

# HAPAS

## Roads and Bridges

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Agrément Certificate  
**No 02/H068 Product Sheet 3**

## RIDGIDRAIN ADVANCED DRAINAGE SYSTEM

### PRODUCT SHEET 3 – RIDGIDRAIN FITTINGS (150 MM to 600 MM)

This Certificate is issued under the Highway Authorities' Product Approval Scheme (HAPAS) by the British Board of Agrément (BBA) in conjunction with the Highways Agency (HA) (acting on behalf of the overseeing organisations of the Department for Transport; the Scottish Executive; the Welsh Assembly Government; the Department for Regional Development, Northern Ireland), the County Surveyors' Society, the Local Government Technical Advisers' Group, and industry bodies. HAPAS Agrément Certificates are normally each subject to a review every five years.

#### PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Ridgidrain Fittings (150 mm to 600 mm) for use with Ridgidrain pipes in sizes from 150 mm to 600 mm in highway drainage.

#### AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with HAPAS requirements
- factors relating to compliance with Regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal five-yearly review.

#### KEY FACTORS ASSESSED

**Strength** — the fittings have adequate strength to resist loads associated with installation and service (see section 4).

**Performance of joints** — the system will remain watertight under normal service conditions (see section 5).

**Durability** — the system will have a service life in excess of 50 years (see section 9).



The BBA has awarded this Agrément Certificate for Ridgidrain Fittings (150 mm to 600 mm) to Polypipe Civils Ltd as fit for their intended use provided they are installed, used and maintained as set out in this Agrément Certificate.

On behalf of the British Board of Agrément

Head of Approvals  
— Engineering

Chief Executive

Date of First issue: 19 May 2003

Date of Second issue: 16 June 2008

*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](http://www.bbacerts.co.uk)*

*Readers are advised to check the validity of this Agrément Certificate by either referring to the BBA's website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)) or contacting the BBA direct.*

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# HAPAS Requirements

## Requirements

The general requirements for drains are contained in the Manual of Contract Documents for Highway Works (MCHW)<sup>(1)</sup>, Volume 1 and Volume 2.

The general requirements for structured wall pipes and fittings are contained in the MCHW Volume 1, Clause 518.

Further information and guidance is given in MCHW, Volume 3, Drawing Numbers F1 and F2.

Additional site requirements may be included on particular contracts.

(1) The MCHW is operated by the Overseeing Organisations : The Highways Agency (HA), Transport Scotland, the Welsh Assembly Government and The Department for Regional Development (Northern Ireland).

## Regulations

### 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 sections: 2 *Delivery and site handling* (2.1) and *General* (10).

## General

This Certificate relates to Ridgidrain Fittings (150 mm to 600 mm), in sizes of 150 mm, 225 mm, 300 mm, 375 mm, 400 mm, 450 mm, 500 mm and 600 mm for highway drainage.

The fittings comply with the MCHW, Volume 1, Clause 518, and are for use in highway drainage in conjunction with the pipes covered by Product Sheet 1 and Product Sheet 2 of this Certificate for the collection and disposal of surface and sub-surface water.

## Technical Specification

### 1 Description

1.1 Ridgidrain Fittings (150 mm to 600 mm) are either fabricated from twin wall pipe and couplers (as certificated in Product Sheets 1 and 2) welded together or are injection moulded. Details and dimensions of the fittings are given in Figure 1.

1.2 The ring seals described in Product Sheets 1 and 2 are available for each size of pipe for connection to the fittings.

1.3 Continuous quality control is exercised during manufacture. Checks include:

- dimensional accuracy
- airtightness
- visual examination.

1.4 Each fitting carries a label bearing the BBA identification mark incorporating the number of this Certificate, and the angle of the bends and junctions.

### 2 Delivery and site handling

2.1 Fittings with 300 mm nominal diameter and above must be handled with care.

2.2 When long-term storage is envisaged, fittings must be protected from direct sunlight.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Ridgidrain Fittings (150 mm to 600 mm).

## Design Considerations

### 3 General

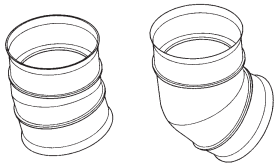
Ridgidrain Fittings (150 mm to 600 mm), when used with the pipes described in Product Sheets 2 and 3 and installed in accordance with the recommendations given in this Certificate, are suitable for use in highways for the collection and disposal of surface and sub-surface water.

### 4 Strength

The fittings have adequate strength to resist loads associated with installation and with subsequent use in the situations described in this Certificate.

Figure 1 Ridgidrain ADS fittings (all measurements in mm — unless otherwise stated)

**Bends (fabricated) 11.25°, 22.5°, 45° and 90°**



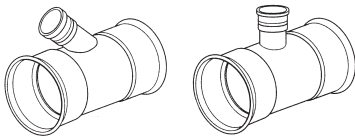
Nominal size
225
300
375
400
450
500
600

**Equal junctions (fabricated) 45° and 90°**

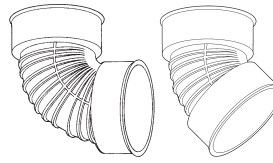
Nominal size
225
300
375
400
500
600

**Unequal junctions (fabricated) 45° and 90°**

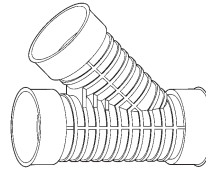
Nominal size
225 x 100
300 x 100
300 x 225
375 x 100
375 x 150
375 x 225
375 x 300
400 x 100
400 x 150
400 x 225
400 x 300
400 x 375
450 x 100
450 x 150
450 x 225
450 x 300
450 x 375
450 x 400
500 x 100
500 x 150
500 x 225
500 x 300
500 x 375
500 x 400
500 x 450
600 x 100
600 x 150
600 x 225
600 x 300
600 x 375
600 x 400
600 x 450
600 x 500



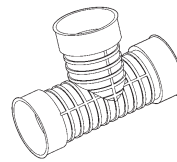
**Injection moulded fittings**



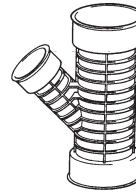
Bends	Nominal size
Bend 15°	150
Bend 30°	150
Bend 45°	150
Bend 87.5°	150



Nominal size	
Equal junction 45°	150 x 150

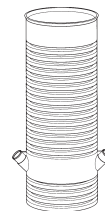


Nominal size	
Equal junction 90°	150 x 150



Nominal size	
Unequal junction 45°	150 x 100 225 x 150 300 x 150

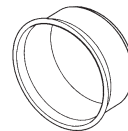
**Special long fittings, single or double 45° branch**



Nominal size	Length (m)	Branch size	
		unequal	equal
400	3 or 6	150	400 <sup>(1)</sup>
450	3 or 6	150	450 <sup>(1)</sup>
500	3 or 6	150	500 <sup>(1)</sup>
600	3 or 6	150	600 <sup>(1)</sup>

(1) Equal double branch not covered by this Certificate.

**End caps**



Nominal size
150
225
300

**Sealing rings**



Nominal size
150
225
300
375
400
450
500
600

## 5 Performance of joints

The joints constructed from connectors with rubber seals remain watertight when subjected to deflection and distortion, and comply with the MCHW, Volume 1, Clauses 504.3 and 518.7 (see section 12).

## 6 Flow characteristics

When used with the pipes described in Product Sheets 1 and 2, the fittings will increase the hydraulic resistance of the system. Loss coefficients (K values) may be taken as:

- 11° bends 0.2
- 22.5° and 45° bends 0.5
- 45° branch connections 1.0

## 7 Practicability of installation

The fittings are installed easily using conventional drain-laying techniques (see section 11).

## 8 Maintenance

8.1 Access to the system for cleaning should be provided by conventional methods.

8.2 Drains incorporating the fittings can be rodded easily using conventional drain rods. In common with other standard plastics drainage systems, toothed root cutters and rods with metal ferrules, as used with some mechanical cleaning systems, could damage the fittings and should not be used.

8.3 Drains incorporating the fittings have adequate resistance to water cleansing using pressure jetting equipment (see section 12). It is recommended that low-pressure, high-volume systems are utilised in accordance with the MCHW, Volume 1, Clause 520.

## 9 Durability

The fittings can be expected to have a life equivalent to that of other plastics fittings listed in Table 5/1 of the MCHW, Volume 1.

# Installation

## 10 General

Drains utilising the Ridgidrain Fittings (150 mm to 600 mm) must be installed in accordance with the MCHW, Volume 1, Clauses 503, 505, 518.7 and 518.8.

## 11 Procedure

11.1 Typical laying, trench and backfilling specification details are given in sections 11 and 12 of Product Sheets 1 and 2.

11.2 To make a joint, a ring seal is fitted externally between the first and second corrugation of the pipe. The seal and the inside of the coupler are lubricated and the pipe pushed fully home to the central register.

11.3 Pipes and fittings must be protected from site construction traffic.

# Technical Investigations

## 12 Tests

Tests were carried out to determine:

- dimensional accuracy
- tensile strength of welds (before and after heat ageing at 70°C for 28 days)
- resistance to internal pressure
- rodding resistance to the MCHW, Volume 1, Clause 518.12
- resistance to an applied torque of 900 Nm<sup>-1</sup>, or the torque at which the pipe and/or connector is damaged, whichever occurs first, test carried out with one end of the fitting fully restrained and connector and pipe fitted to the other
- drop test to EN 12061 : 1999
- fitting stiffness to ISO 13967 : 1998
- strength of flexibility of fabricated fittings to EN 12256 : 1998
- watertightness of fabricated fittings to EN 1053 : 1995
- joint test to BS EN 1277 : 1996, Method 4, Conditions A, B and C
- water jetting WRc method.

## 13 Investigations

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.

## Bibliography

BS EN 1277 : 1996 *Methods of testing plastics — Thermoplastics pipes, fittings and valves — Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

EN 1053 : 1995 *Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness*

EN 12061 : 1999 *Plastics piping systems — Thermoplastics fittings — Test method for impact resistance*

EN 12256 : 1998 *Plastics piping systems — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*

ISO 13967 : 1998 *Thermoplastic fittings — Determination of ring stiffness*

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*, August 1998 (as amended)

Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works*, August 1998 (as amended)

Manual of Contract Documents for Highway Works, Volume 3 *Highway Construction Details*, March 1998 (as amended)

## 14 Conditions

14.1 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.

14.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

14.3 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
- remain in accordance with the requirements of Highways Authorities' Product Approval Scheme.

14.4 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.

14.5 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.



