BRITISH STANDARD

BS EN
1592-3 : 1998

Aluminium and aluminium alloys — HF seam welded tubes

Part 3. Tolerances on dimensions and form for circular tubes

The European Standard EN 1592-3 : 1997 has the status of a British Standard

ICS 77.150.10

National foreword

This British Standard is the English language version of EN 1592-3 : 1997 published by the European Committee for Standardization (CEN). Together with BS EN 1592-1 : 1998, BS EN 1592-2 : 1998 and BS EN 1592-4 : 1998 it supersedes BS 4300-1 : 1967 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee NFE/35, Light metals and their alloys, to Subcommittee NFE/35/5, Wrought aluminium and aluminium 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 committee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 6, an inside back cover and a back cover.

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 March 1998

ISBN 0 580 28821 8

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1592-3

October 1997

ICS 77.150.10

Descriptors: Aluminium, aluminium alloys, aluminium tubes, welded tubes, dimensional tolerances, form tolerances

English version

Aluminium and aluminium alloys — HF seam welded tubes — Part 3: Tolerances on dimensions and form for circular tubes

Aluminium et alliages d'aluminium — Tubes électrosoudés HF — Partie 3: Tolérances sur dimensions et forme des tubes à section circulaire

Aluminium und Aluminiumlegierungen — HF-längsnahtgeschweißte Rohre — Teil 3: Grenzabmaße und Formtoleranzen für Rundrohre

This European Standard was approved by CEN on 19 September 1997.

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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 1592-3 : 1997 E

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 132, Aluminium and aluminium alloys, the secretariat of which is held by AFNOR.

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 April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 12, HF seam welded tubes, to prepare the following standard:

EN 1592-3 *Aluminium and aluminium alloys — HF seam welded tubes — Part 3: Tolerances on dimensions and form for circular tubes*

This standard is part of a series of four standards. The other standards deal with:

EN 1592-1 *Aluminium and aluminium alloys — HF seam welded tubes — Part 1: Technical conditions for inspection and delivery*

EN 1592-2 *Aluminium and aluminium alloys — HF seam welded tubes — Part 2: Mechanical properties*

EN 1592-4 *Aluminium and aluminium alloys — HF seam welded tubes — Part 4: Tolerances on dimensions and form for square, rectangular and shaped tubes*

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.

Contents

1 Scope

This Part of EN 1592 specifies the tolerances on dimensions and form of circular HF seam welded tubes with a diameter up to and including 80 mm and a wall thickness up to and including 2,5 mm.

These tubes are manufactured from rolled aluminium alloy strip longitudinally welded in a continuous process by the passage of an electric current across the abutting edges without the addition of filler metal.

This standard also applies to tubes manufactured from aluminium alloy strip which is painted, lacquered or anodized prior to forming.

Technical conditions for inspection and delivery are specified in EN 1592-1.

2 Normative references

This European Standard incorporates by dated or undated references, 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 1592-1 *Aluminium and aluminium alloys — HF seam welded tubes — Part 1: Technical conditions for inspection and delivery*

3 Dimensions

The dimensions of tubes shall be designated by the outside diameter and wall thickness.

4 Tolerances on dimensions

4.1 External diameter (ovality included)

The outside diameter measured at any point (excluding the first 100 mm from each end) shall be within the tolerances given in table 1.

Table 1. Tolerances on outside diameter (ovality included)

Dimensions in millimetres

Nominal outside diameter D	**Tolerances**
$8 \leq D \leq 15$	$\pm$ 0,10
$15 < D \leq 40$	$\pm$ 0,12
$40 < D \leq 60$	$\pm$ 0,15
$60 < D \leq 80$	$\pm$ 0,20

Other tolerances are available by agreement.

For $D \leq 40$ mm, the measurements shall be performed using a micrometer graduated in hundredths of a millimetre.

For $D > 40$ mm, the measurements shall be performed using a vernier rule with an accuracy of at least 1/50th of a millimetre.

All measurements shall be taken at least 100 mm from the end of the tube.

4.2 Thickness

The tolerances on thickness shall be in accordance with table 2.

Table 2. Tolerances on thickness

Dimensions in millimetres

Nominal thickness t	**Tolerances**
$0,6 \leq t \leq 1,0$	$\pm$ 0,05
$1,0 < t \leq 2,5$	$\pm$ 0,08

These tolerances are not applicable to the weld fin. Other thicknesses and tolerances are available by written agreement between producer and purchaser.

4.3 Length

Tubes shall be supplied in one of the following ways:

– random lengths, subject to a tolerance of $\pm$ 100 mm;

– specified cut lengths with the tolerances in accordance with table 3.

Table 3. Tolerances on specified cut length

Dimensions in millimetres

Specified length L	**Tolerances**
$L < 1\,000$	$\pm$ 1,0
$1\,000 \leq L < 3\,000$	$\pm$ 1,5
$3\,000 \leq L < 7\,000$	$\pm$ 2,0
$7\,000 \leq L$	$\pm$ 3,0

In case of dispute the length shall be measured as shown in figure 1, the tube being placed on a flat surface with 90° angle plates abutted on each end. The measurement shall be taken across the total gap l between plates.

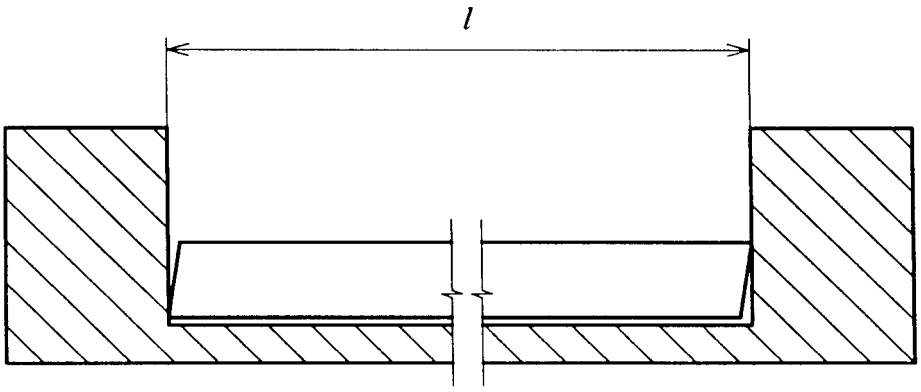


Figure 1. Length measurement

5 Tolerances on form

5.1 Straightness

Deviation from straightness shall be measured as shown in figure 2.

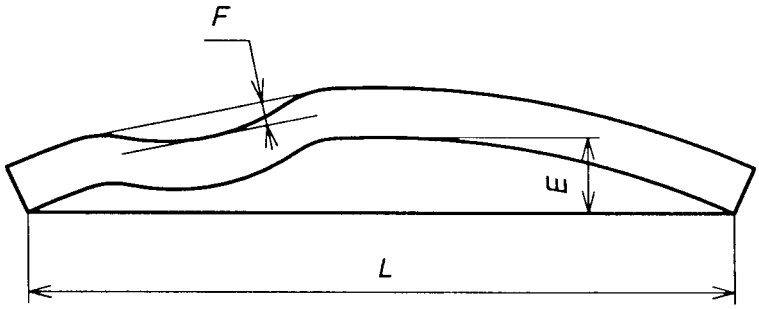


Figure 2. Measurement of deviation from straightness

The deviation F measured on any 1 m length taken at random along the length of the tube, shall not exceed 1,6 mm. The maximum deviation E, expressed in millimetres, measured over the entire length of the tube shall not exceed $1{,}6 \times L$ (in metres).

5.2 Perpendicularity of cut ends

The deviation from perpendicularity of the cut ends (see figure 3) shall not exceed the tolerances given in table 4.

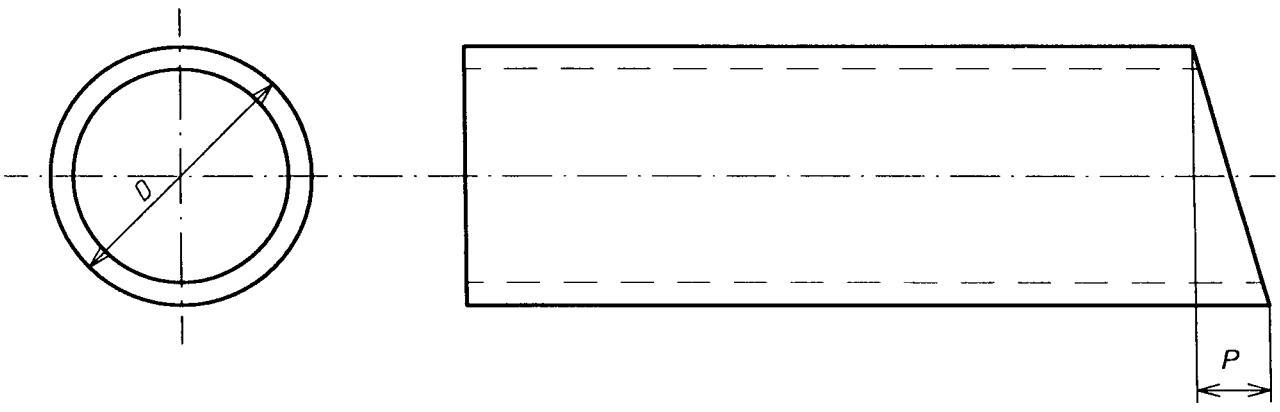


Figure 3. Measurement of deviation from perpendicularity

Table 4. Tolerances on perpendicularity of cut ends

Dimensions in millimetres

Nominal outside diameter *D*	**Tolerance** *P*
$8 \leq D \leq 10$	0,075
$10 < D \leq 15$	0,10
$15 < D \leq 30$	0,20
$30 < D \leq 50$	0,35
$50 < D \leq 70$	0,50
70 < D	0,75

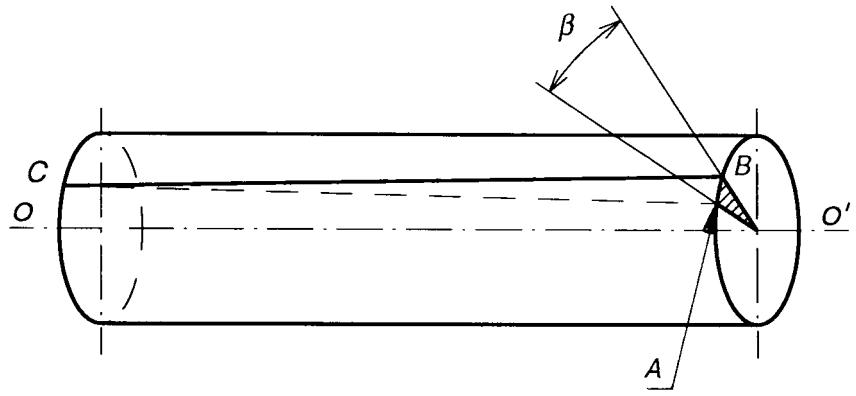
For specific cut length orders, this deviation shall be included in the total length tolerance (see **4.3**).

5.3 Spiralling

Spiralling shall be measured on a 1 m section at any position along the length of the tube (see figure 4). It shall be expressed in degrees per metre.

The standard tolerance β shall be ≤ 2 °/m.

The maximum permitted spiralling over the entire length of the tube shall be less than the value over 1 m multiplied by the length (in metres).



OO′: geometrical axis of the tube

AC: seam without spiralling

BC: seam to be controlled

Figure 4. Measurement of spiralling

5.4 Deburring

Tubes shall not be supplied deburred (i.e. minimal end burrs which do not adversely affect the end use shall be permissible). If deburred tube ends are required, these shall be agreed between producer and purchaser and specified in the order.

5.5 Weld fin

The external weld fin shall be removed completely (i.e. flush with the outside surface of the tube).

NOTE. Normally the total thickness t_s at the weld should not exceed 2,2 times the thickness t of the tube (see figure 5). This applies to tubes with a wall thickness of 0,9 mm or greater.

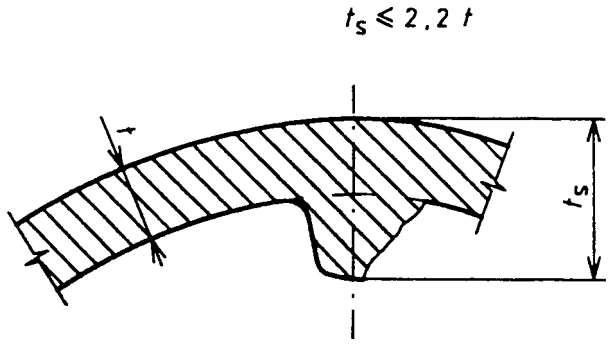


Figure 5. Weld fin

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