

126  
IS : 5137 - 1969

*Indian Standard*  
SPECIFICATION FOR  
CEMENT GROUTING HOSE OF RUBBER  
WITH WOVEN TEXTILE REINFORCEMENT

UDC 621·643·3 : 678·4 : 693·546·3



© Copyright 1969

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

Price Rs 2·50

August 1969

*Indian Standard*  
SPECIFICATION FOR  
CEMENT GROUTING HOSE OF RUBBER  
WITH WOVEN TEXTILE REINFORCEMENT

Rubber Products Sectional Committee, CDC 6

<i>Chairman</i>	<i>Representing</i>
DR D. BANERJEE	National Rubber Manufacturers Ltd, Calcutta; and Association of Rubber Manufacturers of India, Calcutta
<i>Members</i>	
DR B. B. BHATIA	I.C.I. ( India ) Private Ltd, Calcutta
SHRI D. K. CHATTERJEE ( <i>Alternate</i> )	National Test House, Calcutta
SHRI S. K. BOSE	Railway Board ( Ministry of Railways )
SHRI A. GHOSH ( <i>Alternate</i> )	Export Inspection Council of India, Calcutta
SHRI DALIP KUMAR	SHRI P. K. CHATTERJEE ( <i>Alternate</i> )
SHRI G. C. DE	Ministry of Defence ( DGI )
SHRI S. L. GANDHI	Ministry of Defence ( R & D )
SHRI B. H. DALAL ( <i>Alternate</i> )	Rubber Board, Kottayam
SHRI K. K. GANGULY	Hindustan Steel Ltd, Ranchi
SHRI N. S. BANKER ( <i>Alternate</i> )	Inspection Wing, Directorate General of Supplies and Disposals, New Delhi
SHRI P. JOHN JACOB	The Cosmos India Rubber Works Private Ltd, Bombay
SHRI G. C. JAIN	SHRI PULIN L. KINARIWALA ( <i>Alternate</i> )
SHRI S. R. KOCHHAR	DR K. N. MODAK
SHRI LALIT MOHAN JAMNADAS	Indian Rubber Manufacturers Research Association, Bombay; and Indian Rubber Industries Association, Bombay
SHRI K. R. SENGUPTA ( <i>Alternate</i> )	Indian Rubber Industries Association, Bombay
SHRI S. MUKHERJEE	The Dunlop India Ltd, Calcutta
SHRI G. P. DUTTA ( <i>Alternate</i> )	Bata Shoe Co Private Ltd, Calcutta
SHRI S. C. NANDY	Synthetics and Chemicals Ltd, Bombay
SHRI M. M. PATEL	Directorate General of Technical Development, New Delhi
DR A. SEETHARAMIAH	DR N. V. C. RAO ( <i>Alternate</i> )

( Continued on page 2 )

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

**IS : 5137 - 1969**

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
SHRI D. D. TALWALKAR	All India Automobile & Ancillary Industries Association, Bombay
SHRI R. M. KHALADKAR ( <i>Alternate</i> )	
SHRI A. R. YAJNIK	Indian Oil Corporation Ltd (Marketing Division), Bombay
SHRI M. K. JAIN ( <i>Alternate</i> )	
SHRI D. DAS GUPTA, Director (Chem)	Director General, ISI ( <i>Ex-officio Member</i> )
	<i>Secretary</i>
	SHRI N. R. SRINIVASAN
	Deputy Director (Chem), ISI

**Hoses Subcommittee, CDG 6 : 3**

<i>Convener</i>	
DR D. BANERJEE	National Rubber Manufacturers Ltd, Calcutta
	<i>Members</i>
SHRI S. L. GANDHI	Ministry of Defence (DGI)
SHRI B. H. DALAL ( <i>Alternate</i> )	
SHRI G. C. JAIN	Hindustan Steel Ltd, Ranchi
SHRI A. K. GHOSH ( <i>Alternate</i> )	
SHRI LALIT MOHAN JAMNADAS	The Cosmos India Rubber Works Private Ltd, Bombay
SHRI S. G. JAMBHEKAR ( <i>Alternate</i> )	
SHRI M. S. KRISHNASWAMY	Esso Standard Eastern Inc, Bombay
SHRI A. V. SUNDERARAMAN ( <i>Alternate</i> )	
SHRI K. LAL	Dunlop India Ltd, Calcutta
SHRI C. S. MANI ( <i>Alternate</i> )	
SHRI V. N. MAKER	Indian Rubber Industries Association, Bombay
SHRI LALIT MOHAN JAMNADAS ( <i>Alternate</i> )	
SHRI S. P. MULLICK	National Test House, Calcutta
SHRI R. NAGCHAUDHURI	Goodyear India Ltd, Calcutta
SHRI S. R. GANGULI ( <i>Alternate</i> )	
SHRI M. M. PATEL	Synthetics and Chemicals Ltd, Bombay
SHRI V. D. PENDSE	Swastik Rubber Products Ltd, Poona
SHRI D. D. TALWALKAR ( <i>Alternate</i> )	
DR N. V. C. RAO	Directorate General of Technical Development, New Delhi
SHRI G. R. INAMDAR ( <i>Alternate</i> )	
SHRI B. ROY	East India Rubber Works Private Ltd, Calcutta
SHRI S. V. SAMBAMURTI	Indian Oxygen Ltd, Calcutta
SHRI S. S. MAZUMDAR ( <i>Alternate</i> )	
SHRI K. S. SUBBANNA	Burmah-Shell Oil Storage & Distributing Co of India Ltd, Bombay
SHRI A. R. YAJNIK	Indian Oil Corporation Ltd (Marketing Division), Bombay

*Indian Standard*  
SPECIFICATION FOR  
CEMENT GROUTING HOSE OF RUBBER  
WITH WOVEN TEXTILE REINFORCEMENT

**0. FOREWORD**

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 23 May 1969, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

**0.2** These hoses are used for cement grouting purposes. Keeping the working condition in view, hoses suitable for working pressure up to 10.0 kgf/cm<sup>2</sup> have been prescribed in this standard. Recommended minimum outside diameters have been included in Appendix A for the guidance of the manufacturers and consumers.

**0.3** The nominal bore sizes prescribed in this standard are those recommended by ISO/TC 45 Rubber of International Organization for Standardization (ISO).

**0.4** This standard contains clauses 4.2 and 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.

---

**1. SCOPE**

**1.1** This standard prescribes the requirements, methods of sampling and test for cement grouting hose of rubber with woven textile reinforcement and built on mandrels. The hoses are designed for working pressures up to 10.0 kgf/cm<sup>2</sup>.

**2. TERMINOLOGY**

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

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

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

IS : 5137 - 1969

### 3. REQUIREMENTS

#### 3.1 Materials

**3.1.1 Lining** — The lining shall consist of a suitable rubber compound.

**3.1.2 Reinforcement** — The textile reinforcement shall consist of woven fabric of natural or man-made fibre.

NOTE — For reinforcement of cotton textiles see IS : 4388-1967\*.

**3.1.3 Cover** — The cover shall consist of a suitable rubber compound.

#### 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 smooth in the bore.

**3.2.2 Reinforcement** — Reinforcement shall consist of plies of woven fabric, applied on bias at approximately 45° angle. The woven fabric shall be suitably rubberized on both sides with a rubber compound. The finishing end of the last ply shall overlap the end of the first ply by a minimum of 6.0 mm.

**3.2.3 Braided Copper Wire** — One copper wire braid comprising of number of strands and of minimum breaking load of 9 kg shall be incorporated in one of the ply to provide electrical continuity along with the whole length of the hose. In case, two copper wires are used, the minimum composite breaking load shall be 9 kg.

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

#### 3.3 Dimensions and Tolerances

**3.3.1 Bore Sizes and Number of Plies** — The bore sizes and the tolerances of hose when measured according to the method prescribed in 9.1 of IS : 443-1963† shall be as given in Table 1. The minimum number of plies shall be as given in col 4 of Table 1.

**3.3.2 Lining and Cover Thickness** — The thickness of the lining shall be not less than 6.3 mm and that of cover not less than 1.5 mm, when tested according to 8 of IS : 443-1963†.

\*Specification for cotton fabrics for reinforcement of rubber hoses.

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

**TABLE 1 BORE SIZE, TOLERANCE AND NUMBER OF REINFORCEMENT PLYS**

( Clause 3.3.1 )

Sl No.	NOMINAL BORE	TOLERANCE ON NOMINAL BORE	MINIMUM NUMBER OF REINFORCEMENT PLYS
(1)	(2)	(3)	(4)
	mm	mm	
i)	25	$\pm 1.25$	4
ii)	31.5	$\pm 1.25$	3
iii)	38	$\pm 1.5$	5
iv)	50	$\pm 1.50$	5
v)	63	$\pm 1.50$	6
vi)	75	$\pm 2.00$	7

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

**3.3.3.1** The tolerance on hose length shall be  $\pm 1$  percent.

### 3.4 Requirement for Physical Characteristics 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 determined according to the method prescribed in 4 of IS : 443-1963\* shall be as specified in Table 2.

**TABLE 2 TENSILE STRENGTH AND ELONGATION AT BREAK OF LINING AND COVER**

Sl No.	CHARACTERISTIC	REQUIREMENTS	
		Lining	Cover
(1)	(2)	(3)	(4)
i)	Tensile strength kgf/cm <sup>2</sup> , <i>Min</i>	140	85
ii)	Elongation at break, percent, <i>Min</i>	500	300

**3.4.2 Hardness of Lining** — The international rubber hardness degrees ( IRHD ) of the lining shall be maximum 55 when determined according to IS : 3400 ( Part II )-1965†.

**3.4.3 Accelerated Ageing Test** — After ageing at  $70^{\circ} \pm 1^{\circ}\text{C}$  for a period of 72 hours, according to the method prescribed in IS : 3400 ( Part IV )-1965† the rubber used for the lining and cover when tested according to 4 of IS : 443-1963\* shall not vary by more than  $\pm 25$  percent for tensile strength and +10 and -30 percent for elongation at break of the corresponding values obtained before ageing.

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

†Methods of test for vulcanized rubbers : Part II Hardness.

‡Methods of test for vulcanized rubbers : Part IV Accelerated ageing.

## IS : 5137 - 1969

**3.4.4 Adhesion** — The adhesion when tested according to the method prescribed in **6** of IS : 443-1963\* shall be such that the rate of separation does not exceed 25 mm per minute under a load of 5.0 kg for the following:

- a) Between reinforcement plies,
- b) Between lining and reinforcement plies, and
- c) Between cover and reinforcement plies.

**3.4.5 Bursting Pressure** — The hose shall have a minimum bursting pressure of 40 kgf/cm<sup>2</sup>, when tested according to the method prescribed in **11** of IS : 443-1963\*.

**3.4.6 Proof Pressure Test** — Samples of production lengths of hose shall be subjected to internal hydraulic pressure of 1.5 times the working pressure for one minute. The hose shall not show any rupture, leakage or porosity, when tested according to the method prescribed in **12** of IS : 443-1963\*.

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

**3.4.7 Electrical Continuity** — Each manufactured length of hose shall be tested to show evidence of electrical continuity.

NOTE — 4.5 V battery or transformer and a 3.5 V, 0.3 A test bulb may be used for this test.

## 4. MARKING AND PACKING

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

- a) the manufacturer's name or trade-mark, if any;
- b) hose denomination; and
- c) 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.

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

**4.2 Packing** — 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. TEST METHODS

**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.

## APPENDIX A

( Clause 0.2 )

### RECOMMENDED MINIMUM OUTSIDE DIAMETER

**A-1.** The recommended minimum outside diameters for various bore sizes of hoses should be as given in Table 3.

**TABLE 3 RECOMMENDED MINIMUM OUTSIDE DIAMETER**

Sl No.	NOMINAL BORE SIZE	RECOMMENDED MINIMUM OUTSIDE DIAMETER
(1)	(2)	(3)
	mm	mm
i)	25	45.0
ii)	31.5	52.0
iii)	38	60.0
iv)	50	73.0
v)	63	86.5
vi)	75	99.5

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



## INDIAN STANDARDS

### ON Hoses

IS:		Rs
443-1963	Methods of sampling and test for rubber hoses ( <i>revised</i> ) ...	3.50
444-1968	Water hose of rubber with woven textile reinforcement ( <i>second revision</i> ) ( <i>superseding</i> IS: 445-1964) ...	3.50
446-1968	Air hose of rubber with woven textile reinforcement ( <i>second revision</i> ) ( <i>superseding</i> IS: 3557-1965) ...	3.50
447-1968	Welding hose of rubber with woven textile reinforcement ( <i>second revision</i> ) ...	3.50
635-1968	Oil and solvent resistant hose of rubber with woven textile reinforcement ( <i>second revision</i> ) ...	2.50
636-1962	Fire fighting hose (rubber lined woven-jacketed) ( <i>revised</i> ) ...	2.50
911-1968	Air hose of rubber with braided textile reinforcement ( <i>second revision</i> ) ( <i>superseding</i> IS: 912-1963) ...	3.50
913-1968	Water hose of rubber with braided textile reinforcement ( <i>second revision</i> ) ( <i>superseding</i> IS: 914-1963) ...	3.50
1677-1968	Agricultural spray hose of rubber with braided textile reinforcement ( <i>second revision</i> ) ...	3.50
2396-1968	Rubber hose for petrol and diesel fuels with braided textile reinforcement ( <i>first revision</i> ) ( <i>under print</i> ) ...	—
2410-1963	Suction hose of rubber for fire services ...	1.50
2482-1963	Water suction hose of rubber, light duty ...	1.50
2765-1964	Radiator hose ...	2.50
3418-1968	Oil and solvent resistant hose of rubber with braided textile reinforcement ( <i>first revision</i> ) ...	2.50
3549-1965	Water suction and discharge hose of rubber, heavy duty ...	1.50
3572-1968	Welding hose of rubber with braided textile reinforcement ( <i>first revision</i> ) ...	2.50
5137-1969	Cement grouting hose of rubber with woven textile reinforcement	2.50
5166-1969	Cement grouting hose of rubber with braided textile reinforcement ( <i>under print</i> ) ...	—