Welded aluminium tubes

Tolerances according to Euronorm EN 1592 (extract)

1. External diameter

The outside diameter measured at any point (except the first 100mm from each end) must be within the Tolerances in Table 1.

Table 1:

Tolerances for the outer diameter (out-of-roundness included)
Maße in Millimeter Nominal outer diameter D Tolerances

Nominal outer diameter D	Tolerances
8 ≤ D ≤ 15	± 0,10
15 < D ≤ 40	± 0,12
40 < D ≤ 60	± 0,15
60 < D ≤ 60	± 0,20

Other Tolerances are available by agreement.

For D ≤ 40 mm the measurement should be carried out with a micrometre screw with a graduation of 1/100 millimetres.

At D < 40 mm, the measurements shall be carried out with a measuring slide, which has a measuring accuracy of 1/50 millimetre.

All measurements must be carried out at a distance of at least 100 mm from the end of the tube.

2. Thickness

The limiting dimensions for the wall thicknesses are given in Table 2.

Table 2:

Thickness limit dimensions
Dimensions in millimetres

Nominal thickness t	limiting dimensions
0,6 ≤ t ≤ 1,0	± 0,05
1,0 < t ≤ 2,5	± 0,08

These limits do not apply to the weld area. Other thicknesses and dimensions can be agreed between producers and purchasers in writing.

3. Lengths

The tubes must be supplied in the following form:

Production lengths with a limit dimension of +/- 100 mm;

Cut to agreed length, with the limit values given in Table 3.

Table 3:
Limits for agreed lengths
Dimensions in millimetres

Specified length L	Limiting dimensions
L <1 000	± 1,0
1 000 ≤ L < 3 000	± 1,5
3 000 ≤ L < 7 000	± 2,0
7 000 ≤ L	± 3,0

4. Form tolerances

4.1. Straightness

The deviation, measured at an arbitrarily selected section of 1 m length along the length of the tube, must not exceed 1.6 mm. The maximum deviation measured over the total length of the tube and expressed in millimetres may not exceed 1.6 x L (in meters).

5. Alloy and mechanical Quality values

Alloy and mechanical Quality values: Euronorm EN 1592-2

Numerisch numerally	Chemisch chemical	Werkstoff- zustand	Rm Mpa min.	R p0,2 Mpa in.	A % min.
EN AW-3004	EN AW-Al Mn1Mg1	Hx25	190	145	8
		Hx45	220	180	6
		Hx65	240	200	4
		Hx85	250	220	3
EN AW-3005	EN AW-Al Mn1Mg0,5	Hx45	200	175	7
		Hx65	210	185	5
		Hx85	220	195	4
EN AW-5049	EN AW-Al Mg2Mn0,8	Hx25	220	170	10
		Hx45	235	200	7
		Hx65	250	230	5
		Hx85	270	250	3
EN AW-5083	EN AW-Al Mg4,5 Mn0,7	0	275	115	16
		Hx85	420	380	4
EN AW-5086	EN AW-Al Mg4	0	240	100	15
		Hx25	270	170	9
		Hx45	300	220	7
		Hx65	320	260	5
		Hx85	350	320	3
EN AW-7075	EN AW-Al Zn5,5MgCu	0	190	100	15
		T6	530	460	10
		T81	550	500	8

The letter X stands for digit 1, 2 or 3 depending on the final operation to which the tube is subjected i.e.:

1 if mechanical properties are obtained directly by tubing operation
2 when mechanical properties are obtained through a partial annealing after tubing operation
3 when mechanical properties are obtained through a partial annealing at lower temperature, for high Mg content 5000 series alloys (5083, 5086)