

Wavin UK (Holdings) Ltd

Parsonage Way
Chippenham
Wiltshire SN15 5PN
Tel: 01249 654121 Fax: 01249 443286
e-mail: info@wavin.co.uk
website: www.wavin.co.uk

Agrément Certificate
87/1835
Product Sheet 2

OSMADRAIN UNDERGROUND DRAINAGE SYSTEM

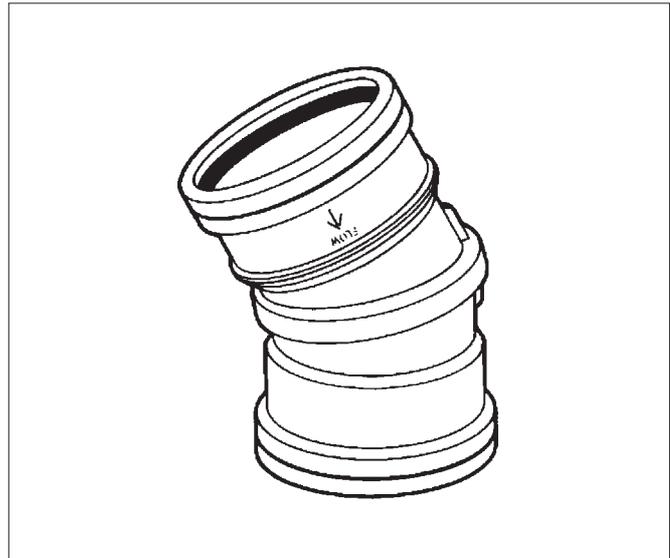
OSMADRAIN 110 MM ADJUSTABLE BENDS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to the Osmadrain 4D 173 and 4D 573 110 mm diameter polypropylene adjustable bends. The adjustable bends are for use with pipes and fittings complying with BS EN 1401-1 : 2009, BS 4660 : 2000, BS 7158 : 2001, BS EN 13598-1 : 2003 and BS EN 13598-2 : 2009.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



KEY FACTORS ASSESSED

Mechanical properties — the products have adequate strength to resist loads associated with installation and with subsequent use (see section 5).

Performance of joints — joints will remain watertight and will not be adversely affected by thermal expansion (see sections 6.1 and 6.2).

Flow characteristics — the products will not adversely affect the flow characteristics of the drainage system (see section 7).

Resistance to chemicals — the products will be unaffected by chemicals likely to be found in domestic sewage (see section 8).

Resistance to elevated temperatures — the products have adequate resistance to the temperatures likely to be found in domestic sewage (see section 9).

Durability — the products will have a life in excess of 50 years (see section 12).

The BBA has awarded this Agrément Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément



Brian Chamberlain

Head of Approvals — Engineering



Greg Cooper

Chief Executive

Date of First issue: 5 October 2010

Originally certificated on 17 November 1988

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

British Board of Agrément
Bucknalls Lane
Garston, Watford
Herts WD25 9BA

©2010

tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, the OsmaDrain 110 mm Adjustable Bends, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2010 (England and Wales)

Requirement:	H1	Foul water drainage
Comment:		The products will convey the flow of foul water and minimise the risk of blockages and leaks. See sections 3, 5, 6.1 and 6.2, 7, 8, 9 and 10 of this Certificate.
Requirement:	H3(3)	Rainwater drainage
Comment:		The products will convey the flow of rainwater and minimise the risk of blockages and leaks. See sections 3, 5, 6.1 and 6.2, 7, 8, 9 and 10 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the products satisfies the requirements of this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	3.6(a)	Surface water drainage
Comment:		The products will meet the relevant requirements of this Standard, with reference to clauses 3.6.1 ⁽¹⁾⁽²⁾ , 3.6.2 ⁽¹⁾⁽²⁾ and 3.6.3 ⁽¹⁾⁽²⁾ . See sections 3, 5, 6.1 and 6.2, 7, 8, 9 and 10 of this Certificate.
Standard:	3.7(b)	Wastewater drainage
Comment:		The products will meet the relevant requirements of this Standard, with reference to clauses 3.7.3 ⁽¹⁾⁽²⁾ and 3.7.4 ⁽¹⁾⁽²⁾ . See sections 3, 5, 6.1 and 6.2, 7, 8, 9 and 10 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	N4(a)(b)	Underground foul drainage
Comment:		The products will convey the flow of foul water and minimise the risk of blockages or leaks. See sections 3, 5, 6.1 and 6.2, 7, 8, 9 and 10 of this Certificate.
Regulation:	N5(a)(b)	Rain-water drainage
Comment:		The products will convey the flow of rainwater and minimise the risk of blockages or leaks. See sections 3, 5, 6.1 and 6.2, 7, 8, 9 and 10 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 13 *General* (13.1) of the *Installation* part of this Certificate.

Non-regulatory Information

NHBC Standards 2010

NHBC accepts the use of the OsmaDrain 110 mm Adjustable Bends, when installed and used in accordance with this Certificate, in relation to *NHBC Standards, Part 5 Substructure and ground floors, Chapter 5.3 Drainage below ground*.

General

This Certificate relates to the OsmaDrain 4D 173 and 4D 573 110 mm diameter polypropylene adjustable bends. The adjustable bends are for use with pipes and fittings complying with BS EN 1401-1 : 2009, BS 4660 : 2000, BS 7158 : 2001, BS EN 13598-1 : 2003 and BS EN 13598-2 : 2009.

Technical Specification

1 Description

1.1 The OsmaDrain Adjustable Bends (see Figures 1 and 2) incorporate two mouldings pressed together to retain a sealing ring. The two components may be rotated to form any angle between 0° and 30°. The 4D 173 bend has a socket inlet and spigot outlet, the 4D 573 bend is a double socket fitting. Each socket incorporates a ring seal retained by a snap cap. The products have an arrow indicating the direction of flow.

Figure 1 Single socket adjustable bend

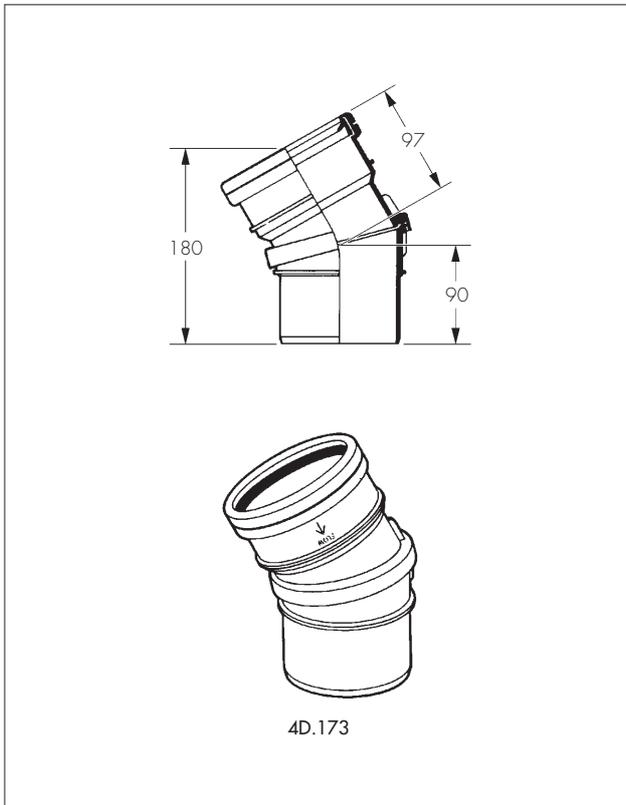
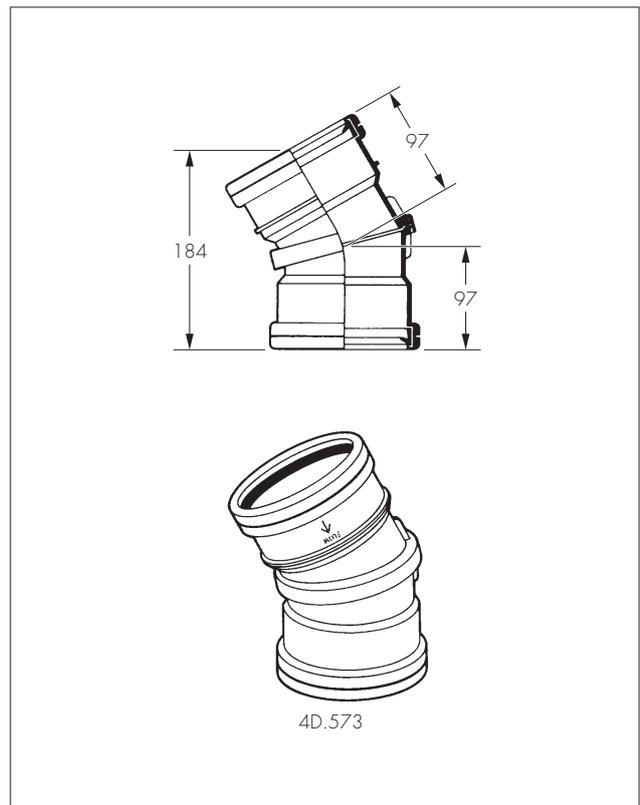


Figure 2 Double socket adjustable bend



1.2 The fitting body and snap cap are injection moulded in polypropylene.

1.3 Quality control checks, including visual and dimensional checks, heat reversion and water pressure resistance tests, are carried out continuously during manufacture.

1.4 The 110 mm diameter ring seals are either Ethylene Propylene Diene Monomer (EPDM) rubber or Thermoplastic Elastomer (TPE) to BS EN 681-1 : 1996 or BS EN 681-2 : 2000 respectively.

1.5 Each fitting is stamped with the manufacturer's name and product code number. A label bearing the BBA identification mark incorporating the number of this Certificate is attached to each fitting.

2 Delivery and site handling

The fittings are delivered to site in polythene bags. This packaging should be retained during storage to minimise the risk of damage to component parts.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the OsmaDrain 110 mm Adjustable Bends.

Design Considerations

3 General

 The 110 mm diameter adjustable bends have been assessed for use with pipes and fittings complying with BS EN 1401-1 : 2009, BS 4660 : 2000, BS 7158 : 2001, BS EN 13598-1 : 2003 and BS EN 13598-2 : 2009, in domestic drains designed in accordance with BS EN 752 : 2008 for the conveyance, by combined or separate systems, of surface water and domestic sewage as is permitted to be discharged into public sewers by the Water Industry Act 1991, Chapter 56, and surface water and sewage as is permitted and defined by the Sewerage (Scotland) Act 1968 and the Water and Sewerage Services (Northern Ireland) Order 1973.

4 Practicability of installation

The products are designed to be installed by a competent contractor experienced with these types of product.

5 Mechanical properties

 The adjustable bends have adequate strength to resist the loads associated with installation and subsequent use, in the locations defined in this Certificate.

6 Performance of joints

 6.1 The performance of joints, when correctly made, will not be adversely affected by thermal expansion or contraction.

6.2 Joints with the pipeline remain watertight under conditions of pipeline movement in excess of those expected to occur in normal good drainage practice.

7 Flow characteristics

 When used in underground drainage systems designed and installed in accordance with the recommendations given in this Certificate, the adjustable bends will not adversely affect the flow characteristics of the drainage system.

8 Resistance to chemicals

 The products are suitable for use where pipes and fittings to BS EN 1401-1 : 2009 and BS 4660 : 2000 are normally used. They have adequate resistance to the type and quantity of chemicals likely to be found in domestic sewage.

9 Resistance to elevated temperatures

 The products are for use where pipes and fittings to BS EN 1401-1 : 2009, BS 4660 : 2000, BS 7158 : 2001, BS EN 13598-1 : 2003 and BS EN 13598-2 : 2009 are normally used and have adequate resistance to the temperatures likely to be found in domestic sewage.

10 Rodding

 Drains incorporating the products can be rodded easily using conventional flexible drain rods. Toothed root cutters, as used with some mechanical cleaning systems, could damage the fittings and should not be used.

11 Maintenance

As the products are confined within the soil and have suitable durability (see section 12), maintenance is not required.

12 Durability

 In the opinion of the BBA, when used in the context of this Certificate, the materials from which the products are manufactured will not significantly deteriorate, and the products will have a life in excess of 50 years.

13 General

13.1 Installation of the OsmoDrain 110 mm Adjustable Bends must be in accordance with BS 8000-14 : 1989, BS EN 1610 : 1998, BS EN 752 : 2008 and the current version of the Certificate holder's *OsmoDrain Installation Guide*.

13.2 Figures 3 to 6 show the products in use in various applications.

Figure 3 Installation of single socket adjustable bend

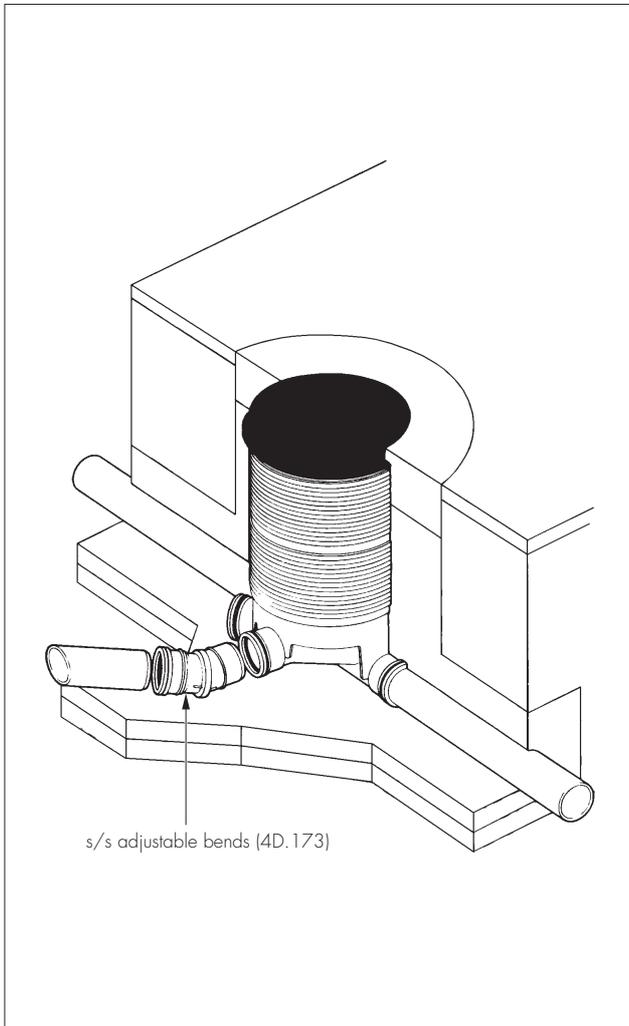


Figure 4 Permissible connections to inspection chamber

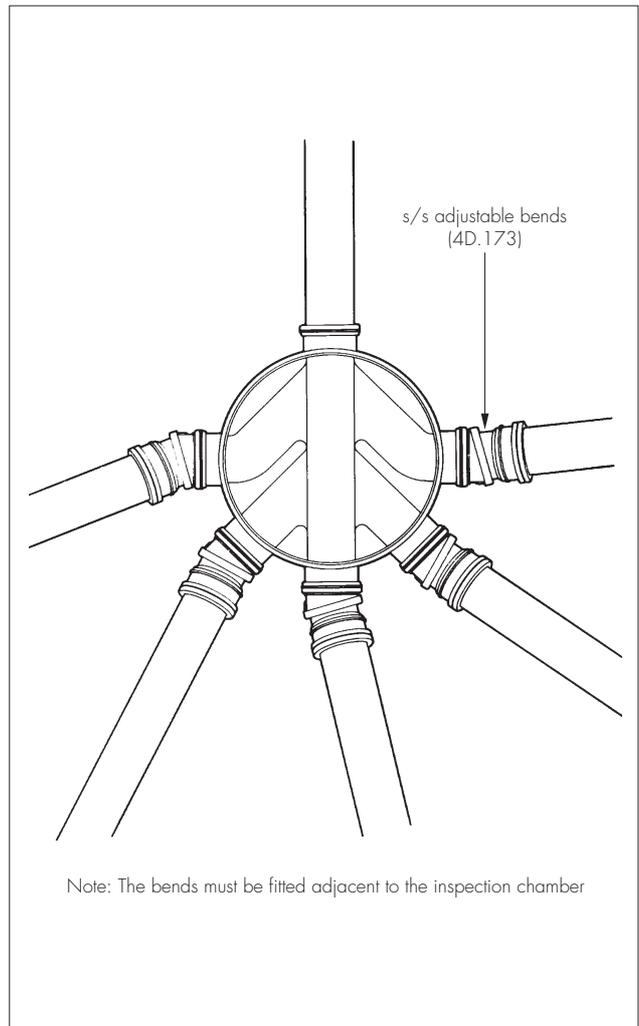


Figure 5 Double socket bend — change in gradient

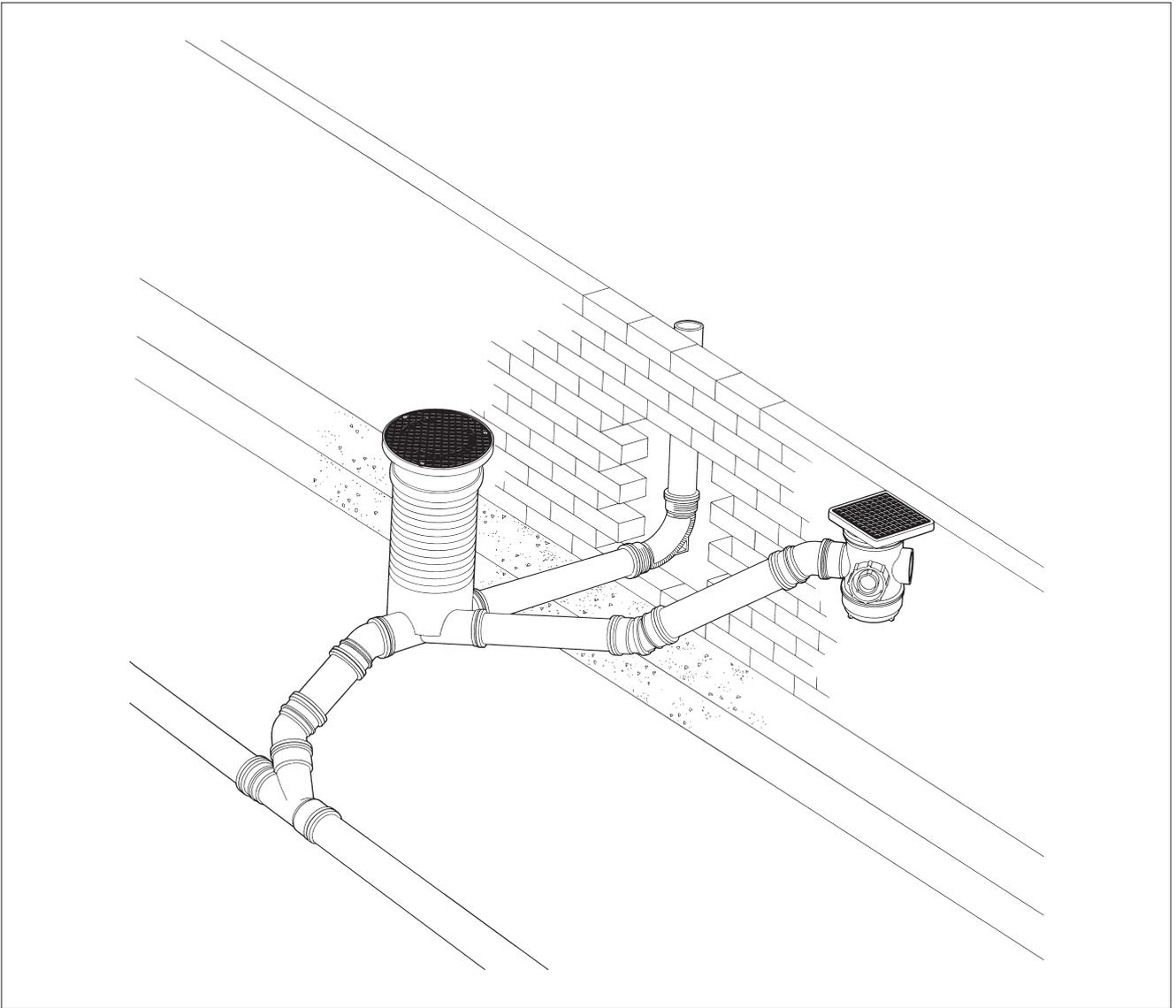
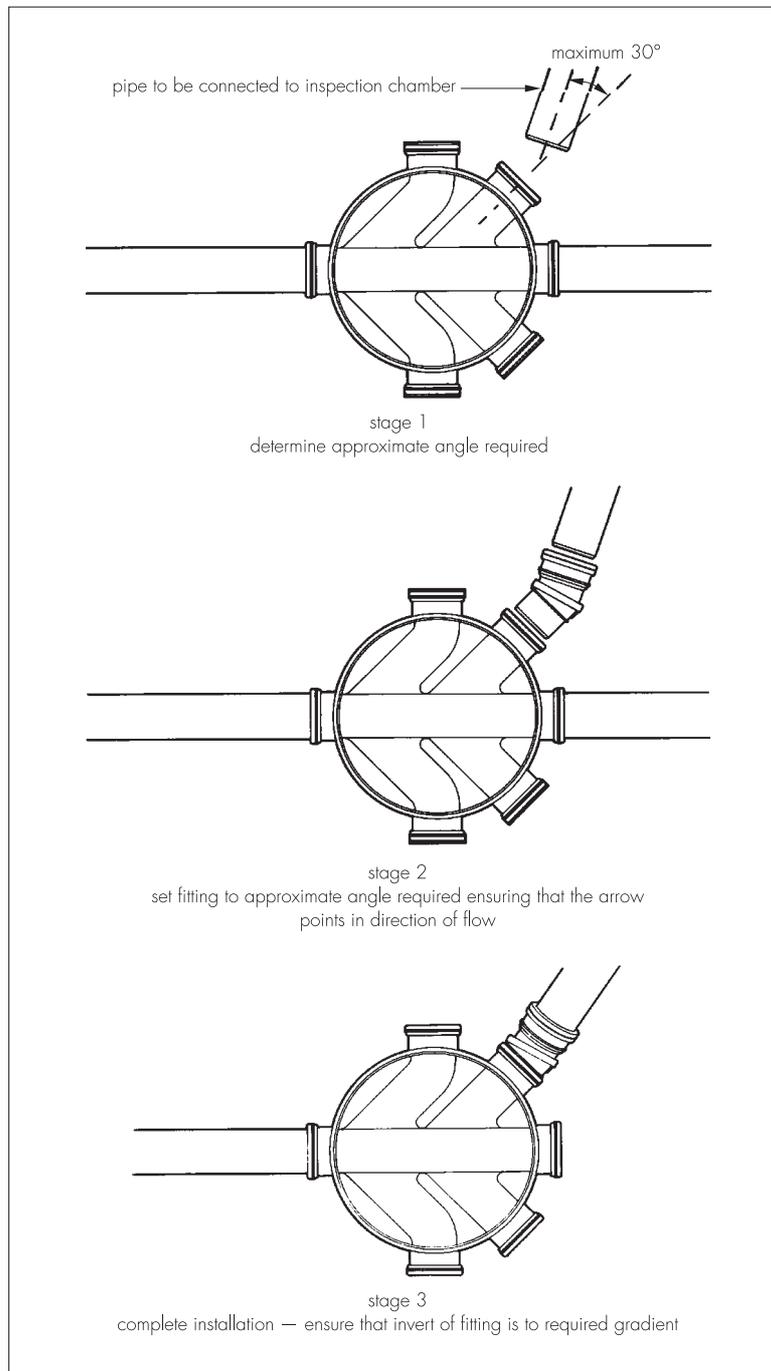


Figure 6 Installation procedure (typical)



14 Procedure

14.1 Joints are made as follows:

- The components to be joined are lined up. The flow direction indicator must point in the direction of flow.
- The fitting is rotated to the approximate angle required.
- Both socket and pipe or spigot are cleaned.
- The ring seal is put in place, ensuring that it is seated correctly.
- The recommended lubricant is applied to the pipe or spigot.
- The pipe is inserted fully into the socket and approximately 10 mm is withdrawn to allow for expansion.
- The invert of the fitting is checked to ensure it follows the required gradient.

14.2 Drain and sewer systems incorporating the bends should be installed in accordance with Certificate 87/1835, Product Sheet 4.

14.3 The products must have adequate protection against damage from site construction traffic and from agricultural or similar operations.

15 Tests

Tests were carried out to determine:

- effect of combined hot and cold water discharges through the product whilst subjected to a loading of 35 kN (BS 4660 : 1973 Appendix K)
- dimensional accuracy
- watertightness of joints under conditions of pipe deformation and hydrostatic pressure of 0.35 bar
- watertightness of joints under conditions of vertical displacement and a hydrostatic pressure of 0.35 bar
- ease of jointing and rotating to angle required
- watertightness of central joint when subject to shear loads
- effect of rodding using polypropylene drain rods with various rodding heads.

16 Other investigations

16.1 An evaluation of existing data was made to assess:

- tensile strength
- compressive strength
- impact strength
- Vicat softening point
- resistance to chemicals
- flow characteristics
- durability.

16.2 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

16.3 A visit was made to a system under construction to assess the practicability of installation.

Bibliography

- BS 4660 : 1973 *Specification for unplasticized polyvinyl chloride (PVC-U) pipes and plastics fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage*
- BS 4660 : 2000 *Thermoplastics ancillary fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage*
- BS 7158 : 2001 *Plastics inspection chambers for drains and sewers — Specification*
- BS 8000-14 : 1989 *Workmanship on building sites — Code of practice for below ground drainage*
- BS EN 681-1 : 1996 *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Vulcanized rubber*
- BS EN 681-2 : 2000 *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Thermoplastic elastomers*
- BS EN 752 : 2008 *Drain and sewer systems outside buildings*
- BS EN 1401-1 : 2009 *Plastics piping systems for non-pressure underground drainage and sewerage. Unplasticized poly(vinylchloride) (PVC-U) — Specifications for pipes, fittings and the system*
- BS EN 1610 : 1998 *Construction and testing of drains and sewers*
- BS EN 13598-1 : 2003 *Plastics piping systems for non-pressure underground drainage and sewerage— Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Specifications for ancillary fittings including shallow inspection chambers*
- BS EN 13598-2 : 2009 *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) — Specifications for manholes and inspection chambers in traffic areas and deep underground installations*

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

17.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

17.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

17.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

BLANK PAGE

Page 11 of 12

