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Agrément Certificate
10/H168
Product Sheet 1

BRETT MARTIN PLUMBING AND DRAINAGE SYSTEMS

BRETT MARTIN TWINWALL DRAINAGE FITTINGS

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 and the Department for Regional Development, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), 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 Brett Martin Twinwall Drainage Fittings, for use in conjunction with any BBA-certificated polyethylene twinwall highway drainage pipes of 150 mm, 225 mm and 300 mm sizes, 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 the loads associated with installation and service (see section 5)

Performance of joints — the system will remain watertight under normal service conditions (see section 6)

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

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are 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: 24 December 2010

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.

HAPAS Requirements

Requirements

The general requirements for drains are contained in the *Manual of Contract Documents for Highway Works (MCHW)*⁽¹⁾, 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 the 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: 1 Description (1.2) and 10 General of this Certificate.

General

This Certificate relates to Brett Martin Twinwall Drainage Fittings.

The fittings comply with the MCHW, Volume 1, Clause 518, and are for use in conjunction with any BBA-certificated polyethylene 150 mm, 225 mm and 300 mm twinwall pipes in highway drainage for the collection and disposal of surface and sub-surface water.

Technical Specification

1 Description

1.1 Brett Martin Twinwall Drainage Fittings are of black polyethylene (PE) manufactured by rotational moulding and are designed to fit any BBA-certificated 150 mm, 225 mm and 300 mm twinwall, highway drainage pipes. The fittings are manufactured from material with the specification given in Table 1.

Table 1 Material properties and specifications⁽¹⁾

Property	Test method reference	Specification
Tensile properties	BS EN ISO 527-3	≥ 14 MPa
Oxygen induction time	BS EN 728	≥ 8 mins at 200°C
Melt Flow Rate	BS EN ISO 1133	≤ 8 g (10 min) ⁻¹ , 2.16 kg at 190°C
Density	BS EN ISO 1183-1, BS EN ISO 1872-1	≥ 930 kg·m ⁻³

(1) This table is in the format of Appendix 5/7 of the MCHW, Volume 2. It is used to satisfy the MCHW, Volume 1, Clause 518.2.

1.2 The fittings covered by this Certificate are listed in Table 2.

<i>Table 2 Twinwall fittings</i>			
Nominal size (mm)	Code No	Description	Weight (kg)
150	1TB15	15° double socket bend	1.4
150	1TB30	30° double socket bend	1.5
150	1TB45	45° double socket bend	1.8
150	1TB90	90° double socket bend	2.0
150	1TT90	150 x 150 x 90° triple socket branch	2.5
150	1TY45	150 x 150 x 45° triple socket branch	2.8
225	2TB15	15° double socket bend	3.5
225	2TB30	30° double socket bend	4.0
225	2TB45	45° double socket bend	4.5
225	2TB90	90° double socket bend	5.0
225	2TY145	225 x 150 x 45° triple socket branch	6.2
225	2TY45	225 x 225 x 45° triple socket branch	7.0
225	2TT190	225 x 150 x 90° triple socket branch	6.2
225	2TT90	225 x 225 x 90° triple socket branch	6.5
300	3TB15	15° double socket bend	6.0
300	3TB30	30° double socket bend	6.5
300	3TB45	45° double socket bend	7.0
300	3TB90	90° double socket bend	8.3
300	3TY145	300 x 150 x 45° triple socket branch	9.5
300	3TY245	300 x 225 x 45° triple socket branch	10.5
300	3TY45	300 x 300 x 45° triple socket branch	13.0
300	3TT190	300 x 150 x 90° triple socket branch	8.0
300	3TT290	300 x 225 x 90° triple socket branch	10.0
300	3TT90	300 x 300 x 90° triple socket branch	11.0

1.3 Ring seals to BS EN 681-1 : 1996 used to seal the fitting to each size of pipe are supplied by the pipe manufacturer.

1.4 Continuous quality control is exercised during manufacture. Checks include dimensional accuracy and visual appearance.

2 Delivery and site handling

2.1 Each fitting is packed in a polythene bag. Each load of fittings is shrink-wrapped onto a wooden pallet.

2.2 When long-term storage is envisaged, the 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 Brett Martin Twinwall Drainage Fittings.

Design Considerations

3 Use

Brett Martin Twinwall Drainage Fittings, when used with BBA-certificated polyethylene twinwall pipe 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 Practicability of installation

The fittings are installed easily by experienced operatives using traditional drain-laying methods in accordance with HA requirements and the MCHW, Volume 1, Clauses 503, 505, 518.7 and 518.8.

5 Strength

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

6 Performance of joints

Joints with pipes using ring 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).

7 Flow characteristics

When used with the appropriate pipes, the fittings will increase the hydraulic resistance of the system. Loss coefficients (K values) may be taken as:

- 45° bends 0.5
- 90° bends 0.7
- branch connections 1.0.

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 flexible drain rods. In common with other standard plastic drainage systems, toothed root cutters and rods with metal ferrules, as used with some mechanical clearing systems, could damage the pipes and fittings and should not be used.

8.3 Drains incorporating the fittings have adequate resistance to water cleansing using pressure jetting equipment. 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 the MCHW, Volume 1, Table 5/1.

Installation

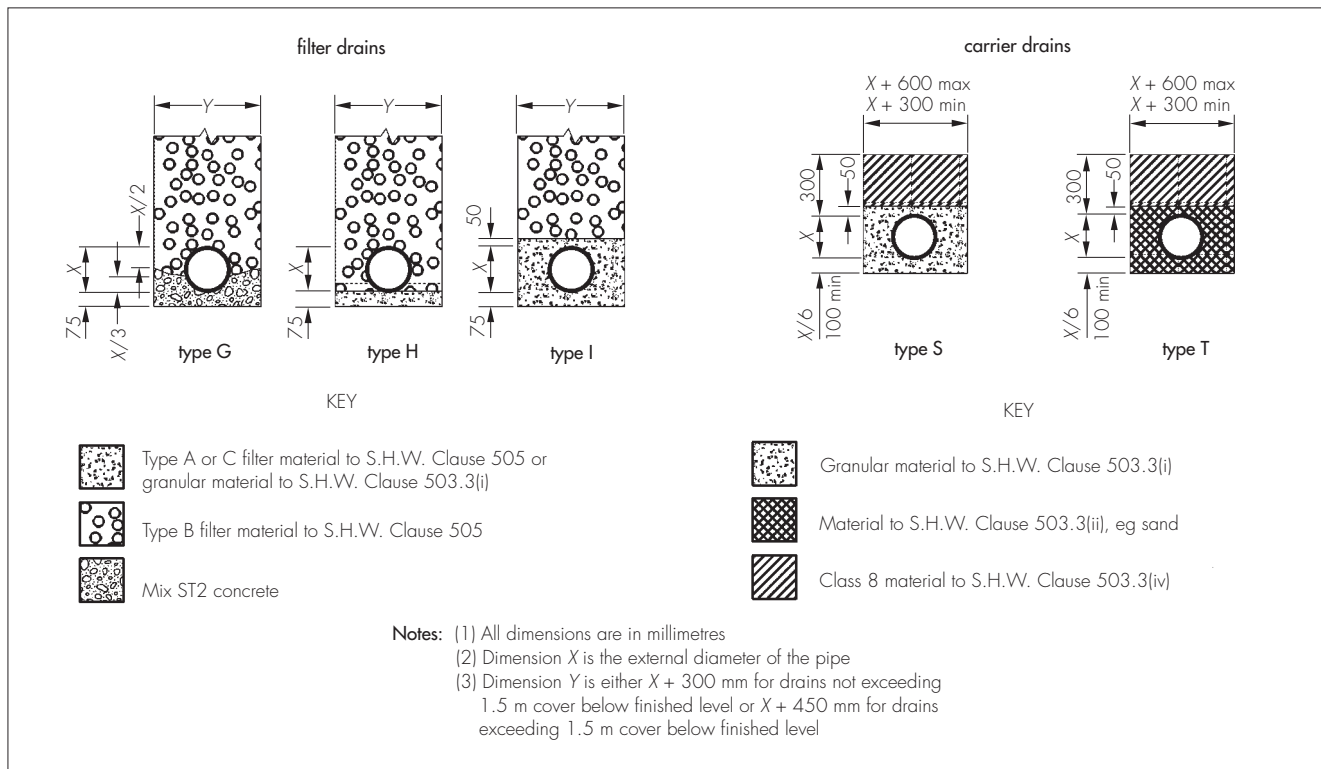
10 General

Drains utilising Brett Martin Twinwall Drainage Fittings must be installed in accordance with HA requirements and the MCHW, Volume 1, Clauses 503, 505, 518.7 and 518.8.

11 Procedures

11.1 For typical laying, trench and backfilling specification details, reference should be made to Figure 1 and the MCHW, Volume 3, Drawing Nos F1 (Types T and S) and F2 (Types G, H and I).

Figure 11 Installation details



11.2 To make a joint, the pipe end and fitting socket should be cleaned and a rubber seal fitted externally between the first and second corrugation in the pipe, in accordance with the recommendations of the manufacturer of the pipe concerned. The seal and inside of the socket should be lubricated and the pipe pushed fully home to the register, either by hand, or using a lever if necessary.

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

12 Tests

Tests were carried out to determine:

- dimensional accuracy
- rodding resistance to the MCHW, Volume 1, Clause 518.12
- fitting ring stiffness to BS EN ISO 13967 : 1998
- drop test to BS EN 12061 : 1999
- joint test to BS EN 1277 : 2003, Method 4, Conditions A, B and C.

13 Investigations

13.1 An examination was made of data in relation to the effect of the production tolerances on the performance of the products.

13.2 An evaluation of existing data was made to assess material properties, chemical resistance and durability.

13.3 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 681-1 : 1996 *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Vulcanized rubber*

BS EN 728 : 1997 *Plastics piping and ducting systems — Polyolefin pipes and fittings — Determination of oxidation induction time*

BS EN 1277 : 2003 *Plastics piping systems — Thermoplastics piping systems for buried non-pressure applications — Test methods for leaktightness of elastomeric sealing ring type joints*

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

BS EN ISO 527-3 : 1996 *Plastics — Determination of tensile properties — Test conditions for films and sheets*

BS EN ISO 1133 : 2005 *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

BS EN ISO 1183-1 : 2004 *Plastics — Methods for determining the density of non-cellular plastics. Immersion method, liquid pycnometer method and titration method*

BS EN ISO 1872-1 : 1993 *Plastics — Polyethylene (PE) moulding and extrusion materials — Designation system and basis for specifications*

BS EN ISO 13967 : 2009 *Thermoplastic fittings — Determination of ring stiffness*

Manual of Contract Documents for Highway Works, Volume 1 *Specification for Highway Works*

Manual of Contract Documents for Highway Works, Volume 2 *Notes for Guidance on the Specification for Highway Works*

Manual of Contract Documents for Highway Works, Volume 3 *Highway Construction Details*

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 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.

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 Highway 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.