

Nederlandse norm

NEN-EN 573-3

(en)

Aluminium en aluminiumlegeringen - Chemische samenstelling en vorm van geknede producten - Deel 3: Chemische samenstelling en vormproducten

Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products

Vervangt NEN-EN 573-3:2013;
NEN-EN 573-3:2019 Ontw.

ICS 77.120.10; 77.150.10
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Als Nederlandse norm is aanvaard:
 - EN 573-3:2019, IDT

Voorbeeld
 Preview

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EUROPEAN STANDARD

EN 573-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2019

ICS 77.120.10; 77.150.10

Supersedes EN 573-3:2013

English Version

Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition and form of products

Aluminium et alliages d'aluminium - Composition
chimique et forme des produits corroyés - Partie 3 :
Composition chimique et forme des produits

Aluminium und Aluminiumlegierungen - Chemische
Zusammensetzung und Form von Halbzeug - Teil 3:
Chemische Zusammensetzung und Erzeugnisformen

This European Standard was approved by CEN on 7 July 2019.

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European foreword

This document (EN 573-3:2019) 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of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2020.

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 will supersede EN 573-3:2013.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 5 “Extruded and drawn products” to revise EN 573-3:2013.

CEN/TC 132 has decided to revise this document as follows:

- addition of the alloy EN AW-2016 in Table 2 and A.2;
- addition of the alloy EN AW-4025 in Tables 4 and A.4;
- addition of the alloy EN AW-6050 in Tables 6 and A.6;
- addition of the alloy EN AW-5018B in Tables 5 and A.5;
- addition of the alloy EN AW-8026 in Table 8 and A.8;
- correction of the alloy EN AW-5449 in Table 5;
- correction of the alloy EN AW-6064A in Table 6;
- modification of the order of alloys to conform with Aluminium Association System.

EN 573 comprises the following parts under the general title *Aluminium and aluminium alloys — Chemical composition and form of wrought products*:

- *Part 1: Numerical designation system;*
- *Part 2: Chemical symbol based designation system;*
- *Part 3: Chemical composition and form of products;*
- *Part 4: Forms of products;*
- *Part 5: Codification of standardized wrought products.*

CEN/TC 132 affirms its policy that if a patentee refuses to grant licenses on standardized products under reasonable and not discriminatory conditions, this product will be removed from the corresponding document.

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For
Preview
EN
573-3:2019

1 Scope

This document specifies the chemical composition limits of wrought aluminium and wrought aluminium alloys and form of products.

NOTE The chemical composition limits of aluminium and aluminium alloys specified herein are completely identical with those registered with the Aluminium Association, 1525, Wilson Boulevard, Suite 600, Arlington, VA 22209, USA, for the corresponding alloys.

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 485-2, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 2: Mechanical properties*
- EN 541, *Aluminium and aluminium alloys — Rolled products for cans, closures and lids — Specifications*
- EN 546-2, *Aluminium and aluminium alloys — Foil — Part 2: Mechanical properties*
- EN 570, *Aluminium and aluminium alloys — Impact extrusion slugs obtained from wrought products — Specification*
- EN 573-2, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 2: Chemical symbol based designation system*
- EN 586-2, *Aluminium and aluminium alloys — Forgings — Part 2: Mechanical properties and additional property requirements*
- EN 602, *Aluminium and aluminium alloys — Wrought products — Chemical composition of semi-finished products used for the fabrication of articles for use in contact with foodstuff*
- EN 603-2, *Aluminium and aluminium alloys — Wrought forging stock — Part 2: Mechanical properties*
- EN 683-2, *Aluminium and aluminium alloys — Finstock — Part 2: Mechanical properties*
- EN 754-2, *Aluminium and aluminium alloys — Cold drawn rod/bar and tube — Part 2: Mechanical properties*
- EN 755-2, *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Part 2: Mechanical properties*
- EN 1301-2, *Aluminium and aluminium alloys — Drawn wire — Part 2: Mechanical properties*
- EN 1592-2, *Aluminium and aluminium alloys — HF seam welded tubes — Part 2: Mechanical properties*
- EN 1715-2, *Aluminium and aluminium alloys — Drawing stock — Part 2: Specific requirements for electrical applications*
- EN 1715-3, *Aluminium and aluminium alloys — Drawing stock — Part 3: Specific requirements for mechanical uses (excluding welding)*

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EN 1715-4, *Aluminium and aluminium alloys — Drawing stock — Part 4: Specific requirements for welding applications*

3 Terms and definitions

No terms and definitions are listed in this document.

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

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

4 Chemical composition limits

The chemical composition of aluminium and aluminium alloys is specified in percentage by mass in Tables 1 to 8. Limits of impurities are expressed as a maximum; limits of alloying elements shown as a range. Aluminium is specified as a minimum for unalloyed aluminium, and as a remainder for aluminium alloys.

The chemical composition of internationally registered wrought aluminium and wrought aluminium alloys not listed in this document can be found in Table sheet [1].

Analysis shall be made for elements which are specified, for example Pb, Sn, Bi, Sb, Zr.

5 Writing rules

5.1 Standard limits for alloying elements and impurities are expressed in percentage by mass to the following decimal places:

- | | |
|--|-----------------|
| — less than 0,001 % | 0,000X; |
| — 0,001 % but less than 0,01 % | 0,00X; |
| — 0,01 % but less than 0,10 %: | |
| — unalloyed aluminium made by a refining process | 0,0XX; |
| — others | 0,0X; |
| — 0,10 % to 0,55 % | 0,XX; |
| — over 0,55 % | 0,X; X,X; XX,X. |

Exception: combined Si + Fe limits for 1xxx designations shall be expressed as 0,XX or 1,XX.

5.2 The aluminium content for unalloyed aluminium made by a refining process is the difference between 100,00 % and the sum of all other metallic elements present in amounts of 0,001 0 % or more each, expressed to the third decimal place before determining the sum, which is rounded to the second decimal place before subtracting.

For unalloyed aluminium not made by a refining process, the aluminium content is the difference between 100,00 % and the sum of all other metallic elements present in amounts of 0,010 % or more each expressed to the second decimal place before determining the sum.

6 Alloy designations

The numerical designation systems used in Teal sheets and European Standards for wrought aluminium alloys are identical. As specified in EN 573-1 [3] the prefix EN AW- is added.

The alternative chemical symbol based alloy designation system shall be based on EN 573-2.

Both the numerical and the chemical symbol based designations are indicated in Tables 1 to 8.

The International numerical system is the preferred one. The chemical symbol based designations are indicated for reference only.

7 Sequence of elements

Standard limits for alloying elements and impurities are expressed in the following sequence: silicon, iron, copper, manganese, magnesium, chromium, nickel, zinc, titanium, gallium, vanadium, remarks, other elements each, other elements total, aluminium.

Limits of additional specified elements are inserted in alphabetical order of their chemical symbols under "Remarks".

8 Rounding rules for determination of compliance

In recording chemical analysis test results, the number representing the result for any element specified in this standard shall be expressed to the same number of decimal places as the corresponding number in this standard. For unalloyed aluminium, the aluminium content is derived as described in 5.2.

The following rounding rules shall be used for determination of compliance with this standard:

- a) when the figure immediately after the last figure to be retained is less than 5, the last figure to be retained remains unchanged;
- b) when the figure immediately after the last figure to be retained is greater than 5, or equal to 5 and followed by at least one figure other than zero, the last figure to be retained is increased by one;
- c) when the figure immediately after the last figure to be retained is equal to 5 and followed by zeros only, the last figure to be retained remains unchanged if even and is increased by one if odd.

Table 1 — Aluminium — 1 000 series

Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others ^a		Aluminium min.
Numerical	Chemical symbols													Each	Total b	
EN AW-1050A	EN AW-Al 99,5	0,25	0,40	0,05	0,05	0,05	-	-	0,07	0,05	-	-	-	0,03	-	99,50 ^c
EN AW-1060	EN AW-Al 99,6	0,25	0,10	0,05	0,03	0,03	-	-	0,05	0,03	-	0,05	-	0,03	-	99,60 ^c
EN AW-1070A	EN AW-Al 99,7	0,20	0,25	0,03	0,03	0,03	-	-	0,07	0,03	-	-	-	0,03	-	99,70 ^c
EN AW-1080A	EN AW-Al 99,8(A)	0,15	0,15	0,03	0,02	0,02	-	-	0,06	0,02	0,03	-	e	0,02	-	99,80 ^c
EN AW-1085	EN AW-Al 99,85	0,10	0,12	0,03	0,02	0,02	-	-	0,03	0,02	0,03	0,05	-	0,01	-	99,85 ^c
EN AW-1090	EN AW-Al 99,90	0,07	0,07	0,02	0,01	0,01	-	-	0,03	0,01	0,03	0,05	-	0,01	-	99,90 ^c
EN AW-1098	EN AW-Al 99,98	0,010	0,006	0,003	-	-	-	-	0,015	0,003	-	-	-	0,003	-	99,98 ^d
EN AW-1100	EN AW-Al 99,0Cu	0,95 Si + Fe		0,05–0,20	0,05	-	-	-	0,10	-	-	-	e	0,05	0,15	99,00 ^c
EN AW-1200	EN AW-Al 99,0	1,00 Si + Fe		0,05	0,05	-	-	-	0,10	0,05	-	-	e	0,05	0,15	99,00 ^c
EN AW-1200A	EN AW-Al 99,0(A)	1,00 Si + Fe		0,10	0,30	0,30	0,10	-	0,10	-	-	-	-	0,05	0,15	99,00 ^c
EN AW-1110	EN AW-Al 99,1	0,30	0,8	0,04	0,01	0,25	0,01	-	-	-	-	-	0,02B; 0,03V + Ti	0,03	0,15	99,10 ^c

Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others ^a		Aluminium min.
Numerical	Chemical symbols													Each	Total ^b	
EN AW-1235	EN AW-Al 99,35	0,05 Si + Fe		0,05	0,05	0,05	-	-	0,10	0,06	-	0,05	-	0,03	-	99,35 ^c
EN AW-1350	EN AW-Al 99,5	0,10	0,40	0,05	0,01	-	0,01	-	0,05	-	0,03	-	0,05 B; 0,02 V + Ti	0,03	0,10	99,50 ^c
EN AW-1350A	EN AW-Al 99,5(A)	0,25		0,02	-	0,05	-	-	0,05	-	-	-	0,03 Cr + Mn + Ti + V	0,03	-	99,50 ^c
EN AW-1450	EN AW-Al 99,5Ti	0,25	0,40	0,05	0,05	0,05	-	-	0,07	0,10- 0,20	-	-	e	0,03	-	99,50 ^c
EN AW-1370	EN AW-Al 99,7	0,10	0,25	0,02	0,01	0,02	0,01	-	0,04	-	0,03	-	0,02 B; 0,02 V + Ti	0,02	0,10	99,70 ^c
EN AW-1198	EN AW-Al 99,98(A)	0,010	0,006	0,006	0,006	-	-	-	0,010	0,006	0,006	-	-	0,003	-	99,98 ^d
EN AW-1199	EN AW-Al 99,99	0,006	0,006	0,006	0,002	0,006	-	-	0,006	0,002	0,005	0,005	-	0,002	-	99,99 ^d

^a "Others" includes listed elements for which no specific limit is shown as well as unlisted metallic elements. The producer may analyse samples for trace elements not specified in the registration or specification. However, such analysis is not required and may not cover all metallic "Other" elements. Should any analysis by the producer or the purchaser establish that an "Others" element exceeds the limit of "Each" or that the aggregate of several "Others" elements exceeds the limit of "Total", the material shall be considered non-conforming.

^b The sum of those "Others" metallic elements 0,010 % or more each, expressed to the second decimal place before determining the sum.

^c The aluminium content for unalloyed aluminium not made by a refining process is the difference between 100,00 % and the sum of all other metallic elements present in amounts of 0,010 % or more each, expressed to the second decimal place before determining the sum.

^d The aluminium content for unalloyed aluminium made by a refining process is the difference between 100,00 % and the sum of all other metallic elements present in amounts of 0,001 0 % or more each, expressed to the third decimal before determining the sum, which is rounded to the second decimal place before subtracting.

^e 0,000 3 max. Be for welding electrode, welding rod and filler wire only.

Table 2 — Aluminium alloys — 2 000 series — Al Cu

Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others ^a		Aluminium min.
Numerical	Chemical symbols													Each	Total b	
EN AW-2001	EN AW-Al Cu5,5MgMn	0,20	0,20	5,2-6,0	0,15- 0,50	0,20- 0,45	0,10	0,05	0,10	0,20	-	-	0,05 Zr ^c	0,05	0,15	Remainder
EN AW-2007	EN AW-Al Cu4PbMgMn	0,6	0,8	3,3-4,6	0,50-1,0	0,40-1,8	0,10	0,20	0,8	0,20	-	-	^d	0,10	0,30	Remainder
EN AW-2011	EN AW-Al Cu6BiPb	0,40	0,7	5,0-6,0	-	-	-	-	0,30	-	-	-	^e	0,05	0,15	Remainder
EN AW-2011A	EN AW-Al Cu6BiPb(A)	0,40	0,50	4,5-6,0	-	-	-	-	0,30	-	-	-	^e	0,05	0,15	Remainder
EN AW-2014	EN AW-Al Cu4SiMg	0,50-1,2	0,7	3,9-5,0	0,40-1,2	0,20-0,8	0,10	-	0,25	0,15	-	-	^f	0,05	0,15	Remainder
EN AW-2014A	EN AW-Al Cu4SiMg(A)	0,50-0,9	0,50	3,9-5,0	0,40-1,2	0,20-0,8	0,10	0,10	0,25	0,15	-	-	0,20 Zr+Ti	0,05	0,15	Remainder
EN AW-2214	EN AW-Al Cu4SiMg(B)	0,50-1,2	0,30	3,9-5,0	0,40-1,2	0,20-0,8	0,10	-	0,25	0,15	-	-	^f	0,05	0,15	Remainder
EN AW-2016	EN AW-Al Cu4SiMgAg	0,30-0,7	0,15	3,5-4,5	0,10- 0,50	0,30-0,8	-	-	-	0,05- 0,15	-	-	Ag 0,30-0,7 Zr 0,10-0,25	0,05	0,15	Remainder
EN AW-2017A	EN AW-Al Cu4MgSi(A)	0,20-0,8	0,7	3,5-4,5	0,40-1,0	0,40-1,0	0,10	-	0,25	-	-	-	0,25 Zr+Ti	0,05	0,15	Remainder
EN AW-2117	EN AW-Al Cu2,5Mg	0,8	0,7	2,2-3,0	0,20	0,20- 0,50	0,10	-	0,25	-	-	-	-	0,05	0,15	Remainder
EN AW-2618A	EN AW-Al Cu2Mg1,5Ni	0,15-0,25	0,9-1,4	1,8-2,7	0,25	1,2-1,8	-	0,8- 1,4	0,15	0,20	-	-	0,25 Zr+Ti	0,05	0,15	Remainder
EN AW-2219	EN AW-Al Cu6Mn	0,20	0,30	5,8-6,8	0,20- 0,40	0,02	-	-	0,10	0,02- 0,10	-	0,05- 0,15	0,10-0,25 Zr	0,05	0,15	Remainder
EN AW-2319	EN AW-Al	0,20	0,30	5,8-6,8	0,20-	0,02	-	-	0,10	0,10-	-	0,05-	0,10-0,25 Zr ^h	0,05	0,15	Remainder

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