

Copper and copper alloys — Plate, sheet and circles for boilers, pressure vessels and hot water storage units

The European Standard EN 1653:1998, with the incorporation of amendment A1:2001, has the status of a British Standard

ICS 77.150.30

National foreword

This British Standard is the English language version of EN 1653:1998, including amendment A1:2001. Together with BS EN 1652:1998 and BS EN 1654:1998, it supersedes BS 2870:1980 and BS 2875:1969 which are withdrawn.

The UK participation in its preparation was entrusted by Technical Committee NFE/34, Copper and copper alloys, to Subcommittee NFE/34/1, Wrought and unwrought copper and copper alloys, 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.

Cross-references

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Summary of pages

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English version

Copper and copper alloys — Plate, sheet and circles for boilers, pressure vessels and hot water storage units

(includes amendment A1:2000)

Cuivre et alliages de cuivre — Plaques, tôles et disques pour chaudières, réservoirs à pression et unités de stockage d'eau chaude
(inclut l'amendement A1:2000)

Kupfer und Kupferlegierungen — Platten, Bleche und Ronden für Kessel, Druckbehälter und Warmwasserspeicheranlagen
(enthält Änderung A1:2000)

This European Standard was approved by CEN on 6 November 1997. Amendment A1:2000 was approved by CEN on 2000-07-14.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 133, Copper and copper alloys, 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of an identical text or by endorsement, at the latest by June 1998, and conflicting national standards shall be withdrawn at the latest by June 1998.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 2, Rolled flat products, to prepare the following standard:

EN 1653, *Copper and copper alloys — Plate, sheet and circles for boilers, pressure vessels and hot water storage units*

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directives.

For relationship with EU Directives, see Annex ZA (informative), which is an integral part of this standard.

This is one of a series of European Standards for copper and copper alloy rolled flat products. Other products are, or will be, specified as follows:

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

EN 1652, *Copper and copper alloys — Plate, sheet, strip and circles for general purposes*

EN 1654, *Copper and copper alloys — Strip for springs and connectors*

EN 1758, *Copper and copper alloys — Strip for lead frames*

Copper and copper alloys — Copper plate, sheet and strip for electrical purposes (WI: 00133022)

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.

Foreword to amendment A1

This amendment EN 1653:1997/A1:2000 to EN 1653:1997 has been prepared by Technical Committee CEN/TC 133, Copper and alloys, the Secretariat of which is held by DIN.

This amendment to the European Standard EN 1653:1997 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

This amendment to the European Standard EN 1653:1997 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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.

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1 Scope

This European Standard specifies the composition, property requirements and tolerances on dimensions and form for copper and copper alloy plate, sheet and circles for boilers, pressure vessels, heat exchangers and hot water storage units.

The sampling procedures, the methods of test for verification of conformity to the requirements of this standard, and the delivery conditions are also specified.

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 1655, *Copper and copper alloys — Declarations of conformity*.

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

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

ISO 1811-2, *Copper and copper alloys — Selection and preparation of samples for chemical analysis — Part 2: Sampling of wrought products and castings*.

ISO 6507-1, *Metallic materials — Hardness test — Vickers test — Part 1: HV 5 to HV 100*.

ISO 6507-2, *Metallic materials — Hardness test — Vickers test — Part 2: HV 0,2 to less than HV 5*.

ISO 7438, *Metallic materials — Bend test*.

NOTE Informative references to documents used in the preparation of this standard, and cited at the appropriate places in the text, are listed in a bibliography, see annex A.

3 Definitions

For the purposes of this standard, the following definitions, based on ISO 197-3, apply.

3.1

plate

flat rolled product of rectangular cross section with uniform thickness greater than 10 mm, usually with sheared, sawn or machined edges

3.2

sheet

flat rolled product of rectangular cross section with uniform thickness from 0,2 mm up to and including 10 mm, supplied in straight lengths, usually with sheared or sawn edges. The thickness does not exceed one tenth of the width

3.3

circle

circular blank

4 Designations

4.1 Material

4.1.1 General

The material is designated either by symbol or by number (see Tables 1 and 2).

4.1.2 Symbol

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

NOTE Although material symbol designations used in this standard might be the same as those in other standards using the designation system given in ISO 1190-1, the detailed composition requirements are not necessarily the same.

4.1.3 Number

The material number designation is in accordance with the system given in EN 1412.

4.2 Material condition

For the purposes of this standard, the following designations, which are in accordance with the system given in EN 1173, apply for the material condition.

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.

H... Material condition designated by the minimum value of hardness requirement for the product with mandatory hardness requirements.

Exact conversion between material conditions designated R... and H... is not possible.

Material condition is designated by only one of the above designations.

4.3 Product

The product designation provides a standardized pattern of designation from which a rapid and unequivocal description of a product is conveyed in communication. It provides mutual comprehension at the international level with regard to products which meet the requirements of the relevant European Standard.

The product designation is no substitute for the full content of the standard.

The product designation for products to this standard shall consist of:

- denomination (“Plate”, “Sheet” or “Circle”);
- number of this European Standard (EN 1653);
- material designation, either symbol or number (see Tables 1 and 2);
- material condition designation (see Tables 3 and 9);
- nominal dimensions:
 - plate, sheet and circles for boilers, pressure vessels and heat exchangers:
 - plate: thickness × width × length and tolerance classes for thickness (if applicable, P), width and length (see example 1);
 - sheet: thickness × width × length and tolerance classes for thickness (if applicable, P), width and length;
 - circles: thickness × diameter and tolerance classes for thickness (if applicable, P), and diameter;

- sheet and circles for hot water storage units:
 - sheet: thickness × width × length;
 - circles: thickness × diameter (see example 2);
- tolerance class for cutting to width and length and diameter of plate, sheet or circles for boilers, pressure vessels and heat exchangers. The following designations shall be used as appropriate: S for sheared, B for band sawn and M for machined. (See Tables 5 and 7.)

The derivation of a product designation is shown for plate in example 1 and another typical product designation is shown in example 2.

EXAMPLE 1

Plate conforming to this standard, in material designated either CuNi10Fe1Mn or CW352H, in material condition R320, nominal thickness 15,05 mm with a plus tolerance, nominal width 800 mm, nominal length 1 500 mm, bandsawn, shall be designated as follows:

Plate EN 1653 — CuNi10Fe1Mn — R320 — 15,05P × 800 × 1 500 — B

or

	Plate	EN 1653	— CW352H	— R320	— 15,05P × 800 × 1 500	— B
Denomination	_____	_____	_____	_____	_____	_____
Number of this European Standard	_____	_____	_____	_____	_____	_____
Material designation	_____	_____	_____	_____	_____	_____
Material condition designation	_____	_____	_____	_____	_____	_____
Nominal dimensions in millimetres	_____	_____	_____	_____	_____	_____
Tolerance class for cutting to width and length	_____	_____	_____	_____	_____	_____

EXAMPLE 2

Circles for boilers conforming to this standard, in material designated either Cu-DHP or CW024A, in material condition R200, nominal thickness 3,55 mm, nominal diameter 1 150 mm, sheared, shall be designated as follows:

Circle EN 1653 — Cu-DHP — R200 — 3,55 × 1 150 — S

or

Circle EN 1653 — CW024A — R200 — 3,55 × 1 150 — S