BS ISO 17464:2016

BSI Standards Publication

Pneumatic tubes for automotive vehicles — Technical requirements and test methods

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of ISO 17464:2016.

The UK participation in its preparation was entrusted to Technical Committee AUE/4, Tyres and wheels for motor vehicles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2016

ISBN 978 0 580 77899 5

ICS 83.160.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2016.

Amendments/corrigenda issued since publication

Date	Text affected

BS ISO 17464:2016

INTERNATIONAL STANDARD

ISO 17464

First edition
2016-02-01

Pneumatic tubes for automotive vehicles — Technical requirements and test methods

Chambres à air pour véhicules automobiles — Exigences techniques et méthodes d'essai

Reference number
ISO 17464:2016(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 31, *Tyres, rims and valves*.

INTERNATIONAL STANDARD ISO 17464:2016(E)

Pneumatic tubes for automotive vehicles — Technical requirements and test methods

1 Scope

This International Standard specifies the technical requirements and test methods for tubes of pneumatic tyres for automotive vehicles.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 3877-3, *Tyres, valves and tubes — List of equivalent terms — Part 3: Tubes*

ISO 9413, *Tyre valves — Dimensions and designation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3877-3 apply.

4 Materials, form and fit

4.1 The tubes shall be manufactured from an appropriate rubber compound and vulcanized to an endless annular ring shape and shall be with a valve or spud conforming to ISO 9413.

4.2 The tubes shall be classified into the following two classes:

a) class A – natural rubber and its derivatives and blends;

b) class B – butyl rubber/halobutyl rubber and its derivative and blends.

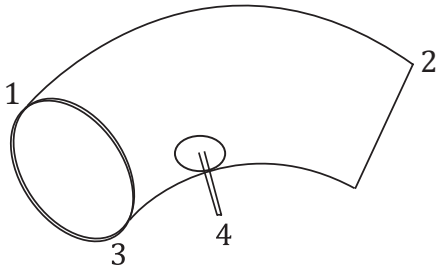
4.2.1 A blend shall be named after prime rubber whose percentage by volume is more than 60 % in the compound.

4.3 The tube shall be uniform in thickness, free from flaws and designed to fit in a tyre of the corresponding nominal size.

4.3.1 Thickness uniformity

Except for the region at or near lap or splice, the thickness of the tube when measured along the longitudinal direction of the tube shall not vary from the arithmetic mean of the readings by ±17,5 % at any point.

4.3.2 The arithmetic mean of the tube thickness shall be determined for the points which lie in the same circumferential line or the length of the tube (see Figure 1). The thickness variation shall be determined for circumferential line at the crown centre.



Key

1 crown
2 crown (±17,5 % from average of four checks) equally spaced around the circumference
3 base
4 valve

Figure 1 — Measurement of tube thickness uniformity

5 Test requirements

5.1 Each type of tube shall conform to the following requirements.

5.1.1 Elongation

Dumbbell test pieces punched out in circumferential direction of the tube when tested in accordance ISO 37 and Annex A shall have elongation at break not less than 500 % for "class A" tubes and not less than 450 % for "class B" tubes.

5.1.2 Strength of splice

Tensile strength of splice determined on dumbbell in accordance with ISO 37 and Annex A shall not be less than 85 kgf/cm^2 for "class A" tubes and 35 kgf/cm^2 for "class B" tubes.

5.1.3 Set after ageing

Dumbbell test pieces punched out in circumferential direction of the tube when subjected to test conditions and test procedure in accordance with Annex B shall have set after ageing not more than 25 % for "class A" tubes and not more than 35 % for "class B" tubes.

5.1.4 Accelerated ageing

Dumbbell test pieces punched out in circumferential direction of the tube body when subjected to accelerated ageing test at (100 ± 2) °C for 48 h and tested in accordance with ISO 37, ISO 188 and Annex C shall not have a percentage drop in elongation at break more than 35 % from original, for both "class A" and "class B" tubes.

6 Air tightness

Each type of tube with valves attached shall be inflated to just round out and tested in water for the evidence of any leakage. Alternatively, vacuum leak or pressure-less detection method may be used as per the manufacturers' practice in lieu of the water test method. The tube shall not show any leakage.

7 Marking

7.1 Tubes shall be permanently and legibly marked on the outside with the following.

a) The manufacturer's name or trade name.

b) The tyre size designation or designations for which the tube is applicable. The size designation description shall contain the following:

   1) the nominal tyre section width code;

   2) the nominal rim diameter code;

   3) the nominal aspect ratio, if applicable;

   4) "R" to identify radial tyre application;

   5) the character "–" or the letter "D" to identify bias tyre application.

c) The manufacturing month and year shall be indicated clearly with the appropriate method, and one scheme example is given in Annex D.

d) The word "BUTYL" and/or blue line of 2,0 mm minimum width to identify tube of class B standard.

8 Sampling

The scale of sampling and the criteria of acceptance shall be as agreed to between the manufacturer and the purchaser.

Annex A
(normative)

Preparation of dumbbell test specimen from tube

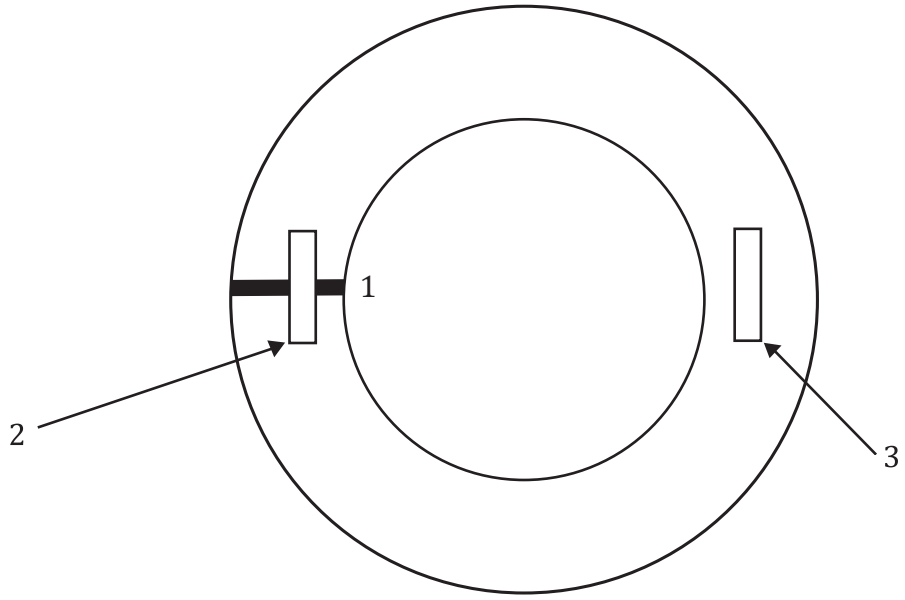
A.1 Preparation of test pieces

A.1.1 Test pieces shall be in dumbbell shape and shall be taken in the circumferential direction of a tube, from portion except the splice joint for the elongation test. For testing strength of joint splice, dumbbell shall be punched out from the splice joint at the centre as shown in Figure A.1.

A.1.2 The number of test pieces shall be four each from a tube. Size of test pieces shall be 6 mm (or 13 mm) dumbbell test pieces, for measurement of tensile strength of splice and elongation of body.

A.1.3 The mean value of both ends of parallel parts shall be used as the thickness of test pieces for calculating the tensile strength of splice joints.

A.1.4 For elongation and tensile strength of joints, measured median value of four test pieces shall be used.



Key

1 splice joint
2 for tensile strength test of splice joint
3 for elongation at break test

Figure A.1 — Method of taking test pieces

Annex B
(normative)

Test conditions and test procedure for set after ageing

B.1 Test conditions for ageing

Type of oven	: Air oven
Temperature	: 104 °C to 110 °C
Time to be kept in oven	: 5 h
Dimensions of test piece	: 6 mm wide 25 mm long measured on 6 mm dumbbell
Stretch of test piece during ageing	: 50 %

B.2 Determination of the set

The test piece shall be removed from the oven and allowed to cool under tension for 2 h. The tension shall be released and the percentage set measured after a rest of not less than 8 h or more than 24 h.

The tension set (set after ageing) shall be expressed as the extension remaining after a specimen has been stretched and allowed to retract in a specified manner and the same shall be expressed as a percentage of the original length. Formula (B.1) is used to calculate the percentage tension set.

$$\text{Tension set} = 100 \times \left(l_1 - l_0 \right) / l_0 \tag{B.1}$$

where

l_1 is the reference length after recovery;

l_0 is the unstrained reference length.

Annex C
(normative)

Accelerated ageing test

C.1 Preparing the test pieces

Prepare four test pieces as specified in Annex B and subject them to the accelerated ageing for (100 ± 2) °C for 48 h.

C.2 Measuring the elongation at break

Measure the elongation at break in accordance with ISO 37 and then calculate the percentage drop in elongation at break compared with respective un-aged elongation at break using Formula (C.1):

$$\mathrm{PDEB} = 100 \times (L_o - L_a) / L_o \qquad \text{(C.1)}$$

where

PDEB is the percentage drop in elongation at break after ageing;

L_o is the median value of elongation at break percentage before ageing test;

L_a is the median value of elongation at break percentage after ageing test.

Annex D
(informative)

Identification scheme for month and year of manufacturing (one example for the scheme of marking month and year on tube)

D.1 Identification scheme

D.1.1 Manufacturing month and year are engraved as per scheme depicted in Figure D.1 or printed as per D.1.6.

D.1.2 Month code circle and year are to be engraved on the tube body.

D.1.3 Each month should be identified by a punch marking of at least 0,5 mm diameter in the respective quarter.

D.1.4 After completing 1 year, fresh identification shall be started again for the next year with next circle.

D.1.5 After completing all three circles, re-engraving can be done after masking the previous engraving/punch marking.

D.1.6 Alternative method which indicates the week and year or month and year of manufacturing is also acceptable.

Dimensions in millimetres

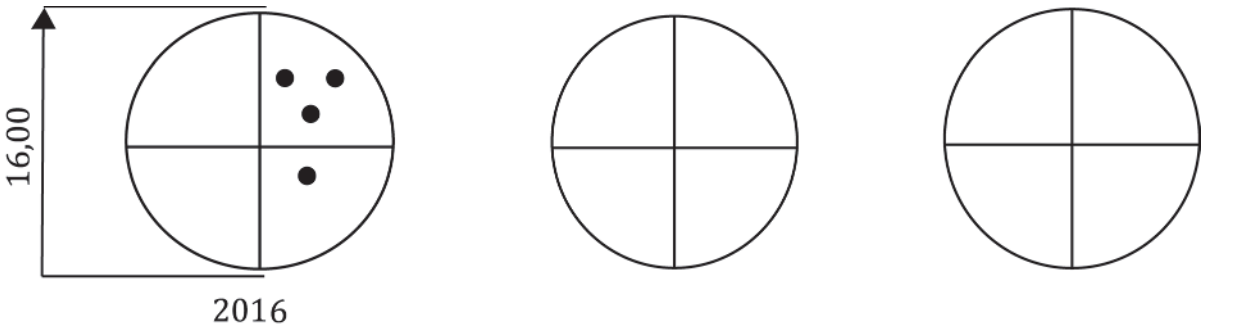


Figure D.1 — Scheme of marking month and year on tube

EXAMPLE Identification for April 2016 is depicted in Figure D.1. However, dots can be in any quadrant. Max dots in a quadrant are three.

ICS 83.160.01
Price based on 7 pages

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.