

## DIN EN 10088-3



ICS 77.140.20; 77.140.50; 77.140.65

Supersedes  
DIN EN 10088-3:2005-09**Stainless steels –****Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes;****English version EN 10088-3:2014,****English translation of DIN EN 10088-3:2014-12**

## Nichtrostende Stähle –

Teil 3: Technische Lieferbedingungen für Halbzeug, Stäbe, Walzdraht, gezogenen Draht, Profile und Blankstahlerzeugnisse aus korrosionsbeständigen Stählen für allgemeine Verwendung;

Englische Fassung EN 10088-3:2014,

Englische Übersetzung von DIN EN 10088-3:2014-12

## Aciers inoxydables –

Partie 3: Conditions techniques de livraison pour les demi-produits, barres, fils tréfilés, profils et produits transformés à froid en acier résistant à la corrosion pour usage général

Version anglaise EN 10088-3:2014,

Traduction anglaise de DIN EN 10088-3:2014-12

Document comprises 77 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original shall be considered authoritative.



*A comma is used as the decimal marker.*

## **National foreword**

This document (EN 10088-3:2014) has been prepared by Technical Committee ECISS/TC 105 “Steels for heat treatment, alloy steels, free-cutting steels and stainless steels” (Secretariat: DIN, Germany).

The responsible German body involved in its preparation was the *DIN-Normenausschuss Eisen und Stahl* (DIN Standards Committee Iron and Steel), Working Committee NA 021-00-06-01 UA *Nichtrostende Stähle*.

This standard specifies the technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes.

## **Amendments**

This standard differs from DIN EN 10088-3:2005-09 as follows:

- a) austenitic grades 1.4615, 1.4646, 1.4020, 1.4378, austenitic-ferritic (duplex) grades 1.4162, 1.4662, 1.4482, 1.4062, 1.4669, ferritic grades 1.4611, 1.4621, 1.4613, martensitic grade 1.4150, precipitation hardening grade 1.4612 have been added;
- b) the chemical composition has been changed for the following grades:  
austenitic grade 1.4597,  
austenitic-ferritic grade 1.4362;
- c) standard inspection document is now test report 2.2 according to EN 10204;
- d) mechanical values have been changed for austenitic grade 1.4372, for martensitic grades 1.4313, 1.4028, 1.4122, 1.4057 and for precipitation hardening grade 1.4606;
- e) mechanical values for bright bars have been changed for austenitic grades 1.4305, 1.4529, 1.4378, 1.4020, for austenitic-ferritic grades 1.4062, 1.4162, 1.4482, 1.4662, 1.4507 and for martensitic grades 1.4028, 1.4122, 1.4057;
- f) the standard has been editorially revised.

## **Previous editions**

DIN 17440: 1967-01, 1972-12, 1985-07, 2001-03

DIN EN 10088-3: 1995-08, 2005-09

English Version

**Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes**

Aciers inoxydables - Partie 3: Conditions techniques de livraison pour les demi-produits, barres, fils tréfilés, profils et produits transformés à froid en acier résistant à la corrosion pour usage général

Nichtrostende Stähle - Teil 3: Technische Lieferbedingungen für Halbzeug, Stäbe, Walzdraht, gezogenen Draht, Profile und Blankstahlerzeugnisse aus korrosionsbeständigen Stählen für allgemeine Verwendung

This European Standard was approved by CEN on 9 August 2014.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

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

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## Foreword

This document (EN 10088-3:2014) has been prepared by Technical Committee ECISS/TC 105 “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 2015 and conflicting national standards shall be withdrawn at the latest by April 2015.

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 10088-3:2005.

This standard mainly differs from the 2005 edition as follows:

- a) addition of austenitic grades 1.4615, 1.4646, 1.4020, 1.4378, addition of austenitic-ferritic (duplex) grades 1.4162, 1.4662, 1.4482, 1.4062, 1.4669, addition of ferritic grades 1.4611, 1.4621, 1.4613 addition of martensitic grade 1.4150, addition of precipitation hardening grade 1.4612;
- b) chemical composition was changed for following grades: austenitic grade 1.4597, austenitic-ferritic grade 1.4362;
- c) standard inspection document is now a test report 2.2 according to EN 10204;
- d) mechanical values changed for austenitic grade 1.4372, for martensitic grades 1.4313, 1.4028, 1.4122, 1.4057 and for precipitation hardening grade 1.4606;
- e) mechanical values for bright bars have been changed for austenitic grades 1.4305, 1.4529, 1.4378, 1.4020, for austenitic-ferritic grades 1.4062, 1.4162, 1.4482, 1.4662, 1.4507 and for martensitic grades 1.4028, 1.4122, 1.4057.

EN 10088, under the general title *Stainless steels*, consists of the following parts:

- *Part 1: List of stainless steels* (including a table of European Standards, in which these stainless steels are further specified, see Annex B);
- *Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*;
- *Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes* [the present document];
- *Part 4: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for construction purposes*;
- *Part 5: Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes*.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Introduction**

The European Organization for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents applied to 10 steel grades.

CEN takes no position concerning the evidence, validity and scope of these patent rights.

The holder of these patent rights has ensured CEN that they are willing to negotiate licenses, under reasonable and non-discriminatory terms and conditions, with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with CEN. Information may be obtained from:

Grade 1.4658:  
Sandvik AB  
SE-811 81 Sandviken, Sweden

Grade: 1.4162, 1.4662  
Outokumpu Stainless AB  
SE-77480 Avesta, Sweden

Grade 1.4062, 1.4615, 1.4669:  
Ugitech  
F-73403 Ugine Cedex, France,

Grade 1.4062, 1.4669  
Industeel  
F-71200 Creusot, 56 Rue Clemenceau, France

Grade 1.4646, 1.4611, 1.4613  
Acciai Speciali Terni  
I-05100 Terni, Italy

## 1 Scope

This European Standard specifies the technical delivery conditions for semi-finished products, hot or cold formed bars, rods, wire, sections and bright products of standard grades and special grades of corrosion resisting stainless steels for general purposes.

NOTE General purposes include the use of stainless steels in contact with foodstuffs.

The general technical delivery conditions specified in EN 10021 apply in addition to the specifications of this European Standard, unless otherwise specified in this European Standard.

This European Standard does not apply to components manufactured by further processing of the product forms listed above with quality characteristics altered as a result of such further processing.

## 2 Normative references

The following referenced 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 10021, *General technical delivery conditions for steel products*

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

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

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

EN 10079:2007, *Definition of steel products*

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

EN 10163-3, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections — Part 3: Sections*

EN 10168, *Steel products — Inspection documents — List of information and description*

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

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

EN 10306, *Iron and steel — Ultrasonic testing of H beams with parallel flanges and IPE beams*

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

EN ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1)*

EN ISO 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits (ISO 286-1)*

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

EN ISO 3651-2, *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)*

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

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 6892-2, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature (ISO 6892-2)*

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

### **3 Terms and definitions**

For the purposes of this document, the terms and definitions regarding types of heat-treatment in EN 10052:1993, regarding product forms in EN 10079:2007 and the following apply.

#### **3.1**

##### **stainless steels**

steels with at least 10,5 % of chromium and maximum 1,2 % of carbon

[SOURCE: EN 10020:2000, 3.2.2]

Note 1 to entry: Stainless steels are further subdivided in accordance with their main property into corrosion resisting steels, heat resisting steels and creep resisting steels.

Note 2 to entry: One type steel in Table 7 in EN 10088-1:2014 and five types of steel in Table 9 in EN 10088-1:2014 contain less chromium than the minimum defined for stainless steels, but are included in the heat-resisting and creep-resisting steels standards respectively, because they form a part of these two families of steels.

#### **3.2**

##### **corrosion resisting steels**

steels with at least 10,5 % Cr and max. 1,20 % C if their resistance to corrosion is of primary importance

#### **3.3**

##### **general purposes**

purposes other than the special purposes mentioned in the Bibliography

#### **3.4**

##### **standard grades**

grades with a relatively good availability and a wider range of application

#### **3.5**

##### **special grades**

grades for special use and/or with limited availability

### **4 Designation and ordering**

#### **4.1 Designation of steel grades**

The steel names and steel numbers (see Tables 2 to 5) were formed in accordance with EN 10027-1 and EN 10027-2 respectively.

#### **4.2 Designation to be used on ordering**

The complete designation for ordering a product according to this document shall contain the following information:



- desired quantity;
- product form (e. g. round bars, square bars or rod);
- where an appropriate dimensional standard is available (see Table 7 and Annex C) the number of the standard plus any choice of requirements; if there is no dimensional standard, the nominal dimensions and tolerances required;
- type of material (steel);
- number of this document;
- steel name or steel number;
- if for the relevant steel in the table for the mechanical properties more than one treatment condition is covered, the symbol for the desired heat treatment or cold worked condition;
- desired condition (see symbols in Table 7);
- if a verification of internal soundness is required, products shall be tested in accordance with EN 10306 or EN 10308;
- any additional optional tests or inspections (see 7.2.3 d);
- standard designation for a test report 2.2 or, if required, any other type of inspection document in accordance with EN 10204 (see 7.2.1).

EXAMPLE      10 t round bars according to EN 10060 of 50 mm diameter made of steel grade EN 10088–3 with the name X5CrNi18–10 and the number 1.4301 in condition 1D (see Table 7), inspection certificate 3.1 as specified in EN 10204:

10 t round bars EN 10060 — 50  
Steel EN 10088–3 — X5CrNi18–10+1D  
EN 10204 — 3.1

or

10 t round bars EN 10060 — 50  
Steel EN 10088–3-1.4301+1D  
EN 10204 —3.1

## **5 Classification of grades**

Steels covered in this document are classified according to their structure into

- austenitic steels,
- austenitic-ferritic steels,
- ferritic steels,
- martensitic steels,
- precipitation hardening steels.

See also EN 10088-1:2014, Annex C.