SLOVENSKI STANDARD
SIST EN 10142:1996

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Zvezno vroče cinkana pločevina in trakovi iz maloogljičnega jekla za hladno preoblikovanje - Tehnični dobavni pogoji

Continuously hot-dip zinc coated low carbon steel strip and sheet for cold forming - Technical delivery conditions

Kontinuierlich feuerverzinktes Band und Blech aus weichen Stählen zum Kaltumformen - Technische Lieferbedingungen

Bandes et tôles en acier doux galvanisées a chaud et en continu pour formage a froid - Conditions techniques de livraison

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English version

Continously hot-dip zinc coated low carbon steel sheet and strip for cold forming - Technical delivery conditions

Tôles et bandes en acier doux galvanisés à chaud et en continu pour formage à froid - Conditions techniques et livraison

Kontinuierlich feuerverzinktes Blech und Band aus weichen Stählen zum Kaltumformen - technische Lieferbedingungen

This European Standard was approved by CEN on 1990-08-04. 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.

This European Standard 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.

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

Contents

Foreword

This EN has been prepared by ECISS/TC27 'Surface coated steel flat products', the Secretariat of which is held by Normenauschuss Eisen und Stahl (FES) im DIN.

It supersedes EURONORM 142-79 'Continuous hot-dip coated unalloyed mild steel sheet and coil for cold forming; technical delivery conditions' published by the European Coal and Steel Community.

The European Committee for Iron and Steel Standardization (ECISS) has allocated TC27 the task of transforming EURONORM 142-79 into a European Standard (EN 10 142). prEN 10 142 appeared in September 1988.

Approval was given at an ECISS/TC27 meeting in April 1989 in Dusseldorf to publish EN 10 142. The following countries attended this meeting: Austria, Belgium, France, Germany, Italy, Luxembourg, Netherlands, Sweden and UK.

This standard was approved by CEN on 1990-08-04.

In accordance with the requirements of the CEN Internal Regulations, the following countries are bound to adopt this European Standard :

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Scope

1.1 This European Standard specifies requirements for continuously hot-dip zinc coated flat products in thicknesses up to 3,0 mm - unless otherwise agreed at the time of ordering - made of the steel given in subclause 5.1 and table 1. The thickness is the final thickness of the delivered product after zinc coating.

This European Standard applies to strip of all widths and to sheets cut from it ($\geq$ 600 mm width) and cut lengths ($<$ 600 mm width).

The types of coating, coating masses and coating finishes available, and surface qualities are given in tables 2 to 4 (see also subclauses 5.2 to 5.4).

1.2 The products covered by this European Standard are suitable for applications where suitability for forming and resistance to corrosion are of prime importance. Corrosion protection afforded by the coating is directly proportional to the mass of coating (see also 5.2.2).

1.3 This European Standard is not applicable to

- continuously hot-dip zinc coated unalloyed steel sheet and strip with specified minimum yield strengths for structural purposes (see EURONORM 147),
- electrolytic zinc coated flat steel products (see EURONORM 152)'
- continuously organic coated flat steel products (see EURONORM 169).

2 Normative References

EN 10 002-1 : 1989	Metallic materials - Tensile test. Part 1. Test method (at ambient temperature)
EN 10 020 : 1989	Definition and classification of grades of steel
prEN 10 079 : 1989	Definition of steel products
prEN 10 204 : 1989	Steel and steel products; inspection documents
EURONORM 12 (1955)[1)]	Bend test for steel sheet and strip less than 33 mm thick
EURONORM 21 (1978)[1)]	General technical delivery conditions for steel and steel products
EURONORM 27 (1974) 1)	Designation of steels

1) Until they are transformed into European Standards, either the Euronorms listed or the corresponding national standards in annex B of this European Standard may be applied.

EURONORM 143 (1979)[1] Continuous hot-dip zinc coated unalloyed mild steel sheet and coil for cold forming; tolerances on dimensions and shape

3 Definitions

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

3.1 Hot-dip zinc coating is basically the application of zinc coating by immersing the prepared products in molten zinc.

In this case, wide strip steel is continuously hot-dip coated; the zinc content of the bath shall be at least 99 %.

3.2 Unalloyed and alloyed quality steels: see EN 10020.

3.3 Strip, sheet, cut lengths: see prEN 10 079. Hot-dip zinc coated steel wide strip - if agreed at the time of ordering - may be further processed into strip of smaller width by slitting (slit strip) or into sheet or cut lengths of by cutting.

3.4 Coating mass: total mass including both surfaces (in g/m^2).

4 Designation

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

a) Type of product (e.g. strip, sheet or cut length).

b) Number of this standard (EN 10 142).

c) Full designation of the steel grades (e.g. Fe P03 G, see table 1).

NOTE. The designations in table 1 are formed in accordance with EURONORM 27 (1974). This EURONORM is currently being transformed into a European Standard (EN 10 027 Part 1). A change of the designations for the steel grades covered by EN 10 142 is also planned.

d) Letter indicating the type of coating:

Z Zinc coating
ZF Zinc-iron alloy coating

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1) Until they are transformed into European Standards, either the Euronorms listed or the corresponding national standards in annex B of this European Standard may be applied.

e) Number denoting the mass of coating (e.g. 275 = 275 g/m^2 including both surfaces, see table 4).

f) Letter denoting the coating finish (N, M or R, see tables 2 and 3).

g) Letter denoting the surface quality (A, B, or C, see tables 2 and 3).

h) Letter denoting the surface treatment (C, O, CO or U, see subclause 5.5).

Examples:

Designation of strip made of steel Fe PO3 G, zinc coating (Z), coating mass 275 g/m^2 (275), coating finish normal spangle (N), surface quality A; surface treatment chemical passivation (C):

Strip EN 10 142 - Fe PO3 G Z 275 NA - C

Designation of sheet made of steel Fe PO5 G, zinc-iron alloy coating (ZF), coating mass 100 g/m^2 (100), coating finish regular R, surface quality B; surface treatment oiled (O):

Sheet EN 10 142 - Fe PO5 GZF 100 RB - O

4.2 Where appropriate, additional information to the designation as specified in 4.1 shall be given to describe clearly the delivery requirements (see clause 12).

5 Classification of grades and types of delivery

5.1 Steel grades

Table 1 gives a summary of the steel grades available. It contains the following steel grades listed in order of increasing suitability for cold forming.

Fe PO2 G: bending and profiling quality,
Fe PO3 G: drawing quality
Fe PO5 G: deep drawing quality
Fe PO6 G: special deep drawing quality

Table 1. Steel grades and mechanical properties

Steel grade	Yield strength R_e,[1] N/mm² max[2]	Tensile strength R_m, N/mm² max[2]	Elongation A_{80}, % min[3]
Fe PO 2 G	-	500	22
Fe PO3 G	300[4]	420	26
Fe PO5 G	260	380	30
Fe PO6 G	220	350	36

1) The yield strength values apply to the 0,2 % proof stress if the yield point is not pronounced, otherwise to the lower yield point (R_{eL}).

2) For all steel grades a minimum value of 140 N/mm² for the yield strength (R_e) and of 270 N/mm² for the tensile strength (R_m) may be expected.

3) For product thicknesses ≤ 0,7 mm (including zinc coating) the minimum elongation values (A_{80}) shall be reduced by 2 units.

4) This value applies to skin passed products only (surface qualities B and C).

5.2 Coatings

5.2.1 Zinc (Z) or zinc-iron alloy (ZF) coatings as given in tables 2 and 3 are applicable for the products.

5.2.2 The available coating masses are given in tables 2 and 3. Other coating masses shall be agreed separately at the time of ordering.

Thicker zinc coatings limit the formability and weldability of the products. Therfore, the forming and weldability requirements should be taken into account when ordering the coating mass.

5.2.3 If agreed at the time of ordering, different coating masses on each surface may be supplied for the hot-dip zinc coated flat products. The two surfaces may have a different appearance as a result of the manufacturing process.

5.3 Coating finish (see tables 2 and 3)

5.3.1 Normal spangle (N)

This finish is obtained when the zinc coating is left to solidify normally. Either no spangle or zinc crystals of different sizes and brightness appear depending on the galvanizing conditions. The quality of the coating is not affected by this.

NOTE. If a pronounced spangle is desired, this shall be indicated specially at the time of ordering.

5.3.2 Minimized spangle (M)

The surface has minimized qpangles obtained by influencing the solidifcation process in a specific way. The finish may be specified if the normal spangle applicable (see 5.3.1) does not satisfy the surface appearance requirements.

5.3.3 Regular zinc-iron alloy coating (R)

This coating results from heat treatment in which iron diffuses through the zinc. The surface has a uniform matt grey appearance.

5.4 Surface quality (see tables 2 and 3 and subclause 6.8)

5.4.1 As coated surface (A)

Imperfections such as small pits, variations in spangle size, dark spots, stripe marks and light passivation stains are permissible. Stretch levelling breaks or zinc run-off marks may appear.

5.4.2 Improved surface (B)

Surface quality B is obtained by skin passing.

With this surface quality, small imperfections such as stretch levelling breaks, skin pass marks, scratches, indentations, spangle structure and zinc run-off marks and light passivation marks are permissible. The surface has no pits.

5.4.3 **Best quality surface (C)**

Surface quality C is obtained by skin passing.

The better surface shall not impair the uniform appearance of a high-class paint finish. The other surface shall have at least the characteristics of surface quality B (see 5.4.2).

Table 2. Available coatings, finishes and surface qualities for zinc coatings (Z)

Steel grade	Coating designation 1)2)	Coating finish N | M 2) Surface qualities A | A | B | C
Fe P02 G	Z100	X X X X
	Z140	X X X X
	Z200	X X X X
	(Z225)	X X X X
	Z275	X X X X
	Z350	X X - -
	(Z450)	X - - -
	(Z600)	X - - -
Fe P03 G	Z100	X X X X
	Z140	X X X X
	Z200	X X X X
	(Z225)	X X X X
	Z275	X X X X
Fe P05 G and Fe P06 G	Z100	X X X X
	Z140	X X X X
	Z200	X X X X
	(Z225)	X X X X
	(Z275)	X X X X

1) See also 5.2.2.

2) The coating designations and surface qualities given in brackets are available on agreement.

Table 3. Available coatings, finishes and surface qualities for zinc-iron alloy coatings (ZF)

Steel grade	Coating designation 1)	Coating finish R Surface qualities A	B	C
All	ZF100	X	X	X
	ZF140	X	X	-

1) See also 5.2.2.

5.5 Surface treatment (surface protection)

5.5.1 General

Hot-dip zinc coated flat products generally receive surface protection at the producer's plant as specified in 5.5.2 to 5.5.4. The period of protection afforded depends on the atmospheric conditions.

5.5.2 Chemical passivation (C)

Chemical passivation protects the surface against humidity and reduces the risk of formation of 'white rust' during transportation and storage. Local discolouring as a result of this treatment is permissible and does not impair the quality.

5.5.3 Oiling (O)

This treatment also reduces the risk of corrosion of the surface.

It shall be possible to remove the oil layer with a suitable degreasing solvent which does not adversely affect the zinc.

5.5.4 Chemical passivation and oiling (CO)

Agreement may be reached on this combination of surface treatment if increased protection against the formation of 'white rust' is required.

5.5.5 Untreated (U)

Hot-dip zinc coated flat products complying with the requirements of this standard are only supplied without surface treatment if expressly desired by the purchaser on his own responsibility. In this case, there is increased risk of corrosion.