

SLOVENSKI STANDARD

SIST EN ISO 683-3:2022

01-april-2022

Nadomešča:
SIST EN ISO 683-3:2019

Toplotno obdelana, legirana in avtomatna jekla - 3. del: Cementacijska jekla (ISO 683-3:2022)

Heat-treatable steels, alloy steels and free-cutting steels - Part 3: Case-hardening steels (ISO 683-3:2022)

Für eine Wärmebehandlung bestimmte Stähle, legierte Stähle und Automatenstähle - Teil 3: Einsatzstähle (ISO 683-3:2022)

Aciers pour traitement thermique, aciers alliés et aciers pour décolletage - Partie 3: Aciers pour cémentation (ISO 683-3:2022)

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c81-9cdd-024494330ec6/sist-en-iso-683-3-2022)

Ta slovenski standard je istoveten z: EN ISO 683-3:2022

ICS:

77.140.10	Jekla za toplotno obdelavo	Heat-treatable steels
77.140.20	Visokokakovostna jekla	Stainless steels

SIST EN ISO 683-3:2022

en,fr,de

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

<https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 683-3

February 2022

ICS 77.140.10; 77.140.20

Supersedes EN ISO 683-3:2019

English Version

**Heat-treatable steels, alloy steels and free-cutting steels -
Part 3: Case-hardening steels (ISO 683-3:2022)**

Aciers pour traitement thermique, aciers alliés et
aciers pour décolletage - Partie 3: Aciers pour
cémentation (ISO 683-3:2022)

Für eine Wärmebehandlung bestimmte Stähle, legierte
Stähle und Automatenstähle - Teil 3: Einsatzstähle (ISO
683-3:2022)

This European Standard was approved by CEN on 18 January 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

SIST EN ISO 683-3:2022

<https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022>



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)
[https://standards.iteh.ai/catalog/standards/sist/86c63dc9-
b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

European foreword

This document (EN ISO 683-3:2022) has been prepared by Technical Committee ISO/TC 17 "Steel" in collaboration with Technical Committee CEN/TC 459/SC 5 "Steels for heat treatment, alloy steels, free-cutting steels and stainless steels" the secretariat of which is held by DIN.

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 August 2022, and conflicting national standards shall be withdrawn at the latest by August 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 683-3:2019.

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

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

(standards.iteh.ai)
Endorsement notice

The text of ISO 683-3:2022 has been approved by CEN as EN ISO 683-3:2022 without any modification.

The European steel numbers to the steel grades are to be found in informative Annex B.

The references to following European standards are given for information:

EN 10017, *Steels rod for drawing and/or cold rolling – Dimensions and tolerances*

EN 10029, *Hot-rolled steel plates 3 mm thick or above – Tolerances on dimensions and shape*

EN 10048, *Hot-rolled narrow steel strip – Tolerances on dimensions and shape*

EN 10051, *Continuously hot-rolled strip and plate/sheet cut from wide strip of non.-alloy and alloy steels – Tolerances on dimensions and shape*

EN 10058, *Hot rolled flat steel bars and steel wide flats for general purposes – Dimensions and tolerances on shape and dimensions*

EN 10059, *Hot rolled square steel bars for general purposes – Dimensions and tolerances on shape and dimensions*

EN 10060, *Hot rolled round steel bars - Dimensions and tolerances on shape and dimensions*

EN 10061, *Hot rolled hexagon steel bars – Dimensions and tolerances on shape and dimensions*

EN ISO 683-3:2022 (E)

EN 10160, *Ultrasonic testing of steel flat product of thickness equal to or greater than 6 mm (reflection method)*

EN 10308, *Non-destructive testing – Ultrasonic testing of steel bars*

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

<https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022>

INTERNATIONAL STANDARD

**ISO
683-3**

Fourth edition
2022-01

Heat-treatable steels, alloy steels and free-cutting steels —

Part 3: Case-hardening steels

*Aciers pour traitement thermique, aciers alliés et aciers pour
décolletage —*

Partie 3: Aciers pour cémentation

(standards.iteh.ai)

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

[https://standards.iteh.ai/catalog/standards/sist/86c63dc9-
b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)



Reference number
ISO 683-3:2022(E)

© ISO 2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

<https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification and designation	2
4.1 Classification.....	2
4.2 Designation.....	3
5 Information to be supplied by the purchaser	3
5.1 Mandatory information.....	3
5.2 Options and/or supplementary or special requirements.....	3
5.3 Ordering example.....	3
6 Manufacturing process	4
6.1 General.....	4
6.2 Deoxidation.....	4
6.3 Heat-treatment condition and surface condition at delivery.....	4
6.3.1 Normal condition at delivery.....	4
6.3.2 Particular heat-treatment condition.....	4
6.3.3 Particular surface conditions.....	4
6.4 Traceability of the cast.....	4
7 Requirements	4
7.1 Chemical composition, hardness and hardenability.....	4
7.1.1 General.....	4
7.1.2 Hardenability.....	5
7.1.3 Chemical composition.....	5
7.2 Machinability.....	5
7.3 Cold shearability.....	5
7.4 Grain size.....	5
7.5 Non-metallic inclusions.....	6
7.5.1 Microscopic inclusions.....	6
7.5.2 Macroscopic inclusions.....	6
7.6 Internal soundness.....	6
7.7 Surface condition.....	6
7.8 Shape, dimensions and tolerances.....	6
8 Inspection	7
8.1 Testing procedures and types of documents.....	7
8.2 Frequency of testing.....	7
8.3 Tests to be carried out for specific inspection.....	7
8.3.1 General.....	7
8.3.2 Visual and dimensional inspection.....	7
9 Test methods	8
9.1 Chemical analysis.....	8
9.2 Hardness and hardenability tests.....	8
9.2.1 Verification of hardness.....	8
9.2.2 Verification of hardenability.....	8
9.3 Retests.....	8
10 Marking	8
Annex A (normative) Supplementary or special requirements	31
Annex B (informative) Designation of steels given in this document and of comparable grades covered in various designation systems	33

ISO 683-3:2022(E)

Annex C (informative) Classification of steel grades according to minimum tensile strength as a function of diameter after hardening and tempering at 200 °C	35
Bibliography	36

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

<https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022>

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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 4, *Heat treatable and alloy steels*.

This fourth edition cancels and replaces the third edition (ISO 683-3:2019), which has been technically revised. The main changes are as follows:

- steel grades 23MnCrMo5-5-4 and 17NiCrMoS6-4 have been added;
- the lower silicon content in [Table 3](#) has been deleted and replaced by a new option in [Clause A.4](#).

A list of all parts in the ISO 683 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

[SIST EN ISO 683-3:2022](https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022)

<https://standards.iteh.ai/catalog/standards/sist/86c63dc9-b07a-4c8f-9cdd-024494330ec6/sist-en-iso-683-3-2022>

Heat-treatable steels, alloy steels and free-cutting steels —

Part 3:

Case-hardening steels

1 Scope

This document specifies the technical delivery requirements for

- semi-finished products, hot formed (e.g. blooms, billets, slabs) (see NOTE 1),
- bars (see NOTE 1),
- wire rod,
- finished flat products, and
- hammer or drop forgings (see NOTE 1)

manufactured from the case-hardening non-alloy or alloy steels listed in [Table 3](#) and supplied in one of the heat-treatment conditions given for the different types of products in [Table 1](#) and in one of the surface conditions given in [Table 2](#).

The steels are, in general, intended for the manufacture of case-hardened machine parts.

NOTE 1 Hammer-forged semi-finished products (blooms, billets, slabs, etc.), seamless rolled rings and hammerforged bars are covered under semi-finished products or bars and not under the term “hammer and drop forgings”.

NOTE 2 For International Standards relating to steels conforming with the requirements for the chemical composition in [Table 3](#), however, supplied in other product forms or treatment conditions than given above or intended for special applications, and for other related International Standards, see the Bibliography.

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 377, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing*

ISO 404, *Steel and steel products — General technical delivery requirements*

ISO 642:1999, *Steel — Hardenability test by end quenching (Jominy test)*

ISO 643, *Steels — Micrographic determination of the apparent grain size*

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

ISO 4948-1, *Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition*

ISO 4948-2, *Steels — Classification — Part 2: Classification of unalloyed and alloy steels according to main quality classes and main property or application characteristics*