DRAFT FOR DEVELOPMENT

DD CEN/TS
14758-3:2006

Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifier(s) (PP-MD) —

Part 3: Guidance for installation

ICS 93.030

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National foreword

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A review of this Draft for Development will be carried out not later than 2 years after its publication.

Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development, will be made in an announcement in the appropriate issue of *Update Standards*. According to the replies received, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

Observations which it is felt should receive attention before the official call for comments will be welcomed. These should be sent to the Secretary of the responsible BSI Technical Committee, Subcommittee PRI/88/1, Plastics piping for non-pressure applications, at British Standards House, 389 Chiswick High Road, London W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the CEN/TS title page, pages 2 to 9 and a back cover.

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TECHNICAL SPECIFICATION

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CEN/TS 14758-3

May 2006

ICS 93.030

English Version

Plastics piping systems for non-pressure underground drainage and sewerage - Polypropylene with mineral modifier(s) (PP-MD) - Part 3: Guidance for installation

Systèmes de canalisations en plastique pour les branchements et les collecteurs d'assainissement enterrés sans pression - Polypropylène avec des modificateurs minéraux (PP-MD) - Partie 3 : Guide de pose

Kunststoff-Rohrleitungssysteme für erdverlegte Abwasserkanäle und -leitungen - Polypropylen mit mineralischen Additiven (PP-MD) - Teil 3: Empfehlungen für die Verlegung

This Technical Specification (CEN/TS) was approved by CEN on 11 September 2005 for provisional application.

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Foreword

This Technical Specification (CEN/TS 14758-3:2006) has been prepared by Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems”, the secretariat of which is held by NEN.

This Technical Specification is a Part of a System Standard for plastics piping systems of a particular material for a specified application. There are a number of such System Standards.

System Standards are based on the results of the work undertaken in ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids", which is a Technical Committee of the International Organization for Standardization (ISO).

They are supported by separate standards on test methods to which references are made throughout the System Standard.

The System Standards are consistent with general standards on functional requirements and on recommended practice for installation.

EN 14758 consists of the following Parts, under the general title *Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifier(s) (PP-MD)*

Part 1: Specifications for pipes, fittings and the system

Part 2: Guidance for the assessment of conformity

Part 3: Guidance for installation (this Technical Specification)

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this CEN Technical Specification: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This Technical Specification, together with ENV 1046 and EN 1610, provides a material-specific set of guidelines for the installation of piping systems made of polypropylene with mineral modifier(s) (PP-MD) in the field of non-pressure underground drainage and sewerage.

— outside the building structure (application area code "U");

— both buried in ground within the building structure (application area code "D") and outside the building.

This is reflected in the marking of products by "U" and "UD".

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.

ENV 1046:2001, *Plastics piping and ducting systems — Systems outside building structures for the conveyance of water or sewage — Practices for installation above and below ground*

EN 1610:1997, *Construction and testing of drains and sewers*

EN ISO 178, *Plastics —Determination of flexural properties (ISO 178:2001)*

EN ISO 9967, *Plastics pipes — Determination of creep ratio (ISO 9967:1994)*

3 Choice of stiffness (SN) series

3.1 General

PP-MD pipe is a flexible pipe.

When loaded a flexible pipe deflects and presses into the surrounding material. This generates a reaction in the surrounding materials which controls deflection of the pipe. The amount of deflection, which occurs is limited by the care exercised in the selection and laying of the bedding and side fill materials.

3.2 Pipes

3.2.1 Standard procedure

The choice of the stiffness (SN) series may be made:

— when the same class of pipe has previously proved to be satisfactory in the same condition;

— or based on local practice (place of installation, usual installation procedure and experience);

— or based on local regulation;

— or based on Tables 1 and 2 of ENV 1046:2001;

— or based on structural design.

3.2.2 Structural design

If a static calculation is required, information on methods is given in EN 1295-1 and the following parameters apply:

— Flexural modulus: E(1min) 1600-3600 MPa determined in accordance with EN ISO 178 depending on the compound;

— Creep ratio: γ< 4 determined in accordance with EN ISO 9967;

— Deflection limits for calculation given in Table 1.

Table 1 — Deflection limits

Pipe series [a]	Initial deflection	Long term deflection
SN 4 and SN 8	0,09 d_n	0,12 d_n
[a] See EN 14758-1		

NOTE Deflection up to 15 % e.g. caused by soil movement, will not affect the proper functioning of the piping system.

3.3 Fittings

Fittings according to EN 14758-1 [1], because of their geometry, have a stiffness greater than the stiffness of the corresponding pipe. Therefore the following applies:

— fittings marked with SN 4 may be used with pipes up to SN 8;

NOTE When fittings conforming to one of the product standards listed in Annex B of EN 14758-1:2005 [1] are used in combination with pipes and fittings conforming to EN 14758-1 [1], the appropriate recommended practice for installation applies.

3.4 Application area code D

Only pipes and fittings marked “UD” should be installed in situations covered by application area D: buried in ground either within the building structure or not more than 1 m from the building structure.

4 Storage in sunlight

Storage in direct sunlight for long periods and/or high temperatures could cause deformations affecting the jointing.

To avoid this risk the following precautions are recommended:

— limit the height of the stacks of pipes;

— shield the stacks of pipes from continuous and direct sunlight and arrange to allow the free passage of air around the pipes;

— store the fittings in boxes or sacks manufactured so as to permit the free passage of air.

The fading of the colour caused by outside storage does not affect the mechanical properties of pipes and fittings made of PP-MD.

5 Handling and installation at low temperature

Although the impact strength of PP-MD pipes is reduced at low temperatures, experience has shown that even at substantially sub-zero temperatures, these products can be satisfactorily handled and laid, when adequate care is taken.

A special marking on PP-MD pipes "❄" or "❄❄" (ice crystal) shows that the pipe conforms to an additional impact test requirement for pipes intended to be installed at temperatures below 0 °C respectively -10 °C.

6 Push-fit joints (elastomeric sealings)

Jointing should be carried out according to the manufacturer's instructions. However, in the absence of such instructions, it is recommended that the following instructions are used:

a) spigot end shall be chamfered;

b) only sealing rings and lubricants supplied by the manufacturer of the pipe and/or fitting shall be used;

c) for pipes cut on site, the end to be jointed shall be cut square and chamfered to produce a finish equivalent to that of the pipes and fittings supplied by the manufacturer;

d) pipe end, the socket and the ring groove shall be clean and the sealing ring shall be seated correctly into its location;

e) lubricant shall be applied over the whole chamfered end. It shall not be aggressive to the PP-MD or to the elastomeric seal;

f) pipe shall be carefully aligned with the adjoining pipe socket and pushed to the required insertion depth;

g) when a lever is used on the pipe to push the joint, a block of wood should be inserted between the lever and the end of the pipe to prevent damage to the pipe.

7 Maximum deviation from straightness

Pipes should normally be installed straight.

However, as PP-MD pipes are flexible, the following deviation from straightness (see Figure 1) will not cause problems:

$d_n \leq 200$ mm: $R \geq 300 d_n$;

$d_n > 200$ mm: $R \geq 500 d_n$.

Care may be necessary to avoid any extra stress on the socket joint itself.

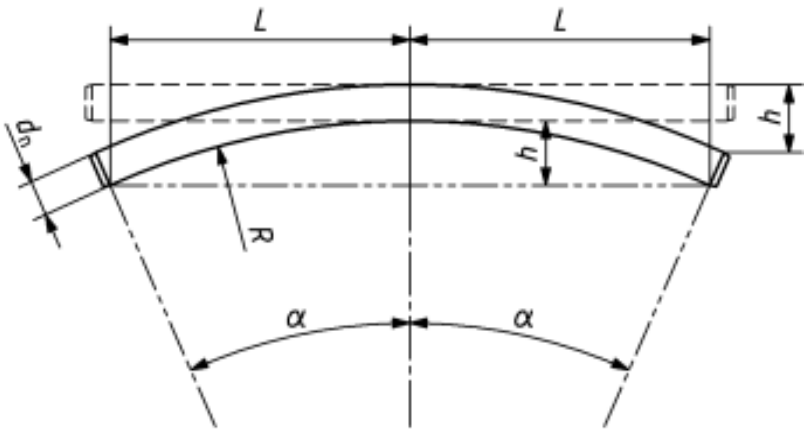
The greatest permitted angular deflection in the socket should be as follows:

2° for $d_n \leq 315$ mm;

1,5° for 315 mm < $d_n \leq 630$ mm;

1° for $d_n > 630$ mm.

Larger angular deflections are permitted in case of joints specifically designed for large angular deflections. In these cases the manufacturer shall declare the designed angular deflection.



NOTE Approximately $h \approx L^2/2R$ and $\alpha \approx L/R$ (α *in radians).*

Figure 1 — Parameters of deviation from straightness

8 Connection to rigid structures

Special fittings for this purpose are available. In such cases the manufacturer's instructions should be followed.

9 Repairs

Slip-couplers or purpose-designed special fittings are available from manufacturers for effecting repairs. Because designs vary, it is necessary to follow individual manufacturer's instructions. However, in the absence of such instructions, it is recommended that the following instructions are used:

a) full extent of the damaged or failed section shall be identified and removed;

b) cut pipe ends shall be square and shall be prepared for push-fit jointing as described in 6c);

c) repair, or slip-, couplings shall be placed in position. The replacement pipe length shall then be laid on the suitably prepared bed and the slip-couplings moved to their final positions (see Figure 2);

d) embedment shall then be replaced to give compaction values approximately equal to those immediately adjacent to the repair.

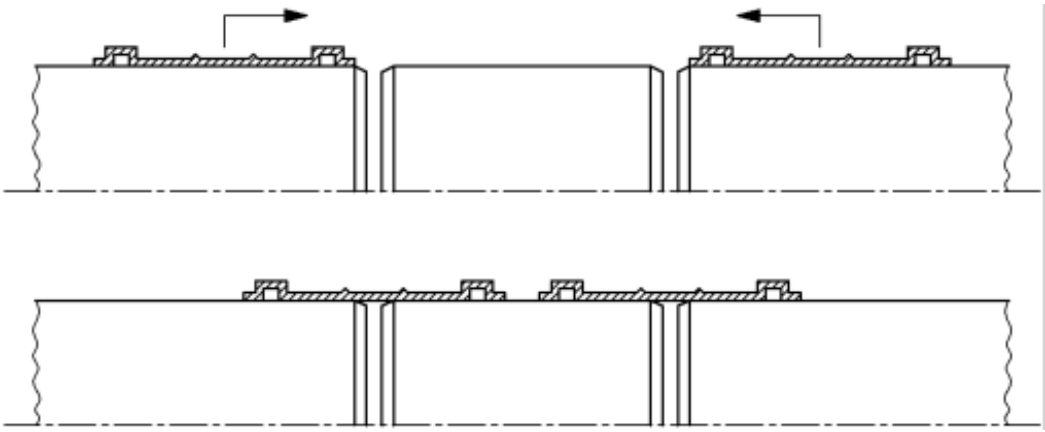


Figure 2 — Repairs using slip-couplers

10 Connection to existing pipes

For PP-MD pipelines an additional connection can be made in a manner similar to that for making a repair when an appropriate fitting is used. Alternatively, a saddle connection may be made, in which case the manufacturer's instructions should be followed.

11 Testing on site

PP-MD non-pressure pipelines shall be tested according to the procedures described in Clause 13 of EN 1610:1997.

PP-MD pipes are not porous, therefore it is possible to use more stringent parameters and requirements. In this case, the following are proposed:

a) testing with air:

   1) testing method : LC;

   2) test pressure : 100 mbar (10 kPa);

   3) pressure drop : 5 mbar (0,5 kPa);

   4) testing time : 3 min for $d_n < 400$ mm;
      $0{,}01 d_n$ min for $d_n \geq 400$ mm.

b) testing with water:

   1) 0,04 l/m^2 during 30 min for pipelines;

   2) 0,05 l/m^2 during 30 min for manholes and inspection chambers.

Bibliography

[1] EN 14758-1:2005, Plastics piping systems for non-pressure underground drainage and sewerage — Polypropylene with mineral modifier(s) (PP-MD) — Part 1: Specifications for pipes, fittings and the system

[2] EN 1295-1, Structural design of buried pipelines under various conditions of loading — Part 1: General requirements.

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