

# SVENSK STANDARD

## SS-EN 10028-5:2017

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### **Platta produkter av stål för tryckändamål – Del 5: Svetsbara finkornstål, termomekaniskt valsade**

### **Flat products made of steels for pressure purposes – Part 5: Weldable fine grain steels, thermomechanically rolled**

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Denna standard ersätter SS-EN 10028-5:2009, utgåva 3.

The European Standard EN 10028-5:2017 has the status of a Swedish Standard. This document contains the official version of EN 10028-5:2017.

This standard supersedes the Swedish Standard SS-EN 10028-5:2009, edition 3.

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EUROPEAN STANDARD

EN 10028-5

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2017

ICS 77.140.30; 77.140.50

Supersedes EN 10028-5:2009

English Version

## Flat products made of steels for pressure purposes - Part 5: Weldable fine grain steels, thermomechanically rolled

Produits plats en acier pour appareils à pression -  
Partie 5 : Aciers soudable à grains fins, laminés  
thermomécaniquement

Flacherzeugnisse aus Druckbehälterstählen - Teil 5:  
Schweißgeeignete Feinkornbaustähle,  
thermomechanisch gewalzt

This European Standard was approved by CEN on 7 May 2017.

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.

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**SS-EN 10028-5:2017 (E)**

<b>Contents</b>	<b>Page</b>
<b>European foreword</b> .....	<b>3</b>
<b>1 Scope</b> .....	<b>4</b>
<b>2 Normative references</b> .....	<b>4</b>
<b>3 Terms and definitions</b> .....	<b>4</b>
<b>4 Tolerances on dimensions</b> .....	<b>4</b>
<b>5 Calculation of mass</b> .....	<b>4</b>
<b>6 Classification and designation</b> .....	<b>5</b>
<b>6.1 Classification</b> .....	<b>5</b>
<b>6.2 Designation</b> .....	<b>5</b>
<b>7 Information to be supplied by the purchaser</b> .....	<b>5</b>
<b>7.1 Mandatory information</b> .....	<b>5</b>
<b>7.2 Options</b> .....	<b>5</b>
<b>7.3 Example for ordering</b> .....	<b>5</b>
<b>8 Requirements</b> .....	<b>6</b>
<b>8.1 Steelmaking process</b> .....	<b>6</b>
<b>8.2 Delivery condition</b> .....	<b>6</b>
<b>8.3 Chemical composition</b> .....	<b>6</b>
<b>8.4 Mechanical properties</b> .....	<b>6</b>
<b>8.5 Surface condition</b> .....	<b>6</b>
<b>8.6 Internal soundness</b> .....	<b>6</b>
<b>9 Inspection</b> .....	<b>6</b>
<b>9.1 Types of inspection and inspection documents</b> .....	<b>6</b>
<b>9.2 Tests to be carried out</b> .....	<b>6</b>
<b>9.3 Retests, sorting and reprocessing</b> .....	<b>6</b>
<b>10 Sampling</b> .....	<b>7</b>
<b>11 Test methods</b> .....	<b>7</b>
<b>12 Marking</b> .....	<b>7</b>
<b>Annex A (informative) Information on weldability</b> .....	<b>11</b>
<b>Annex B (informative) Changes to the previous version EN 10028-5:2009</b> .....	<b>12</b>
<b>Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Directive 2014/68/EU</b> .....	<b>13</b>

## **European foreword**

This document (EN 10028-5:2017) 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 10028-5:2009.

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 B.

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.

## SS-EN 10028-5:2017 (E)

### 1 Scope

This European Standard specifies the requirements for flat products for pressure equipment made of weldable fine grain thermomechanically rolled steels as specified in Table 1.

The steels are not suitable for hot forming.

NOTE 1 At the time of publication of this European Standard, no sufficient data for the standardization of the elevated temperature properties of these steels was available.

If their use at such temperatures is intended the conditions for this should be specially agreed between the interested parties.

The requirements of EN 10028-1:2017 also apply.

NOTE 2 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 1011-1:2009, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*

EN 1011-2:2001, *Welding — Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*

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

EN 10028-1:2017, *Flat products made of steels for pressure purposes — Part 1: General requirements*

EN 10204:2004, *Metallic products — Types of inspection documents*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10028-1:2017 apply.

### 4 Tolerances on dimensions

See EN 10028-1:2017.

### 5 Calculation of mass

See EN 10028-1:2017.



## 6 Classification and designation

### 6.1 Classification

6.1.1 This European Standard covers the steel grades given in Table 1 in three qualities:

- a) the basic series (P...M);
- b) series with low temperature properties down to  $-40\text{ °C}$  (P...ML1);
- c) series with low temperature properties down to  $-50\text{ °C}$  (P...ML2).

6.1.2 In accordance with EN 10020:2000 all the steels specified in this document are alloy special steels.

### 6.2 Designation

See EN 10028-1:2017.

## 7 Information to be supplied by the purchaser

### 7.1 Mandatory information

See EN 10028-1:2017.

### 7.2 Options

A number of options are specified in this document and listed below. Additionally the relevant options of EN 10028-1:2017 apply. If the purchaser does not indicate a wish to implement any of these options at the time of enquiry and order, the products shall be supplied in accordance with the basic specification (see also EN 10028-1:2017):

- 1) providing data on suitable welding conditions (see 8.2.2);
- 2) maximum carbon equivalent (see 8.3.3);
- 3) specification of a minimum impact energy of 40 J (see 8.4 and Table 5);
- 4) mid thickness test pieces for the impact test (see Clause 10).

### 7.3 Example for ordering

10 plates with nominal dimensions, thickness = 50 mm, width = 2 000 mm, length = 10 000 mm, made of a steel grade with the name P355ML2 and the number 1.8833 as specified in EN 10028-5, inspection certificate 3.1 as specified in EN 10204:

**10 plates – 50 × 2 000 × 10 000 – EN 10028-5 – P355ML2 – Inspection certificate 3.1**

or

**10 plates – 50 × 2 000 × 10 000 – EN 10028-5 – 1.8833 – Inspection certificate 3.1**

## **SS-EN 10028-5:2017 (E)**

### **8 Requirements**

#### **8.1 Steelmaking process**

See EN 10028-1:2017.

#### **8.2 Delivery condition**

**8.2.1** The products covered by this European Standard shall be supplied in the thermomechanically rolled condition.

**8.2.2** Information on weldability are given in Annex A of this standard.

#### **8.3 Chemical composition**

**8.3.1** The requirements of Table 1 apply for the chemical composition according to the cast analysis.

**8.3.2** The product analysis shall not deviate from the specified values for the cast analysis as specified in Table 1 by more than the values given in Table 2.

**8.3.3** A maximum value for the carbon equivalent in accordance with Table 3 may be agreed at time of enquiry and order.

#### **8.4 Mechanical properties**

The values given in Tables 4 and 5 (see also EN 10028-1:2017 and Clause 10) shall apply.

Optionally, a minimum impact energy value of 40 J may be specified for temperatures where lower minimum values are specified (see Table 5, footnote a).

#### **8.5 Surface condition**

See EN 10028-1:2017.

#### **8.6 Internal soundness**

See EN 10028-1:2017.

### **9 Inspection**

#### **9.1 Types of inspection and inspection documents**

See EN 10028-1:2017.

#### **9.2 Tests to be carried out**

See EN 10028-1:2017.

#### **9.3 Retests, sorting and reprocessing**

See EN 10028-1:2017.

## **10 Sampling**

See EN 10028-1:2017.

For the impact test, deviating from EN 10028-1:2017, Table 4, footnote g, the preparation of test pieces taken from the mid thickness may be agreed at the time of enquiry and order. In this case, test temperatures and minimum impact energy values shall also be agreed.

## **11 Test methods**

See EN 10028-1:2017.

## **12 Marking**

See EN 10028-1:2017.