



SLOVENSKI STANDARD

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

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

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

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

Ta slovenski standard je istoveten z: EN 573-3:2003

ICS:

77.040.30	Kemijska analiza kovin	Chemical analysis of metals
77.150.10	Aluminijski izdelki	Aluminium products

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 573-3

July 2003

ICS 77.120.10; 77.150.10

Supersedes EN 573-3:1994

English version

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

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

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

This European Standard was approved by CEN on 23 May 2003.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This document (EN 573-3:2003) 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 January 2004, and conflicting national standards shall be withdrawn at the latest by January 2004.

Within its programme of work, Technical Committee CEN/TC 132 has been entrusted to prepare the following standard:

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

This standard is part of a set of five standards. The other standards deal with:

EN 573-1, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 1: Numerical designation system.*

EN 573-2, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 2: Chemical symbol based designation system.*

EN 573-4, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 4: Forms of products.*

prEN 573-5, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 5: Codification of standardized wrought products.*

Annex A is normative.

This document includes a Bibliography.

This document supersedes EN 573-3:1994.

CEN/TC 132 has decided to revise this standard every two years if necessary.

The following technical modifications have been introduced during the revision:

- clause 1: note modified;
- clause 6: titanium appears now after zinc; gallium and vanadium added;
- clause 8 added: notes for Tables 1 to 8;
- Tables 1 to 8: the column "Ti" appears now after the columns "Zn";
- Table 3: alloys EN AW-3005A and EN AW-3105B added;
- Table 4: alloy EN AW-4014 deleted; alloys EN AW-4016, EN AW-4017 and EN AW-4018 added;
- Table 5: alloys EN AW-5119A, EN AW-5449, EN AW-5654A, EN AW-5356A, EN AW-5456B, EN AW-5556B, EN AW-5183A, EN AW-5383, EN AW-5186 and EN AW-5187 added;

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- Table 6: alloys EN AW-6008 and EN AW-6016 added;
- Table 8: alloys EN AW-8021B and EN AW-8015 added;
- annex A added: Guidelines for the registration of new wrought aluminium and aluminium alloys in CEN/TC 132 standards and for the elimination of existing alloys from these standards.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies the chemical composition limits of wrought aluminium and aluminium alloys.

The chemical composition limits of aluminium and aluminium alloys specified herein are completely identical with those registered with the Aluminum Association, Washington D.C. 20006, USA, for the corresponding alloys.

NOTE Some of the products listed in the present standard can be subject to patent or patent applications, and their listing herein should not be construed in any way as the granting of a licence under such patent rights.

CEN/TC 132 affirms it is its policy that in the case when a patentee refuses to grant licences on a standardised product under reasonable and not discriminatory conditions, then this product shall be excluded from the corresponding standard.

2 Normative references

This European Standard incorporates by dated or undated reference, 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 (including amendments).

EN 573-1, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 1: Numerical designation system.*

EN 573-2, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 2: Chemical symbol based designation system.*

EN 573-4:1994, *Aluminium and aluminium alloys – Chemical composition and form of wrought products – Part 4: Forms of products.*

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3 Chemical composition limits

The chemical composition of aluminium and aluminium alloys is specified in percentage by mass in Tables 1 to 8. Limits are expressed as a maximum unless shown as a range or a minimum.

Aluminium is specified as a minimum for unalloyed aluminium, and as a remainder for aluminium alloys.

Except for “aluminium” and “others”, analysis is normally made for elements for which specific limits are shown.

Tables 1 to 8 shall be updated made according to the procedure specified in annex A.

EN 573-3:2003 (E)**4 Writing rules**

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

4.2 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 0,0010 % 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.

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5 Alloy designations

The four-figure numerical and the alternative chemical symbol based alloy designation systems are specified respectively in EN 573-1 and EN 573-2.

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

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

6 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, etc., other elements each, other elements total, aluminium.

Additional specified elements having limits are inserted in alphabetical order of their chemical symbols between zinc and titanium, or are specified in footnotes in Tables 1 to 8 and listed in clause 8.

7 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 4.2.

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.

8 Footnotes to Tables 1 to 8

- 1 The sum of those "Others" metallic elements 0,010 % or more each, expressed to the second decimal place before determining the sum.
- 2 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.
- 3 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 0,0010 % or more each, expressed to the third decimal before determining the sum, which is rounded to the second decimal place before subtracting.
- 4 0,0003 max. Be for welding electrode and filler wire only.
- 5 0,20-0,6 Bi; 0,20-0,6 Pb.
- 6 Zr+Ti limit of 0,20 maximum may be used for extruded and forged products if mutually agreed by supplier or manufacturer and purchaser.
- 7 0,40-0,7 Bi; 0,40-0,7 Pb.
- 8 Zr+Ti limit of 0,25 maximum may be used for extruded and forged products if mutually agreed by supplier or manufacturer and purchaser.
- 9 0,08-0,20 Zr; 0,08-0,25 Zr+Ti.
- 10 0,25-0,40 Ag.
- 11 0,20 Bi; 0,8-1,5 Pb; 0,20 Sn.
- 12 2,2-2,7 Li.
- 13 1,7-2,3 Li.
- 14 Includes listed elements for which no specific limit is shown.
- 15 0,003 max. Pb.
- 16 0,40-0,7 Bi; 0,40-1,2 Pb.
- 17 0,20 max. Zr+Ti.
- 18 0,0005 % max Be for welding electrode, welding rod and filler wire.

NOTE Numbers have been used to indicate footnotes in this table, in order to remain consistent with the system used in the Aluminum Association "Teal Sheets" [1].

Table 1 — Aluminium – 1000 series

Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others ¹⁴		Aluminium min.
Numerical	Chemical symbols													Each	Total ¹	
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 ³
EN AW-1098	EN AW-Al 99,98	0,010	0,006	0,003	-	-	-	-	0,015	0,003	-	-	-	0,003	-	99,98 ³
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 ³
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 ²
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 ²
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	-	-	0,02	-	99,80 ²
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 ²
EN AW-1370	EN AW-EAl 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 ²
EN AW-1060	EN AW-Al 99,6	0,25	0,35	0,05	0,03	0,03	-	-	0,05	0,03	-	0,05	-	0,03	-	99,60 ²
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 ²
EN AW-1350	EN AW-EAl 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 ²
EN AW-1350A	EN AW-EAl 99,5(A)	0,25	0,40	0,02	-	0,05	-	-	0,05	-	-	-	0,03 Cr + Mn + Ti + V	0,03	-	99,50 ²
EN AW-1450	EN AW-Al 99,5Ti	0,25	0,40	0,05	0,05	0,05	-	-	0,07	0,10-0,20	-	-	-	0,03	-	99,50 ²
EN AW-1235	EN AW-Al 99,35	0,65 Si + Fe		0,05	0,05	0,05	-	-	0,10	0,06	-	0,05	-	0,03	-	99,35 ²
EN AW-1200	EN AW-Al 99,0	1,00 Si + Fe		0,05	0,05	-	-	-	0,10	0,05	-	-	-	0,05	0,15	99,00 ²
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 ²
EN AW-1100	EN AW-Al 99,0Cu	0,95 Si + Fe		0,05-0,20	0,05	-	-	-	0,10	-	-	-	4	0,05	0,15	99,00 ²

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Table 2 — Aluminium alloys- 2000 series- Al Cu

Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ga	V	Remarks	Others ¹⁴		Aluminium min.
Numerical	Chemical symbols													Each	Total ¹	
EN AW-2001	EN AW-AI 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 ¹⁵	0,05	0,15	Remainder
EN AW-2007	EN AW-AI Cu4PbMgMn	0,8	0,8	3,3-4,6	0,50-1,0	0,40-1,8	0,10	0,20	0,8	0,20	-	-	11	0,10	0,30	Remainder
EN AW-2011	EN AW-AI Cu6BiPb	0,40	0,7	5,0-6,0	-	-	-	-	0,30	-	-	-	5	0,05	0,15	Remainder
EN AW-2011A	EN AW-AI Cu6BiPb(A)	0,40	0,50	4,5-6,0	-	-	-	-	0,30	-	-	-	5	0,05	0,15	Remainder
EN AW-2014	EN AW-AI 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	-	-	6	0,05	0,15	Remainder
EN AW-2014A	EN AW-AI 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-AI 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	-	-	6	0,05	0,15	Remainder
EN AW-2017A	EN AW-AI 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-AI 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-AI 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-AI 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-AI Cu6Mn(A)	0,20	0,30	5,8-6,8	0,20-0,40	0,02	-	-	0,10	0,10-0,20	-	0,05-0,15	0,10-0,25 Zr ⁴	0,05	0,15	Remainder
EN AW-2024	EN AW-AI Cu4Mg1	0,50	0,50	3,8-4,9	0,30-0,9	1,2-1,8	0,10	-	0,25	0,15	-	-	6	0,05	0,15	Remainder
EN AW-2124	EN AW-AI Cu4Mg1 (A)	0,20	0,30	3,8-4,9	0,30-0,9	1,2-1,8	0,10	-	0,25	0,15	-	-	6	0,05	0,15	Remainder
EN AW-2030	EN AW-AI Cu4PbMg	0,8	0,7	3,3-4,5	0,20-1,0	0,50-1,3	0,10	-	0,50	0,20	-	-	0,20 Bi; 0,8-1,5 Pb	0,10	0,30	Remainder
EN AW-2031	EN AW-AI Cu2,5NiMg	0,50-1,3	0,6-1,2	1,8-2,8	0,50	0,6-1,2	-	0,6-1,4	0,20	0,20	-	-	-	0,05	0,15	Remainder
EN AW-2091	EN AW-AI Cu2Li2Mg1,5	0,20	0,30	1,8-2,5	0,10	1,1-1,9	0,10	-	0,25	0,10	-	-	0,04-0,16 Zr ¹³	0,05	0,15	Remainder

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