

Steels for quenching and tempering - Part 1: General technical delivery conditions

Steels for quenching and tempering - Part 1:
General technical delivery conditions

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 10083-1:2006 sisaldab Euroopa standardi EN 10083-1:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 20.09.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 10083-1:2006 consists of the English text of the European standard EN 10083-1:2006.</p> <p>This document is endorsed on 20.09.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala:</p> <p>This part of prEN 10083 specifies the general technical delivery requirements for - semi-finished products, hot formed, e.g. blooms, billets, slabs (see NOTES 2 and 3); - bars (see NOTE 2); - rod; - wide flats; - hot-rolled strip and sheet/plate; - forgings (see NOTE 2)</p>	<p>Scope:</p> <p>This part of prEN 10083 specifies the general technical delivery requirements for - semi-finished products, hot formed, e.g. blooms, billets, slabs (see NOTES 2 and 3); - bars (see NOTE 2); - rod; - wide flats; - hot-rolled strip and sheet/plate; - forgings (see NOTE 2)</p>
--	--

ICS 77.140.10

Võtmesõnad: acceptance specification, chemical composition, classification, consistency (mechanical property), definition

English Version

Steels for quenching and tempering - Part 1: General technical delivery conditions

Aciers pour trempe et revenu - Partie 1: Conditions techniques générales de livraison

Vergütungsstähle - Teil 1: Allgemeine technische Lieferbedingungen

This European Standard was approved by CEN on 7 July 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	3
1 Scope	4
2 Normative references	5
3 Terms and definitions	6
4 Classification and designation.....	6
4.1 Classification.....	6
4.2 Designation	6
5 Information to be supplied by the purchaser	7
5.1 Mandatory information.....	7
5.2 Options	7
6 Manufacturing process	8
6.1 General.....	8
6.2 De-oxidation	8
6.3 Heat treatment and surface condition at delivery	8
6.4 Cast separation	8
7 Requirements	9
7.1 Chemical composition, hardenability and mechanical properties	9
7.2 Machinability	9
7.3 Shearability of semi-finished products and bars	9
7.4 Structure	9
7.5 Internal soundness	10
7.6 Surface quality	10
7.7 Dimensions, tolerances on dimensions and shape	10
8 Inspection	10
8.1 Testing procedures and types of documents.....	10
8.2 Frequency of testing	11
8.3 Tests to be carried out for specific inspection.....	11
9 Preparation of samples and test pieces.....	12
9.1 Selection and preparation of samples for chemical analysis	12
9.2 Location and orientation of samples and test pieces for mechanical tests.....	12
9.3 Location and preparation of samples for hardness and hardenability tests	12
9.4 Identification of samples and test pieces	12
10 Test methods.....	13
10.1 Chemical analysis.....	13
10.2 Mechanical tests	13
10.3 Hardness and hardenability tests	13
10.4 Retests	14
11 Marking, labelling, packaging.....	14
Annex A (normative) Ruling sections for the mechanical properties	18
Annex B (normative) Options	20
Annex C (informative) Other relevant standards	22
Annex D (informative) Dimensional standards applicable to products complying with this European Standard.....	23
Annex E (informative) Determining the non-metallic inclusion content.....	24

Foreword

This document (EN 10083-1:2006) has been prepared by Technical Committee ECISS/TC 23 “Steels for heat treatment, alloy steels and free-cutting steels - Qualities and dimensions”, 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 February 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

Together with Part 2 and Part 3 of this standard, this Part 1 is a revision of the following European Standards:

EN 10083-1:1991 + A1:1996, *Quenched and tempered steels — Part 1: Technical delivery conditions for special steels*

EN 10083-2:1991 + A1:1996, *Quenched and tempered steels — Part 2: Technical delivery conditions for unalloyed quality steels*

EN 10083-3:1995, *Quenched and tempered steels — Part 3: Technical delivery conditions for boron steels*
and of

EURONORM 86:1970, *Steels for flame and induction hardening — Quality specifications*

The specific requirements for steels for quenching and tempering are given in the following parts:

Part 2: Technical delivery conditions for non alloy steels

Part 3: Technical delivery conditions for alloy steels

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

1 Scope

This part of EN 10083 specifies the general technical delivery requirements for

- semi-finished products, hot formed, e.g. blooms, billets, slabs (see NOTES 2 and 3),
- bars (see NOTE 2),
- rod,
- wide flats,
- hot-rolled strip and sheet/plate,
- forgings (see NOTE 2)

manufactured from the direct hardening non alloy steels for quenching and tempering (see EN 10083-2), the direct hardening alloy steels for quenching and tempering (see EN 10083-3), the non alloy flame and induction hardening steels (see EN 10083-2) and the alloy flame and induction hardening steels (see EN 10083-3), and supplied in one of the heat treatment conditions given for the different types of products in the relevant tables of EN 10083-2 and EN 10083-3 and in one of the surface conditions given in the relevant tables of EN 10083-2 and EN 10083-3.

The steels are generally intended for the manufacture of quenched and tempered, flame or induction hardened machine parts, but can also be used in the normalized condition (see EN 10083-2).

Where applicable, the requirements for mechanical properties given in EN 10083-2 and EN 10083-3 are restricted to the relevant tables in these documents.

NOTE 1 European Standards on similar grades are listed in Annex C.

NOTE 2 Hammer forged semi-finished products (blooms, billets, slabs etc.), seamless rolled rings and hammer forged bars are in the following covered under semi-finished products or bars and not under the term "forgings".

NOTE 3 Special agreements should be made when ordering un-worked continuously cast semi-finished products.

NOTE 4 In accordance with EN 10020, the steels covered by EN 10083-2:2006 are quality and special steels, the steels covered by EN 10083-3:2006 are special steels. The differences between quality and special steels are characterized by the following requirements, which are valid for special steels only:

- the minimum impact values in the quenched and tempered condition (for non alloy special steels in the case of mean percentages by mass of carbon $< 0,50$ % only);
- limiting hardenability values in the Jominy test (for non alloy steels in the case of percentages by mass of carbon $> 0,30$ % only);
- limited oxide inclusion content;
- lower maximum contents for phosphorus and sulphur.

NOTE 5 This European Standard does not apply for bright steel products. For bright steel products EN 10277-1 and EN 10277-5 apply.

In special cases, variations in these technical delivery requirements or additions to them may be agreed at the time of enquiry and order (see Annex B).

In addition to the specifications of this European Standard, the general technical delivery conditions given in EN 10021 are applicable unless otherwise specified.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

EN 10020:2000, *Definition and classification of grades of steel*

EN 10021, *General technical delivery requirements for steel and iron products*

EN 10027-1, *Designation systems for steels — Part 1: Steel names*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10045-1, *Metallic materials — Charpy impact test — Part 1: Test method*

EN 10052:1993, *Vocabulary of heat treatment terms for ferrous products*

EN 10079:1992, *Definition of steel products*

EN 10083-2:2006, *Steels for quenching and tempering — Part 2: Technical delivery conditions for non alloy steels*

EN 10083-3:2006, *Steels for quenching and tempering — Part 3: Technical delivery conditions for alloy steels*

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

EN 10163-2, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections — Part 2: Plates and wide flats*

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

EN 10221, *Surface quality classes for hot-rolled bars and rods — Technical delivery conditions*

CR 10261, *ECISS Information Circular 11 — Iron and steel — Review of available methods of chemical analysis*

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

EN ISO 377:1997, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997)*

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

EN ISO 643, *Steels — Micrographic determination of the apparent grain size (ISO 643:2003)*

EN ISO 3887, *Steels — Determination of depth of decarburization (ISO 3887:2003)*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1:2005)*

EN ISO 6508-1:2005, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T) (ISO 6508-1:2005)*

EN ISO 14284:2002, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996)*