
**Rubber, vulcanized or
thermoplastic — Determination of
hardness —**

Part 3:
**Dead-load hardness using the very low
rubber hardness (VLRH) scale**

*Caoutchouc vulcanisé ou thermoplastique — Détermination de la
dureté —*

*Partie 3: Dureté sous charge constante au moyen de l'échelle de très
faible dureté (VLRH)*





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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).

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 voluntary nature of standards, 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 48-3 cancels and replaces ISO 27588:2012, of which it constitutes a minor revision. The 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.

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

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 test specified in this document is intended as a more discriminating alternative to the international rubber hardness degrees scale (ISO 48-2) for rubbers below 35 IRHD. A durometer method for soft rubbers is described in ISO 48-4 as the AO scale. Examples of applications are low-modulus bearings, soft roller coverings and printing rubbers.

[Figure 1](#) shows a comparison of the ranges of the IRHD N and IRHD L methods in ISO 48-2 with the VLRH scale of this document.

The methods differ primarily in the diameter of the indenting ball and the magnitude of the indenting force, these being chosen to suit the particular application.

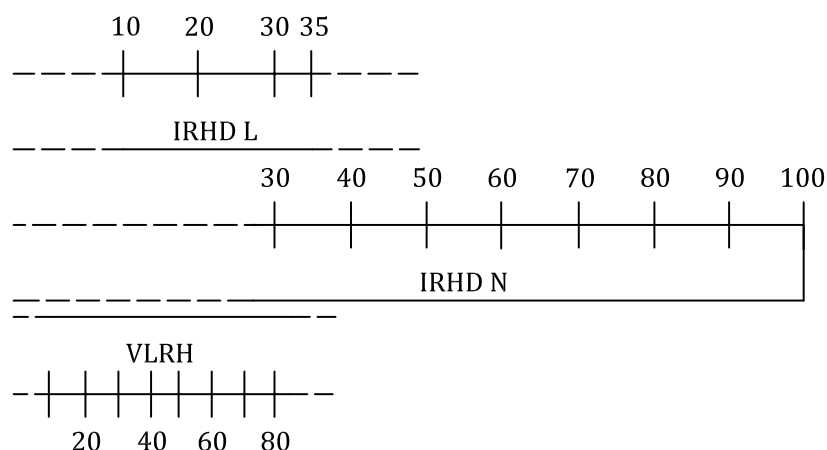


Figure 1 — Comparison of the ranges of hardness measurement methods for rubber

Rubber, vulcanized or thermoplastic — Determination of hardness —

Part 3:

Dead-load hardness using the very low rubber hardness (VLRH) scale

WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to determine the applicability of any other restrictions.

1 Scope

This document specifies a dead-load method for the determination of the hardness of very soft vulcanized or thermoplastic rubbers using the very low rubber hardness (VLRH) scale.

The relation between the depth of penetration and the VLRH scale is linear.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 48-9:2018, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 9: Calibration and verification of hardness testers*

ISO 18899, *Rubber — Guide to the calibration of test equipment*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Principle

The hardness test consists of measuring the difference between the depths of indentation of a ball into the rubber under a small contact force and a large total force. From this difference, the hardness in “very low rubber hardness degrees” (VLRH) is obtained using [Table A.1](#) (see [Annex A](#)) or graphs based on this table or a scale, reading directly in very low rubber hardness degrees, calculated from the tables and fitted to the indentation-measuring instrument.