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# International Standard



# 3486

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

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## **Wrought copper and copper alloys — Cold-rolled flat products delivered in straight lengths (sheet) — Dimensions and tolerances**

*Cuivre et alliages de cuivre corroyés — Produits plats laminés à froid livrés en longueurs droites (tôles) — Dimensions et tolérances*

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Descriptors : copper, copper alloys, cold rolled products, metal sheet, grades (quality), dimensions, dimensional tolerances, form tolerances.

## Foreword

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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.

International Standard ISO 3486 was developed by Technical Committee ISO/TC 26, *Copper and copper alloys*, and was circulated to the member bodies in January 1978.

It has been approved by the member bodies of the following countries:

Australia	France	Romania
Austria	Germany, F.R.	South Africa, Rep. of
Belgium	India	Spain
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The member body of the following country expressed disapproval of the document on technical grounds :

USA

# Wrought copper and copper alloys — Cold-rolled flat products delivered in straight lengths (sheet) — Dimensions and tolerances

## 1 Scope and field of application

This International Standard specifies dimensions and tolerances of cold-rolled flat products (sheet) made from copper and copper alloys in accordance with clause 4.

For dimensions and tolerances of cold-rolled flat products in coils or on reels, see ISO 3487.

## 2 References

ISO 497, *Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers.*

ISO 1634, *Wrought copper and copper alloys — Rolled flat products (plate, sheet, strip) — Mechanical properties.*

ISO 3487, *Wrought copper and copper alloys — Cold-rolled flat products in coils or on reels (strip) — Dimensions and tolerances.*

## 3 Dimensions and tolerances

### 3.1 Thickness (see table 1)

Nominal thickness should be selected from the R''20 series of preferred numbers, in accordance with ISO 497.

For sheet with a width over 50 mm the measurement of thickness should be made at a distance greater than 10 mm from the edge.

Table 1 — Tolerances on thickness

Values in millimetres

Thickness		± Tolerances on thickness, for widths											
>	<	≤ 350			> 350 ≤ 700			> 700 ≤ 1 000			> 1 000 ≤ 1 250		
		Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
≥ 0,1	0,2	—	0,020	0,03	—	—	—	—	—	—	—	—	—
0,2	0,3	0,020	0,025	0,04	0,03	0,03	0,06	—	—	—	—	—	—
0,3	0,5	0,025	0,030	0,05	0,035	0,04	0,07	0,05	0,05	0,10	0,06	0,07	0,12
0,5	0,8	0,030	0,040	0,06	0,04	0,05	0,09	0,06	0,07	0,12	0,07	0,09	0,15
0,8	1,2	0,035	0,050	0,08	0,05	0,06	0,12	0,07	0,09	0,15	0,09	0,11	0,18
1,2	1,8	0,050	0,060	0,10	0,07	0,08	0,15	0,09	0,11	0,18	0,11	0,13	0,21
1,8	2,5	0,060	0,080	0,12	0,09	0,10	0,18	0,11	0,13	0,21	0,14	0,15	0,24
2,5	3,2	0,07	0,10	0,15	0,10	0,12	0,21	0,13	0,15	0,24	0,17	0,18	0,28
3,2	4,0	0,09	0,12	0,18	0,12	0,14	0,24	0,15	0,18	0,28	0,20	0,21	0,32
4,0	5,0	0,12	0,14	0,21	0,14	0,17	0,28	0,17	0,21	0,32	0,23	0,24	0,36
5,0	7,0	—	0,17	0,24	—	0,20	0,32	—	0,24	0,36	—	0,27	0,40
7,0	10,0	—	0,20	0,28	—	0,23	0,36	—	0,27	0,40	—	0,30	0,45

**3.2 Width**

See table 2.

**3.3 Length**

See table 2.

**Table 2 — Width and length tolerances for sheet (guillotined)**

Values in millimetres

Thickness		Tolerances on width, for widths		Tolerance on length, for lengths
>	≤	≤ 350	> 350 ≤ 1 250	≤ 5 000
—	2	+ 2	+ 4	+ 10
2	5	+ 4	+ 6	+ 10
5	10	+ 8	+ 10	+ 10

**3.4 Squareness of sheet**

The diagonal distance between opposite corners of any sheet shall not differ by more than the values laid down in table 3, provided that the tolerances on width and length were met.

**Table 3 — Squareness of sheet**

Values in millimetres

Width		Maximum allowable differences between diagonals, for lengths		
>	≤	> 1 000 ≤ 2 000	> 2 000 ≤ 3 000	> 3 000
350	700	6	7	8
700	1 250	8	9	10

**4 Materials**

For materials see table 4. Mechanical properties are given in ISO 1634.

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Table 4 – Materials

Type	Designation
<b>Coppers</b>	Cu-ETP Cu-FRHC Cu-FRTP Cu-OF Cu-DHP
<b>Alloyed coppers</b>	CuAg0,05 CuAg0,1 CuAg0,05 (P) CuAg0,1 (P) CuAs (P)
<b>Copper-zinc alloys</b>	CuZn5 CuZn10 CuZn15 CuZn20 CuZn30 CuZn33 CuZn37 CuZn40
<b>Copper-zinc-lead alloys</b>	CuZn35Pb2 CuZn36Pb1 CuZn38Pb2 CuZn40Pb CuZn39Pb2
<b>Special copper-zinc alloys</b>	CuZn20Al2 CuZn28Sn1 CuZn38Sn1
<b>Copper-tin alloys</b>	CuSn2 CuSn4 CuSn6 CuSn8 CuSn10 CuSn4Zn4
<b>Copper-aluminium alloys</b>	CuAl5 CuAl8 CuAl8Fe3
<b>Copper-nickel alloys</b>	CuNi20 CuNi25 CuNi5Fe1Mn CuNi10Fe1Mn CuNi20Mn1Fe CuNi30Mn1Fe CuNi44Mn1
<b>Copper-nickel-zinc alloys</b>	CuNi18Zn20 CuNi18Zn27 CuNi15Zn21 CuNi12Zn24 CuNi10Zn27 CuNi10Zn28Pb1
<b>Special copper alloys</b>	CuSi3Mn1 CuBe1,7 CuBe2 CuCo2Be CuNi1Si CuNi2Si

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