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

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Replacing GB/T 26656-2011

**Metallographic test for compacted (vermicular) graphite cast
irons**

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Foreword

This document was issued on 23 May 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 23 May 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 77.080.10, Chinese classification J31.

It replaces GB/T 26656-2011, which is superseded.

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules for Standardization Documents" drafting.

This document replaces GB/T 26656-2011 "Metallographic Examination of Vermicular Graphite Cast Iron". Compared with GB/T 26656-2011, except for structural adjustment and

Apart from editorial changes, the main technical changes are as follows.

- a) The scope of application has been changed (see Chapter 1, Chapter 1 of the.2011 edition);
- b) Added the terms and definitions of "maximum Fred's circle diameter" and "particle roundness" (see 3.1, 3.2);
- c) The calculation formula of creep rate has been changed (see 5.1.2, 4.1.2 of the.2011 edition);
- d) Changed the expression method of creep rate value range, and replaced the creep rate classification diagram (see 5.1.4, 4.1.6 of the.2011 edition);

e) Changed the expression method of pearlite content and the corresponding pearlite content grading evaluation reference map (see 5.2,.2011 edition

4.2.2);

f) Changed the expression method of phosphorus eutectic content and the corresponding phosphorus eutectic content grading evaluation reference map (see 5.3,.2011 edition

4.3.2);

g) Changed the representation method of carbide content and the corresponding carbide content grading and evaluation reference map (see 5.4,.2011 edition

4.4.2).

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

This document is proposed and managed by the National Foundry Standardization Technical Committee (SAC/TC54).

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This document was first published in 2011, and this is the first revision.

Metallographic examination of vermicular graphite cast iron

1 Scope

GB/T 26656-2023 covers the metallographic examination of compacted (vermicular) graphite cast iron - how the specimen is taken and prepared, and what is then rated on the polished section: the form of the graphite, sorted into six classes, the vermicularity rate, and the quantity and distribution of pearlite, phosphorus eutectic and carbides. Terms such as the maximum Feret diameter give the size of an individual graphite particle a fixed meaning, so two laboratories rating the same field arrive at the same class. Compacted graphite iron sits between grey and ductile iron, and its strength, stiffness and thermal conductivity depend on holding the graphite in worm-like form; when the melt drifts toward nodules or back toward flakes the casting quietly takes on the behaviour of one neighbour or the other, which is why the foundry buys and sells on the graphite picture and not on chemistry alone. The preparation clause carries the same weight - a section cut through the as-cast skin, or one where polishing has plucked graphite out of the surface, rates the preparation rather than the iron. Informative appendices give the graphite classification, reference images of vermicular graphite, and a way of determining the vermicularity rate. Of use to iron foundries, engine and machine builders, and metallurgical laboratories.

This document specifies the preparation, inspection items and rating of metallographic specimens of vermicular graphite cast iron.

This document is applicable to the identification of graphite morphology of sand-cast vermicular graphite cast iron, as well as the vermicularization rate, pearlite, phosphorus eutectic and carbide quantity and distribution.

level assessment.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, only the version corresponding to the date is applicable to this document;

for undated reference documents, the latest version (including all amendments) is applicable to

this document.

GB/T 13298 Metal Microstructure Examination Method

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1

Maximum Féret diameter maximum Féret diameter

l_m

The maximum linear distance between any two points on the outer contour of graphite particles.

3.2

particle roundness particle roundness

The area of a graphite particle divided by the circle area of the largest Fred's circle diameter of the graphite particle.

4 Preparation of metallographic samples

4.1 The metallographic sample should be taken from the test block or casting, and the testing surface should avoid the casting surface.

4.2 The metallographic sample shall be prepared according to the provisions of GB/T 13298. During the process of intercepting and preparing the metallographic sample, it shall prevent the organization from changing and graphite peeling off.

The surface of the sample should be smooth and clean, and there should be no coarse scratches.

5 Inspection items and ratings

5.1 Classification and evaluation of creep rate

5.1.1 Graphite Morphology

Graphite form is divided into six categories, see Appendix A.

The morphology of graphite in vermicular graphite cast iron is mainly vermicular graphite (type III), and a small amount of spherical (group) graphite (type V, type VI) and group flocculent graphite.