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HAPAS Certificate
10/H168
Product Sheet 1

BRETT MARTIN PLUMBING AND DRAINAGE SYSTEMS

BRETT MARTIN TWINWALL DRAINAGE FITTINGS

This HAPAS Certificate Product Sheet(1) is issued by the British Board of Agrément (BBA), supported by Highways England (HE) (acting on behalf of the Overseeing Organisations of the Department for Transport; Transport Scotland; the Welsh Government and the Department for Infrastructure, Northern Ireland), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Local Government Technical Advisers Group and industry bodies. HAPAS Certificates are normally each subject to a review every three years.
(1) Hereinafter referred to as 'Certificate'.

This Certificate relates to Brett Martin Twinwall Drainage Fittings, for use in highway drainage in conjunction with BBA-certificated polyethylene twinwall highway drainage pipes (nominal sizes: 150, 225 and 300 mm), with either associated seals or BBA-certified seals(1).

(1) Compatibility lists for seals can be obtained from the Certificate holder.

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 three-yearly review.

KEY FACTORS ASSESSED

Strength — the fittings have adequate strength to resist the loads associated with installation and service (see section 6).

Performance of joints — joints will remain watertight under normal service conditions (see section 7).

Maintenance — the products may be cleaned using standard techniques (see section 9).

Durability — the products will have a service life in excess of 50 years (see section 10).

The BBA has awarded this 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

Date of Fourth issue: 13 February 2019

Originally certificated on 24 December 2010

Certificate amended on 13 June 2019 to update seal details.

Paul Valentine
Technical Excellence Director

Claire Curtis-Thomas
Chief Executive

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.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

Requirements

The general requirements for drains are contained in the *Manual of Contract Documents for Highway Works* (MCHW)(1), Volumes 1 and 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: Highways England (HE), Transport Scotland, the Welsh Government and the Department for Infrastructure (Northern Ireland).

Regulations

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See section: 1 *Description* (1.2) of this Certificate.

Additional Information

This Certificate relates to Brett Martin Twinwall Drainage Fittings, for use in highway drainage in conjunction with BBA-certificated polyethylene twinwall highway drainage pipes(1) (nominal sizes: 150, 225 and 300 mm) and BBA-certified, for the collection and disposal of surface and sub-surface water.

The fittings comply with the MCHW, Volume 1, Clause 518.

Technical Specification

1 Description

1.1 Brett Martin Twinwall Drainage Fittings are black polyethylene (PE), manufactured by rotational moulding and are designed to fit BBA-certificated polyethylene twinwall highway drainage pipes, nominal sizes: 150, 225 and 300 mm, and BBA-certified seals. The fittings are manufactured from material with the specifications 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
Thermal stability (OIT)	BS EN 11357-6	≥ 10 mins at 200°C
Melt Flow Rate	BS EN ISO 1133-1	3 g (10 min) ≤ MFR ≤ 16 g (10 min)$^{-1}$, 5 kg at 190°C
Density	BS EN ISO 1183-1	≥ 930 kg·m^{-3}

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

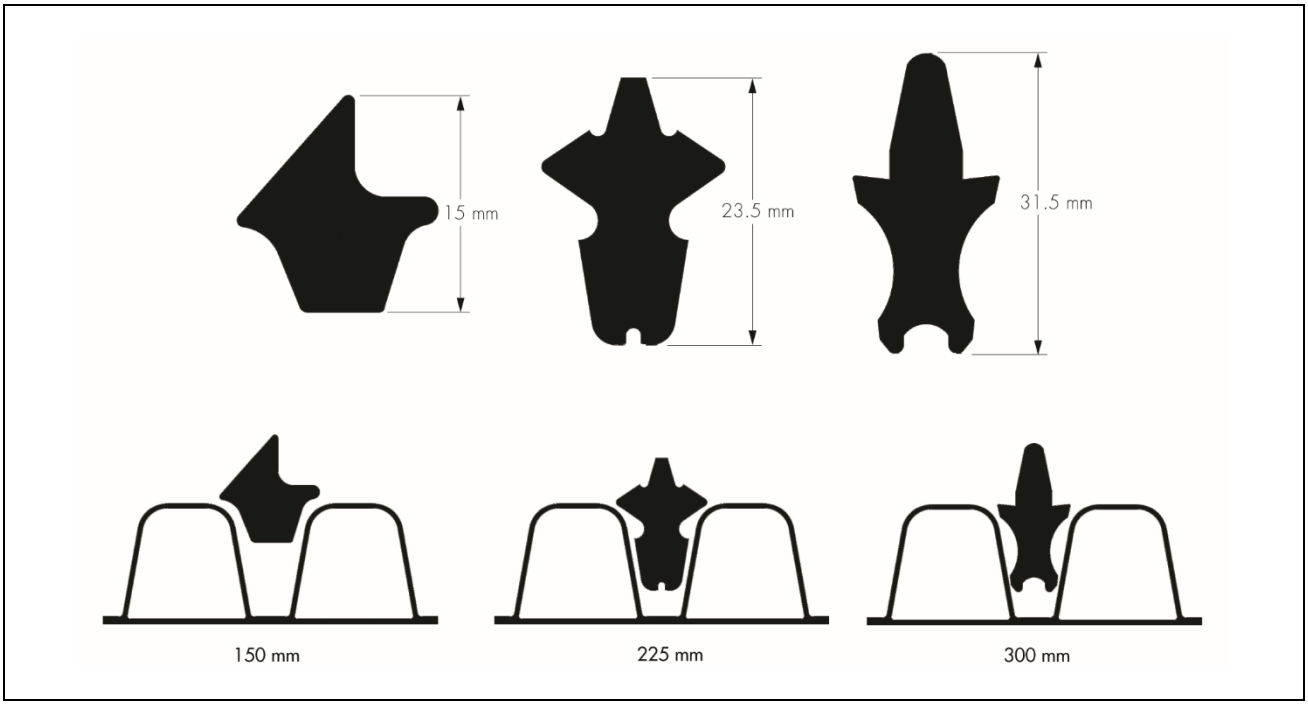
1.2 The fittings covered by this Certificate are listed in Table 2.

Table 2 Twin wall fittings

Nominal size (mm)	Code No	Description	Mass (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 Rubber ring seals to BS EN 681-1 : 1996 are available for each size of pipe, for connection to the fittings.

Figure 1 BBA-certified alternative compatible seals



2 Manufacture

2.1 Brett Martin Twinwall Drainage Fittings are manufactured by rotational moulding. This method uses a coarse powder of polyethylene (PE) melted inside a hot mould.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control being operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 The BBA logo incorporating the number of this Certificate is moulded into each fitting.

3.2 Each fitting is individually packed in a polythene bag with corresponding seals. Each load of fittings is shrink-wrapped onto a wooden pallet.

3.3 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

4 Use

Brett Martin Twinwall Drainage Fittings, when used with polyethylene twinwall pipes and BBA-certified compatible seals provided by Brett Martin(1), and installed in accordance with the recommendations of this Certificate, are suitable for use in highways for the collection and disposal of surface and sub-surface water.

(1) Compatibility lists for seals can be obtained from the Certificate holder.

5 Practicability of installation

The fittings are installed by experienced operatives using traditional drain-laying methods in accordance with HE requirements and the MCHW, Volume 1, Clauses 503, 505, 518.8 and 518.9.

6 Strength

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

7 Performance of joints

Joints with pipes using ring associated 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).

8 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.

9 Maintenance

9.1 Access to drains for cleaning should be provided by conventional methods.

9.2 Drains incorporating the fittings can be rodded easily using flexible drain rods. 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.

9.3 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.

10 Durability

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

11 Reuse and Recyclability

The products are manufactured from polyethylene, which is recyclable.

Installation

12 General

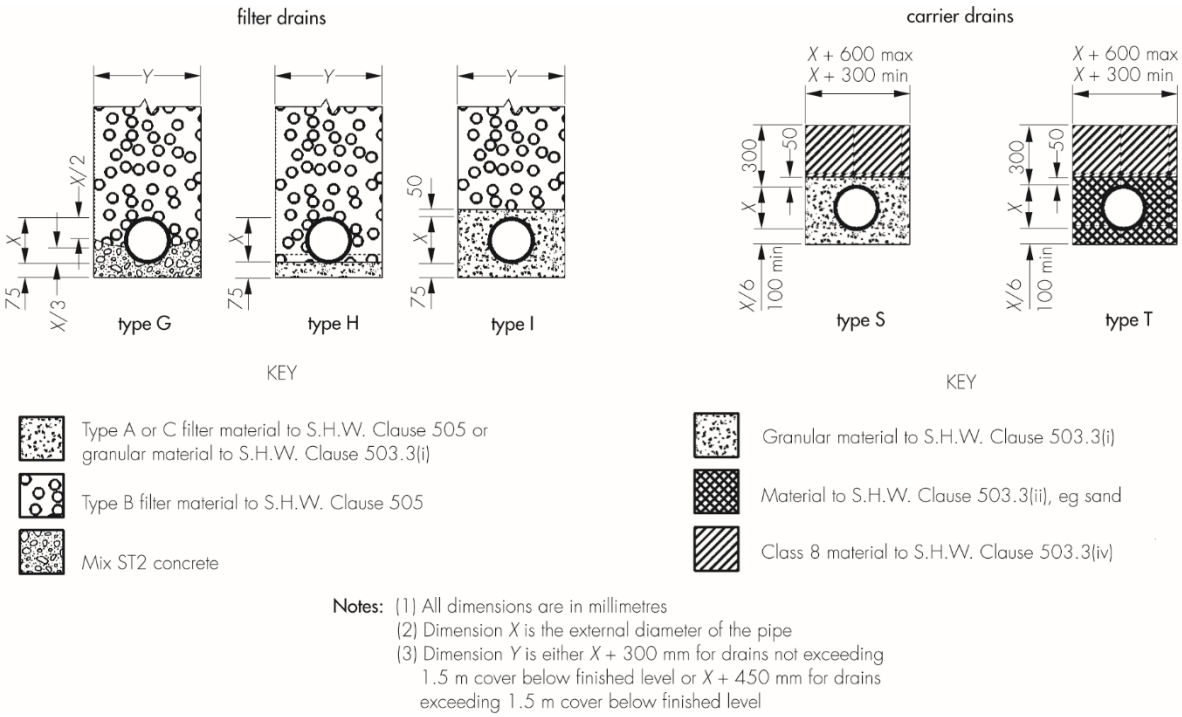
12.1 Drains utilising Brett Martin Twinwall Drainage Fittings must be installed in accordance with HE requirements and the MCHW, Volume 1, Clauses 503, 505, 518.7 and 518.8.

12.2 Prior to backfilling, each installation must achieve satisfactory results when tested for airtightness in accordance with the MCHW, Volume 1, Clause 509.

13 Procedures

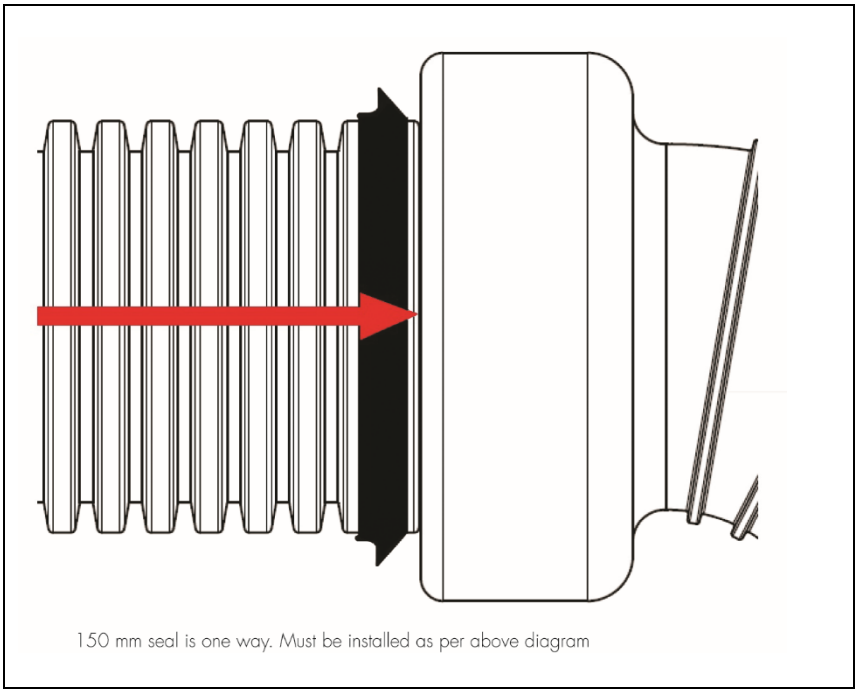
13.1 For typical laying, trench and backfilling specification details, reference should be made to Figure 2 of this Certificate and the MCHW, Volume 3, Drawing Nos F1 (Types T and S) and F2 (Types G, H and I).

Figure 2 Installation details



13.2 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. The 150 mm compatible seal, supplied by Brett Martin, must be fitted as per Figure 3 below.

Figure 3 150 mm seal installation



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

Technical Investigations

14 Tests

Tests were carried out to determine:

- dimensional accuracy
- rodding resistance
- ring stiffness
- drop test
- leaktightness of joints.

15 Investigations

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

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

15.3 The manufacturing process was evaluated, 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 ISO 527-3 : 2012 *Plastics — Determination of tensile properties — Test conditions for films and sheetsISO 1133-1 : 2011 Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

BS EN ISO 1133-1 : 2011 *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Method for materials sensitive to time-temperature history and/or moisture*

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

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*

16 Conditions

16.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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.

16.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

16.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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.

16.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

16.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

16.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue 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.

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