IS : 5894 - 1970

Indian Standard

SPECIFICATION FOR RUBBER SAND BLAST HOSE WITH BRAIDED TEXTILE REINFORCEMENT

UDC 621·643·3 : 621·7·023·1

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

Price Rs 2·50

March 1971

Indian Standard

SPECIFICATION FOR RUBBER SAND BLAST HOSE WITH BRAIDED TEXTILE REINFORCEMENT

Rubber Products Sectional Committee, CDC 6

Chairman	*Representing*
DR D. BANERJEE	National Rubber Manufacturers Ltd, Calcutta; *and* Association of Rubber Manufacturers in India, Calcutta
Members	
SHRI S. K. BOSE	National Test House, Calcutta
SHRI A. GHOSE (*Alternate*)	
SHRI D. K. CHATTERJEE	The Alkali & Chemical Corporation of India Ltd, Calcutta
DR S. K. RAY (*Alternate*)	
SHRI B. H. DALAL	Ministry of Defence (DGI)
SHRI M. KUMARAN (*Alternate*)	
SHRI DALIP KUMAR	Ministry of Railways
SHRI G. C. DE	Export Inspection Council of India, Calcutta
SHRI P. K. CHATTERJEE (*Alternate*)	
SHRI G. M. GADRE	Directorate General of Supplies & Disposals
SHRI G. C. JAIN	Hindustan Steel Ltd, Ranchi
SHRI LALIT MOHAN JAMNADAS	Cosmos India Rubber Works Pvt Ltd, Bombay
SHRI PULIN L. KINARIWALA (*Alternate*)	
DR P. JOHN JACOB	The Rubber Research Institute of India, Kottayam
SHRI S. V. LATHIA	Lathia Rubber Manufacturing Co Pvt Ltd, Bombay
SHRI D. P. LATHIA (*Alternate*)	
DR K. N. MODAK	Indian Rubber Industries Association, Bombay; *and* Indian Rubber Manufacturers' Research Association, Bombay
SHRI K. R. SENGUPTA (*Alternate*)	Indian Rubber Industries Association, Bombay
SHRI S. MUKHERJEE	Dunlop India Ltd, Calcutta
SHRI P. N. S. MYER (*Alternate*)	
SHRI S. C. NANDY	Bata Shoe Co Pvt Ltd, Calcutta
SHRI M. M. PATEL	Synthetics and Chemicals Ltd, Bombay
SHRI K. RAJGOPAUL	Indian Oil Corporation Ltd, (Marketing Division), Bombay
DR A. SEETHARAMIAH	Directorate General of Technical Development
DR N. V. C. RAO (*Alternate*)	

(*Continued on page* 2)

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

(*Continued from page* 1)

Members	*Representing*
SHRI D. D. TALWALKAR	All India Automobile & Ancillary Industries Association, Bombay
SHRI R. M. KHALADKAR (*Alternate*)	
SHRI D. DAS GUPTA, Director (Chem)	Director General, ISI (*Ex-officio Member*)

Secretaries

SHRI N. R. SRINIVASAN
Deputy Director (Chem), ISI

SHRI SATISH CHANDER
Assistant Director (Chem), ISI

Hoses Subcommittee, CDC 6 : 3

Convener	
SHRI K. LAL	Dunlop India Limited, Calcutta
Members	
SHRI T. C. PAUL (*Alternate* to Shri K. Lal)	
DR D. BANERJEE	National Rubber Manufacturers Ltd, Calcutta
DR M. L. BHAUMIK (*Alternate*)	
SHRI B. H. DALAL	Ministry of Defence (DGI)
SHRI M. KUMARAN (*Alternate*)	
SHRI G. C. DE	Export Inspection Council of India, Calcutta
SHRI K. M. BIJLI (*Alternate*)	
SHRI C. D. DIXIT	Ministry of Railways
SHRI A. GHOSH	National Test House, Calcutta
SHRI G. C. JAIN	Hindustan Steel Ltd, Ranchi
SHRI A. K. GHOSH (*Alternate*)	
SHRI LALIT MOHAN JAMNADAS	The Cosmos India Rubber Works Pvt Ltd, Bombay
SHRI S. C. JAMBHEKAR (*Alternate*)	
SHRI V. N. MAKER	Indian Rubber Industries Association, Bombay
SHRI S. B. SANGTANI (*Alternate*)	
SHRI R. NAGCHOUDHURI	Goodyear India Ltd, Calcutta
SHRI S. R. GANGULI (*Alternate*)	
DR K. D. PAHARIA	Directorate of Plant Protection, Quarantine & Storage
SHRI M. M. PATEL	Synthetics and Chemicals Ltd, Bombay
SHRI V. D. PENDSE	Swastik Rubber Products Ltd, Poona
SHRI R. M. KHALADKAR (*Alternate*)	
SHRI K. RAJGOPAUL	Indian Oil Corporation Ltd (Marketing Division), Bombay
DR N. V. C. RAO	Directorate General of Technical Development
SHRI G. R. INAMDAR (*Alternate*)	
SHRI K. S. SUBBANNA	Burmha-Shell Oil Storage & Distributing Co of India Ltd, Bombay
SHRI M. SALIM VOHRA	Premier Rubber and Cable Industries, Thana
SHRI A. D'COSTA (*Alternate*)	

Indian Standard

SPECIFICATION FOR RUBBER SAND BLAST HOSE WITH BRAIDED TEXTILE REINFORCEMENT

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 28 September 1970, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard prescribes the minimum acceptable requirements for satisfactory performance of rubber hoses for wet and dry sand blasting. The recommended outside diameters of the hoses are given in Appendix A, for the guidance of manufacturers and consumers.

0.3 This standard contains clause **4.2.3** which calls for agreement between the purchaser and the supplier.

0.4 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 wet and dry sand blasting hose of rubber with braided textile reinforcement.

2. TERMINOLOGY

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

3. TYPES

3.1 The standard covers the following two types of hoses:

Type 1 — For a working pressure of 7 kgf/cm²

Type 2 — For a working pressure of 10 kgf/cm²

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

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

4. REQUIREMENTS

4.1 Materials

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

4.1.2 *Reinforcement* — The textile reinforcement shall consist of yarn or natural or synthetic fibre.

4.1.3 *Cover* — The cover shall consist of abrasion resistant rubber compound.

4.2 Construction

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

4.2.2 *Reinforcement* — The textile reinforcement shall consist of firmly and evenly braided yarn over the lining. The braids of textile reinforcement shall be so impregnated with a rubber compound that a distinct layer of rubber is formed between each braid.

4.2.3 *Braided Copper Wire* — If required by the purchaser, one copper wire of braided construction comprising a number of strands and of minimum breaking load of 9 kg shall be incorporated between the plies to provide electrical continuity along the whole length of the hose. In case two copper wires are used, the minimum composite breaking load shall be 9 kg.

4.2.4 *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.

4.3 Dimensions and Tolerances

4.3.1 *Diameter 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.

4.3.2 *Lining and Cover Thickness* — The thickness of the lining and cover when measured according to method prescribed in **8.2** of IS : 443-1963* shall not be less than 6·3 mm and 1·5 mm respectively.

4.3.3 *Hardness of Lining* — When tested according to IS : 3400 (Part II)-1965†, a value of 40 to 50 international rubber hardness degrees (IRHD) is recommended for the lining of the hose.

NOTE — The resiliance of the lining is an important consideration in sand blast hoses and, therefore, it is desirable that the hardness is kept within the range specified above.

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

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

TABLE 1 BORE SIZES AND NUMBER OF REINFORCEMENT PLIES

(*Clause* 4.3.1)

Nominal Bore	Tolerance on Nominal Bore	No. of Reinforcement Plies	
		Type 1	Type 2
(1)	(2)	(3)	(4)
mm	mm		
20·00	±0·75	2	2
25·00	±1·25	2	3
31·50	±1·25	3	3
38·00	±1·50	3	3
45·00	±1·50	3	3
50·00	±1·50	3	3

Note 1 — Other sizes within this range may be supplied by agreement. The tolerances should be those of the previous smaller sizes.

Note 2 — For hoses having 2 plies and more, plies mentioned above may vary by 1 ply, provided the hose meets with the requirements of this specification.

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

4.3.4.1 The tolerance on the specified hose length shall be ±1 percent.

4.4 Physical Requirements for Finished Hose

4.4.1 *Tensile Strength and Elongation at Break of Lining and Cover* — The tensile strength and elongation at break of the rubber used for lining and cover of the hoses when tested according to the method prescribed in **4** of IS : 443-1963* shall be as prescribed in Table 2.

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

Sl No.	Characteristics	Requirements for	
		Lining	Cover
(1)	(2)	(3)	(4)
i)	Tensile strength, kgf/cm², *Min*	150	110
ii)	Elongation at break, percent, *Min*	500	350

4.4.2 *Accelerated Ageing* — After ageing at 70 ± 1°C for a period of 72 hours according to the method prescribed in **7** of IS : 443-1963*, the

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

rubber used for the lining and cover, when tested according to method prescribed in **4** of IS : 443-1963*, shall not vary by more than ±20 percent for tensile strength and +10, −25 percent for elongation at break of the corresponding values obtained before ageing.

4.4.3 *Adhesion* — The adhesion strength, when tested according to the method prescribed in **6** of IS : 443-1963*, shall be such that the rate of separation does not exceed 25·0 mm per minute under a load of 4·5 kg for the following:

a) Between plies,

b) Between lining and ply, and

c) Between cover and ply.

4.4.4 *Hydraulic Pressure* — The hoses, when tested according to the method prescribed in **11** of IS : 443-1963*, shall withstand minimum bursting pressure as under:

Type 1 — 35 kgf/cm²

Type 2 — 50 kgf/cm²

4.4.5 *Proof Pressure* — Samples of production lengths of hoses, when subjected to internal hydraulic pressure of 1·5 times working pressure for one minute, shall not show any rupture, leakage or porosity.

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

4.4.6 *Electrical Continuity Test* — Each manufactured length of hose shall show evidence of electrical continuity.

NOTE — A 4·5-V battery and 3·5-V, 0·3-A test bulb may be used for this test.

5. MARKING

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

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

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

5.1.1 Each length of the 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

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

requirements of that standard, under a well-defined 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.

6. SAMPLING AND CRITERIA FOR CONFORMITY

6.1 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*.

7. TESTS

7.1 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 DIAMETERS

A-1. OUTSIDE DIAMETER

A-1.1 The recommended minimum outside diameter should be as given in Table 3.

TABLE 3 RECOMMENDED MINIMUM OUTSIDE DIAMETER

Nominal Bore	Recommended Outside Diameter	
	Type 1	Type 2
(1)	(2)	(3)
20·00	38·5	38·5
25·00	43·5	45·5
31·50	52·0	52·0
38·00	58·5	58·5
45·00	65·5	65·5
50·00	70·5	70·5

Note — In the case of fluted hose, this measurement shall be taken on the top of the flute and the depth of the flute shall not exceed 0·5 mm.

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

INDIAN STANDARDS

ON

Rubber Hoses

IS:		Rs
443-1963	Methods of sampling and test for rubber hoses (*revised*) ...	3·50
444-1968	Water hose of rubber with woven textile reinforcement (*second revision*) (*superseding* IS : 445-1964)	3·50
446-1968	Air hose of rubber with woven textile reinforcement (*second revision*) (*superseding* IS : 3557-1965)	3·50
447-1968	Welding hose of rubber with woven textile reinforcement (*second revision*)	3·50
635-1968	Oil and solvent resistant hose of rubber with woven textile reinforcement (*second revision*)	2·50
636-1962	Fire fighting hose (rubber lined woven jacketed) (*revised*) ...	2·50
911-1968	Air hose of rubber with braided textile reinforcement (*second revision*) (*superseding* IS : 912-1963)	3·50
913-1968	Water hose of rubber with braided textile reinforcement (*second revision*) (*superseding* IS : 914-1963)	3·50
1677-1968	Agricultural spray hose of rubber with braided textile reinforcement (*second revision*)	3·50
2396-1968	Rubber hose for petrol and diesel fuels with braided textile reinforcement (*first revision*)	2·50
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 (*first revision*)	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 (*first revision*)	2·50
5797-1970	Electrically bonded aircraft fuelling rubber hose	—
5821-1970	Hot water hose of rubber with woven textile reinforcement ...	—
5937-1970	Hot water hose of rubber with braided textile reinforcement ...	—