

Methods of testing vulcanized rubber —

**Part A19: Heat resistance and
accelerated ageing tests —**

**[ISO title: Rubber, vulcanized —
Accelerated ageing or heat-resistance
tests]**

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Committees responsible for this British Standard

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- British Railways Board
- British Rubber Manufacturers' Association
- ERA Technology Ltd.
- GAMBICA (BEAMA Ltd.)
- Institution of Mechanical Engineers
- Institution of Water Engineers and Scientists
- Malaysian Rubber Producers' Research Association
- Ministry of Defence
- National College of Rubber Technology
- Rubber and Plastics Research Association of Great Britain
- SATRA Footwear Technology Centre

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National foreword

This revision of BS 903-A19 has been prepared under the direction of the Rubber Standards Committee. It is identical with ISO 188-1982 “*Rubber, vulcanized — Accelerated ageing or heat resistance tests*” published by the International Organization for Standardization (ISO).

The major changes in this revision compared with the 1975 edition are as follows.

- a) The oxygen pressure method has been reintroduced in order to satisfy renewed demand (see clause 4).
 - b) In the air oven method, the procedures using a cell type oven and a single container oven are no longer referred to as methods A and B respectively (see clause 3).
 - c) Also in the air oven method, the list of preferred test temperatures with lower and upper values of 55 ± 1 °C and 250 ± 3 °C respectively has been superseded by a list of specified test temperatures with lower and upper values of 70 ± 1 °C and 300 ± 3 °C respectively (see 3.7).
- NOTE Other test temperatures, from the list given in BS 903-A35, may be used if product specifications require their use.
- d) For all methods, the volume occupied by the test pieces is now required to be not more than 10 % of the capacity of the ageing chamber (cell or oven) (see 3.2.1, 3.2.2 and 4.2.1).
 - e) The use of specially prepared test pieces is no longer a requirement but is still recommended in preference to the exposure of complete articles or sample sheets (see 3.3 and 4.3).

This edition of BS 903-A19 supersedes the 1975 edition, which is withdrawn.

Terminology and conventions. The text of the international standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “International Standard” appear, referring to this standard, they should be read as “Part of BS 903”.

Cross-reference. The Technical Committee has reviewed the provisions of ISO 1826, to which reference is made in 3.4, and has decided that they are acceptable for use in conjunction with this standard. The relevant requirements of ISO 1826 are reproduced in National appendix A for the convenience of users of this British Standard.

Additional information. In attempting to predict the behaviour of actual rubber articles from the tests described in this standard, consideration should be given to the following effects of thickness.

- a) Where rubber articles are a few centimetres thick, the bulk of the material may experience little or no ageing even though the surface and test specimens of the same rubber are very badly aged. For even moderately sized items, most of the bulk property changes are likely to occur under anaerobic conditions and thus accelerated and heat ageing tests on thin samples in the presence of air can give gross underestimates of the useful life of a product.

b) In the air ageing tests, oxygen is at its normal atmospheric concentration and, if oxidation is rapid, may not diffuse into the rubber quickly enough to maintain uniform oxidation unless the test pieces are sufficiently thin. It is not possible to stipulate definitive safe thickness limits since different rubbers can have widely different oxygen diffusion rates and oxidation rates. However, as a working guide for reasonably well protected rubbers that do not age very rapidly, a thickness of 2.0 ± 0.2 mm should prove satisfactory and should be used. At temperatures above 100 °C and for materials that age rapidly, this thickness may be too great. The uniformity of ageing is best checked by determining the aged tensile stress at a given elongation at a number of thicknesses. Tensile strength and hardness, unlike tensile stress at a given elongation, can be considerably affected by surface conditions and the effect of thickness on these two properties may be less pronounced. Comparisons should only be made between test pieces of similar thickness.

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Summary of pages

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This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.