

**Plastist torustiku- ja kanalisüsteemid.  
Termoplasttorud. Väljastpoolt  
kulumisele vastupidavuse  
kindlaksmääramine trepi meetodil**

Plastics piping and ducting systems -  
Thermoplastics pipes - Determination of resistance  
to external blows by the staircase method

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1411:1999 sisaldab Euroopa standardi EN 1411:1996 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1411:1999 consists of the English text of the European standard EN 1411:1996.</p> <p>This document is endorsed on 23.11.1999 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> Standard esitab meetodi termoplasttorude väljastpoolt suunatud kulumisele vastupidavuse kindlaksmääramiseks, kasutades trepi meetodit. Meetod ei kehti perforeeritud torude kohta. Meetod on ette nähtud torude testimiseks 0 °C juures. Vajaduse korral võib meetodit rakendada temperatuurivahemikus -20 °C kuni +23 °C.</p>	<p><b>Scope:</b></p>
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**Võtmesõnad:** kattekiht, kindlaksmääramine, löögikindlus, plasttorud, termoplastvaigud, testimine, torustikud

ICS 23.040.20

Descriptors: Plastics, pipes, thermoplastics, impact resistance, testing.

**English version**

Plastics piping and ducting systems

**Thermoplastics pipes**

Determination of resistance to external blows by the staircase method

Systèmes de canalisations et de gaines en plastiques; tubes thermoplastiques; détermination de la résistance aux chocs externes par la méthode en escalier

Kunststoff-Rohrleitungs- und Schutzrohrsysteme; Rohre aus Thermoplasten; Bestimmung der Widerstandsfähigkeit gegen äußere Schlagbeanspruchung im Stufenverfahren

This European Standard was approved by CEN on 1996-01-04.

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.

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.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems" of which the secretariat is held by NNI.

This standard is based on ISO/CD 11173:1991 "Thermoplastics pipes - Determination of resistance to external blows - Staircase method", prepared by the International Organization for Standardization (ISO). It is a modification of ISO/CD 11173 for reasons of applicability to other test conditions and alignment with texts of other standards on test methods.

The modifications are:

- the procedure has been extended to enable use without prior knowledge of a relevant drop height, striker mass or  $H_{50}$  value;
- editorial changes have been introduced.

The material-dependent parameters and/or performance requirements are incorporated in the System Standard(s) concerned.

Annex A, which is informative, gives a bibliography.

This standard is one of a series of standards on test methods which support System Standards for plastics piping systems and ducting systems.

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 July 1996, and conflicting national standards shall be withdrawn at the latest by July 1996 .

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

## 1 Scope

This standard specifies a method for determining the resistance to external blows of thermoplastics pipes by using the staircase method. This method is not applicable to perforated pipes.

The method is intended to be applied for pipe testing at 0 °C. When necessary the method can be applied at -20 °C or +23 °C.

## 2 Definitions

For the purposes of this standard, the following definitions apply.

**2.1  $H_{50}$  value:** The height of fall (drop height) of a striker of specified mass which provokes failure of 50 % of test pieces from samples of pipe taken to represent a batch.

*NOTE: In practice, test pieces are drawn at random from a batch and the result is only an estimate of the  $H_{50}$  for that batch.*

**2.2 production batch:** a clearly identifiable collection of units, manufactured consecutively or continuously under the same conditions, using material or compound conforming to the same specification.

## 3 Principle

Test pieces, comprising cut lengths of pipe, are subjected to a single blow by a falling striker of specified mass and shape dropped from one of a sequence of different heights onto either a random position around the circumference of the pipe or on to a specified generatrix of the pipe.

If a test piece fails (see d) of 7.1), the drop height for the next blow is decreased by a predetermined amount. If a test piece does not fail, the drop height for the blow on the subsequent test piece is increased accordingly. If sufficient test pieces are used, the  $H_{50}$  value of a batch, or a production run from an extruder, can be calculated.

A preliminary test procedure (see 7.2) is carried out to obtain a rough indication of the  $H_{50}$  value and to identify the first test piece from which the result will be used in a main test procedure (see 7.3).

The severity of this test method can be adjusted to suit different specification needs by changing the mass of the striker and/or the test temperature.