SLOVENSKI STANDARD
oSIST prEN 10338:2024

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Vroče in hladno valjani neprevlečeni izdelki večfaznih jekel za hladno oblikovanje - Tehnični dobavni pogoji

Hot rolled and cold rolled non-coated products of multiphase steels for cold forming - Technical delivery conditions

Warmgewalzte und kaltgewalzte Flacherzeugnisse ohne Überzug aus Mehrphasenstählen zum Kaltumformen - Technische Lieferbedingungen

Produits plats non revêtus laminés à chaud et laminés à froid en aciers multiphasés pour formage à froid - Conditions techniques de livraison

Ta slovenski standard je istoveten z: **prEN 10338**

ICS:

77.140.50	Ploščati jekleni izdelki in polizdelki	Flat steel products and semi-products

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EUROPEAN STANDARD

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English Version

Hot rolled and cold rolled non-coated products of multiphase steels for cold forming - Technical delivery conditions

Produits plats non revêtus laminés à chaud et laminés à froid en aciers en aciers multiphases pour formage à froid - Conditions techniques de livraison

Kaltgewalzte und warmgewalzte Flacherzeugnisse ohne Überzug aus Mehrphasenstählen zum Kaltumformen - Technische Lieferbedingungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 459/SC 9.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 10338:2024) has been prepared by Technical Committee CEN/TC 459/SC 9 “Coated and uncoated flat products to be used for cold forming”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 10338:2015.

prEN 10338:2024 includes the following significant technical changes with respect to EN 10338:2015:

— scope and normative references have been updated;

— definitions have been added in Clause 3;

— example has been added in Clause 5;

— Tables 1, 2, 4 and 5 have been updated.

1 Scope

This document applies to hot rolled and cold rolled non-coated steel flat products made of multiphase steels for cold forming. It covers cold rolled products of thicknesses t < 3 mm and hot rolled products of thicknesses t ≤ 6,5 mm.

These products are delivered in sheet, hot rolled strip, slit hot rolled strip, cold strip, slit cold rolled strip or cut lengths obtained from slit wide strip.

Flat products of multiphase steels for cold forming can be delivered with an electrolytic zinc coating according to EN 10152.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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 10048, *Hot rolled narrow steel strip — Tolerances on dimensions and shape*

EN 10049, *Measurement of roughness average Ra and peak count RPc on metallic flat products*

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

EN 10079, *Definition of steel products*

EN 10130, *Cold rolled low carbon steel flat products for cold forming — Technical delivery conditions*

EN 10131, *Cold rolled uncoated and zinc or zinc-nickel electrolytically coated low carbon and high yield strength steel flat products for cold forming — Tolerances on dimensions and shape*

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

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

EN ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2019)*

ISO 10275, *Metallic materials — Sheet and strip — Determination of tensile strain hardening exponent*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020, EN 10021, EN 10079 and EN 10204 and the following apply.

3.1
ferritic-bainitic steel
F
steel characterized by a matrix of ferrite or strengthened ferrite containing bainite or strengthened bainite

Note 1 to entry: The high strength of the matrix is caused by grain refinement, precipitation of micro-alloying elements and a high dislocation density.

3.2
dual-phase steel
X
steel microstructure consisting mainly of ferrite and martensite that allows for the additional presence of bainite with increasing strength

Note 1 to entry: At a given high tensile strength dual phase steels show a low yield ratio (R_e/R_m) and a strong work hardening capacity. Therefore, dual phase steels are especially suited for forming operations with high stretching portions.

3.3
transformation induced plasticity steel
T
steel characterized by ferritic matrix containing retained austenite capable of transformation into martensite during the forming process

Note 1 to entry: Also known as trip steel.

Note 2 to entry: Because of high work-hardening rate, the steel reaches high uniform elongation values and high tensile strength levels.

3.4
complex-phase steel
C

steel characterized by a multi-phase microstructure containing mostly a ferritic-bainitic matrix whereas martensite, tempered martensite, retained austenite and pearlite can be present as additional phases

Note 1 to entry: The extremely fine-grained microstructure is generated by retarded recrystallization or precipitation of micro-alloying elements. Compared to dual phase steels they show a higher yield ratio, lower work hardenability and good hole expansion ratios.

3.5
martensitic steel
MS
steel characterized by a mainly martensitic micro-structure with small amounts of ferrite and/or bainite and a very high strength

Note 1 to entry: The drawability is limited; this steel grade is more suited for bending processes like roll forming.

3.6
dual-phase steel with improved formability
DH
steel microstructure with improved formability consisting mainly of ferrite and martensite and small amounts of bainite and retained austenite

Note 1 to entry: At a given high tensile strength, dual phase steels with improved formability show a higher total elongation, a low yield ratio (R_e/R_m) and a strong work hardening capacity. Therefore, dual phase steels with improved formability are especially suited for forming operations with high stretching portions.

3.7
complex-phase steel with improved formability
CH
steel microstructure with improved formability consisting of mainly ferrite, martensite, bainite and retained austenite

Note 1 to entry: Depending on the strength class, small amounts of ferrite may also be present in complex phase steels with improved formability. At a given high tensile strength, complex phase steels with improved formability show a high yield ratio (R_e/R_m).

3.8
multi-phase steel with high global formability
FH
steel microstructure with high global formability containing a combination of tempered martensite, bainite and retained austenite

Note 1 to entry: In addition, ferrite and martensite can be present.

4 Dimensions and tolerances

The tolerances on dimensions and shape shall be those given in EN 10051 and EN 10048 for the hot rolled products and in EN 10131 for the cold rolled products.

5 Classification and designation

5.1 Classification

The steel grades covered by this document are alloy quality steels in accordance with EN 10020. They shall be classified in accordance with their increasing minimum tensile strength (Rm) (see Tables 1, 2, 4 and 5).

5.2 Designation

The steel names in this document are in accordance with EN 10027-1; the steel numbers are assigned in accordance with EN 10027-2.

The designation consists of the expression “sheet”, “hot rolled wide strip”, “hot rolled narrow strip”, “cold rolled wide strip”, “slit hot rolled wide strip”, “slit hot rolled narrow strip”, “slit cold rolled wide strip”, “hot rolled cut length” or “cold rolled cut length” followed in order by:

— reference to this document (i.e. prEN 10338:2024);

— steel name or number of the steel grade according to Table 1, Table 2, Table 4 and Table 5.

EXAMPLE 1 Hot rolled strip delivered with nominal thickness of 2,00 mm, nominal width of 1500 mm in accordance with EN 10051, made of steel HDT450F (1.0961) in accordance with EN 10338:

Hot rolled strip EN 10051 — 2,00x1500 — steel EN 10338 — HDT450F

or

Hot rolled strip EN 10051 — 2,00x1500 — steel EN 10338 — 1.0961

EXAMPLE 2 Hot rolled strip delivered with nominal thickness of 2,50 mm, nominal width of 600 mm in accordance with EN 10048, made of steel HDT760C (1.0998):

Hot rolled narrow strip EN 10048 — 2,50x600 — steel EN 10338 — HDT760C

or

Hot rolled narrow strip EN 10048 — 2,50x600 — steel EN 10338 — 1.0998

EXAMPLE 3 Cold rolled strip delivered with nominal thickness of 1,5 mm, nominal width of 1000 mm in accordance with EN 10131, made of steel grade HCT690T (1.0947) in accordance with EN 10338:

Cold rolled strip EN 10131 — 1,5x1000 — steel EN 10338 — HCT690T

or

Cold rolled strip EN 10131 — 1,5x1000 — steel EN 10338 — 1.0947

6 Information to be supplied at the time of enquiry and order

6.1 Mandatory information

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

a) full designation as given in 5.2;

b) quantities to be delivered;

c) nominal dimensions, dimensional standard and, if applicable, symbols denoting relevant special tolerances;

d) if inspection documents are required and their type;

e) if an external inspection is to be carried out at the manufacturer's works;

f) if oiling is not required;

g) limits on mass and sizes of coils or individual bundles.

6.2 Options

A number of options are specified in this document and listed below. If the purchaser does not indicate their wish to implement one of these options, the products shall be supplied in accordance with the basic specification of this document (see 6.1).

a) if the products are to be delivered with mill edges or sheared edges;

b) intended application of the products, including the suitability for surface coatings;

c) if the products are to be welded, indication of the method to be used;

d) if the products are to be supplied as suitable for making a specific part;

e) if other protective coatings are required;

f) detailed description of all other special requirements;

g) any special requirements for packing and marking;

h) if the products are to be supplied skin-passed (for hot rolled products);

i) if the products are to be supplied descaled (for hot rolled products);

j) position of the surface of better quality (for cold rolled products);

k) surface finish (for cold rolled products).

7 Manufacturing process and delivery conditions

7.1 Manufacturing process

Unless otherwise agreed at the time of enquiry or order, the steel manufacturing and production process shall be at the manufacturer's option.

They shall be reported to the purchaser upon request.

7.2 Delivery conditions

7.2.1 The hot rolled products shall usually be delivered with their surface as rolled. By agreement at the time of enquiry and order, the products may be delivered with descaled surface. When they are delivered as rolled, they shall be covered with a thin layer of scale of variable coloration.

The products may be supplied with a light skin-pass, either at the manufacturer's discretion or by agreement at the time of enquiry and order.

7.2.2 The cold rolled products are normally supplied in the skin-passed condition, however if by agreement at the time of the enquiry and order, non-skin-passed products may be supplied.

7.2.3 The descaled hot rolled and cold rolled products shall usually be delivered oiled or prepared with a dry lubricant. In the first case, both surfaces are preserved by a layer of neutral non-drying product, free of impurities, and uniformly spread in such a way that under normal conditions of packaging, transportation, handling and storage the products will show no corrosion for up to three months from the date on which the products are made available. The date of availability shall be notified to the purchaser with reasonable prior notice compatible with the validity of corrosion resistance.

The oil or dry lubricant shall be capable of being removed by alkaline solutions or normal solvents.

The choice of protective oils or dry lubricants may be the subject of a special agreement at the time of enquiry and order.

If the conditions of transportation or storage are such that special protection against corrosion is required, the manufacturer shall be informed at the time of enquiry and order.

If the purchaser does not require the surfaces to be treated, this shall be clearly indicated at the time of enquiry and order.

NOTE If the order is for untreated products, the manufacturer is not responsible for the risk of rust. The purchaser is also advised that there is a greater risk of the appearance of light scratches during handling, transportation and putting into application.

7.2.4 Descaled products may be supplied with trimmed edges upon agreement at the time of enquiry and order (designation GK following EN 10051 and EN 10048).