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Aluminum Alloy Die Castings

铝合金压铸件

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Aluminum Alloy Die Castings

1 Scope

This document specifies the technical requirements, test methods, inspection rules, as well as delivery, marking, packaging, transportation and storage of aluminum alloy die castings.

This document is applicable to the manufacturing and quality inspection of aluminum alloy die castings.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. 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 228.1 Metallic Materials - Tensile Testing - Part 1: Method of Test at Room Temperature

GB/T 231.1 Metallic Materials - Brinell Hardness Test - Part 1: Test Method

GB/T 1182 Geometrical Product Specifications (GPS) - Geometrical Tolerancing - Tolerances of Form, Orientation, Location and Run-out

GB/T 1958 Geometrical Product Specifications (GPS) - Geometrical Tolerance - Verification

GB/T 2828.1 Sampling Procedures for Inspection by Attribute - Part 1: Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-by-lot Inspection

GB/T 2829 Sampling Procedures and Tables for Periodic Inspection by Attributes (apply to inspection of process stability)

GB/T 3177 Geometrical Product Specifications (GPS) - Inspection of Plain Workpiece Sizes

GB/T 5611 Foundry Terminology

GB/T 6060.1 Surface Roughness Comparison Specimen - Part 1: Casting Surface

GB/T 6060.3 Surface Roughness Comparison Specimen - Part 3: Spark-eroded, Shot-blasted, Grit-blasted, Lapped, Filed and Polished Surface

GB/T 6414 Castings - Dimensional Tolerances and Geometrical Tolerances and Machining Allowances

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

5 Test Methods

5.1 Chemical Composition

The inspection methods for the chemical composition shall comply with the stipulations of GB/T 7999, GB/T 20975.3, GB/T 20975.4, GB/T 20975.5, GB/T 20975.7, GB/T 20975.8, GB/T 20975.10, GB/T 20975.11, GB/T 20975.12, GB/T 20975.14, GB/T 20975.16 and GB/T 20975.17. Under the condition that the accuracy of analysis is guaranteed, other methods are allowed to be used.

5.2 Mechanical Properties

5.2.1 The tensile test of aluminum alloy die casting shall be carried out in accordance with the stipulations of GB/T 228.1.

5.2.2 The hardness test of aluminum alloy die casting shall be carried out in accordance with the stipulations of GB/T 231.1.

5.2.3 When aluminum alloy die casting requires an inspection of its own body, the sampling location, specimen size and test method shall be determined by the demand-side and the supply-side through negotiation.

NOTE 1: when sampling the body of aluminum alloy die casting, avoid damaging the surface dense layer of the specimen. After destroying the dense layer, the mechanical properties of the specimen will generally decrease significantly.

NOTE 2: when aluminum alloy die casting, which belongs to structural part, is subject to sampling of its own body for the test of mechanical properties, the die cast test bars shall be used for the functional part as a reference for material properties.

NOTE 3: the surface hardness of the test piece and the hardness test result at the center of the cross-section will generally be significantly different. The demand-side and the supply-side shall determine the test location through negotiation, so as to avoid disputes.

NOTE 4: there are also generally large differences in the mechanical properties between the inlet pouring gate end and the filling end of aluminum alloy die casting.

5.3 Dimensions

5.3.1 The inspection of geometric dimensions of aluminum alloy die casting shall comply with the stipulations of GB/T 3177.

5.3.2 The inspection of geometric tolerances of aluminum alloy die casting shall comply with the stipulations of GB/T 1958.

5.3.3 Use general or special-purpose measuring instruments that satisfy the accuracy for inspection.

6.4.5 If any product is disqualified in the random inspection of surface quality, the batch shall be determined as disqualified.

6.4.6 If any product is disqualified in the random inspection of internal quality, the batch shall be determined as disqualified.

7 Delivery, Marking, Packaging, Transportation and Storage

7.1 Exit-factory Inspection Report

When it is required in the contract or agreement, the supply-side shall submit an inspection report to the demand-side. The inspection report shall at least provide the following contents:

- a) Report name, serial No., test method and test conditions;
- b) All necessary information out sample identification, testing organization, analysis date and report date, etc.;
- c) Express test results and test times in an appropriate form;
- d) Abnormal phenomena that occur during the test;
- e) Signature or seal of the auditor and approver.

7.2 Certificate

When aluminum alloy die casting is delivered, it shall be accompanied by an inspection certificate. The specific content and format of the certificate shall be determined by the demand-side and the supply-side through negotiation.

7.3 Product Marking

7.3.1 Aluminum alloy die casting shall have the following marks cast or engraved on the non-machined surface:

- a) Designation of raw material;
- b) Part No.;
- c) Trademark or symbol of the supply-side;
- d) Year, month and mold No. of manufacturing;
- e) Other marks specified by the demand-side.

7.3.2 When the demand-side has special requirements, they shall be determined by the demand-side and the supply-side through negotiation.

7.4 Packaging Marks

The outer packaging of aluminum alloy die casting shall have the following marks:

- a) Part No.;
- b) Product code;
- c) Packaging quantity and date;
- d) Traceability information exclusive to the internal system;
- e) Trademark or symbol of the supply-side;
- f) Serial No. of this document;
- g) Other requirements specified by the demand-side.

7.5 Packaging

The packaging of aluminum alloy die casting shall be firm and reliable, and shall not be damaged or broken during transportation and handling. The packaging of export products shall comply with the packaging requirements for export commodities.

7.6 Transportation

During transportation, aluminum alloy die casting shall comply with the stacking requirements and are strictly prohibited from being exposed to rain, moisture, throwing and violent collisions.

7.7 Storage

Aluminum alloy die casting shall be stored in a dry, well-ventilated warehouse without harmful gases, and cannot be stored together with acids, alkalis or other corrosive chemicals.

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