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GB/T 9441-2009

Replacing GB/T 9441-1988

Metallographic test for spheroidal graphite cast iron

球墨铸铁金相检验

(ISO 945-1:2008, Microstructure of cast irons –

Part 1: Graphite classification by visual analysis, MOD)

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Foreword

This standard is modified in relation to ISO 945-1:2008 *Microstructure of Cast Irons - Part 1: Graphite Classification by Visual Analysis* (English version).

The main technical differences between this standard and ISO 945-1:2008 are as follows:

- This standard is modified in relation to IV~VI graphite in ISO 945-1:2008, and makes some editorial changes in the structure;
- This standard is modified in relation to IV~VI graphite dimensions and the calculation of the number of VI and V graphite nodules;
- This standard integrates graphite form classification diagrams, annex A, and annex C to be informative annex A;
- This standard adds the methods of assessing the number of pearlite, ferrite in dispersed distribution, carbide, and phosphide eutectic, and corresponding standard diagrams.

This standard replaces GB/T 9441-1988 *Metallographic Test for Spheroidal Graphite Cast Iron*.

There have been significant changes in this standard, compared with GB/T 9441-1988, in the following technical aspects:

- This standard alters the part of 4.1 spheroidizing grade and assessment in original standard, adopts the proportion of spheroidal (VI type) and bulk (V type) graphite particles to the number of graphite in ISO 945 as the spheroidization rate, and changes the spheroidizing grade diagrams in original standard;
- The computation rule in original annex A is incorporated in 4.1.2;
- Image analysis methods of the spheroidization rate are added;
- The result representation in chapter 5 and the test report in chapter 6 are added;
- The “test rules” are deleted, and are incorporated into corresponding test items;
- The test item of “pearlite fineness” is deleted;
- Cementite is changed into carbide;
- Annex A is changed, and the graphite classification and typical pictures in ISO 945 are made to be Annex A.

Annex A of this standard is informative.

Metallographic test for spheroidal graphite cast iron

1 Scope

This standard specifies the method for assessing the microstructure of spheroidal graphite cast iron in optical microscopes.

This standard specifies the methods for assessing spheroidizing grade, graphite size, number of nodular graphite, number of pearlite, number of ferrite in dispersed distribution, number of phosphide eutectic, and number of carbide; it lists out the corresponding standard figures.

This standard is applicable to assessing the cast-state, normalized-state and annealed-state metallographic structure of ordinary and low-alloy spheroidal graphite cast iron.

2 Normative references

The articles contained in the following documents have become part of this document when they are quoted herein. For the dated documents so quoted, all the subsequent modifications (including all corrections) or revisions made thereafter do not apply to this standard. However, the parties who reach an agreement according to this standard are encouraged to study whether the latest versions of these documents may be used. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB/T 13298 Inspection methods of microstructure for metals

3 Sample preparation

3.1 Metallographic samples shall be cut out from the test blocks or castings that are poured at the same time and heat-treated as the same heat as the castings.

3.2 Preparing metallographic samples shall conform to GB/T 13298. Extracting and preparing metallographic samples shall prevent structural change, graphite scaling-off, and graphite tailing. The surface of a sample shall be smooth, and free of wide scratches.

4 Test item and standard diagram

4.1 Spheroidizing grade and assessment

6 Test report

The test report shall include:

a) Standard number;

b) Name and characterization of samples;

c) Determination method;

d) Test results;

e) Test report number and test date;

f) Test personnel.

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