

Metallic materials - Leeb hardness test - Part 1: Test method (ISO 16859-1:2015)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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EUROPEAN STANDARD

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English Version

Metallic materials - Leeb hardness test - Part 1: Test method (ISO 16859-1:2015)

Matériaux métalliques - Essai de dureté Leeb - Partie 1
: Méthode d'essai (ISO 16859-1:2015)

Metallische Werkstoffe - Härteprüfung nach Leeb - Teil
1: Prüfverfahren (ISO 16859-1:2015)

This European Standard was approved by CEN on 10 July 2015.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 16859-1:2015) has been prepared by Technical Committee ISO/TC 164 “Mechanical testing of metals” in collaboration with Technical Committee ECISS/TC 101 “Test methods for steel (other than chemical analysis)” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2016, and conflicting national standards shall be withdrawn at the latest by April 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 16859-1:2015 has been approved by CEN as EN ISO 16859-1:2015 without any modification.

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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 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 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

ISO 16859 consists of the following parts, under the general title *Metallic materials — Leeb hardness test*:

- *Part 1: Test method*
- *Part 2: Verification and calibration of the testing devices*
- *Part 3: Calibration of reference test blocks*

Metallic materials — Leeb hardness test —

Part 1: Test method

1 Scope

This part of ISO 16859 covers the determination of a dynamic hardness of metallic materials using seven different Leeb scales (HLD, HLS, HLE, HLDL, HLD+15, HLC, HLG).

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 16859-2, *Metallic materials — Leeb hardness test — Part 2: Verification and calibration of the testing devices*

ISO 16859-3, *Metallic materials — Leeb hardness test — Part 3: Calibration of reference test blocks*

3 Principle

When testing hardness according to Leeb, a moving impact body collides at normal incidence with a surface and rebounds. The velocity of the impact body is measured before (v_A) and after impact (v_R). The energy amount absorbed by the test piece respectively dissipated in the test measures the dynamic Leeb hardness of the test piece. It is assumed that the impact body does not permanently deform.

The ratio of the impact and rebound velocity values gives the coefficient of restitution for the impact configuration and energy used. This coefficient represents the proportion of initial kinetic energy returned to the impact body within the contact time of the impact.

The hardness number according to Leeb, HL, is calculated as given in Formula (1)

$$HL = \frac{v_R}{v_A} \cdot 1\,000 \quad (1)$$

where

v_R is rebound velocity;

v_A is impact velocity.

By definition, the Leeb hardness is a ratio and thus becomes a quantity without dimensions.

4 Symbols, abbreviated terms, and designations

4.1 For most common Leeb scale and type of impact devices, see [Table 1](#).

NOTE Other parameter values can be used based on the specific agreement between the parties.