

BS 903-0:2012



BSI Standards Publication

Physical testing of rubber

Part 0: General

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 12, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 August 2012. It was prepared by Technical Committee PRI/22 *Physical Testing of Rubber*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 903-0:2003, which is withdrawn.

Information about this document

BS 903 is the best-known British Standard for rubber and was first published as a compilation of test methods in 1940. It quickly developed an international reputation, especially in the Commonwealth and parts of Europe, and many of its methods were subsequently adopted as international (ISO) standards. Some individual parts of BS 903 remain but most test methods for rubber are now BS ISO standards which are no longer part of an easily recognizable series. This Part of BS 903 has been prepared to bring these test methods together. The work of Subcommittee ISO/TC 45/SC2, *Rubber and rubber products – Testing and analyses*, continues in reviewing and revising international standards and in developing new test methods and guides to keep abreast of changes and developments in technology, and in this the UK plays a leading and active role. As a consequence, the status of methods is continually changing, as new editions are published and new methods appear. It is therefore never possible for this Part of BS 903 to be completely up-to-date and this edition only provides a snapshot in time.

The methods in BS 903 were originally divided into four series of parts:

- the 'A' series for physical testing of rubber;
- the 'B' series for chemical tests for raw and vulcanized rubber;
- the 'C' series for determination of electrical properties; and
- the 'D' series for testing of ebonite.

The current methods for physical testing, including determination of electrical properties, are listed in this standard. The BS 903 'B' series has been replaced by BS 7164. The BS 903 'D' series has been withdrawn but certain test methods for plastics are applicable to ebonite (see BS 2782-0).

Contractual and legal considerations

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

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

1 Scope

This part of BS 903 provides a general introduction to BS 903 and to BS ISO standards. It describes a range of laboratory-scale methods for the physical testing of rubber in raw, unvulcanized, vulcanized and thermoplastic forms. A list of closely-related British Standards is also provided.

NOTE The status of methods referenced need to be verified with the relevant standards body; they are continually changing as new editions are issued and new methods appear, in line with developments in technology.

2 Terms and definitions

For the purposes of this part of BS 903, the terms and definitions given in BS ISO 1382 apply.

3 Normative reference

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.

BS ISO 1382, *Glossary of rubber terms*

4 Reproducibility

A number of the test methods include a statement on test precision as determined by an interlaboratory test programme and ISO/TC 45 intends for this to be extended to all methods.

NOTE Attention is drawn to ISO/TR 9272 and ISO/TR 11753.

5 Test method categories and properties

5.1 General

The individual test methods published in BS 903 and as BS ISO standards are listed in Annex A. The methods fall into eight main categories:

- 1) tests for raw and unvulcanized rubber;
- 2) preparative procedures;
- 3) mechanical tests;
- 4) viscoelastic tests;
- 5) degradation and environmental tests;
- 6) tests on effect of fluids
- 7) adhesion and contact property tests; and
- 8) electrical tests.

NOTE The prefix "BS 903" applies to the referenced standards unless otherwise indicated.

In terms of these categories, the standards may be grouped as in Table 1 to Table 8, although there is some overlap.

5.2 Raw and unvulcanized rubber

See Table 1 for tests for raw and unvulcanized rubber.

Table 1 Raw and unvulcanized rubber

Type of test	Standard
Mooney viscometer tests	
Mooney viscosity	BS ISO 289-1
Delta Mooney (for non –pigmented, oil-extended, emulsion-polymerized SBR)	A58-1: (≡ ISO 289-3)
Mooney stress relaxation rate	BS ISO 289-4
Plastimeter tests	
Rapid plasticity number	BS ISO 2007
Plasticity retention index	BS ISO 2930
Curemeter tests	
Curemeters – Guide to the use of curemeters	A60-1 (≡ BS ISO 6502)
Vulcanization characteristics using oscillating disc curemeter	BS ISO 3417
Other tests	
Green strength of raw or unvulcanized rubber	BS ISO 9026
Assessment of carbon black dispersion	BS ISO 11345
<i>NOTE BS ISO 11345 is also applicable to vulcanized rubber.</i>	

5.3 Preparative procedures

See Table 2 for preparative procedures.

Table 2 Preparative procedures

Type of test	Standard
Preparation, mixing and vulcanization of test samples	BS ISO 2393
Preparation of samples and test pieces	BS ISO 23529
Measurement of dimensions of test pieces	BS ISO 23529
<i>NOTE 1 For raw rubber, attention is also drawn to BS ISO 1795.</i>	
<i>NOTE 2 See BS ISO 23529 for guidance on the selection of standard test temperatures and humidities for conditioning and testing, and for directions for achieving elevated or subnormal temperatures.</i>	

5.4 Mechanical

See Table 3 for mechanical tests.

Table 3 Mechanical tests

Type of test	Standard
Density	BS ISO 2781
Stress-strain properties	
in tension	BS ISO 37
in compression	BS ISO 7743
in shear	BS ISO 1827
dynamic	BS ISO 4664
stress in tension on heating	BS ISO 12493