IS:9168 - 1979

Indian Standard

Specification for All-rubber flaps for pneumatic tyres for automobiles

UDC 629·113·012·55-763·5 : 678·4·06

Indian Standard

SPECIFICATION FOR ALL-RUBBER FLAPS FOR PNEUMATIC TYRES FOR AUTOMOBILES

[Ref : Doc : EDC 38 (3031)]
Automotive Vehicles Sectional Committee, EDC 38; and Tyres, Tubes and Rim Subcommittee, EDC 38 : 8

1. Scope — Covers the dimensions, general requirements and methods of checking the physical tost requirements of all-rubber flaps used with pneumatic automotive tyres.

2. Design and Construction

2.1 All-rubber flaps shall be manufactured, using a suitable compound of natural rubber or synthetic rubber polymer base or a blend thereof, or butyl rubber compound, to the design requirements (*see* 2.1.1 *and* 2.1.2) and shall be of the endless type.

2.1.1 Flaps shall be suitable for tyre/rim/inner tube combinations, for which the minimum widths are given in Appendix A.

2.1.2 All flaps shall have a sectional profile relatively thick at the central portion, which comes in contact with the inside face of the rim and shall gradually taper symmetrically at each side to an edge-gauge not exceeding 2·2 mm. The circumferential length of the flaps should be such as not to cause buckling or wrinkling when the tyre/inner tube/flap assembly is mounted with normal care on the appropriate rim.

2.2 A valve hole shall be provided in each flap and shall be of a diameter dependent on the tube valve stem. It shall be positioned, away from the joint in the unvulcanized flap, at the centre of the flap sectional width, except where meant for fitment to rims having an off-central valve hole.

2.2.1 A working tolerance of ±8 mm is allowed on the design location of the valve hole in a flap.

3. Designation — Shall include the commonly used name, that is, flap, the nominal rim diameter size code, the flap width code (*see* Appendix A) and the number of this Indian Standard.

Example:

A flap used for the nominal rim diameter size code 20 and having an overall section width 153 mm (Width Code M) shall be designated as: Flap 20M IS : 9168

4. Physical Tests and Other Requirements

4.1 *Joint Adhesion Strength* — Where the joint is visible in a finished flap, the adhesion strength at the joint may be checked and shall be not less than 9 kg/cm width, when tested in accordance with the test procedure outlined in Appendix B.

4.2 *Hardness* — The shore hardness of the unused finished flap shall lie between 40° and 75° when measured by Shore Type 'A' Durometer. The hardness will depend on the polymer and compound type (*see* 2.1). The hardness shall be measured at the thickest region of the flap at the centre.

4.3 *Retention of Properties on Ageing* — The test piece shall be a punched Type I dumb-bell shaped piece prepared according to IS : 3400(Part I)-1965 'Method of test for vulcanized rubber : Part I Tensile stress-strain properties'. It shall be subjected to ageing in an air oven at 100°C (±1°C) for 24 hours. The tensile strength and elongation after ageing shall not vary from the initial values (unaged) obtained on a similar test piece taken from the same flap sample by more than +15 or −50 percent.

4.3.1 The shore hardness of the aged sample (*see* 4.3) shall not vary from the initial values (*see* 4.2) by more than −5°, +10° Shore A.

5. Marking

5.1 All flaps shall bear the appropriate size designation and the tyre/rim combination, for which the flap is intended, together with the manufacturer's name and/or trade-mark and the country of origin.

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5.2 *ISI Certification Marking* — Details available with the Indian Standards Institution.

6. Packing — Flaps should be suitably packed according to the prevalent commercial practice.

APPENDIX A

(*Clauses* 2.1.1 *and* 3)

FLAP WIDTHS AND FLAP CODES

A-1. Minimum widths of flaps and the corresponding width codes shall be as given in Table 1.

TABLE 1 MINIMUM WIDTHS OF FLAPS AND FLAP CODE

Flap Width Code	Nominal Tyre Section (Where code not used)		Flap Width *Min*
			mm
K			100
KM		Marking optional	124
M			153
N			176
RR		Marking optional	207
V			226
—	18·00	To be followed	380
—	21·00	by the nominal	426
—	24·00	rim diameter size code	426
—	26·5		565

Note 1 — Flap width codes are preceded by the nominal rim diameter size code.

Example:

A flap of 153 mm width and meant for fitment to a rim of nominal diameter code 20, such as 8·00×20, is designated as '20M'.

Note 2 — Flap width shall be measured, in its vulcanized shape, over that side of the flap which comes adjacent to the rim during use. The widths are the minimum acceptable widths for the tyre on the Recommended or Alternate rim sizes indicated in Indian Standard Specification for pneumatic tyres for automobiles : Part II Truck, bus and light truck tyres (*under preparation*), and Indian Standard Specification for pneumatic tyres for automobiles : Part III Tyres for military applications (*under preparation*).

APPENDIX B

(*Clause* 4.1)

TEST FOR JOINT ADHESION STRENGTH

B-1. Test Piece

B-1.1 Clean cut, with a single stroke in a cutting press dumb-bell test pieces longitudinally conforming to Type I according to IS : 3400 (Part I)-1965, keeping the joint at the middle of the narrow portion of the dumb-bell piece.

Note — If the dumb-bell test pieces, when cut from the thickest portion of the flap, show some concavity at any of the two edges, the arithmetic mean width shall be taken in calculations.

B-2. Test Temperature

B-2.1 The test should preferably be carried out at 27°±2°C and the test pieces matured at the preferred temperature for a period of not less than 12 hours before being tested.

B-3. Test Procedure

B-3.1 Insert the ends of the test piece into the jaws of a tensile testing machine, sensitive enough to record with accuracy low values in particular, taking care to see that the tension is uniformly distributed over its cross section. The lower jaw through which the load is applied should be capable of a substantially constant rate of traverse at 200 mm per minute. Record the breaking load in kilograms from the scale.

B-3.2 Test preferably three, but at least two, test pieces from the joint. The average of the readings shall be the final result for breaking strength of the joint per 6·0 mm (—0, +0·4 mm) width.

B-3.3 For checking conformance to 4.1, the joint adhesion strength per centimetre width shall be calculated from the formula:

$$\text{Joint adhesion strength} = \frac{L \times 10}{W} \text{ kg/cm}$$

where

L = breaking load of the dumb-bell strip in kg, and

W = arithmetic mean width of the test piece in mm.

EXPLANATORY NOTE

This standard is applicable to the flaps used with automobile tyres in order to avoid inner tubes getting trapped between the rim-wheel components during tyre mounting and to provide protection against deterioration of inner tubes by heat transfer from the brake drum.

The dimensions of flaps given in this standard are generally applicable to tyres for trucks, buses, light trucks, military vehicles and off-the-road vehicles. For these types of tyres reference to following Indian Standards may be made:

a) Indian Standard Specification for pneumatic tyres for automobiles : Part II Truck, bus and light truck tyres (*under preparation*); and

b) Indian Standard Specification for pneumatic tyres for automobiles : Part III Tyres for military applications (*under preparation*).

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