and free from air blisters, porosity and other surface defects. The lining shall be seamless and oil resistant.

3.1.2 *Reinforcement* — The reinforcement shall consist of plies of woven fabric applied on bias at approximately 45° angle. The woven fabric shall be well-frictioned or suitably spread on both sides with a rubber compound. The finishing end of the last ply shall overlap the start of the first ply by 6 mm minimum.

NOTE — Fabrics of cotton, rayon, polyamide, polyester or other equivalent fabrics may be used for reinforcement, provided test requirements specified in this standard are complied with.

3.1.3 *Rubber Cover* — The rubber cover shall be reasonably uniform and free from air blisters, porosity and other surface defects. The cover shall have a cloth-marked finish, and the whole shall be consolidated by wrapping and uniformly vulcanized.

3.2 Dimensions and Tolerances

3.2.1 *Diameters and Number of Plies* — The internal and external diameters of the hose and the minimum number of fabric plies shall be as prescribed in Table 1.

3.2.2 *Thickness of Lining and Cover* — The thickness of lining and cover of the hose for all sizes of internal diameter (Table 1) shall be not less than 2·5 mm.

3.2.3 *Length* — The standard length of the hose shall be 15 m.

3.2.3.1 The tolerance on standard or any specified length of the hose hose shall be ± 1 percent.

*Methods of sampling and test for rubber hoses (*revised*).

TABLE 1 INTERNAL AND EXTERNAL DIAMETERS AND NUMBER OF PLIES FOR AIR HOSE OF RUBBER, HEAVY DUTY, WITH WOVEN REINFORCEMENT

(*Clause* 3.2.1)

Sl No.	Internal Diameter	Tolerance on Internal Diameter	Minimum Number of Plies	External Diameter	Tolerance on External Diameter
(1)	(2)	(3)	(4)	(5)	(6)
	mm	mm	mm	mm	mm
i)	12·50	±0·75	6	31·0	±1·0
ii)	16·00		7	36·0	
iii)	20·00		6	38·0	
iv)	25·00	±1·25	7	45·0	±1·5
v)	31·50		7	51·0	
vi)	38·00		7	57·0	
vii)	50·00		7	70·0	

3.3 Tensile Strength and Elongation at Break of Lining and Cover — The tensile strength and elongation at break of the rubber used for the lining and cover of the hose shall be as specified in Table 2.

TABLE 2 TENSILE STRENGTH AND ELONGATION AT BREAK OF LINING AND COVER FOR AIR HOSE OF RUBBER, HEAVY DUTY, WITH WOVEN REINFORCEMENT

Sl No.	Characteristic	Requirements	
		Lining	Cover
(1)	(2)	(3)	(4)
i)	Tensile strength, kg/cm², *Min*	70	105
ii)	Elongation at break, percent, *Min*	300	350

3.4 Adhesion — The adhesion shall be such that the rate of separation does not exceed 25 mm per minute under a load of 4·5 kg for the following:

a) Between fabric plies,

b) Between lining and fabric, and

c) Between cover and fabric.

3.5 Accelerated Ageing — After ageing at 70° ± 1°C for a period of 168 h, the tensile strength and the elongation at break of the lining and cover shall not vary by more than +10 or −35 percent of the corresponding values, obtained before ageing.

3.6 Bursting Pressure (Hydraulic Test) — The hose test piece shall comply with the requirement specified in Table 3.

TABLE 3 REQUIREMENT FOR HYDRAULIC TEST FOR AIR HOSE OF RUBBER, HEAVY DUTY, WITH WOVEN REINFORCEMENT

Sl No.	Internal Diameter of Hose	Minimum Bursting Pressure
(1)	(2)	(3)
	mm	kg/cm²
i)	12·5	80
ii)	16·0	80
iii)	20·0	50
iv)	25·0	50
v)	31·5	50
vi)	38·0	50
vii)	50·0	50

3.6.1 The recommended working pressure shall be one-fourth of the minimum bursting pressure specified in Table 3.

3.7 Resistance to Oil (Oil Absorption Test) — The inner rubber lining shall be oil resistant. The increase in weight of the sample after immersion in axle oil, regular conforming to IS : 1628-1960*, at 27° ± 2°C for 72 hours, shall not exceed 15 percent of the original weight.

4. MARKING AND PACKING

4.1 Each length of the hose shall be indelibly marked adjacent to each end with:

a) manufacturer's name or trade-mark, if any, type of hose; and

b) month and year of manufacture, if specified by the purchaser.

4.1.1 Each length of the hose may also be suitably marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

*Specification for oil, lubricating axle, regular and premium.

4.2 The material shall be packed as agreed to between the purchaser and the supplier.

5. SAMPLING AND CRITERIA FOR CONFORMITY

5.1 For the purpose of ascertaining the conformity of the hose in a consignment to this specification, the scale of sampling and the criteria for conformity shall be as prescribed in **3** of IS : 443-1963*.

6. TESTS

6.1 Unless otherwise agreed to between the purchaser and the supplier, carry out all tests within three months from the date of receipt of the material by the purchaser.

6.2 Carry out tests regarding diameter, thickness, tensile strength, elongation at break, adhesion, accelerated ageing, bursting pressure (hydraulic test) and resistance to oil (oil absorption test) in accordance with IS : 443-1963*.

6.3 Do not take the measurements of diameters at points where there are bias joints in the fabric reinforcement of the hose.

*Methods of sampling and test for rubber hoses (*revised*).

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*Under print.