



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 3887:2018

# Steels - Determination of the depth of decarburization (ISO 3887:2017)

## I.S. EN ISO 3887:2018

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN ISO 3887:2018 is the adopted Irish version of the European Document EN ISO 3887:2018, Steels - Determination of the depth of decarburization (ISO 3887:2017)

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EUROPEAN STANDARD

EN ISO 3887

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2018

ICS 77.040.99

Supersedes EN ISO 3887:2003

English Version

## Steels - Determination of the depth of decarburization (ISO 3887:2017)

Aciers - Détermination de la profondeur de décarburation (ISO 3887:2017)

Stahl - Bestimmung der Entkohlungstiefe (ISO 3887:2017)

This European Standard was approved by CEN on 21 November 2017.

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**EN ISO 3887:2018 (E)**

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## **European foreword**

This document (EN ISO 3887:2018) has been prepared by Technical Committee ISO/TC 17 “Steel” 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of an identical text or by endorsement, at the latest by July 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

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 3887:2003.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### **Endorsement notice**

The text of ISO 3887:2017 has been approved by CEN as EN ISO 3887:2018 without any modification.

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# INTERNATIONAL STANDARD

**ISO  
3887**

Third edition  
2017-11

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## **Steels — Determination of the depth of decarburization**

*Aciers — Détermination de la profondeur de décarburation*



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ISO 3887:2017(E)

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**ISO 3887:2017(E)**



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## ISO 3887:2017(E)

### 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](http://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](http://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](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition (ISO 3887:2003), which has been technically revised. The following changes have been made:

- the scope has been expanded from “non-alloy and low-alloy steels” to “steel products”;
- the definitions of “partial decarburization” and “complete decarburization” have been modified;
- the term “depth of ferrite decarburization” has been deleted;
- the terms “depth profile of carbon content” and “depth profile of hardness” have been added;
- more measurement details for the micro-indentation hardness method have been added;
- two new methods of measuring the carbon depth profile, by GDOES and EPMA, have been added;
- examples of typical decarburization microstructures have been added.

# Steels — Determination of the depth of decarburization

## 1 Scope

This document defines the decarburization and specifies three methods of measuring the depth of decarburization of steel products.

## 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 4545-1, *Metallic materials — Knoop hardness test — Part 1: Test method*

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

ISO 9556, *Steel and iron — Determination of total carbon content — Infrared absorption method after combustion in an induction furnace*

ISO 14594, *Microbeam analysis — Electron probe microanalysis — Guidelines for the determination of experimental parameters for wavelength dispersive spectroscopy*

ISO 14707, *Surface chemical analysis — Glow discharge optical emission spectrometry (GD-OES) — Introduction to use*

ISO 15349-2, *Unalloyed steel — Determination of low carbon content — Part 2: Infrared absorption method after combustion in an induction furnace (with preheating)*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

### 3.1

#### **decarburization**

reduction of carbon content from the surface zone of the steel

Note 1 to entry: A distinction is made between

- a) partial decarburization,  $d_3$ , measured as the distance from the point at which the carbon content exceeds the solubility limit in ferrite, becoming visible as e.g. pearlite, to the point at which there is no more visible difference to the core carbon concentration, and
- b) complete decarburization, also called ferrite decarburization,  $d_1$ , measured as the distance between the surface of the product and the point up to which the carbon content is below the solubility limit of carbon in ferrite so that only ferrite is present.

Note 2 to entry: The depth of complete decarburization as described in b) is determined by examination of the microstructure.

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