



SLOVENSKI STANDARD
SIST EN 10209:1998

01-avgust-1998

Hladno valjani ploščati izdelki iz maloogljčnih jekel za emajliranje - Tehnični dobavni pogoji

Cold rolled low carbon steel flat products for vitreous enamelling - Technical delivery conditions

Kaltgewalzte Flacherzeugnisse aus weichen Stählen zum Emaillieren - Technische Lieferbedingungen

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Produits plats laminés a froid, en acier doux pour émailage par vitrification - Conditions techniques de livraison

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ICS:

77.140.50

Ploščati jekleni izdelki in polizdelki

Flat steel products and semi-products

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en

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EUROPEAN STANDARD

EN 10209

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1996

ICS 77.140.50

Descriptors: iron- and steel products, cold rolled products, metal plates, low carbon steels, vitreous enamels, cupping, folding, delivery condition, surface condition, quality, chemical composition, mechanical properties, tests

English version

Cold rolled low carbon steel flat products for vitreous enamelling - Technical delivery conditions

Produits plats laminés à froid, en acier doux
pour émaillage par vitrification - Conditions
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This European Standard was approved by CEN on 1995-03-21. 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

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be supplied by the purchaser at the time of ordering -
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Foreword

This European Standard 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 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 October 1996, and conflicting standards shall be withdrawn at the latest by October 1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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 and in thicknesses equal to or less than 3 mm, delivered in sheet, wide strip, slit wide strip or cut lengths obtained from slit wide strip or sheet.

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

- cold-rolled low carbon steel flat products for cold forming (EN 10130);
- cold-rolled non oriented electrical steel sheet and strip delivered in fully processed state (prEN 10106);
- cold-rolled electrical non-alloyed steel sheet and strip delivered in semi-processed state (prEN 10126);
- cold-rolled electrical alloyed steel sheet and strip delivered in semi-processed state (prEN 10165);
- cold reduced blackplate (EN 10205);
- steel sheet and strip for welded gas cylinders (prEN 10120);
- hot-rolled flat products made of high yield strength steels for cold forming (prEN 10149);
- cold-rolled uncoated non-alloy mild steel narrow strip for cold forming (prEN 10139);
- 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 place 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 10002-2	Verification of force measuring system of tensile testing machines
EN 10002-4 ¹⁾	Metallic materials - Verification of extensometers used in uniaxial testing
EN 10020	Definition and classification of grades of steel
EN 10021	General technical delivery requirements for steel and iron products
EN 10027-1	Systems for designating steels - Part 1: Symbolic designation, main symbols
EN 10027-2	Systems for designating steels - Part 2: Numerical systems
EN 10079	Definition and classification 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
Information circular IC 10	Designation systems for steels; Additional symbols for names of steels
EURONORM 18	Selection and preparation of samples and test pieces for steel and iron and steel products ²⁾
EURONORM 49	Roughness measurement of cold-rolled uncoated steel sheet and strip ²⁾

¹⁾ Draft at present stage of work

²⁾ Until the EURONORMS are converted to European Standards, they can either be implemented or reference can be made to the corresponding national standards, the list of which is given in annex F of this European Standard.

3 Definitions

For the purposes of this European Standard the definitions of the cold rolled flat products listed in clause 1 are those given in EN 10079.

4 Designation

4.1 Steel symbols are attributed in accordance with EN 10027-1 and ECISS information circular IC 10; numerical designations are attributed in accordance with EN 10027-2.

4.2 Products conforming to this European Standard shall be designated, in order, in the following way:

- a) Product designation (e.g. strip, sheet or "slit strip cut longitudinally").
- b) Number of this European Standard (EN 10209).
- c) Symbolic or numerical designation of the steel, shown in table 2.
- d) Where appropriate, the symbol relating to surface finish (see table 1).

Examples of conventional designations:

Designation of a steel sheet with the symbolic designation DC01EK and the numerical designation 1.0390 with rough surface finish (*r*):

Sheet EN 10209 DC01EK *r*
or
Sheet EN 10209 - 1.0390 *r*

Designation of a wide strip of steel with the symbolic designation DC06ED and the numerical designation 1.0872 with normal surface finish (*m*):

Wide strip EN 10209 - DC06ED *m*
or
Wide strip EN 10209 - 1.0872 *m*.

5 Requirements

5.1 Steelmaking and manufacturing processes

Unless otherwise agreed at the time of ordering, the production methods are left to the discretion of the manufacturer.

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

5.2 Method of deoxidation

See table 2.

5.3 Chemical composition

The maximum values for the chemical compositions based on ladle analysis shall be as given in table 2.

5.4 Suitability for vitreous enamelling

5.4.1 Qualities DC01EK, DC04EK and DC06EK are suitable for one or two coats of conventional enamelling.

5.4.2 Qualities DC03ED, DC04ED and DC06ED are mainly suitable for direct enamelling, as well as for special applications of conventional two coat enamelling for better sag resistance. In the latter case it shall be possible to take special steps to enhance the adherence of the enamel.

5.4.3 The following methods of test are defined in order to determine the suitability of the steel for enamelling:

- hydrogen permeation test (see annex B.1) (alternatively, if agreed at the time of ordering, an enamelling test as described in annex B.2 may be specified).

NOTE: These two tests enable the risk of fish scaling following enamelling to be assessed.

- iron loss test for qualities of steel for direct enamelling as described in 5.4.2 (see annex C).

5.4.4 An enamel adherence test (see annex D) is also defined (pretreatment and enamelling conditions shall be agreed at the time of ordering).

5.4.5 The application of the methods of test described in annexes B, C and D may be the subject of an agreement at the time of ordering.

5.5 Delivery condition

5.5.1 Products specified in this standard are normally supplied in the skin-passed condition. If agreed at the time of ordering non-skin-passed products may be supplied.

5.5.2 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 packaging, transportation, handling and storage the products will show no corrosion for up to three months.

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 ordering.

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 ordering.

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 application.

5.6 Choice of properties

The products covered by this European Standard correspond to the requirements of tables 1 and 2. Subject to special agreement, they may be supplied with special suitability for the production of a specific part; in this case a maximum rejection percentage may be set by mutual agreement and acceptance on the basis of mechanical properties does not apply.

5.7 Mechanical properties

The mechanical properties given in table 2 only apply to skin-passed products. These mechanical properties are valid for the period specified in table 2 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 the mechanical properties.

5.8 Surface characteristics

5.8.1 General

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

5.8.2 Surface appearance

The products are supplied with a surface appearance which does not adversely affect suitability for forming, the application of an enamel coating and the uniform appearance of the enamelled surface on the exposed surface.

When supplied as wide strip and slit wide strip, the percentage of surface defects may be higher than when supplied as sheet and cut lengths. This shall be taken into account by the purchaser and the permissible percentage of surface defects shall be set by special agreement at the time of ordering. 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.

5.8.3 Surface finish

The surface finish may be normal or rough.

In the absence of a requirement in the order, products shall be supplied with the normal surface finish.

The limiting figures for average surface roughness for the two types of finish are given in table 1.

The measurements shall be made in accordance with EURONORM 49.

If specially agreed at the time of ordering, other ranges for surface roughness may be specified for specific end uses.

Table 1: Surface finishes and standard roughness

Surface finish	Symbol	Roughness
Normal	<i>m</i>	$0,6 \mu\text{m} < R_a \leq 1,9 \mu\text{m}$
Rough	<i>r</i>	$R_a > 1,6 \mu\text{m}$

5.9 Stretcher strain marks

All the 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.

Quality DC06EK and DC06ED products do not exhibit stretcher strain marks after deformation.

For the other qualities the absence of stretcher strain marks may be guaranteed for six months after the products are made available.

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5.10 Weldability <https://standards.iteh.ai/catalog/standards/sist/04f4d85a-40ff-43c8-b4a7-3b79d95344de/sist-en-10209-1998>

The material is specified as suitable for normal welding procedures as long as the products are degreased beforehand. The welding procedure shall be specified at the time of ordering (see 10 h).

5.11 Tolerances on dimensions and shape

Tolerances on dimensions and shape are given in EN 10131.