

Continuously hot-dip coated strip and sheet of low carbon steels for cold forming — Technical delivery conditions

The European Standard EN 10327:2004 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 10327:2004. It supersedes BS EN 10142:2000, and together with BS EN 10326:2004, supersedes BS EN 10154:2002, BS EN 10214:1995 and BS EN 10215:1995, which are withdrawn.

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English version

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

Bandes et tôles en acier doux revêtues en continu par
immersion à chaud pour formage à froid - Conditions
techniques de livraison

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

This European Standard was approved by CEN on 23 April 2004.

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Foreword

This document (EN 10327:2004) 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of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

This European Standard supersedes EN 10142:2000 and, together with EN 10326, it also supersedes EN 10154:2002, EN 10214:1995 and EN 10215:1995.

This document includes a Bibliography.

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

1 Scope

1.1 This document specifies requirements for continuously hot-dip coated products made of low carbon steels for cold forming coated with zinc (Z), zinc-iron alloy (ZF), zinc-aluminium alloy (ZA), aluminium-zinc alloy (AZ) and aluminium-silicon alloy (AS) (see Table 1) with thicknesses of 0,35 mm to 3,0 mm unless otherwise agreed (see 1.2). The thickness is the final thickness of the delivered product after coating.

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

1.2 If agreed at the time of enquiry and order, this document may also be applied to continuously hot-dip coated flat products in thicknesses $> 3,0$ mm. In this case the mechanical property, adhesion of coating and surface condition requirements shall also be agreed at the time of enquiry and order.

1.3 The products covered by this document are mainly used where cold formability and corrosion resistance are the most important factors. Corrosion resistance of the alloy is proportional to the coating thickness, hence to its mass (see also 7.3.2).

1.4 This document is not applicable to:

- continuously hot-dip coated structural steel flat products (see EN 10326);
- electrolytically zinc coated cold rolled steel flat products (see EN 10152);
- continuously organic coated (coil coated) steel flat products (see EN 10169-1, ENV 10169-2 and EN 10169-3);
- continuously hot-dip coated strip and sheet of steels with higher yield strength for cold forming (see EN 10292).

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).

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

EN 10020:2000, *Definition and classification of grades of steel.*

EN 10021:1993, *General technical delivery requirements for steel and steel 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 10079:1992, *Definition of steel products.*

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

EN 10204:1991, *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.*

CR 10260, *Designation systems for steel – Additional symbols.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 10020:2000, EN 10021:1993, EN 10079:1992 and EN 10204:1991 and the following apply.

NOTE 1 General guidelines for the protection of iron and steel can be found in EN ISO 14713.

NOTE 2 In the present cases, strip is continuously hot-dip coated in a bath the composition of which is given in 3.1 to 3.4.

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 % (see also 7.4.2)

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 7.4.3)

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 and approximately 5 % aluminium

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

3.6 coating mass

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

4 Classification and designation

4.1 Classification

In accordance with EN 10020 the steel grades covered by this document are alloy quality steels. They are classified in accordance with their increasing suitability for cold forming as follows (see Table 1):

DX51D: bending and profiling quality;

DX52D: drawing quality;

DX53D: deep drawing quality;

DX54D: special deep drawing quality;

DX55D: special deep drawing quality, (only +AS), heat resistance up to 800 °C;

DX56D: extra deep drawing quality;

DX57D: super deep drawing quality.

4.2 Designation

4.2.1 Steel names

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

4.2.3 Steel numbers

For the steel grades covered by this document, the steel numbers as given in Table 1 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 the tolerances on dimensions and shape and, if applicable, letters denoting relevant special tolerances;
- e) term "steel";
- f) number of this document (EN 10327);
- g) steel name or steel number and symbol for the type of hot-dip coating as given in Table 1;
- h) number designating the nominal mass of coating (e.g. 275 = 275 g/m² including both surfaces, see Tables 3 to 6);
- i) letter denoting the coating finish (N, M or R, see 7.3 and Tables 4 and 5);
- j) letter denoting the surface quality (A, B or C, see 7.5);
- k) letter denoting the surface treatment (C, O, CO, S, P or PO, see 7.6).

EXAMPLE 1 sheet, delivered with dimensional tolerances in accordance with EN 10143 with nominal thickness of 0,80 mm, ordered with special thickness tolerances (S), nominal width 1200 mm, ordered with special width tolerances (S), nominal length 2500 mm, ordered with special flatness tolerances (FS), made of steel DX53D+ZF (1.0355+ZF) in accordance with EN 10327, coating mass 100 g/m² (100), coating finish R, surface quality B, surface treatment oiled (O):

1 sheet EN 10143-0,80Sx1200Sx2500FS
steel EN 10327-DX53D+ZF100-R-B-O

or:

1 sheet EN 10143-0,80Sx1200Sx2500FS
steel EN 10327-1.0355+ZF100-R-B-O