
BYfUj bU^_U!" "XY. HY b] b]XcVUj b]dc[c^]nUdc`]nXY_YZxf[c] cj YzdU]WZy]W
]b`dfcZ`YnUgd`c`ybc`i dcfUvc

Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes

Nichtrostende Stähle - Teil 3: Technische Lieferbedingungen für Halbzeug, Stäbe, Walzdraht und Profile für allgemeine Verwendung

Aciers inoxydables - Partie 3: Conditions techniques de livraison pour les demi-produits, barres, fils machine et profils pour usage général

<https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-f8b9811a7f06/sist-en-10088-3-1997>

Ta slovenski standard je istoveten z: EN 10088-3:1995

ICS:

77.140.20	Visokokakovostna jekla	Stainless steels
77.140.50	Ú[z a^b \ ^} a^ a^ \ a^] [ã â^ \ ã	Flat steel products and semi-products
77.140.65	Jeklene žice, jeklene vrvi in verige	Steel wire, wire ropes and link chains

SIST EN 10088-3:1997

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 10088-3:1997

<https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-f8b9811a7f06/sist-en-10088-3-1997>

EUROPEAN STANDARD

EN 10088-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1995

ICS 77.140.20; 77.140.50

Descriptors: iron- and steel products, hot rolled products, drawing : forming process, semi-finished products, metal bars, wire rod, metal sections, stainless steels, delivery, designation, dimensions, dimensional tolerances, chemical composition, grades : quality, classifications, mechanical properties, tests, marking

English version

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

iTeh STANDARD PREVIEW

Aciers inoxydables - Partie 3: Conditions techniques de livraison pour les demi-produits, barres, fils machine et profils pour usage général

Nichtrostende Stähle - Teil 3: Technische Lieferbedingungen für Halbzeug, Stäbe, Walzdraht und Profile für allgemeine Verwendung

<https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-f8b9811a7f06/sist-en-10088-3-1997>

This European Standard was approved by CEN on 1995-02-28. 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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents	Page
Foreword	3
1 Scope	4
2 Normative references	4
3 Definitions	5
3.1 Stainless steels	5
3.2 Product forms	6
3.3 Types of heat treatment	6
4 Dimensions and tolerances on dimensions	6
5 Calculation of mass and tolerances on mass	6
6 Designation and ordering	6
6.1 Designation of steel grades	6
6.2 Designation to be used on ordering	6
7 Classification of grades	7
8 Requirements	7
8.1 Production process	7
8.2 Delivery condition	7
8.3 Chemical composition	8
8.4 Chemical corrosion properties	8
8.5 Mechanical properties	8
8.6 Surface quality	9
8.7 Internal soundness	9
9 Testing	9
9.1 General	9
9.2 Agreement on tests and inspection documents	9
9.3 Specific inspection and testing	10
9.4 Test methods	11
9.5 Retests	11
10 Marking	12
Annex	
A (informative) Guidelines for further treatment (including heat treatment) in fabrication	30
B (informative) Applicable dimensional standards	34
C (informative) Bibliography	35



Vorwort

Diese Europäische Norm wurde vom SC 1 "Stainless steels" vom Technischen Komitee ECISS/TC 23 "Für eine Wärmebehandlung bestimmte Stähle, legierte Stähle und Automatenstähle - Gütenormen" erarbeitet, dessen Sekretariat vom DIN betreut wird.

Diese Europäische Norm ersetzt:

EU 88-2:1986 Nichtrostende Stähle - Teil 2: Technische Lieferbedingungen für Blech und Band für allgemeine Verwendung

Diese Europäische Norm muß den Status einer nationalen Norm erhalten, entweder durch Veröffentlichung eines identischen Textes oder durch Anerkennung bis Oktober 1995, und etwaige entgegenstehende nationale Normen müssen bis Oktober 1995 zurückgezogen werden.

Entsprechend der CEN/CENELEC-Geschäftsordnung sind folgende Länder gehalten, diese Europäische Norm zu übernehmen: Belgien, Dänemark, Deutschland, Finnland, Frankreich, Griechenland, Irland, Island, Italien, Luxemburg, Niederlande, Norwegen, Österreich, Portugal, Schweden, Schweiz, Spanien und das Vereinigte Königreich.

ITeH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 10088-3:1997

<https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-f8b9811a7f06/sist-en-10088-3-1997>

1 Scope

1.1 This part of EN 10088 specifies the technical delivery conditions for semi-finished products, hot or cold formed bars, rods and sections of standard grades and special grades of stainless steels for general purposes.

NOTE:

Here and in the following are understood

- under the term "general purposes" purposes other than the special purposes mentioned in Annex C;
- under the term "standard grades" grades with a relative good availability and a wider range of application;
- under the term "special grades" grades for special use and/or with limited availability.

1.2 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.

1.3 This European Standard does not apply to components manufactured by further processing the product forms listed in 1.1 with quality characteristics altered as a result of such further processing.

2 Normative references

SIST EN 10088-3:1997

[https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-](https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-8b9811a7f06/sist-en-10088-3-1997)

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 10002-1	Metallic materials - Tensile testing - Part 1: Method of test (at ambient temperature)
EN 10002-5	Metallic materials - Tensile testing - Part 5: Method of test at elevated temperature
EN 10003-1 ¹⁾	Metallic materials - Hardness test - Brinell - Part 1: Test method

¹⁾ At present at the stage of draft.

- EURONORM 18²⁾ Selection and preparation of samples and test pieces for steel and iron and steel products
- EN 10021 General technical delivery requirements for steel and steel products
- EN 10027-1 Designation systems for steels - Part 1: Steel names, principal symbols
- EN 10027-2 Designation systems for steels - Part 2: Numerical system
- EN 10 045-1 Metallic materials - Charpy impact test - Part 1: Method of test
- EN 10052 Vocabulary of heat treatment terms for ferrous products
- EN 10079 Definition of steel products
- EN 10088-1 Stainless steels - Part 1: List of stainless steels
- EURONORM 114²⁾ Determination of the resistance to intergranular corrosion of austenitic stainless steels: corrosion test in a sulphuric acid-copper sulphate medium (Monypenny-Strauss test)
- EURONORM 168²⁾ Iron and steel products - Inspection documents - Contents
- EN 10204 Metallic products - Types of inspection documents
- EN 10221 Surface quality classes for hot-rolled bars and rods - Technical delivery conditions

See also Annex B.

3 Definitions

3.1 Stainless steels

The definition in EN 10088-1 applies.

²⁾ It may be agreed at the time of ordering, until this EURONORM has been adopted as a European Standard, that either this EURONORM or a corresponding national standard should be applied.

3.2 Product forms

The definitions in EN 10079 apply.

3.3 Types of heat treatment

The definitions in EN 10052 apply.

4 Dimensions and tolerances on dimensions

The dimensions and the tolerances on dimensions are to be agreed at the time of enquiry and order, as far as possible with reference to the dimensional standards listed in Annex B (see also Table 6).

5 Calculation of mass and tolerances on mass

5.1 When calculating the nominal mass from the nominal dimensions the values given in EN 10088-1 shall be used as a basis for the density of the steel concerned.

5.2 If the tolerances on mass are not specified in the dimensional standard listed in Annex B, they may be agreed at the time of enquiry and order.

6 Designation and ordering

6.1 Designation of steel grades

The steel names and steel numbers (see Tables 1 to 4) were formed in accordance with EN 10027-1 and EN 10027-2 respectively.

6.2 Designation to be used on ordering

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

- the desired quantity;
- the product form (e. g. bar or rod);
- where an appropriate dimensional standard is available (see Annex B) the number of the standard plus any choice of requirements;
if there is no dimensional standard, the nominal dimensions and tolerances required;
- the type of material (steel);
- the number of this European Standard;
- the 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;
- the desired process route (see symbols in Table 6);
- if an inspection document is required, its designation in accordance with EN 10204.

Example:

10 t rounds of a steel grade with the name X5CrNi18-10 and the number 1.4301 as specified in EN 10088-3 of 50 mm diameter, dimensional tolerances as specified in EURONORM 60, in process route 1D (see Table 6), inspection document 3.1.B as specified in EN 10204:

10 t rounds EURONORM 60 - 50
Steel EN 10088-3-X5CrNi18-10+1D
Inspection document 3.1.B

or

10 t rounds EURONORM 60 - 50
Steel EN 10088-3-1.4301+1D
Inspection document 3.1.B

iTeh STANDARD PREVIEW
(standards.iteh.ai)

7 Classification of grades

Steels covered in this European Standard are classified according to their structure into

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

See also NOTE in 1.1 and Annex B to EN 10088-1.

8 Requirements**8.1 Production process**

Unless a special steel-making process is agreed when ordering, the steel-making process for steels conforming to this European Standard shall be at the discretion of the manufacturer.

8.2 Delivery condition

The products shall be supplied in the delivery condition agreed in the order by reference to the process route given in Table 6 and, where different alternatives exist, to the treatment conditions

given in Tables 7 to 11 and 17 (see also Annex A).

8.3 Chemical composition

8.3.1 The chemical composition requirements given in Tables 1 to 4 apply in respect of the chemical composition according to the cast analysis.

8.3.2 The product analysis may deviate from the limiting values for the cast analysis given in Tables 1 to 4 by the values listed in Table 5.

8.4 Chemical corrosion properties

Referring to resistance to intergranular corrosion as defined in EURONORM 114, for ferritic, austenitic and austenitic-ferritic stainless steels the specifications in Tables 7, 10 and 11 apply.

NOTE 1: EURONORM 114 is not applicable for testing martensitic and precipitation hardening steels.

NOTE 2: The corrosion resistance of stainless steels is very dependant on the type of environment and can therefore not always be clearly ascertained through laboratory tests. It is therefore advisable to draw on the available experience of the use of the steels.

[SIST EN 10088-3:1997](https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-1609811a7f06/sist-en-10088-3-1997)

8.5 Mechanical properties

<https://standards.iteh.ai/catalog/standards/sist/b35bf223-e88b-417c-9be1-1609811a7f06/sist-en-10088-3-1997>

8.5.1 The mechanical properties at room temperature as specified in Tables 7 to 11 apply for each specified heat treatment condition. This does not apply to the process route 1U (hot rolled, not heat treated, not descaled) and to semi-finished products.

If by agreement at the time of ordering the products are to be supplied in a non-heat-treated condition, the mechanical properties specified in Tables 7, 8, 9, 10 and 11 shall be obtainable from reference test pieces which have received the appropriate heat treatment (simulated heat treatment).

For cold worked products, the mechanical properties at room temperature as specified in Table 17 apply.

NOTE: Austenitic steels are insensitive to brittle fracture in the solution annealed condition. Because they do not have a pronounced transition temperature, which is characteristic of other steels, they are also useful for application at cryogenic temperatures.

8.5.2 The values in Tables 12 to 16 apply for the 0,2 % and 1 % proof strength at elevated temperatures.

8.6 Surface quality

Slight surface imperfections, inherent in the production process, are permitted.

If more exact requirements for the surface quality are necessary, these shall be agreed at the time of enquiry and order, where appropriate, on the basis of EN 10221.

8.7 Internal soundness

For the internal soundness, where appropriate, requirements together with the conditions for their verification may be agreed at the time of enquiry and order.

9 Testing

9.1 General

The manufacturer shall carry out appropriate process control, inspection and testing to assure himself that the delivery complies with the requirements of the order.

This includes the following:

- A suitable frequency of verification of the dimensions of the products.
- An adequate intensity of visual examination of the surface quality of the products.
- An appropriate frequency and type of test to ensure that the correct grade of steel is used.

The nature and frequency of these verifications, examinations and tests is determined by the manufacturer, in the light of the degree of consistency that has been determined by the evidence of the quality system. In view of this, verifications by specific tests for these requirements are not necessary unless otherwise agreed.

9.2 Agreement on tests and inspection documents

9.2.1 At the time of ordering the issue of one of the inspection documents in accordance with EN 10204 may be agreed for each delivery.

9.2.2 If it is agreed to issue a test report 2.2 in accordance with EN 10204 it shall indicate the following information:

- a) the information groups A, B and Z of EURONORM 168;
- b) the results of the cast analysis in accordance with the code numbers C71 to C92 in EURONORM 168.

9.2.3 If the issuing of an inspection certificate 3.1.A, 3.1.B or 3.1.C according to EN 10204 or of an inspection report 3.2 according to EN 10204 has been agreed, specific inspections according to 9.3 are to be carried out and the following informations shall be given in the inspection document with the code numbers and details required by EURONORM 168:

- a) } As under 9.2.2 a) and b).
- b) }
- c) The results of the mandatory tests marked in Table 18, second column, by a m.
- d) The results of any optional test or inspections agreed when ordering.

9.3 Specific inspection and testing

9.3.1 Extent of testing

The tests to be carried out, either mandatorily (m) or by agreement (o) and the composition and size of the test units, and the number of sample products, samples and test pieces to be taken are given in Table 18.

9.3.2 Selection and preparation of samples

9.3.2.1 The specifications of Euronorm 18 shall be observed in sampling and sample preparation. The stipulations in 9.3.2.2 apply additionally for the mechanical tests.

9.3.2.2 The samples for the tensile test shall be taken in accordance with Figures 1 to 3. If it has been agreed that impact tests shall be carried out, the samples shall be taken from the same location.

The samples shall be taken from products in the delivery condition. If agreed, samples from bars may be taken before straightening. For samples to be given a simulated heat treatment the conditions for annealing, hardening and tempering shall be agreed.

9.3.2.3 Samples for the hardness test and for the resistance to intergranular corrosion test, where requested, shall be taken from the same locations as those for the mechanical tests.