Plastics piping systems for non-pressure underground conveyance and storage of non-potable water - Test method for determination of long-term compression strength of boxes

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NATIONAL FOREWORD

See Eesti standard EVS-EN 17151:2019 sisaldab Euroopa standardi EN 17151:2019 ingliskeelset teksti.	This Estonian standard EVS-EN 17151:2019 consists of the English text of the European standard EN 17151:2019.
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 21.08.2019.	Date of Availability of the European standard is 21.08.2019.
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 standardiosakond@evs.ee.

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Systèmes de canalisations en plastique pour le transport et le stockage souterrains sans pression de l'eau non potable - Méthode d'essai pour la détermination de la résistance à la compression à long terme des structures alvéolaires ultra-légères

Kunststoff-Rohrleitungssysteme für die drucklose unterirdische Entwässerung für Nicht-Trinkwasser - Prüfverfahren zur Bestimmung der Langzeitdruckfestigkeit von Versickerungsblöcken

This European Standard was approved by CEN on 19 October 2018.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 17151:2019) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2021.

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

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

Introduction

This standard is intended to reflect the current state of knowledge of determining and predicting the long-term lifetime of products mentioned in the scope while maintaining reasonable testing times for producers and developers of these systems.

The products covered by this standard are part of storm water management systems.

CEN TC 155 is aware that these products are used in modular systems and that the long term compression strength determined by this standard applies to a single box and might not reflect the maximum allowable loads on an installed system.

Linearity is assumed to extrapolate the (log) load versus log time curve from the results of the creep rupture tests. The test described in Annex A is intended to demonstrate linearity over the extrapolated lifetime by testing at elevated temperatures.

This test is given as an informative annex due to limited practical experience and lack of reliability analyses. CEN TC 155 wants to encourage stakeholders to perform these tests before the next revision.

NOTE Linear behaviour of the boxes can be assumed when the difference in the slope between creep tests performed at 20 °C and at 70 °C as described in Annex A is small and therefore there has been no deviation from linear behaviour.

The test method follows the principles of ISO 9080 [1] and applies them to the testing of boxes.

CEN TC 155 is aware that including a not failed data point at 4 380 h in the calculation of LCL would bias the outcome in the lower 95 % confidence level (LCL) for the stress leading to a failure at 50 years.

1 Scope

This document specifies a test method for determining the long-term compression strength for a specified period on boxes made of thermoplastics materials for non-pressure underground conveyance and storage of non-potable water.

The document is applicable for boxes which maintain their linear behaviour over the specified period.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 3126, *Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126)*

EN ISO 7500-1:2018, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system (ISO 7500-1:2018)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
box
thermoplastic cuboid shaped element, with or without sidewalls, used to create a modular storage system

3.2
integral component
load bearing component contributing to the overall strength of the box

3.3
initial height, length, width
h_i, l_i, b_i
respectively height (test direction), length and width of the sample before testing, in mm

3.4
initial height after pre-load
h_0
height of the sample after applying a pre-load, but before the load is further increased and recorded, in mm

3.5
long-term compression strength
95 % lower confidence limit of the applied stress for which the sample would survive 50y without creep rupture, in kN/m^2