BSI Standards Publication

Steel — Determination of the thickness of surface-hardened layers

National foreword

This British Standard is the UK implementation of EN ISO 18203:2022. It is identical to ISO 18203:2016. It supersedes BS EN ISO 2639:2002, BS EN 10328:2005 and BS ISO 18203:2016, which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/101, Test methods for metals.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2022

ISBN 978 0 539 19318 3

ICS 77.040.99

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2016.

Amendments/corrigenda issued since publication

Date	Text affected
30 June 2022	This corrigendum renumbers BS ISO 18203:2016 as BS EN ISO 18203:2022

EUROPEAN STANDARD EN ISO 18203

NORME EUROPÉENNE

EUROPÄISCHE NORM March 2022

ICS 77.040.99 Supersedes EN ISO 2639:2002, EN 10328:2005

English Version

Steel - Determination of the thickness of surface-hardened layers (ISO 18203:2016)

Acier - Détermination de l'épaisseur des couches durcies superficielles (ISO 18203:2016)

Stahl - Bestimmung der Dicke gehärteter Randschichten (ISO 18203:2016)

This European Standard was approved by CEN on 20 March 2022.

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Ref. No. EN ISO 18203:2022: E

European foreword

The text of ISO 18203:2016 has been prepared by Technical Committee ISO/TC 17 "Steel" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 18203:2022 by Technical Committee CEN/TC 459/SC 1 "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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

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

This document supersedes EN ISO 2639:2002 and EN 10328:2005.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 18203:2016 has been approved by CEN as EN ISO 18203:2022 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 18203 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 7, *Methods of testing (other than mechanical tests and chemical analysis)*.

Introduction

In the past, there are three ISO standards for measuring surface-hardened layer. Because those standards employed almost the same principle of measuring, it is intended to make it easy for maintenance of the standards and application of test by integrating three standards.

The method of estimating uncertainty of measurement is not included in this ISO standard. In future revision, uncertainty of measurement may be reflected based on real applications to this test.

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Steel — Determination of the thickness of surface-hardened layers

1 Scope

This International Standard specifies a method of measuring the case-hardened depth, surface hardening depth, nitriding hardness depth and total thickness of surface-hardened depth, obtained, for example, by mechanical (shot blasting, shot peening, etc.), thermal (flame induction hardening, electron beam hardening, laser beam hardening etc.) or thermochemical (carbonitriding, carburizing and hardening, hardening and nitriding, etc.) treatment.

2 Normative reference

The following referenced documents are indispensable for the application 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 4545-1, *Metallic materials – Knoop hardness test – Part 1: Test method*

ISO 4545-2, *Metallic materials – Knoop hardness test – Part 2: Verification and calibration of testing machines*

ISO 4885, *Ferrous products — Heat treatments — Vocabulary*

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

ISO 6507-2, *Metallic materials — Vickers hardness test — Part 2: Verification and calibration of testing machines*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4885 and the following apply.

3.1
case hardening depth, *CHD*
perpendicular distance between the surface and the layer having a hardness of 550 HV in accordance with ISO 6507-1 or equivalent Knoop hardness in accordance with ISO 4545-1

Note 1 to entry: For steels which present a hardness greater than 450 HV at a distance from the surface of three times the case hardening depth (determined with a limiting hardness value of 550HV) from the surface, a limiting hardness value greater than 550 HV – in steps of 25 units – can be selected for the determination of the case hardening case-hardened depth by agreement between interested parties.

Note 2 to entry: In general, case hardening consists of carburizing or carbonitriding followed by quench hardening (see ISO 4885).

3.2
surface hardening depth, *SHD*
the distance between the surface of the product and the layer where HV is equal to the value specified by the term “hardness limit”Hardness limit is a function of the minimum surface hardness required for the part, given by the following equation:

hardness limit (HV) = A X minimum surface hardness (HV)