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Abrasion-resistant white iron castings

抗磨白口铸铁件

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Abrasion-resistant white iron castings

1 Scope

This Standard specifies terms and definitions, designations, technical requirements, test methods, inspection rules, marks, storage, packaging and transportation of abrasion-resistant white iron castings with Cr and Ni and abrasion-resistant white iron castings with Cr.

This Standard applies to abrasion-resistant parts in metallurgy, building materials, electric power, construction, shipbuilding, coal, chemical and machinery industries.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 223.11, *Iron, steel and alloy -- Determination of chromium content -- Visual titration or potentiometric titration method*

GB/T 223.18, *Methods for chemical analysis of iron steel and alloy -- The sodium thiosulfate separation iodometric method for the determination of copper content*

GB/T 223.23, *Iron, steel and alloy -- Determination of nickel content -- The dimethylglyoxime spectrophotometric method*

GB/T 223.26, *Iron, steel and alloy -- Determination of molybdenum content -- The thiocyanate spectrophotometric method*

GB/T 223.59, *Iron, steel and alloy -- Determination of phosphorus content -- Bismuth phosphomolybdate blue spectrophotometric method and antimony phosphomolybdate blue spectrophotometric method*

GB/T 223.60, *Methods for chemical analysis of iron, steel and alloy - The perchloric acid dehydration gravimetric method for the determination of silicon content*

GB/T 223.64, *Iron, steel and alloy -- Determination of manganese content -- Flame atomic absorption spectrometric method*

GB/T 223.67, *Iron, steel and alloy -- Determination of sulfur content -- Methylene blue spectrophotometric method*

GB/T 223.69, *Iron, steel and alloy -- Determination of carbon contents -- Gas-volumetric method after combustion in the pipe furnace*

GB/T 230.1, *Metallic materials -- Rockwell hardness test -- Part 1: Test method*

GB/T 231.1, *Metallic materials -- Brinell hardness test -- Part 1: Test method*

GB/T 5611, *Foundry terminology*

GB/T 5612, *Code for representing cast iron*

GB/T 6060.1-1997, *Roughness comparison specimens. Cast surfaces*

GB/T 6414-1999, *Castings. System of dimensional tolerances and machining allowances*

GB/T 11351-1989, *Mass tolerances for castings*

GB/T 15056, *Casting surface roughness -- Appraising method*

GB/T 20066, *Steel and iron -- Sampling and preparation of samples for the determination of chemical composition*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 5611 as well as the followings apply.

3.1 abrasion-resistant white iron

White iron that the metallographic structure is a metal matrix plus carbides, and has good wear resistance.

3.2 abrasion-resistant white iron with Cr and Ni

Abrasion-resistant white cast iron with nickel and chromium as the main alloy elements.

3.3 abrasion-resistant white iron with Cr

Abrasion-resistant white cast iron with chromium as the main alloying element.

4 Designations

According to the chemical composition of abrasion-resistant white iron, 10 designations

supplier and purchaser.

5.6.3 The surface roughness of castings shall comply with the specifications in the drawing or order contract. If there is no stipulation in the drawing or order contract, the surface roughness of the casting shall meet the requirements of level Ra25 in GB/T 6060.1-1997.

5.7 Dimensional and weight tolerances

The geometry, dimensions, weight and deviations of the castings shall comply with the drawings or ordering contract. If there is no stipulation in the drawing and order contract, the dimensional deviation of castings shall meet the requirements of level CT11 in GB/T 6414-1999; the weight deviation of castings shall meet the requirements of level MT11 in GB/T 11351-1989.

5.8 Defect cleaning

During the cleaning and treatment of casting defects in castings, flame cutting, arc gouging cutting, electric welding cutting and welding repair are not allowed.

6 Test methods

6.1 The analysis method of chemical composition shall be in accordance with GB/T 223.69, GB/T 223.60, GB/T 223.64, GB/T 223.11, GB/T 223.26, GB/T 223.23, GB/T 223.18, GB/T 223.67, GB/T 223.59. Modern instrumental analysis methods such as spectroscopic analysis can also be used.

6.2 Rockwell hardness test is carried out in accordance with GB/T 230.1. Brinell hardness test is carried out in accordance with GB/T 231.1.

6.3 Surface roughness inspection methods are carried out in accordance with GB/T 6060.1 and GB/T 15056

6.4 For casting geometric shape and dimensional inspection, inspection tools, gauge blocks, templates or scribing inspection with corresponding accuracy shall be selected.

7 Inspection rules

7.1 Inspection location and time

7.1.1 The inspection location shall be agreed upon by both parties. Inspection shall generally be carried out on the supplier's location. Inspection samples can be selected at the supplier's factory.

7.1.2 According to the agreement between the two parties, the supplier and the

purchaser agree on the inspection date. During inspection at the supplier's location, if the purchaser's representative does not arrive at the agreed time, in order to avoid interruption of the manufacturing cycle, the supplier may conduct its own inspection and submit the inspection results to the demander, unless expressly prohibited.

7.2 Inspection rights and responsibilities

7.2.1 Inspection of castings and specimens is generally carried out by the supplier's inspection department.

7.2.2 When the supplier does not have the necessary inspection means, or when there is a dispute between the supplier and the purchaser about the quality of the casting, the inspection can be conducted by a third-party independent agency.

7.2.3 Representatives of the purchaser have the right to enter the location where castings, test blocks, and specimens to be inspected are manufactured and stored, and may designate samples to be selected in accordance with regulations. They have the right to participate in sample selection and preparation and inspection of castings, test blocks, specimens, but shall not interfere with the supplier's work procedures. Supplier's safety procedures shall be followed. Be accompanied by supplier representatives whenever possible. At the same time, the supplier's intellectual property rights shall be respected and the supplier's technical secrets shall be kept confidential.

7.3 Division of inspection lots

Inspection lots are divided into the following three types. Specific requirements shall be agreed upon by both supply and demand parties.

7.3.1 Batch by heat: Castings of the same type, poured from the same heat, and subjected to the same heat treatment in the same furnace are considered a batch.

7.3.2 Batch by quantity or weight: Castings of the same designation cast in multiple heats under the condition of stable smelting process and heat treated by the same process in multiple heats are classified into a batch with a certain number or weight of castings.

7.3.3 Batch by piece: It refers to certain castings that have special technical requirements, with one or several pieces as a batch.

7.4 Chemical composition inspection

7.4.1 When smelting in an electric furnace, each furnace is considered a batch. When cupola furnace is used for smelting, every 2 h is considered as a batch. Take one specimen from each batch for chemical composition inspection. The sampling and preparation methods of specimens for chemical composition determination shall be carried out in accordance with the provisions of GB/T 20066. When taking chips, they shall be taken below 6 mm from the casting surface.

7.4.2 If the chemical composition test result is unqualified, double sampling and retesting will be required. If there is still one sample that is unqualified, the batch of castings will be unqualified.

7.5 Hardness inspection

7.5.1 Hardness inspection is performed on a batch-by-batch basis. Randomly select 3 pieces (or 3 test blocks) from each batch for inspection. If one piece fails, the same number of castings (test blocks) can be randomly selected for re-inspection. When the number of unqualified castings (test blocks) sampled twice is greater than or equal to 2, the batch of castings is deemed unqualified. If 2 pieces (test blocks) are unqualified in the first sampling, the batch of castings will be deemed unqualified. When batching by piece, the sampling method shall be agreed upon by both parties.

7.5.2 Surface hardness shall be tested 2 mm~3 mm below the casting surface. The surface hardness test site is selected from the main wear site of the casting. When it is difficult to test the hardness on the casting body, the surface hardness can also be tested on the cast test block attached to the casting body. The attached cast test block shall not be separated from the casting body before completing any required heat treatment. If the purchaser does not put forward special requirements, the location and size of the attached cast test block shall be determined by the supplier. The sampling and inspection method for testing the hardness at 40% of the casting section depth is determined by the supplier. The hardness test surface must be produced by machining, wire cutting or EDM technology, but the wire cutting or EDM machined surface must also be machined to remove the heat affected zone.

7.5.3 When the hardness test of heat-treated castings fails, the batch of castings and test blocks are allowed to be heat-treated again. Then carry out the hardness test required by the standard. If the hardness test passes after re-heat treatment, the batch of castings is still qualified. However, without the consent of the purchaser, it is not allowed to reheat the castings and test blocks more than twice (except for stress relief heat treatment).

7.6 Surface quality inspection

The surface quality of castings shall be inspected piece by piece in accordance with the requirements of 5.6.

7.7 Dimension and weight inspection

The size and weight deviation of castings can be inspected piece by piece according to the requirements of 5.7 or randomly inspected according to the method agreed between the supplier and the purchaser.

7.8 Rounding of test results

The test results of chemical composition and hardness can be revised according to the

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