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

**GB/T 8491-2026**

Replacing GB/T 8491-2009

**Corrosion resistant high silicon iron castings**

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### 4 Brand

The designation method for high-silicon corrosion-resistant cast iron and its castings shall comply with the provisions of GB/T 5612, and is divided into 9 grades, as shown in Table

1.High-silicon corrosion-resistant... For the performance, applicable conditions, and application examples of etched cast iron, please refer to Appendix A.

### 5 Manufacturing Method

5.1 Unless otherwise specified, the smelting method and casting process shall be determined by the supplier.

5.2 High-silicon cast iron parts can be supplied in the as-cast state. For complex structures, parts with large wall thickness deviations, or critical components, stress-relief annealing should be performed. Supply Status The terms are agreed upon by both the supply and demand parties.

5.3 The heat treatment methods for castings are detailed in Appendix B.

## 6 Technical Requirements

6.1 Chemical composition The grade and corresponding chemical composition of high-silicon corrosion-resistant cast iron parts shall conform to the provisions of Table 1.

### 6.2 Mechanical Properties

6.2.1 The mechanical properties of high-silicon corrosion-resistant cast iron parts are generally not used as acceptance criteria; however, if the purchaser requires them, test bars should be prepared according to the requirements of both the supplier and the purchaser. Bending tests shall be conducted at the agreed frequency and number to determine its bending strength and deflection, and the test results shall conform to the provisions of Table 2.

6.2.2 The hardness requirements for high-silicon corrosion-resistant cast iron parts shall be agreed upon by the supplier and the buyer. Table 2 lists the reference values for the hardness of heat-resistant cast iron.

6.3 Geometric shape and dimensions The geometry and dimensions of the castings shall conform to the specifications in the buyer's drawings or purchase order. Unless otherwise specified, the geometry and dimensions of the castings shall conform to the specifications in the purchase order. The tolerance should be selected according to the appropriate tolerance grade specified in GB/T 42124.3.

Note. High-silicon corrosion-resistant cast iron is a relatively brittle metallic material, and its castings have no sharp angles or abrupt cross-sectional transitions in their structural design.

6.4 Weight The weight tolerance of castings shall conform to the specifications in the drawings or purchase order. Unless otherwise specified, the weight tolerance grade of castings shall be as follows: GB/T 11351 specifies the selection of appropriate tolerance grades.

### 6.5 Surface Quality

6.5.1 The surface roughness of the casting shall conform to the specifications in the drawings or purchase order. If the specifications are not specified in the drawings or purchase order, the surface roughness of the casting shall conform to the specifications in the purchase order. The degree should conform to the corresponding value specified in GB/T 6060.1.

6.5.2 Castings should be thoroughly cleaned and excess parts trimmed. Permissible levels of gating and riser residue, burrs, roughness, and internal cavity cleanliness in castings should conform to the drawings. As stipulated in the sample or order contract.

6.5.3 Castings shall be free from cracks and casting defects that reduce strength, affect corrosion resistance, or impair the product's appearance. The buyer shall have magnetic particle inspection performed on the castings. For testing and penetration testing requirements, the supplier shall conduct the testing in accordance with the buyer's requirements and meet the corresponding technical requirements.

6.5.4 The permissible casting defects on the surface of the casting, their shape, quantity, size and location, and repair methods shall be agreed upon by the supplier and the buyer.

## 6.6 Internal Quality

6.6.1 There should be no cracks inside the casting. The types, ranges, quantities and sizes of defects that are allowed inside the casting shall be agreed upon by the supplier and the buyer.

6.6.2 If the buyer requires radiographic testing or other similar tests on the castings, the supplier shall conduct the tests in accordance with the buyer's requirements and ensure that the tests meet the corresponding technical requirements.

6.7 Leakage When a leakage test is required for castings, it should be specified in the drawings or purchase contract. The leakage test can be conducted using room temperature clean water for a water pressure test. No special requirements. For special requirements, the test pressure should be

1.5 times the working pressure, with a minimum test pressure of

0.275 MPa, and the pressure holding time should be no less than 10 minutes. Leaks or sweating should occur.

6.8 Corrosion Resistance Unless otherwise specified, the corrosion resistance of high-silicon corrosion-resistant cast iron is generally not used as an acceptance criterion. However, if the buyer requires otherwise, corrosion resistance must be specified. The demand shall be agreed upon by both the supply and demand parties.

## 7.1 Chemical Composition Analysis

7.1.1 Chemical composition analysis can be performed using conventional chemical analysis methods or spectroscopic analysis methods. Sampling methods for conventional chemical analysis shall conform to GB/T 20066. The regulations shall be followed, and the spectral sampling method shall be in accordance with GB/T 5678 or GB/T 14203. The specific method shall be determined through negotiation between the supplier and the buyer. When there is a dispute over the analytical results, chemical analysis shall be used for arbitration.

7.1.2 Routine chemical analysis for the determination of carbon, silicon, manganese, sulfur, phosphorus, chromium, molybdenum, and copper shall be performed according to GB/T

20123 or GB/T 223.69, respectively. GB/T 223.60, GB/T 223.58 or GB/T 223.64, GB/T 223.68, GB/T 223.3 or GB/T 223.59, GB/T 223.11 or The specifications shall be followed as provided in GB/T 223.12, GB/T 223.26, GB/T 223.28, GB/T 223.18, or GB/T 223.19. Accuracy shall be met. Under the premise of [the above], other methods can also be used.

7.1.3 Spectroscopic analysis shall be performed in accordance with the provisions of GB/T 14203 and GB/T 24234.

## **7.2 Mechanical property test**

7.2.1 The bending strength and deflection tests shall be performed in accordance with the provisions of JB/T 7945.2.

7.2.2 Hardness testing shall be performed in accordance with the provisions of GB/T 231.1.

7.3 Geometric shape and dimensional inspection The geometric and dimensional tolerances of castings shall be inspected using measuring instruments of appropriate precision.

7.4 Weight Tolerance Inspection The inspection of casting weight tolerance shall be carried out in accordance with the provisions of GB/T 11351.

## **7.5 Surface quality inspection**

7.5.1 The surface roughness inspection of castings shall be carried out in accordance with the provisions of GB/T 15056.

7.5.2 The appearance quality of castings shall be inspected by visual inspection and by measuring instruments, gauge blocks, templates or scribing of corresponding accuracy.

7.5.3 Magnetic particle testing shall be performed in accordance with the provisions of GB/T 9444.

7.5.4 Penetrant testing shall be performed in accordance with the provisions of GB/T 9443.

7.6 Internal Quality Inspection Internal quality inspection shall be carried out in accordance with the provisions of GB/T 5677.

7.7 Leakage Inspection Leakage testing shall be conducted in accordance with the provisions of GB/T 13927.

7.8 Corrosion Resistance Test The corrosion resistance test shall be carried out in accordance with the provisions of GB/T 19291, and the removal of corrosion residues shall be carried out in accordance with the provisions of GB/T 16545.

## **8.1 Inspection and Acceptance**