IS : 2415 - 1969

Indian Standard

SPECIFICATION FOR CYCLE RUBBER TUBES

(First Revision)

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

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Indian Standard
SPECIFICATION FOR CYCLE RUBBER TUBES
(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 18 August 1969, after the draft finalized by the Rubber Products Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was originally published in 1963. In this revision, the requirements for ageing test have been modified and the requirement for joint adhesion strength has been added. The methods of test have been aligned with the various methods of test for vulcanized rubbers formulated since the publication of the original version.

0.3 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 the requirements, method of sampling and test for cycle rubber tubes intended for use with Grade 1 and Grade 2 tyres prescribed in IS : 2414-1966†.

2. MANUFACTURE

2.1 The tubes shall be manufactured from natural or synthetic rubber or a mixture of both; suitably compounded and vulcanized. The tubes shall not have any leak. The valve for the tubes shall conform to IS : 532-1964‡ and the rubber tubing for valves shall conform

*Rules for rounding off numerical values (*revised*).
†Specification for cycle tyres (*revised*).
‡Specification for bicycle tube valves (*revised*).

to IS : 5079-1969*.

NOTE — For tubes made of butyl rubber, the requirements prescribed in this standard may not be suitable.

2.2 The dimensions of cycle rubber tubes shall be compatible with the appropriate cycle tyres (*see* IS : 2414-1966†).

3. REQUIREMENTS

3.1 Dimensions — The dimensions of the different sizes of cycle rubber tubes when deflated shall be as given in Table 1.

TABLE 1 DIMENSIONS FOR RUBBER TUBES

Sl No.	Size Designation	Flat Length of Double-Folded Tube	Flat Width	Minimum Thickness of Tube
(1)	(2)	(3)	(4)	(5)
		mm	mm	mm
i)	28 × 1½	$1\,015^{+15}_{-25}$	44·0 ± 2·0	0·80
ii)	26 × 1½	925^{+15}_{-25}	44·0 ± 2·0	0·80
iii)	28 × 1¾	$1\,000^{+15}_{-25}$	48·0 ± 2·5	0·80
iv)	26 × 1¾	910^{+15}_{-25}	48·0 ± 2·5	0·80

3.2 Tensile Strength and Elongation at Break — The tensile strength and elongation of rubber used for cycle tubes when tested according to IS : 3400 (Part I)-1965‡ employing Type 1 dumb-bell test pieces, shall be as follows:

Tensile strength, *Min*	140 kgf/cm²
Elongation at break, *Min*	550 percent

3.3 Tension Set — Tension set of the rubber used for cycle tubes, when tested according to the method given in IS : 3400 (Part XIII)§ shall not be more than 20 percent employing dumb-bell test pieces conforming to Type 1 of IS : 3400 (Part I)-1965‡ and stretching to 300 ± 30 percent between reference lines.

*Specification for rubber valve tubing for cycle tube valves.
†Specification for cycle tyres (*revised*).
‡Methods of test for vulcanized rubbers: Part I Tensile stress-strain properties.
§Methods of test for vulcanized rubbers: Part XIII Tension set (*under preparation*).

3.4 Ageing — Tensile strength and elongation at break of Type 1 dumb-bell test pieces prepared in accordance with IS : 3400 (Part I)-1965*, aged in an air-oven at 70° ± 1°C for 168 hours in accordance with IS : 3400 (Part IV)-1965† and tested according to IS : 3400 (Part I)-1965* shall not vary by more than ±20 percent for tensile strength and +10 and −25 percent for elongation at break of the corresponding values specified in **3.2.**

3.5 Joint Adhesion Strength — Joint adhesion strength shall be not less than 4 kg/cm being the average for three test pieces and none falling below 3·0 kg/cm when tested according to Appendix A.

3.6 Leak Test — Cycle rubber tubes when subjected to inflating pressure (not exceeding 3·2 kgf/cm^2) and immersed in water, shall not show any sign of leakage.

4. MARKING

4.1 The cycle rubber tube shall have marked upon it the nominal size, the manufacturer's name, initials or trade-mark and country of origin.

4.1.1 The tubes 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.

5. SAMPLING

5.1 For the purpose of ascertaining the conformity of cycle tubes in a consignment to this specification, the scale of sampling and the criteria for conformity shall be subject to agreement between the supplier and the purchaser. However, for guidance, a typical sampling procedure is given in Appendix B.

*Methods of test for vulcanized rubbers: Part I Tensile stress-strain properties.
†Methods of test for vulcanized rubbers: Part IV Accelerated ageing.

APPENDIX A

(*Clause* 3.5)

DETERMINATION OF JOINT ADHESION STRENGTH

A-1. TEST PIECE

A-1.1 Cut dumb-bell test pieces longitudinally conforming to Type 1 of IS : 3400 (Part I)-1965* keeping the joint in the middle of the narrow portion of the dumb-bell test piece, by a single stroke of a press. Wet the rubber if necessary with water or soap solution and support on a sheet of slightly yielding material.

A-2. TEST TEMPERATURE

A-2.1 The test shall be carried out at 27° ± 2°C and the test pieces shall be kept at this temperature for a period of not less than 12 hours.

A-3. PROCEDURE

A-3.1 Insert the test piece into the grips of the tensile testing machine, capable of recording lower values correctly, taking care to adjust it symmetrically so that tension is distributed uniformly over the cross-section. The lower jaw, through which the load is applied, should be capable of a substantially constant rate of traverse at the rate of 200 mm per minute. Record the load from the scale.

A-3.1.1 Test three pieces from each joint of the tube.

A-4. EXPRESSION OF RESULTS

A-4.1 Express the adhesion value as the load in kg/cm of the joint.

APPENDIX B

(*Clause* 5.1)

SAMPLING OF CYCLE RUBBER TUBES AND CRITERIA FOR CONFORMITY

B-1. SCALE OF SAMPLING

B-1.1 Lot — In any consignment, all the cycle tubes of the same nominal size and manufactured by the same firm under relatively similar conditions of manufacture shall be separated in groups of 5 000 tubes or less and each group shall constitute a lot.

B-1.2 Test for the determination of the conformity of the lot to the requirement of this specification shall be carried out for each lot separately. The number of tubes to be selected for this purpose shall be in accordance with col 1 and 2 of Table 2.

*Methods of test for vulcanized rubbers: Part I Tensile stress-strain properties.

B-1.3 Required number of tubes shall be selected at random. In case of lots where the tubes are stacked, the following procedure is recommended for use:

Starting from any tube count them in one order 1, 2, 3, etc, up to r and so on, where r is the integral part of N/n. Every rth tube thus counted shall be withdrawn to constitute the sample.

TABLE 2 SCALE OF SAMPLING

(*Clause* B-1.2)

Lot Size	No. of Tubes to Be Selected	Permissible Number of Defective Tubes
N	n	
(1)	(2)	(3)
Up to 500	10	0
501 „ 1 000	15	1
1 001 „ 3 000	30	1
3 001 „ 5 000	50	2

B-2. NON-DESTRUCTIVE TESTS

B-2.1 Each of the tubes selected according to **A-1.3** shall be tested for all the dimensions specified in **3.1** and leak test (*see* **3.6**). Any tube failing to satisfy any of the requirements of dimensions and leak test shall be considered as defective.

B-2.1.1 If the number of defective tubes found in the sample is not more than the corresponding number of permissible defective given in col 3 of Table 2, the lot shall be declared as conforming to the requirements of the dimensions and leak test. Only such lots shall be further examined for the destructive type of characteristics as given in **B-3.**

B-3. DESTRUCTIVE TESTS

B-3.1 From each of the lots of tubes that are found satisfactory according to **B-2.1.1,** one tube shall be chosen at random and the required number of test pieces shall be taken from the tube in the manner prescribed in **3.2, 3.3, 3.4** and **3.5.** The test pieces so obtained shall be subjected to the test for tensile strength, elongation, tension set, ageing and joint adhesion strength.

B-3.1.1 The lot shall be declared as conforming to the requirements of this specification if the test results for the different characteristics are all found satisfactory. In case any of the test results for the tube fails for any of the characteristics, two more tubes shall be taken and tests carried out for that characteristic on specimens obtained from the two tubes, and only on finding all the specimens from the two tubes satisfactory, the lot shall be considered as conforming to the requirements of that characteristic.

INDIAN STANDARDS

ON

Rubber Products Other than Hoses and Footwear

IS:		Rs
637-1965	Rubber tubings for general purposes (*revised*)	2·00
638-1965	Sheet rubber jointing and insertion rubber jointings (*revised*)	2·50
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2415-1969	Cycle rubber tubes (*first revision*)	2·50
3565-1966	Rubber teats for feeding bottles	2·50
3692-1965	Rubber closures (pharmaceutical)	3·00
3701-1966	Rubber protective sheaths (condoms)	2·50
3867-1966	Rubber ice bags	3·50
4135-1967	Hospital rubber sheetings	5·00
4148-1967	Surgical rubber gloves	3·50
4149-1967	Post-mortem rubber gloves	3·50
4770-1968	Rubber gloves for electrical purposes	6·00
5079-1969	Rubber valve tubing for cycle tube valves	2·00
5192-1969	Vulcanized rubber compounds	2·00
5193-1969	Rubber sealing rings for domestic fruit and vegetable preserving jars	5·00
5270-1969	Rubber grommets for general purposes	4·00
5382-1969	Rubber sealing rings for gas mains, water mains and sewers (*under print*)	—