BRITISH STANDARD

BS EN
12861:1999

Copper and copper alloys — Scrap

The European Standard EN 12861:1999 has the status of a British Standard

ICS 77.120.30

National foreword

This British Standard is the English language version of EN 12861:1999.

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

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 29 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 November 1999

ISBN 0 580 32847 3

Amendments issued since publication

Amd. No.	Date	Comments

EUROPEAN STANDARD **EN 12861**

NORME EUROPÉENNE

EUROPÄISCHE NORM July 1999

ICS 77.150.30

English version

Copper and copper alloys — Scrap

Cuivre et alliages de cuivre — Scrappes

Kupfer und Kupferlegierungen — Schrotte

This European Standard was approved by CEN on 14 June 1999.

cen

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

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

Ref. No. EN 12861:1999 E

Contents

Page

Foreword 3

1 Scope 4

2 Normative references 4

3 Definitions 4

4 Designations 6
4.1 Material 6
4.2 Product 6

5 Ordering information 7

6 Requirements 7
6.1 Characteristics 7
6.2 Condition 7
6.3 Moisture 7
6.4 Composition 8
6.5 Metal content/metal yield 8
6.6 Deliveries against contract 8
6.7 Additional requirements 8

Page

7 Inspection of incoming material 9
7.1 General 9
7.2 Time limits 9
7.3 Test procedures 10
7.4 Retests 12
7.5 Rounding of results 12

8 Packaging 12

Annex A (informative) Bibliography 13

Annex B (normative) Copper scrap 14

Annex C (normative) Copper-zinc scrap 22

Annex D (normative) Condenser tube scrap 28

Annex E (normative) Miscellaneous copper and copper alloy scrap 29

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.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 11 "Scrap" to prepare the following standard:

EN 12861
Copper and copper alloys – Scrap

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 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

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.

1 Scope

This European Standard specifies the requirements for characteristics, condition, moisture, composition, metal content, metal yield and test procedures of secondary raw materials for direct melting (melting grades) in the form of copper and copper alloy scrap.

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 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 12167
Copper and copper alloys – Profiles and rectangular bar for general purposes

EN 12449
Copper and copper alloys – Seamless, round tubes for general purposes

EN 12451
Copper and copper alloys – Seamless, round tubes for heat exchangers

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 apply:

3.1 scrap for direct melting

Metallic product with levels of impurity elements which would not prohibit its use for direct melting, with or without preliminary mechanical treatment (e.g. baling, fragmenting, crushing).

3.1.1 production scrap

Clean metallic product arising from production processes (e.g. offcuts from casting, rolling, extrusion, forging) or from further processing (e.g. stamping grids).

3.1.2 old scrap

Metallic product other than material specified as "production scrap" (see 3.1.1).

3.2 free from ..... (substance)

Maximum quantity of substances adhering to the scrap:

– 0,005 % (*m*/*m*) for metallic impurities;

– 0,2 % (*m*/*m*) for moisture;

– 0,05 % (*m*/*m*) for other non-metallic impurities.

3.3 excluded ..... (substance)

Maximum quantity of substances adhering to the scrap:

– 0,000 1 % (*m*/*m*) for metallic impurities;

– 0,001 % (*m*/*m*) for non-metallic impurities.

3.4 clean material

State of the material free from foreign substances (e.g. paper, dirt, liquid residues, grease, plastics) (see 3.2 for definition "free from ....." and 3.6 for definition "foreign substances").

3.5 bright material

Material which neither intentionally nor unintentionally had been subject to any process that resulted in a coating (see 3.7) (e.g. oxidation or other surface changes due to environmental interactions and/or changes due to their usage).

3.6 foreign substances

Material, other than specified in this standard, whether metallic or non-metallic, including free iron (see 3.8).

3.7 coated, plated or enamelled material

Material with any kind of coating or plating, independent of the process of coating or plating, e.g. paint, varnish, print, plastics or metals (e.g. aluminium, lead, chromium, nickel, tin).

3.8 free iron

Ferrous materials (e.g. steels) either magnetic or non-magnetic.

3.9 moisture

Any liquid (single- or multi-phase) that adheres to the scrap when it reaches the point of delivery due to fabrication, usage or pick-up during storage.

3.10 impurities

Metallic or non-metallic elements present but which are not intentionally added to or retained by a metal.

3.11 remainder

Percentage content of the element calculated by difference from 100 % (*m*/*m*).

3.12 mass deduction

Quantity being deducted from mass in case of exceeding limits that have been stipulated in this standard.

3.13 inspection lot

Consignment or a part thereof submitted for inspection by the purchaser.

3.14 representative sample

Sample, fully representing the range of scrap in an inspection lot.

3.15 metal content

Net mass of the inspection lot after deduction of all foreign substances including moisture.

4 Designations

4.1 Material

The material is designated either by symbol or number (see annexes B to E). The material number designation is in accordance with the system given in EN 1412.

4.2 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 (scrap);

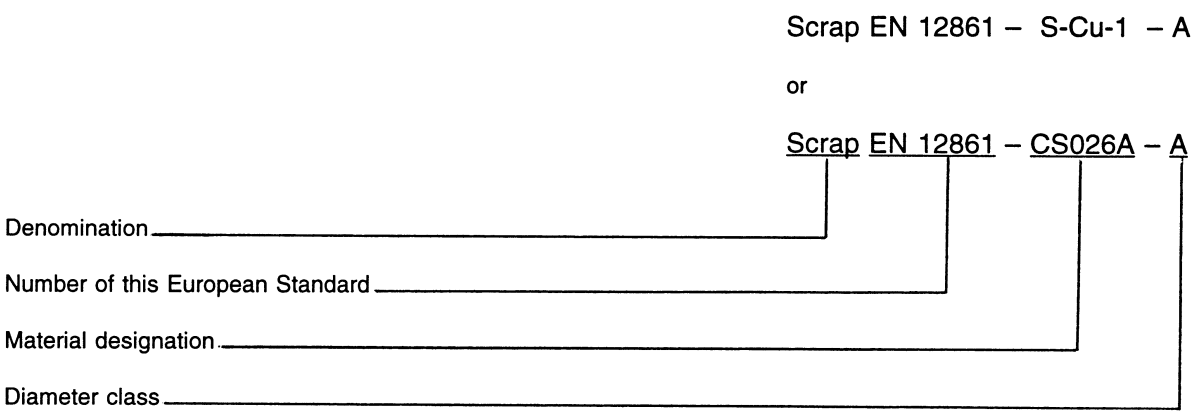
– number of this European Standard (EN 12861);

– material designation, either symbol or number (see tables in annexes B to E);

– diameter class, if specified (see tables in annexes B to E).

The derivation of a product designation is shown in the following example.

EXAMPLE:
Scrap conforming to this standard, in material designated either S-Cu-1 or CS026A, diameter class A, shall be designated as follows:



5 Ordering information

In order to facilitate the enquiry, order and confirmation of order procedures between the purchaser and the supplier, the purchaser shall state on his enquiry and order the following information:

a) quantity of material required (mass);

b) denomination (scrap);

c) number of this European Standard (EN 12861);

d) material designation (see annexes B to E);

e) diameter class, if specified (see annexes B to E);

NOTE: It is recommended that the product designation, as described in 4.2, is used for items b) to e).

In addition, the purchaser shall also state on the enquiry and order any of the following, if required:

f) form of packaging.

EXAMPLE 1:
Ordering details for 20 t scrap conforming to EN 12861, in material designated either S-Cu-1 or CS026A, diameter class A:

20 t scrap EN 12861 – S-Cu-1 – A

or

20 t scrap EN 12861 – CS026A – A

EXAMPLE 2:
Ordering details for 15 t scrap conforming to EN 12861, in material designated either S-CuNi15 or CS350H:

15 t scrap EN 12861 – S-CuNi15

or

15 t scrap EN 12861 – CS350H

6 Requirements

6.1 Characteristics

The characteristics shall conform to the requirements for the appropriate material given in annexes B to E.

6.2 Condition

The condition of the scrap shall conform to the requirements for the appropriate material given in annexes B to E. Briquetted or baled material may be supplied subject to agreement between the purchaser and the supplier. Unless otherwise agreed, the maximum dimension of each piece shall not be greater than 800 mm × 500 mm × 400 mm and shall not exceed 200 kg.

6.3 Moisture

The moisture shall conform to the requirements for the appropriate material given in annexes B to E. The test(s) shall be carried out in accordance with table 1. The moisture content shall be determined upon presentation of the inspection lot to the agreed receiving point.

6.4 Composition

The compositions given in annexes B to E refer to the analytical results obtained, using "state of the art" techniques, from a representative sample taken from an inspection lot. If necessary, the representative sample shall be dried and melted before analysis.

Reference methods shall be the appropriate EN or ISO Standards agreed between the disputing parties.

It is the right of the supplier not to accept the classification of the purchaser and require an audit in arbitration with the presence of a third party accepted by both the purchaser and the supplier.

The composition shall conform to the requirements for the appropriate material given in annexes B to E.

The scrap shall be free from the following elements, provided they are not alloying elements:

– cadmium, bismuth, selenium, antimony, cobalt.

The following elements shall be excluded, provided they are not alloying elements:

– beryllium, mercury, tellurium.

6.5 Metal content/metal yield

The metal content or metal yield shall conform to the requirements for the appropriate material given in annexes B to E.

6.6 Deliveries against contract

Unless agreed between the purchaser and the supplier, for contract quantities from 10 000 kg up to and including 300 000 kg, the difference between that and the total quantity delivered shall not exceed 1 % (*m*/*m*). If the contract quantity is smaller than 10 000 kg, the difference shall not exceed 100 kg. If the contract quantity is larger than 300 000 kg, the difference shall not exceed 3 000 kg.

6.7 Additional requirements

If not otherwise specified in annexes B to E, the following applies:

The scrap shall be free from:

– mica, asbestos, plastics, PVC, rubber, paper impregnated with oil.

The following substances shall be excluded according to definition 3.3 unless there are European or national laws which must take precedence:

– chlorine;

– materials being recognized as substances that deplete the ozone layer of the earth.

No radioactively contaminated scrap or radioactively contaminated substances adhering to the scrap or mixed with the scrap (see figure 1) shall be accepted.

7 Inspection of incoming material

7.1 General

The inspection scheme given in figure 1 shall be applied.

In the case of separately identifiable sources of scrap, it nevertheless may be delivered as a single consignment subject to agreement between the purchaser and the supplier. The scrap from each source shall be inspected separately.

The test procedures shall be carried out on representative samples. For expression of results, the rounding rules given in 7.5 shall be used.

In case of dispute with respect to sampling or testing methods or their results, arbitration shall be agreed between the purchaser and the supplier.

7.2 Time limits

All scrap is accepted with reservation on qualitative control at the purchaser's plant. Within 5 working days from receipt of the material the purchaser shall advise the supplier on the classification and moisture content of the material accepted with reservation. The 5 working days term shall be increased to 10 days if further analysis is required to ensure that the delivered type is in accordance with the one declared.

7.3 Test procedures

The test procedures given in table 1 shall be used as appropriate.

Table 1: Test procedures

Characteristic	Test procedure
Moisture	– Estimation – Weighing before and after removal of the moisture from a representative sample • Removal of the moisture shall be achieved by heating to a maximum temperature of 350 °C until no more weight changes are detected
Free iron	– Estimation – Presorting and weighing – Other methods subject to agreement between the purchaser and the supplier.
Composition	– Quantitative analysis methods subject to agreement between the purchaser and the supplier.
Size and diameter	– Measurement
Amount of insulation	– Estimation – Other methods subject to agreement between the purchaser and the supplier.
Metal content	– Estimation – Determination of the content of moisture and foreign substances in a representative sample using methods subject to agreement between the purchaser and the supplier.
Metal yield	– Estimation – Determination of the content of moisture and free iron in a representative sample followed by remelting and weighing of the ingot. The remelting shall be performed in a furnace, with the sample covered by suitable means, e.g. salt and the superheat limited to 100 °C.
Foreign substances	– Estimation – Dissolution of the metal in nitric acid for the determination of non-metallic substances

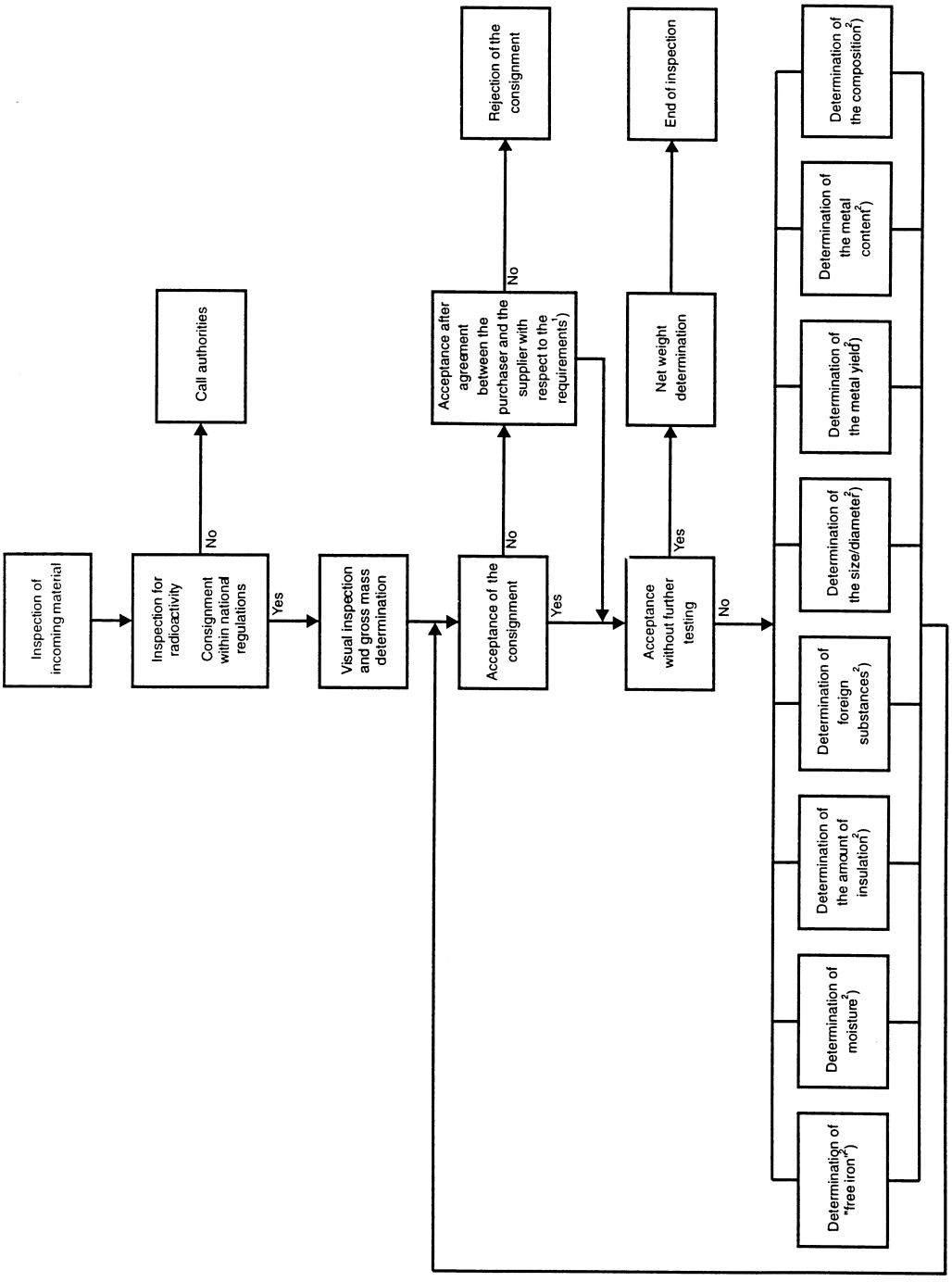


Figure 1: Inspection of incoming material

[1]) For the limits see 7.2.
[2]) Refer to table 1 for applicable methods.

7.4 Retests

If there is a failure of one, or more than one, of the tests in table 1, two representative samples from the same inspection lot shall be permitted to be selected for retesting the failed characteristic(s) except in the case of determination of the amount of moisture.

If the test samples from both representative samples pass the appropriate test procedure, then the inspection lot represented shall be deemed to conform to the particular characteristic of this standard.

If a test sample fails a test procedure, the inspection lot represented shall be deemed not to conform to this standard.

7.5 Rounding of results

For the purpose of determining conformity to the compositional limits specified in this standard, a value obtained from a test procedure shall be rounded in accordance with the following procedure which is based upon the guidance given in annex B of ISO 31-0 : 1992. It shall be rounded in one step to the same number of figures used to express the specified limit in this standard.

The following rules shall be used for rounding:

a) if the figure immediately after the last figure to be retained is less than 5, the last figure to be retained shall be kept unchanged;

b) if the figure immediately after the last figure to be retained is equal to or greater than 5, the last figure to be retained shall be increased by one.

8 Packaging

Any form of packaging shall be agreed between the purchaser and the supplier.

Annex A (informative)

Bibliography

In the preparation of this European Standard, use was made of a number of documents for reference purposes. These informative references are cited at the appropriate places in the text and the publications are listed hereafter.

EN 1412
Copper and copper alloys – European numbering system

ISO 31-0 : 1992
Quantities and units – Part 0: General principles

Annex B (normative)

Copper scrap

B.1 Type S-Cu-1

(Cu min. 99,90 %, P-free)

B.1.1 Characteristics

Production electrolytic copper scrap consisting of scrap from processing (wire), extrusion discards and discarded material from electrical lines (connection bars, wire, cable etc.) with a minimum size in at least one direction of 30 mm. Smaller sizes shall be subject to agreement between the purchaser and the supplier. The minimum wire diameter shall conform to the requirements given in table B.1.

Table B.1: Diameter class

Class	Diameter mm min.
A	1,0
B	0,2

B.1.2 Condition

The scrap shall be bright, with the exception of extrusion discards, clean and free from foreign substances.

B.1.3 Moisture

The scrap shall be free from moisture.

B.1.4 Composition

The composition shall conform to the requirements given in table B.2.

Table B.2: Composition of S-Cu-1 (CS026A)

Material designation		Composition in % (*m*/*m*)				
Symbol	Number	Element	Cu	Bi	P	Pb
S-Cu-1	CS026A	min.	99,90[1)]	–	–	–
		max.	–	0,000 5	0,001	0,005
[1)] Including Ag up to 0,015 %. Other elements shall not exceed 0,002 % each.						

B.2 Type S-Cu-2

(Cu min. 99,90 %, P-free)

B.2.1 Characteristics

Old electrolytic copper scrap consisting of wire (not burned) and connection bars with a minimum size in at least one direction of 30 mm. Smaller sizes shall be subject to agreement between the purchaser and the supplier. The minimum wire diameter shall conform to the requirements given in table B.3.

Table B.3: Diameter class

Class	Diameter mm min.
A	1,0
B	0,2

B.2.2 Condition

The scrap shall be clean and free from foreign substances.

B.2.3 Moisture

The scrap shall be free from moisture.

B.2.4 Composition

The composition shall conform to the requirements given in table B.4.

Table B.4: Composition of S-Cu-2 (CS027A)

Material designation		Composition in % (*m*/*m*)				
Symbol	Number	Element	Cu	Bi	P	Pb
S-Cu-2	CS027A	min.	99,90[1)]	–	–	–
		max.	–	0,000 5	0,001	0,005
[1)] Including Ag up to 0,015 %. Other elements shall not exceed 0,002 % each.						

B.3 Type S-Cu-3

(Enamelled copper wire, P-free)

B.3.1 Characteristics

Production copper scrap consisting of enamelled wire with a minimum length of 30 mm. Smaller lengths shall be subject to agreement between the purchaser and the supplier. The minimum wire diameter shall conform to the requirements given in table B.5.

Table B.5: Diameter class

Class	Diameter[1)] mm min.
A	1,0
B	0,5
C	0,2
[1)] Diameter is measured including the enamel.	

B.3.2 Condition

The scrap shall be clean and free from foreign substances other than enamel.

B.3.3 Moisture

The scrap shall be free from moisture.

B.3.4 Composition

The composition shall conform to the requirements given in table B.6.

Table B.6: Composition of S-Cu-3 (CS028A)

Material designation		Composition in % (*m*/*m*)				
Symbol	Number	Element	Cu	Bi	P	Pb
S-Cu-3	CS028A	min.	99,90[1)]	–	–	–
		max.	–	0,000 5	0,001	0,005
[1)] Including Ag up to 0,015 %. Other elements shall not exceed 0,002 % each.						

B.4 Type S-Cu-4

(Cu min. 99,90 %, P-containing)

B.4.1 Characteristics

Production copper scrap consisting of tubes, strips, plates, discs and extrusion discards with a minimum size in at least one direction of 30 mm. Smaller sizes shall be subject to agreement between the purchaser and the supplier.

B.4.2 Condition

The scrap shall be clean and free from foreign substances.

B.4.3 Moisture

The scrap shall be free from moisture.

B.4.4 Composition

The composition shall conform to the requirements given in table B.7.

Table B.7: Composition of S-Cu-4 (CS029A)

Material designation		Composition in % (*m*/*m*)			
Symbol	Number	Element	Cu	P	Pb
S-Cu-4	CS029A	min.	99,90[1)]	–	–
		max.	–	0,06	0,005
[1)] Including Ag up to 0,015 %. Other elements shall not exceed 0,002 % each.					

B.5 Type S-Cu-5

(Cu min. 99,90 %, P-containing)

B.5.1 Characteristics

Old copper scrap consisting of tubes, strips, plates, discs and extrusion discards with a minimum size in at least one direction of 30 mm. Smaller sizes shall be subject to agreement between the purchaser and the supplier.

B.5.2 Condition

The scrap shall be clean and free from foreign substances.

B.5.3 Moisture

The scrap shall be free from moisture.

B.5.4 Composition

The composition shall conform to the requirements given in table B.8.

Table B.8: Composition of S-Cu-5 (CS030A)

Material designation		Composition in % (*m*/*m*)			
Symbol	Number	Element	Cu	P	Pb
S-Cu-5	CS030A	min.	99,90[1)]	–	–
		max.	–	0,06	0,005
[1)] Including Ag up to 0,015 %. Other elements shall not exceed 0,002 % each.					

B.6 Type S-Cu-6

(Cu min. 99,7 %)

B.6.1 Characteristics

Old copper scrap consisting of burned but not brittle wire and cuttings with a minimum size in at least one direction of 30 mm. The minimum wire diameter permitted is 1 mm. Smaller sizes or wire diameters shall be subject to agreement between the purchaser and the supplier.

Paper insulated wire shall be subject to agreement between the purchaser and the supplier. The amount of paper shall be deducted.

B.6.2 Condition

The scrap may contain foreign substances (ashes, burned paper residues).

B.6.3 Moisture

The scrap shall be free from moisture.

B.6.4 Composition

The composition shall conform to the requirements given in table B.9.

Table B.9: Composition of S-Cu-6 (CS051B)

Material designation		Composition in % (*m*/*m*)									
Symbol	Number	Element	Cu	Al	Bi	Fe	Ni	P	Pb	Sn	Zn
S-Cu-6	CS051B	min.	99,7[1)]	–	–	–	–	–	–	–	–
		max.	–	0,02	0,000 5	0,04	0,01	0,001	0,04	0,04	0,04
[1)] Including Ag up to 0,015 % and O up to 0,06 %. Other elements shall not exceed 0,002 % each.											

B.6.5 Metal content

The metal content shall be at least 98,5 % (*m*/*m*).

B.7 Type S-Cu-7

(Cu min. 99,5 %)

B.7.1 Characteristics

Old copper scrap consisting of tubes, punchings, cuttings, shearings of strip, plates, discs, copper ware and burned but not brittle wire with a minimum size in at least one direction of 30 mm. The minimum thickness of punchings and strip permitted is 0,2 mm. The minimum wire diameter permitted is 0,5 mm. Smaller sizes, thicknesses of punchings and strips or wire diameters permitted shall be subject to agreement between the purchaser and the supplier.

B.7.2 Condition

The scrap may contain foreign substances (e.g. non-metallic sediments).

B.7.3 Moisture

The scrap shall be free from moisture.

B.7.4 Composition

The composition shall conform to the requirements given in table B.10.

Table B.10: Composition of S-Cu-7 (CS052B)

Material designation		Composition in % (*m*/*m*)									
Symbol	Number	Element	Cu	Al	As	Fe	Ni	P	Pb	Sn	Zn
S-Cu-7	CS052B	min.	99,5[1)]	–	–	–	–	–	–	–	–
		max.	–	0,05	0,005	0,05	0,02	0,06	0,1	0,06	0,05
[1)] Including Ag up to 0,015 % and O up to 0,06 %. Other elements shall not exceed 0,002 % each.											

B.7.5 Metal content

The metal content shall be at least 98,0 % (*m*/*m*).

B.8 Type S-Cu-8

(Cu min. 98 %)

B.8.1 Characteristics

Old copper scrap consisting of burned but not brittle wire, cuttings, shearings of strip, plate, discs or tube and copper ware with a minimum size in at least one direction of 30 mm. Smaller sizes shall be subject to agreement between the purchaser and the supplier. There shall be no radiators or boilers.

B.8.2 Condition

The scrap may contain foreign substances. Turnings, sawings and millings shall be subject to agreement between the purchaser and the supplier.

B.8.3 Moisture

The scrap shall be free from moisture.

B.8.4 Composition

The composition shall conform to the requirements given in table B.11.

Table B.11: Composition of S-Cu-8 (CS053B)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-Cu-8	CS053B	min.	98[1)]	–	–	–	–	–	–	–
		max.	–	0,05	0,30	0,10	0,50	0,25	0,50	0,05
[1)] Including Ag up to 0,015 % and O up to 0,06 %.										

B.8.5 Metal content

The metal content shall be at least 96,0 % (*m*/*m*).

B.9 Type S-Cu-9

(Cu min. 96 %)

B.9.1 Characteristics

Old copper scrap consisting of wire, either brittle or not, plate, copper ware and other forms with a minimum size in at least one direction of 30 mm, unclassifiable in any of the other types defined [S-Cu-1 (CS026A) to S-Cu-8 (CS053B)] because of excessive metallic impurities. Smaller sizes shall be subject to agreement between the purchaser and the supplier. Coated and/or plated scrap shall be accepted only if impurity levels after melting are within the limits given in table B.12.

B.9.2 Condition

The scrap may contain foreign substances. Turnings, sawings and millings shall be subject to agreement between the purchaser and the supplier.

B.9.3 Moisture

The scrap shall be free from moisture.

B.9.4 Composition

The composition shall conform to the requirements given in table B.12.

Table B.12: Composition of S-Cu-9 (CS054B)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-Cu-9	CS054B	min.	96[1)]	–	–	–	–	–	–	–
		max.	–	0,20	0,50	0,20	1,50	0,50	1,50	0,1
[1)] Including Ag up to 0,015 % and O up to 0,06 %.										

B.9.5 Metal content

The metal content shall be at least 92,0 % (*m*/*m*).

B.10 Type S-Cu-10

(Granulated copper wire)

B.10.1 Characteristics

Copper wire, either coated or uncoated, that has been granulated. The minimum diameter permitted is 0,5 mm. Smaller diameters shall be subject to agreement between the purchaser and the supplier.

B.10.2 Condition

The scrap shall be clean and free from other metallic substances. For material S-Cu-10C (CS056B) the maximum content of non-metallic substances shall not exceed 0,1 % (*m*/*m*). For material S-Cu-10D (CS057B) the maximum content of non-metallic substances shall not exceed 0,2 % (*m*/*m*).

B.10.3 Moisture

The scrap shall be free from moisture.

B.10.4 Composition

The composition shall conform to the appropriate requirements given in table B.13.

Table B.13: Composition of S-Cu-10A (CS031A), S-Cu-10B (CS055B), S-Cu-10C (CS056B), S-Cu-10D (CS057B)

Material designation		Composition in % (*m*/*m*)									
Symbol	Number	Element	Cu	Al	Bi	Fe	Ni	P	Pb	Sn	Zn
S-Cu-10A	CS031A	min. max.	99,90[1)] –	– 0,002	– 0,000 5	– 0,002	– 0,002	– 0,001	– 0,005	– 0,002	– 0,002
S-Cu-10B	CS055B	min. max.	99,8[1)] –	– 0,02	– 0,000 5	– 0,02	– 0,02	– 0,002	– 0,02	– 0,02	– 0,02
S-Cu-10C	CS056B	min. max.	98,5[1)] –	– 0,05	– 0,002	– 0,1	– 0,1	– 0,002	– 0,8	– 0,25	– 0,15
S-Cu-10D	CS057B	min. max.	97,5 –	– 0,1	– 0,002	– 0,2	– 0,2	– 0,002	– 1,0	– 0,5	– 0,3

[1)] Including Ag up to 0,015 % and O up to 0,06 %. Other elements shall not exceed 0,002 % each.

Annex C (normative)

Copper-zinc scrap

C.1 Type S-CuZn-1
(Cu min. 63,5 %)

C.1.1 Characteristics

Production brass scrap. Plates and tubes shall be subject to agreement between the purchaser and the supplier. Scrap may be from individual wrought materials or combinations which will result in the scrap designations shown in table C.1. The final scrap designation will depend upon the composition of a representative sample after melting in accordance with table C.2. Unless otherwise agreed between the purchaser and the supplier a maximum of 10 % of pieces smaller than 30 mm and/or lighter than 5 g shall be accepted.

Table C.1: Copper-zinc alloys, binary

Permitted materials[1)] material designation		Scrap material designation		
Symbol	Number			
CuZn5	CW500L	S-CuZn-1A (CS510L)	S-CuZn-1B (CS511L)	S-CuZn-1C (CS512L)
CuZn10	CW501L			
CuZn15	CW502L			
CuZn20	CW503L			
CuZn28	CW504L			
CuZn30	CW505L			
CuZn33	CW506L			
CuZn36	CW507L			
CuZn37	CW508L			
CuZn40	CW509L			

[1)] For composition see appropriate EN-product standard, e.g. EN 1652, EN 1654, EN 12167 and EN 12449.

C.1.2 Condition

The scrap shall be bright and clean, free from "free iron" and free from foreign substances. Coated or plated material shall be subject to agreement between the purchaser and the supplier.

C.1.3 Moisture

The scrap shall be free from moisture.

C.1.4 Composition

The composition shall conform to the appropriate requirements given in table C.2.

Table C.2: Composition of S-CuZn-1A (CS510L), S-CuZn-1B (CS511L), S-CuZn-1C (CS512L)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-1A	CS510L	min. max.	63,5 –	– 0,02	– 0,05	– 0,3	– 0,05	– 0,1	Rem. –	– 0,1
S-CuZn-1B	CS511L	min. max.	62 –	– 0,05	– 0,1	– 0,3	– 0,1	– 0,1	Rem. –	– 0,1
S-CuZn-1C	CS512L	min. max.	59,5 –	– 0,05	– 0,2	– 0,3	– 0,3	– 0,2	Rem. –	– 0,2

C.2 Type S-CuZn-2
(Cu min. 69 %)

C.2.1 Characteristics

Brass scrap in the form of shell cases.

C.2.2 Condition

The scrap shall consist of clean, fired brass shell cases without primers and any other foreign material. Coated or plated material shall be subject to agreement between the purchaser and the supplier.

C.2.3 Moisture

The scrap shall be free from moisture.

C.2.4 Composition

The composition shall conform to the requirements given in table C.3.

Si-bearing shell cases shall be subject to agreement between the purchaser and the supplier.

Table C.3: Composition of S-CuZn-2 (CS513L)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-2	CS513L	min. max.	69 –	– 0,02	– 0,05	– 0,3	– 0,05	– 0,1	Rem. –	– 0,1

C.3 Type S-CuZn-3
(Cu min. 69 %)

C.3.1 Characteristics

Brass scrap in the form of cartridge cases.

C.3.2 Condition

The scrap shall consist of clean, fired, muffled, not shattered cartridge cases free from foreign substances other than residues from burned powder. Plated material and sealed ends shall not be accepted. Shattered material shall be subject to agreement between the purchaser and the supplier.

C.3.3 Moisture

The scrap shall be free from moisture.

C.3.4 Composition

The composition shall conform to the requirements given in table C.4.

Table C.4: Composition of S-CuZn-3 (CS514L)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-3	CS514L	min. max.	69 –	– 0,02	– 0,05	– 0,3	– 0,05	– 0,1	Rem. –	– 0,1

C.4 Type S-CuZn-4
(Leaded brass)

C.4.1 Characteristics

Leaded brass scrap consisting of rods, extrusion discards and cuttings or from cold- or hot-forming processes (not casting), with a minimum size in at least one direction of 30 mm. Smaller sizes and shells with primers without silicon shall be subject to agreement between the purchaser and the supplier.

C.4.2 Condition

The scrap shall not contain other alloys, coated or plated material and shall be free from "free iron".

C.4.3 Moisture

The scrap shall be free from moisture.

C.4.4 Composition

The composition shall conform to the appropriate requirements given in table C.5.

Table C.5: Composition of S-CuZn-4A (CS625N), S-CuZn-4B (CS626N)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-4A	CS625N	min. max.	57 –	– 0,05	– 0,3	– 0,3	– 3,5[1)]	– 0,3	Rem. –	– 0,2
S-CuZn-4B	CS626N	min. max.	57 –	– 0,1	– 0,4	– 0,3	– 3,5[1)]	– 0,5	Rem. –	– 0,2

[1)] In the case of CuZn38Pb4 (CW609N) max. 4,2 %.

C.5 Type S-CuZn-5

(Leaded brass turnings)

C.5.1 Characteristics

Leaded brass turnings free from filings and grindings. Material with a size smaller than 0,59 mm shall be free from foreign substances.

C.5.2 Condition

The scrap shall not contain other alloys and shall be free from "free iron". If either are present, up to 0,5 % (*m*/*m*), the determined quantity shall be doubled and subtracted as mass deduction. The inspection lot may contain fractions of max. 30 % (*m*/*m*) fine material when sieved with 30 mesh (0,59 mm). The fraction which passed 30 mesh (0,59 mm) may contain max. 1 % (*m*/*m*) fine material when sieved again with 120 mesh (0,125 mm).

C.5.3 Moisture

C.5.3.1 S-CuZn-5A (CS627N)

The moisture content is expected to be less than 2 % (*m*/*m*). Moisture contents between 2 % to 4 % (*m*/*m*) shall be subtracted as mass deduction. Moisture contents between 4 % to 6 % (*m*/*m*) shall be doubled and subtracted as mass deduction.

C.5.3.2 S-CuZn-5B (CS628N)

The moisture content is expected to be less than 3 % (*m*/*m*). Moisture contents between 3 % to 5 % (*m*/*m*) shall be subtracted as mass deduction. Moisture contents between 5 % to 7 % (*m*/*m*) shall be doubled and subtracted as mass deduction.

C.5.4 Composition

The composition shall conform to the appropriate requirements given in table C.6.

Table C.6: Composition of S-CuZn-5A (CS627N), S-CuZn-5B (CS628N)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-5A	CS627N	min. max.	57 –	– 0,05	– 0,3	– 0,3	– 3,5[1)]	– 0,3	Rem. –	– 0,2
S-CuZn-5B	CS628N	min. max.	57 –	– 0,1	– 0,4	– 0,3	– 3,5[1)]	– 0,5	Rem. –	– 0,2

[1)] In the case of CuZn38Pb4 (CW609N) max. 4,2 %.

C.5.5 Metal yield

The metal yield of S-CuZn-5B (CS628N) shall be at least 91 % (*m*/*m*).

NOTE: Metal yield is the direct useful metal in the inspection lot after drying, removal of free iron and proper remelting. The metal in the slag is not included in the net mass.

C.6 Type S-CuZn-6

C.6.1 Characteristics

Mixed brass valves and taps. Chromium and nickel coatings or platings shall be accepted. No manganese and/or silicon-bearing brass shall be accepted.

C.6.2 Condition

The scrap shall be free from "free iron".

C.6.3 Moisture

The scrap shall be free from moisture.

C.6.4 Composition

The composition shall conform to the requirements given in table C.7.

Table C.7: Composition of S-CuZn-6 (CS629N)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-6	CS629N	min. max.	57 –	– 0,4	– 0,6	– 0,5	– 3,5[1)]	– 0,6	Rem. –	– 0,4

[1)] In the case of CuZn38Pb4 (CW609N) max. 4,2 %.

NOTE: Sum of Fe+Sn+Ni+Al+others total = max. 1,7 %

C.6.5 Metal content

The metal content shall be at least 97 % (*m*/*m*).

C.7 Type S-CuZn-7

C.7.1 Characteristics

Brass scrap from various sources including brass castings, rolled brass, brass rod including plated material. Maximum dimension permitted in any one direction is 400 mm. No aluminium, manganese and/or silicon bearing alloys shall be accepted unless within the composition given in table C.8.

C.7.2 Condition

The maximum content of "free iron" shall not exceed 1 % (*m*/*m*). Shredded material shall be excluded. No cartridge cases shall be accepted.

C.7.3 Moisture

The scrap shall be free from moisture.

C.7.4 Composition

The composition shall conform to the requirements given in table C.8.

Table C.8: Composition of S-CuZn-7 (CS630N)

Material designation		Composition in % (*m*/*m*)								
Symbol	Number	Element	Cu	Al	Fe	Ni	Pb	Sn	Zn	Others total
S-CuZn-7	CS630N	min. max.	57 –	– 0,3	– 0,6	– 0,5	– 3,5[1)]	– 0,7	Rem. –	– 0,2

[1)] In the case of CuZn38Pb4 (CW609N) max. 4,2 %.

NOTE: Sum of Fe+Sn+Ni+Al+others total = max. 1,7 %

C.7.5 Metal content

The metal content shall be at least 95 % (*m*/*m*).

Annex D (normative)

Condenser tube scrap

D.1 Characteristics

Open ended condenser tube scrap of a single composition according to table D.1.

Table D.1: Condenser tube scrap

Scrap material designation		Permitted materials[1] material designation	
Symbol	Number	Symbol	Number
S-CuNi10Fe1Mn	CS352H	CuNi10Fe1Mn	CW352H
S-CuNi30Fe2Mn2	CS353H	CuNi30Fe2Mn2	CW353H
S-CuNi30Mn1Fe	CS354H	CuNi30Mn1Fe	CW354H
S-CuZn20Al2As	CS702R	CuZn20Al2As	CW702R
S-CuZn28Sn1As	CS706R	CuZn28Sn1As	CW706R
S-CuZn30As	CS707R	CuZn30As	CW707R

[1] The composition is given in EN 12451.

D.2 Condition

The scrap shall be clean, free from "free iron" and organic residues. The scrap shall be free from coated material.

D.3 Moisture

The scrap shall be free from moisture.

D.4 Composition

The composition shall conform to the requirements for the appropriate alloy given in EN 12451.

D.5 Metal content

The metal content shall be at least 98 %.

Annex E (normative)

Miscellaneous copper and copper alloy scrap

E.1 Characteristics

Production copper and copper alloy scrap of a single composition according to a European product standard or other specification. Unless otherwise agreed between the purchaser and the supplier a maximum of 10 % of pieces smaller than 30 mm and/or lighter than 5 g shall be accepted.

E.2 Condition

The scrap shall be bright and clean, free from "free iron" and free from foreign substances. Coated or plated material shall be subject to agreement between the purchaser and the supplier.

E.3 Moisture

The scrap shall be free from moisture.

E.4 Composition

The composition shall either conform to a European product standard or any other specification subject to agreement between the purchaser and the supplier.

For scrap conforming to a European product standard, the scrap material designation derives from the designation of the standardized copper alloy by adding the prefix S- to the material symbol and by substitution of the letter S for the letter W in the material number, see examples in table E.1.

Table E.1: Examples

Material designation according to a European product standard		Scrap material designation	
Symbol	Number	Symbol	Number
CuAl10Fe1	CW305G	S-CuAl10Fe1	CS305G
CuNi15	CW350H	S-CuNi15	CS350H
CuSn8	CW453K	S-CuSn8	CS453K

For scrap conforming to another specification the designation shall be agreed between the purchaser and the supplier.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL