GB

NATIONAL STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.80

J 31

GB/T 14408-2014

Replacing GB/T 14408-1993

Low alloy steel castings for general engineering and structural purposes

一般工程与结构用低合金钢铸件

Issued on: May 06, 2014 **Implemented on: December 01, 2014**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;

Standardization Administration of the People's Republic of China.

Table of contents

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 14408-1993 “Low alloy steel castings for general engineering and structural purposes”. As compared with GB/T 14408-1993, the main technical changes of this standard are as follows:

- MAKE major change in the structure; CANCEL the Appendix A from the original standard; MOVE some clauses from Appendix A into the standard text; DELETE the A1 inquiry and ordering, A3 chemical composition report, and A15 inspection document clauses from the original standard;

- ADD the chemical composition spectral analysis;

- ADD two material designations: ZGD1030-1240 and ZGD1240-1450;

- As an option, ADD the requirements for impact energy absorption;

- In the reference standards, based on the update and revision of each standard, RESERVE 11 reference standards of the original 17 standards; DELETE 6 standards; and ADD 13 reference standards.

This standard was proposed by AND shall be under the jurisdiction of the National Foundry Standardization Technical Committee (SAC/TC 54).

The responsible drafting organizations of this standard: Shenyang Foundry Research Institute, China Yituo Group Co., Ltd.

The participating drafting organizations of this standard: Zhejiang Yurong Industry Co., Ltd., Anhui Ningguo Wear-resistant Fittings Factory, Anhui Ningguo Xinning Industrial Co., Ltd., Lanzhou Lanshi Casting Co., Ltd., Guangdong Shaozhu Group Co., Ltd.

The main drafters of this standard: Li Fengjun, Yu Bo, Li Lailong, Han Jianpu, Li Chenghu, Zhou Daohong, Zhao Ziwen, Jiang Chunhong, Liu Qiping, Guo Yahui.

This Standard replaces the standard previously issued as follows:

- GB/T 14408-1993.

Low alloy steel castings for general engineering and structural purposes

1 Scope

This standard specifies the material designations, technical requirements, test methods, inspection rules, markings, packaging, storage and transportation of the low alloy steel castings for general engineering (except high temperature, pressure resistant, corrosion resistant, and wear resistant materials) and structural purposes.

This standard is applicable to low alloy steel castings for general engineering and structural purposes.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this Standard.

GB/T 222 Permissible tolerances for chemical composition of steel products

GB/T 223.3 Methods for chemical analysis of iron, steel and alloy - The diantipyrylmethane phosphomolybdic acid gravimetric method for the determination of phosphorus

GB/T 223.4 Alloyed steel - Determination of manganese content - Potentiometric titration or visual titration

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 223.68 Methods for chemical analysis of iron, steel and alloy - The combustion potassium iodate volumetric method for the determination of sulfur content

GB/T 223.69 Methods for chemical analysis of iron, steel and alloy - The gas-volumetric method for combustion in the pipe furnace for the determination of carbon content

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 229 Metallic materials - Charpy pendulum impact test method

GB/T 230.1 Metallic materials - Rockwell hardness test - Part 1: Test methods (scales A, B, C, D, E, F, G, H, K, N, T)

GB/T 231.1 Metallic materials - Brinell hardness test - Part 1: Test methods

GB/T 4336 Carbon steel and low-alloy steel - Determination of multi-element contents - Spark discharge atomic emission spectrometric method (routine method)

GB/T 4338 Metallic materials - Tensile testing at elevated temperature

GB/T 5613 Designation for cast steels

GB/T 5677 Radiographic testing for steel castings

GB/T 5678 Sampling methods for spectro-chemical analysis for cast alloys

GB/T 6060.1 Roughness comparison specimen - Cast surfaces

GB/T 6414 Castings - System of dimensional tolerances and machining allowances

GB/T 7233.1 Steel castings - Ultrasonic examination - Part 1: Steel castings for general purposes

GB/T 9443 Penetrant testing for steel castings

GB/T 9444 Magnetic particle testing of steel castings

GB/T 11351 Mass tolerances for castings

GB/T 16923 Normalizing and annealing of steel parts

GB/T 16924 Quenching and tempering of steel parts

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

4.5.3 Major defect welding up needs agreement from the purchase in advance. The major defect welding up shall be with such records as welding positions and ranges, AND the part with such defects shall be detected in accordance with the same standards to access whether the welding up is qualified.

4.6 Correction

The deformation of the casting can be eliminated by means of correction, AND stress relief shall be done after correction.

4.7 Heat treatment

4.7.1 Castings are subjected to heat treatment. Unless otherwise specified, the heat treatment process is determined by the supplier.

4.7.2 The commonly used heat treatment process are annealing; normalizing; normalizing + tempering; quenching + tempering.

4.7.3 Heat treatment of castings shall be carried out in accordance with the provisions of GB/T 16923 and GB/T 16924.

4.8 Surface quality

4.8.1 Casting surface roughness shall be selected in accordance with GB/T 6060.1 AND shall be indicated in the drawing or ordering contract.

4.8.2 Castings shall be trimmed of flash and burr, AND removed of casting riser. The surface shall be removed of sticky sand and scale.

4.8.3 Residual amount of riser cutting shall comply with the requirements as agreed between the supplier and the purchaser.

4.9 Defects

4.9.1 Defects that affect the performance of castings are not allowed.

4.9.2 Surface defects in the machining allowance are allowed on the machined surface.

4.9.3 The types, ranges and quantities of defects allowed on the non-machined surface of the casting and within the casting shall be agreed upon between the supplier and the purchaser.

4.9.4 When the purchaser requires the non-destructive testing against the castings, the testing position, method and criteria are to be determined between the supplier and the purchaser, AND indicated in the drawings or contract.

Rockwell hardness test shall be carried out in accordance with the provisions of GB/T 230.1. Brinell hardness test shall be carried out in accordance with the provisions of GB/T 231.1.

5.3 Surface inspection

Casting surface roughness test shall be carried out in accordance with the provisions of GB/T 6060.1.

5.4 Geometry and size inspection

Casting geometry and size inspection shall be made by the detection tools of corresponding accuracy OR otherwise by triple coordinate measuring instrument or crossed inspection.

5.5 Non-destructive testing

5.5.1 Penetrant testing

Casting penetration testing shall be carried out in accordance with the provisions of GB/T 9443.

5.5.2 Magnetic particle testing

Casting magnetic particle testing shall be carried out in accordance with the provisions of GB/T 9444.

5.5.3 Ultrasonic testing

Casting ultrasonic testing shall be carried out in accordance with the provisions of GB/T 7233.1.

5.5.4 Radiographic testing

Casting X or gamma radiographic testing shall be carried out in accordance with the provisions of GB/T 5677.

6 Inspection rules

6.1 Inspection procedures

Unless otherwise specified, the inspection of the casting shall be carried out by the supplier.

6.2 Inspection sites

6.6 Re-inspection

6.6.1 When the mechanical properties test results do not comply with the requirements, AND it is not caused by the reasons as listed in 6.5.3, the supplier may conduct re-inspection.

6.6.2 When the tensile test results are unqualified, two spare tensile test samples will be taken from the same batch for the test, AND if the two test results comply with the provisions of Table 2, the tensile performances of this batch of castings are considered as qualified. If there is one sample test result is disqualified, the supplier may treat it in accordance with 6.7.

6.6.3 When the impact energy absorption is disqualified, three spare impact energy absorption test samples are taken from the same batch for the test. AND the test result is added by the original result AND averaged. If the average value complies with the requirements of Table 2, the impact energy absorption of this batch of castings is still considered as qualified; otherwise the supplier may treat it in accordance with 6.7.

6.7 Re-heat treatment

When the mechanical properties re-inspection results still do not comply with the requirements of Table 2, it may make the castings and test blocks subjected to re-heat treatment AND the test again in accordance with 6.5.1 and 6.5.2; however, the number of re-heat treatment without agreement from the purchaser shall not exceed 2 (except for tempering).

6.8 Surface quality, casting defect inspection

6.8.1 Casting surface quality shall be inspected one by one in accordance with the requirements of 4.8.

6.8.2 Casting defects shall be inspected visually one by one in accordance with the requirements of 4.9.

6.9 Geometrical shape and dimensions, dimensional tolerances and machining allowance inspection

The geometry and dimensions, dimensional tolerances and machining allowances of the castings may be tested in accordance with the requirements of 4.10, OR otherwise spot checked with the quantity as negotiated between the supplier and the purchaser.

6.10 Non-destructive testing

8 Additional requirements

With consultation between the supplier and the purchaser, one or more of the following additional requirements may be specified.

8.1 Weight and weight deviation

Weight deviation shall follow the requirements of GB/T 11351.

8.2 Batch uniformity

8.2.1 It shall conduct hardness test on 5% of each batch of castings (OR at least 5 pieces) OR on the castings of the negotiated number, in order to assess the uniformity of each batch of castings.

8.2.2 Hardness shall be measured at the same location of each casting.

8.2.3 The deviation between each hardness value and the average of the hardness of all the castings of this batch shall not exceed ± 15% OR no more than the agreed percentage, otherwise the supplier shall carry out the test on the batch one by one; AND the disqualified castings shall be subjected to re-heat treatment or the entire batch of castings are subjected to re-heat treatment.

8.3 High temperature strength

The test temperature and performance indicators of the high temperature mechanical properties test shall be as agreed by the supplier and the purchaser, AND the test method shall follow the provisions of GB/T 4338.

8.4 Low temperature impact toughness test

The test temperature and performance indicators of the low temperature impact toughness test shall be as agreed by the supplier and the purchaser, AND the test method shall follow the provisions of GB/T 229.

8.5 Large cross-section test block

If the purchaser has requirement, it may test the mechanical properties of the large cross-section test block. AND the size, shape and performance indicators of the test block shall be as negotiated between the supplier and the purchaser.

8.6 Pressure compactness test

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------