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Indian Standard

SPECIFICATION FOR BRAIDED
AIR HOSE OF RUBBER, HEAVY DUTY

(*Revised*)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 MATHURA ROAD
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Indian Standard

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Indian Standard

SPECIFICATION FOR BRAIDED AIR HOSE OF RUBBER, HEAVY DUTY

(Revised)

0. FOREWORD

0.1 This revised Indian Standard was adopted by the Indian Standards Institution on 1 April 1963, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was first published in 1958. In view of the adoption of metric system in the country, the Rubber Products Sectional Committee decided to replace the existing sizes of rubber hoses by rationalized metric sizes. It was, therefore, considered necessary to revise this standard. In this revised standard, rationalized metric sizes have been adopted; requirements for tensile strength, accelerated ageing and adhesion have been modified; and the requirement for permanent set has been deleted.

0.3 Taking into consideration the views of producers, consumers and technologists, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the prevailing manufacturing and trade practices in the country in this field. Furthermore, due consideration had to be given to the need for international co-ordination among standards prevailing in different countries of the world. These considerations led the Sectional Committee to consult B. S. 796 : 1955 Specification for Hose of Rubber with Cotton or Rayon Braided Reinforcements issued by the British Standards Institution.

0.4 Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to the latest version of the standard.

0.5 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 Rules for Rounding Off Numerical Values (*Revised*).

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The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

0.6 This standard is intended chiefly to cover the technical provisions relating to braided air hose of rubber, heavy duty, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for air hose of rubber, heavy duty, with braided cotton reinforcement for pneumatic tools, rock drill and mining.

NOTE — Rayon, nylon or any other equivalent yarns may be used for reinforcement provided test requirements specified in this standard are complied with.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given under 2 of IS : 443-1963 Methods of Sampling and Test for Rubber Hoses (*Revised*) shall apply.

3. SAMPLING AND CRITERIA FOR CONFORMITY

3.1 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 under 3 of IS : 443-1963.

4. CONSTRUCTION

4.1 The hose shall be constructed as specified in 4.1.1 to 4.1.3.

4.1.1 Inner Rubber Lining — The inner rubber lining shall be reasonably uniform, and free from air blisters, porosity and other surface defects. The lining shall be seamless and oil resistant. The oil resistance shall be measured by the method prescribed under 10 of IS : 443-1963, and the increase in weight of the sample after immersion in axle oil (conforming to IS : 1628-1960 Specification for Oil, Lubricating, Axle, Regular and Premium) at $27^{\circ} \pm 2^{\circ}\text{C}$ for 72 hours shall not exceed 15 percent of the original weight.

4.1.2 Reinforcement — The reinforcement shall consist of plies of cotton yarn (see Note under 1.1) firmly braided over the rubber lining. The plies of braid shall be so impregnated with a rubber compound that a distinct layer of rubber as braid insulation is formed between each ply.

4.1.3 Outer Rubber Cover — The outer rubber cover shall be reasonably uniform, free from air blisters, porosity and other surface defects. The cover of the moulded type hose shall be smooth or fluted, as required. The cover of the braided hose manufactured on mandrels shall have a cloth-marked finish, and the whole shall be consolidated by wrapping and uniformly vulcanized.

5. DIMENSIONS AND TOLERANCES

5.1 Diameters and Number of Plies — The internal and external diameters of the hose and the number of reinforcement plies shall be as given in Table I.

TABLE I INTERNAL AND EXTERNAL DIAMETERS AND NUMBER OF PLYS OF BRAIDED AIR HOSE OF RUBBER, HEAVY DUTY

SL No.	INTERNAL DIAMETER	TOLERANCE ON INTERNAL DIA	MINIMUM NUMBER OF PLYS	*EXTERNAL DIAMETER	TOLERANCE ON EXTERNAL DIA
(1)	(2)	(3)	(4)	(5)	(6)
	mm	mm	mm	mm	mm
i)	12.50	± 0.75	2	26.5	± 1.0
ii)	12.50	± 0.75	3	28.5	± 1.0
iii)	16.00	± 0.75	2	30.0	± 1.0
iv)	16.00	± 0.75	3	32.0	± 1.0
v)	20.00	± 0.75	2	34.0	± 1.0
vi)	20.00	± 0.75	3	36.0	± 1.0
vii)	25.0	± 1.0	3	42.0	± 1.5
viii)	31.5	± 1.0	3	48.5	± 1.5
ix)	38.0	± 1.5	3	55.0	± 1.5
x)	50.0	± 1.5	3	67.0	± 1.5

*In the case of fluted hoses, this measurement shall be taken on the top of the flutes and the depth of the flute shall not exceed 0.5 mm.

5.1.1 The diameters shall be measured by the method prescribed under 9 of IS : 443-1963 Methods of Sampling and Test for Rubber Hoses (Revised).

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5.2 Thickness of Lining and Cover — The thickness of the lining and cover shall be not less than that specified in Table II. The braids shall be separated by a distinct layer of rubber insulation.

TABLE II THICKNESS OF LINING AND COVER OF BRAIDED AIR HOSE OF RUBBER, HEAVY DUTY

SL No.	INTERNAL DIAMETER	THICKNESS	
		Lining	Cover
(1)	(2)	(3)	(4)
	mm	mm	mm
i)	Up to and including 20·00	2·5	2·5
ii)	Over 20·00	3·0	2·5

5.2.1 The thickness shall be measured by the method prescribed under **8** of IS : 443-1963 Methods of Sampling and Test for Rubber Hoses (*Revised*).

5.3 Length — The standard length of the wrapped type hose shall be 15 metres. The long-length moulded-type hose shall be supplied in coils of 150 metres standard length for sizes up to and including 25·0 mm internal diameter and 75 metres standard length for sizes over 25·0 mm internal diameter.

NOTE — A coil of the moulded type hose of size up to and including 25·0 mm internal diameter may consist of not more than three lengths, no one length of which shall be less than 15 metres. A coil of hose size over 25·0 mm internal diameter may consist of not more than two lengths, no one length of which shall be less than 15 metres.

6. TESTS

6.0 Unless otherwise agreed to between the purchaser and the supplier, all tests shall be carried out within three months of the date of receipt of the material by the purchaser.

6.1 Tensile Strength and Elongation at Break of Lining and Cover — When tested according to the method prescribed under **4** of IS : 443-1963, 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 III.

TABLE III TENSILE STRENGTH AND ELONGATION AT BREAK OF LINING AND COVER OF BRAIDED AIR HOSE OF RUBBER, HEAVY DUTY

(Clause 6.1)

Sl No.	CHARACTERISTIC	REQUIREMENT	
		Lining	Cover
(1)	(2)	(3)	(4)
		mm	mm
i)	Tensile Strength, kg/cm^2 , <i>Min</i>	70	105
ii)	Elongation at Break, percent, <i>Min</i>	300	350

6.2 Adhesion — When tested according to the method prescribed in 6 of IS : 443-1963 Methods of Sampling and Test for Rubber Hoses (*Revised*), 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:

- Between braids,
- Between lining and braid, and
- Between cover and braid.

6.3 Accelerated Ageing Test — After ageing as prescribed under 7 of IS : 443-1963, the tensile strength and elongation at break of the rubber used for the lining and cover of the hose shall not vary by more than ± 35 percent of the corresponding value obtained before ageing.

6.4 Hydraulic Test — When tested according to the method prescribed under 11 of IS : 443-1963, the hose shall comply with the requirements specified in Table IV.

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

7. MARKING

7.1 Each length of the wrapped type hose shall be indelibly marked adjacent to each end with:

- the manufacturer's name or trade-mark and hose denominations; and
- the month and year of manufacture, if required by the purchaser.

**TABLE IV REQUIREMENTS OF HYDRAULIC TEST FOR BRAIDED
AIR HOSE OF RUBBER, HEAVY DUTY**

(Clauses 6.4 and 6.4.1)

SL No.	INTERNAL DIAMETER	MINIMUM NUMBER OF PLYS	REQUIREMENT	
			Increase in External Diameter Under Pressure of 20.0 kg/cm ² , Percent, <i>Max</i>	Bursting Pressure, kg/cm ² , <i>Min</i>
(1)	(2)	(3)	(4)	(5)
	mm			
i)	12.5	2	7	55
ii)	12.5	3	7	70
iii)	16.0	2	7	50
iv)	16.0	3	7	65
v)	20.0	2	7	45
vi)	20.0	3	7	55
vii)	25.0	3	10	45
viii)	31.5	3	10	35
ix)	38.0	3	10	30
x)	50.0	3	12	28

7.2 For long-length moulded-type hose, the markings specified under **7.1** shall be made at intervals of 10 metres.

7.3 Each length of the hose of both wrapped and moulded types may also be 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.