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Indian Standard

SPECIFICATION FOR OIL AND SOLVENT RESISTANT HOSE OF RUBBER WITH WOVEN TEXTILE REINFORCEMENT

(Second Revision)

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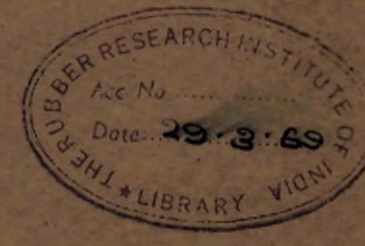

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

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(Second Revision)

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Indian Standard

SPECIFICATION FOR OIL AND SOLVENT RESISTANT HOSE OF RUBBER WITH WOVEN TEXTILE REINFORCEMENT

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 9 October 1968, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was originally published in 1955 and subsequently revised in 1964. In the present revision, outside diameters have been specified as recommendatory in Appendix A. The number of plies have been reduced wherever possible and cover thickness has also been brought down for bore sizes above 20 mm. The requirements for accelerated ageing test and proof pressure test have been added, and adhesion strength requirement has been lowered. These changes have been necessitated by the present line of thinking at the level of ISO/TC 45 ' Rubber ' of International Organization for Standardization and the current trade practices. Contrary to the line of thinking at ISO, the Committee felt that there should be two separate specifications — one for braided reinforcement and the other for woven reinforcement, even though both are put to the same end-use, in view of the distinct marketing practices in this country. The requirements for oil and solvent resistant hose of rubber with braided textile reinforcement are given in IS : 3418-1968*.

0.3 In preparing this standard, considerable assistance has been derived from draft ISO Recommendation No. 1307 ' Hose (bore sizes, test pressures and tolerances on length)'.

0.4 This standard contains Table 1 (Note 1) and clause **6.1** which call for agreement between the purchaser and the supplier.

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

*Oil and solvent resistant hose of rubber with braided textile reinforcement (*first revision*).

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

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for oil and solvent resistant hose of rubber with woven textile reinforcement suitable for conveying lubricating oils, transformer oils, vegetable oils (non-edible) and solvents having low aromatic content. The hose is designed for a working pressure of 7·0 kgf/cm² for nominal bore sizes up to and including 38 mm.

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 Materials

3.1.1 *Lining* — The lining shall consist of a rubber compound, resistant to oil and solvents.

3.1.2 *Reinforcement* — The reinforcement shall consist of woven fabric of natural or synthetic fibre.

NOTE — For reinforcement with cotton textiles, *see* IS : 4388 - 1967†.

3.1.3 *Cover* — The cover shall consist of a rubber compound, resistant to oil and solvent.

3.2 Construction

3.2.1 *Lining* — The lining shall be reasonably uniform in thickness, concentric and free from air blisters, porosity and splits. It shall be seamless and as smooth in the bore as is consistent with good manufacturing practice.

3.2.2 *Reinforcement* — The textile reinforcement shall consist of plies of woven fabric applied on bias at approximately 45° angle. The woven fabric shall be well rubberized on both sides with a rubber compound, resistant to oil and solvent. The finishing end of the last ply shall overlap the start of the first ply at least by 6·0 mm.

3.2.3 *Cover* — The cover shall be reasonably uniform in thickness, concentric and free from air blisters, porosity and splits. The cover may have a cloth marked finish and the whole shall be consolidated by wrapping and uniformly vulcanized.

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

†Specification for cotton fabrics for reinforcement of rubber hoses.

3.3 Dimensions

3.3.1 *Diameters and Reinforcement Plies* — The bore size when measured according to the method prescribed in **9.2** of IS : 443-1963* and the number of reinforcement plies of the hose shall be as given in Table 1.

TABLE 1 BORE SIZE AND NUMBER OF REINFORCEMENT PLIES

Nominal Bore Size	Tolerance on Nominal Bore Size	Number of Reinforcement Plies
(1)	(2)	(3)
mm	mm	
5	±0·75	2
6·3	±0·75	2
8	±0·75	2
10	±0·75	2
12·5	±0·75	2
16	±0·75	2
20	$\begin{cases}+0{\cdot}75\\-1{\cdot}25\end{cases}$	3
25	±1·25	4
31·5	±1·25	4
38	±1·50	4

NOTE 1 — Other sizes within this range may be supplied by agreement. The tolerance shall be those of the next smaller size.

NOTE 2 — Plies mentioned above may vary by 1 ply provided the hose meets with the requirements of this specification.

3.3.2 *Lining and Cover Thickness* — The thickness of lining and cover of the hose when determined according to **8** of IS : 443-1963* shall be not less than that specified in Table 2.

TABLE 2 LINING AND COVER THICKNESS

Nominal Bore Size	Lining Thickness	Cover Thickness
(1)	(2)	(3)
mm	mm	mm
Up to and including 20	1·5	1·0
Over 20	2·0	1·0

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

3.3.3 *Length* — The standard length of the hose shall be 15 metres.

3.3.3.1 The tolerance on any specified hose length shall be ±1 percent.

3.4 Requirements of Physical Tests on Finished Hose

3.4.1 *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 when tested according to **4** of IS : 443-1963* shall be as specified in Table 3.

TABLE 3 TENSILE STRENGTH AND ELONGATION AT BREAK OF THE LINING AND COVER

CHARACTERISTIC	REQUIREMENTS FOR LINING AND COVER
(1)	(2)
Tensile strength, kgf/cm², *Min*	55
Elongation at break, percent, *Min*	250

3.4.2 *Accelerated Ageing Test Requirement* — After ageing at 100°±1°C for a period of 72 hours, the rubber used for the lining and cover of the hose shall not vary more than ±25 percent for tensile strength and $^{+10}_{-45}$ percent for elongation at break of the corresponding values obtained before ageing, when tested according to **4** of IS : 443-1963*.

3.4.3 *Swelling Test* — The lining and cover of the hose after immersion in the test liquid shall not change in volume by more than +100 percent, when tested according to **13** of IS : 443-1963*.

3.4.4 *Adhesion Strength* — The strength of adhesion shall be such that the rate of separation does not exceed 25 mm per minute under 3·5 kg load for the following, when tested according to **6** of IS : 443-1963* :

a) Between reinforcement plies,

b) Between lining and reinforcement plies, and

c) Between cover and reinforcement plies.

3.4.5 *Hydraulic Test Requirement* — The minimum bursting pressure of the hose shall be not less than 21·0 kgf/cm², when tested according to **11** of IS : 443-1963*.

3.4.6 *Proof Pressure Test Requirement* — Samples of production length of hose when subjected to internal hydraulic pressure, 1·5 times that of working pressure for one minute, shall not show any rupture, leakage or porosity.

NOTE — This test should be carried out at the factory. If the hose is offered at places other than the factory, manufacturer's certificate should be accepted.

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

4. MARKING

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

a) the manufacturer's name or trade-mark, hose denomination; and

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

4.1.1 Each length of hose 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.

5. SAMPLING AND CRITERIA FOR CONFORMITY

5.1 For the purpose of ascertaining the conformity of the hose in a consignment of 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, all tests shall be carried out within three months from the date of receipt of the material by the purchaser.

APPENDIX A

(*Clause* 0.2)

RECOMMENDED MINIMUM OUTSIDE DIAMETER

A-1. DIAMETER

A-1.1 The recommended minimum outside diameter for various bore sizes of the hose should be as given in Table 4.

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

TABLE 4 RECOMMENDED MINIMUM OUTSIDE DIAMETER

(*Clause* A-1.1)

Nominal Bore Size	Recommended Minimum Outside Diameter
(1)	(2)
mm	mm
5	12·0
6·3	13·0
8	15·0
10	17·0
12·5	19·5
16	23·0
20	28·0
25	35·0
31·5	42·0
38	48·5