Aerospace series - Test methods for metallic materials - Part 005: Uninterrupted creep and stress-rupture testing

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 2002-005:2007 sisaldab Euroopa standardi EN 2002-005:2007 ingliskeelset teksti. Käesolev dokument on jõustatud 18.12.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 2002-005:2007 consists of the English text of the European standard EN 2002-005:2007. This document is endorsed on 18.12.2007 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This standard applies to uninterrupted constant-load tensile creep strain and stress-rupture testing of metallic materials governed by aerospace standards. It defines the properties that may need to be determined and the terms used in describing tests and test pieces. It specifies the dimensions of test pieces and the method of testing. The duration of the creep strain and stress-rupture tests complying with this standard shall be less than 10 000 h and at temperatures not exceeding 1 100 °C. This standard may also apply to metallic materials for test durations exceeding 10 000 h and/or for test temperatures exceeding 1 100 °C providing that previous agreement has been reached between the manufacturer and the purchaser.	**Scope:** This standard applies to uninterrupted constant-load tensile creep strain and stress-rupture testing of metallic materials governed by aerospace standards. It defines the properties that may need to be determined and the terms used in describing tests and test pieces. It specifies the dimensions of test pieces and the method of testing. The duration of the creep strain and stress-rupture tests complying with this standard shall be less than 10 000 h and at temperatures not exceeding 1 100 °C. This standard may also apply to metallic materials for test durations exceeding 10 000 h and/or for test temperatures exceeding 1 100 °C providing that previous agreement has been reached between the manufacturer and the purchaser.

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Aerospace series - Test methods for metallic materials - Part 005: Uninterrupted creep and stress-rupture testing

Série aérospatiale - Méthodes d'essais applicables aux matériaux métalliques - Partie 005 : Essai non interrompu de fluage et essai de rupture par fluage

Luft- und Raumfahrt - Prüfverfahren für metallische Werkstoffe - Teil 005: Kriech- und Zeitstandversuch unter konstanter Zugbeanspruchung

This European Standard was approved by CEN on 23 June 2007.

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 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 Management Centre has the same status as the official versions.

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

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Foreword

This document (EN 2002-005:2007) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

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 May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

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.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard applies to uninterrupted constant-load tensile creep strain and stress-rupture testing of metallic materials governed by aerospace standards. It defines the properties that may need to be determined and the terms used in describing tests and test pieces. It specifies the dimensions of test pieces and the method of testing. The duration of the creep strain and stress-rupture tests complying with this standard shall be less than 10 000 h and at temperatures not exceeding 1 100 °C.

This standard may also apply to metallic materials for test durations exceeding 10 000 h and/or for test temperatures exceeding 1 100 °C providing that previous agreement has been reached between the manufacturer and the purchaser.

2 Normative references

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

EN ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system (ISO 7500-1:2004)*

EN ISO 9513, *Metallic materials — Calibration of extensometers used in uniaxial testing (ISO 9513:1999)*

ASTM E 1012-91, *Practice for verification of specimen alignment under tensile loading.* [1)]

3 Principle

The test consists in maintaining a test piece at a uniform temperature and subjecting it to a constant tensile force at that temperature in order to determine specified properties.

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
test piece
portion of the test sample on which the creep strain or stress-rupture test is carried out (see Figures 1 to 5)

4.2
proportional test piece
these test pieces have an original basis gauge length ($L_o = L_{eo'}$ or $L_{s'}$) which bears a specified relationship to the cross-sectional area

This ensures that comparable values for percentage elongation after rupture (A) are obtained from test pieces of different size but having the same relationship. The relationship $L_o = 5{,}65\sqrt{S_o}$ which for test pieces of circular cross section gives a value of $L_o = 5\,d_o$ has been accepted by international agreement and is preferred in the use of this standard. The relationship is indicated in the symbol for percentage elongation after rupture (A) as a subscript, e.g. $A_{5'}$ representing the ratio L_o/d.

1) Published by American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103.