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*Indian Standard*

# SPECIFICATION FOR WATER HOSE OF RUBBER, HIGH PRESSURE, WITH WOVEN REINFORCEMENT

*( Revised )*

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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# *Indian Standard*

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## *( Revised )*

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# *Indian Standard*

# SPECIFICATION FOR WATER HOSE OF RUBBER, HIGH PRESSURE, WITH WOVEN REINFORCEMENT

## *( Revised )*

## 0. FOREWORD

**0.1** This Indian Standard ( Revised ) was adopted by the Indian Standards Institution on 24 December 1964, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

**0.2** Water hose of rubber prescribed in this standard is intended for purposes such as car washing and spraying of mild solutions of fungicides or insecticides not containing oils or tarry matter. It is built on mandrels and is suitable for application for pressure upto 28·5 kg/cm². The quality requirements of the basic components of this type of hose, namely, the lining or tube, that is, the surface with which water is in contact, the reinforcement which provides the strength necessary to withstand the internal pressure of water, the cover which protects the reinforcement from external damage, have been adequately covered in this standard.

**0.3** This standard was first published in 1953. In view of the experience gained during its use, the Rubber Products Sectional Committee decided to revise this standard. In the revision rationalized metric dimensions have been given, the requirements for tensile strength, accelerated ageing, adhesion test and hydraulic test have been modified and the requirement for permanent set has been deleted.

**0.4** Taking into consideration the views of producers, consumers and technologists, the Sectional Committee felt that it shall be related to the prevailing manufacturing and trade practices followed in the country in this field and other overseas standards on the subject. Bore sizes, tolerance on internal and external diameters of hoses and lengths, have also been brought in line with the draft proposal on hoses of International Organization for Standardization ( ISO ).

**0.5** Considerable assistance has also been drawn from B.S. 924-1943 ' Specification for rubber hose with woven fabric reinforcement ' issued by the British Standards Institution in formulating this standard.

**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.

## 1. SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for water hose of rubber, high pressure, with woven fabric reinforcement, and built on mandrels. This hose is used for purposes such as car washing and spraying of mild solutions of insecticides not containing oils or tarry matter.

## 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 seamless, reasonably uniform and free from air blisters, porosity and other surface defects.

**3.1.2** *Reinforcement* — The reinforcement shall consist of plies of woven fabric (*see* Note) 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 a minimum of 6 mm.

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

*Rules of rounding off numerical values (*revised*).

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

**TABLE 1 INTERNAL AND EXTERNAL DIAMETERS AND NUMBER OF PLIES FOR WATER HOSE OF RUBBER, HIGH PRESSURE, WITH WOVEN REINFORCEMENT**

( *Clause* 3.2.1 )

| Sl No. | Internal Diameter | Tolerance on Internal Diameter | Number of Fabric Plies | External Diameter | Tolerance on External Diameter |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| | mm | mm | | mm | mm |
| i) | 10·0 | ±0·75 | 5 | 23·0 | ±1·0 |
| ii) | 12·5 | ±0·75 | 6 | 28·0 | ±1·0 |
| iii) | 16·0 | ±0·75 | 6 | 31·5 | ±1·0 |
| iv) | 20·0 | ±0·75 | 7 | 37·0 | ±1·00 |

**3.2.2** *Thickness of Lining and Cover*

**3.2.2.1** *Lining* — The thickness of the lining shall be not less than 1·5 mm for hose size of 10·0 mm internal diameter and 2·0 mm for hose sizes above 10·0 mm internal diameter.

**3.2.2.2** *Cover* — The thickness of the cover for all hose sizes shall be not less than 1·5 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 shall be ±1 percent.

**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 WATER HOSE OF RUBBER, HIGH PRESSURE, WITH WOVEN REINFORCEMENT**

| Sl No. | Characteristic | Requirements for | |
|---|---|---|---|
| | | Lining | Cover |
| (1) | (2) | (3) | (4) |
| i) | Tensile strength, kg/cm², *Min* | 70 | 70 |
| ii) | Elongation at break, percent, *Min* | 250 | 250 |

**3.4 Adhesion** — The adhesion shall be such that the rate of separation does not exceed 25 mm per minute for the following, under the specified load:

| | *Specified Load* |
|---|---|
| a) Between fabric plies | 4·5 kg |
| b) Between lining and fabric | 4·0 kg |
| c) Between cover and fabric | 4·0 kg |

**3.5 Accelerated Ageing** — After ageing at 70 ± 1°C for the period of 168 hours, the tensile strength and 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 requirements as specified in Table 3.

**TABLE 3 REQUIREMENTS FOR HYDRAULIC TEST FOR WATER HOSE OF RUBBER, HIGH PRESSURE WITH WOVEN REINFORCEMENT**

| Sl No. | Internal Diameter of Hose | Minimum No. of Fabric Plies | Bursting Pressure *Min* |
|---|---|---|---|
| (1) | (2) | (3) | (4) |
| | mm | | kg/cm² |
| i) | 10·0 | 5 | 85 |
| ii) | 12·5 | 6 | 85 |
| iii) | 16·0 | 6 | 70 |
| iv) | 20·0 | 7 | 70 |

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

## 4. MARKING

**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, and type of hose; and

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

**4.2** 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.

## 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

**6.0** 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** Tests regarding diameter, thickness, tensile strength, elongation at break, adhesion, accelerated ageing and bursting pressure ( hydraulic test ) shall be carried out in accordance with IS : 443-1963*.

**6.1.1** The measurements of diameters shall not be taken at points where there are bias in the fabric reinforcement of the hose.

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

# INDIAN STANDARDS

## ON

## Rubber Hoses

| IS: | | Rs |
|---|---|---|
| 443-1963 | Methods of sampling and test for hoses (*revised*) ... ... | 3·50 |
| *444-1964 | Specification for hose of rubber, low pressure, with woven reinforcement (*revised*) ... ... ... ... | |
| 445-1964 | Specification for water hose of rubber, high pressure, with woven reinforcement (*revised*) ... ... ... ... | 1·50 |
| *446-1964 | Specification for air hose of rubber, light duty, with woven reinforcement (*revised*) ... ... ... ... | |
| *447-1964 | Specification for welding and cutting hose of rubber with woven reinforcement (*revised*) ... ... ... | |
| *635-1964 | Specification for oil and solvent resisting hose of rubber with woven reinforcement (*revised*) ... ... ... | |
| 636-1962 | Specification for fire fighting hose (rubber lined woven-jacketed) (*revised*) ... ... ... ... ... | 2·50 |
| 911-1963 | Specification for braided air hose of rubber, heavy duty (*revised*) ... ... ... ... ... | 1·50 |
| 912-1963 | Specification for braided air hose of rubber, light duty (*revised*) | 1·50 |
| 913-1963 | Specification for braided water hose of rubber, high pressure (*revised*) ... ... ... ... ... | 1·50 |
| 914-1963 | Specification for braided water hose of rubber, low pressure (*revised*) ... ... ... ... ... | 1·50 |
| 1677-1963 | Specification for braided spray hose of rubber, high pressure (*revised*) ... ... ... ... ... | 1·50 |
| 2396-1963 | Specification for braided hose of rubber for petrol and diesel fuels ... ... ... ... ... | 1·50 |
| 2410-1963 | Specification for suction hose of rubber for fire services ... | 1·50 |
| 2482-1963 | Specification for water suction hose of rubber, light duty ... | 1·50 |
| 2765-1964 | Specification for radiator hose ... ... ... | 2·50 |

*Under print.