



SLOVENSKI STANDARD
SIST EN 1290:1999
01-december-1999

Neporušitvene preiskave zvarov - Preiskava zvarov z magnetnimi delci

Non-destructive examination of welds - Magnetic particle examination of welds

Zerstörungsfreie Prüfung von Schweißverbindungen - Magnetpulverprüfung von Schweißverbindungen

Contrôle non destructif des assemblages soudés - Contrôle par magnétoscopie des assemblages soudés

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Ta slovenski standard je istoveten z: EN 1290:1998

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ICS:

25.160.40 Varjeni spoji in vari Welded joints

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en

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ICS 25.160.40

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English version

Non-destructive examination of welds - Magnetic particle examination of welds

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This European Standard was approved by CEN on 26 January 1998.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 1998, and conflicting national standards shall be withdrawn at the latest by August 1998.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This standard specifies magnetic particle examination techniques for the detection of surface imperfections in ferromagnetic welds including the heat affected zones using the magnetic method. Techniques recommended are suitable for most welding processes and joint configurations. Variations to the basic techniques that will provide a higher or lower examination sensitivity, are described in annex A.

Techniques for examination of welds, with geometries in accordance with those shown in tables 1, 2 and 3 can be used directly from this standard.

Acceptance levels for indications are described in EN 1291.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 473	Qualification and certification of NDT personnel - General principles
EN 1291	Non-destructive examination of welds - Magnetic particle testing of welds - Acceptance levels
pr EN 1956	Non-destructive testing - Penetrant testing and magnetic particle testing - Viewing conditions
EN 12062	Non-destructive examination of welds - General rules for metallic materials

3 Definitions

For the purposes of this standard, the definitions given in EN 12062 apply.

4 Safety precautions

European, national and local safety and environmental protection regulation shall be observed at all times.

Special consideration shall be given to toxic flammable and/or volatile materials, electrical safety and unfiltered UV radiation.

5 General

5.1 Information

5.1.1 Contractual agreement

Before carrying out magnetic particle examination, the following items, if applicable, shall be agreed between the contracting parties :

- a) specific examination procedure ;
- b) certification requirements for NDT personnel ;
- c) extent of coverage ;
- d) state of manufacture ;
- e) examination techniques to be used ;
- f) overall performance test ;
- g) demagnetization ;
- h) acceptance level ;
- i) action necessary for unacceptable indications.

5.1.2 Additional information

Prior to examination, the following additional information can be required :

- a) type and designation of the parent and weld materials ;
- b) welding process ;
- c) location and extent of welds to be examined ;
- d) joint preparation and dimensions ;
- e) location and extent of any repairs ;
- f) post-weld treatment (if any) ;
- g) surface conditions.

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Operators can ask for further information that could be helpful in determining the nature of any indications detected.

5.2 Personnel qualification

Personnel performing non-destructive examination in accordance with this standard shall be qualified to an appropriate level in accordance with EN 473 or an equivalent standard at an appropriate level in the relevant industrial sector.

5.3 Surface conditions and preparation

Areas to be examined shall be free from scale, oil, grease weld spatter, machining marks, dirt, heavy and loose paint and any other foreign matter that can affect sensitivity.

It can be necessary to improve the surface condition e.g. by abrasive paper or local grinding to permit accurate interpretation of indications.

Cleaning and preparation of surfaces shall not be detrimental to the material, the surface finish or the magnetic examination media.

5.4 Magnetizing

5.4.1 Magnetizing equipment

Unless otherwise agreed the following types of alternative current-magnetizing equipment shall be used :

- a) electromagnetic yokes ;
- b) current flow equipment with prods ;
- c) adjacent or threading conductors or coil techniques.

The use of direct current-magnetization or permanent magnets shall be by agreement between the contracting parties.

The magnetizing equipment used shall comply with the requirements of relevant European standards. Prior to the publication of European Standards related to the subject, the corresponding national standards may be used.

Where prods are used, precautions shall be taken to minimize overheating, burning or arcing at the contact tips. Removal of arc burns shall be carried out where necessary. The affected area shall be tested by a suitable method to ensure the integrity of the surface.

5.4.2 Verification of magnetization

For most weldable ferromagnetic materials, a tangential magnetic field strength of 2 kA/m to 6 kA/m (r.m.s.) is recommended.

Verification of the magnetic field strength shall be carried out using one of the following methods :

- a) a component containing fine natural or artificial imperfections in the least favourable locations ;
- b) measurement of the tangential field strength as close as possible to the surface using a Hall effect probe. The appropriate tangential field strength can be difficult to measure close to abrupt changes in the shape of a component, or where flux leaves the surface of a component;
- c) calculation of the approximate tangential field strength. The calculations form the basis of the current values specified in tables 2 and 3;

d) other methods based on established principles.

NOTE : Flux indicators, placed in contact with the surface under examination, can provide a guide to the magnitude and direction of the tangential field, but should not be used to verify that the field strength is acceptable.

5.5 Application techniques

5.5.1 Field directions and examination area

The detectability of an imperfection depends on the angle of its major axis with respect to the direction of the magnetic field. This is explained for one direction of magnetization in figure 1.

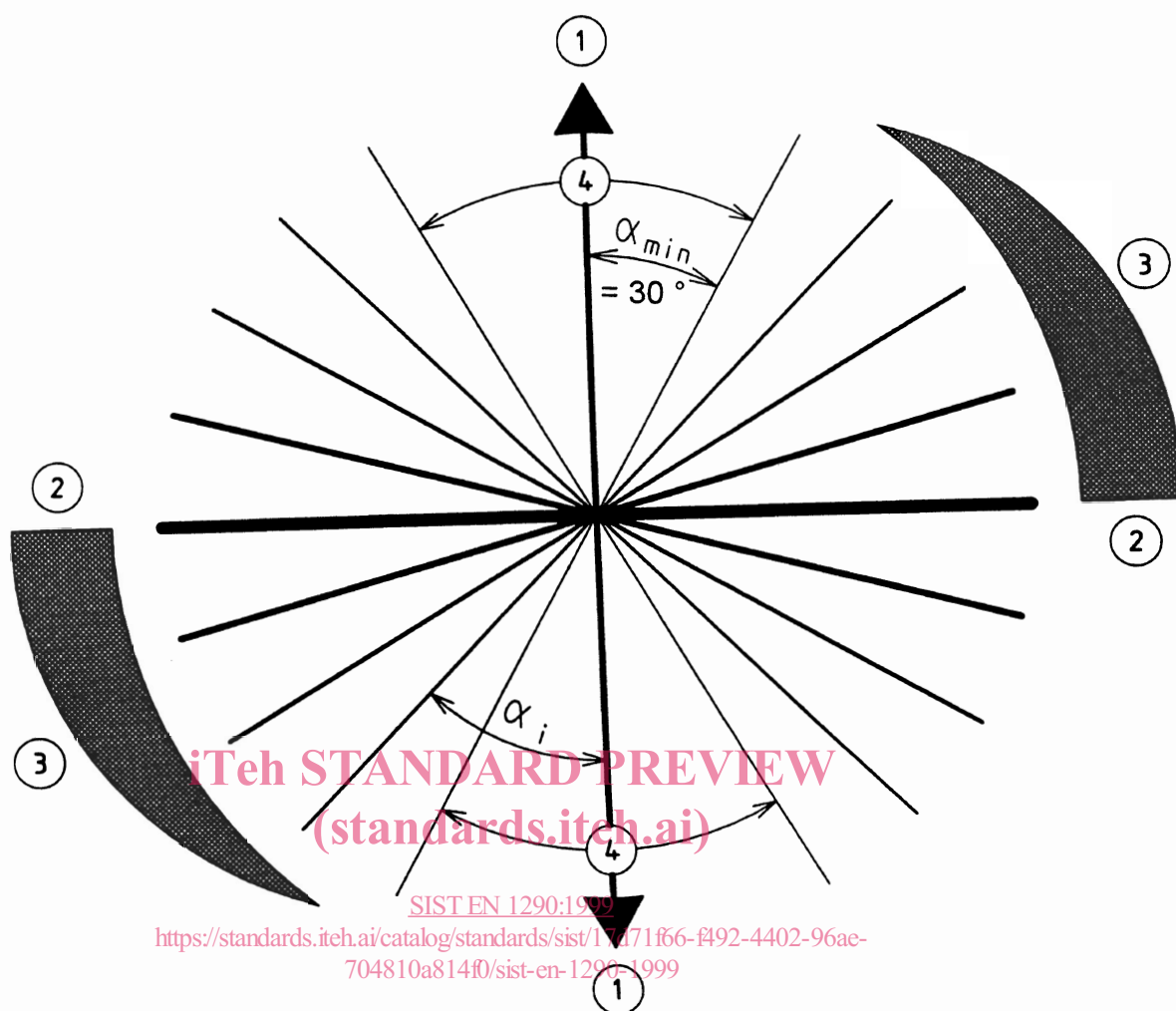


Figure 1 : Directions of detectable imperfections