

This is a preview of "ISO 683-1:2016". [Click here to purchase the full version from the ANSI store.](#)

Third edition
2016-07-01

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

Part 1: Non-alloy steels for quenching and tempering

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

Partie 1: Aciers non alliés pour trempe et revenu



Reference number
ISO 683-1:2016(E)

© ISO 2016

This is a preview of "ISO 683-1:2016". Click [here](#) to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

This is a preview of "ISO 683-1:2016". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	v
1 Scope	1
2 Normative references	2
3 Terms and definitions	3
4 Classification and designation	3
4.1 Classification	3
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	4
5.3 Ordering example	4
6 Manufacturing process	4
6.1 General	4
6.2 Deoxidation	5
6.3 Heat-treatment condition and surface condition at delivery	5
6.3.1 Normal condition at delivery	5
6.3.2 Particular heat-treatment condition	5
6.3.3 Particular surface conditions	5
6.4 Traceability of the cast	5
7 Requirements	5
7.1 Chemical composition, mechanical properties and hardenability	5
7.1.1 General	5
7.1.2 Chemical composition	5
7.1.3 Mechanical properties	5
7.1.4 Hardenability	6
7.1.5 Surface hardness	6
7.2 Machinability	6
7.3 Cold shearability	6
7.4 Grain size	6
7.5 Non-metallic inclusions	7
7.5.1 Microscopic inclusions	7
7.5.2 Macroscopic inclusions	7
7.6 Internal soundness	7
7.7 Surface quality	7
7.8 Decarburization	7
7.9 Shape, dimensions and tolerances	8
8 Inspection	8
8.1 Testing procedures and types of documents	8
8.2 Frequency of testing	8
8.3 Specific inspection and testing	8
8.3.1 Verification of the hardenability, hardness and mechanical properties	8
8.3.2 Visual and dimensional inspection	9
9 Test methods	9
9.1 Chemical analysis	9
9.2 Mechanical tests	9
9.2.1 Tensile test	9
9.2.2 Impact test	9
9.3 Hardness and hardenability tests	9
9.3.1 Hardness in treatment conditions +A and +S	9
9.3.2 Verification of hardenability	9
9.3.3 Surface hardness	9

This is a preview of "ISO 683-1:2016". [Click here to purchase the full version from the ANSI store.](#)

9.4	Retests	10
10	Marking	10
Annex A	(normative) Ruling sections for mechanical properties	30
Annex B	(normative) Supplementary or special requirements	34
Annex C	(informative) Designation of steels given in this part of ISO 683 and of comparable grades covered in various designation systems	36
Annex D	(informative) Dimensional standards applicable to products complying with this part of ISO 683	38
Bibliography	39

This is a preview of "ISO 683-1:2016". 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 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 on 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.

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 4, *Heat treatable and alloy steels*.

This third edition cancels and replaces the second edition (ISO 683-1:2012), of which it constitutes a minor revision.

ISO 683 consists of the following parts, under the general title *Heat-treatable steels, alloy steels and free-cutting steels*:

- *Part 1: Non-alloy steels for quenching and tempering*
- *Part 2: Alloy steels for quenching and tempering*
- *Part 3: Case-hardening steels*
- *Part 4: Free-cutting steels*
- *Part 5: Nitriding steels*
- *Part 14: Hot-rolled steels for quenched and tempered springs*
- *Part 15: Valve steels for internal combustion engines*
- *Part 17: Ball and roller bearing steels*
- *Part 18: Bright steel products*