



SLOVENSKI STANDARD
SIST EN 10095:2000
01-april-2000

Toplotno obstojna jekla in nikljeve zlitine

Heat resisting steels and nickel alloys

Hitzebeständige Stähle und Nickellegierungen

Aciers et alliages de nickel réfractaires

Ta slovenski standard je istoveten z: EN 10095:1999

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ICS:

77.120.40	Nikelj, krom in njune zlitine	Nickel, chromium and their alloys
77.140.20	Visokokakovostna jekla	Stainless steels

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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10095

March 1999

ICS 77.120.40; 77.140.20

English version

Heat resisting steels and nickel alloys

Aciers et alliages de nickel réfractaires

Hitzebeständige Stähle und Nickellegierungen

This European Standard was approved by CEN on 1 March 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by September 1999, and conflicting national standards shall be withdrawn at the latest by September 1999.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

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

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NOTE: The clauses marked with a point (•) contain information relating to agreements which are to be made at the time of ordering. The clauses marked with two points (••) contain information relating to agreements which may be made at the time of ordering.

1 Scope

1.1 This European standard covers the grades of wrought steels and nickel alloys listed in tables 1 to 3 which are usually employed for products, for which the main requirement is their resistance to the effects of hot gases and products of combustion at temperatures above 550 °C.

1.2 This EN 10095 specifies the technical delivery conditions for semi-finished products, for hot or cold rolled sheet/plate and strip, hot or cold formed bars, rods and sections of heat resisting steels and nickel alloys.

1.3 Some grades from EN 10088-1 and prEN 10028-7 may be used as heat resisting steels. These grades are listed in the informative annex D.

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

1.5 This European Standard does not apply to components manufactured by further processing the product forms listed in 1.2 with quality characteristics altered as a result of such further processing.

1.6 This European Standard is not intended for pressure purposes.

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2 Normative references

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 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 testing (at ambient temperature)
EN 10002-5	Metallic materials - Tensile testing - Part 5: Method of test at elevated temperature
EN 10003-1	Metallic materials - Hardness test - Brinell - Part 1: Test method
EN 10021	General technical delivery requirements for steel and iron 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 10052	Vocabulary of heat treatment terms for ferrous products
EN 10079	Definition of steel products
EN 10163-2	Delivery requirements for surface condition of hot rolled steel plates, wide flats and sections - Part 2: Plate 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
EN ISO 377	Steel and steel products - Location and preparation of samples and test pieces for mechanical testing.
EN ISO 9001	Quality systems - Model for quality assurance in design/development, production, installation and servicing
EN ISO 9002	Quality systems - Model for quality assurance in production, installation and servicing
EU 168-86 ¹⁾	Iron and steel products - Inspection documents - Contents
ISO 14284	Steel and iron - Sampling and preparation of samples for the determination of chemical composition

1) •• 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 Definitions

For the purpose of this European Standard, the following definition applies in addition to the definitions given in EN 10021, EN 10052, EN 10079, EN ISO 377 and ISO 14284:

3.1 Heat-resistance: Property of materials that are used at above 550°C (for steels: wustite point) due to their excellent resistance to the effects of hot gases and products of combustion as well as their resistance to the influence of molten salts and molten metals but also showing good mechanical properties during short and long-term stressing.

4 Classification and designation

4.1 Classification

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

- ferritic steels;
- austenitic-ferritic steels;
- austenitic steels; and
- austenitic nickel alloys.

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4.2 Designation <https://standards.iteh.ai/catalog/standards/sist/28927120-ac90-4402-b948-19323cd2624e/sist-en-10095-2000>

The names and numbers of the steels (see table 1 and 2) were formed in accordance with EN 10027-1 and EN 10027-2 respectively.

NOTE: Explanation on the designation of nickel alloys (see table 3)

- name: The preceding chemical symbols indicate the main alloy elements and the figure immediately following indicates the average content of these alloys subsequently followed by the symbol for the other added important alloy elements.
- material number: The structure is set out according to EN 10027-2 with the number 2 for the material group number. This material group comprises chemically resistant and high temperature or heat resistant nickel and cobalt alloys.

5 Information to be supplied by the purchaser

5.1 • Mandatory information

The following information shall be supplied by the purchaser at the time of enquiry and order:

- a) the quantity to be delivered;

- b) the designation of the product form (e.g. bar or rod, strip or sheet);
- c) where an appropriate dimensional standard is available (see annex A) the number of the standard and the indications required by this, also the nominal dimensions and tolerances;
- d) the type of material (steel or nickel alloy);
- e) the number of this European Standard (EN 10095);
- f) the name or number of the steel grade or nickel alloy (see 4.2);
- g) if for the relevant grade in the table more than one treatment condition for the mechanical properties is covered, the symbol for the desired heat treatment condition or cold worked condition;
- h) the desired process route (see symbols in tables 7 and 8).

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EXAMPLE:

10 t rounds of a steel grade with the name X10NiCrAlTi32-21 and the number 1.4876 as specified in EN 10095 of 50 mm diameter, dimensional tolerances as specified in EURONORM 60, in process route 1D.

10 t rounds EURONORM 60 - 50
steel EN 10095 - X10NiCrAlTi32-21+1D

or

10 t rounds EURONORM 60 - 50
steel EN 10095 - 1.4876+1D

5.2 •• Options

A number of options are specified in this European Standard and listed below. If the purchaser does not indicate his wish to implement one of these options, the supplier shall supply in accordance with the basis specification of this European Standard (see 5.1).

- a) any requirement concerning a special melting or forming process (see 6.1);
- b) any requirement relating to surface quality (see 7.4);
- c) any requirement concerning the issue of an inspection document (see 8.2);
- d) any requirement concerning the method of analysis to determine the product analysis (see 8.4.1);
- e) any requirement concerning special marking of the products (see 9.2, 9.3 and table 10);

6 Manufacturing process

6.1 •• General

Unless a special melting or forming process is agreed when ordering, the production process for steels and alloys conforming to this European Standard shall be at the discretion of the manufacturer.

6.2 • Delivery condition

The products shall be supplied in the delivery condition agreed in the order by reference to the process route given in tables 7 and 8 and to the treatment conditions given in table B.1.

7 Requirements

7.1 General

The supplier shall operate and certify a quality system in accordance with EN ISO 9002²⁾.

7.2 Chemical composition

7.2.1 The chemical composition requirements given in tables 1 to 3 apply with respect to the cast analysis.

7.2.2 The product analysis may deviate from the limiting values for the cast analysis given in tables 1 to 3 by the values listed in tables 4 and 5.

7.3 Mechanical properties

The mechanical properties at room temperature as specified in table 6 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 table 6 shall be obtainable from reference test pieces which have received the appropriate heat treatment (simulated heat treatment).

7.4 Surface quality

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

²⁾ This requirement is also fulfilled by a quality system in accordance with EN ISO 9001.

- If more exact requirements for the surface quality are necessary, these shall be agreed at the time of enquiry and order.

When products are delivered in coil form, the degree and extent of such imperfections may be expected to be greater due to the impracticality of removing short lengths of coil. For hot-rolled quarto-plates, the specification in EN 10163-2 class A3, applies unless otherwise stated.

For long products, where appropriate the requirements shall be on the basis of EN 10221.

7.5 • 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 A.

7.6 Calculation of mass and tolerances on mass

7.6.1 When calculating the nominal mass from the nominal dimensions the values given in table B.5 shall be used as a basis for the density of the steel concerned.

7.6.2 • If the tolerances on mass are not specified in the dimensional standard listed in Annex A, they shall be agreed at the time of enquiry and order.

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8 Inspection and testing

8.1 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 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.