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Replacing GB/T 12225-2005

General Purpose Industrial Valves - Specification of Copper Alloy Castings

通用阀门 铜合金铸件技术条件

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Standardization Administration Committee of the People's Republic of China.

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Foreword

This Standard is drafted in accordance with stipulations in GB/T 1.1-2009.

This Standard serves as a replacement of GB/T 12225-2005 General Purpose Industrial Valves - Specification of Copper Alloy Castings. In comparison with GB/T 12225-2005, there are several main technical changes as follows:

---Copper alloy nameplates ZCuZn31Al2 and ZCuAl9Fe4Ni4Mn2 are added;

---In mechanical properties, Brinell hardness complies with a new method of representation;

---The illustration of sample for tensile test is modified in accordance with GB/T 228.1;

---The marking of castings is modified in accordance with GB/T 12220.

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee (188) on Valves of Standardization Administration of China (SAC/TC 188).

The responsible drafting organizations of this Standard: Hefei General Machinery Research Institute, Ningbo AMICO Copper Valves Manufacturing INC., Zhejiang WANDEKAI Fluid Equipment Science and Technology Co., Ltd., Zhejiang DunAn Valve Applications Co., Ltd., KAIRUITE Valve Co., Ltd.

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The release of previous versions of the standard replaced by this Standard is as follows:

---GB/T 12225-1989, GB/T 12225-2005.

General Purpose Industrial Valves - Specification of Copper Alloy Castings

1 Scope

This Standard specifies the classification, nameplate, marking method and code, technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of copper alloy castings.

This Standard is applicable to valves of sand casting and metal casting (non-pressure casting) and copper alloy castings of pipe fittings (hereinafter referred to as castings).

2 Normative References

The following documents are indispensable to the application of this Standard. In terms of references with a specified date, only versions with a specified date are applicable to this Standard. The latest version (including all the modifications) of references without a specified date is also applicable to this Standard.

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 1176 Casting Copper and Copper Alloys

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

GB/T 11351 Mass Tolerances of Casting

GB/T 13927 Pressure Testing for General Purpose Valves

3 Casting Classification

Castings shall be divided into four grades. Please refer to Table 1 for the grade classification and assessment requirement.

Table 1 -- Casting Assessment Requirement

Casting Grade	Assessment Requirement
I	Chemical composition, mechanical properties
II	Mechanical properties

welding or other methods. However, they shall comply with the drawings or the stipulation in the contract of ordering. The pressure-containing parts shall satisfy the test requirement of the shell body.

6 Test Methods and Inspection Rules

6.1 Chemical Composition

6.1.1 The determination of chemical composition of castings shall comply with the stipulation in GB/T 1176. However, on the premise of guaranteeing the accuracy, other methods that are approved by the demand side and the supply side are also allowed to be adopted for determination.

6.1.2 The same time of processing the same type of products shall be deemed as one shift; the quantity of the same type of products that are completed through successive processing shall be deemed as one batch. In terms of Grade-I and Grade-III castings, the main chemical composition and impurity content of materials shall be tested in accordance with each smelting furnace number. However, under the circumstance where the raw materials and technologies are stable, products are allowed to be tested in accordance with the shift or batch. However, there shall be test pieces for retrospective inspection. Products can also be tested in accordance with the requirements in the contract of ordering based on the negotiation between the demand side and the supply side; the result of analysis shall comply with the stipulation in Table 3 and Table 4.

6.1.3 In terms of Grade-I and Grade-III castings, when the materials are deemed as unqualified in the first determination of chemical composition, they are allowed to be re-sampled and re-tested. If the materials are still unqualified, the chemical composition of this furnace (batch) of castings shall be deemed as unqualified.

6.2 Mechanical Properties

6.2.1 The mechanical properties of alloy of Grade-I and Grade-II castings shall be tested in accordance with each smelting furnace number. However, under the circumstance where the raw materials and technologies are stable, products are allowed to be tested in accordance with the shift or batch. In addition, products can also be tested in accordance with the requirements in the contract of ordering based on the negotiation between the demand side and the supply side.

6.2.2 The tensile test shall be conducted in accordance with the stipulation in GB/T 228.1. Its result shall comply with the stipulation in Table 5.

6.2.3 The hardness test shall adopt the method that is stipulated in GB/T 231.1. Its result shall comply with the stipulation in Table 5.

6.2.4 Take 1 test piece from each furnace number (batch) for test; when it is qualified,

the mechanical properties of the materials of this furnace number (batch) of castings shall be qualified; when it is unqualified, take another 2 test pieces for test. If both of the 2 test pieces are qualified, then, this furnace number (batch) of castings have qualified mechanical properties.

6.2.5 When casting materials are unqualified in the mechanical properties, it is allowable to conduct thermal treatment on the castings and the test pieces (test bars) and conduct the test again in accordance with the stipulation in 6.2.4. Re-thermal treatment cannot be conducted for over two times.

6.2.6 When separated test piece is unqualified, take a sample from the casting body and re-test in accordance with the stipulation in 6.2.4.

6.2.7 When it is impossible to take a test piece from the castings, cut a flat test piece in accordance with the stipulation in GB/T 228.1. The location of the sampling can be negotiated and determined by the demand side and the supply side.

6.2.8 When defects on test pieces lead to disqualification in the test, this test shall be deemed as invalid, and another test shall be conducted. If the test pieces are taken from the casting body, it shall be determined that the castings are unqualified in the mechanical properties.

6.3 Shell Test

6.3.1 The shell test of the castings shall comply with the stipulation in GB/T 13927.

6.3.2 The shell test of the castings can be conducted before the casting manufacturer's delivery of the products or after the demand side's machining or comply with the stipulation in the contract of ordering. However, the casting manufacturer shall be responsible for the quality of castings in the shell test.

7 Marking, Packaging, Transportation and Storage

7.1 Pressure-containing castings, such as valve body and bonnet, shall cast out nominal dimension (DN) or (NPS), nominal pressure (PN) or pressure class (Class), manufacturer's name or trademark, material code number and furnace (batch) number. When it is difficult to cast out the marks, it is allowable to adopt the method of embossing for marking. At least the nominal dimension, nominal pressure, and the manufacturer's name or trademark shall be marked, or as stipulated in the contract of ordering.

7.2 In terms of castings that have gone through welding repair, apparent markings shall be left during the manufacturing process. Pay attention to this during the inspection. The welding repair of pressure-containing castings shall be recorded and based on the demand side's consent.

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