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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 23301-2024

Replacing GB/T 23301-2009

Cast aluminium alloys for automobile wheels

汽车车轮用铸造铝合金

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1 Scope

GB/T 23301-2024 is the Chinese material standard for the cast aluminium alloys used to make car wheels. A cast alloy wheel is a safety-critical component made by the tens of millions, and it is one of the few castings that has to survive both a fatigue life and an impact, which is why the alloy is specified separately from the wheel. The standard sets the alloy grades and their designation, the chemical composition and the limits on the impurities that matter to a casting, iron above all, the requirements on the form in which the alloy is supplied, the mechanical properties in the cast and heat treated conditions, the metallurgical quality requirements covering hydrogen content, inclusions and grain refinement and modification, the test methods including the sampling and the preparation of test bars, the inspection rules and the marking, packaging, transport and quality certificate. The 2024 edition replaces GB/T 23301-2009. For an alloy producer, a wheel foundry or a carmaker qualifying a supply in China, this is the specification.

This document specifies the grades and codes, technical requirements, test methods, inspection rules, as well as marking, quality certificates, packaging, transportation and storage of cast aluminum alloys for automobile wheels. This document applies to the production and inspection of cast aluminum alloys (including aluminum alloy liquid and aluminum alloy ingots) for automobile wheels.

2 Normative references

The provisions of the following documents constitute the essential clauses of this document

through normative references in this text. Among them, for referenced documents with dates, only the versions corresponding to the dates are applicable to this document; for referenced documents without dates, the latest versions (including all amendments) are applicable to this document.

GB/T 5611 Foundry terminology

GB/T 7999 Optical emission spectrometric analysis method of aluminum and aluminum alloys

GB/T 8063 Designation of cast nonferrous metals and their alloys

GB/T 8170 Rules of rounding off for numerical values & expression and judgment of limiting values

GB/T 15115-2024 Die casting aluminum alloys

GB/T 20975.3 Methods for chemical analysis of aluminium and aluminium alloys - Part 3: Determination of copper content

GB/T 20975.4 Methods for chemical analysis of aluminium and aluminium alloys - Part 4: Determination of iron content

GB/T 20975.5 Methods for chemical analysis of aluminium and aluminium alloys - Part 5: Determination of silicon content

GB/T 20975.7 Methods for chemical analysis of aluminium and aluminium alloys - Part 7: Determination of manganese content

GB/T 20975.8 Methods for chemical analysis of aluminium and aluminium alloys - Part 8: Determination of zinc content

GB/T 20975.12 Methods for chemical analysis of aluminium and aluminium alloys - Part 12: Determination of titanium content

GB/T 20975.16 Methods for chemical analysis of aluminium and aluminium alloys - Part 16: Determination of magnesium content

GB/T 20975.17 Methods for chemical analysis of aluminium and aluminium alloys - Part 17: Determination of strontium content

3 Terms and definitions

The terms and definitions defined in GB/T 5611 apply to this document.

4 Alloy grades and codes

4.1 Alloy grades The designation method of grades of cast aluminum alloys for automobile wheels (hereinafter referred to as aluminum alloys) shall comply with the provisions of GB/T

8063.

4.2 Alloy codes The codes of aluminum alloys are expressed as follows: reference mechanical properties.

5.3 Pinhole and density

5.3.1 The pinhole degree of aluminum alloy ingots shall not be lower than Grade 2 specified by JB/T 7946.3-2017.

5.3.2 The density of the reduced pressure solidification specimen of aluminum alloy liquid shall not be less than

5.4 Slag inclusion The slag inclusion K value of aluminum alloy shall not be greater than 0.15.

5.5 Appearance and fracture

5.5.1 The surface of the aluminum alloy ingot shall be clean and free of mildew and foreign inclusions, but slight slag inclusions and trimming marks, or slight cracks caused by pouring shrinkage are allowed.

5.5.2 The aluminum alloy liquid surface shall be clean, without obvious slag and non-metallic floating objects.

5.5.3 The fracture structure of aluminum alloy ingots shall be dense, without serious shrinkage, slag and non-metallic inclusions.

5.6 Prohibited substances The prohibited substances in aluminum alloys shall comply with the requirements of GB/T 30512.

6.1 Chemical composition

6.1.1 The chemical composition analysis method shall be in accordance with the provisions of GB/T 7999.

6.1.2 In case of any dispute over the analysis results, arbitration shall be conducted in accordance with the provisions of GB/T 20975.3, GB/T 20975.4, GB/T 20975.5, GB/T 20975.7, GB/T 20975.8, GB/T 20975.12, GB/T 20975.16, GB/T 20975.17 and GB/T 20975.21.

6.1.3 The rounding comparison method is used to determine the analytical values. The rounding of values is carried out in accordance with the provisions of GB/T 8170, and the rounding digits are consistent with the limit digits specified in Table 1.

a) Material grade or code;

b) Heat number and production batch number;

d) Manufacturer's name or trademark;

e) Date of manufacture.

8.1.2 The packaging of aluminum alloy liquid shall have the following markings. The markings shall be clear, marked in a fixed position on the insulation bag, and consistent with the content of the delivery note. Different batches of aluminum alloy liquid cannot be mixed.

a) Material grade or code;

b) Insulation bag number and production batch number;

c) Manufacturer's name or trademark;

d) Date of manufacture.

8.2 Quality certificate Each batch of aluminum alloy shall have a product certificate and quality certificate when leaving the factory. The quality certificate shall indicate:

a) Supplier name or code;