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**Aluminum alloy die forgings for
control arms of passenger vehicle**

乘用车控制臂用铝合金模锻件

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Foreword

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

This Standard was proposed by China Nonferrous Metals Industry Association.

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

Main drafting organizations of this Standard: Suzhou Nonferrous Metals Research Institute Co., Ltd., Jiangsu CNPT-Rabily Industrial Co., Ltd., Wuhu Hetian Automobile Industry Co., Ltd., China First Automobile Co., Ltd. Technology Center, Dongfeng Motor Corporation, Chongqing Changan Automobile Co., Ltd., Nonferrous Metals Technology and Economic Research Institute, Guangdong Industrial Analysis and Testing Center, National Nonferrous Metals Quality Supervision and Inspection Center.

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Aluminum alloy die forgings for control arms of passenger vehicle

1 Scope

This Standard specifies the requirements, test methods, inspection rules, marks, packaging, transport, storage, quality certificate and order (contract) of aluminum alloy die forgings for control arms of passenger vehicle.

This Standard is applicable to aluminum alloy die forgings for control arms of passenger vehicle (hereinafter referred to as the forging).

2 Normative references

The following referenced documents are indispensable for the application 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.

GB/T 231.1, *Metallic materials - Brinell hardness test - Part 1: Test method*

GB/T 3190, *Wrought aluminium and aluminium alloys - Chemical composition limits*

GB/T 3199, *Wrought Aluminium and Aluminium Alloy Products - Packing, Marking, Transporting and Storing*

GB/T 3246.1, *Inspection method for structure of wrought aluminum and aluminum alloy products Part 1: Inspection method for microstructure*

GB/T 3246.2, *Inspection method for structure of wrought aluminum and aluminum alloy products - Part 2: Inspection method for macrostructure*

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

GB/T 8545-2012, *Die forgings of aluminium and aluminium alloy - Dimensional tolerance and machining allowance*

GB/T 16865, *Test pieces and method for tensile test for wrought aluminium and magnesium alloys products*

pores, folds, segregation, aggregation and non-metallic inclusions.

4.6.3 In any section of the forging, there is no oxide film defect that is greater than 0.3 mm.

4.6.4 The cross section of the product is not allowed to have coarse recrystallization grain. The depth of the coarse recrystallization grain layer in the surface layer shall not exceed 3 mm. At the parting line, the depth of the coarse recrystallization grain layer shall not exceed 8 mm; the width shall not exceed 7 mm.

4.7 Microstructure

The microstructure is not allowed to over-burn.

4.8 Appearance quality

4.8.1 A slight bump, scratches, pressure pit, scratches and other defects are allowed.

4.8.2 The forging on the forging surface is not allowed to repair; or material shortage, peelings, bubbles, cracks, layers, stacks and other defects are not allowed.

4.9 Banned substance

The forging shall meet requirements for automobile banned substances specified in GB/T 30512.

5 Test methods

5.1 Chemical composition

The analysis method for chemical composition shall comply with GB/T 20975 or GB/T 7999. The arbitration analysis shall use the method specified in GB/T 20975.

5.2 Size deviation

The measurement of size deviation of the forging shall comply with GB/T 8545-2012.

5.3 Mechanical properties

The test method for tensile mechanical properties at room temperature shall comply with GB/T 16865.

5.4 Brinell hardness

The test method for Brinell hardness shall comply with GB/T 231.1.

5.5 Macrostructure

The test method for macrostructure shall comply with GB/T 3246.2.

5.6 Microstructure

The test method for microstructure shall comply with GB/T 3246.1.

5.7 Appearance quality

Appearance quality is visually inspected under natural scattered light. The fluorescence penetration test shall be carried out according to GB/T 18851.

5.8 Banned substance

The test method for banned substance shall be carried out according to GB/T 30512.

6 Inspection rules

6.1 Inspection and acceptance

6.1.1 The forging shall be inspected by the supplier to ensure that the product quality in line with this Standard and the order (or contract) requirements. Fill in the quality certificate.

6.1.2 The purchaser shall inspect the product received in accordance with the provisions of this Standard. When the inspection results do not comply with this Standard and the order (or contract), it shall be put forward in written form by the supplier and solved by the supplier and the purchaser via negotiation. The objection to the appearance quality and size deviation shall be put forward within one month from the date of receipt of the product. Any objection to other performance shall be put forward within 3 months from the date of receipt of the product. For arbitration, it may entrust an organization approved by the supplier and the purchaser. The sampling shall be carried out by the supplier and the purchaser at the purchaser's.

6.2 Batch

The forging shall be submitted in batch for acceptance. Each batch shall consist of the products of same designation, status and same thermal treatment furnace number. The number of each batch shall be confirmed by the supplier.

6.3 Metering

7 Mark, packaging, transport, storage and quality certificate

7.1 Mark

7.1.1 The packaging box mark of the forging shall comply with GB/T 3199.

7.1.2 On the qualified die forging, it shall print the following marks or labels:

- a) alloy designation and supply status;
- b) thermal treatment number;
- c) product's mark;
- d) batch number or date of production;
- e) the inspection seal of supplier's quality inspection department or signature (or seal) of the inspector.

7.2 Packaging

The product's packaging shall comply with GB/T 3199. Particular requirements shall be confirmed by the supplier and the purchaser via negotiation and indicated in the order (or contract).

7.3 Transport and storage

The product's transport and storage shall comply with GB/T 3199.

7.4 Quality certificate

Each batch of products shall be attached with product quality certificates, indicating:

- a) supplier's name;
- b) product's name;
- c) designation and status;
- d) furnace number, batch number, thermal treatment number and date of manufacture;
- e) weight or number of pieces;
- f) analysis inspection results of each item;