SLOVENSKI STANDARD
SIST EN 603-3:2021

01-november-2021

Nadomešča:
SIST EN 603-3:2002

Aluminij in aluminijeve zlitine - Gneteni surovci za kovanje - 3. del: Odstopki mer in tolerance oblike

Aluminium and aluminium alloys - Wrought forging stock - Part 3: Tolerances on dimensions and form

Aluminium und Aluminiumlegierungen - Stranggepresstes oder gewalztes Schmiedevormaterial - Teil 3: Grenzabmaße und Formtoleranzen

Aluminium et alliages d'aluminium - Produits corroyés destinés à la forge - Partie 3: Tolérances sur dimensions et forme

Ta slovenski standard je istoveten z: **EN 603-3:2021**

ICS:

77.150.10	Aluminijski izdelki	Aluminium products

SIST EN 603-3:2021 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 603-3

September 2021

ICS 77.150.10

Supersedes EN 603-3:2000

English Version

Aluminium and aluminium alloys - Wrought forging stock - Part 3: Tolerances on dimensions and form

Aluminium et alliages d'aluminium - Produits corroyés destinés à la forge - Partie 3: Tolérances sur dimensions et forme

Aluminium und Aluminiumlegierungen - Stranggepresstes oder gewalztes Schmiedevormaterial - Teil 3: Grenzabmaße und Formtoleranzen

This European Standard was approved by CEN on 4 July 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (EN 603-3:2021) 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 March 2022, and conflicting national standards shall be withdrawn at the latest by March 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 603-3:2000.

Compared to the previous edition, Table 20 has been modified.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the tolerances on dimensions and form of wrought aluminium and aluminium alloy forging stock.

It applies to extruded and rolled products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 573-3, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products*

EN 603-1, *Aluminium and aluminium alloys - Wrought forging stock - Part 1: Technical conditions for inspection and delivery*

EN 603-2, *Aluminium and aluminium alloys - Wrought forging stock - Part 2: Mechanical properties*

EN 12258-1, *Aluminium and aluminium alloys - Terms and definitions - Part 1: General terms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12258-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

4 Dimensional ranges

The tolerances on dimensions and form expressed in this document cover extruded products of regular cross-section in the form of round bars having diameters up to and including 320 mm, square bars having width across flats up to and including 220 mm, rectangular bars having widths up to and including 600 mm in thicknesses up to and including 240 mm and hot rolled plate in widths up to and including 3 500 mm in thicknesses from 10 mm up to and including 200 mm.

Tolerances on dimensions and form of such products in excess of these ranges shall be subject to agreement between supplier and purchaser and stated on the order or drawing.

5 Alloys

5.1 Chemical composition

The chemical composition limits of the alloys shall be as specified in EN 573-3.

5.2 Alloy groups

For the purposes of this document, the alloys are divided into two groups which correspond to varying difficulty when manufacturing the extruded forging stock. The division into Group I and Group II of these alloys is specified in Table 1.

The division into Class A and Class B alloys shall be as specified in EN 573-3. Class A covers aluminium and aluminium alloys produced in large volume as wrought forging stock for which mechanical properties are specified in EN 603-2. Class B covers aluminium and aluminium alloys produced in limited volume as wrought forging stock for which mechanical properties are not specified.

Table 1 — Alloy Groups

Alloy Group I (extrude with ease)			Alloy Group II (difficult to extrude)		
Alloy designation		Class	Alloy designation		Class
EN AW-1050A	[Al 99,5]	B	EN AW-2011	[Al Cu6BiPb]	B
			EN AW-2014	[Al Cu4SiMg]	A
EN AW-6005A	[Al SiMg(A)]	B	EN AW-2017A	[Al CuMgSi(A)]	B
			EN AW-2618A	[Al Cu2Mg1,5Ni]	B
EN AW-6060	[Al MgSi]	B	EN AW-2219	[Al Cu6Mn]	B
			EN AW-2024	[Al Cu4Mg1]	A
EN AW-6061	[Al Mg1SiCu]	B	EN AW-2031	[Al Cu2,5NiMg]	B
			EN AW-4032	[Al Si12,5MgCuNi]	B
EN AW-6082	[Al Si1MgMn]	A	EN AW-5454	[Al Mg3Mn]	B
			EN AW-5754	[Al Mg3]	A
			EN AW-5019	[Al Mg5]	B
			EN AW-5083	[Al Mg4,5Mn0,7]	A
			EN AW-7010	[Al Zn6MgCu]	B
			EN AW-7012	[Al Zn6Mg2Cu]	B
			EN AW-7020	[Al Zn4,5Mg1]	B
			EN AW-7075	[Al Zn5,5MgCu]	A
Other alloys shall be grouped as follows: Alloy Group I: — unalloyed aluminium; — alloys Al Mn; — alloys Al Mg with a maximum of 2,8 % Mg; — alloys Al MgSi. Alloy Group II: — alloys Al Mg with more than 2,8 % Mg; — alloys Al CuMg; — alloys Al ZnMg.					

6 Tolerances on dimensions and form

6.1 General

The technical conditions for inspection and delivery of wrought forging stock are specified in EN 603-1.

NOTE These products are normally supplied in the F temper as defined in EN 515.

6.2 Extruded round bar

6.2.1 Diameter

Tolerances on diameter shall be as specified in Table 2.

Tolerances on diameter can vary dependent on the method of extrusion (direct or indirect) and the type of extrusion die used (single hole or multi hole).

With Group II alloys closer tolerances are possible when the indirect method of extrusion is employed using either a single hole or multi hole die at the discretion of the supplier.

In diameters up to and including 120 mm, however, the forging requirement can demand restricted tolerances combined with a more uniform material structure obtainable only with the use of a single hole die. In such cases the purchaser shall specify this special requirement on the order.

Table 2 — Tolerances on diameter

Dimensions in millimetres

Diameter		Tolerances			
Over	Up to and including	Alloy Group I	Alloy Group II		
			Direct extrusion	Indirect extrusion	
				Normal tolerance Single or Multi hole die	Restricted tolerance Single hole die only
8 [a]	18	±0,22	±0,30	±0,20	±0,15
18	25	±0,25	±0,35	±0,23	±0,20
25	40	±0,30	±0,40	±0,27	±0,22
40	50	±0,35	±0,45	±0,30	±0,25
50	65	±0,40	±0,50	±0,35	±0,27
65	80	±0,45	±0,70	±0,40	±0,30
80	100	±0,55	±0,90	±0,45	±0,35
100	120	±0,65	±1,0	±0,50	±0,40
120	150	±0,80	±1,2	±0,60 [b]	—
150	180	±1,0	±1,4	±0,70 [b]	—
180	220	±1,15	±1,7	±0,85 [b]	—
220	270	±1,3	±2,0	±1,0 [b]	—
270	320	±1,6	±2,5	±1,3 [b]	—

[a] Including diameter 8 mm.

[b] Single hole die only.

6.2.2 Ovality

Ovality shall be determined by calculating the difference between the maximum and minimum diameters measured at one cross section.

The maximum permissible ovality shall be 50 % of the tolerance range specified in Table 2; e.g. for a diameter tolerance of ±0,22 mm, the maximum permissible ovality shall be 0,22 mm.

6.2.3 Length

The tolerances on fixed length shall be as specified in Table 3.

If fixed lengths are to be supplied, this shall be stated on the order.

Table 3 — Fixed length tolerances

Dimensions in millimetres

Diameter		Tolerances on lengths *L*		
Over	**Up to and including**	$L \leq 2\,000$	$2\,000 < L \leq 5\,000$	$L > 5\,000$
—	100	+5 0	+7 0	+10 0
100	200	+7 0	+9 0	+12 0
200	320	+8 0	+11 0	—

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

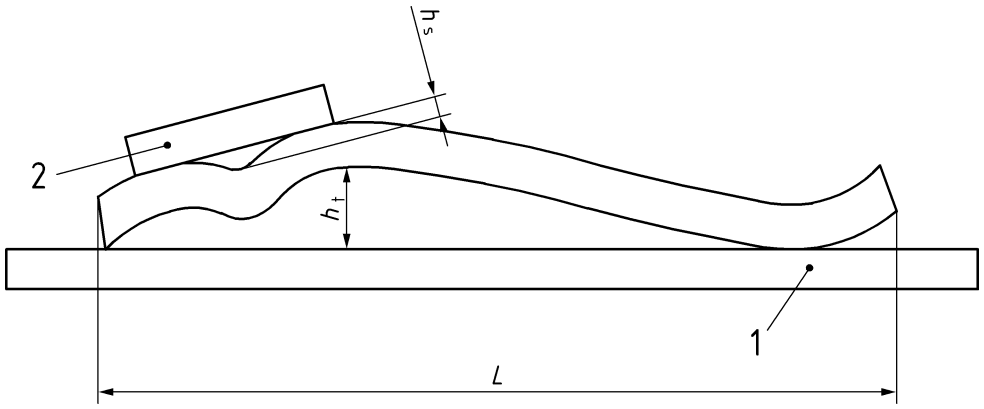
6.2.4 Perpendicularity of cut ends

The maximum deviation from perpendicularity of cut ends shall be within half of the fixed length tolerance range (see Table 3) for both fixed and random lengths, e.g. for a tolerance on fixed length of ${}^{+10}_{0}$ mm, the perpendicularity of cut ends shall be within 5 mm.

6.2.5 Straightness

The maximum deviations from straightness, h_t and h_s shall be as specified in Table 4. They shall be measured as shown in Figure 1 with the bar placed on a horizontal baseplate so that its mass decreases the deviation.

These straightness tolerances shall be applied only when requested by the purchaser and stated on the order.



Key

1 baseplate

2 straightedge

Figure 1 — Measurement of deviation from straightness

Table 4 — Straightness tolerances

Dimensions in millimetres

Diameter		Maximum deviation from straightness h_t (mm/m)	Maximum localized kink in any 300 mm portion h_s
Over	Up to and including		
8 [a]	80	2,0	0,80
80	120	2,0	1,0
120	200	3,0	1,5
200	320	6,0	3,0

[a] Including diameter 8 mm.

6.3 Extruded square bar

6.3.1 Width across flats

The width across flats tolerances shall be as specified in Table 5.