INTERNATIONAL STANDARD

ISO 16859-2

First edition
2015-09-15

Metallic materials — Leeb hardness test —

Part 2: Verification and calibration of the testing devices

Matériaux métalliques — Essai de dureté Leeb —

Partie 2: Vérification et étalonnage des dispositifs d'essai

Reference number
ISO 16859-2:2015(E)

© ISO 2015



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ... **iv**

1 Scope ... **1**

2 Normative references ... **1**

3 General conditions ... **1**

4 Direct verification ... **1**
4.1 General ... 1
4.2 Calibration parameters ... 2
4.3 Verification of mass and geometry of impact body ... 3
4.4 Verification of geometry and hardness of indenter ball ... 3
4.5 Verification of geometry of support ring ... 3
4.6 Verification of impact velocity ... 3
4.7 Indirect verification of instrument ... 4

5 Indirect verification ... **4**
5.1 General ... 4
5.2 Procedure ... 4
5.3 Variation coefficient (***V***) ... 5
5.4 Error of test instrument ... 5
5.5 Measurement uncertainty ... 6

6 Intervals between verifications ... **6**

7 Verification report/calibration certificate ... **7**

Annex A (informative) **Measurement uncertainty of calibration results of Leeb hardness testing instrument** ... **8**

Annex B (informative) **Direct verification of single coil instrument** ... **11**

Bibliography ... **12**

© ISO 2015 – All rights reserved

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 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*

© ISO 2015 – All rights reserved

Metallic materials — Leeb hardness test —

Part 2: Verification and calibration of the testing devices

1 Scope

This part of ISO 16859 specifies methods for direct and indirect verification of test instruments used for determining Leeb hardness in accordance with ISO 16859-1, and also describes when these two types of verification are to be performed.

The direct verification involves checking that individual instrument performance parameters fall within specified limits, whereas the indirect verification utilizes hardness measurements of reference test blocks, calibrated in accordance with ISO 16859-3, to check the overall performance of the instrument for testing in the direction of gravity. The indirect method can be used on its own for the periodic performance checking in service.

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 16859-1, *Metallic materials — Leeb hardness test — Part 1: Test method*

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

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

3 General conditions

Before a Leeb hardness testing instrument is verified, the instrument shall be checked to ensure that it is properly set up and operating in accordance with the manufacturer's instructions.

Especially it should be checked that

a) the impact body is correctly installed in the guide tube,

b) the support ring is mounted tightly to the bottom of the impact device,

c) cables are correctly connected, if applicable, and

d) the settings of the indicating unit are correct.

4 Direct verification

4.1 General

4.1.1 Direct verification should be carried out at a temperature of (23 ± 5) °C. If the verification is made outside this temperature range, this shall be reported in the verification report.

4.1.2 The instruments used for verification shall be traceable to national measurement standards.

© ISO 2015 – All rights reserved