



SLOVENSKI STANDARD SIST EN 10292:2007

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Continuously hot-dip coated strip and sheet of steels with high yield strength for cold forming - Technical delivery conditions

Kontinuierlich schmelztauchveredeltes Band und Blech aus Stählen mit hoher Streckgrenze zum Kaltumformen - Technische Lieferbedingungen

Bandes et tôles en aciers a haute limite d'élasticité revetues en continu par immersion a chaud pour formage a froid - Conditions techniques de livraison

Ta slovenski standard je istoveten z: EN 10292:2007

ICS:

77.140.50 Ú[[z aãá \|^} áá á^ \ áá Flat steel products and semi-products
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SIST EN 10292:2007 en;fr;de

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English Version

Continuously hot-dip coated strip and sheet of steels with high yield strength for cold forming - Technical delivery conditions

Bandes et tôles en aciers à haute limite d'élasticité
revêtues en continu par immersion à chaud pour formage à
froid - Conditions techniques de livraison

Kontinuierlich schmelztauchveredeltes Band und Blech aus
Stählen mit hoher Streckgrenze zum Kaltumformen -
Technische Lieferbedingungen

This European Standard was approved by CEN on 3 February 2007.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 10292:2007) has been prepared by Technical Committee ECISS/TC 27 "Surface coated flat products – Qualities, dimensions, tolerances and specific tests", the secretariat of which is held by DIN.

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 September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

This document supersedes EN 10292:2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This European Standard specifies requirements for continuously hot-dip zinc (Z), zinc-iron alloy (ZF), zinc-aluminium alloy (ZA), aluminium-zinc alloy (AZ) and aluminium-silicon alloy (AS) coated flat products made of steels with high yield strength for cold forming (see Tables 1 and 3) with thicknesses up to and including 3,0 mm unless otherwise agreed. The thickness is the final thickness of the delivered product after coating.

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

The products covered by this European Standard are mainly used where cold formability and corrosion resistance for a defined minimum yield strength are the most important factors.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10002-1:2001, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

EN 10020, *Definition and classification of grades of steel*

EN 10021, *General technical delivery requirements for steel products*

EN 10079, *Definition of steel products*

EN 10143, *Continuously hot-dip coated steel sheet and strip — Tolerances on dimensions and shape*

EN 10204, *Metallic products — Types of inspection documents*

EN 10325, *Steel — Determination of yield strength increase by the effect of heat treatment (Bake-Hardening-Index)*

EN ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition (ISO 14284:1996)*

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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020, EN 10021, EN 10079, EN 10204 and the following apply.

3.1
hot-dip zinc coating (Z)
application of a zinc coating by immersing the prepared products in a molten bath containing a zinc content of at least 99 %

3.2**hot-dip zinc-iron coating (ZF)**

application of a zinc coating by immersing the prepared products in a molten bath containing a zinc content of at least 99 % ; subsequent annealing produces an iron-zinc coating with an iron content of normally 8 % to 12 % (see also 7.3.2.3)

3.3**hot-dip zinc-aluminium alloy coating (ZA)**

application of a zinc-aluminium coating by immersing the prepared products in a molten bath which is composed of zinc, approximately 5 % aluminium and small amounts of misch metal

3.4**hot-dip aluminium-zinc alloy coating (AZ)**

application of an aluminium-zinc coating by immersing the prepared products in a molten bath which is composed of 55 % aluminium, 1,6 % silicon and the balance zinc

3.5**hot-dip aluminium-silicon alloy coating (AS)**

application of an aluminium-silicon coating by immersing the prepared products in a molten bath which is composed of aluminium and 8 % to 11 % silicon

NOTE In the present cases, the wide strip is continuously hot-dip coated in a bath the composition of which is given in 3.1 to 3.5.

3.6**coating mass**

total mass of coating including both surfaces of the product (expressed in grams per square metre)

3.7**bake-hardening steel (B)**

steel that demonstrates an increase in proof strength following heating in the region of 170 °C for 20 min

3.8**low alloy/micro-alloyed steel (LA)**

steel containing one or more of alloys Nb, Ti and V to achieve required proof strength levels

3.9**interstitial free steel (Y)**

steel whose composition is controlled to achieve improved r - and n -values

4 Classification and designation**4.1 Classification**

The steel grades covered by this European Standard are alloy quality steels according to EN 10020. They are classified according to their minimum proof strength at room temperature.

4.2 Designation**4.2.1 Steel names**

The steel names as given in Tables 1 and 3 are allocated in accordance with EN 10027-1.

4.2.2 Steel numbers

The steel numbers as given in Tables 1 and 3 are allocated in accordance with EN 10027-2.

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) quantity to be delivered,
- b) type of product (strip, sheet, cut length),
- c) number of the dimensional standard (EN 10143),
- d) nominal dimensions and tolerances on dimensions and shape and, if applicable, letters denoting relevant special tolerances,
- e) term "steel",
- f) number of this European Standard, i.e. EN 10292,
- g) steel name or steel number and symbol for the type of hot-dip coating as given in Tables 1 and 3,
- h) number designating the nominal mass of coating (e.g. 080 = 80 g/m² including both surfaces, see Table 4),
- i) in case of hot-dip zinc coated products, letter denoting the coating finish (N, M or R, see Tables 5 and 6 and 7.3.2),
- j) letter denoting the surface quality (A, B or C, see 7.3.3) and
- k) letter denoting the surface treatment (C, O, CO, S, P or U, see 7.3.4).

EXAMPLE 1 sheet, delivered with dimensional tolerances according to EN 10143 with a nominal thickness of 0,70 mm, ordered with special thickness tolerances (S), nominal width 2 200 mm, ordered with special width tolerances (S), nominal length 2 500 mm, ordered with special flatness tolerances (FS), made of steel HX300LAD (1.0932), aluminium-silicon coated (AS), coating mass 80 g/m² (080), best quality surface (C), chemically passivated and oiled (CO) according to EN 10292.

1 sheet – EN 10143 – 0,70Sx1200Sx2500FS – steel EN 10292 – HX300LAD+AS080 – C – CO

or

1 sheet – EN 10143 – 0,70Sx1200Sx2500FS – steel EN 10292 – 1.0932+AS080 – C – CO

5.2 Options

A number of options are specified in this European Standard and listed below. If the purchaser does not indicate his wish to implement one of these options, the products shall be supplied in accordance with the basis specification of this European Standard (see 5.1).

- a) verification of the product analysis (see 7.1.2);
- b) products suitable for the manufacture of a specific part (see 7.2.2);
- c) coating masses different from those of Table 4 (see 7.3.1.2);
- d) special requirements for different coating masses on each side (see 7.3.1.3);
- e) hot-dip zinc coated products with pronounced spangle (see 7.3.2.2 a));

- f) special requirements for a maximum Fe-Al-Si alloy layer mass occurring during hot-dip aluminium-silicon coating (see 7.3.2.6);
- g) products supplied free from coil breaks (see 7.3.5);
- h) maximum or minimum value for the coating mass on each product side (see 7.3.7.2);
- i) determination of the tensile properties and/or the Bake-Hardening-Index BH_2 and/or the coating mass by calculation (see 8.1.4);
- j) notification of which surface has been inspected (see 8.5.4);
- k) testing for compliance with the requirements of this European Standard (see 8.1.1 and 8.1.2);
- l) supply of an inspection document and type of document (see 8.7);
- m) marking desired by branding of the products (see 9.2);
- n) requirements for packing (see Clause 10).

6 Manufacturing process

The processes used in steelmaking and manufacture of the products are left to the discretion of the manufacturer.

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7 Requirements (standards.iteh.ai)

7.1 Chemical composition

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7.1.1 Cast analysis

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The chemical composition determined by cast analysis shall be in accordance with the requirements given in Table 1.

Table 1 — Chemical composition (cast analysis)

Designation		Symbols for the type of the available hot-dip coatings	% by mass							
Steel grade	Steel number		C max.	Si max.	Mn max.	P max.	S max.	Al min.	Ti max.	Nb max.
HX180YD	1.0921	+Z, +ZF, +ZA, +AZ, +AS	0,01	0,15	0,70	0,06	0,025	–	0,12	0,09
HX180BD	1.0914	+Z, +ZF, +ZA, +AZ, +AS	0,1	0,50	0,70	0,06	0,025	0,015	0,12	0,09
HX220YD	1.0923	+Z, +ZF, +ZA, +AZ, +AS	0,01	0,20	0,90	0,08	0,025	–	0,12	0,09
HX220BD	1.0919	+Z, +ZF, +ZA, +AZ, +AS	0,1	0,50	0,70	0,08	0,025	0,015	0,12	0,09
HX260YD	1.0926	+Z, +ZF, +ZA, +AZ, +AS	0,01	0,25	1,10	0,10	0,025	–	0,12	0,09
HX260BD	1.0924	+Z, +ZF, +ZA, +AZ, +AS	0,1	0,50	0,80	0,10	0,025	0,015	0,12	0,09
HX260LAD	1.0929	+Z, +ZF, +ZA, +AZ, +AS	0,12	0,50	0,60	0,030	0,025	0,015	0,12	0,09
HX300YD	1.0927	+Z, +ZF, +ZA, +AZ, +AS	0,01	0,30	1,30	0,10	0,025	–	0,12	0,09
HX300BD	1.0930	+Z, +ZF, +ZA, +AZ, +AS	0,11	0,50	0,80	0,12	0,025	0,015	0,12	0,09
HX300LAD	1.0932	+Z, +ZF, +ZA, +AZ, +AS	0,11	0,50	1,00	0,030	0,025	0,015	0,15	0,09
HX340LAD	1.0933	+Z, +ZF, +ZA, +AZ, +AS	0,11	0,50	1,00	0,030	0,025	0,015	0,15	0,09
HX380LAD	1.0934	+Z, +ZF, +ZA, +AZ, +AS	0,11	0,50	1,40	0,030	0,025	0,015	0,15	0,09
HX420LAD	1.0935	+Z, +ZF, +ZA, +AZ, +AS	0,11	0,50	1,40	0,030	0,025	0,015	0,15	0,09

^a **H** flat products of high strength for cold forming; **X** rolling condition (hot rolled or cold rolled) not specified; **nnn** minimum proof strength $R_{p0,2}$ in MPa; **B** bake-hardened; **Y** interstitial free; **LA** low alloy (micro-alloyed); **D** intended for hot-dip coating.

7.1.2 Product analysis

If a product analysis is agreed at the time of enquiry and order, the permitted deviations from the values of the cast analysis given in Table 1 shall be in accordance with the requirements in Table 2.

Table 2 — Permissible product analysis deviations from the values given in Table 1 for the cast analysis

Element	Specified limits according to the cast analysis % by mass	Permissible deviations from the limits of the cast analysis % by mass
C	≤ 0,12	+ 0,02
Si	≤ 0,50	+ 0,03
Mn	≤ 1,00	+ 0,05
	> 1,00 ≤ 1,40	+ 0,10
P	≤ 0,12	+ 0,01
S	≤ 0,025	+ 0,005
Al _{tot}	≥ 0,015	- 0,005
Ti	≤ 0,15	+ 0,02
Nb	≤ 0,09	+ 0,02

7.2 Mechanical properties

7.2.1 The products shall comply with requirements in Table 3

7.2.2 If specially agreed at the time of enquiry and order, products with suitability for manufacturing a specific part may be supplied. In this case the values in Table 3 do not apply. The reject tolerances arising when the material is processed shall not exceed a specific proportion to be agreed upon at the time of enquiry and order.

7.2.3 If ordered in accordance with 7.2.1, the mechanical property values in Table 3 apply for a period of three months for bake-hardening grades and of six months for all other grades commencing from the date on which the products are made available by the works.

7.2.4 The values for the tensile test apply to the test piece cross section without coating.

7.2.5 The strain ratio r and the strain hardening exponent n shall be in the range of homogeneous deformation, within the strain range of 10 % to 20 %.

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