BRITISH STANDARD

BS EN
755-4:2008

# Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles —

## Part 4: Square bars, tolerances on dimensions and form

ICS 77.150.10



BSI
British Standards

# National foreword

This British Standard is the UK implementation of EN 755-4:2008. It supersedes BS EN 755-4:1996 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee NFE/35, Light metals and their alloys.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2008



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ICS 77.150.10

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English Version

# Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 4: Square bars, tolerances on dimensions and form

Aluminium et alliages d'aluminium - Barres, tubes et profilés filés - Partie 4: Barres carrées, tolérances sur dimensions et forme

Aluminium und Aluminiumlegierungen - Stranggepresste Stangen, Rohre und Profile - Teil 4: Vierkantstangen, Grenzabmaße und Formtoleranzen

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# Foreword

This document (EN 755-4:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

This document supersedes EN 755-4:1995.

Within its programme of work, Technical committee CEN/TC 132 entrusted CEN/TC 132/WG 5 "*Extruded and drawn products*" to revise EN 755-4:1995.

The following technical modifications have been introduced during the revision:

— Clause 2: Alloys EN AW-3102, EN AW-6008, EN AW-6010A, EN AW-6014, EN AW-6023, EN AW-6360, EN AW-6262A, EN AW-6065 and EN AW-6182 are added in Group I

— Clause 2: Alloys EN AW-5049, EN AW-7108, EN AW-7108A and EN AW-7021 are added in Group II

EN 755 comprises the following parts under the general title "*Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles*":

— *Part 1: Technical conditions for inspection and delivery*

— *Part 2: Mechanical properties*

— *Part 3: Round bars, tolerances on dimensions and form*

— *Part 4: Square bars, tolerances on dimensions and form*

— *Part 5: Rectangular bars, tolerances on dimensions and form*

— *Part 6: Hexagonal bars, tolerances on dimensions and form*

— *Part 7: Seamless tubes, tolerances on dimensions and form*

— *Part 8: Porthole tubes, tolerances on dimensions and form*

— *Part 9: Profiles, tolerances on dimensions and form*

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# 1 Scope

This document specifies the tolerances on dimensions and form for aluminium and aluminium alloy extruded square bars having widths across flats from 10 mm up to 220 mm.

The temper designations used in this part are according to EN 515.

# 2 Alloy groups

The division into group I and group II of the most commonly used general engineering alloys is specified in Table 1. Grouping of other alloys is subject to agreement between supplier and purchaser.

**Table 1 — Alloy groups**

| | |
|---|---|
| Group I | EN AW-1050A, EN AW-1070A, EN AW-1200, EN AW-1350<br>EN AW-3102, EN AW-3003, EN AW-3103<br>EN AW-5005, EN AW-5005A, EN AW-5051A, EN AW-5251<br>EN AW-6101A, EN AW-6101B, EN AW-6005, EN AW-6005A, EN AW-6106, EN AW-6008, EN AW-6010A, EN AW-6012, EN AW-6014, EN AW-6018, EN AW-6023, EN AW-6351, EN AW-6060, EN AW-6360, EN AW-6061, EN AW-6261, EN AW-6262, EN AW-6262A, EN AW-6063, EN AW-6063A, EN AW-6463, EN AW-6065, EN AW-6081, EN AW-6082, EN AW-6182 |
| Group II | EN AW-2007, EN AW-2011, EN AW-2011A, EN AW-2014, EN AW-2014A, EN AW-2017A, EN AW-2024, EN AW-2030<br>EN AW-5019, EN AW-5049, EN AW-5052, EN AW-5154A, EN AW-5454, EN AW-5754, EN AW-5083, EN AW-5086<br>EN AW-7003, EN AW-7005, EN AW-7108, EN AW-7108A, EN AW-7020, EN AW-7021, EN AW-7022, EN AW-7049A, EN AW-7075 |

# 3 Tolerances on dimensions

## 3.1 Width across flats

The tolerances on width across flats are specified in Table 2.

For the purpose of this standard the alloys are distributed into two groups which correspond to varying difficulty when manufacturing the products.

The division into group I and group II of the most commonly used general engineering alloys is specified in Table 1.

**Table 2 — Width across flats tolerances**

Dimensions in millimetres

| Width across flats $S$ | | Tolerances | |
|---|---|---|---|
| Over | Up to and including | Alloy group I | Alloy group II |
| ≥ 10 | 18 | ± 0,22 | ± 0,30 |
| 18 | 25 | ± 0,25 | ± 0,35 |
| 25 | 40 | ± 0,30 | ± 0,40 |
| 40 | 50 | ± 0,35 | ± 0,45 |
| 50 | 65 | ± 0,40 | ± 0,50 |
| 65 | 80 | ± 0,45 | ± 0,70 |
| 80 | 100 | ± 0,55 | ± 0,90 |
| 100 | 120 | ± 0,65 | ± 1,0 |
| 120 | 150 | ± 0,80 | ± 1,2 |
| 150 | 180 | ± 1,0 | ± 1,4 |
| 180 | 220 | ± 1,15 | ± 1,7 |

## 3.2 Corner radii

Maximum corner radii are specified in Table 3.

**Table 3 — Maximum corner radii**

Dimensions in millimetres

| Width across flats $S$ | | Maximum corner radii | |
|---|---|---|---|
| Over | Up to and including | Alloy group I | Alloy group II |
| ≥ 10 | 25 | 1,0 | 1,5 |
| 25 | 50 | 1,5 | 2,0 |
| 50 | 80 | 2,0 | 3,0 |
| 80 | 120 | 2,5 | 3,0 |
| 120 | 180 | 2,5 | 4,0 |
| 180 | 220 | 3,5 | 5,0 |

## 3.3 Length

If fixed lengths are to be supplied, this shall be stated in the order document. The fixed length tolerances are specified in Table 4.

**Table 4 — Fixed length tolerances**

Dimensions in millimetres

| Width across flats $S$ | | Tolerances on length | | |
|---|---|---|---|---|
| Over | Up to and including | $L \leq 2000$ | $2000 < L \leq 5000$ | $L > 5000$ |
| ≥ 10 | 100 | $^{+5}_{0}$ | $^{+7}_{0}$ | $^{+10}_{0}$ |
| 100 | 200 | $^{+7}_{0}$ | $^{+9}_{0}$ | $^{+12}_{0}$ |
| 200 | 220 | $^{+8}_{0}$ | $^{+11}_{0}$ | $^{+14}_{0}$ |

If no fixed or minimum length is specified in the order document, square extruded bars may be delivered in random lengths. The actual lengths and tolerances on random lengths shall be agreed between supplier and purchaser.

### 3.4 Squareness of cut ends

The squareness of cut ends shall be within half of the fixed-length tolerance range (Table 4) for both fixed and random lengths, (e.g. for a fixed length tolerance of $^{+10}_{0}$ mm the squareness of cut ends shall be within 5 mm).

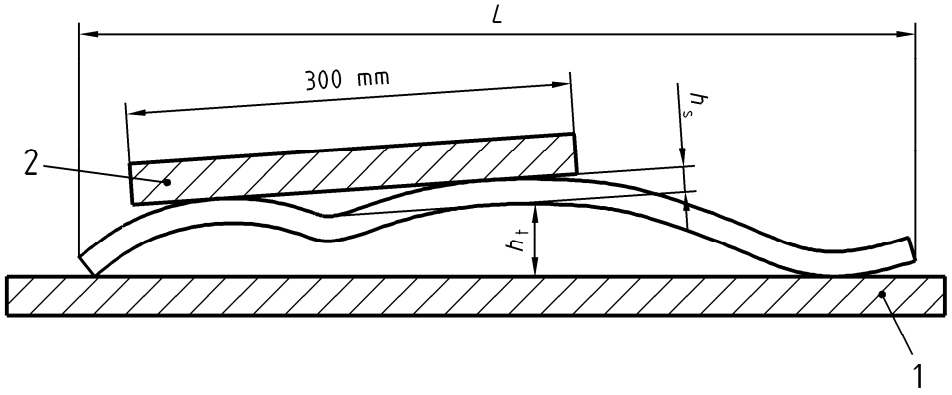
## 4 Tolerances on forms

### 4.1 Straightness

Deviations from straightness, $h_s$ and $h_t$, shall be measured as shown in Figure 1 with the square bar placed on a horizontal base plate so that its mass decreases the deviation.

The straightness tolerances are specified in Table 5 (The straightness tolerance $h_t$ applies to the whole length, e.g. for a length of 6 m the maximum deviation from straightness $h_t$ is the value given in the table multiplied by 6 m).

The straightness tolerances apply to square bars in all tempers except O and Tx510. If a straightness tolerance is required for either O or Tx510 temper, it shall be agreed between supplier and purchaser.




**Key**

1 base plate
2 straight edge

**Figure 1 — Measurement of deviation from straightness**

**Table 5 — Straightness tolerances**

Dimensions in millimetres

| Width across flats $S$ | | Maximum deviation from straightness per metre length $h_t/length$ mm/m | Maximum localised kink in any 300 mm portion $h_s$ |
|---|---|---|---|
| Over | Up to and including | | |
| ≥ 10 | 80 | 2 | 0,8 |
| 80 | 120 | 2 | 1,0 |
| 120 | 220 | 3 | 1,5 |

## 4.2 Convexity - Concavity

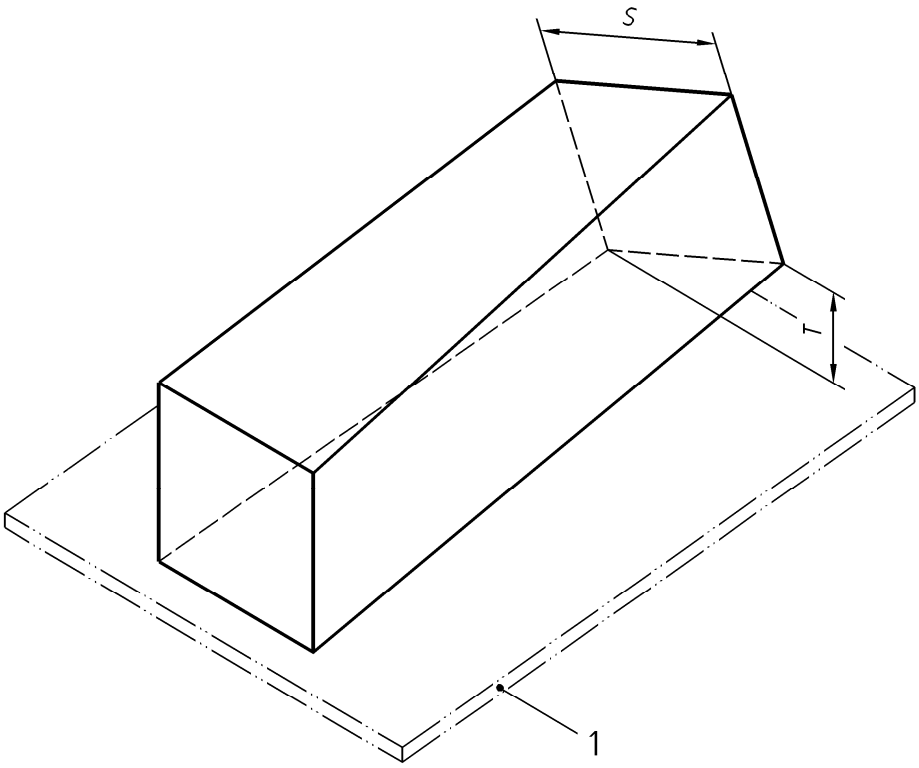
The convexity - concavity for square bars shall be included within the width across flats tolerances as given in Table 2.

## 4.3 Twist

The twist measurement shall be carried out as shown in Figure 2.

The twist tolerances are specified in Table 6.

The twist tolerances apply to square bars in all tempers except O and Tx510. If a twist tolerance is required for either O or Tx510 temper, it shall be agreed between supplier and purchaser.




**Key**

1 base plate

**Figure 2 — Measurement of twist**

**Table 6 — Twist tolerances**

Dimensions in millimetres

| Width across flats $S$ | | Twist tolerances $T$ | |
|---|---|---|---|
| Over | Up to and including | Per 1 000 mm of length | Over the total length |
| ≥ 10 | 30 | 1 | 3 |
| 30 | 50 | 1,5 | 4 |
| 50 | 120 | 2 | 5 |
| 120 | 220 | 3 | 6 |

## 4.4 Squareness

The deviation from square shall be measured as shown in Figure 3. Squareness tolerances are specified in Table 7.

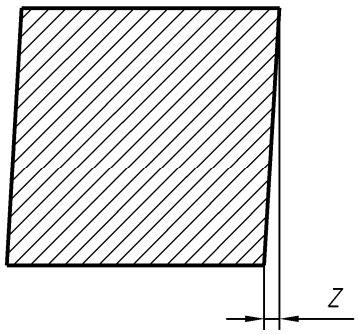



**Figure 3 — Measurement of deviation from square**

**Table 7 — Squareness tolerances**

Dimensions in millimetres

| Width across flats $S$ | | Maximum deviation from square $Z$ |
|---|---|---|
| Over | Up to and including | |
| ≥ 10 | 100 | 0,01 x width |
| 100 | 180 | 1,0 |
| 180 | 220 | 1,5 |

# Bibliography

[1] EN 515, *Aluminium and aluminium alloys — Wrought products — Temper designations*

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