

## **Non-destructive testing of steel forgings - Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings**

Non-destructive testing of steel forgings - Part 4:  
Ultrasonic testing of austenitic and austenitic-ferritic  
stainless steel forgings

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 10228-4:2000 sisaldab Euroopa standardi EN 10228-4:1999 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 11.01.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 10228-4:2000 consists of the English text of the European standard EN 10228-4:1999.</p> <p>This document is endorsed on 11.01.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>This part of prEN 10228 describes the techniques to be used for the manual, pulse-echo, ultrasonic testing of forgings manufactured from austenitic and austenitic-ferritic stainless steels.</p>	<p><b>Scope:</b></p> <p>This part of prEN 10228 describes the techniques to be used for the manual, pulse-echo, ultrasonic testing of forgings manufactured from austenitic and austenitic-ferritic stainless steels.</p>
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**ICS** 77.040.20, 77.140.85

**Võtmesõnad:**

**Hinnagrupp** M

ICS 77.040.20; 77.140.85

**English version**

**Non-destructive testing of steel forgings**

**Part 4: Ultrasonic testing of austenitic and austenitic-ferritic stainless steel forgings**

Essais non destructifs des pièces forgées en acier – Partie 4: Contrôle par ultrasons des pièces forgées en aciers inoxydables austénitiques et austéno-ferritiques

Zerstörungsfreie Prüfung von Schmiedestücken aus Stahl – Teil 4: Ultraschallprüfung von Schmiedestücken aus austenitischem und austenitisch-ferritischem nicht-rostendem Stahl

This European Standard was approved by CEN on 1999-07-09.

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.

The European Standards exist 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, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

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 ECISS/TC 28 "Steel forgings", the secretariat of which is held by BSI.

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 February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

The titles of the other Parts of this European Standard are:

Part 1: Magnetic particle inspection.

Part 2: Penetrant testing.

Part 3: Ultrasonic testing of ferritic and 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This Part of EN 10228 specifies methods for the manual, pulse-echo, ultrasonic testing of forgings manufactured from austenitic and austenitic-ferritic stainless steels. Mechanised scanning techniques, such as immersion testing, may be used but should be agreed between the purchaser and supplier.

This Part of EN 10228 applies to four types of forgings, classified according to their shape and method of production. Types 1, 2 and 3 are essentially simple shapes. Type 4 covers complex shapes.

This Part of EN 10228 does not apply to

- rolled bars;
- closed die forgings;
- turbine rotor and generator forgings.

Ultrasonic testing of ferritic and martensitic steel forgings is the subject of Part 3 of this European Standard.

## 2 Normative references

This Part of EN 10228 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 Part of EN 10228 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
prEN 583-2	Non-destructive testing – Ultrasonic examination – Part 2: Sensitivity and range setting
prEN 583-5	Non-destructive testing – Ultrasonic examination – Part 5: Characterisation and sizing of discontinuities
EN 1330-1	Non destructive testing – Terminology – Part 1: List of general terms
prEN 1330-4	Non destructive testing – Terminology – Part 4: Terms used in ultrasonic testing
prEN 12223	Ultrasonic examination – Calibration blocks

- prEN 12668-1 Non-destructive testing – Characterization and verification of ultrasonic examination equipment – Part 1: Instruments
- prEN 12668-2 Non-destructive testing – Characterization and verification of ultrasonic examination equipment – Part 2: Probes
- prEN 12668-3 Non-destructive testing – Characterization and verification of ultrasonic examination equipment – Part 3: Combined equipment

### 3 Definitions

The definitions given in EN 1330-1 and prEN 1330-4 apply.

### 4 Items for agreement

The following aspects concerning ultrasonic testing shall be agreed between the purchaser and supplier at the time of the enquiry or order:

- a) the volume(s) to be tested and whether grid scanning coverage or 100 % scanning coverage is required (see clause 12);
- b) whether near surface examination is required (see 7.2.6);
- c) the quality class required, or the quality classes and the zones to which they apply (see clause 14);
- d) whether any special scanning coverage, equipment or couplant is required in addition to that detailed in clauses 7 and 12;
- e) the scanning technique to be used if not manual (see clause 1);
- f) the sizing techniques to be used for extended discontinuities (see clause 15);
- g) the technique(s) to be used for setting sensitivity (see clause 11);
- h) whether the test is to be conducted in the presence of the purchaser or his representative;
- i) whether a written procedure shall be submitted for approval by the purchaser (see clause 5);
- j) whether examination by shear wave probes is required (see 11.3);
- k) the remaining examination requirements for complex forgings (type 4) (see 12.2).

### 5 Written procedure

Ultrasonic testing shall be performed in accordance with a written procedure. Where specified in the enquiry or order, the written procedure shall be submitted to the purchaser for approval prior to testing.