First edition
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Rubber, vulcanized or thermoplastic — Determination of hardness —

Part 4: Indentation hardness by durometer method (Shore hardness)

Caoutchouc vulcanisé ou thermoplastique - Détermination de la dureté —

Partie 4: Dureté par pénétration par la méthode au duromètre (dureté Shore)

Reference number
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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).

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For an explanation of the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This first edition of ISO 48-4 cancels and replaces ISO 7619-1:2010 which has been technically revised.

The main changes compared to the previous edition are as follows:

— a new standard number has been given.

— in the Introduction, an explanation of the purpose of the grouping work has been added.

— in 6.3.1, the description has been improved to distinguish hand-held instruments and on-a-stand instruments more clearly.

— in Clause 8, the description for the required time for conditioning has been improved for better understanding.

— in 9.2, the use of talcum powder has been removed.

— in Annex A, precision results from ITPs that were carried out in 1985 and 2007 have been included.

A list of all parts in the ISO 48 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO/TC 45/SC 2 established a principle that it would be helpful for users if standards on the same subject but covering different aspects or methods were grouped together, preferably with an introductory guidance standard, rather than being scattered throughout the numbering system. This has been achieved for some subjects, for example curemeters (ISO 6502) and dynamic properties (ISO 4664).

In 2017, it was decided to group standards for hardness and, subsequently, it was agreed that they would be grouped under the ISO 48 number. The new standards together with the previously numbered standards are listed below.

— ISO 48-1: former ISO 18517

— ISO 48-2: former ISO 48

— ISO 48-3: former ISO 27588

— ISO 48-4: former ISO 7619-1

— ISO 48-5: former ISO 7619-2

— ISO 48-6: former ISO 7267-1

— ISO 48-7: former ISO 7267-2

— ISO 48-8: former ISO 7267-3

— ISO 48-9: former ISO 18898

The hardness of rubber, as measured by a durometer (Shore hardness) or an IRHD pocket meter, is determined from the response of the rubber to an applied indentation. The response is complex and will depend on:

a) the elastic modulus of the rubber;

b) the viscoelastic properties of the rubber;

c) the thickness of the test piece;

d) the geometry of the indentor;

e) the pressure exerted;

f) the rate of increase of pressure;

g) the interval after which the hardness is recorded.

Because of these factors, it is inadvisable to relate results using a durometer (Shore hardness) directly to IRHD values, although correlations have been established for some individual rubbers and compounds.

Durometers were originally portable hand-held instruments that have proved to be particularly convenient for making measurements on products. By now a lot of laboratories also use them on a stand with a weight applied to the pressure foot in order to improve precision significantly.

NOTE ISO 48-2 specifies hardness measurements for determination of hardness between 10 IRHD and 100 IRHD. Further information on the relationship between the durometer values and IRHD values is given in References [5][6][7].