BRITISH STANDARD

BS EN
504:2000

Roofing products from metal sheet — Specification for fully supported roofing products of copper sheet

The European Standard EN 504:1999 has the status of a British Standard

ICS 91.060.20

National foreword

This British Standard is the English language version of EN 504:1999.

The UK participation in its preparation was entrusted by Technical Committee B/542, Roofing and cladding products for discontinuous laying, to Subcommittee B/542/5, Sheet roof and wall coverings, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 13 and a back cover.

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EN 504

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English version

Roofing products from metal sheet - Specification for fully supported roofing products of copper sheet

Produits de couverture en tôle métallique - Spécification pour les produits de couverture en tôle de cuivre totalement supportés

Dachdeckungsprodukte aus Metallblech – Festlegungen für vollflächig unterstützte Bedachungselemente aus Kupferblech

This European Standard was approved by CEN on 16 September 1999.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 504:1999 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 128, Roof covering products for discontinuous laying and products for wall cladding, the Secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Annexes A and B are informative.

Introduction

Figure 1 indicates the position of this standard in the CEN framework of standards concerning roofing products of metal.

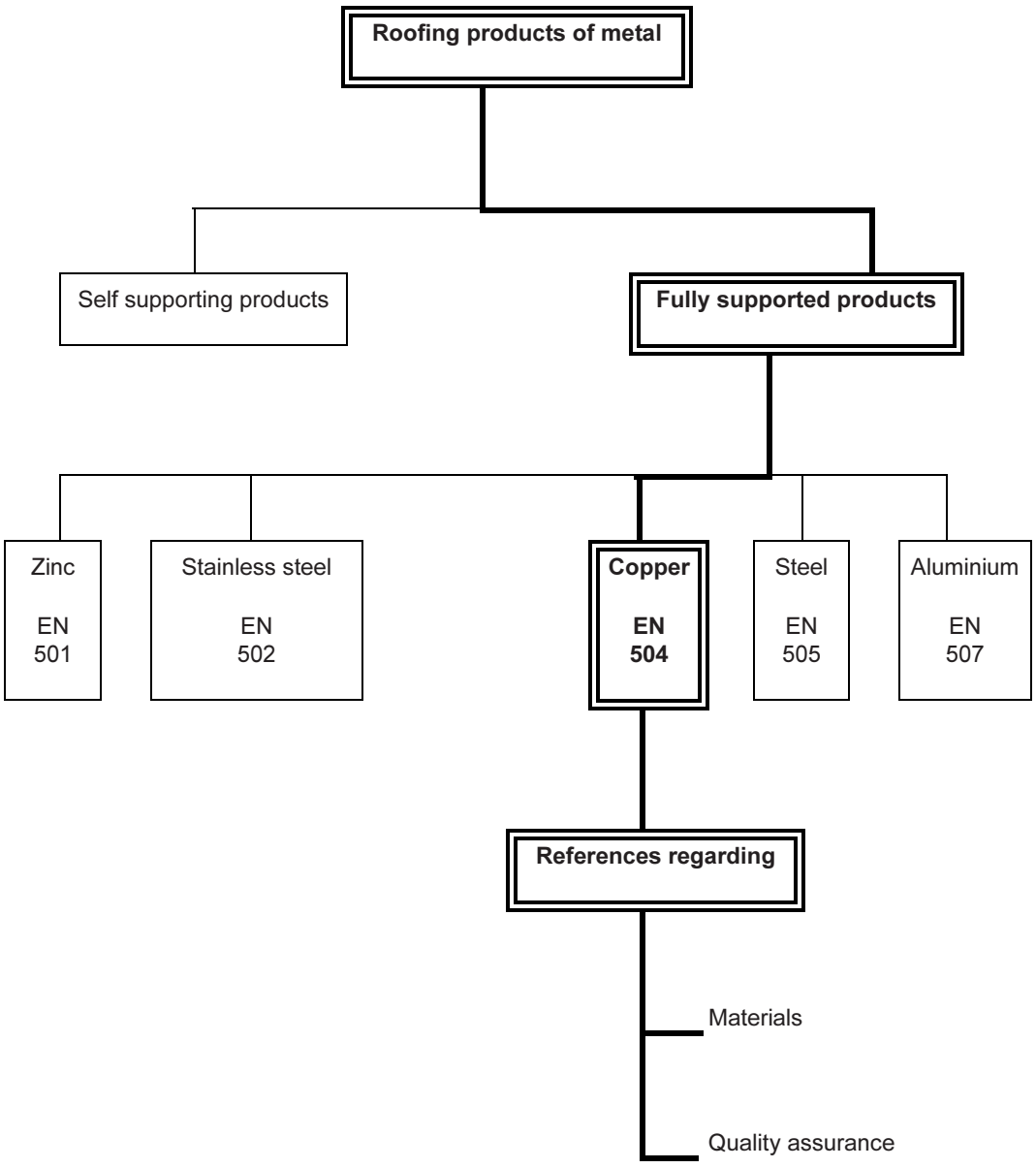


Figure 1 - Framework of standards

In this standard the performance of the product has been defined in terms of a number of type tests.

The performance of a roof constructed with these products depends not only on the properties of the product as it is required by this standard, but also on the design, construction and performance of the roof as a whole in relation to the environment and conditions of use.

1 Scope

This European Standard specifies requirements for roofing products used for assembly into coverings for pitched roofs, made from copper sheet.

The standard establishes general characteristics, definitions and labelling for the products, together with requirements for the materials from which the products can be manufactured. It is intended to be used either by manufacturers to ensure that their products conform to the requirements or by purchasers to verify that the products conform to the requirements before they are despatched from the factory. It specifies the requirements for products which enable them to meet all normal service conditions. Products can be prefabricated or semiformed products as well as strip and sheet for on-site-formed applications, e.g. standing-seam-roofs.

The standard applies to all discontinuously laid and fully supported roofing products made of copper sheets and strips. No requirements for supporting construction, design of roof system application and execution of connections and flashings are included.

NOTE The standard deals partly with flat products, partly with formed (prefabricated) products. Requirements for preformed self-supporting products are given in prEN 506.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 1172, *Copper and copper alloys - Sheet and strip for building purposes*.

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

3 Definitions, symbols and abbreviations

3.1 Terms and definitions

For the purposes of this standard, the following definition applies in addition to the definitions in EN 1172.

3.1.1
fully supported
installation conditions such that the lower flat portions of the product are supported by a continuous construction

3.2 Symbols and abbreviations

3.2.1
material
Cu-DHP Phosphorus deoxidized copper, high residual phosphorus

NOTE The material designation is based on the system given in ISO 1190-1.

3.2.2
material condition
H Material condition designated by the minimum value of hardness requirement for the product with mandatory hardness requirements;
R Material condition designated by the minimum value of tensile strength requirement for the product with mandatory tensile strength, 0,2 % proof strength and elongation requirements.

NOTE The system used for designating the material conditions is given in EN 1173.

4 Requirements

4.1 General

The product shall be manufactured from materials in accordance with 4.2.

NOTE The supplier of the materials is responsible for carrying out the tests necessary to verify that the materials supplied to the manufacturer comply with the requirements and should provide appropriate inspection documents (according to EN 10204) on request.

A permanent quality control system shall be adopted by the manufacturer[1)].

4.2 Materials

4.2.1 Copper grade

The copper grade used shall be Cu-DHP in accordance with EN 1172.

4.2.2 Material condition

The material condition shall be chosen from one of the following, given in EN 1172:

- R220 or H040
- R240 or H065
- R290 or H090

NOTE 1 The main requirements for the material are: corrosion resistance, strength, fatigue strength and formability.

NOTE 2 Physical properties are given, for information, in annex A.

4.2.3 Surface quality

The surface quality of sheet and strip shall be consistent with the manufacturing process and in accordance with EN 1172.

[1)] e.g., quality management system based on the relevant standard of the EN ISO 9000 series (see EN ISO 9000-1), or otherwise.

4.3 Products

4.3.1 Flat products

4.3.1.1 Mechanical properties

Mechanical properties shall be in accordance with EN 1172.

4.3.1.2 Dimensions and tolerances

Dimensions and tolerances shall be in accordance with EN 1172.

4.3.1.3 Thickness

Nominal thicknesses shall be in the range of 0,5 mm to 1,0 mm dependent upon processing and service conditions.

4.3.2 Formed (prefabricated) products

4.3.2.1 Performance characteristics

Performance requirements for formed products shall be specified and agreed at the time of ordering.

4.3.2.2 Dimensions and tolerances

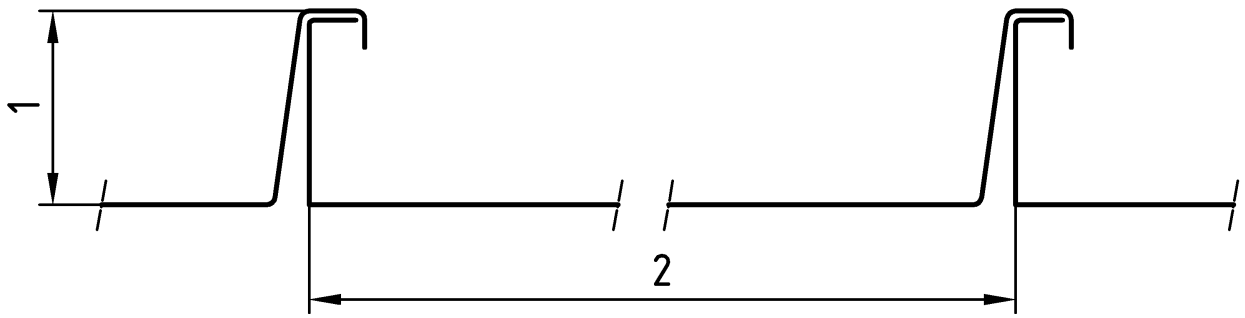
The minimum nominal thickness shall be 0,5 mm.

The tolerances on geometrical characteristics, as illustrated in Fgures 2 and 3, shall be as given in Table 1.

Measurements shall be made at 200 mm from the ends of the product.

Table 1 - Dimensional tolerances on formed (prefabricated) products

Geometrical characteristics	Tolerance
Length (ℓ)	$^{+10}_{0}$ mm
Cover width (b)	± 5 mm
Squareness (S)	3 mm/m width
Straightness (f_S)	deviation of 2 mm per metre length, up to a maximum deviation of 10 mm
Depth (h)	3 % of nominal depth, maximum ± 2 mm



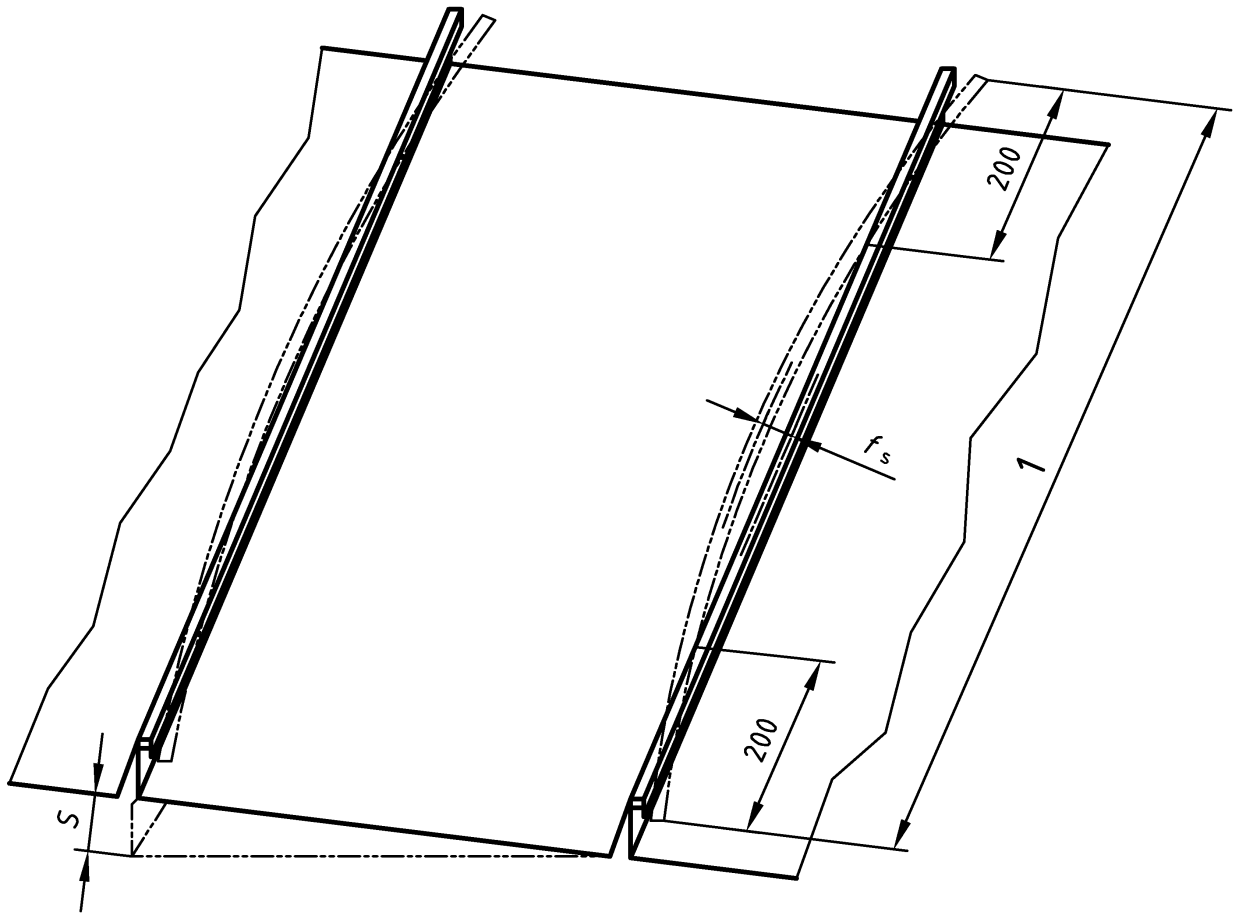
Legend

1 Depth (*h*)

2 Cover width (*b*)

Figure 2 - Standing seam construction (as example), section before installation

Dimensions in millimetres



Legend

1 Length (ℓ)

Figure 3 - Standing seam construction, view before installation

4.3.3 Safety in case of fire

Until appropriate European Standards are published, products coated with organic coatings shall conform to national building regulations regarding fire properties.

NOTE All products referred to in this standard are incombustible and resistant against sparks and heat radiation.

5 Sampling and test methods

5.1 Flat products

The sampling and test methods shall be in accordance with EN 1172.

5.2 Formed (prefabricated) products

5.2.1 Sampling

From each delivery of products, the number required for the tests shall be selected in accordance with EN 1172.

5.2.2 Testing

5.2.2.1 General

The products shall be supplied with inspection documents to comply with the requirements of this European Standard.

The following information shall be given at the time of ordering:

- type of test (specific or non-specific test, see EN 10204);
- type of inspection document, see EN 10204.

5.2.2.2 Test unit

For the verification of dimensions, the test unit shall consist of at least one complete piece of the amount delivered.

If specially agreed at the time of ordering, the test unit may consist of more than one piece.

5.2.2.3 Number of tests

One series of tests shall be carried out per test unit to determine the geometrical characteristics.

6 Designation

Products covered by this standard shall be designated as follows:

- type of product;
- material designation and condition (see 3.2);
- dimensions: thickness, width, length;
- number of this standard (EN 504).

EXAMPLE

Roof panel, material Cu-DHP, material condition R240, 0,6 mm thickness, 1 000 mm width and 2 000 mm length, shall be designated:

Roof panel - Cu-DHP-R240 - 0,6 x 1 000 x 2 000 - EN 504

7 Marking, labelling and packaging

7.1 Marking and labelling

At least the following information shall be attached to every pack or strip:

- name or registered identification of the manufacturer;
- designation of the product (see clause 6);
- order number;
- ordered dimensions and quantity;
- gross mass (kg).

NOTE The supplier and purchaser can agree the type of marking for sheet and strip which can be carried out continuously and directly on to the products.

7.2 Packaging and special ordering conditions

The packaging requirements and any special requirements to take account of particular conditions shall be agreed between manufacturer and purchaser at the time of ordering.

7.3 Transport, storage and handling

Any instructions regarding handling or storage shall be clearly visible on the package.

NOTE 1 Moisture, in particular condensation inside packages, can lead to the formation of stains.

NOTE 2 The packages should be fully supported by means of battens or pallets providing sufficient space to permit good ventilation while avoiding any permanent deformations of the sheets. The packages should be inclined in order to promote drainage.

The packages should be stored under a covered warehouse or under a cover made form tarpaulin over a frame. The frame should allow sufficient space between tarpaulin and packages to allow air to circulate.

Annex A
(informative)

Physical properties

Physical properties of the material in accordance with this standard are given in Table A.1.

Table A.1 - Physical properties

Density	= 8,9 g/cm^3
Thermal expansion coefficient	16,8 x 10^{-6} K^{-1}
Melting point	1083 °C
Thermal conductivity	325 W/m x K

Annex B
(informative)

A-deviations

A-Deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/CENELEC member.

This European Standard falls under Directive 89/106/EEC.

NOTE (from CEN/CENELEC RI Part 2, 3.1.9): Where standards fall under EC Directives, it is the view of the Commission of the European Communities (OJ N°G.59, 9.3.1982) that the effect of the decision of the Court of Justice in case 815/79 Cremonini/Vrankovich (European Court Reports 1980, p3583) is that compliance with A-deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted except under the safeguard procedure provided for in the relevant Directive.

A-deviations in an EFTA country are valid instead of the relevant provisions of the European Standard in that country until they have been removed.

Sweden: The following national regulations shall be complied with:

- ordinance AFS 1983 :12 : Work on roofs (§ 17);
- building code BFS 1993 :57,8 :22.

Bibliography

prEN 506, *Roofing products from metal sheet - Specification for self-supporting products of copper and zinc sheet.*

EN 1173, *Copper and copper alloys - Material condition or temper designation*.

EN ISO 9000-1, *Quality management and quality assurance standards - Part 1: Guidelines for selection and use.* (ISO 9000-1:1994)

ISO 197-3, *Copper and copper alloys - Terms and definitions - Part 3: Wrought products.*

ISO 1190-1, *Copper and copper alloys - Code of designation - Part 1: Designation of material.*

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