SLOVENSKI STANDARD
SIST EN 10154:2003

01-april-2003

Nadomešča:
SIST EN 10154:1998

Kontinuirno prevlečeni jekleni trakovi in plošče z vročim omakanjem v aluminij-siliciju (AS) - Tehnični dobavni pogoji

Continuously hot-dip Aluminium-Silicon (AS) coated steel strip and sheet - Technical delivery conditions

Kontinuierlich schmelztauchveredeltes Band und Blech aus Stahl mit Aluminium-Silicium-Überzügen (AS) - Technische Lieferbedingungen

Bandes et tôles en acier revetues en continu par immersion a chaud d'une couche d'Aluminium-Silicium (AS) - Conditions techniques de livraison

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77.140.50	Ploščati jekleni izdelki in polizdelki	Flat steel products and semi-products

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EN 10154

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English version

Continuously hot-dip aluminium-silicon (AS) coated steel strip and sheet - Technical delivery conditions

Bandes et tôles en acier revêtues en continu par immersion à chaud d'une couche d'aluminium-silicium (AS) - Conditions techniques de livraison

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This European Standard was approved by CEN on 17 February 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Contents

Foreword

This document EN 10154:2002 has been prepared by 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 November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

This European Standard supersedes EN 10154:1996.

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

1 Scope

This European Standard specifies requirements for continuously hot-dip aluminium-silicon alloy coated flat products made of low carbon steels for cold forming (see Table 1) or of structural steels (see Table 2) in thicknesses ≤ 3,0 mm. 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 aluminium-silicon alloy coating is obtained by immersing the products in a bath containing 8 % to 11 % Si (also referred to as type 1).

The available coatings, coating masses and surface qualities are given in 7.2 to 7.3 and Table 3.

The products covered by this European Standard are mainly used where heat resistance and corrosion resistance are the most important factors.

This European Standard is not applicable to steel flat products with hot-dip coating of pure aluminium (normally referred to as type 2 coating).

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate points in the text, and the publications are listed hereafter. Subsequent amendments to, or revisions of, any of these publications apply to this draft European Standard only when incorporated in it by amendment or revision. In the case of undated references, the most recent edition of the publications referred to applies (including amendments).

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

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

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

EN 10027-1, *Designation systems for steels - Part 1: Steel names - principal symbols.*

EN 10027-2, *Designation systems for steels - Part 2: Numerical system.*

EN 10079, *Definition of steel products.*

EN 10143, *Continuously hot-dip metal coated steel sheet and strip - tolerances on dimensions and shape.*

EN 10204, *Metallic products - types of inspection documents.*

ENV 606, *Bar coded transport and handling labels for steel products.*

CR 10260, *Designation systems for steel - additional symbols.*

EURONORM 12[1)], *Bend test for steel sheet and strip less than 3 mm thick.*

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1) Until it is transformed into an European Standard, either EURONORM 12 or the corresponding national standard may be applied.

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 European Standard the following terms and definitions apply in addition to the terms and definitions in EN 10020, EN 10021, EN 10079 and EN 10204.

3.1
hot-dip aluminium-silicon alloy coating (AS)
application of an aluminium-silicon coating by immersing the prepared products in a molten bath of aluminium-silicon alloy

NOTE In the present case, wide strip is continuously hot-dip coated in a bath the composition (type 1) of which is given in clause 1.

3.2
coating mass
total mass of coating including the Al-Fe-Si alloy layer on both surfaces on the product (expressed in grams per square metre)

4 Classification and designation

4.1 Classification

4.1.1 The steel grades according to Table 1 of this European Standard are classified according to their increasing suitability for cold forming as follows:

DX51D+AS: bending and profiling quality,

DX52D+AS: drawing quality,

DX53D+AS: deep drawing quality,

DX54D+AS: special deep drawing quality,

DX55D+AS: deep drawing quality, heat resistance up to 800 °C,

DX56D+AS: extra deep drawing quality.

The steel grades according to Table 2 of this European Standard are classified according to their decreasing specified minimum yield strength values with the exception of DX56D.

4.1.2 Heat resistance may be assumed for temperatures up to 700 °C except for steel grade DX55D+AS for which heat resistance may be assumed for temperatures up to 800 °C.

4.2 Designation

4.2.1 Steel names

For the steel grades covered by this European Standard, the steel names as given in Tables 1 and 2 are allocated in accordance with EN 10027-1 and CR 10260.

4.2.2 Steel numbers

For the steel grades covered by this European Standard, the steel numbers as given in Tables 1 and 2 are allocated in accordance with EN 10027-2 and CR 10260.

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) the quantity to be delivered;

b) the type of product (strip, sheet, cut length);

c) the number of the dimensional standard (EN 10143);

d) the nominal dimensions and the tolerances on dimensions and shape and, if applicable, letters denoting relevant special tolerances;

e) the term “steel”;

f) number of this standard (EN 10154);

g) steel name or steel number and symbol for the type of hot dip coating as given in Tables 1 and 2;

h) number designating the nominal mass of coating (e.g. 080 = 80 g/m² including both surfaces, see Table 3);

i) letter denoting the surface quality (A, B or C, see 7.3);

j) letter denoting the surface treatment (C, O, CO or U, see 7.4).

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 1 200 mm, ordered with special width tolerances (S), nominal length 2 500 mm, ordered with special flatness tolerances (FS), made of steel S250GD+AS120-C-CO(1.0242+AS120-C-CO) according to EN 10154:

1 sheet EN 10143-0,70Sx1200Sx2500FS

steel EN 10154-S250GD+AS120-C-CO

or

1 sheet EN 10143-0,70Sx1200Sx2500FS

steel EN 10154-1.0242+AS120-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 supplier shall supply in accordance with the basis specification of this European Standard (see 5.1).

a) any low carbon steel products suitable for the manufacture of a specific part (see 7.1.2);

b) any special requirements for a maximum Al-Fe-Si alloy layer mass occurring during hot-dip aluminium-silicon coating (see 7.2.2);

c) any requirement for special applications on bright appearance (type B surface, see NOTE to 7.3.3) and protection by a strippable film on one surface (see NOTE to 7.4.2);

d) any products supplied free from coil breaks (see 7.5);

e) any products supplied free from stretcher strains when cold forming (see 7.6.2);

f) any maximum or minimum value for the coating mass per product surface (see 7.7.2);

g) notification of which surface has been inspected (see 7.9.1);

h) any testing for compliance with the requirements of this standard (see 8.1.1 and 8.1.2);

i) any supply of an inspection document and type of document (see 8.1.2);

j) any requirement for packing (see 10).

6 Manufacturing process

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

7 Requirements

7.1 Mechanical properties

7.1.1 The products shall be supplied on the basis of the mechanical property requirements in Table 1 and Table 2.

7.1.2 If specially agreed at the time of enquiry and order, products made of steel grades DX52D+AS, DX 53D+AS, DX54D+AS, DX55D+AS and DX56D+AS with suitability for manufacturing a specific part may be supplied. In this case the values in Table 1 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.

7.1.3 If ordered in accordance with 7.1.1 the mechanical property values in Table 1 for the low carbon steels apply for the following periods commencing from the date on which the products are made available by the works:

— 8 days for steel grades DX51D+AS and DX52D+AS;

— 6 months for steel grades DX53D+AS, DX54D+AS, DX55D+AS and DX56D+AS.

7.1.4 For the structural steel flat products the mechanical properties in Table 2 apply. A reduction in the formability may occur with time. It is therefore in the interest of the purchaser to use the products as soon as possible.

7.1.5 The tensile test values apply to

— transverse test pieces for the low carbon steel grades according to Table 1;

— longitudinal test pieces for the structural steel grades according to Table 2.

The values shall be related to the test piece cross section without coating.

Table 1 - Grades and mechanical properties of low carbon steels for cold forming

Designation Steel grade			Yield strength R_e [a] MPa *)	Tensile strength R_m MPa *)	Elongation A_{80} % min.[b]	Plastic strain ratio r_{90} min.	Strain hardening exponent n_{90} min.
Steel name	Steel number	Symbol for the type of hot-dip coating					
DX51D	1.0226	+AS	-	270 to 500	22	-	-
DX52D	1.0350	+AS	140 to 300[c]	270 to 420	26	-	-
DX53D	1.0355	+AS	140 to 260	270 to 380	30	-	-
DX54D	1.0306	+AS	120 to 220	260 to 360	34	1,4[e,f]	0,18[f]
DX55D[d]	1.0309	+AS	140 to 240	270 to 370	30	-	-
DX56D	1.0322	+AS	120 to 180	260 to 330	39	1,7[e,f]	0,20[f]

*) 1 MPa = 1 N/mm².

a 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}).

b For product thicknesses between 0,5 mm and 0,7 mm inclusive the minimum elongation values (A_{80}) shall be reduced by 2 units. For product thicknesses less than 0,5 mm the values are to be agreed upon at the time of enquiry and order.

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

d See 4.1.2.

e For thicknesses > 1,5 mm, the r_{90}-value shall be reduced by 0,2.

f For thicknesses ≥ 0,7 mm, the r_{90}-value shall be reduced by 0,2 and the n_{90}-value shall be reduced by 0,01. For thicknesses < 0,5 mm, the r_{90}- and n_{90}-values shall be agreed at the time of enquiry and order.