
British Standard Specification for
**Continuously organic coated
steel flat products**

Produits plats prélaqués en acier — Spécifications

Organisch bandbeschichtetes Flacherzeugnis aus Stahl

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National foreword

This British Standard has been prepared under the direction of the Iron and Steel Standards Committee and is identical with Euronorm 169-1985 'Continuously organic coated steel flat products' published by the Commission of the European Communities.

Terminology and conventions. The text of the Euronorm has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

Wherever the word 'Euronorm' or the number 'EU 169' appear referring to this standard, they should be read as 'British Standard' or 'BS 6781', respectively.

Cross-references

International standards	Corresponding British Standards
ISO 2813-1978	BS 3900 Methods of test for paints Part D5 : 1980 Measurement of specular gloss of non-metallic films at 20 °, 60 ° and 85 ° (Identical)
ISO 3668-1976	Part D1 : 1978 Visual comparison of the colour of paints (Identical)
ISO 3768-1976	BS 5466 Methods for corrosion testing of metallic coatings Part 1 : 1977 Neutral salt spray test (NSS test) (Identical)
ISO 4628/1-1982	BS 3900 Methods of test for paints Part H1 : 1983 Designation of intensity, quantity and size of common types of defect : general principles and rating schemes (Identical)
ISO 4628/2-1982	Part H2 : 1983 Designation of degree of blistering (Identical)
ISO 4628/3-1982	Part H3 : 1983 Designation of degree of rusting (Identical)
ISO 4892-1981	BS 2782 Methods of testing plastics Method 540B : 1982 Methods of exposure to laboratory light sources, (xenon arc lamp, enclosed carbon arc lamp, open-flame carbon arc lamp, fluorescent tube lamps) (Identical)
ISO 7253-1984	BS 3900 Methods of test for paints Part F12 : 1985 Determination of resistance to neutral salt spray (Identical)

The Technical Committee has reviewed the provisions of the other international standards and Euronorms to which reference is made in the text and has decided that they are acceptable for use in conjunction with this standard. The related British Standards are listed.

International standards	Related British Standards
ISO 1043-1978	BS 3502 Common names and abbreviations for plastics and rubbers Part 1 : 1978 Principal commercial plastics
ISO 1519-1973	BS 3900 Methods of test for paints Part E1 : 1970 Bend test (cylindrical mandrel)
ISO 1520-1973	Part E4 : 1976 Cupping test
ISO 2409-1972	Part E6 : 1974 Cross-cut test
ISO 2808-1974	BS 3900 Methods of test for paints Part C5 : 1975 Determination of film thickness
ISO 2815-1973	Part E9 : 1976 Buchholz indentation test
ISO 3270-1984	None
ISO 4997-1978	BS 1449 Steel plate, sheet and strip Part 1 : 1983 Specification for carbon and carbon-manganese plate, sheet and strip
ISO/TR 6272-1979	BS 3900 Methods of test for paints Part E3 : 1973 Impact (falling weight) resistance
ISO 7724/1-1984	None
ISO 7724/2-1984	None
ISO 7724/3-1984	None
Euronorms	Related British Standards
EU 18-1979	None
EU 21-1978	None
EU 79-1982	BS 6562 Terms used in the iron and steel industry Part 2 : 1986 Glossary of terms used in classifying and defining steel industry products by shape and dimensions
EU 130-1977	BS 1449 Steel plate, sheet and strip Part 1 : 1983 Specification for carbon and carbon-manganese plate, sheet and strip
EU 131-1977	
EU 139-1981	
EU 140-1981	
EU 142-1979	BS 2989 : 1982 Specification for continuously hot-dip zinc coated and iron-zinc alloy coated steel : wide strip, sheet/plate and slit wide strip
EU 143-1979	
EU 146-1980	None
EU 147-1979	BS 2989 : 1982 Specification for continuously hot-dip zinc coated and iron-zinc alloy coated steel : wide strip, sheet/plate and slit wide strip
EU 148-1979	
EU 149-1980	BS 1449 Steel plate, sheet and strip Part 1 Specification for carbon and carbon-manganese plate, sheet and strip
EU 152-1981	BS 6687 : 1986 Specification for electrolytically zinc coated steel flat rolled products
EU 153-1980	BS 6582 : 1985 Specification for continuously hot-dip lead alloy (terne) coated cold reduced carbon steel flat rolled products
EU 154-1980	BS 6536 : 1985 Specification for continuously hot-dip aluminium/silicon coated cold reduced carbon steel sheet and strip

ISO 2579, ISO 4686/6, ISO 7253, EU 168 and the unnumbered Euronorm referred to in 4.1 are all in preparation, but as they are referred to for information only they do not affect the technical content of this British Standard.

NOTE. *Typographical errors.* In clause 3, paragraphs 2 and 3 are identical and paragraph 3 should be deleted. In the final paragraph of 4.1, the word 'also' has been spelled incorrectly in the Euronorm text.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

FOREWORD

Organic coated steel flat products may be used to advantage in cases where corrosion resistance and decorative appearance are of primary importance. They have applications throughout the flat products processing industry e.g. in the building, automotive, fabricating and packaging industries.

Organic coated steel flat products may be delivered in numerous types and grades, depending on the base material used (various grades of steel with or without metallic coating), on the coating material and type of coating and on the requirements for the surface appearance and the formability. The properties of the products may vary within greater or smaller limits depending on the choice and combination of the characteristics mentioned.

Because of the varieties of product available, it is not practicable to specify, in detail, minimum requirements for all the properties and characteristics of all the types of product.

The main purposes of this Euronorm are therefore to :

- (a) establish definitions and appropriate designation ;
- (b) summarize the important characteristics of the products available and the ways in which the products should be selected, ordered, processed and tested.

Minimum requirements should be agreed between manufacturer and purchaser at the time of ordering in each individual case, provided that this Euronorm does not specify the appropriate requirements and that technical delivery conditions for particular uses of continuously organic coated flat steel products are not specified elsewhere.

1. SCOPE AND FIELD OF APPLICATION

This Euronorm provides information on the selection, ordering and processing of continuously organic coated steel flat products and specifies appropriate technical requirements for the products, e.g. for test methods and tolerances on coating thickness and product dimensions and shape.

This Euronorm applies to cold-rolled steel flat products, with or without metallic coatings, that are continuously organic coated by the coil coating process.

Products covered by this Euronorm are wide strip in coils in widths up to 1850 mm, sheets cut from strip, slit wide strip, strip produced in widths less than 600 mm and cut lengths (from sheet or slit strip) with a maximum product thickness for the substrate of 2 mm.

2. DEFINITIONS

The definitions given in Euronorm 79 shall apply for the terms 'cold-rolled', 'wide strip', 'strip', 'sheet', 'slit strip' and 'cut lengths'.

Coil coating is a method in which cold-rolled steel strip with or without metallic coating is organically coated in a continuous process.

This process includes, in the same operation, cleaning and chemical pre-treatment of the surface and either :

- one or two-sided, one or multiple rolled application of liquid organic coating materials which are subsequently cured ; or

- laminating with plastic films.

Further definitions regarding coating materials and application of coatings are given in 4.2.1 and 4.2.2.

3. DESIGNATION

The overall designation of organic coated flat products consists of the name of the product (e.g. 'strip' or 'sheet'), to which are added in the following order :

- (a) the complete designation of the substrate in accordance with the data in the applicable Euronorms (see 4.1) ;
- (b) code letter C (for 'organic coated') ;
- (c) item number for the coating system (see table 2) ;
- (d) symbol for the coating material on the top side (see table 1) ;
- (e) code number which is the nominal thickness of the topside coating in μm ;
- (f) symbol for the coating material on the bottom side (see table 1), if applicable ;
- (g) code number which is the nominal thickness of the bottom side coating in μm , if applicable ;
- (h) number of the Euronorm (EU 169).

Any other data, e.g. any required decorative properties (colour, gloss, embossing) or subsequent surface treatment (see 4.2.2) (e.g. with protective film) are to be added in plain text.

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Examples :

strip Fe P 04 EU 130 C9 PVC (F) 200 Colour..., embossing... EU 169
 strip Fe P 01 Gz 275 EU 142 C6 SP 25/5 Colour..., gloss..., with protective film EU 169
 sheet T 57 E2, 8/2, 8 EU 146 C7 EP 6/EP 6 EU 169
 sheet Fe P 02 EU 130 G7 E 25/25 EU 152 C5 AY 25 Colour... EU 169
 sheet Fe P 04 EU 130 C4 ZP 13 oiled EU 169

4. GENERAL INFORMATION

4.1 Substrate

The initial product for organic coated flat products complying with this Euronorm shall be cold-rolled steel strip, with or without metallic coatings, complying with one or other of the following standards :

- EU 130 - Cold-rolled non-coated mild unalloyed steel flat products for cold-forming-Quality standard
- EU 139 - Cold-rolled uncoated non-alloy mild steel narrow strip for cold-forming-Quality standard
- EU 142 - Continuous hot-dip zinc coated unalloyed mild steel sheet and coil for cold-forming-Quality standard

EU 146 - Tinplate and blackplate in coil form for subsequent cutting into sheets-Qualities, dimensions and tolerances

EU 147 - Continuous hot-dip zinc-coated unalloyed steel sheet and coil Quality standard for structural purposes — with specified minimum yield strengths

EU 149 - Flat products in high yield strength steels for cold-forming — Wide flats, sheet/plate, wide and narrow strip

EU 152 - Electrolytic zinc coated steel flat rolled products

EU 153 - Hot-dip terne (lead-alloy) coated cold-reduced carbon steel flat rolled products of commercial and drawing qualities — Technical delivery conditions

EU 154 - Hot-dip aluminium-silicon coated carbon steel flat rolled products of commercial and drawing qualities — Technical delivery conditions

EU ... - Cold-rolled products without coatings made of general structural steels (in preparation)

ISO 4997 - Cold-reduced steel sheet of structural quality

If agreed at the time of ordering, continuously organic coated flat products may also be supplied using different substrates, for which there are as yet no standards.

Notes :

1. Where the initial product is hot dipped zinc coated strip, organic coatings are generally applied only to strip with zinc coating up to 275 g/m² (Z 275) including both sides. Heavier zinc coatings for special purposes shall be agreed on ordering.
2. It should be noted that the technical and mechanical properties of the substrate can be altered by the coil coating process.

4.2 Coating

4.2.1 Coating materials

The more common coating materials used for organic coated flat products, together with their normal coating thicknesses (dry film thicknesses) are given in table 1.

The coating materials dealt with in this EURONORM comprise organic polymers e.g. synthetic resin or plastics, to which pigments, additives and solvents have generally been added. This produces them in a form suitable for coil coating and the desired decorative or functional coating properties are obtained. The characteristics of these coating materials are listed in Annex A.

4.2.2 Coating systems

The coating systems available for the top and bottom sides of the product are given in table 2. The choice of coating system is to be agreed between customer and supplier.

The top side is that side of the strip which is continuously controlled by the manufacturer and which, in normal production, is uppermost (it is often referred to as the 'prime side').

For strip supplied in coil form, the top side is normally the outside of the coil; for sheet and cut lengths (in stacks or bundles), the top side is normally uppermost.

If the purchaser requires an alternative arrangement this shall be expressly stated at the time of ordering.

The following definitions apply for the coating systems listed in table 2 :

- (a) **Uncoated.** A condition in which the surface of the original substrate remains uncoated.
- (b) **Backing coat.** A single coating of any type, 3 µm to 12 µm thick, with no particular requirements for appearance, formability, corrosion protection, etc.
- (c) **One coat system.** A single coating either with requirements on appearance, formability, corrosion protection, subsequent painting, etc. or as a primer with special properties regarding adhesion and corrosion protection for two coat systems.
- (d) **Two coat system.** A double coating consisting of a primer and a top coat with particular requirements for appearance, formability, corrosion protection, etc.

Note : Some coating materials can only be applied as a two coat system arrangement.

- (e) **Film coating.** A film applied to the substrate to which a heat-activated adhesive and, if appropriate, a primer has been applied beforehand.

4.2.3 Subsequent surface treatment

If severe service conditions are expected during transportation, storage or processing the coil coated strip may on agreement be supplied with the additional protection of a temporary strippable film, wax or oil.

Type, thickness, adhesion properties, formability, tear strength and light fastness are to be taken into consideration when choosing protective films.

Only certain protective films can be exposed to outdoor weathering, and these only for a limited period.

4.3 Method of manufacture

Within the context of the data on coil coating, see 4.2, the details of the manufacture of the products is at the discretion of the manufacturer.

4.4 Properties and test methods

4.4.1 General

Table 3 gives a summary of the main properties of organic coated flat products to this EURONORM, which may be of importance in their processing and use. The properties assessed are those of the finished composite material.

The minimum or maximum values to be achieved for the properties given in table 3 shall be agreed at the time of ordering, taking the test methods to be used into consideration.

The properties listed in Table 3 shall be evaluated according to the following :