

Testing of welded joints in thermoplastics semi-finished products - Part 3: Tensile creep test

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Testing of welded joints in thermoplastics semi-finished products - Part 3: Tensile creep test

Essais des assemblages soudés sur produits semi-finis en
thermoplastiques - Partie 3: Essai de fluage en traction

Prüfen von Schweißverbindungen aus thermoplastischen
Kunststoffen - Teil 3: Zeitstand-Zugversuch

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Foreword

This document (EN 12814-3:2014) has been prepared by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by NBN.

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of an identical text or by endorsement, at the latest by August 2014, and conflicting national standards shall be withdrawn at the latest by August 2014.

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 12814-3:2000.

The main changes with respect to the previous edition are listed below:

- a) addition of a NOTE for an alternative test using a whole pipe welded sample (Clause 5) making reference to Annex B (informative), Whole pipe tensile creep rupture test;
- b) addition of a NOTE for the sampling procedures (Clause 6) in case of socket joints with reference to Annex D (informative), Testing of socket joints.

EN 12814, *Testing of welded joints of thermoplastics semi-finished products*, is divided into the following parts:

- *Part 1: Bend test;*
- *Part 2: Tensile test;*
- *Part 3: Tensile creep test* (the present document);
- *Part 4: Peel test;*
- *Part 5: Macroscopic examination;*
- *Part 6: Low temperature tensile test;*
- *Part 7: Tensile test with waisted test specimens;*
- *Part 8: Requirements.*

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Introduction

The design of welded thermoplastics constructions under static load is based on the long-term creep rupture with behaviour, specifically the resistance to slow crack growth of the thermoplastics material and the welds.

For design purposes, the relevant characteristic values for the welded joints are the “long-term tensile welding factors” to which this European Standard provides the test method.

The long-term tensile welding factors are normally used in conjunction with the creep rupture curve of the parent material, given for example in EN 1778, when designing welded semi-finished products under static load.

The long-term tensile welding factor(s), the crack behaviour and the appearance of the fracture surface provide information on the quality of the weld.

NOTE The behaviour of the failure obtained during the tensile creep test can be related to the notch sensitivity of the parent material. An example of a test to provide information about the notch sensitivity of parent material is given in Annex A.

1 Scope

This European Standard specifies the dimensions, the method of sampling and the preparation of the test specimens, and the conditions for performing the tensile creep test perpendicular to the weld in order to determine the long-term tensile welding factor.

A tensile creep test may be used in conjunction with other tests (e.g. bend test, tensile test, macrographic examination, ...) to assess the performance of welded assemblies, made from thermoplastics materials.

The test is applicable to welded assemblies made from thermoplastics materials filled or unfilled such as tubes and fittings, sheets, plates and profiles, but not reinforced, irrespective of the welding process used.

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 13100-1, *Non destructive testing of welded joints of thermoplastics semi-finished products — Part 1: Visual examination*

EN ISO 899-1, *Plastics — Determination of creep behaviour — Part 1: Tensile creep (ISO 899-1)*

3 Terms and definitions

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

3.1

test temperature

temperature of the medium surrounding the test specimen during the test

3.2

test stress

test load divided by the minimum cross sectional area of the test specimen

3.3

creep rupture curve

regression curve through the geometric mean values of failure times

3.4

minimum failure time

t_{tm}

creep rupture time of the parent material to ensure that the test method is applicable

3.5

ductile fracture

large scale deformation of material from fracture surfaces

3.6

brittle fracture

little or no deformation of material from fracture surfaces

4 Symbols and designations

Symbols and designations are given in Table 1.