Polypipe Ltd t/a Polypipe Civils & Green Urbanisation

Charnwood Business Park North Road Loughborough Leicestershire LE11 1LE

Tel: 01509 615100 Fax: 01509 610215

e-mail: civilssales@polypipe.com

website: www.polypipe.com

RIDGISEWER GRAVITY SEWER SYSTEM

RIDGISEWER 400 mm, 450 mm, 500 mm and 600 mm FITTINGS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings, for use in domestic drains and public and private sewers at depths of up to 10 metres.

(1) Hereinafter referred to as 'Certificate'.

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

Strength — the products have adequate strength for the intended application (see section 6). **Performance of joints** — the joints remain watertight under normal use (see section 7). **Flow characteristics** — the products will have normal flow characteristics associated with polypropylene underground sewerage systems (see section 8).

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

Resistance to elevated temperatures — the products have adequate resistance to temperatures likely to be found in domestic sewage (see section 10).

Durability — the material from which the products are manufactured will not deteriorate significantly and the service life of the products will be in excess of 50 years (see section 12).

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 Third issue: 29 April 2021

Originally certificated on 10 January 2003

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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.** Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément Bucknalls Lane Watford Herts WD<u>25 9BA</u>



Agrément Certificate

03/3979

Product Sheet 1





Hardy Giesler Chief Executive

> tel: 01923 665300 clientservices@bbacerts.co.uk www.bbacerts.co.uk

©2021 Page 1 of 12

Regulations

In the opinion of the BBA, Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

is the		lding Degulations 2010 (England and Males) (second ad)
E .	The Bui	lding Regulations 2010 (England and Wales) (as amended)
Requirement: Comment:	H1(1)	Foul water drainage A system incorporating the products will convey the flow of foul water and minimise the risk of blockages or leaks. See sections 6, 7 and 8 of this Certificate.
Requirement: Comment:	H3(3)	Rainwater drainage A system incorporating the products will convey the flow of rainwater and minimise the risk of blockages or leaks. See sections 6, 7 and 8 of this Certificate.
Regulation: Comment:	7(1)	Materials and workmanship The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Den.	The Bui	lding (Scotland) Regulations 2004 (as amended)
Regulation: Comment:	8(1)(2)	Durability, workmanship and fitness of materials The products are acceptable. See sections 11.1 and 12 and the <i>Installation</i> part of this Certificate.
Regulation: Standard: Standard: Comment:	9 3.6 3.7	Building standards applicable to construction Surface water drainage Wastewater drainage A system incorporating the products will satisfy the relevant requirements of these Standards, with reference to clauses $3.6.3^{(1)(2)}$, $3.6.8^{(1)(2)}$, $3.6.10^{(1)(2)}$, $3.7.1^{(1)1(2)}$, $3.7.4^{(1)(2)}$, $3.7.9^{(1)(2)}$ and $3.7.10^{(1)(2)}$. See section 6.1, 6.2, 7 and 8 of this Certificate.
Standard: Comment:	7.1(a)(b)	Statement of sustainability A system incorporating the products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation: Comment:	12	 Building standards applicable to conversions Comments in relation to the products under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1⁽¹⁾⁽²⁾ and Schedule 6⁽¹⁾⁽²⁾. (1) Technical Handbook (Domestic).
izz		(2) Technical Handbook (Non-Domestic).
E E	The Bui	Iding Regulations (Northern Ireland) 2012 (as amended)
Regulation: Comment:	23(a)(i) (iii)(b)(i)	Fitness of materials and workmanship The products are acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation: Comment:	81	Underground foul drainage A system incorporating the products will convey the flow of foul water and minimise the risk of blockages or leaks. See section 6.1, 6.2, 7 and 8 of this Certificate.
Regulation: Comment:	82	Rainwater drainage A system incorporating the products will convey the flow of rain water and minimise the risk of blockages or leaks. See section 6.1, 6.2, 7 and 8 of this Certificate.

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 sections: 3 *Delivery and site handling* (3.2) of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 5.3 *Drainage below ground*.

CE marking

The Certificate holder has taken the responsibility of CE marking the elastomeric sealing rings in accordance with harmonised European Standard BS EN 681-1 : 1996.

Technical Specification

1 Description

1.1 Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings comprise polypropylene bends, junctions, end caps and socket plugs (terracotta outer wall with blue inner wall). The rubber sealing rings are made from ethylene propylene diene monomer (EPDM) to BS EN 681-1 : 1996, Type WC. The range of fittings covered by this Certificate is shown in Figure 1.

Figure 1 Ridgisewer fittings (all measurements in mm)					
Bends (fabricated) - polypropylene					
Short radius bends 11.25°	Short radius bends 22.5°	Short radius bends 45°	Short radius bends 90°		
400 to 600	400 to 600	400 to 600	400 to 600		
Nominal sizes	Nominal sizes	Nominal sizes	Nominal sizes		
400	400	400	400		
450	450	450	450		
500	500	500	500		
600	600	600	600		

Page 3 of 12

Figure 1 Ridgisewer fittings (all measurements in mm) (continued)							
Junctions (fabricated) - polypropylene							
	Equal jun		Equal junctions 90°				
Equal junctions 45° Nominal sizes 400 × 400 450 × 450 500 × 500 600 × 600				Nominal sizes 400 × 400 450 × 450 500 × 500 600 × 600			
	Unequal iu	nctions 45°		Ur	nequal iur	nctions 90°	
	Nomin	al sizes			Nomina	al sizes	
	400 x 110	500 x 110		400 x 1		500 x 1	110
	400 x 110	500 x 110		400 x 1		500 x 1	
	400 x 150	500 x 150		400 x 1		500 x 1	
	450 x 110	600 x 110		-			
				450 x 110 600 x 110 450 x 150 600 x 150			
	450 x 150 600 x 150 450 x 160 600 x 160			450 x 160 600 x 1			
	Special lon	g fittings, single or do		(3000 mm lo lominal size - 400 450 500 600 1) Equal double	une 110, 1 110, 1 110, 1 110, 1	Branch siz qual 50, 160 50, 160 50, 160 50, 160 50, 160	equal ⁽¹⁾ 400 450 500 600
	End caps - polypropylene						
		Ella C	ταμο - μοιγμισμγ				
					Nomina 40 45 50 60	0 0 0	

igure 1 Ridgisewer fittings (all measurements in mm) (co	ontinued)	
Socket plugs -	- polypropylene	
	Nominal sizes	
	400	
	450	
	500	
	600	
		_
Sealir	ng rings	
Sealir		
	ng rings	
	ng rings Nominal sizes	
Sealir	ng rings Nominal sizes 400	

1.2 The material properties of the products are given below in Table 1

Property	Test method reference	Specification
Melt mass-flow rate	BS EN ISO 1133-1	≤ 1g (10 min) ⁻¹ 2.16 kg at 230°C
Reference density	BS EN ISO 1183-1	<u>≥</u> 890 kg.m⁻³
Thermal stability (OIT)	BS EN 728	≥ 4 min
Tensile properties	BS EN ISO 527-2	Sample 1B at 50 mm min ≥ 18 MPa
Effects of heating	BS EN ISO 580	150°C ± 2°C (Pass)

1.3 The fittings are fabricated from polypropylene Ridgisewer Pipes, kitemarked as detailed in section 2.4.

2 Manufacture

2.1 The fittings are fabricated from Ridgisewer pipe, socketed pipe and couplers, which are cut to the appropriate length and angle, and welded together by extrusion welding to form the desired fitting. The sealing rings are injection-moulded from EPDM.

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 operated by the manufacturer are being maintained.

2.3 The management system of Polypipe Ltd t/a Polypipe Civils has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015, BS EN ISO 14001 : 2015 and BS ISO 45001 : 2018 by BSI (Certificate Q06225, EMS 535794 and OHS 73211 respectively).

2.4 BSI Kitemark licence No. KM 636505 has been issued to Polypipe Civils Limited, Boston Road Industrial Estate, Holmes Way, Horncastle, LN9 6JW, for the manufacture of pipes certified to WIS 4-35-01 : 2008 (Issue 2) and BS EN 13476-3 : 2007 + A1 : 2009.

3 Delivery and site handling

3.1 Each fitting carries a label bearing the BBA logo incorporating the number of this Certificate and the angle of the bends and junctions.

3.2 The fittings may be stored on pallets (depending on size) and despatched individually. The fittings must be handled with care.

3.3 When long-term storage is envisaged, the fittings must be protected from direct sunlight. If protection cannot be provided, consideration must be given to the effects of daily exposure to direct sunlight:

• up to 3 months — negligible UV degradation but possible extreme surface temperatures of up to 80°C may cause some localised distortion

- 3 to 12 months may have significant effect on the impact resistance and physical properties
- over 12 months damage will occur unless protection provided.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings.

Design Considerations

4 General

4.1 Ridgisewer 400 mm, 450 mm, 500 mm and 600 mm Fittings are satisfactory for use as sewerage systems designed in accordance with BS EN 752 : 2017 for the conveyance of surface water and domestic sewage. The products can be used in combined or separate systems, as is permitted to be discharged into public sewers by the Water Industry Act 1991, 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 2006.

4.2 The fittings have not been assessed for use with untreated trade effluents and such use is outside the scope of this Certificate.

4.3 The products are suitable for use where pipe to WIS 4-35-01 : 2008 (Issue 2) and BS EN 13476-3 : 2018, and fittings to BS EN 1401-1 : 2019, are normally used; the products can be used individually or in combination, as described in this Certificate.

5 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced in below-ground drainage work.

6 Strength



6.1 The fittings have adequate strength for use in situations where pipe to WIS 4-35-01 : 2008 (Issue 2) is suitable.

6.2 The nominal short-term stiffness is not less than 8 kN·m⁻².

7 Performance of joints



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

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

8 Flow characteristics



8.1 The products will have the normal flow characteristics associated with polypropylene underground sewerage systems.

8.2 Full bore velocities are available from *Tables for the Hydraulic Design of Pipes, Sewers and Channels*, Volume 2, 8th Edition by H R Wallingford and D I H Barr. The values are based on the Colebrook-White equation.

9 Resistance to chemicals

The products have adequate resistance to the type and quantities of chemicals likely to be found in domestic sewage.

10 Resistance to elevated temperatures

The products have adequate resistance to the temperatures likely to be found in domestic sewage.

11 Maintenance



11.1 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.

11.2 The products have adequate resistance to water cleansing using pressure jetting equipment. It is recommended that low-pressure, high-volume systems are utilised in accordance with WIS 4-35-01 : 2008 (Issue 2).

12 Durability



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

13 Reuse and recyclability

The products contain polypropylene (PP), which can be recycled.

Installation

14 General

14.1 Underground drain and sewer systems incorporating the fittings must be installed in accordance with the *Ridgisewer Technical Brochure* and, when appropriate, BS EN 1610 : 2015, BS EN 752 : 2017 and the Water UK/WRc plc document *Sewers for Adoption*, 8th edition.

14.2 Precautions must be taken to protect the fittings from damage during construction.

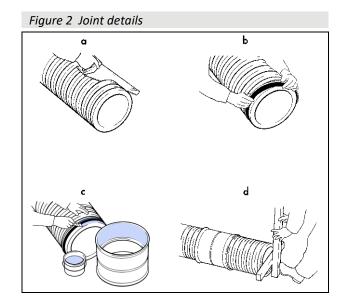
15 Procedure — jointing

15.1 The pipe is cut midway between the corrugations, as shown in Figure 2 (a).

15.2 Swarf is removed from the pipe end; a chamfer is not required.

15.3 The pipe spigots and sockets are cleaned, and the sealing ring is checked to ensure that it is correctly seated (not twisted) between the first and second corrugations of the pipe end, as shown in Figure 2 (b).

15.4 The Certificate holder's lubricant (outside the scope of this Certificate) is applied generously to the whole of the inside area of the socket and to the sealing ring, ensuring that it does not subsequently become contaminated with dirt, as shown in Figure 2 (c).



15.5 The pipe is offered to the socket, and is aligned and pushed fully home, as shown in Figure 2 (d).

15.6 Jointing to other materials must be carried out in accordance with the Ridgisewer Design and Installation Guide.

16 Procedure — pipe-laying (see Figure 3)

Pipe laying on trench bottom in granular material

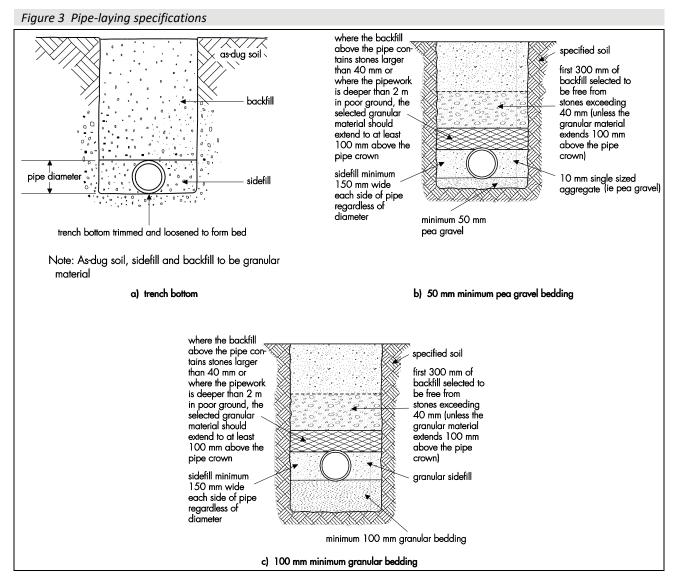
16.1 Where the as-dug material is suitable⁽¹⁾ for use as bedding, the bottom of the trench may be trimmed to form the pipe bed.

(1) Suitable material is defined in BS EN 1610 : 2015, Section 5.2.2.

16.2 Small depressions should be made to accommodate the pipe sockets or couplings. After the pipe has been laid, these depressions should be carefully filled to ensure that no voids remain under, or around, the socket.

16.3 When the formation is prepared, the pipes should be laid upon it, true to line and level within the specified tolerances. Each pipe should be checked, and any necessary adjustments to level made by raising or lowering the formation, ensuring that the pipes finally rest evenly on the adjusted formation throughout the length of the barrels. Adjustment should never be made by local packing.

16.4 Where the formation is low and does not provide continuous support, it should be brought up to the correct level by placing and compacting suitable material.



Pipe laying on granular beds

16.5 When the as-dug material is not suitable for use as a bedding, a layer of suitable granular material (see section 16.1) must be spread evenly on the trimmed trench bottom before the pipes are installed. The trench should be excavated to allow for the thickness of granular bedding under the barrels.

16.6 The trench formation is prepared, the bedding placed and the pipes are laid.

16.7 Where the as-dug material can be hand trimmed by shovel and is not puddled when walked upon, a 50 mm depth of bedding material may be used. In this case the material must be a nominal 10 mm, single-sized aggregate with no sharp edges, ie pea gravel.

16.8 When the pipes are to be laid on rock, compacted sand or gravel requiring mechanical means of trimming, or in very soft or wet ground, the bedding should be a minimum of 100 mm.

Sidefill

16.9 In all cases, the sidefill must be of the same specification as the bedding material, and extend to the level of the crown of the pipe and be placed and compacted.

Backfill

16.10 Specifications for backfill above the level of the crown of the pipe are shown in Figure 3.

17 Tests

Tests were carried out and the results assessed to determine

- dimensional accuracy
- impact resistance (drop) test
- ring stiffness of the fittings
- strength and flexibility of fabricated fittings
- watertightness of fabricated fittings
- leaktightness of joints subjected to diameter deflection and angular deflection.

18 Investigations

18.1 Existing data was assessed in relation to

- ease of jointing
- resistance to internal puncture
- resistance to internal pressure.

18.2 An assessment was made of data relating to

- resistance to damage before installation
- resistance to damage from sharp aggregate
- practicability of installation
- chemical resistance
- design method
- flow capacities.

18.3 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 728 : 1997 Plastics piping and ducting systems — Polyolefin pipes and fittings — Determination of oxidation induction time

BS EN 752 : 2017 Drain and sewer systems outside buildings. Sewer system management

BS EN 1401-1 : 2019 Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U) — Specifications for pipes, fittings and the system

BS EN 1610 : 2015 Construction and testing of drains and sewers

BS EN 13476-3 : 2007 + A1 : 2009 Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B

BS EN 13476-3 : 2018 Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B

BS EN ISO 527-2 : 2012 Plastics — Determination of tensile properties — Test conditions for moulding and extrusion plastics

BS EN ISO 580 : 2005 — Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Methods for visually assessing the effects of heating

BS EN ISO 1133-1 : 2011 Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics

BS EN ISO 1183-1 : 2019 Plastics — Methods for determining the density and relative density of non-cellular plastics — Immersion method, liquid pycnometer method and titration method

BS EN ISO 9001 : 2015 Quality management systems — Requirements

BS EN ISO 14001 : 2015 Environmental management system - Requirements

BS ISO 45001:2018 Occupational health and safety management systems. Requirements with guidance for use Water UK/WRc plc Sewers for Adoption, 8th edition, August 2018

Water Industry Specification WIS 4-35-01 : 2008 (Issue 2) Specification for thermoplastic structured wall pipes – Supplementary Test Requirements

19 Conditions

19.1 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.

19.2 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.

19.3 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.

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

19.5 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.

19.6 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.

British Board of Agrément		
Bucknalls Lane		tel: 01923 665300
Watford		clientservices@bbacerts.co.uk
Herts WD25 9BA	©2021	www.bbacerts.co.uk_