



SLOVENSKI STANDARD
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**Elektrolizno cinkani hladno valjani ploščati izdelki za hladno preoblikovanje -
Tehnični dobavni pogoji**

Electrolytically zinc coated cold rolled steel flat products for cold forming - Technical delivery conditions

Elektrolytisch verzinkte kaltgewalzte Flacherzeugnisse aus Stahl zum Kaltumformen - Technische Lieferbedingungen

Produits plats en acier, laminés à froid, revêtus de zinc par voie électrolytique pour formage à froid - Conditions techniques de livraison

Ta slovenski standard je istoveten z: prEN 10152

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77.140.50	Ploščati jekleni izdelki in polizdelki	Flat steel products and semi-products
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Electrolytically zinc coated cold rolled steel flat products for cold forming - Technical delivery conditions

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Elektrolytisch verzinkte kaltgewalzte Flacherzeugnisse
aus Stahl zum Kaltumformen - Technische
Lieferbedingungen

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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 10152:2015) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 10152:2009.

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1 Scope

This European Standard specifies requirements for continuously electrolytic (or produced with an alternative process on cold rolled finish substrate) zinc coated cold rolled flat products of low carbon steels suitable for cold forming according to Table 1 in rolled widths ≥ 600 mm and thicknesses from 0,35 mm up to below and including 3 mm, delivered as strip (in coil form), sheet, slit strip or cut lengths obtained from slit strip or sheet.

NOTE 1 This European Standard can also be applied to continuously electrolytic zinc coated flat products of:

- a) steels according to EN 10139 (cold rolled strip in rolled widths < 600 mm),
- b) steels normally characterized by minimum yield strength or minimum tensile strength values in addition to formability parameters, e.g.
 - 1) steels with high yield strength and improved formability according to EN 10268 (cold rolled flat products),
 - 2) multiphase steels (cold rolled or hot rolled) according to prEN 10338,
 - 3) steels for construction according to national or regional standards (see e.g. DIN 1623).

NOTE 2 By agreement at the time of enquiry and order this European Standard can be applied to continuously electrolytic zinc coated hot-rolled steel flat products (e.g. according to EN 10025-1 and -2, EN 10111, EN 10149-1 to EN 10149-3, etc.).

NOTE 3 As the mass of the zinc coating applied is relatively small, the material is not intended to withstand outside exposure without further chemical treatment and painting.

NOTE 4 The products covered by this European Standard can be used as substrates for organic coated flat products specified in EN 10169 for building and general engineering applications.

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 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 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*

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EN 10204:2004, *Metallic products - Types of inspection documents*

ISO 10113, *Metallic materials — Sheet and strip — Determination of plastic strain ratio*

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

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

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, EN 10204:2004 and the following apply.

3.1 electrolytic zinc coating (ZE)
application of a zinc coating by electrolysis on a suitably prepared steel surface from an aqueous zinc salt solution by the use of an electric current

Note 1 to entry Flat products can have a zinc coating on one or both surfaces. If both surfaces are zinc coated, a different coating thickness can be applied on each side (this process being referred to as differential zinc coating).

4 Classification and designation**4.1 Classification**

The steel grades specified in this European Standard are classified in accordance with EN 10020:2000 as non-alloy quality steels (DC01, DC03, DC04, DC05) and alloy quality steels (DC06, DC07) and by their increasing suitability for cold forming as follows:

- DC01: drawing quality;
- DC03: deep drawing quality;
- DC04, DC05: special deep drawing quality;
- DC06: extra deep drawing quality;
- DC07: super deep drawing quality.

4.2 Designation

4.2.1 The steel names are allocated in accordance with EN 10027-1. The steel numbers are allocated in accordance with EN 10027-2.

4.2.2 The products covered by this document shall be designated as follows in the given order:

- 1) Type of product (e.g. strip, sheet, cut length);
- 2) Number of this European Standard (EN 10152);
- 3) Steel name or steel number and symbol for the type of electrolytic coating (see Table 1);

- 4) Numbers denoting the nominal coating thickness on each surface (e.g. 50/50 = nominal coating thickness of 5,0 µm on each side, see Table 2 and 6.9.2);
- 5) Letters A or B indicating the surface quality (see 6.10.2);
- 6) Letters denoting the surface treatment (see 6.11 and Table 3).

EXAMPLE 1 Designation of strip made of steel DC03+ZE (1.0347+ZE), electrolytically zinc coated with a nominal thickness of 5,0 µm on each surface (50/50), surface quality A, surface treatment phosphated (P):

Strip EN 10152+ZE50-DC03/50-A-P

or

Strip EN 10152-1.0347+ZE50/50-A-P

EXAMPLE 2 Designation of sheet made of steel DC05+ZE (1.0312+ZE), electrolytically zinc coated with a nominal thickness of 7,5 µm on one surface and of 2,5 µm on the other surface (75/25), surface quality B, surface treatment phosphated and oiled (PO):

Sheet EN 10152+ZE75-DC05/25-B-PO

or

Sheet EN 10152-1.0312+ZE75/25-B-PO

4.2.3 Where appropriate, additional information to the designation as specified in 4.2.2 shall be given to describe clearly the delivery requirements (see Clause 5).

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) complete designation (see 4.2.2);
- b) nominal dimensions (thickness, width and, in the case of sheet and cut lengths, length);
- c) quantity;
- d) limiting mass and sizes of the coils and individual bundles of sheets;
- e) surface quality and surface finish (see 6.10);
- f) type of surface treatment (see 6.11 and Table 3).

5.2 Options

A number of options are specified in this document and listed below; if the purchaser does not indicate a wish to implement any of these options, the products shall be supplied in accordance with the basis specification of this document (see 5.1):

- 1) Delivery of hot rolled products (see NOTE 2 to Clause 1);

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- 2) Use of substrates not specified in Table 1 (see 6.1);
- 3) Steelmaking and manufacturing processes (see 6.2);
- 4) Non-skin passed products (see 6.5);
- 5) Products supplied suitable for the manufacture of a specific part (see 6.6);
- 6) Delivery of several steel grades as alloy steels (see Table 1, footnote f);
- 7) Differential coatings (see 6.9.4);
- 8) One-side coated products (see 6.9.5);
- 9) Maximum coating mass per product surface (see 6.9.6);
- 10) Quality of the uncoated surface for one-side coated products and/or testing of both surfaces (see 6.10.2.1);
- 11) Range for surface roughness Ra (see 6.10.3);
- 12) Specification of dimensional tolerances different from those in EN 10131 or EN 10051, respectively (see 6.13.2);
- 13) Type of inspection and inspection document to be delivered (see 7.1.1 to 7.1.3);
- 14) Certificate of compliance with order (see 7.1.2);
- 15) determination of the tensile properties by calculation (see 7.1.2);
- 16) Marking by branding (see 8.2);
- 17) Requirements for packaging (see Clause 9).

6 Requirements**6.1 General**

The requirements according to 6.2 to 6.5 and 6.13 apply to products made of the steel grades given in Table 1.

For other steels used as substrate for electrolytically deposited coatings of zinc the requirements shall be based on the appropriate quality standard for the non-coated steel product.

6.2 Steelmaking and manufacturing processes

Unless otherwise agreed at the time of enquiry and order, the steelmaking and manufacturing processes are left to the discretion of the manufacturer. The purchaser shall be informed of these processes, if required.

6.3 Deoxidation

The method of deoxidation shall be in accordance with that specified in Table 1.

6.4 Chemical composition

The chemical composition based on cast analysis shall be as given in Table 1.

6.5 Delivery condition

The steel substrates are normally supplied in the skin-passed condition. By agreement at the time of enquiry and order non skin-passed products may be supplied.

6.6 Choice of properties

The products covered by this document shall comply with the requirements of Table 1. By agreement at the time of enquiry and order, they can be supplied with suitability for manufacturing a specific part. In this case a specific proportion exceeding the reject tolerances may be agreed and acceptance on the basis of mechanical properties is not applicable.

6.7 Mechanical properties

6.7.1 The mechanical properties are given in Table 1; they apply only to skin-passed products.

NOTE 1 The properties in Table 1 are those specified for cold rolled non-coated low carbon steel flat products according to EN 10130 with the exception of the R_e , A_{80} and n_{90} values for the grades DC04+ZE, DC05+ZE, DC06+ZE and DC07+ZE which have been altered with respect to the influence of the electrolytical treatment on those properties.

The mechanical properties are valid for the period specified in Table 1 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.

NOTE 2 Prolonged storage of products of grade DC01+ZE could result in some change in the mechanical properties leading to a reduction in formability.

6.7.2 The tensile test values apply to transverse samples and relate to the test piece cross-section without zinc coating.

6.7.3 Strain ratio r_{90} (see Table 1) and the strain hardening exponent n_{90} shall be determined in the range of homogeneous deformation, within the strain range of 10 % to 20 %.

NOTE The uniform elongation of the material to be tested can be lower than 20 %. In this case an upper limit of the strain range of ≥ 15 % can be applied.