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मानक

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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

स्वचल वाहन — हवा भरे टायरों के लिए
रबड़ के फ्लैप — विशिष्टि
(पहला पुनरीक्षण)

Indian Standard

**AUTOMOTIVE VEHICLE — ALL RUBBER
FLAPS FOR PNEUMATIC TYRES —
SPECIFICATION**

(First Revision)

ICS 83.160.10 : 43.040

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Tyres, Tubes and Rim Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1979. The revision of this standard has been taken up based on the experience gained in implementation by the tyre industry. In the revised version the shore hardness values have modified and tensile properties before and after ageing have also been specified.

This Indian 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 and off-the-road vehicles. For these types of tyres reference to following Indian Standards may be made:

- i) IS 10914 (Part 2) : 1992 'Automotive vehicles — Pneumatic tyre — Diagonal ply : Part 2 Truck, bus and light trucks — Specification (*second revision*)'.
- ii) 'Automotive vehicle — Pneumatic tyres: Part 2 Truck, bus and light truck tyres — Radial ply — Specification' (*under preparation*).

The Committee responsible for the preparation of this standard is given in Annex C.

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.

Indian Standard

AUTOMOTIVE VEHICLE — ALL RUBBER FLAPS FOR PNEUMATIC TYRES — SPECIFICATION

(*First Revision*)

1 SCOPE

This Indian Standard specifies the dimensions, general requirements and methods of checking the physical test requirements of all-rubber flaps used with pneumatic automotive tyres.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
3400 (Part 1) : 1987	Methods of test for vulcanized rubbers: Part 1 Tensile stress-strain properties (<i>second revision</i>)
10914 (Part 2) : 1992	Automotive vehicles — Pneumatic tyre — Diagonal ply: Part 2 Truck, bus and light truck — Specification (<i>second revision</i>)

3 DESIGN AND CONSTRUCTION

3.1 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* 3.1.1 and 3.1.2) and shall be of the endless type.

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

3.1.2 All flaps shall have 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 shall 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.

3.2 A valve hole shall be provided in each flap and shall be at least 12 mm 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.

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

4 DESIGNATION

Designation shall include the commonly used name, that is, flap, the nominal rim diameter size code, the flap width code (*see* Annex 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

5 PHYSICAL TESTS AND OTHER REQUIREMENTS

5.1 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 Annex B.

5.2 Hardness

The shore hardness of the unused finished flap before heat ageing shall lie between 45° and 65° when by Shore Type 'A' Durometer. The hardness shall be measured at the thickest region of the flap at the centre.

5.3 Retention of Properties on Ageing

The test piece shall be a punched Type 1 dumb-bell shaped piece prepared according to IS 3400 (Part 1) : 1987. It shall be subjected to ageing in an air oven at $100^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 24 hours. The tensile strength and elongation before and after ageing shall as given below:

- | | | | |
|---|---------------------|--|-----------------|
| a) <i>Before heat ageing:</i> | | iii) Elongation at break | +15% to
-50% |
| i) Hardness, Shore A | 45 to 65 | | |
| ii) Tensile strength, kg/cm ² ,
<i>Min</i> | 90 | 6 MARKING | |
| iii) Elongation at break, <i>Min</i> | 350 | All flaps shall bear the appropriate size designation and the tyre/rim combination, for which the flap is intended, together with the manufacturer's code, source of manufacturer or trade-mark. | |
| b) <i>After heat ageing at 100°C for 24 hours (shall not vary):</i> | | 7 PACKING | |
| i) Change in hardness
Shore A | -5 to + 10
units | Flaps shall be suitably packed to avoid damage during transit/handling. | |
| ii) Tensile strength, kg/cm ² | +15% to
-50% | | |

ANNEX A

(Clause 3.1.1 and 4)

FLAP WIDTHS AND FLAP WIDTH 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 Width Code

Flap Width Code	Nominal Tyre Section (Where code not used)	Flap Width, <i>Min</i> mm
K } KM } M }	Marking optional	100
		124
		153
N } RR } V }	Marking optional	176
		207
		225
— } — } — } — }	To be followed by the nominal rim diameter size code	18.00 } 21.00 } 24.00 } 26.5 }
		350
		426
		426
		565

NOTES

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 B6.0 × 20, is designated as '20M'.

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 IS 10914 (Part 2): 1992.

ANNEX B

(Clause 5.1)

TEST FOR JOINT ADHESION STRENGTH

B-1 TEST PIECE

B-1.1 Test piece shall be prepared as per the method given in IS 3400 (Part 1): 1987, keeping the joint at the middle of the narrow portion of the dumb-bell pieces.

NOTE — If the dumb-bell test piece, 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 piece shall be conditioned at 27 ± 2°C for a period of not less than 12 hours before being testing. The testing shall be carried out under ambient temperature condition or at 27±2°C.

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). Take care that the tension is uniformly distributed over the cross section of the jaws. The lower jaw through which the load is applied shall 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 Testing shall be carried out on three test pieces of which at least two pieces shall be taken from the joint. The average of the readings shall be the final result for breaking strength of the joint per $6.0^{+0.4}$ mm width.

B-3.3 The joint adhesion strength per centimetre width which is indicated in 5.1 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.

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

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