

TERAS

Mittemetalsete lisandite sisalduse määramine Mikrograafiline meetod standardkaartide kasutamisega

Steel

Determination of content of nonmetallic inclusions
Micrographic method using standard diagrams

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

Käesolev Eesti standard EVS-ISO 4967:2007 "Teras. Mittemetalsete lisandite sisalduse määramine. Mikrograafiline meetod standardkaartide kasutamiseks" sisaldab rahvusvahelise standardi ISO 4967:1998 "Steel — Determination of content of nonmetallic inclusions — Micrographic method using standard diagrams" identset ingliskeelset teksti.

Standardi avaldamise korraldas Eesti Standardikeskus.

Standard EVS-ISO 4967:2007 on kinnitatud Eesti Standardikeskuse 21.11.2007 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teataja 2007. aasta detsembrikuu numbris.

Standard on kättesaadav Eesti Standardikeskusest.

This Estonian Standard EVS-ISO 4967:2007 consists of the identical English text of the International Standard ISO 4967:1998 "Steel — Determination of content of nonmetallic inclusions — Micrographic method using standard diagrams".

Estonian standard is published by the Estonian Centre for Standardisation.

This standard is ratified with the order of Estonian Centre for Standardisation dated 21.11.2007 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

The standard is available from Estonian Centre for Standardisation.

Käsitlusala

Käesolev standard määratleb standardkaartide abil mittemetalsete lisandite sisalduse määramise meetodi sepistatud ja valtsitud terastoodetes, mille redutseerimisaste on vähemalt 3. Seda meetodit kasutatakse terase sobivuse hindamiseks antud kasutusala. Kuna aga korratavate tulemuste saavutamine katse läbiviijast olenevalt on keeruline isegi suure hulga teimikute puhul, tuleb meetodi kasutamisel olla tähelepanelik.

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Käesolev standard kirjeldab mittemetalsete lisandite sisalduse määramiseks ka kujutiseanalüüsi tehnoloogiaid (vt lisa D).

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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.

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.

International Standard ISO 4967 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 7, *Methods of testing (other than mechanical tests and chemical analysis)*.

This second edition cancels and replaces the first edition (ISO 4967:1979), which has been technically revised.

Annex A forms an integral part of this International Standard. Annexes B to D are for information only.

Steel — Determination of content of nonmetallic inclusions — Micrographic method using standards diagrams

1 Scope

This International Standard specifies a micrographic method of determining the nonmetallic inclusions in rolled or forged steel products having a reduction ratio of at least 3 using standard diagrams. This method is widely used to assess the suitability of a steel for a given use. However, since it is difficult to achieve reproducible results owing to the influence of the test operator, even with a large number of specimens, precautions should be taken when using the method.

NOTE For certain types of steel (e.g., free cutting steels), the standardized diagrams described in this International Standard may not be applicable.

This International Standard also provides for the determination of nonmetallic inclusions by image analysis technologies (see annex D).

2 Principle

The method consists of comparing the observed field to the chart diagrams defined in this International Standard and taking in consideration separately each type of inclusion. In the case of image analysis, fields will be rated according to the relationships given in annex D.

The chart pictures correspond to square fields of view, each with an area of 0,50 mm², as obtained with a longitudinal plane-of-polish and as observed at 100 ×.

According to the shape and distribution of the inclusions, the standard diagrams are divided into five main groups, bearing the reference A, B, C, D and DS.

These five groups represent the most commonly observed inclusion types and morphologies:

- **Group A (sulfide type):** highly malleable, individual grey particles with a wide range of aspect ratios (length/width) and generally rounded ends;
- **Group B (aluminate type):** numerous non deformable, angular, low aspect ratio (generally < 3), black or bluish particles (at least three) aligned in the deformation direction;
- **Group C (silicate type):** highly malleable, individual black or dark grey particles with a wide range of aspect ratios (generally ≥ 3) and generally sharp ends;
- **Group D (globular oxide type):** non deformable, angular or circular, low aspect ratio (generally < 3), black or bluish, randomly distributed particles;
- **Group DS (single globular type):** circular, or nearly circular, single particle with a diameter ≥ 13 μm.