TECHNICAL SPECIFICATION

ISO/TS 7024

First edition
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Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Thermoplastics — Recommended practice for installation

Systèmes de canalisations en plastique pour l'évacuation des eaux-vannes et des eaux usées (à basse et à haute température) à l'intérieur des bâtiments — Thermoplastiques — Pratiques recommandées pour la pose

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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

ISO/TS 7024 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 1, *Plastics pipes and fittings for soil, waste and drainage (including land drainage)*.

This Technical Specification is a guidance document only, to be mainly used as a basis for preparing more specific manufacturer's instructions. It is associated with standards for piping systems covering a particular thermoplastic material for a specified application. There are a number of such standards.

This Technical Specification is consistent with general standards on functional requirements and on recommended practice for installation.

This first edition cancels and replaces Technical Report ISO/TR 7024:1985.

Introduction

This Technical Specification covers the recommended practice for installation of the thermoplastics piping systems for soil and waste discharge. The most important recommendations are expressed by the use of the imperative. These are strongly recommended.

Guidance for installation is presented, e.g. by the use of “may” or “is recommended”, for consideration as a matter of judgement in each case.

This Technical Specification refers to ISO standards in which buried application is not covered. Buried application is described, for information only, in Annex A.

Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Thermoplastics — Recommended practice for installation

1 Scope

This Technical Specification gives the recommended practice for installation of thermoplastics piping systems in the field of soil and waste discharge (low and high temperature) inside buildings (marked with “B”).

This Technical Specification is applicable to thermoplastics pipes and fittings as specified in the associated standards ISO 3633 (PVC-U), ISO 7671 (PP), ISO 7682 (ABS), ISO 8770 (PE-HD), ISO 19220 (SAN + PVC) and ISO 7675 (PVC-C), their joints and to joints with components of other plastics and non-plastics materials intended to be used for the following purposes.

a) Soil and waste discharge pipework for the conveyance of domestic waste waters (low and high temperature).

NOTE 1 See Clause 4 for waste discharge temperature limits.

b) Ventilating pipework associated with a).

c) Rainwater pipework within the building structure (see Figure 1).

If specified in the relevant associated standard, this Technical Specification also covers soil and waste discharge pipework fixed externally on to the building (See Figure 1). It is not applicable to pipework that passes under the building without any connection from the discharge system.

NOTE 2 According to the associated standards, for external above-ground soil and waste discharge, additional requirements depending on the climate are to be agreed between the manufacturer and the user.

NOTE 3 According to the associated standards, components conforming to other standards on plastic piping systems may be used with pipes and fittings conforming to a given associated standard, if they conform to the requirements for joint dimensions and functional requirements of the given associated standard.

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.

ISO 3633, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Unplasticized poly(vinyl chloride) (PVC-U)*

ISO 7671, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Polypropylene (PP)*

ISO 7675, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Chlorinated poly(vinyl chloride) (PVC-C)*

ISO 7682, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Acrylonitrile/butadiene/styrene (ABS)*

ISO 8770, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — polyethylene (PE)*

ISO/TR 10358, *Plastics pipes and fittings — Combined chemical-resistance classification table*

ISO 19220, *Plastics piping systems for soil and waste discharge (low and high temperature) inside buildings — Styrene copolymer blends (SAN + PVC)*

EN 12056-1, *Gravity drainage systems inside buildings — Part 1: General and performance requirements*

EN 12056-2, *Gravity drainage systems inside buildings — Part 2: Sanitary pipework, layout and calculation*

EN 12056-3, *Gravity drainage systems inside buildings — Part 3: Roof drainage, layout and calculation*

EN 12056-5, *Gravity drainage systems inside buildings — Part 5: Installation and testing, instructions for operation, maintenance and use*

3 Terms, definitions, symbols and abbreviations

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

3.1 General terms

For the general terms, refer to EN 12056-1, EN 12056-2 or EN 12056-3, where applicable, and see Figure 1 (the figure is schematic only).

Local and/or national regulations may require separate drainpipe systems for foul and rainwater.

3.2 Terms and definitions

For the purposes of this document, the terms and definitions given in the relevant associated standard apply, together with the following.

3.2.1
associated standard
standard which specifies all requirements applicable to pipes, fittings and joints made of a particular material to be installed according to the recommendations of this Technical Specification

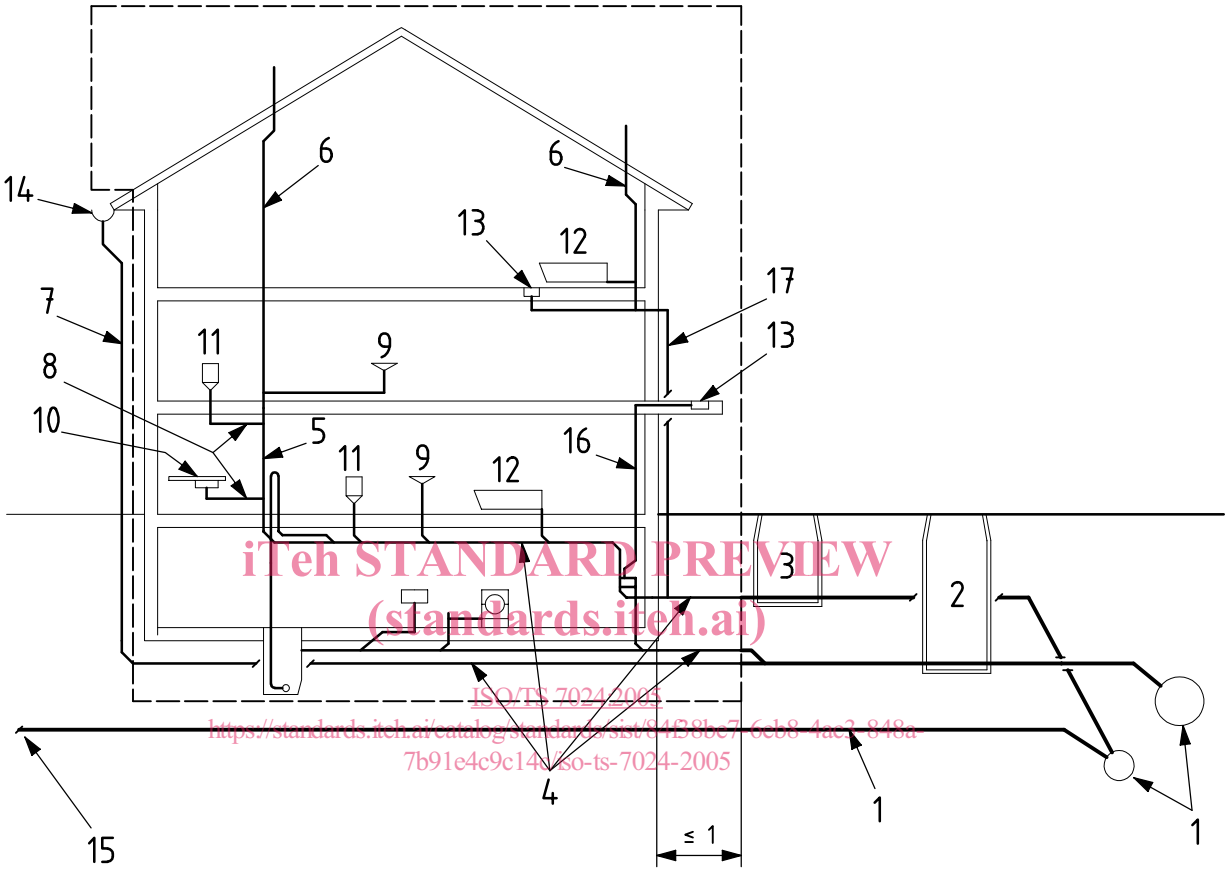
3.2.2
ring seal socket length
type S, type N or M or type L
length of a ring seal socket, which is designated as short (type S), normal or medium (type N or type M), or long (type L) in the relevant associated standards

NOTE In some cases, type N sockets are designated by type M (medium).

3.2.3
flexible leg
L_1 and L_2
free length between two fixed points either sides of a bend of a solvent cement system designated L_1 and L_2

3.2.4
expansion gap
E, E_1, E_2
distance left during installation between the bottom of a socket and the spigot of the inserted component, allowing expansion of the system

Dimensions in metres



Key

1	sewer	7	rainwater down pipe	13	floor gully/trap
2	manhole	8	branch discharge pipe	14	gutter
3	inspection chamber	9	wash basin	15	pipework from other buildings
4	drains	10	sink	16	internal rainwater down pipe
5	discharge stack	11	water closet	17	external discharge stack
6	stack vent	12	bath		

NOTE Keys 1, 2, 7 and 14 are not covered by this Technical Specification. Key 3 is covered if the distance to the building wall is smaller than or equal to 1 m.

Figure 1 — Terms for a soil and waste discharge system

3.3 Symbols

3.3.1 Symbols for installation

D_{max} recommended maximum distance between support centres in above-ground installation (see 6.2.4.2)

$L_{c,max}$ maximum recommended distance between anchored brackets in concreted-in installation (see 7.1.2.7)

L_F free length between fixed points in above-ground installation (see 6.2.3.1)

Y effective sealing length (see 6.2.3.2)

3.3.2 Symbols for junctions

NOTE The symbols of a basic nature for junctions are given in ISO 2553, ISO 14617-3 and ISO 14617-15.

3.3.2.1 Symbol for sockets for solvent cement jointing

The design symbol (square-shaped) given in Figure 2 signifies a rigid, non-removable connection of two pipes and/or fittings made by means of a solvent cement socket.

Figure 2 — Design symbol for solvent cement joint

3.3.2.2 Symbols for sockets for ring seal jointing

The design symbols (cup-shaped) given in Figure 3 signify a non-rigid, removable connection of two pipes and/or fittings made by means of a rubber seal in a type S, type N, type M or type L socket.

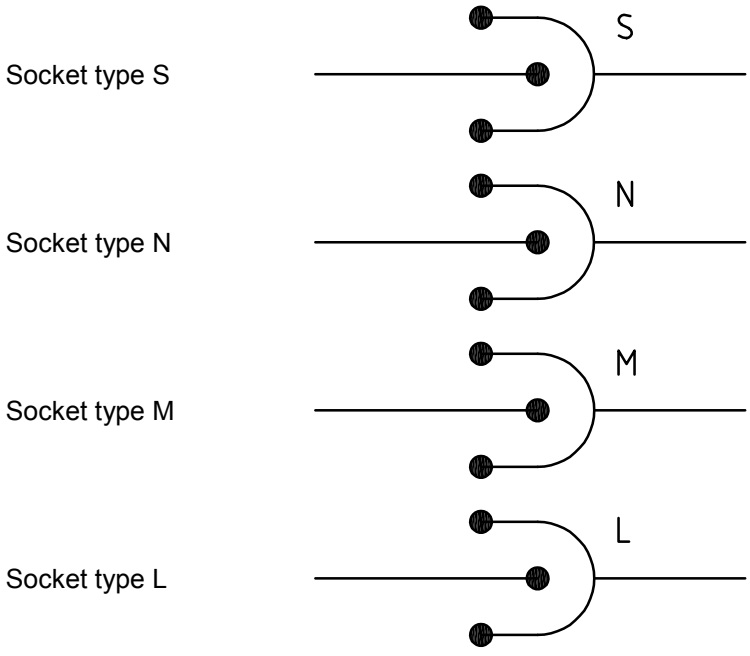
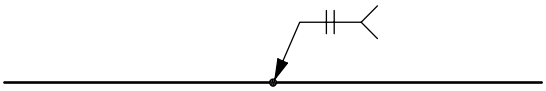


Figure 3 — Design symbols for ring seal joint

3.3.2.3 Symbol for butt-fusion joint

The design symbol given in Figure 4 signifies a rigid, non-removable connection of two pipes and/or fittings made after fusion by means of a heating plate.

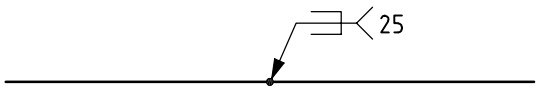


NOTE A number should be written between the two branches of the fork. It refers to the number of the welding process given in ISO 4063.

Figure 4 — Design symbol for butt-fusion joint

3.3.2.4 Symbol for electrofusion sleeve coupling

The design symbol given in Figure 5 signifies a rigid, non-removable connection of two pipes and/or fittings made by means of integral electrically powered fusion.



NOTE The number written between the two branches of the fork refers to the number of the welding process given in ISO 4063; in this case, the number is 25 for resistance butt welding.

Figure 5 — Design symbol for electrofusion sleeve coupling

3.3.2.5 Symbol for flange and backing ring joint

The design symbol given in Figure 6 signifies a rigid connection of two pipes and/or fittings made by means of bolts and nuts.

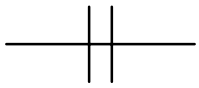


Figure 6 — Design symbol for flange and backing ring joint

3.3.2.6 Symbol for compression joint

The design symbol given in Figure 7 signifies a rigid connection of two pipes and/or fittings made by means of thread, rubber ring and screw.

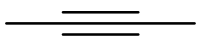
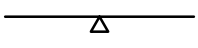


Figure 7 — Design symbol for compression joint

3.3.3 Symbols for brackets

The design symbols for brackets given in Figure 8 signify an anchor bracket or a guide bracket, respectively.



Anchor bracket
(for fixed point)

Guide bracket
(for free movement of pipe)

Figure 8 — Design symbols for brackets

3.4 Abbreviations

For the thermoplastics materials, the following abbreviations apply:

ABS Acrylonitrile-butadiene-styrene

PE Polyethylene

PP Polypropylene

PP-H Polypropylene homopolymer

PVC-C Chlorinated poly(vinyl chloride)

PVC-U Unplasticized poly(vinyl chloride)

SAN + PVC Styrene copolymer blend

4 Design limits of the system

Discharge systems of thermoplastics are primarily designed for intermittent waste discharge of domestic origin, including from washing and dishwashing machines. Discharge systems of PE, PP, ABS and PVC-C are also designed for discharges from public laundries, launderettes or other installations where long periods of high temperature discharge occur. For the design of systems for other discharges than domestic waste, see Clause 13 and manufacturer's recommendations.

Apply the requirements for the calculation of the flow capacity of plumbing installations, as specified in relevant European Standards, subject to any applicable national and/or local regulations.

NOTE Among European Standards, EN 12056-2 and EN 12056-3 are primarily applicable for flow capacity calculation.

5 Storage, transport and handling

5.1 General

Attention is drawn to any relevant local and/or national safety regulations.

Avoid damage to the surfaces and ends of pipe and fittings.

Loading and handling of components made of PP-homopolymers (marked PP-H), for which performance impact testing is carried out at 23 °C (see ISO 7671) is not recommended at ambient temperatures lower than + 5 °C. For components made of other materials, follow the manufacturer's instructions regarding installation at low temperature.

Support pipes with sockets and with pre-assembled fittings, in such a way that they are protected from damage and that the ends are free from loading, e.g. by alternating the socket and non-socket ends in given or adjacent layers.

5.2 Transport

Load pipes and fittings in such a way that no damage occurs during transport (see Figure 9).

Stack the pipes at a maximum stacking height of 1,5 m, unless otherwise specified in the manufacturer's instructions, e.g. when transporting caged bundles.

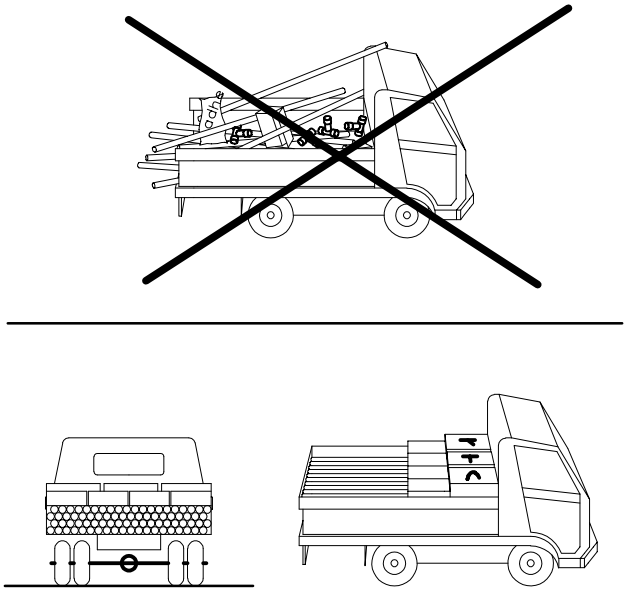


Figure 9 — Loading for transport

5.3 Storage

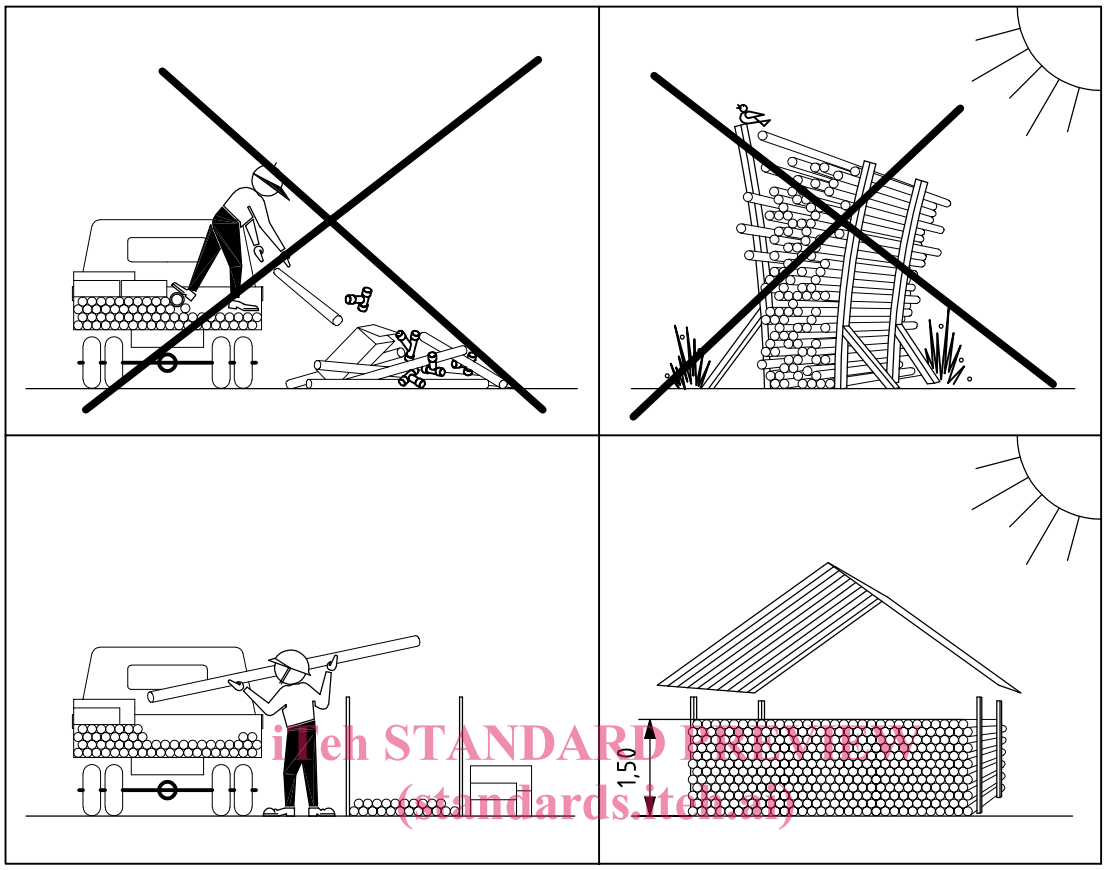
Do not carelessly unload pipes and fittings (see Figure 10).

Provide a storage area free from substances harmful to the relevant thermoplastics (see Clause 13), comprising smooth and level ground or a flat timber base to avoid the risk of bent or damaged pipes. Where PE pipes are supplied in coils, store them either stacked flat one on top of the other or (chiefly for sizes greater than DN 90) vertically in purpose-built racks or cradles.

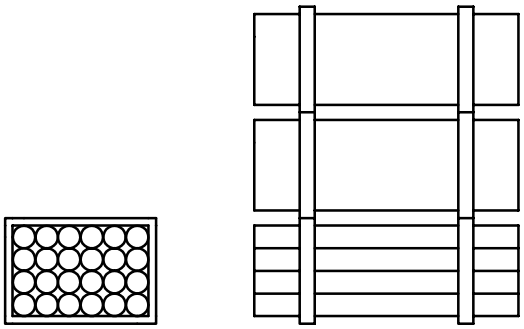
Avoid storage in direct sunlight over a period longer than one year. Where long-term storage and/or strong sunlight is expected, screening from the direct rays of the sun is recommended, except for black-coloured PE components.

Recommended maximum stacking height is 1,5 m [see Figure 10, a)], unless otherwise stated in the manufacturer's instructions, e.g. when stacking caged bundles [see Figure 10, b)].

Dimensions in metres



a)



b)

Figure 10 — Storage on site

5.4 Handling on site

To avoid risk of damage, carry (i.e. do not drag) pipes and fittings to the work place (see Figure 11).

NOTE Careless handling might lead to damaged materials and faulty installations.

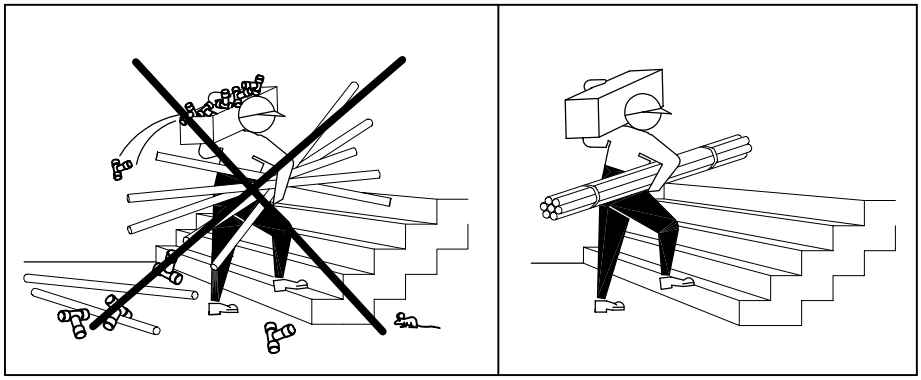


Figure 11 — Handling on site

6 Installation

6.1 General recommendations for installation

6.1.1 Cutting of pipe

Cut pipe square to length with a fine-tooth saw, or special purpose equipment (see Figure 12). Remove all burrs at the inside and outside edges of the cut surfaces.

Prior to fusion jointing, if necessary, e.g. if the pipe ends were slightly tapered during their production, cut 10 mm to 15 mm from the factory-made pipes.

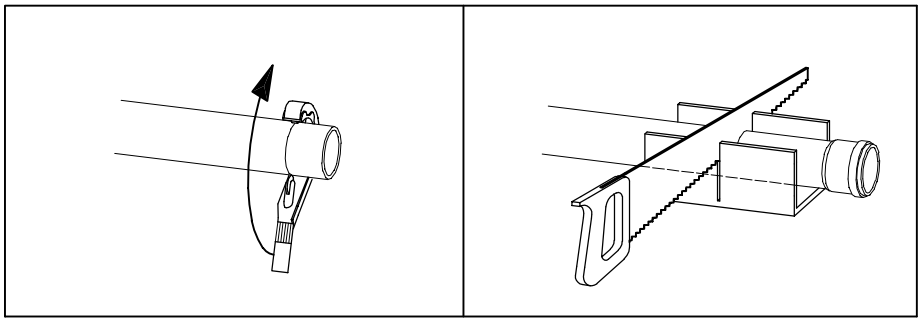


Figure 12 — Cutting of pipe