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# GB/T 3190-2020

Replacing GB/T 3190-2008

# Chemical Composition of Wrought Aluminum and Aluminum Alloys

变形铝及铝合金化学成分

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**Issued by: State Administration for Market Regulation;**

**Standardization Administration of the People's Republic of China.**

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# Foreword

This Standard was drafted in accordance with the rules in GB/T 1.1-2009.

This Standard serves as a replacement of GB/T 3190-2008 *Wrought Aluminum and Aluminum Alloy - Chemical Composition*. In comparison with GB/T 3190-2008, apart from editorial modifications, the main technical changes are as follows:

---Normative References are modified (see Chapter 2; Chapter 2 of Version 2008);

---In the table of International Four-digit Designations and Chemical Composition, 79 designations are added; 6 designations are deleted (see 3.1.1; 3.1.1 of Version 2008);

---In the table of Domestic Four-character Designations and Chemical Composition, 29 designations are added; Designation - 2A97 is deleted (see 3.1.1; 3.1.1 of Version 2008);

---The header of the table of International Four-digit Designations and Chemical Composition and the table of Domestic Four-character Designations and Chemical Composition is modified; eight element columns are added: “Ag”, “B”, “Bi”, “Ga”, “Li”, “Pb”, “Sn” and “V” (see 3.1.1; 3.1.1 of Version 2008);

---The control requirements for aluminum and aluminum alloy materials for packaging are added (see 3.1.5);

---The requirements for sampling are modified (see 3.2; 3.2 of Version 2008);

---The requirements for component analysis are modified (see 3.3; 3.3 of Version 2008);

---The designations and chemical compositions of inactive alloys are added (see Appendix A);

---*A Comparison Table of Previously Used Designations* is modified (see Appendix B; Appendix A of Version 2008).

This Standard was proposed by China Nonferrous Metals Industry Association.

This Standard shall be under the jurisdiction of National Technical Committee 243 on Nonferrous Metals of Standardization Administration of China (SAC/TC 243).

The drafting organizations of this Standard: Northeast Light Alloy Co., Ltd.; China Nonferrous Metals Techno-Economic Research Institute; Shandong Nanshan Aluminum Co., Ltd.; GRINM Group Corporation Limited; Xiamen Xiashun Holdings Limited; Guangdong Haomei New Materials Co., Ltd.; Xingfa Aluminum Holdings Limited; Fujian Nanping Aluminum Co., Ltd.; Southwest Aluminum (Group) Co., Ltd.;

# Chemical Composition of Wrought Aluminum and Aluminum Alloys

## 1 Scope

This Standard stipulates the chemical composition of wrought aluminum and aluminum alloys.

This Standard is applicable to aluminum and aluminum alloy processed products (sheets, strips, foils, pipes, rods, profiles, wires and forgings, etc.) manufactured by the method of pressure machining, as well as the ingots and billets used.

## 2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 7999 *Optical Emission Spectrometric Analysis Method of Aluminum and Aluminum Alloys*

GB/T 8170 *Rules of Rounding off for Numerical Values & Expression and Judgement of Limiting Values*

GB/T 16474 *Designation System for Wrought Aluminum and Aluminum Alloy*

GB/T 17432 *Methods for Sampling for Analyzing the Chemical Composition of Wrought Aluminum and Aluminum Alloys*

GB/T 20975 (all parts) *Methods for Chemical Analysis of Aluminum and Aluminum Alloys*

GB/T 27675 *Designation System for Aluminum and Aluminum Alloys Composite Sheets, Strips and Foils*

YS/T 870 *Chemical Analysis of High Purity Aluminum - Determination of Trace Impurities - Inductively Coupled Plasma Mass Spectrometry*

## 3 Requirements

### 3.1 Chemical Composition

**3.3.1** Merely conduct routine analysis on the elements specified in the values other than "Al" and "Others" in Table 2, Table 3 and Table A.1. When it is suspected that the mass fraction of non-routine analysis elements exceeds the limits of this Standard, the producer shall analyze these elements.

**3.3.2** The chemical composition analysis method in Table 2, Table 3 and Table A.1 shall comply with the stipulations of GB/T 20975, GB/T 7999 or YS/T 870. In terms of designations whose "Co" element content is less than 0.005%, or, designations whose "Al" element content is not less than 99.90%, the arbitration analysis of chemical composition shall adopt the method specified by YS/T 870. The arbitration analysis of "O" element content may also be determined through negotiation between the demand-side and the supply-side. The arbitration analysis of the remaining chemical compositions shall adopt the method specified by GB/T 20975.

**3.3.3** When calculating "the sum" of "others" in Table 2, Table 3 and Table A.1, before the summation, the various element analysis values shall be expressed to 0.XX%.

**3.3.4** In Table 2, Table 3 and Table A.1, "Al" element content which is ≥ 99.00% shall be determined through the method of calculation:

---When "Al" element content is ≥ 99.00% ~ 99.90 %, use 100.00% to minus the sum of all the routine analysis elements with a mass fraction of not less than 0.010% and non-routine analysis metal elements that are suspected of being excessive. Before the summation, the various element values shall be expressed to 0.0X%;

---When "Al" element content is > 99.90% ~ 99.99%, use 100.00% to minus the sum of all the routine analysis elements with a mass fraction of not less than 0.0010% and non-routine analysis metal elements that are suspected of being excessive. Before the summation, the various element values shall be expressed to 0.0XX%. After the summation, the sum shall be rounded off to 0.0X%;

---When "Al" element content is > 99.99%, use 100.00% to minus the sum of all the routine analysis elements with a mass fraction of not less than 0.0010% and non-routine analysis metal elements that are suspected of being excessive. Before the summation, the various element values shall be expressed to 0.00XX%. After the summation, the sum shall be rounded off to 0.00X%.

**3.3.5** The determination of analysis values shall adopt the round-off comparison method. The round-off rules of numerical values shall comply with relevant stipulations of GB/T 8170. The rounded-off digits shall be consistent with the limit digits specified in Table 2, Table 3 and Table A.1 in this Standard.

**3.3.6** The manufacturer shall conduct supervision and control analysis of the control elements in 3.1.3, 3.1,4 and 3.1.5, so as to ensure that the control elements comply

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