TECHNICAL SPECIFICATION

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CEN/TS 17152-4

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English Version

Plastics piping systems for non-pressure underground conveyance and storage of non-potable water - Boxes used for infiltration, attenuation and storage systems - Part 4: Guidance for structural design of modular systems

Systèmes de canalisations en plastique pour le transport et le stockage souterrains sans pression de l'eau non potable - Structures alvéolaires ultra-légères pour les systèmes d'infiltration, de rétention et de stockage - Partie 4: Guide pour la conception structurelle des systèmes modulaires

Kunststoff-Rohrleitungssysteme für die drucklose unterirdische Entwässerung für Nicht-Trinkwasser - Versickerungsblöcke zur Verwendung in Infiltrations-, Zwischenspeicher- und Speichersystemen - Teil 4: Leitfaden für die statische Berechnung von Systemen

This Technical Specification (CEN/TS) was approved by CEN on 25 May 2025 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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

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European foreword

This document (CEN/TS 17152-4:2025) 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of an identical text or by endorsement, at the latest by January 2026, and conflicting national standards shall be withdrawn at the latest by January 2026.

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.

This document supersedes CEN/TS 17152-4:2024.

The early revision of CEN/TS 17152-4:2024 is proposed by CEN TC 155 WG 26 to change some clauses which could result in unsafe design. In addition several editorial mistakes are corrected.

The main changes compared to the previous version are:

a) amended Figure 1 (5.1);

b) amended Figure 3 (6.2);

c) revised text 6.3 (limitation height of the system and installation depth) and improved text calculation of *K*;

d) revised text 6.4 (limitation height of the system and installation depth) and improved text calculation of *K*;

e) γ_Q changed to 1,35 in 7.1 and 7.2.

This document is supported by separate standards on test methods to which normative references are made.

EN 17152 consists of the following parts under the general title *Plastics piping systems for non-pressure underground conveyance and storage of non-potable water — Boxes used for infiltration, attenuation and storage systems*:

— *Part 1: Specifications for storm water boxes made of PP and PVC*;

— *Part 3: Assessment of conformity* (CEN/TS);

— *Part 4: Guidance for the structural design of modular systems* (CEN/TS).

Recommended practices for installation are described in CEN/TR 17179 [1].

National standards for pipes and fittings for the transport of surface water are not considered to be conflicting with this document and can thus be allowed to coexist.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

Introduction

The products covered by this document are part of surface water (previously referred to as stormwater) management systems.

Geocellular systems are an assemblage of boxes, in one or more layers, for which the material and the material characteristics are according to EN 17152-1. The assemblage is considered as a modular system for the purposes of this design guidance.

The general principles of designing structures to withstand long-term loads are well established. However, their application is generally for rigid structures such as concrete bridges, e.g. Eurocode 2 series: Design of concrete structures (EN 1992).

The behaviour of thermoplastics is more complex and the design loads which may be experienced may be different in magnitude and action. This guidance is intended to aid the designer in determining realistic loadings in the design of thermoplastic geocellular modular systems.

NOTE In this guidance, the terms pressure(s) and strength will be used, corresponding to actions and resistances in Eurocodes.

1 Scope

This document gives guidance on the structural design of underground modular systems for infiltration, attenuation and storage of surface water under various conditions of loading. The procedures are explained, with the appropriate variables in the design formulae, and provides graphical information on vehicle surcharge loadings.

These modular systems are constructed from multiple cuboid shaped thermoplastic boxes generally with ancillary components such as inlet/outlet connectors, vents, and access/inspection provision. This guidance is for the design of modular systems conforming to EN 17152-1.

The boxes, including integral components, are injection moulded, extruded or thermoformed thermoplastics, manufactured from polypropylene (PP) or unplasticized poly(vinyl chloride) (PVC-U), and are intended to be used as elements in a modular system where the manufacturer has clearly stated in the documentation how the components are assembled to create a complete infiltration, attenuation or storage system.

Outside the scope of this document are the following conditions:

— seismic loads;

— lateral loads from adjacent structures and embankments;

— influence of trees;

— backfill materials not according to CEN/TR 17179 [1].

Geotextile and/or geomembrane used with modular systems are outside the scope of this document.

NOTE If reference is made in this document to Eurocode standards, the conditions in a national foreword or national annex are normally stated.

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 1997-1:2024, *Eurocode 7 - Geotechnical design - Part 1: General rules*

EN 17152-1:2019, *Plastics piping systems for non-pressure underground conveyance and storage of non-potable water - Boxes used for infiltration, attenuation and storage systems - Part 1: Specifications for storm water boxes made of PP and PVC-U*

EN ISO 472:2013, *Plastics - Vocabulary (ISO 472:2013)*

EN ISO 1043-1:2011, *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1:2011)*