TECHNICAL REPORT

ISO/TR 945-2

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Microstructure of cast irons —

Part 2:
Graphite classification by image analysis

Microstructure des fontes —

Partie 2: Classification du graphite par analyse d'image

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TR 945-2 was prepared by Technical Committee ISO/TC 25, *Cast irons and pig irons*.

ISO 945 consists of the following parts, under the general title *Microstructure of cast irons*:

— *Part 1: Graphite classification by visual analysis*

— *Part 2: Graphite classification by image analysis* [Technical Report]

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Introduction

Image analysis, as well as other testing methods, is part of the general or specific assessment of the quality of castings to be agreed between the manufacturer and purchaser at the time of acceptance of the order.

The characterisation of the graphite particle shape in cast irons is often made visually, using the reference sketches of ISO 945-1. The procedure described in ISO 945-1 has an inherent subjective character that can be overcome by using image analysis and appropriate computer software.

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Microstructure of cast irons —

Part 2:
Graphite classification by image analysis

1 Scope

This part of ISO 945 deals with the two-dimensional characterisation of graphite form and size in cast irons.

A standard method for determining graphite form by image analysis had not been developed at the time of this report, but several methods are in use in the industry. The purpose of this part of ISO 945 is to give an illustration of what is possible and to suggest ways in which the technique might develop in the future.

This part of ISO 945 does not apply to the graphite distribution of grey (lamellar graphite) cast iron as defined in ISO 945-1.

This part of ISO 945 describes procedures used to carry out image analysis of graphite form and size and provides a method of comparison to the results obtained using visual analysis techniques.

It does not specify any particular mathematical description of the graphite forms but provides a means for comparison.

NOTE A mathematical description of graphite form is given in ISO 16112. Other mathematical descriptions of graphite forms and information on technical research are given in the Bibliography.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
maximum Féret diameter
maximum length of an object whatever its orientation

NOTE This dimension applies to all graphite forms.

2.2
roundness
area of the graphite particle divided by the area of the circle whose diameter is the maximum Féret diameter of the same graphite particle (X)

NOTE The calculation of roundness is shown in Figure 1.

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