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English Version

Plastics piping systems - Validated design parameters of buried thermoplastics piping systems

Systèmes de canalisations en matières plastiques -
Paramètres de calcul validés pour les systèmes enterrés
de canalisations en matières thermoplastiques

Kunststoff-Rohrleitungssysteme - Gültige
Berechnungsparameter von erdverlegten
thermoplastischen Rohrleitungssystemen

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Foreword

This document (CEN/TS 15223:2008) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

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Introduction

In Europe several design methods exist and some are still under development. The plastics pipes industry has carried out a lot of research with full-scale trials. From these research graphs have been made that shows the deflection in the pipes immediately after installation. Also the so-called settlement period is measured. This settlement will always take place. In case that heavy traffic is present, the final deflection will be reached faster.

It is strongly advised to check any calculated deflection with the values in the two design graphs.

The information compiled is meant to be used by designers. The values given are meant for general guidance.

For the purpose of design using simple methods, two soil groups are used, granular and cohesive. For more detailed and sophisticated design, more soil groups are used, for which reason reference is made to EN 1295-1 ^[1] and to national methods.

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1 Scope

This document covers thermoplastics pipe material related properties and design topics to be taken into account when carrying out any static pipe calculation. It also provides *guidance* to applying structural design of thermoplastics piping systems for pressure and non-pressure applications. It furthermore provides documentation based on long term experience, to be *used in justifying and/or verification* of any structural design method.

NOTE For piping systems for the conveyance of gaseous fluids additional guidance is given in EN 12007-2.

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 476, *General requirements for components used in discharge pipes, drains and sewers for gravity systems*

EN 773:1999, *General requirements for components used in hydraulically pressurized discharge pipes, drains and sewers*

EN 805:2000, *Water supply — Requirements for systems and components outside buildings*

CEN/TR 1295-2, *Structural design of buried pipelines under various conditions of loading — Part 2: Summary of nationally established methods of design*

CEN/TR 1295-3, *Structural design of buried pipelines under various conditions of loading — Part 3: Common method*

EN 1446, *Plastics piping and ducting systems — Thermoplastics pipes — Determination of ring flexibility*

EN 12007-2, *Gas supply systems — Gas pipelines for maximum operating pressure up to and including 16 bar — Part 2: Specific functional recommendations for polyethylene (MOP up to and including 10 bar)*

EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation (ISO 9080:2003)*

EN ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification and designation — Overall service (design) coefficient (ISO 12162:1995)*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

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

3.1.1

constant load

load on a pipe, e.g. from internal pressure, that is not changing with time

3.1.2

constant deformation

deformation due to deflection of the pipe that is not changing with time, e.g. due to constraint from the soil