SLOVENSKI STANDARD
SIST EN 10152:1997

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Elektrolizno cinkani hladno valjani ploģļ ati izdelki - Tehniļ ni dobavni pogoji

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

Elektrolytisch verzinkte kaltgewalzte Flacherzeugnisse aus Stahl - Technische Lieferbedingungen

Produits plats en acier, laminés a froid, revetus de zinc par voie électrolytique - Conditions techniques de livraison

Ta slovenski standard je istoveten z: **EN 10152:1993**

ICS:

25.220.40	Kovinske prevleke	Metallic coatings
77.140.50	Ploģļ ati jekleni izdelki in polizdelki	Flat steel products and semi-products

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EUROPEAN STANDARD

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EN 10152:1993

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Descriptors: Iron and steel products, cold rolled products, metal bars, steels, galvanizing, electrodeposited coatings, designation, delivery, chemical composition, mechanical properties, adhesion, appearance, quality classes, inspection, marking

English version

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This European Standard was approved by CEN on 1993-10-05. 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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Contents list

Foreword

This European Standard has been drawn up by ECISS/TC 27 "Surface coated flat products", the Secretariat of which is held by Normenausschuß Eisen und Stahl (FES) im DIN.

The European Standard EN 10152 supersedes

EURONORM 152-80:Electrolytic zinc coated steel flat rolled products

At a meeting of ECISS/TC 27 held on 7 July 1992 in Düsseldorf the text was agreed for circulation for formal vote within CEN. The following countries were represented at this meeting: Austria, Belgium, Finland, France, Germany and United Kingdom.

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 April 1994, and conflicting national standards shall be withdrawn at the latest by April 1994.

In accordance with the CEN/CENELEC Internal Regulations, 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 United Kingdom.

1 Scope

1.1 This European Standard specifies requirements for continuously electrolytic 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 and including 3 mm, delivered as strip (in coil form), sheet, slit strip or cut lengths obtained from slit strip or sheet.

1.2 This European Standard may also be applied to continuously electrolytic zinc coated cold rolled flat products of

a) steels according to EN 10139 (cold rolled strip in rolled widths < 600 mm),
b) other types of low carbon steel for cold forming,
c) steels normally characterized by minimum yield strength values in addition to formability parameters, e. g.
   - steels with high yield strength and improved formability according to EURONORM 149, Part 4, or other microalloyed steels,
   - phosphorous alloyed steels and bake-hardening steels,
   - general purpose structural steels.

1.3 By special agreement at the time of ordering this European Standard may be applied to continuously electrolytic zinc coated hot-rolled steel flat products (e.g. according to EN 10025, EURONORM 111, EURONORM 149 Part 1 to Part 3 etc.).

1.4 The coating masses, surface qualities and surface finishes are given in 5.9, 5.11 and table 2. 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.

1.5 This European Standard is not applicable to

- hot-dip zinc coated steel sheet and strip (see EN 10142 and EN 10147),

- continuously organic coated steel flat products (see EN 10169).

2 Normative References

This European Standard incorporates by dated or undated reference provisions from other publications. These normative reference 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 testing; Part 1: Method of testing (at ambient temperature)
EN 10002-2	Metallic materials; Tensile testing; Part 2: Verification of the force measuring system of the tensile testing machines
EN 10002-4[1)]	Metallic materials; Tensile testing; Part 4: Verification of extensometers used in uniaxial testing
EN 10021[1)]	General technical delivery requirements for steel and steel products
EN 10025	Hot rolled products of non-alloy structural steels; technical delivery conditions
EN 10027-1	Designation systems for steel; Part 1: Steel names; principal symbols
EN 10027-2	Designation systems for steel - Part 2: Numerical system
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 non-coated flat products in low carbon steel for cold forming; tolerances on dimensions and shape
EN 10139[1)]	Cold rolled uncoated low carbon steel strip for cold forming; Technical delivery conditions
EN 10204	Steel and iron and steel products - Inspection documents
ECISS Information Circular IC 10	Designation systems for steel; Additional symbols for steel names

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1) At present at the stage of draft

EURONORM 12 (1955)[2]	Bend test for steel sheet and strip less than 3 mm thick
EURONORM 111 (1977)[2]	Hot rolled non coated mild unalloyed steel and strip for cold orming; quality standard
EURONORM 149 (1980)[2]	Flat products in high yield strength steels for cold forming; wide flats, sheet/plate, wide and narrow strip Part 1: General requirements. Part 2: Specific requirements for thermomechanically treated hot rolled products. Part 3: Specific requirements for normalized hot rolled products. Part 4: Specific requirements for cold rolled products.
ISO 9513	Metallic materials - Verification of extensometers used in uniaxial testing

3 Definitions

For the purposes of this European Standard the following definitions apply.

3.1 Flat products, strip, sheet, cut length: See EN 10079.

3.2 Electrolytic zinc coating is understood to be a coating of zinc applied by electrolysis on a suitably prepared steel surface from an aquaous zinc salt solution by the use of an electric current.

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

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[2] Until they are transformed into European Standards, either the EURONORMS referred to or the corresponding national standards may be applied.

4 Designation

4.1 The steel names are allocated in accordance with EN 10027-1 and ECISS Information Circular IC 10; the steel numbers are allocated in accordance with EN 10027-2.

4.2 The products covered by this European Standard shall be designated as follows in the order given:

a) Type of product (e. g. strip, sheet, cut length),
b) Number of this standard (EN 10152),
c) Steel name or steel number (see table 1),
d) 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 5.9.2).
e) Letters A or B indicating the surface quality (see 5.11.2).
f) Letters denoting the surface treatment (see 5.12 and table 3).

Examples:

Designation of strip made of steel DC03+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 - DC03+ZE50/50-AP

Designation of sheet made of steel DC05+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 - DC05+ZE75/25-BPO

4.3 Where appropriate, additional information to the designation as specified in 4.2 shall be given to describe clearly the delivery requirements (see clause 10).

5 Requirements

5.1 General

The requirements according to 5.2 to 5.8 and 5.13 apply to products made of the steel grades given in table 1.

For other steels used as substrate for electrolytically deposited coatings of zinc (see 1.2 and 1.3) the requirements shall be based on the appropriate quality standard for the non-coated steel product.

5.2 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 requires it.

5.3 Deoxidation

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

5.4 Chemical composition

The chemical composition based on ladle analysis shall be as given in table 1.

5.5 Delivery condition

The products specified in this European 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.

5.6 Choice of properties

The products covered by this European Standard shall comply with the requirements of table 1. 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.

5.7 Mechanical properties

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

Note: 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 and DC06+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. Prolonged storage of products of grade DC01+ZE could result in some change in the mechanical properties leading to a reduction in formability.

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

Table 1: Chemical composition and mechanical properties of electrolytically zinc coated mild steel flat products*)[1)]

Steel grade		Definition and classification according to EN 10020	Desoxi-dation	Validity of mechanical properties	Surface appea-rance	Absence of stretcher strain marks	R_e N/mm² [2)]	R_m N/mm²	A_{80} % min. [3)]	r_{90} min. [4),5)]	n_{90} min. [4)]	Chemical composition (ladle analysis, % max.)				
Steel name	Steel number											C	P	S	Mn	Ti
DC01+ZE[6)]	1.0330	Non alloy quality steel[7)]	Manufacturer's discretion	- -	A B	- 3 months	[9)]-/280 [10)]	270/410	28	-	-	0,12	0,045	0,045	0,60	
DC03+ZE	1.0347	Non alloy quality steel[7)]	Fully killed	6 months 6 months	A B	6 months 6 months	[9)]-/240	270/370	34	1,3	-	0,10	0,035	0,035	0,45	
DC04+ZE	1.0338	Non alloy quality steel[7)]	Fully killed	6 months 6 months	A B	6 months 6 months	[9)]-/220	270/350	37	1,6	0,160	0,08	0,030	0,030	0,40	
DC05+ZE	1.0312	Non alloy quality steel[7)]	Fully killed	6 months 6 months	A B	6 months 6 months	[9)]-/190	270/330	39	1,9	0,190	0,06	0,025	0,025	0,35	
										$\bar{r}$ [4)5)] min.	$\bar{n}$ [4)] min.					
DC06+ZE	1.0873	Alloy quality steel	Fully killed	6 months 6 months	A B	no limit no limit	[9)]-/190	270/350	37	1,8	0,200	0,02	0,020	0,020	0,25	0,3[11)]

*) Notes see page 11