This datasheet provides an outline of the large number of extensive EN Standards covering Copper and Copper Alloys.

Other datasheets on this Aalco web site do provide further information on individual alloys including compositions and Mechanicla Properties.

An excellent further reference providing much more detail on Alloy Compositions, Mechanical Properties, etc. - Publication 120 - in available from the Copper Development Association: www.cda.org.uk

For information on Product Tolerances please refer to the latest edition of the published EN Standard.

EN STANDARDS FOR COPPER ALLOYS

This table lists relevant EN Standards and the nearest equivalent old BS Standard

Product Form	EN Standard	Old BS Standard
Free Machining Rod	12164	2874
Plate	1652, 1653	2875 Pt 3
Sheet, Strip & Foil	1172, 1652, 1653, 1654	2870
Tube - Water, Gas, Sanitation	1057	2871 Pt 1
Tube - General Purpose	12449	2871 Pt 2
Tube - Heat Exchangers	12451	2871 Pt 3
Copper Rod & Bar - Electrical Uses	13601	1433
High Conductivity Copper (Oxygen Free)	13604	2901

EN ALLOYS NUMBERING SYSTEM

The system uses 6 characters.

The first character is a C for Copper-based alloys.

The second character is a letter from the table below.

The third, fourth and fifth characters comprise a 3-digit number, which with a sixth character (a letter) indicate the alloy group. These number series and corresponding letters are also shown in the table below.

An example is CW614N.

Character/Digits	Key
B	Ingot for re-melting to produce cast products
C	Cast Products
F	Filler Materials for Brazing and Welding
M	Master Alloys
R	Refined Unwrought Copper
S	Scrap
W	Wrought Products
X	Non-Standardised Materials
000 to 099 A or B	Pure Copper
100 to 199 C or D	Copper Alloys with less than 5% added elements
200 to 299 E or F	Miscellaneous Copper Alloys with more than 5% added elements
300 to 349 G	Copper-Aluminium Alloys
350-399 H	Copper-Nickel Alloys (Cupro-Nickel)
400 to 449 J	Copper-Nickel-Zinc Alloys
450 to 499 K	Copper-Tin Alloys
500 to 599 L or M	Copper-Zinc Alloys - Binary
600 to 699 N or P	Copper-Zind-Lead Alloys
700 to 799 R or S	Copper-Zinc Alloys - Complex

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CONVERTING OLD BS ALLOY TO EN ALLOY

Old BS Alloy	EN Alloy	Notes
C101	CR004A	
C104	CR008A	
C106	CR024A	
CZ106	CW505L	
CZ108	CW508L	
CZ112	CW712R	Naval Brass
CZ114	CW721R & CW722R	High Tensile Brass / Manganese Bronze
CZ121	CW614N	Free Machining Brass
CZ130	CW624N	
CZ131	CW606N	Riveting Quality Brass
CA104	CW307G	Aluminium Bronze
PB102	CW451K	Phosphor Bronze

DIAMETER TOLERANCES - FREE MACHINING ROD

These tolerances are extracted from EN 12164: 2011 (E).

For full detail please refer to the complete standard.

Diameter (MM)	Tolerance (mm) - Class A
Over 2.0 to 3.0	-0 / +0.04
Over 3.0 to 6.0	+0 / -0.05
Over 6.0 to 10.0	+0 / -0.06
Over 10.0 to 18.0	+0 / -0.07
Over 18.0 to 30.0	+0 / -0.08
Over 30.0 to 50.0	+0 / -0.16
Over 50.0 to 80.0	+0 / -0.19

WIDTH ACROSS FLATS TOLERANCE - FREE MACHINING HEX

These tolerances are extracted from EN 12164: 2011 (E).

For full detail please refer to the complete standard.

Width Across Flats (mm)	Tolerance (mm)
Over 2.0 to 3.0	+0 / -0.06
Over 3.0 to 6.0	+0 / -0.08
Over 6.0 to 10.0	+0 / -0.09
Over 10.0 to 18.0	+0 / -0.11
Over 18.0 to 30.0	+0 / -0.13
Over 30.0 to 50.0	+0 / -16
Over 50.0 to 60.0	+0 / -0.19

THICKNESS TOLERANCES - HOT ROLLED PLATE

These tolerances are extracted from EN 1652: 1997.

They apply to plates of width 1000mm to 1500mm only.

Note that wider tolerances apply for some alloys, including CW702R

For full detail please refer to the complete standard.

Thickness (mm)	Tolerance in mm Plus or Minus (+ or -)
Up to 2.5	By Agreement
Over 2.5 to 5.0	0.35
Over 5.0 to 7.5	0.45
Over 7.5 to 10.0	0.55
Over 10.0 to 15.0	0.90
Over 15.0 to 25.0	1.30
Over 25.0 to 50.0	1.50
Over 50.0	1.80

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THICKNESS TOLERANCES - COLD ROLLED SHEET & STRIP

These tolerances are extracted from EN 1652: 1997.

They apply to sheets of width 1000mm to 1250mm only.

Note that wider tolerances (multiply those below by 1.250) apply for some alloys, including CW702R.

For full detail please refer to the complete standard.

Thickness (mm)	Tolerance in mm Plus or Minus (+ or -)
Over 0.3 to 0.4	0.07
Over 0.4 to 0.5	0.08
Over 0.5 to 0.8	0.09
Over 0.8 to 1.2	0.10
Over 1.2 to 1.8	0.11
Over 1.8 to 2.5	0.13
Over 2.5 to 3.2	0.17
Over 3.2 to 4.0	0.20
Over 4.0 to 5.0	0.23
Over 5.0 to 6.0	0.26
Over 6.0 to 7.0	0.29
Over 7.0 to 8.0	0.32
Over 8.0 to 9.0	0.35
Over 9.0 to 10.0	0.38

DIAMETER TOLERANCES - GENERAL PURPOSE TUBE

These tolerances are extracted from EN 12449: 1999.

Tolerances shown are in mm plus or minus (+ or -)

Tolerances in column 2 are applicable to the mean diameter.

Tolerances in column 3 are applicable to any diameter and have a number of exclusions including colied tubes and annealed tubes.

For full detail please refer to the complete standard.

O/D (mm)	Tol + or - on mean diameter	Tol + or - on mean diameter
Over 3.0 to 10.0	0.06	0.12
Over 10.0 to 20.0	0.08	0.16
Over 20.0 to 30.0	0.12	0.24
Over 30.0 to 50.0	0.15	0.30
Over 50.0 to 100.0	0.20	0.50
Over 100.0 to 200.0	0.50	1.0
Over 200.0 to 300.0	0.75	1.5
Over 300.0 to 450.0	1.0	2.0

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WALL THICKNESS TOLERANCES - GENERAL PURRPOSE TUBE

These tolerances are extracted from EN 12449: 1999.

In the header of columns 2 to 6: t is the nominal wall thickness in mm. In the rest of columns 2 to 6 is the tolerance plus or minus (+ or -) in mm.

For full detail please refer to the complete standard.

O/D (mm)	t 0.3 to 1.0	t 1.01 to 3.0	t 3.01 to 6.0	t 6.01 to 10.0	t Over 10.0
3 to 40.0	15	13	11	10	-
40.01 to 120	15	13	12	11	10
120.1 to 250	-	13	13	12	11
250.1 to 450	-	-	15	15	15

DIAMETER TOLERANCES - HEAT EXCHANGER TUBE

These tolerances are extracted from EN 12451: 1999.

For full detail please refer to the complete standard.

O/D (mm)	Tolerance in mm
6.0 to 14.0	+0 / -0.12
Over 14.0 to 26	+0 / -0.20
Over 26.0 to 76.0	+0 / -0.30

CONTACT

Address: Please make contact directly with your local service centre, which can be found via the Locations page of our web site
Web: www.aalco.co.uk

REVISION HISTORY

Datasheet Updated 18 July 2019

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