

SURVEOTSTARBELISED LEHTTERASED. OSA 1:
ÜLDNÕUDED

Flat products made of steels for pressure purposes -
Part 1: General requirements

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 10028-1:2017 sisaldab Euroopa standardi EN 10028-1:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 10028-1:2017 consists of the English text of the European standard EN 10028-1:2017.
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EUROPEAN STANDARD

EN 10028-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Supersedes EN 10028-1:2007+A1:2009

English Version

Flat products made of steels for pressure purposes - Part 1: General requirements

Produits plats en acier pour appareils à pression -
Partie 1: Prescriptions générales

Flacherzeugnisse aus Druckbehälterstählen - Teil 1:
Allgemeine Anforderungen

This European Standard was approved by CEN on 11 May 2017.

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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.

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

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Contents	Page
European foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	6
4 Tolerances on dimensions	7
5 Calculation of mass	7
6 Classification and designation	7
6.1 Classification	7
6.2 Designation	8
7 Information to be supplied by the purchaser	8
7.1 Mandatory information	8
7.2 Options	9
7.3 Examples of ordering	9
8 Requirements	9
8.1 Steelmaking process	9
8.2 Delivery condition	9
8.3 Chemical composition	9
8.4 Mechanical properties	10
8.5 Surface condition	10
8.6 Internal soundness	10
9 Inspection	10
9.1 Types of inspection and inspection documents	10
9.2 Tests to be carried out	11
9.3 Retests, sorting and reprocessing	13
10 Sampling	13
10.1 Frequency of testing	13
10.2 Selection and preparation of samples and test pieces	13
11 Test methods	18
11.1 Chemical analysis	18
11.2 Tensile test at room temperature	18
11.3 Tensile test at elevated temperature	18
11.4 Impact test	18
11.5 Other testing	19
12 Marking	19
Annex A (informative) Changes to the previous version EN 10028-1:2007+A1:2009	21
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2014/68/EU	22

European foreword

This document (EN 10028-1:2017) has been prepared by Technical Committee ECISS/TC 107 “Steels for pressure purposes”, 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 January 2018 and conflicting national standards shall be withdrawn at the latest by January 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 10028-1:2007+A1:2009.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Directive 2014/68/EU.

For relationship with Directive 2014/68/EU, see informative Annex ZA, which is an integral part of this document.

A list of changes between this document and the previous version can be found in Annex A.

EN 10028, *Flat products made of steels for pressure purposes* is a series of standards that consists of the following parts:

- *Part 1: General requirements*
- *Part 2: Non-alloy and alloy steels with specified elevated temperature properties*
- *Part 3: Weldable fine grain steels, normalized*
- *Part 4: Nickel alloy steels with specified low temperature properties*
- *Part 5: Weldable fine grain steels, thermomechanically rolled*
- *Part 6: Weldable fine grain steels, quenched and tempered*
- *Part 7: Stainless 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, 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.

1 Scope

This European Standard specifies general technical delivery conditions for flat products for the construction of pressure equipment.

The general technical delivery conditions in EN 10021 also apply.

NOTE Once this European Standard is published in the EU Official Journal (OJEU) under Directive 2014/68/EU, presumption of conformity to the Essential Safety Requirements (ESRs) of Directive 2014/68/EU is limited to technical data of materials in this European Standard (Part 1 and the other relevant part of the series) and does not presume adequacy of the material to a specific item of equipment. Consequently, the assessment of the technical data stated in this material standard against the design requirements of this specific item of equipment to verify that the ESRs of Directive 2014/68/EU are satisfied, needs to be done.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 764-5:2014, *Pressure equipment – Part 5: Inspection documentation of metallic materials and compliance with the material specification*

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

EN 10021:2006, *General technical delivery conditions for steel products*

EN 10028-2:2017, *Flat products made of steels for pressure purposes – Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 10028-3:2017, *Flat products made of steels for pressure purposes – Part 3: Weldable fine grain steels, normalized*

EN 10028-4:2017, *Flat products made of steels for pressure purposes – Part 4: Nickel alloy steels with specified low temperature properties*

EN 10028-5:2017, *Flat products made of steels for pressure purposes – Part 5: Weldable fine grain steels, thermomechanically rolled*

EN 10028-6:2017, *Flat products made of steels for pressure purposes – Part 6: Weldable fine grain steels, quenched and tempered*

EN 10028-7:2016, *Flat products made of steels for pressure purposes – Part 7: Stainless steels*

EN 10029:2010, *Hot-rolled steel plates 3 mm thick or above – Tolerances on dimensions and shape*

EN 10048:1996, *Hot rolled narrow steel strip – Tolerances on dimensions and shape*

EN 10051:2010, *Continuously hot-rolled strip and plate/sheet cut from wide strip of non-alloy and alloy steels – Tolerances on dimensions and shape*

EN 10079:2007, *Definitions of steel products*

EN 10088-1:2014, *Stainless steels – Part 1: List of stainless steels*

- EN 10160:1999, *Ultrasonic testing of steel flat product of thickness equal or greater than 6 mm (reflection method)*
- EN 10163-2:2004, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections – Part 2: Plate and wide flats*
- EN 10164:2004, *Steel products with improved deformation properties perpendicular to the surface of the product – Technical delivery conditions*
- EN 10168:2004, *Steel products – Inspection documents – List of information and description*
- EN 10204:2004, *Metallic products – Types of inspection documents*
- EN 10307:2001, *Non-destructive testing – Ultrasonic testing of austenitic and austenitic-ferritic stainless steels flat products of thickness equal to or greater than 6 mm (reflection method)*
- EN ISO 148-1:2016, *Metallic materials – Charpy pendulum impact test – Part 1: Test method (ISO 148-1:2016)*
- EN ISO 377:2013, *Steel and steel products – Location and preparation of samples and test pieces for mechanical testing (ISO 377:2013, Corrected version 2015-06-01)*
- EN ISO 2566-1:1999, *Steel – Conversion of elongation values – Part 1: Carbon and low alloy steels (ISO 2566-1:1984)*
- EN ISO 2566-2:1999, *Steel – Conversion of elongation values – Part 2: Austenitic steels (ISO 2566-2:1984)*
- EN ISO 3651-2:1998, *Determination of resistance to intergranular corrosion of stainless steels – Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels – Corrosion test in media containing sulfuric acid (ISO 3651-2:1998)*
- EN ISO 6892-1:2016, *Metallic materials – Tensile testing – Part 1: Method of test at ambient temperature (ISO 6892-1:2016)*
- EN ISO 6892-2:2011, *Metallic materials – Tensile testing – Part 2: Method of test at elevated temperature (ISO 6892-2:2011)*
- EN ISO 9444-2:2010, *Continuously hot-rolled stainless steel – Tolerances on dimensions and form – Part 2: Wide strip and sheet/plate (ISO 9444-2:2009)*
- EN ISO 9445-1:2010, *Continuously cold-rolled stainless steel – Tolerances on dimensions and form – Part 1: Narrow strip and cut lengths (ISO 9445-1:2009)*
- EN ISO 9445-2:2010, *Continuously cold-rolled stainless steel – Tolerances on dimensions and form – Part 2: Wide strip and plate/sheet (ISO 9445-2:2009)*
- EN ISO 14284:2002, *Steel and iron – Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996)*
- EN ISO 18286:2010, *Hot-rolled stainless steel plates – Tolerances on dimensions and shape (ISO 18286:2008)*

ISO 9444-1:2009, *Continuously hot-rolled stainless steel – Tolerances on dimensions and form – Part 1: Narrow strip and cut lengths*

CEN/TR 10261, *Iron and steel – European standards for the determination of chemical composition*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020:2000, EN 10079:2007 and the following apply.

3.1

annealing

heat treatment consisting of heating and soaking at a suitable temperature, followed by cooling under conditions such that, after return to ambient temperature, the metal will be in a structural state closer to that of equilibrium

Note 1 to entry: In English the term “box annealing” is used when the annealing is carried out in a sealed condition to minimize oxidation.

3.2

normalizing

heat treatment consisting of austenitizing followed by air cooling

3.3

normalizing rolling

rolling process in which the final deformation process is carried out in a certain temperature range leading to a material condition equivalent to that obtained after normalizing so that the specified mechanical properties are still met even after subsequent normalizing

3.4

thermomechanical rolling

forming process in which the final deformation takes place within a certain range of temperatures leading to a material condition having certain properties which cannot be obtained or preserved by a single heat treatment

Note 1 to entry: Thermomechanical rolling (symbol M) may include processes of increased cooling rates with or without tempering including self-tempering but excluding definitively direct quenching and tempering.

3.5

quenching

operation after austenitizing which consists of cooling a workpiece more rapidly than in still air

Note 1 to entry: Quenching includes direct quenching.

3.6

tempering

heat treatment applied to a ferrous product, generally after quenching, or another heat treatment to bring the properties to the required level, and consisting of heating to specific temperatures ($< A_{c1}$) and soaking one or more times, followed by cooling at an appropriate rate