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

GB/T 12230-2023

Replacing GB/T 12230-2005

**General purpose industrial valves - Specification of stainless
steel castings**

通用阀门 不锈钢铸件技术条件

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1 Scope

GB/T 12230-2023 is the Chinese national standard on general purpose industrial valves - specification of stainless steel castings, in the field of fluid systems and general-purpose components. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification

calls it up - which in practice is how most foreign buyers meet it. It was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 December 2023. Classification: ICS 23.060.01, CCS J16. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document specifies the technical requirements, test methods and inspection rules, marking and quality certificate, and additional requirements for stainless steel castings of general purpose valves. This document applies to austenitic stainless steel castings for pressure purpose. Austenitic stainless steel castings not for pressure purpose can use this as a reference.

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 222 Permissible tolerances for chemical composition of steel products

GB/T 228.1 Metallic materials - Tensile testing - Part

4 Technical requirements

4.1 Smelting The smelting of castings shall be carried out in an electric furnace or a refining furnace, such as an argon oxygen decarburization furnace (AOD).

4.2 Casting process and evaluation

4.2.1 Casting process The casting process shall be evaluated and qualified before being used in mass production of castings.

4.2.2 Casting process evaluation

4.2.2.1 Casting process evaluation shall be carried out in the following cases.

- a) the first production of the mold;
- b) major changes in the casting process design, such as the gate and riser system;
- c) changes in production process conditions, such as site, smelting equipment, etc.;
- d) casting defects related to process design are found in mass production.

4.2.2.2 The casting process evaluation report shall at least include the following.

- a) casting process design documents;
- b) heat treatment records or reports;
- c) chemical composition and mechanical properties test reports;
- d) dimensional inspection report;
- e) appearance inspection report;
- f) penetrant testing report;
- g) radiographic testing report. completely removed during machining, and the internal cooling iron shall not change the material of the casting and cause cracks.

4.9 Shell test The acceptance criteria for shell test shall comply with the provisions of GB/T 13927 or GB/T 26480.

4.10 Repair welding

4.10.1 Repair welding of castings shall be carried out in accordance with the evaluated welding process specifications, and the welding process evaluation shall be carried out in accordance with NB/T 47014.

4.10.2 Welders who repair castings shall pass the examination and hold the corresponding qualification certificate in accordance with the requirements of GB/T 15169.

4.10.3 The repair welding area and its heat affected zone after repair welding shall be inspected, and the acceptance criteria shall not be lower than the requirements of castings.

4.10.4 The following repair welding is a major repair welding.

- a) the depth of the pit to be repaired exceeds 20 % of the wall thickness of the casting or 25 mm, whichever is smaller;
- b) the area to be repaired is greater than 65 cm².

5.1 Chemical composition analysis

5.1.1 Smelting analysis Each smelting heat number shall be subjected to smelting chemical composition analysis, and samples shall be taken during the pouring process. The sampling method shall comply with the provisions of GB/T 20066 or GB/T 5678. The chemical analysis method shall comply with the provisions of Table 7 in GB/T 16253-2019. The chemical composition analysis results shall comply with the provisions of Table 1.

5.1.2 Finished product analysis Take representative samples from each heat number, each batch or each casting for chemical composition analysis. The sampling method and chemical analysis method shall comply with the provisions of 5.1.1. The allowable deviation of finished product analysis shall comply with the provisions of GB/T 222.

5.2 Mechanical properties test

5.2.1 Test coupon The test coupon shall comply with the provisions of

3.7 in GB/T 16253-2019.

5.2.2 Tensile test The room-temperature tensile test method and specimens shall comply with the provisions of GB/T 228.1. For castings of the same smelting heat number and the same heat treatment batch number, one specimen shall be taken for tensile test, and the test results shall comply with the provisions of Table 2.

5.2.3 Retest

5.2.3.1 If the room-temperature tensile test results do not comply with the provisions of Table 2 due to the following reasons, the test results are invalid. Take another specimen from the same test coupon or another test coupon of the same heat number for test, and the test results shall comply with the provisions of Table 2.

- a) the specimen is defective or the testing machine does not function properly.
- b) the specimen has processing defects.
- c) the tensile specimen is broken outside the gauge length.

5.2.3.2 When the room-temperature tensile test results do not comply with the requirements of Table 2 and are not the cases listed in 5.2.3.1, it can take two specimens from the original test coupon or another test coupon of the same furnace for test. The test results of the two specimens shall comply with the provisions of Table 2.

5.2.4 Reheat treatment When the room-temperature tensile test or retest results do not meet the requirements of Table 2, it is allowed to reheat the castings and test coupons for test. Reheat treatment shall not exceed two times. The test results after reheat treatment shall meet the requirements of Table 2.

5.3 Dimension inspection Dimension inspection can be measured by tools such as calipers.

5.4 Appearance inspection Visually inspect the inner and outer surfaces of the castings. The surface roughness assessment method shall comply with the provisions of GB/T 15056.

5.5 Shell test Shell test method shall comply with the provisions of GB/T 13927 or GB/T 26480.

6.1 Marking

6.1.1 The castings shall be marked in the form of cast characters. The content, position and size of the cast characters shall comply with the drawing requirements of the purchaser.