

Non-destructive testing of welds — Magnetic particle testing of welds

The European Standard EN 1290:1998, with the incorporation of amendments A1:2002 and A2:2003, has the status of a British Standard

ICS 25.160.40

National foreword

This British Standard is the English language version of EN 1290:1998, including amendments A1:2002 and A2:2003.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by **A1** **A1**.

As agreed by CEN/TC 121/SC 5 resolution 134/2000 and in accordance with amendment A1:2002, the term “examination” has been replaced by “testing” throughout the document.

The UK participation in its preparation was entrusted to Technical Committee WEE/46, Non-destructive examination, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 14, an inside back cover and a back cover.

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English version

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

(includes amendments A1:2002 and A2:2003)

Contrôle non destructif des assemblages soudés —
Contrôle par magnétoscopie des assemblages soudés
(inclut les amendements A1:2002 et A2:2003)

Zerstörungsfreie Prüfung von
Schweißverbindungen —
Magnetpulverprüfung von Schweißverbindungen
(enthält Änderungen A1:2002 und A2:2003)

This European Standard was approved by CEN on 26 January 1998, amendment A1 was approved by CEN on 28 April 2002 and amendment A2 was approved by CEN on 20 November 2003.

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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.

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CEN

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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 document has been prepared under a mandate given to CEN by the European Commission and the European FreeTrade Association.

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.

Foreword to amendment A1

This document EN 1290:1998/A1:2002 has been prepared by Technical Committee CEN/TC 121, Welding, the secretariat of which is held by DS.

This amendment to the European Standard EN 1290:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Annex A is informative.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Foreword to amendment A2

This document EN 1290:1998/A2:2003 has been prepared by Technical Committee CEN/TC 121 Welding, the secretariat of which is held by DS.

This Amendment to the European Standard EN 1290:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This standard specifies magnetic particle testing 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 testing sensitivity are described in Annex A.

Techniques for testing of welds, with geometries in accordance with those shown in Table 1, Table 2 and Table 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 testing of welds — Magnetic particle testing of welds — Acceptance levels*.

EN 12062, *Non-destructive testing of welds — General rules for metallic materials*.

☐ EN ISO 3059, *Non-destructive testing — Penetrant testing and magnetic particle testing — Viewing conditions*.

(ISO 3509:2001) ☐

3 Definitions

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

4 Safety precautions

European, national and local safety and environment protection regulations 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 ☐ *Items to be specified*

Before carrying out magnetic particle testing, the following items, if applicable, shall be specified: ☐

- a) specific testing procedure;
- b) certification requirements for NDT personnel;
- c) extent of coverage;
- d) state of manufacture;
- e) testing 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 testing, the following additional information can be required:

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

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 testing 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 tested 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 testing media.

5.4 Magnetizing

5.4.1 Magnetizing equipment

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

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

Direct-current magnetization or permanent magnets **[A1]** may be used if specified **[A1]**.

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.