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Varm- och kallvalsade obelagda produkter av flerfasstål för kallformning – Tekniska leveransbestämmelser

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

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EUROPEAN STANDARD

EN 10338

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2015

ICS 77.140.50

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 à froid en aciers multiphasés pour formage à froid - Conditions techniques de livraison

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

This European Standard was approved by CEN on 16 April 2015.

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

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European foreword

This document (EN 10338:2015) has been prepared by Technical Committee ECISS/TC 109 “Coated and uncoated flat products to be used for cold forming”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by January 2016, and conflicting national standards shall be withdrawn at the latest by January 2016.

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1 Scope

This European Standard 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 $t \leq 6$ mm.

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

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

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

EN 10021:2006, *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 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 10079:2007, *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 10204:2004, *Metallic products - Types of inspection documents*

EN 10325, *Steel - Determination of yield strength increase by the effect of heat treatment [Bake-Hardening-Index]*

EN ISO 377:2013, *Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO 377:2013)*

EN ISO 6892-1:2009, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1:2009)*

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 10020:2000, EN 10021:2006, EN 10079:2007 and EN 10204:2004 and the following apply.

3.1

ferritic-bainitic steel (F)

steel with a matrix of ferrite or strengthened ferrite containing bainite or strengthened bainite

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

3.2

dual-phase steel (X)

steel consisting of mainly ferrite and martensite and possible bainite as a complementary phase

Note 1 to entry: According to their high tensile strength levels, dual phase steels show a low yield strength ratio and a high work hardening rate.

3.3

transformation induced plasticity steel (T)

steel with a ferritic matrix containing retained austenite capable of transformation into martensite during the forming process (TRIP effect)

Note 1 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 with a multiphase microstructure containing mainly bainite, ferrite, whereas martensite, tempered martensite, retained austenite and pearlite may be present as additional phases

Note 1 to entry: The fine grained microstructure may be generated by retarded recrystallisation or precipitation of micro-alloying elements.

3.5

martensitic steel (MS)

steel with a martensitic matrix containing small amounts of ferrite and/or bainite

Note 1 to entry: Within the group of multiphase steels the MS steels show the highest tensile strength level.

3.6

multiphase steel (MP)

steel with a multiphase microstructure containing significant amounts of non-ferritic phases as e.g. bainite, martensite and/or tempered martensite

Note 1 to entry: MP steels are multiphase steels that cannot be considered as ferritic-bainitic, dual-phase, TRIP, complex-phase and martensitic steels (see 3.1 to 3.5).

4 Dimensions and tolerances

The tolerances on dimensions and shape shall be those given in EN 10051 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 standard are alloy quality steels in accordance with EN 10020:2000. They shall be classified in accordance with their increasing minimum tensile strength (R_m) (see Tables 1, 2, 4 and 5).

5.2 Designation

The steel names in this European Standard are in compliance 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”, “cold rolled wide strip”, “slit hot rolled wide strip”, “slit cold rolled wide strip”, “hot rolled cut length” or “cold rolled cut length” followed in order by:

- the reference to this European Standard EN 10338;
- the 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 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 by the purchaser at the time of enquiry and order

6.1 Mandatory information

The following information shall be supplied by the purchaser 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 standard and listed below. If the purchaser does not indicate his wish to implement one of these options, the products shall be supplied in accordance with the basic specification of this standard (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.