



BSI Standards Publication

# Heat-treated steels, alloy steels and free-cutting steels

---

Part 17: Ball and roller bearing steels

This is a preview of BS EN ISO 683-17:2023. [Click here to purchase the full version from the ANSI store.](#)

## National foreword

This British Standard is the UK implementation of EN ISO 683-17:2023. It is identical to ISO 683-17:2023. It supersedes BS EN ISO 683-17:2014, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/105, Steels for Heat Treatment, Alloy Steels, Free-Cutting Steels and Stainless Steels.

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

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2023  
Published by BSI Standards Limited 2023

ISBN 978 0 539 21429 1

ICS 77.140.10; 21.100.20; 77.140.20

### Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2023.

### Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

---

This is a preview of BS EN ISO 683-17:2023. [Click here to purchase the full version from the ANSI store.](#)

## EUROPÄISCHE NORM

October 2023

ICS 21.100.20; 77.140.10

Supersedes EN ISO 683-17:2014

English Version

## Heat-treated steels, alloy steels and free-cutting steels - Part 17: Ball and roller bearing steels (ISO 683-17:2023)

Aciers pour traitement thermique, aciers alliés et  
aciers pour décolletage - Partie 17: Aciers pour  
roulements (ISO 683-17:2023)

Für eine Wärmebehandlung bestimmte Stähle, legierte  
Stähle und Automatenstähle - Teil 17: Wälzlagerstähle  
(ISO 683-17:2023)

This European Standard was approved by CEN on 5 September 2023.

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, Türkiye 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**

This is a preview of BS EN ISO 683-17:2023. [Click here to purchase the full version from the ANSI store.](#)

## **European foreword**

This document (EN ISO 683-17:2023) 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 April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

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 683-17:2014.

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, Türkiye and the United Kingdom.

## **Endorsement notice**

The text of ISO 683-17:2023 has been approved by CEN as EN ISO 683-17:2023 without any modification.

This is a preview of BS EN ISO 683-17:2023. Click here to purchase the full version from the ANSI store.

## Contents

	Page
<b>Foreword</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Classification and designation</b> .....	<b>2</b>
4.1 Classification.....	2
4.2 Designation.....	2
<b>5 Information to be supplied by the purchaser</b> .....	<b>3</b>
5.1 Mandatory information.....	3
5.2 Options/Supplementary or special requirements.....	3
<b>6 Manufacturing process</b> .....	<b>3</b>
6.1 General.....	3
6.2 Deoxidation, vacuum degassing and hydrogen removal.....	4
6.3 Heat-treatment and surface condition at delivery.....	4
6.3.1 Heat-treatment condition.....	4
6.3.2 Particular surface conditions.....	4
6.3.3 Traceability of the cast.....	4
<b>7 Requirements</b> .....	<b>4</b>
7.1 General.....	4
7.2 Chemical composition.....	4
7.3 Hardenability.....	4
7.4 Hardness.....	5
7.5 Microstructure.....	5
7.5.1 Austenitic grain size of case-hardening and induction-hardening bearing steels.....	5
7.5.2 Spheroidization and distribution of carbides.....	5
7.5.3 Structure of case-hardening steels in the condition +FP.....	5
7.6 Non-metallic inclusions.....	5
7.6.1 Microscopic inclusions.....	5
7.6.2 Macroscopic inclusions.....	5
7.7 Internal soundness.....	5
7.8 Surface quality.....	5
7.9 Shape, dimensions and tolerances.....	6
<b>8 Inspection</b> .....	<b>6</b>
8.1 Testing procedures and types of inspection documents.....	6
8.2 Frequency of testing.....	6
8.3 Specific inspection and testing.....	6
8.3.1 Verification of the hardenability and hardness.....	6
8.3.2 Inspection of the surface quality.....	6
8.3.3 Dimensional and shape inspection.....	7
<b>9 Test methods</b> .....	<b>7</b>
9.1 Chemical analysis.....	7
9.2 Hardness and hardenability tests.....	7
9.2.1 Hardness.....	7
9.2.2 Verification of hardenability.....	7
9.2.3 Retests.....	7
<b>10 Marking</b> .....	<b>7</b>
<b>Annex A (normative) Supplementary or special requirements</b> .....	<b>19</b>
<b>Annex B (informative) Designations of the steels given in <a href="#">Tables 3, 5</a> and <a href="#">6</a> and of comparable grades covered in various designation systems</b> .....	<b>22</b>

This is a preview of BS EN ISO 683-17:2023. [Click here to purchase the full version from the ANSI store.](#)

<b>Bibliography</b> .....	<b>24</b>
---------------------------	-----------

This is a preview of BS EN ISO 683-17:2023. [Click here to purchase the full version from the ANSI store.](#)

## 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 document 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)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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](http://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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459/SC 5, *Steels for heat treatment, alloy steels, free-cutting steels and stainless steels*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 683-17:2014), which has been technically revised.

The main changes are as follows:

- induction hardening steel 50CrMo4 and stainless steel X30CrMoN15-1 were added;
- requirements for Ca and Ti content have been added for through-hardening bearing steels;
- requirements for O content have been further restricted for through-hardening and induction-hardening bearing steels;
- option for H content for premium bearing steels has been added for through-hardening, case-hardening and induction-hardening bearing steels;
- option for verification of microscopic inclusions in [Table A.1](#) for through-hardening bearing steels has been revised.

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](http://www.iso.org/members.html).

This is a preview of BS EN ISO 683-17:2023. [Click here to purchase the full version from the ANSI store.](#)

This is a preview of BS EN ISO 683-17:2023. Click here to purchase the full version from the ANSI store.

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

## Part 17: Ball and roller bearing steels

### 1 Scope

This document specifies the technical delivery requirements for five groups of wrought ball and roller bearing steels as listed in [Table 3](#), namely

- through-hardening bearing steels (steels with about 1 % C and 1 % to 2 % Cr),
- case-hardening bearing steels,
- induction-hardening bearing steels (unalloyed and alloyed),
- stainless bearing steels, and
- high-temperature bearing steels.

This document is applicable to the products and heat-treatment conditions given in [Table 1](#) and the surface conditions given in [Table 2](#).

### 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, *Steel — Hardenability test by end quenching (Jominy test)*

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

ISO 3763, *Wrought steels — Macroscopic methods for assessing the content of non-metallic inclusions*

ISO 3887, *Steels — Determination of the depth of decarburization*

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*

ISO 4967, *Steel — Determination of content of non-metallic inclusions — Micrographic method using standard diagrams*

ISO 4969, *Steel — Etching method for macroscopic examination*