SA Water

Engineering

Technical Standard

TS 0506 - Authorised Products - Vacuum Sewer Systems

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Government of South Australia

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Application & Interpretation of this Document

It is the responsibility of the users of this Standard to ensure that the application of information is appropriate and that any designs based on this Standard are fit for SA Water's purposes and comply with all relevant Australian Standards, Acts and regulations.

Users of this Standard accept sole responsibility for interpretation and use of the information contained in this Standard. Users should independently verify the accuracy, fitness for purpose and application of information contained in this Standard.

Only the current revision of this Standard should be used which is available for download from the SA Water website.

Significant/Major Changes Incorporated in This Edition

This Revision updates the April 2016 edition (1.0) of TS 0506 Authorised Products – Vaccuum Sewer Systems. Changes from Revision1.0 include:

All Clauses
Tables reformatted
Clause 1
Introduction information updated
Clause 1.1
Purpose information updated
Clause 2.1
New Clause added – Safety in Design
Clause 1.3.2
Document table updated
Clause 1.4
Definitions table updated
Clause 3.3
New manufacturer and products added - **Advanced Piping Systems**
Clause 4.2
New manufacturer and products added - **Advanced Piping Systems**
Clause 5
Image updated
Clause 6.1.1
Image updated

Document Controls

Revision History

Revision	Date	Author	Comments
1.0	08 April 2016	R Pearce	
2.0	25 August 2022	K Claridge	Refer page 2, for identified changes in this revision.

Template: Technical Standard Version 6.00, 10/05/2016

Approvers

Role	Signature and Date
Responsible Discipline Lead Kevin Claridge	25/08/2022 X  Signer's Name Signed by: CL001730
Manager Engineering Quality and Innovation Matthew Davis	26/08/2022 X  Signer's Name Signed by: DA003681
Senior Manager Engineering Services Richard Gray	26/08/2022 X  Signer's Name Signed by: GR001964

Reviewers

Role	Name	Revision	Review Date
Manager Engineering Quality and Innovation	Matthew Davis	1.0	10 August 2022

Contents

1 Introduction

SA Water is responsible for the construction and commissioning of an extensive amount of engineering infrastructure such that it is safe and fit for purpose.

This standard has been developed to assist in the design, maintenance, construction, and management of this infrastructure. This document lists technically conforming products approved for installation within SA Water's infrastructure networks.

The products listed have been approved after their evaluation based upon the SA Water product appraisal procedure.

Approved products shall only be obtained from the listed manufacturer or their authorised agent.

1.1 Purpose

The purpose of this standard is to detail minimum requirements to ensure that assets covered by the scope of this standard are constructed and maintained to consistent standards and attain the required asset life.

This document provides confirmation of products SA Water has authorised, based on their technical merits. Design Consultants and Construction Contractors should use the information presented within this document for confirmation of products SA Water has authorised for use.

Product Manufacturers, suppliers and other stakeholders may also use the information as reference material.

SA Water personnel should source items from the Store. If not stocked they should procure by means of:

- utilising the relevant SA Water Period Contract or Standing Offer Arrangement,
- where an item is not covered under a Contract or Standing Offer Arrangement, contacting a relevant Stores or Procurement Officer.

1.2 Glossary

The following glossary items are used in this document:

Term	Description
DICL	Ductile Iron Cement Lined
DN	Diameter Nominal
PVC	Polyvinyl Chloride
PVC M	Polyvinyl Chloride Modified
PVC O	Polyvinyl Chloride Oriented
PVC U	Polyvinyl Chloride Unplasticised
SA Water	South Australian Water Corporation
TG	SA Water Technical Guideline
TS	SA Water Technical Standard

1.3 References

1.3.1 Australian and International

The following table identifies Australian and International standards and other similar documents referenced in this document:

Number	Title
AS 2032	Code of practice for the installation of PVC pipe systems
AS 2033	Installation of polyethylene pipe systems
AS 2638-2	Gate valves for water works purposes
AS 3680	Polyethylene sleeving for ductile iron pipelines
AS 3681	Guidelines for the application of polyethylene sleeving to ductile iron pipelines and fittings
AS 3996	Access covers and grates
AS 3996	Metal access covers, road grates and frames
AS 4310	Piston type vacuum interface valves for municipal sewer systems
AS/NZS 1477	PVC U pipes and fittings for pressure applications
AS/NZS 2280	Ductile iron pipes and fittings
AS/NZS 2648-1	Underground marking tape - non-detectable tape
AS/NZS 4129	Fittings for polyethylene pipe for pressure applications
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
AS/NZS 4441	Oriented PVC (PVC-O) pipes for pressure applications
AS/NZS 4765	Modified PVC (PVC-M) pipes for pressure applications
EN 1091	Vacuum Sewerage Systems Outside Buildings
WSA PS 207	Polyethylene (PE) pipe for water supply
WSA PS 260	Gate valves - resilient seated
WSA PS 262	Extension spindles for gate valves
WSA PS 318	Marking tape, detectable
WSA PS 319	Marking tape, non-detectable

1.3.2 SA Water Documents

The following table identifies the SA Water standards and other similar documents referenced in this document:

Number	Title
TS 0101	Safety in Design
TS 0502	Authorised Products - Gravity Sewer and Pressure Pumping Main Systems
TS 0503	Authorised Products - Water Systems

1.4 Definitions

The following definitions are applicable to this document:

Term	Description
SA Water's Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): • Superintendent's Representative (e.g. AS 4300 & AS 2124 etc.) • SA Water Project Manager • SA Water Construction Technical Officer/Manager • Reticulation Networks Wastewater/Water Specialist • SA Water nominated contact person
Responsible Discipline Lead	The engineering discipline expert responsible for TS0506 defined on page 3 (via SA Water's Representative)
Constructor	The organisation responsible for constructing and installing infrastructure for SA Water whether it be a third party under contract to SA Water or an in-house entity.
Designer	The organisation responsible for designing infrastructure for SA Water whether it be a third party under contract to SA Water or a Constructor, or an in-house entity

1.5 Disclaimer

- SA Water reserves the right to alter, amend or withdraw this document, at any time, without prior notice.
- SA Water does not give preference to any particular make or type of product listed herein. Manufacturers are presented in alphabetical order, not in any order of preference.
- All products listed may be subject to change by the manufacturer. In such circumstances manufacturers are required to notify SA Water of any changes in the design, materials or manufacturing process of any approved product. SA Water is reliant upon manufacturers providing such notification in a timely manner and takes no responsibility for any issue that may arise should a manufacturer fail to do so.
- It is the responsibility of the Designer/ Constructor to ensure selected products are appropriate for the intended application.
- It is the responsibility of the Designer/ Constructor to ensure the product complies with the infrastructure category and meets the relevant Australian standards.
- It is the responsibility of the Constructor to ensure components do not exceed any expiry date.
- Product sizing may vary between manufacturers. Size range provided herein is a guide only and the Designer/ Constructor shall refer to the manufacturer for the product size and availability.
- Pipe and fitting sizing has been limited to DN 200 throughout this document. Larger sizes are available from the manufacturer. However, consideration of any product not itemised herein is subject to SA Water approval.
- Information within this document is correct at time of publication E&OE. The date of publication of this document can be found on the front page, and, in the left hand corner of the footer on each subsequent page.

2 Scope

This document specifies products that are authorised for use in Vacuum Sewer Systems covered by WSA 06-2008.

Specific approval from SA Water is required for the use of a Vacuum Sewer System.

2.1 Safety in Design

SA Water is committed providing safe workplaces for our people and safe services for our customers.

In keeping with this commitment, and to ensure the Supplier/Manufacturer has satisfied their legislated duties, the Supplier/Manufacturer shall provide information in accordance with the Work Health and Safety Act 2012 (SA) part 2 division 3, section 25. This may take the form of Operation and Maintenance manuals and/or SiD Hazard Registers (as specified by TS 0101).

Designers that utilise products contained in this Standard shall apply SA Water Technical Standard T S0101 to incorporate the information provided by the Supplier/Manufacturer in the development of their design/s and transfer this to relevant parties.

3 Pipes

3.1 Gravity Pipes (PVC & PE)

The vacuum sewer system would typically require some gravity pipes and fittings used for property connection pipework, which enables waste water to gravitate to a vacuum collection chamber, connected to the vacuum system.

For details of approved gravity pipes and fittings , refer TS 0502, Section 3.

3.2 PVC Vacuum Pipe

<table>
<tr><td rowspan="2">Shall comply with the following Standard/s</td><td>Modified PVC (PVC M)</td><td>AS 2032
AS/NZS 4765</td><td rowspan="4"> 
DN 100 - 300</td></tr>
<tr><td>Oriented PVC (PVC O)</td><td>AS 2032
AS/NZS 4441</td></tr>
<tr><td>Specification</td><td colspan="2">Series 2 (CIOD), PN 16.
Series 2 (CIOD), PN 9 & PN 12 are also available.
Use of PN 9, PN 12 shall be subject to approval.</td></tr>
<tr><td>Notes</td><td>Modified PVC (PVC M)</td><td>If cream coloured pipe is not available, (normally blue) coloured pipe shall be sleeved using a cream coloured sleeving with wording stating SEWER MAIN.
All pipe connections shall be Rubber Ring Jointed (RRJ).</td></tr>
<tr><td></td><td>Oriented PVC (PVC O)</td><td>Not generally used for vacuum sewer.
Project specific approval required prior to use.</td></tr>
<tr><td>Manufacturers</td><td colspan="3">Refer TS 0503, Clause 3.2.1</td></tr>
</table>

3.3 Polyethylene Vacuum Pipe

<table>
<tr><td>Shall comply with the following Standard/s</td><td>AS/NZS 4130</td><td rowspan="2">  </td></tr>
<tr><td>Specification</td><td>PE 100 Pipe – PN 16

Or

PE 80 Pipe - PN 12.5 Minimum
Use of PN 12.5 is subject to approval.</td></tr>
<tr><td>Notes</td><td>Solid CREAM (preferred)
or
BLACK with CREAM stripe</td><td>OD90, 110, 125, 180, 250 & 315</td></tr>
<tr><td>Manufacturers</td><td colspan="2">Refer TS 0503, Clause 3.3</td></tr>
</table>

3.4 Ductile Iron Pipe

Shall comply with the following Standard/s	AS 3680 AS 3681 AS/NZ 2280	 DN 300
Specification		
Notes	Ductile Iron pipes can only be used with specific approval from SA Water DI pipe with a polyurethane coating is the preferred pipe. DI pipe with a cement lining (DICL) can only be used with specific approval from SA Water. Cream sleeving required marked with the words SEWER PIPE	
Manufacturers	**Refer TS 0503, Clause 3.1**	

4 Fittings

4.1 Ductile Iron

Shall comply with the following Standard/s	AS/NZS 2280
Specification	PN 16 (Series 2) unless otherwise specified
Notes	BLACK or BLUE coloured fittings are acceptable with cream sleeving The current range of Non cement lined, FBE coated ductile iron fittings as shown in TS 0503 are acceptable for use in a pressure sewer system. **Cement lined fittings shall not be used.** Post-formed PVC-M bends can also be used for PVC pipe.
Manufacturers	For the range of FBE Fittings and Manufacturers, **refer TS 0503, Clauses 4.1.1.1 to 4.1.2.4**.

4.2 Polyethylene Electrofusion Fittings

Shall comply with the following Standard/s	AS/NZS 4129 Only PE products identified in this document are approved for use. In addition, the products shall be obtained from one of the listed Manufacturers, or his Agent.
Specification	Electrofusion welding shall only be performed by welders who have attained the **PMBWELD302B** qualification.
Notes	Upon completion, the Fabrication Company shall provide the SA Water Representative with a **Form**: 1. Signed by an authorised officer of the Fabrication Company and shall be co-signed by the Construction Contractor installing the item. 2. Identifying every weld, with the date of the weld and name and ID of the technician who undertook the weld. 3. Itemising the materials used, ie item manufacturer & description. 4. Each weld shall be stamped with the welder ID. 5. Diameters larger than OD 250 shall require specific SA Water approval.

Shall comply with the following Standard/s	AS/NZS 4129	
Standard Pipe Size	**PE Pipe Equivalent**	
DN 100	125 mm OD	
DN 150	180 mm OD	
DN 200	250 mm OD	
Manufacturers		For the range of PE Electrofusion Fittings and Manufacturers, **refer TS 0503, Clause 4.2.2**.

Note: If butt welded PE Pipe Specials are required, **Refer TS 0503, Clause 9.1.1** for Authorised Fabricators

5 Collection Chambers

<table>
<tr><td>Shall comply with the following Standard/s</td><td>AS 4310
EN 1091</td><td rowspan="2"> 
Product Example</td></tr>
<tr><td>Notes</td><td>• For maintenance / compatibility reasons SA Water is limiting the types of collection chambers used in the infrastructure network and SA Water MUST be consulted before any collection chamber or vacuum interface valves are purchased
• Collection chambers can be manufactured from concrete, polyethylene, fibreglass or stainless steel
• Collection chambers are supplied to suite individual locations</td></tr>
<tr><td rowspan="3">Manufacturers</td><td colspan="2">Flovac</td></tr>
<tr><td colspan="2">Airvac</td></tr>
<tr><td colspan="2">Sekisui Ribloc</td></tr>
</table>

6 Valves & Covers

6.1 Valves

6.1.1 Vacuum Interface Valve

Shall comply with the following Standard/s	AS 4310 EN 1091	  DN 80 PVC & 90 mm PE
Notes	For maintenance / compatibility reasons SA Water is limiting the types of vacuum interface valves used in the infrastructure network and SA Water MUST be consulted before any collection chamber or vacuum interface valves are purchased	
Manufacturers	**Flovac**	
	Airvac	
	Sekisui Ribloc	

6.1.2 Resilient Seat Valves

6.1.2.1 Socket - Socket

Shall comply with the following Standard/s	AS 2638-2 WSA PS 260	 DN 80 - 200
Manufacturers	**Refer TS 0503, Clause 7.1.2**	

6.1.2.2 PE Connection Ends

Shall comply with the following Standard/s	AS 2638-2 WSA PS 260	
		
RSVG FL/ PE Ends **DN80 Flange - PE OD75** **(fusions or butt weld applications)**	Series 01/70 (tensile resistant PE ends – restrained joints) PE OD75 – 250	Series 36/80 (fusions or butt weld applications) PE OD75 - 250
	Series 16/50 (POM with tensile restrained joints for PE pipes) PE OD63	
Manufacturers	**Refer TS 0503, Clause 7.1.3**	

6.1.2.3 6.1.3 Valve Spindle Extension

Shall comply with the following Standard/s	WSA PS 262	 Length 150, 300 & 450
Manufacturers		**Refer TS 0503, Clause 7.10**

6.2 Valve Covers

6.2.1 Trafficable (Class D)

Shall comply with the following Standard/s	AS 3996	
Full Height  Half Height  Covers to be marked **SEWER**	Trafficable Cover Support Slab 	Trafficable Support Ring 
1200 x 800 x 170	1200 x 800 x 170	600 x 140 Thick
Manufacturers	**Refer TS 0503, Clause 11.1**	

6.2.2 Non Trafficable

Valve Cover system Small Non- Trafficable 		Non-Trafficable Support Ring 
		600 x 70 Thick
Manufacturers	Iplex Crevet	**Refer TS 0503, Clause 11.1**
	Viadux	

7 Signs & Marking Tape

7.1 Metal Markers

Notes	Text: Vacuum Sewer Stop Valve	
Manufacturers	**Ferretti International**	
	Peninsular Castings	

7.2 Marking Tape

Shall comply with the following Standard/s	AS/NZS 2648.1 WSA PS 318 WSA PS 319				
Specification	• Sewer tapes are to be CREAM • 'WARNING: RESTRAINED PIPELINE TYTON LOK FITTINGS' – Non Detectable • 'DANGER BURIED MAIN BELOW' – Non Detectable • 'DANGER BURIED MAIN BELOW' – Detectable				
Notes	Detectable tape to be placed 100 – 150 mm below finished ground level above pipe				
Manufacturer	**Boddingtons**	**Hi-Tech**	**Romac Trading**	**Tapex**	**Viadux**