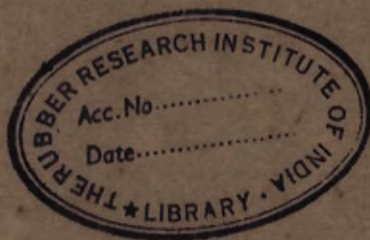


IS : 912 - 1963

Indian Standard
SPECIFICATION FOR BRAIDED AIR HOSE
OF RUBBER, LIGHT DUTY
(*Revised*)

UDC 621.643.3 : 678.4



© Copyright 1963 by

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 MATHURA ROAD
NEW DELHI 1

Price Rs 1.50

July 1963

Indian Standard

SPECIFICATION FOR BRAIDED AIR HOSE OF RUBBER, LIGHT DUTY

(*Revised*)

Rubber Products Sectional Committee, CDC 6

Chairman

DR. D. BANERJEE

Representing

National Rubber Manufacturers Ltd., Calcutta,
and Association of Rubber Manufacturers in
India, Calcutta

Members

MR. A. L. BLACKWOOD	Firestone Tyre & Rubber Co. of India Private Ltd., Bombay
MR. J. SAMSON (<i>Alternate</i>)	
SHRI P. K. BOSE	The Dunlop Rubber Co. (India) Ltd., Calcutta
SHRI J. C. SENGUPTA (<i>Alternate</i>)	
SHRI S. K. BOSE	Government Test House, Calcutta
SHRI S. P. MULLICK (<i>Alternate</i>)	
MR. W. EVANS	Indian Electrical Manufacturers' Association, Calcutta
SHRI D. P. SAHAI (<i>Alternate</i>)	
SHRI S. L. GANDHI	Ministry of Defence (CGDP)
SHRI K. K. GANGULY (<i>Alternate</i>)	
MR. G. GRIFFITHS	Indian Rubber Manufacturers Ltd., Calcutta
SHRI LALIT MOHAN JAMNADAS	The Rubber Board, Kottayam, and The Cosmos India Rubber Works Private Ltd., Bombay
SHRI SHAMSUNDER AZAD (<i>Alternate</i>)	The Cosmos India Rubber Works Private Ltd., Bombay
SHRI K. V. MODAK	Indian Rubber Manufacturers' Research Association, Bombay
SHRI M. PARAB	Bata Shoe Co. Ltd., Calcutta
SHRI N. M. RAJU	The Automotive Manufacturers' Association of India, Calcutta
MAJ V. RANGANATHAN	Directorate General of Armed Forces Medical Services (Ministry of Defence)
DR. A. SEETHARAMIAH	Department of Technical Development (Ministry of Economic & Defence Co-ordination)
DR. N. V. C. RAO (<i>Alternate</i>)	
SHRI SANJOY SEN	Indian Cycle Manufacturers' Association, Calcutta
SHRI K. R. SENGUPTA	Indian Rubber Industries Association, Bombay
SHRI B. BASU (<i>Alternate</i>)	

(*Continued on page 2*)

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 MATHURA ROAD
NEW DELHI 1

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
DR. V. R. SHARMA	Imperial Chemical Industries (India) Private Ltd., Calcutta
DR. D. K. ROYCHAUDHURI (<i>Alternate</i>)	
SHRI V. S. VAIDYA	Swastik Rubber Products Ltd., Poona
SHRI V. D. PENDSE (<i>Alternate</i>)	
SHRI R. VENKATA RAO	Railway Board (Ministry of Railways)
DR. SADGOPAL,	Director, ISI (<i>Ex-officio Member</i>)
Deputy Director (Chem)	

Secretary

SHRI D. DAS GUPTA
Assistant Director (Chem), ISI

Hoses Subcommittee, CDC 6 : 3

Convener

DR. D. BANERJEE National Rubber Manufacturers Ltd., Calcutta

Members

SHRI S. L. GANDHI	Ministry of Defence (CGDP)
SHRI J. P. GOENKA	Jaya Shree Textiles & Industries Ltd., Rishra, Distt Hooghly
SHRI M. L. HARKAWAT (<i>Alternate</i>)	
SHRI K. N. KRISHNAMURTHY	ESSO Standard Eastern Incorporated, Bombay
SHRI N. V. KRISHNAMURTHY	The Dunlop Rubber Co. (India) Ltd., Calcutta
SHRI K. LAL (<i>Alternate</i>)	
SHRI LALIT MOHAN JAMNADAS	The Cosmos India Rubber Works Private Ltd., Bombay
SHRI SHAMSUNDER AZAD (<i>Alternate</i>)	
SHRI V. N. MAKAR	Indian Rubber Industries Association, Bombay
SHRI LALIT MOHAN JAMNADAS (<i>Alternate</i>)	
SHRI S. P. MULLICK	Government Test House, Calcutta
SHRI R. NAGCHAUDHRI	The Goodyear India Ltd., Calcutta
MR. R. A. BAUER (<i>Alternate</i>)	
DR. N. V. C. RAO	Department of Technical Development (Ministry of Economic & Defence Co-ordination)
SHRI B. N. SETHI (<i>Alternate</i>)	
SHRI T. R. RAO	Burmah-Shell Oil Storage & Distributing Co. of India Ltd., Bombay
SHRI H. N. DEOGAN (<i>Alternate</i>)	
SHRI K. G. UNNITHAN	The Travancore Rubber Works, Trivandrum

Indian Standard
**SPECIFICATION FOR BRAIDED AIR HOSE
OF RUBBER, LIGHT 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. Moreover, it was thought desirable to prescribe two grades to cover the quality of products now marketed in the country and for export trade. In the revised standard, therefore, rationalized metric sizes have been adopted and two grades have been prescribed, 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 been 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 Reinforcement 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*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

IS : 912 - 1963

0.6 This standard is intended chiefly to cover the technical provisions relating to braided air hose of rubber, light 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, light duty, with braided cotton reinforcement for compressed air and pneumatic tools.

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. GRADES

3.1 There shall be two grades of the hose, namely, Grade 1 and Grade 2.

3.1.1 The requirements for Grade 1 and Grade 2 hoses differ only in respect of tensile strength and elongation at break of the lining and cover, and bursting pressure of the hose.

4. SAMPLING AND CRITERIA FOR CONFORMITY

4.1 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.

5. CONSTRUCTION

5.1 The hose shall be constructed as specified in **5.1.1** to **5.1.3**.

5.1.1 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 20 percent of the original weight.

5.1.2 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.

5.1.3 Outer Rubber Cover — The outer rubber cover shall be reasonably uniform and 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.

6. DIMENSIONS AND TOLERANCES

6.1 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.

NOTE — The size range for Grade 2 hose shall be up to and including 25.0 mm internal diameter. The number of reinforcement plies and external diameter of Grade 2 hose shall be the same as that of Grade 1 hose for all sizes except 25.0 mm internal diameter size which shall have two reinforcement plies and 38.0 mm external diameter.

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

SL No.	INTERNAL DIAMETER	TOLERANCE ON INTERNAL DIAMETER	MINIMUM NUMBER OF PLYS	*EXTERNAL DIAMETER	TOLERANCE ON EXTERNAL DIAMETER
(1)	(2)	(3)	(4)	(5)	(6)
	mm	mm		mm	mm
i)	5.00	± 0.75	1	14.0	± 1.0
ii)	6.30	± 0.75	1	15.5	± 1.0
iii)	8.00	± 0.75	1	17.0	± 1.0
iv)	10.00	± 0.75	1	19.0	± 1.0
v)	12.50	± 0.75	2	24.0	± 1.0
vi)	16.00	± 0.75	2	27.5	± 1.0
vii)	20.00	± 0.75	2	31.5	± 1.0
viii)	25.0	± 1.0	3	40.0	± 1.5
ix)	31.5	± 1.0	3	46.5	± 1.5
x)	38.0	± 1.5	3	53.0	± 1.5
xi)	50.0	± 1.5	3	65.0	± 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.

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

6.2 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, LIGHT DUTY

Sl. No.	INTERNAL DIAMETER	THICKNESS	
		Lining	Cover
(1)	(2)	(3)	(4)
	mm	mm	mm
i)	Up to and including 10.00	2.0	1.0
ii)	Over 10.00 up to and including 20.00	2.5	1.5
iii)	Over 20.00	3.0	1.5

6.2.1 The thickness shall be measured by the method prescribed under 8 of IS : 443-1963.

6.3 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.

7. TESTS

7.0 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.

7.1 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, LIGHT DUTY

(Clause 7.1)

SL No.	CHARACTERISTIC	REQUIREMENT			
		Lining		Cover	
		Grade 1	Grade 2	Grade 1	Grade 2
(1)	(2)	(3)	(4)	(5)	(6)
i)	Tensile strength, kg/cm ² , <i>Min</i>	55	40	70	40
ii)	Elongation at break, percent, <i>Min</i>	250	200	350	200

7.2 Adhesion — When tested according to the method prescribed under 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:

- a) Between braids,
- b) Between lining and braid, and
- c) Between cover and braid.

7.3 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.

7.4 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.

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

8. MARKING

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

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

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

(Clauses 7.4 and 7.4.1)

SL No.	INTERNAL DIAMETER	REQUIREMENT			
		Increase in External Diameter, Percent, <i>Max</i>		Bursting Pressure, kg/cm ² , <i>Min</i>	
		Grade 1 (Under Pressure) of 20.0 kg/cm ²	Grade 2 (Under Pressure) of 7.0 kg/cm ²	Grade 1	Grade 2
		(3)	(4)	(5)	(6)
(1)	(2)				
	mm				
i)	5.00	8	5	50	28
ii)	6.30	8	5	50	28
iii)	8.00	8	5	50	28
iv)	10.00	8	5	50	28
v)	12.50	8	5	50	28
vi)	16.00	8	5	50	28
vii)	20.00	8	5	45	28
viii)	25.0	8	5	40	28
ix)	31.5	10	—	35	—
x)	38.0	10	—	30	—
xi)	50.0	12	—	28	—

8.2 For long-length moulded-type hose, the markings specified under **8.1** shall be made at intervals of 10 metres.

8.3 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.