Non-destructive testing of steel forgings - Part 1: Magnetic particle inspection



### EESTI STANDARDI EESSÕNA

### NATIONAL FOREWORD

	This Estonian standard EVS-EN 10228-1:2016 consists of the English text of the European standard EN 10228-1:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 01.06.2016.	Date of Availability of the European standard is 01.06.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile <u>standardiosakond@evs.ee</u>.

### ICS 77.040.20, 77.140.85

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### EUROPEAN STANDARD

NORME EUROPÉENNE

### EN 10228-1

## EUROPÄISCHE NORM

June 2016

ICS 77.040.20; 77.140.85

Supersedes EN 10228-1:1999

### **English Version**

# Non-destructive testing of steel forgings - Part 1: Magnetic particle inspection

Essais non destructifs des pièces forgées - Partie 1 : Contrôle par magnétoscopie Zerstörungsfreie Prüfung von Schmiedestücken aus Stahl - Teil 1: Magnetpulverprüfung

This European Standard was approved by CEN on 3 October 2015.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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### **European foreword**

This document (EN 10228-1:2016) has been prepared by Technical Committee ECISS/TC 111 "Steel castings and forgings", the secretariat of which is held by AFNOR.

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 December 2016 and conflicting national standards shall be withdrawn at the latest by December 2016.

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

This document supersedes EN 10228-1:1999.

Annex B provides the significant technical changes to the previous version EN 10228-1:1999.

EN 10228 consists of the following parts under the general title *Non-destructive testing of steel forgings*:

- Part 1: Magnetic particle inspection;
- Part 2: Penetrant testing;
- Part 3: Ultrasonic testing of ferritic or martensitic steel forgings;
- Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### 1 Scope

This European Standard describes techniques and acceptance criteria to be used for the magnetic particle testing of forgings manufactured from ferromagnetic materials. The method described is used for the detection of surface discontinuities. It can also detect discontinuities just below the surface but the sensitivity to such discontinuities decreases rapidly with depth.

NOTE A steel forging is considered to be ferromagnetic if the magnetic flux density is greater than 1 T for a tangential magnetic field strength of 2,4 kA/m.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3059, Non-destructive testing — Penetrant testing and magnetic particle testing — Viewing conditions (ISO 3059)

EN ISO 9712, Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712)

EN ISO 9934-1, Non-destructive testing — Magnetic particle testing — Part 1: General principles (ISO 9934-1)

EN ISO 9934-2, Non-destructive testing — Magnetic particle testing — Part 2: Detection media (ISO 9934-2)

EN ISO 9934-3, Non-destructive testing — Magnetic particle testing — Part 3: Equipment (ISO 9934-3)

### 3 Items for agreement

The following aspects concerning magnetic particle inspection shall be agreed between the purchaser and the supplier at the time of enquiry and order:

- a) the manufacturing stages(s) at which magnetic particle inspection shall be performed (see Clause 7);
- b) the surface areas to be examined (see Clause 8);
- c) the quality class required, or the quality classes and the surface areas to which they apply (see 8.2 and Clause 14);
- d) whether the testing shall be performed with the specified detection media (see 6.2);
- e) whether a particular current waveform is required (see 10.2);
- f) the applicable recording and acceptance criteria if different from those detailed in Table 2.
- g) whether demagnetization shall be carried out after testing, together with the maximum level of residual magnetism (see Clause 16);
- h) whether testing shall be conducted in the presence of the purchaser or his representative;