



SLOVENSKI STANDARD SIST EN 10130 + A1:2000

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Cold rolled low carbon steel flat products for cold forming - Technical delivery conditions

Kaltgewalzte Flacherzeugnisse aus weichen Stählen zum Kaltumformen - Technische Lieferbedingungen

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Produits plats laminés a froid, en acier doux pour emboutissage au pliage a froid - Conditions techniques de livraison

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Ta slovenski standard je istoveten z: EN 10130:1991 + A1:1998

ICS:

77.140.50 Ú[[z æå\|^} æ å^| æ Flat steel products and semi-products
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10130:1991+A1

May 1998

ICS 77.140.50

Supersedes EN 10130:1991

Descriptors: iron and steel products, cold rolled products, metal plates, low carbon steels, cold-working, cupping, folding, delivery condition, acceptance testing

English version

Cold-rolled low carbon steel flat products for cold forming - Technical delivery conditions

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emboutissage au pliage à froid - Conditions techniques de
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This amendment A1 modifies the European Standard EN 10130:1991; it was approved by CEN on 1 May 1998.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant 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 amendment 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.

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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 EN 10130:1991 + Amendment 1:1998 has been prepared by Technical Committee ECISS/TC 13 "Flat products for cold working - Qualities, dimensions, tolerances and specific tests", the secretariat of which is held by IBN.

This Amendment to the European Standard EN 10130:1991 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 1998, and conflicting national standards shall be withdrawn at the latest by November 1998.

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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1 Scope

This European Standard applies to cold-rolled non-coated low carbon steel flat products in rolled widths equal to or over 600 mm for cold forming, with a minimum thickness of 0,35 mm, and unless otherwise agreed at the time of the order, equal to or less than 3 mm, delivered in sheet, coil, slit coil, or cut lengths obtained from slit coil or sheet.

It does not apply to cold-rolled narrow strip (rolling width < 600 mm) nor to flat cold-rolled products for which there is a specific standard, in particular the following:

- cold-rolled non-grain oriented magnetic steel sheet and strip (EN 10106);
- semi-processed steel strip for the construction of magnetic circuits (EN 10126 and EN 10165);
- blackplate in coils (EN 10205);
- steel sheet and strip for welded gas cylinders (EN 10120);
- hot-rolled flat products in high yield strength steels for cold forming (EN 10149-2-3);
- cold-rolled flat products in high yield strength steels for cold forming (prEN 10268);
- cold-rolled uncoated non alloy mild steel narrow strip for cold forming (EN 10139);
- cold-rolled low carbon steel flat products for vitreous enamelling (EN 10209);
- cold-rolled structural steels for general purposes.

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 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 test - Part 1 : Method of test (at ambient temperature)
EN 10002-2	Part 2: Verification of the force measuring systems of the testing machines
EN 10002-4	Part 4: Verification of the extensometers used in uniaxial testing
EN 10020	Definition and classification of grade of steel
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 10079	Definition of steel products
EN 10131	Cold rolled uncoated 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
CR 10260	Designation systems for steel - Additional symbols for steel names
EURONORM 18	Selection and preparation of samples and test piece for steel and iron and steel products
EURONORM 49	Roughness measurement of cold-rolled uncoated steel sheet and strip

3 Definitions

For the purpose of this European Standard, the following definitions of cold rolled flat products given in clause 1 are identical to those given in EN 10079.

4 Designation

The symbolic designation of the steel grades in this European Standard is in conformity with EN 10027-1 and CR 10260, the numerical designation is allocated in conformity with EN 10027-2.

The designation consist of the word : 'sheet' 'wide strip', 'slit wide strip' or 'cut lengths' followed in order by :

- the reference of this European Standard EN 10130+A1;
- the symbol DC ;
- the grade designation (01- 03 - 04 - 05 or 06 or the numerical designation) ;
- the symbol concerning the surface quality (A for surface quality A or B for surface quality B)
- if applicable the symbol relating to the surface finish (see table 1)

Example of designation :

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- designation of sheet made of steel grade DC01, surface quality A (A), surface finish normal (m) : sheet EN 10130+A1 DC01 (1.0330) Am:
- designation of coil made of steel grade DC06, surface quality B (B), surface finish semi-bright (g) : coil EN 10130+A1 DC06 (1.0312) Bg

5 Requirements

5.1 Steelmaking and manufacturing processes

Unless otherwise agreed at the time of ordering, the steelmaking and manufacturing processes are left to the discretion of the manufacturer.

The purchaser shall be informed of these processes, if he specifies it.

5.2 Deoxidation

For grade DC01 the method of deoxidation shall be at the manufacturer's discretion. Grades DC03, DC04, DC05 and DC06 shall be fully killed.

5.3 Chemical composition

The chemical composition based on ladle analysis shall be as given in table 2.

5.4 Delivery condition

5.4.1 Products specified in this standard are normally supplied in the skin-passed condition. By agreement at the time of the enquiry and order non-skin-passed products may be supplied.

5.4.2 The products are normally delivered oiled. In this case, both the surfaces are preserved by a layer of neutral non-drying oil, free of foreign bodies and uniformly spread in such a way that under normal conditions of packing, transportation, handling and storage the products will show no corrosion for up to three months.

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If the conditions of transportation or storage are such that special protection against corrosion is required the purchaser shall inform the manufacturer at the time of the order.

The layer of oils shall be capable of being removed by alkaline solutions or normal solvents.

The choice of protective oils may be the subject of special agreement.

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

NOTE: If the order is for unoiled 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.

5.5 Choice of properties

The products covered by this European Standard shall comply with the requirements of tables 1 and 2. By agreement they may be delivered as suitable for making a particular part; in this case a maximum percentage of scrap may be agreed and acceptance on the basis of mechanical properties is not applicable.

5.6 Mechanical properties

The mechanical properties given in table 2 apply only to skin-passed products (see 5.8.2). The mechanical properties are valid for the period specified in table 2 from the date on which the products are made available.

For non-skin-passed products (see 5.8.3) the mechanical properties shall be agreed at the time of enquiry and order.

The date of availability shall be notified to the purchaser with reasonable prior notice compatible with the validity of the mechanical properties. Prolonged storage of products of grade DC01 could result in some change in the mechanical properties leading to a reduction in formability.

5.7 Surface characteristics

5.7.1 General

The surface characteristics consist of the surface quality and the surface finish.

The surface quality and finish shall be specified by the purchaser at the time of the order.

For non-skin-passed products surface quality B is not applicable and no requirement for a particular surface finish can be made.

5.7.2 Surface quality

The products are supplied with either of the surface qualities A or B.

- Surface quality A
Defects such as pores, slight indentations, small marks, minor scratches and slight colouring which do not effect formability or the application of surface coatings are permitted.

- Surface quality B
The better surface shall be free of defects which might affect the uniform appearance of a quality paint or an electrolytic coating (see 5.9). The other surface shall at least conform to surface quality A.

In the case of delivery of coil and slit coil the percentage of defects may be greater than in the case of delivery in sheet or cut lengths. This shall be taken into account by the purchaser and the percentage of admissible surface defects shall be agreed at the time of the enquiry and order.

Unless otherwise agreed, a single surface of the product shall comply with the specified requirements. The other surface shall be such that during subsequent treatment it does not have a deleterious effect on the better surface.

5.7.3 Surface finish

The surface finish may be bright, semi-bright, normal or rough. In the absence of a requirement on the order, products shall be supplied with the normal finish.

The limiting figures for average surface roughness for the four types of finish are given in table 1. The measurement shall be made in accordance with EURONORM 49.

By agreement at the time of the enquiry and order other ranges for surface roughness may be specified for specific end uses.

Table 1 : Surface finish and roughness values

Surface finish	Symbol	Roughness
Bright	b	$R_a \leq 0,4 \mu\text{m}$
Semi-bright	g	$R_a \leq 0,9 \mu\text{m}$
Normal	m	$0,6 \mu\text{m} < R_a \leq 1,9 \mu\text{m}$
Rough	r	$R_a > 1,6 \mu\text{m}$

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5.8 Stretcher strain marks

5.8.1 General

All products are generally subjected to a light skin-pass after annealing at the manufacturer's works to avoid the formation of stretcher strain marks during subsequent forming.

The tendency to form such marks may reappear a certain time after the skin-pass. It is therefore in the purchaser's interest to form the products as soon as possible.

Products of grade DC06 do not exhibit stretcher strain marks whether delivered skin-passed or non skin-passed.

5.8.2 Skin-passed products

The manufacturer shall ensure the absence of stretcher strain marks:

- for 6 months after products of grades DC03, DC04 and DC05 are made available, for surface qualities A and B,

- for 3 months after products of DC01 are made available for surface quality B.

5.8.3 Non-skin-passed products

Stretcher strain marks are permitted in the condition of delivery and on drawn items.

5.9 Suitability for surface coating

The products may be intended for metallic coating by the hot dip coating, or other coating process, and/or organic or other coatings. When such a coating is required, it shall be specified at the time of ordering.

5.10 Weldability

The material is specified as suitable for normal welding procedures. It is, however, desirable to state the welding procedure at the time of ordering but essential to do so in the case of gas welding.

5.11 Tolerances on shape and dimensions

Tolerances on shape and dimensions are given in European Standard EN 10131.

6 Tests

6.1 General

6.1.1 The purchaser shall specify at the time of the enquiry and order his requirements for

- type of inspection and testing : specific or non-specific, see EN 10021
- type of inspection document, see EN 10204

6.1.2 Specific inspection and testing shall be carried out in accordance with 6.2 to 6.6.

6.1.3 Specific inspection and testing may not be specified either for the product analysis or the surface finish.

6.2 Inspection units

The inspection unit is 30 t or a fraction of 30 t of products of the same grade and nominal thickness. When a coil exceeds 30 t it constitutes a single inspection unit, as do its products.

6.3 Number of tests

For each inspection unit a tensile test shall be carried out and where appropriate a determination of n and r (see table 2 and annexes A and B).

6.4 Sampling

The requirements of EURONORM 18 and EN 10021 are supplemented by the following specific requirements.

- for sheet and cut lengths the selection of products to be tested and the position of the samples in the products is left to the discretion of the inspection representative;
- in the case of coil and slit coil, the sample should preferably be taken from the outer end.

If the width of the product permits, the test pieces for the tensile test shall be taken perpendicular to the direction of rolling.

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6.5 Test methods

6.5.1 The products shall be tested in the condition of delivery.

The tests shall be carried out at ambient temperature.
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6.5.2 The tensile test shall be carried out as described in EN 10002 Part 1 using the 2 specimens (initial gauge length $L_0 = 80$ mm, width $b = 20$ mm) as described in annex A of EN 10002 Part 1.

6.5.3 Surface roughness measurement shall be determined in accordance with EURONORM 49.

6.5.4 The determination of plastic strain ratio r and tensile strain hardening component n shall be carried out in accordance with annexes A and B of this standard.

6.5.5 For the determination of the chemical composition the corresponding European Standards and EURONORMs shall apply in case of dispute.

6.6 Retests

The requirements of EN 10021 shall apply.

For coils, in the event of the test results giving rise to dispute, the samples for retests shall be taken at intervals of at least one lap but also at a maximum distance of 20 m from the appropriate end.

6.7 Inspection document

By agreement at the time of enquiry and order an inspection document chosen from those given in European Standard EN 10204 shall be supplied (see also 6.1.1).

7 Marking

Unless otherwise agreed at the time of ordering, marking shall be carried out on the inspected surface by means of an easily removed non-corrosive ink.