

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

JT/T 1304-2019

**Technical specification of aluminum centrifugal pumps for
cavitation corrosion characteristics test with engine coolants**

发动机冷却液气穴腐蚀特性试验用铝制离心泵技术条件 清晰版

(English Translation)

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Foreword

This standard is in accordance with GB/T Draft the rules given in 1-2009.

This standard was proposed and managed by the National Technical Committee for Automobile Maintenance Standardization (SAC/TC 247).

This standard was drafted. Highway Research Institute of the Ministry of Transport, Beijing Zhonggong Gaoyuan Automobile Test Co., Ltd., Tianjin Product Quality Institute of Supervision and Testing Technology, Tianjin University of Technology, Tianjin Lobel Instrument Co., Ltd., Unipec Petrochemical Co., Ltd., Dongfeng Commercial Vehicle Limited company technology center.

1 Scope

This standard specifies the technical requirements and test methods of aluminum centrifugal pumps for testing the cavitation corrosion characteristics of engine coolant.

This standard applies to the production and inspection of aluminum centrifugal pumps for testing the cavitation corrosion characteristics of engine coolant.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article Pieces. For undated references, the latest version (including all amendments) applies to this document.

GB/T 3216 Acceptance test for hydraulic performance of rotary power pump Class 1, Class 2 and Class 3 GB/T 6682 Analytical laboratory water specifications and test methods GB/T 2075 (all parts) Methods for chemical analysis of aluminum and aluminum alloys GB/T 29531 Pump vibration measurement and evaluation method SH/T 0087 Test Method for Cavitation Corrosion of Engine Coolant Aluminum Pumps

3 Terms and definitions

The following terms and definitions apply to this document.

Pump cover pump

Aluminum casting used to assemble with the pump body to form the internal flow channel.

Pump body

Aluminum castings used to install transmissions, mechanical seals and other components.

Impeller blade

The aluminum casting is driven by the prime mover to make the pumped liquid flow in a fixed direction.

Pump characteristic curve pump capacity curve the curve used to describe the relationship between the flow and the head of a pump at a certain speed.

4 Technical requirements

4.1

Overall structure the aluminum centrifugal pump (hereinafter referred to as "aluminum pump") for the test of engine coolant cavitation corrosion characteristics consists of a pump cover, a pump body, an impeller, a gasket, a shaft, it consists of flanges and other parts. The typical structure is shown in Figure 1.

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Explanation.

1 --- impeller; 4 --- pump cover;

2 --- pump body; 5 --- gasket;

3 --- shaft; 6 --- connecting flange.

Figure 1 Typical structure of aluminum pump

4.2

Material

The main parts of the aluminum pump (pump cover, pump body and impeller) are made of aluminum alloy, and the chemical composition should meet the requirements in Table 1.

Table 1 Chemical composition of pump cover, pump body and impeller

Chemical composition (mass fraction) (%) Element Si Fe Cu Cu Mg Ni Zn Sn Al Content 9. 6 to 12. 0 ≤ 1. 3 1. 5 to 3. 5 ≤ 0. 5 ≤ 0. 3 < 0. 5 ≤ 1. 0 ≤ 0. 3 balance 4.3 main dimensions

4.3.1

The outer diameter of the aluminum pump impeller is $100\text{mm} \pm 0.2\text{mm}$, 6 blades are evenly distributed on the impeller.

4.3.2

The inner diameter of the water inlet of the aluminum pump is $33\text{mm} \pm 0.5\text{mm}$.

4.3.3

The dimensions of the aluminum pump cover and the outer dimensions of the pump are shown in Figures 2 and 3.

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In millimeters

Figure 2 Dimensions of Aluminum Pump Cover

In millimeters

Figure 3 Outside dimensions of aluminum pump

4.4

Appearance

The casting surface of the aluminum pump must not have obvious defects such as holes and cracks that affect the appearance and strength of the product.

4.5

working performance

4.5.1

Hydraulic performance Under the condition that the speed of the aluminum pump is $4600\text{r/min} \pm 100\text{r/min}$, the third grade water specified in GB/T 6682 is used as the test medium to carry out the water in the force performance test, the obtained flow and head tolerance coefficients shall meet the requirements in Table 2. Hydraulic performance test measurement point is not less than 5 Read out the aluminum pump characteristic curve (Figure 4).

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Table 2 Hydraulic performance requirements of aluminum pumps

Project tolerance factor Flow rate (m^3/h) within $\pm 10\%$ of reference value Head (m) within $\pm 8\%$ of reference value

Figure 4 Characteristics of aluminum pump

4.5.2

Vibration speed when the aluminum pump is operated within the working conditions, the vibration speed (root mean square value) should be lower than 7.1 mm/s.

4.5.3

Water pressure resistance the aluminum pump is subjected to a hydraulic pressure test of (200 ± 5) kPa, which is maintained for 10 min, and there should be no leakage.

4.6

Other requirements

4.6.1

Aluminum pump shaft seals use reliable sealing components. No leakage or seizures should occur during the test.

4.6.2

EPDM rubber or asbestos material should be selected for the aluminum pump gasket. During the test, ensure that the seal is intact and there is no leakage.

4.6.3

The aluminum pump shall be able to meet the test conditions specified in SH/T 0087.

5 Test method

5.1

The chemical composition of the aluminum pump material is analyzed in accordance with the method specified in GB/T 2075.

5.2

The hydraulic performance of the aluminum pump is tested in accordance with the method specified in GB/T 3216.

5.3

The vibration speed of the aluminum pump is tested in accordance with the method specified in GB/T 29531.

5.4

The hydraulic pressure resistance test is performed on a dedicated hydraulic pressure test bench with an accuracy of not less than 1.5 level, 400 kPa pressure gauge. Test medium is the third-grade water specified in GB/T 6682, and the holding time is 10 min. Check for leaks.

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