

DIN EN ISO 683-3**DIN**

ICS 77.140.10; 77.140.20

Supersedes
DIN EN ISO 683-3:2018-09**Heat-treatable steels, alloy steels and free-cutting steels –
Part 3: Case-hardening steels (ISO 683-3:2019);
English version EN ISO 683-3:2019,
English translation of DIN EN ISO 683-3:2019-04**

Für eine Wärmebehandlung bestimmte Stähle, legierte Stähle und Automatenstähle –
Teil 3: Einsatzstähle (ISO 683-3:2019);
Englische Fassung EN ISO 683-3:2019,
Englische Übersetzung von DIN EN ISO 683-3:2019-04

Aciérs pour traitement thermique, aciers alliés et aciers pour décolletage –
Partie 3: Aciérs pour cémentation (ISO 683-3:2019);
Version anglaise EN ISO 683-3:2019,
Traduction anglaise de DIN EN ISO 683-3:2019-04

Document comprises 43 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original shall be considered authoritative.

A comma is used as the decimal marker.

National foreword

This document (EN ISO 683-3:2019) has been prepared by Technical Committee ISO/TC 17 "Steel" in collaboration with Technical Committee CEN/TC 459 "ECIIS — European Committee for Iron and Steel Standardization", Subcommittee SC 5 "Steels for heat treatment, alloy steels, free-cutting steels and stainless steels" (Secretariat: DIN, Germany).

The responsible German body involved in its preparation was *DIN-Normenausschuss Eisen und Stahl* (DIN Standards Committee Iron and Steel), Subcommittee NA 021-00-05-01 UA "Non-alloy and alloy mechanical engineering steels".

This document specifies the technical delivery conditions for case hardening steels.

Amendments

This standard differs from DIN EN ISO 683-3:2018-09 as follows:

- a) in Table 1, Footnote a has been added;
- b) in Table 3, Footnote e has been added.

Previous editions

DIN 1661: 1924-09, 1929-06
DIN 1662: 1928-07, 1930-06
DIN 1662 Supplement 3: 1932-05
DIN 1663: 1936-05, 1939x-12
DIN 1663 Supplement 3: 1937-02, 1940-08
DIN 1663 Supplement 4: 1937-02, 1940-08
DIN 1664: 1941-05
DIN 1666: 1943-11
DIN 17210: 1951-12, 1959-01, 1969-12, 1986-09
DIN EN 10084: 1998-06, 2008-06
DIN EN ISO 683-3:2018-09

February 2019

ICS 77.140.10; 77.140.20

Supersedes EN ISO 683-3:2018

English Version

Heat-treatable steels, alloy steels and free-cutting steels —
Part 3: Case-hardening steels
(ISO 683-3:2019)

Aciérs pour traitement thermique, aciers alliés et
aciérs pour décolletage —
Partie 3: Aciérs pour cémentation
(ISO 683-3:2019)

Für eine Wärmebehandlung bestimmte Stähle,
legierte Stähle und Automatenstähle —
Teil 3: Einsatzstähle
(ISO 683-3:2019)

This European Standard was approved by CEN on 17 December 2018.

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, 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 United Kingdom.



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.....	4
Foreword	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Classification and designation.....	8
4.1 Classification.....	8
4.2 Designation.....	8
5 Information to be supplied by the purchaser.....	8
5.1 Mandatory information	8
5.2 Options and/or supplementary or special requirements.....	8
5.3 Ordering example	9
6 Manufacturing process.....	9
6.1 General.....	9
6.2 Deoxidation	9
6.3 Heat-treatment condition and surface condition at delivery	9
6.3.1 Normal condition at delivery.....	9
6.3.2 Particular heat-treatment condition.....	9
6.3.3 Particular surface conditions	9
6.4 Traceability of the cast.....	9
7 Requirements	10
7.1 Chemical composition, hardness and hardenability.....	10
7.1.1 General.....	10
7.1.2 Hardenability.....	10
7.1.3 Chemical composition	10
7.2 Machinability	10
7.3 Cold shearability.....	10
7.4 Grain size.....	10
7.5 Non-metallic inclusions	11
7.5.1 Microscopic inclusions	11
7.5.2 Macroscopic inclusions	11
7.6 Internal soundness	11
7.7 Surface condition	11
7.8 Shape, dimensions and tolerances.....	11
8 Inspection	12
8.1 Testing procedures and types of documents	12
8.2 Frequency of testing.....	12
8.3 Tests to be carried out for specific inspection.....	12
8.3.1 General.....	12
8.3.2 Visual and dimensional inspection.....	12

9	Test methods	12
9.1	Chemical analysis	12
9.2	Hardness and hardenability tests.....	13
9.2.1	Verification of hardness	13
9.2.2	Verification of hardenability	13
9.3	Retests	13
10	Marking	13
Annex A (normative) Supplementary or special requirements.....		35
A.1	Fine grain steel	35
A.2	Non-destructive tests	35
A.3	Product analysis.....	35
A.4	Reduction ratio and deformation ratio	35
A.5	Special agreements for marking	36
Annex B (informative) Designation of steels given in this document and of comparable grades covered in various designation systems.....		37
Annex C (informative) Dimensional standards applicable to products complying with this document.....		39
Annex D (informative) Classification of steel grades according to minimum tensile strength as a function of diameter after hardening and tempering at 200 °C.....		40
Bibliography		41

European foreword

This document (EN ISO 683-3:2019) 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 2019, and conflicting national standards shall be withdrawn at the latest by August 2019.

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 683-3:2018.

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 683-3:2019 has been approved by CEN as EN ISO 683-3:2019 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 10021, *General technical delivery conditions for steel products*

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

EN 10204, *Metallic products — Types of inspection documents*

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