INTERNATIONAL STANDARD

ISO 1634-2

First edition
1987-06-01

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Wrought copper and copper alloy plate, sheet and strip

Part 2: Technical conditions of delivery for plate and sheet for boilers, pressure vessels and heat-exchangers

Plaques, tôles et bandes en cuivre et en alliages de cuivre corroyés —
Partie 2: Conditions techniques de livraison des plaques et tôles pour chaudières, appareils à pression et échangeurs thermiques

Reference number
ISO 1634-2 : 1987 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 1634-2 was prepared by Technical Committee ISO/TC 26, *Copper and copper alloys*.

With ISO 1634-1, it cancels and replaces ISO 1634 : 1974, of which they constitute a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Printed in Switzerland

Wrought copper and copper alloy plate, sheet and strip —

Part 2:
Technical conditions of delivery for plate and sheet for boilers, pressure vessels and heat-exchangers

1 Scope and field of application

This part of ISO 1634 specifies the technical conditions of delivery for wrought copper and copper alloy plate and sheet for boilers, pressure vessels and heat-exchangers, currently available in commercial quantities.

For the purpose of this part of ISO 1634, the definitions for copper and copper alloys in ISO 197-1 and for plate and sheet in ISO 197-3 as well as the principles for designation in ISO 1190-1 and ISO 1190-2 apply.

For technical conditions of delivery for plate, sheet and strip

- for general purposes, see ISO 1634-1;
- for strip for springs, see ISO 1634-3.

2 References

2.1 Definitions

ISO 197, *Copper and copper alloys — Terms and definitions*

- *Part 1: Materials.*
- *Part 3: Wrought products.*

2.2 Designations

ISO 1190, *Copper and copper alloys — Code of designation*

- *Part 1: Designation of materials.*
- *Part 2: Designation of tempers.*

2.3 Chemical composition

ISO 426, *Wrought copper-zinc alloys — Chemical composition and forms of wrought products*

- *Part 1: Non-leaded and special copper-zinc alloys.*
- *Part 2: Leaded copper-zinc alloys.*

ISO 428, *Wrought copper-aluminium alloys — Chemical composition and forms of wrought products.*

ISO 429, *Wrought copper-nickel alloys — Chemical composition and forms of wrought products.*

ISO 1337, *Wrought coppers (having minimum copper content of 99,85 %) — Chemical composition and forms of wrought products.*

2.4 Technical conditions of delivery

ISO 1634, *Wrought copper and copper alloy plate, sheet and strip*

- *Part 1: Technical conditions of delivery for plate, sheet and strip for general purposes.*
- *Part 3: Technical conditions of delivery for strip for springs.*

2.5 Methods of test

2.5.1 Sampling

ISO 4739, *Wrought copper and copper alloy products — Selection and preparation of specimens and test pieces for mechanical testing.*

2.5.2 Tensile testing

ISO 6892, *Metallic materials — Tensile testing.*

2.5.3 Hardness testing

ISO 6507-1, *Metallic materials — Hardness test — Vickers test — Part 1:* HV5 *to* HV100.

ISO 6508, *Metallic materials — Hardness test — Rockwell test (scales A — B — C — E — F — G — H — K).*

3 Ordering information

The purchaser shall state on his inquiry and order the following information:

a) quantity;

b) designation of the material and temper required (see table 2);

c) dimensions: thickness, width, length and tolerances.

4 Requirements

4.1 Chemical composition

The chemical composition shall comply with the requirements as specified in the International Standards referred to in table 1.

Table 1 — Chemical composition

Materials	Chemical composition in accordance with
Coppers	ISO 1337
Copper-zinc alloys	ISO 426-1 and ISO 426-2
Copper-aluminium alloys	ISO 428
Copper-nickel alloys	ISO 429

4.2 Mandatory mechanical properties

This part of ISO 1634 embodies the principles that tensile strength, 0,2 proof stress and elongation are generally sufficient to define the condition of the material.

The mandatory requirements are the minimum values for tensile strength, 0,2 proof stress and elongation.

The approximate values for hardness (Vickers hardness, Rockwell B scale) are given for information only.

Mechanical properties are given in table 2.

Plate and sheet having thicknesses outside these ranges may not comply with the properties given in table 2.

4.3 Dimensions and tolerances

For plate and sheet according to this part of ISO 1634, the tolerances shall be agreed upon between supplier and purchaser.

4.4 Surface quality

The plates and sheets shall be clean, sound and free from injurious defects. Discoloration which is characteristic of proper heat treatment shall not be cause for rejection. A superficial film or residual light lubricant is normally present and is permissible unless otherwise specified.

5 Methods of test

5.1 Sampling

Selection and preparation of test specimens and test pieces for mechanical testing shall be carried out in accordance with ISO 4739.

The lot size shall be subject to the agreement between supplier and purchaser.

If not otherwise specified the rate of sampling for plate and sheet shall be one test piece per lot for each of the tests referred to in 5.2 and 5.3 as appropriate.

5.2 Tensile testing

The test shall be carried out in accordance with ISO 6892.

5.3 Hardness testing

5.3.1 Vickers hardness

The test shall be carried out in accordance with ISO 6507-1.

5.3.2 Rockwell hardness

The test shall be carried out in accordance with ISO 6508.

5.4 Retests

5.4.1 If both of the two test pieces which were originally taken from a lot fail to meet the specification for any reason, the lot shall be deemed not to comply with this part of ISO 1634.

5.4.2 If one of the two test pieces taken originally from the lot fails to meet the specification, for any reason, two further test pieces shall be taken. One of these two test pieces shall be taken from the plate or sheet from which the failed test piece was originally taken, unless that plate or sheet has been withdrawn from the lot by the supplier. The other test piece shall be taken from another sample from the same lot. All appropriate tests shall be carried out.

5.4.3 Should both of the new test pieces pass the tests, the lot represented by the test pieces shall be deemed to comply with this part of ISO 1634. Should either of the additional test pieces fail, the lot represented by the test pieces shall be deemed not to comply with this part of ISO 1634.

Table 2 — Mandatory mechanical properties

Temper	Thickness mm	Tensile strength R_m N/mm² min.	0,2 Proof stress $R_{p\,0,2}$ N/mm² min.	Elongation A_5 % min.	Elongation A_{50} % min.	Hardness Vickers HV approx.	Hardness Rockwell B scale approx.
Cu-DHP							
O	2 to 20	210	45	40	40	55	20
M	2 to 20	220	50	35	—	55	20
CuZn40Pb							
M	2 to 15	340	125	30	30	90	48
M	over 15	300	100	30	30	80	38
O	over 2	300	100	40	—	80	38
CuZn20Al2							
O	2 to 10	280	90	40	—	70	25
	over 10	280	90	35	—	70	25
HAR	2 to 40	390	240	25	—	110	62
CuZn28Sn1							
O	10 to 100	310	105		15	70	25
CuZn38Sn1							
M	2 to 15	340	140	28	35	85	43
M	over 15	325	125	28	35	80	41
O	2 to 75	340	125	30	35	85	43
O	> 75 to 125	325	100	30	35	80	41
HAR	2 to 15	400	200	18	18	110	62
CuAl5							
O	3 to 30	310	115	40	40	80	38
HA	3 to 12	380	150	20	25	105	59
HA	> 12 to 30	345	140	25	30	85	43
CuAl8Fe3							
O	3 to 50	485	205	30	35	135	74
O	over 50	450	195	30	35	125	70
CuAl9Ni3Fe2							
O	15 to 100	490	180	25		125	70
CuAl10Ni5Fe4							
O	3 to 50	620	250	8	10	165	85
O	50 to 90	585	230	8	10	150	80
O	over 90	550	205	8	10	140	75
CuNi10Fe1Mn							
M	2 to 10	300	120	25	25	80	35
M	over 10	280	105	20	20	75	30
O	2 to 125	270	100	30	30	75	30
HA	2 to 90	320	160	20	20	100	54
CuNi30Mn1Fe							
O	2 to 125	320	130	30	35	95	50

This page intentionally left blank

This page intentionally left blank

UDC 669.3 : 621.18

Descriptors : wrought products, copper products, metal plates, sheet metal, specifications.

Price based on 3 pages