Indian Standard

SPECIFICATION FOR RADIATOR HOSE

(First Revision)

Automotive and Aircraft Rubber and Plastics Components Sectional Committee, PCDC 17

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0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 10 November 1982, after the draft finalized by the Automotive and Aircraft Rubber and Plastics Components Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 Radiator hose is of primary importance in the automobile cooling system. External leakage due to defective rubber hose and poor circulation due to collapsed hose are some of the common defects.

0.3 This standard was pulished in 1964 and covered requirements for straight hoses only. In this revision, preformed shapes have been included and the requirement for minimum number of plies has been deleted.

0.4 In the preparation of this revision, considerable assistance has been derived from ISO/DIS 4081 'Rubber tubing and hose coolant type, for use in cars and light commercial vehicles', issued by the International Organization for Standardization.

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.

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1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for radiator hoses of internal combustion engines, supplied either in a preformed shape or as a straight piece.

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

characteristic by more than the following when tested in accordance with of IS : 443-1975*:

Characteristic	*Change in Value, Percent, Max*
Volume	+ 40
Tensile strength	− 30
Elongation at break	− 40

4.2 Construction

4.2.1 The hose shall be manufactured with a polymeric lining. The hose shall normally contain a reinforcement based on natural or synthetic fibres and may have a polymeric cover.

4.2.2 The hose shall be uniform in quality throughout its length, free from porosity and uniformly vulcanized. The internal surface of the lining shall be smooth and clean.

4.3 Bore — *The hose shall be supplied in the following nominal bore sizes* (in mm); when tested in accordance with **4.2.1** of IS: 443-1975*.

12·5, 16, 20, 22, 25, 28, 31·5, 38, 40, 50 and 63

4.3.1 The bore shall not vary from the nominal by more than ± 0·75 mm.

4.4 Wall and Lining Thickness — The wall thickness of the hose shall be as given in Table 2. The thickness of the inner lining shall be minimum 60 percent of the total wall thickness, when tested in accordance with **4.2.2** of IS : 443-1975*.

TABLE 2 WALL THICKNESS OF RADIATOR HOSE

Sl No.	Nominal Bore	Wall Thickness	Tolerance
(1)	(2)	(3)	(3)
	mm	mm	mm
i)	Up to and including 31·5	4·4	± 0·6
ii)	Above 31·5	5·2	± 0·8

4·5 Tolerance on Hose Length — Tolerance on the hose length up to 300 mm shall be ±6·0 mm, and over 300 mm shall be ±2 percent.

4.5.1 For preformed hose, tolerance applies to each arm length from the end of the hose to the intersection with the nearest centre line including the enlargement where applicable.

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

4.6 Tolerance on Angle in Shaped Hose — Tolerance on an angle in any plane shall be ±5°.

4.7 Burst Pressure — The minimum burst pressure of the hose, when tested in accordance with 8.2 of IS : 443-1975* shall be as specified in Table 3.

TABLE 3 MINIMUM BURST PRESSURE OF RADIATOR HOSE

Sl No.	Nominal Bore mm	Minimum Burst Pressure	
		Unreinforced MPa (kgf/cm², Approx)	Reinforced MPa (kgf/cm², Approx)
(1)	(2)	(3)	(4)
i)	*Up to and including* 31·5	0·2 (2)	1·0 (10)
ii)	Above 31·5	0·2 (2)	0·7 (7)

4.8 Expansibility — The surface of the hose shall not crack when a ball with diameter 10 percent more than its inner diameter is passed through it.

4.9 Resistance Against Low Temperature — After storage for 24 hours at −40°C, the hose shall neither show cracks nor split into layers.

4.10 Adhesion (for Reinforced Hoses only) — The adhesion between the lining and the reinforcement and between the reinforcement and the cover, when determined in accordance with 7 of IS : 443-1975* shall be not less than 1·5 kg for the 25-mm test piece.

4.10.1 The change in adhesion after accelerated ageing at 110°C for 72 hours shall not exceed −25 percent of the value obtained befor ageing.

4.11 Circumferential Swelling (for Reinforced Hoses only) — The outside circumference of the hose shall not increase by more than 7·5 percent of the original value, when the hose is left for 1 hour at a water pressure of 0·17 MPa (approximately 1·7 kgf/cm²) and a temperature of −85 ± 1°C.

Measure the initial outside circumference of the hose. Leave the hose for 1 hour at a water pressure of 0·17 MPa (approximately 1·7 kgf/cm²) and a temperature of 85 ± 1°C. Measure the outside circumference again.

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

4.12 Oil Resistance (for Type B Hose only) — After immersion of the hose in Oil No. 3 at 100 ± 1°C for 72 hours as prescribed in IS : 3400 (*Part VI*)-1967*, the material used for the lining and the cover shall not change in its characteristics by more than the following:

Characteristic	*Change in Value, Percent, Max*
Volume	+ 75
Tensile strength	— 40
Elongation at bread	— 40

5. PACKING AND MARKING

5.1 Packing — The hoses shall be packed as agreed to between the purchaser and the supplier.

5.2 Marking — Each hose shall be indelibly marked adjacent to each end with the following:

a) Manufacturer's name and trade-mark, if any;

b) Hose type, bore size and length; and

c) Month and year of manufacture.

5.2.1 Each 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. The ISI 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 which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. 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

6.1 For the purpose of ascertaining the conformity of the hose in a consignment of this specification, the method of the sampling and the criteria for conformity shall be as prescribed in 3 of IS : 443-1975†.

*Methods of test for vulcanized rubbers: Part VI Resistance to liquids.
†Methods of sampling and test for rubber hoses (*second revision*).