WATER SERVICES
ASSOCIATION OF AUSTRALIA

Sewer Equipment Company Australia

PRODUCT APPRAISAL REPORT 1918

Trelleborg epros® DrainPacker System for Rehabilitation of Sewer Pipes

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Document History

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Peer Reviewers

Name/Title	Organisation	Date
Product Appraisal Technical Advisory Group	WSAA	21 February 2020
WSAA Expert Panel	WSAA	21 February 2020
Peter Pittard, WSAA Consultant	WSAA	27 November 2019
Carl Radford, Product Appraisal Manager	WSAA	21 February 2020

Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

1. influencing national and state policies on the provision of urban water services and sustainable water resource management
2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

Copyright

CONTENTS

1 EXECUTIVE SUMMARY

Sewer Equipment Company Australia (SECA) is an Australian based company established in 1967 in Sydney NSW. The company specialises in supply of equipment for the cleaning, testing, inspection and rehabilitation of sewers and drains.

The Trelleborg Group is a Swedish based global company operating in about 50 countries and employing more than 24,000 people. The group is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its business areas are Trelleborg Coating Systems, Trelleborg Industrial Solutions, Trelleborg Offshore and Construction, Trelleborg Wheel Systems and Trelleborg Sealing Solutions. Trelleborg Pipe Seals, headquartered in Germany, is a member of Trelleborg Sealing Solutions and the supplier of the Trelleborg epros® DrainPacker System for rehabilitation of gravity drains and sewer pipes.

The Trelleborg epros DrainPacker System is a sectional or point repair method for pipes of any material including concrete, vitrified clay, asbestos cement, cast or ductile iron, GRP, PVC and PE, within the size range from DN 100 to DN 1200, provided the host pipe and soil system in structurally stable. The system is suitable for repairing defects in underground non-pressure gravity drain and sewer pipelines including radial and/or longitudinal cracks, mechanical wear, corrosion, leaking joints and may also be used for obstruction of laterals.

The system basics are described as follows: A resin impregnated fibre glass mat is folded and wrapped around a prepared foil protected packer. After preparation of the pipe wall surface, the assembled packer is inserted into the pipe using air push rods or ropes and located to the point of repair, which is pre-determined by a CCTV camera. The packer is then inflated using compressed air to expand the impregnated fibreglass against the wall of the pipe to create a tight-fit permanent bond. Excess resin penetrates into the damaged area of the pipe wall to seal any cracks and voids. After the resin is allowed to fully cure, the packer is deflated and removed from the pipe. The repair system does not provide any obstruction to flow.

Repair lengths range from 0.5m to 5m. The packers are available in four different models; short, long, flex and lateral.

Two grades of fibreglass mats are available (1,050 g/m^2 and 1,400 g/m^2) and different resin mixes are recommended depending on the ambient temperature and humidity.

The features of the system include high chemical and heat resistance, adjustable resin cure times, ability to bond with all types of pipe material, excellent performance in hot or cold temperatures, no volatile organic compounds, less than 0.6% shrinkage and service life of 50+ years.

A comprehensive range of literature and installation manuals are available and SECA provides backup and installation assistance for Water Agency personnel and preferred contractors.

Trelleborg Pipe Seals has an ISO 9001:2015 Quality Management System licence.

The Trelleborg epros DrainPacker System has been approved by DIBt, (Deutsches Institut für Bautechnik) the German government approval body for construction products and types. A copy of the approval report is available from WSAA.

1.1 Recommendations

It is recommended that WSAA members consider acceptance/authorisation of the Trelleborg epros DrainPacker System for repairs to localised defects in non-pressure sewerage pipes.

2 THE APPLICANT

The Applicant is Sewer Equipment Company Australia (SECA) located in Sydney NSW.

Sewer Equipment Company Australia (SECA) is an Australian based company established in 1967 in Sydney NSW. The company specialises in supply of equipment for the cleaning, testing, inspection and rehabilitation of sewers and drains.

2.1 The Supplier

The Trelleborg Group is a Swedish based global company operating in about 50 countries and employing more than 24,000 people. The group is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its business areas are Trelleborg Coating Systems, Trelleborg Industrial Solutions, Trelleborg Offshore and Construction, Trelleborg Wheel Systems and Trelleborg Sealing Solutions. Trelleborg Pipe Seals, headquartered in Germany, is a member of Trelleborg Sealing Solutions and the supplier of the Trelleborg epros® DrainPacker System for rehabilitation of gravity drains and sewer pipes.

All materials associated with the system are manufactured within the Trelleborg Group.

3 THE PRODUCT

The Trelleborg epros DrainPacker System is a sectional or point repair method for pipes of any material including concrete, vitrified clay, asbestos cement, cast or ductile iron, GRP, PVC and PE, within the size range from DN 100 to DN 1200, provided the host pipe and soil system in structurally stable.

The system is suitable for repairing defects in underground non-pressure gravity drain and sewer pipelines including radial and/or longitudinal cracks, mechanical wear, corrosion, leaking joints and may also be used for obstruction of laterals. Repair lengths range from 0.5m to 5m

The system basics are described as follows:

- A resin impregnated fibre glass mat is folded and wrapped around a prepared foil protected packer.
- Preparation of the pipe wall surface is a prequisite using abrasion and water blasting methods.
- The assembled packer is inserted into the pipe using air push rods or pull ropes and located to the point of repair that has been pre-determined by a CCTV camera.
- The packer is then inflated using compressed air to expand the impregnated fibreglass against the wall of the pipe to create a tight-fit permanent bond. Excess resin penetrates into the damaged area of the pipe wall to seal any cracks and voids.
- After the resin is allowed to fully cure, the packer is deflated and removed from the pipe.

The repair system provides a smooth and structurally sound lining without obstruction to flow.

The packers are available in four different models; short, long, flex and lateral and are esily installed through conventional access chambers.

- Short packers are available in diameters from DN 100 to DN 700 with a maximum repair length range of 605mm to 670mm.
- Long packers are available in diameters from DN 200 to DN 800 with a maximum repair length range of 200mm to 4565mm.
- Flex packers (very flexible) are available in diameters from DN 100 to DN 1200 with a maximum repair length range of 560mm to 4630mm.
- Lateral packers, designed for house lateral connections, are available in diameters from DN 100 to DN 200 with a maximum repair length range of 210mm to 4710mm.

FIGURE 1 TYPICAL PACKER – SHORT TYPE

The acid proof fibre glass matting consists of a fibreglass fabric and powder bonded glass mat sewn together into a flat sheet material and would into rolls. Two grades of mats are available: 1,050 g/m^2 and 1,400 g/ m^2.

FIGURE 2 FIBREGLASS MATTING

The epros silicate resin systems are highly chemical resistant and heat resistant and can be used in a wide range of different ambient temperatures. There are three types of resin mixes offered depending on the ambient temperature and humidity: Summer resin (Type S) is recommended for high ambient temperatures, Winter resin (Type W) is recommended for low ambient temperatures and Type W01 is a special mix for subarctic temperatures.

4 SCOPE OF THE APPRAISAL

The scope of this Appraisal is to review relevant documentation associated with the Trelleborg epros DrainPacker pipeline rehabilitation system in order to assess potential application for repair of defective sewerage pipelines. The applicable size range is DN 100 to DN 1200. The system is suitable for sewer pipes of any material.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The Product Appraisal Technical Advisory Group accepts products certified by means of an ISO Type 5 product certification scheme undertaken by a JAS-ANZ accredited Conformity Assessment Body (CAB) or by an international accreditation system recognised by JAS-ANZ.

The manufacturer is generally expected to have a production management and control system that has been duly accredited in accordance with AS/NZS ISO 9001 as a prerequisite to undergoing a product certification audit.

The ISO Type 5 Product Certification Scheme shall meet the criteria described in WSA TN-08.

5.2 Performance Requirements

Performance requirements are generally obtained from the relevant product Standard and/or WSAA Specification. In this case there is no directly applicable standard and this Appraisal has substantially relied upon the DIBt comprehensive approval document for the DrainPacker System.

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

The Trelleborg epros DrainPacker System has been assessed and approved by DIBt (Deutsches Institut für Bautechnik), the German government approval body for construction products and types.

SECA has submitted a copy of ISO 9001:2015 Certificate of Registration No. NL016252-1 issued to Trelleborg Pipe Seals Duisburg GmbH by Bureau Veritas.

A copy of the ISO 9001 certificate is included in Appendix C and is also available from WSAA.

6.2 Compliance with Performance Requirements

6.2.1 General

The Trelleborg epros DrainPacker system was approved by DIBt in January 2016 and is valid until January 2021.

See Appendix B for a copy of the cover page. The full report is available from WSAA.

6.2.2 Material requirements

6.2.2.1 Fibreglass Mat

Trelleborg epros GlassFibreMat is an acid proof fibre glass matting consisting of a fibreglass fabric and powder bonded glass mat sewn together into a flat sheet material and would into rolls. Two grades of mats are available: 1,050 g/m2 and 1,400 g/ m2.

Guidance on the appropriate mat for particular applications is available from SECA.

The relevant standards covering the fibreglass matting are DIN 1259-1, DIN 61853-1, DIN61853-2 and DIN 61854-1.

6.2.2.2 Resin

Trelleborg epros silicate resins consist of two components (Component A is the hardener and Component B is the resin) that are mixed together prior to impregnation of the Fibreglass matting. There are three types of resin mixes offered depending on the ambient temperature and humidity: Summer resin (Type S) is recommended for high ambient temperatures, Winter resin (Type W) is recommended for low ambient temperatures and Type W01 is a special mix for subarctic temperatures.

Guidance for mixing ratios appropriate to particular applications is available from SECA.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

A copy of the DrainPacker Installation Instructions has been submitted for this Appraisal and is included in Appendix A.

Installation training and support is offered for Water Agency in-house personnel or preferred contractors.

8 PACKAGING AND TRANSPORT

Fibreglass and resins are packaged as bulk or as Drain Packer Patch Kits. Details of the contents are included in Appendix A.

9 PRODUCT WARRANTY

The products are covered by the normal commercial and legal requirements of the *Competition and Consumer Act 2010 (Cth)*, which covers manufacture to the relevant standard, and details of Sewer Equipment Company Australia's warranty is included in their terms and conditions of sale.

10 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD TESTING REPORT

The epros DrainPacker system has been used world-wide for more than 15 years in countries including Australia, Malaysia, Hong Kong, Sri Lanka, China, Thailand, New Zealand, Korea, Singapore, Abu Dhabi, Bahrain, Qatar, Oman, Saudi Arabia, Israel, USA, Canada, UK and Europe.

There are no Australian Water Agency approvals currently in place. It is envisaged that this Appraisal will be a pre-requisite to future applications for approval.

11 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

There were no issues raised.

12 FUTURE WORKS

There are no future works items outstanding.

13 DISCLAIMERS

This Product Appraisal Report (Report) is issued by the Water Services Association of Australia Limited on the understanding that:

This Report applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this Report.

To maintain the recommendations of this Report any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Report and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products.

WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

The following information explains a number of very important limits on your ability to rely on the information in this Report. Please read it carefully and take it into account when considering the contents of this Report.

Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

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This Report has been published and/or prepared by the Water Services Association of Australia Limited and nominated Project Manager and peer group of technical specialists (the Publishers).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

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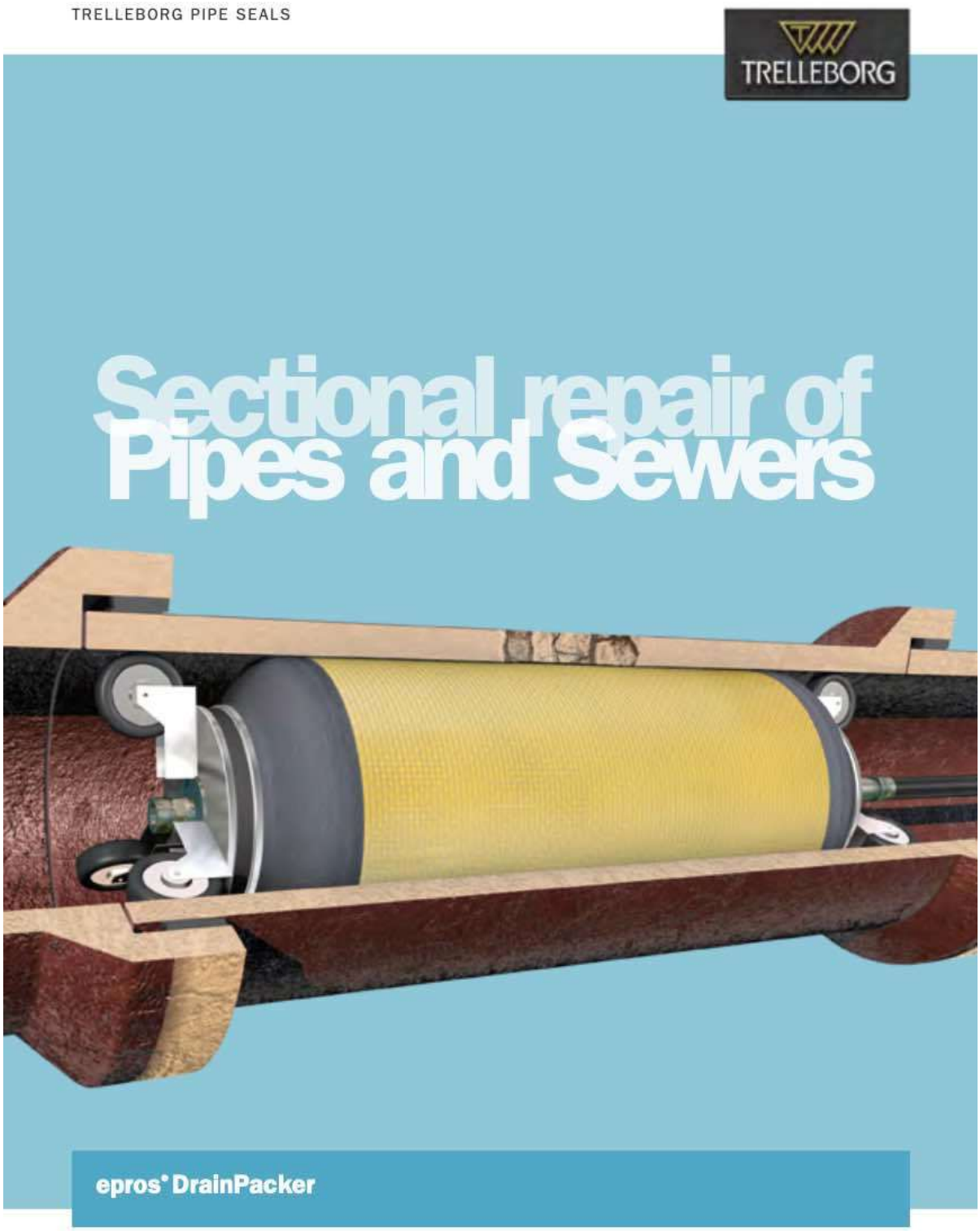
APPENDIX A – TECHNICAL LITERATURE



Introducing Trelleborg Pipe Seals

Part of the wider Trelleborg Industrial Solutions Business Area of Trelleborg Group, Trelleborg Pipe Seals is a world leader in new seals and rehabilitation sealing solutions for concrete and plastic pipes, manholes, and connectors used for water supply, sewerage and drainage. Drawing on advanced polymer technology, the high performance of our seals ensures the fulfilment of the highest possible reliability standards.

With a global reach and a track record spanning more than half a century, we deliver continuous innovation to customers across the globe with a logistics and sales network spanning Asia Pacific, Europe, Middle East, Africa, North America and South America. Drawing on our engineering expertise and advanced technological solutions, we will see your project through from the beginning to the end.

Whether you need an entirely new system or if your existing one needs rehabilitation, we offer a range of market-leading seals that promise:

High quality

Quick and easy installation

Improved productivity

Zero leakage

Trelleborg Pipe Seals offers the highest reliability and performance standards, providing watertight solutions that protect not only your pipe cycle, but your reputation too.

epros® DrainPacker What it's used for

Trelleborg Pipe Seals is among the leading specialist companies offering innovative technologies for the maintenance of sewer systems.

The epros®DrainPacker repair system by Trelleborg Pipe Seals is a sectional or point repair method for all types of wastewater, sewer and drainage pipes. The system uses epros®SilicateResins and chemically resistant, non-corroding fiberglass – CRF(+).

The epros®DrainPacker method is suitable for the sectional repair of buried, damaged gravity sewer pipes and pressurized pipelines. The process provides structural repair with a frictional fit in the sewer pipes of public and private sewerage systems. Pipe sizes that can be repaired range from DN 35 to DN 1200 [1.4" – 48"] – General Technical DIBt Approval for DN 100 to DN 800 [4" – 31.5"] – and include diverse eggshaped crossections.

Repair lengths range from between 0.5 m to 5 m (1.6 ft to 16½ ft), depending on the packer design (please refer to the related operation and maintenance manual of the packer).

For repair lengths exceeding 5 m [16½ ft], it is possible to use the epros®DrainPacker method in an overlapping technique. Longer pipe segments need to be repaired from pipe joint to pipe joint. Lateral connections that are no longer in use can be blocked off. This product can be used in the case of heavy infiltration or even underwater.

The method is applicable to circular and eggshaped pipes made of concrete, asbestos cement, plastic (PVC, PP, HDPE), cast iron, ductile cast iron, reinforced concrete or vitrified clay.

BENEFITS

- epros®SilicateResins have a high chemical and heat resistance
- epros®SilicateResins are ambient-cure resins with a cure time of approx. 1 to 3 hours (cure times can be controlled and adjusted)
- Components are able to create a frictional bond with all kinds of pipe material (i.e. vitrified clay, plastic, steel, etc.) and provide a close and tight fit to HDPE pipes
- Excellent performance at extreme temperatures whether hot or cold
- Quick and easy installation
- No volatile organic compounds (VOC) (styrenefree)
- Virtually no shrinkage (< 0.6 %)
- Method can be used in critical areas such as airports and tunnels due to the selfextinguishing properties of the cured resin
- The epros®DrainPacker is available in four different models – short, long, flex and lateral – and in lengths ranging from 0.6 m to 5 m (2 ft to 16½ ft) and in pipe diameters ranging from 35 mm to 1,200 mm (1.4" to 48")
- The short and flex packers allow the service flow to be maintained during the cure time without expensive bypass pumping
- Independently tested (IKT Gelsenkirchen, WRc UK) in conformance to worldwide standards such as ASTM, WIS and DIN EN. Approved by the German government body, DIBt.
- Tested service life of 50+ years (10,000 hrs)
- Recommended by experienced users worldwide with more than 100,000 installations every year

epros® DrainPacker Functional principle

1

A fiberglass mat is impregnated with resin according to the epros® DrainPacker method, then folded and wrapped around the prepared foil-protected packer.

2

The pre-assembled epros® DrainPacker is introduced into the pipe section with the help of air push rods or pulled in place with a rope.

The preassembled epros® DrainPacker carrying the impregnated fiberglass mat is pushed with the help of air push rods or pulled with a rope to the point of repair. The exact position of the repair point is determined beforehand through the use of a CCTV system.

When the epros® DrainPacker has reached the correct position in the pipe, it is gradually inflated using compressed air. This causes the packer to expand and press the impregnated fiberglass mat against the pipe wall. This creates a tight-fit, permanent bond against the host pipe, with the excess resin penetrating into the pipe's damaged areas (cracks and voids).

The resin-impregnated fiberglass mat can then be cured at ambient temperature according to the information provided in the method statement or technical data sheets. The required cure times depend on the climatic conditions within the sewer. After the resin is completely cured, the packer is deflated and removed from the pipe.

The cured fiberglass/resin composite now covers the full area of the repaired pipe section without obstructing service flow. This pipe-in-pipe system is thus integrated with the host pipe and fully meets hydraulic requirements. The line is ready for immediate service.

epros® DrainPacker Packer types

Trelleborg Pipe Seals supplies a wide range of high-quality, inflatable, multi-sized packers for point or sectional pipe repair. They are installer friendly as they are light and easy to insert into small manholes and inspection chambers.

epros® FlexPacker (very flexible)

- Available in diameters ranging from DN 100 to DN 1200 [4" – 48"] and multiple sizes, for example, from DN 150 to DN 250 [6" – 10"]
- Maximum repair length, depending on the packer size, ranges from 560 mm to 4,630 mm [approx. 22" to 182"]
- Flexible packers allow for easy insertion into the pipe from the manhole or inspection chamber
- Uniform results thanks to adjustable wheel-sets which allow for the centring of the packer in the pipe
- With bypass, except for packer size DN 100/150 [4"/6"]
- Low maintenance and repairable

epros® SPacker (short)

- Rigid design specifically built for a larger flow through
- Available in diameters ranging from DN 100 to DN 700 [4" – 28"] and multiple sizes, for example, DN 150 to 200 [6" – 8"]
- Maximum repair length, depending on the packer size, ranges from 605 mm to 670 mm [approx. 23.8" – 26.4"]
- Uniform results thanks to adjustable wheelsets which allow for the centring of the packer in the pipe
- Bypass model
- Low maintenance and repairable

epros® DrainPacker Packer types

epros® HLPacker (for the house lateral connection)

- Available in diameters ranging from DN 35 to DN 200 [1.4" – 8"]
- Maximum repair length, depending on the packer size, ranges from 210 mm to 4710 mm [approx. 8.3" – 15.4 ft]
- Highly flexible and thus, easy to install, even through small access points
- Can be positioned using pull-in-place (rope) or push-in-place (rods) methods
- Without wheel-set and bypass

epros® LPacker (long)

- Available in diameters ranging from DN 200 to DN 800 [8" – 32"]
- Maximum repair length, depending on the packer size, ranges from 200 mm to 4,565 mm [approx. 8" – 15 ft]
- Lightweight and highly flexible
- Packers can be easily inserted through DN 600 [24"] manholes
- Can be positioned using pull-in-place (rope) or push-in-place (rods) methods
- Without wheel-set and bypass, special models available upon request

Flexible air push rods and flexible adapters are available with all packers. This allows repair from a single access point. All air push rods and flex adapters are equipped with air couplers incl. retaining ring.

epros® Silicate Resin Systems

eprosSilicateResins are highly chemical-resistant and heat-resistant. In case of fire, they are self-extinguishing and can therefore be used in critical areas such as airports and tunnels. **Their patented formula does not contain any volatile organic compounds (VOC) and is completely styrene-free.** They can be used in a wide range of locations with differing ambient temperatures, ranging from Iceland to Abu Dhabi, and boast a service life of 50+ years. eprosSilicateResins are also able to forge excellent bonds with all pipe materials and provide a tight fit when used with HDPE pipes – all of which results in them being one of the most popular and well-established consumables among pipe repair installers and customers worldwide.

eprosSilicateResin System Type W

A patented resin mixture made up of two components: a resin (B) and a hardener (A) in a mixing ratio of 2:1 by volume. This so-called "winter resin" is recommended for use under lower outdoor temperatures.

It provides an ample pot time and cures at ambient temperature. It is also possible to customise pot and curing times by mixing this Type W resin with Type W01 or Type S.

eprosSilicateResin System Type S

A patented resin mixture is made up of two components: a resin (B) and a hardener (A) in a mixing ratio of 2:1 by volume. This so-called "summer resin" is recommended for use under higher outdoor temperatures.

It provides an ample pot time and cures at ambient temperature. It is also possible to customise pot and curing times by mixing this Type W resin with Type W or Type W01.

eprosSilicateResin System Type W01

A patented resin mixture is made up of two components: a resin (B) and a hardener (A) in a mixing ratio of 2:1 by volume, recommended for use in subarctic areas or as an accelerator for Type W and Type S.

epros® Silicate Resin Systems

OVERVIEW

System Description	Colour		Mixing ratio	Pot time		Curing time	
				Minutes	°C [°F]	Minutes	°C [°F]
epros®SilicateResinSystem S	brown	neutral	2 : 1	30	20 [68]	260	15 [59]
epros®SilicateResinSystem W	brown	neutral	2 : 1	15	20 [68]	115	15 [59]
epros®SilicateResinSystem W01	brown	neutral	2 : 1	13 – 16 4.5 – 7.5	10 [50] 22 [71.6]	20	20 [68]

epros® Drain FibreGlassMats

The eprosDrainPacker method is designed for repairing pipes and joints at lengths of up to 5 m (16½ ft). The chemically resistant, non-corroding (CRF+) **eprosFibreGlassMat CRF(+) 1050 g/m²** and **eprosFibreGlassMat CRF(+) 1400 g/m²** are used in conjunction with eprosSilicateResin systems to restore the structural stability of the host pipe or replace entire part lengths.

- Acid-proof fiberglass matting
- Woven fiberglass fabric and powder-bonded glass mat, sewn together into a flat sheet material wound into rolls.

eprosFibreGlassMat CRF (+) 1050 g/m²

CRF(+) 1050 g/m², 125 cm

CRF(+) 1050 g/m², 250 cm

eprosFibreGlassMat CRF (+) 1400 g/m² Customization*

CRF(+) 1400 g/m², 35 cm – for DN 100 [4"]*

CRF(+) 1400 g/m², 44 cm – for DN 125 [5"]*

CRF(+) 1400 g/m², 53 cm – for DN 150 [6"]*

CRF(+) 1400 g/m², 70 cm – for DN 200 [8"]*

CRF(+) 1400 g/m², 88 cm – for DN 250 [10"]*

CRF(+) 1400 g/m², 105 cm – for DN 300 [12"]*

CRF(+) 1400 g/m², 125 cm

TRELLEBORG PIPE SEALS

TRELLEBORG

epros® DrainPacker Patch Kit

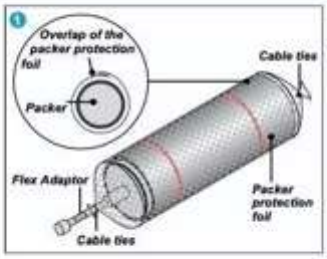
THE PIPE REPAIR SOLUTION THAT EVERYONE GETS

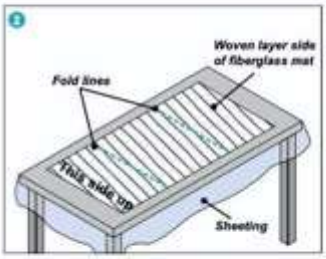
Installation instructions

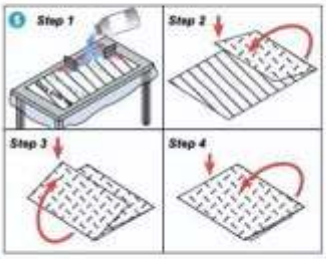
Pre-installation Procedures

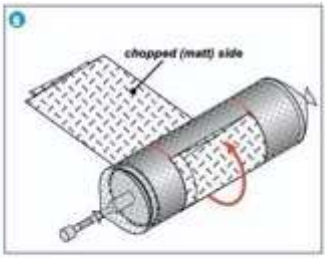
1. Select an **epros® DrainPacker Patch Kit** in the correct configuration for the pipe to be repaired.
2. We highly recommend cleaning the pipe prior to installation with a high-pressure water jet to remove grease, roots and other deposits. The pipe surface does not need to be dry; the patch can be installed without problems even if the pipe is full of water.
3. Insert a camera into the pipe to locate and assess the damage(s). At the same time, mark the camera cable/push rod at the insertion point – this marks the distance to the repair point (for installation point 9 below).

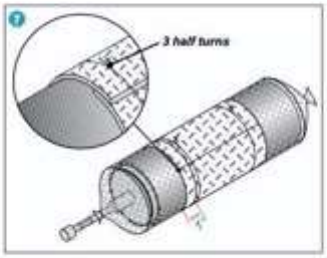
Please follow the manufacturers safety instructions when using the epros® DrainPacker Patch Kit.
Ensure that eye and hand protection is used.
Handle carefully and avoid direct contact with the chemicals.

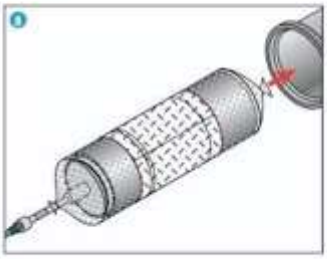


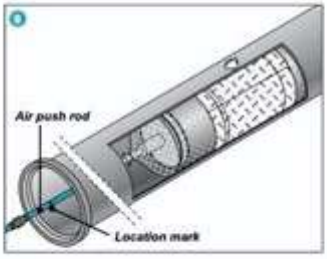


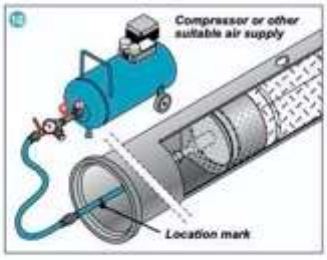


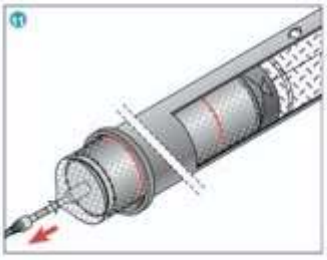












Installation Instructions

(refer to the corresponding diagrams on the left)

Ensure all items are present and to hand prior to commencing the work.

1. Pull the packer protection foil completely over the packer and secure at each end with the cable ties provided. Connect the flex adaptor to one side of the packer.

   Note: Use the correct packer for the corresponding pipe diameter as recommended below.
2. Lay out the groundsheet and open out the fiberglass mat. Position as marked "This Side Up".
3. Remove the cover from both bottles and put the hardener in the resin bottle.
4. Close the resin bottle and mix thoroughly the resin by shaking the bottle for one minute.

   Important: Once mixing is complete, the resin must be applied and the packer must be installed within 13 minutes (W) or 28 minutes (S) [pot time dependents on resin type and temperature – please refer to table].
5. Open the resin bottle and pour part of the contents (50 – 60 %) onto the correctly positioned fiberglass mat.

   Step 1: Use the spatula provided to spread the resin evenly and liberally to coat the surface.
   Step 2: Fold along the first line. Pour on approximately one third of the remaining resin and spread out evenly.
   Step 3: Make the second fold. Pour out approximately half of the remaining resin and spread out evenly.
   Step 4: Turn over the folded impregnated mat onto the protective foil and pour on the remaining resin and spread evenly.
6. Place the impregnated fiberglass mat on the packer and centre it. Roll the mat around the packer.
7. Fix the mat onto the packer by using the provided wire ties. Position the wire ties 25 mm or 1 inch from the end of the fiberglass mat and also position additional wire ties all 60 cm or 2 ft. Secure the wire ties with 3 half turns. Slightly inflate the packer to tighten fit if needed.
8. Insert the packer and patch into the pipe.
9. Push the packer into the pipe and position it at the point of repair, as marked on the push rod during pre-installation.
10. Inflate the packer to the recommended working pressure (depending on packer type). The wire ties will release and allow the impregnated mat to be pressed against the inner surface of the pipe at the point of repair.

    Note: If the pipe is badly damaged, then care must be taken when inflating the packer to avoid distorting the internal diameter of the pipe. Full pressure might not be needed.
11. Leave the packer in place and maintain the working pressure until the resin is fully cured (curing time dependent on resin type and temperature – refer to table). You can then deflate the packer and remove it from the pipe.

Equipment Required In Addition To The Patch Kit:

1. High-pressure water jet or similar, for cleaning the host pipe
2. Basic push camera or similar, for pipe inspection and measurement
3. Trelleborg Packer in the correct size
4. Trelleborg Push Rods and/or Pull Rope
5. Trelleborg Flex Adaptor
6. Trelleborg Pressure Regulator, including valve
7. Air compressor

For more information regarding our different patch kits please refer to

or go to
http://bit.ly/2shADiC

Packaging and Transport

Fibreglass and Resins are packaged as bulk or as Drain Packer Patch Kits.

Bulk is packaged as follows:

Fibreglass roll wrapped in plastic bag showing the following data

- Fibreglass Matt type -1050 gm² or 1400gm²
- Roll width
- Total weight
- Mass per unit area
- Batch number

Resin Type A & B in plastic drums labelled with the following

– Component designation A (hardener) and B (resins)
– Winter or summer quality of the resins (“epros®ResinType W01”, “epros®ResinType W”, and “epros®ResinType S”) component B
– Processing temperature range – from ±0°C to +25°C
Holding capacity (volume or weight)
– Where required, the label in accordance with the relevant hazardous material regulation
– Batch number

Drain Packer Patch Kits are packaged as follows:

Plastic Bucket labelled with contents which include:

- 1 PCS epros®SilicateResin - labelled
- 1 PCS epros®Hardener for Resin, - labelled
- 1 PCS epros®FibreGlassMat CRF (+) - labelled
- 2 PCS Protective foil
- 1 PCS Ground sheet
- 2 PCS Safety glasses
- 1 PCS Binding wire
- 5 PCS Disposable gloves (pair)
- 8 PCS Cable ties
- 2 PCS Spatula

APPENDIX B – APPROVAL DOCUMENTATION

A copy of the complete Approval Report from DIBt is available from WSAA.

Translated from German / page 1 of 33 :

Deutsches Institut für Bautechnik

DIBt

General Technical Approval

Approval Body for Construction Products & Types
Construction Engineering Inspection Body
Public-law agency jointly held by the Federal German Government and the German state governments

Member of EOTA, UEAtc and WFTAO

Date: 11/01/2016

Reference no.: III 54-1.42.3-30/15

Approval No:
Z-42.3-385

Valid
from: **31 January 2016**
until: **31 January 2021**

Applicant:
Trelleborg Pipe Seals Duisburg GmbH
Dr. Alfred-Herrhausen-Allee 36
47228 Duisburg

Object of Approval:
"epros®DrainPacker method" for the rehabilitation of buried damaged sewer lines within the nominal diameter range from DN 100 to DN 800 using short and long liners

The above mentioned object of approval is hereby granted general technical approval.
The present General Technical Approval covers 19 pages and 14 appendices.
This General Technical Approval replaces the General Technical Approval No. Z-42.3-385 of 29 June 2010, revised and extended by the Decision dated 27 October 2010.

DIBt | Kolonnenstrasse 30 B | D-10829 Berlin | Tel.: +49 30 78730-0 | Fax: +49 30 78730-320 | e-mail: dibt@dibt.de | www.dibt.de

APPENDIX C – QUALITY CERTIFICATIONS

Copies of the following Quality Certification certificate is available for downloading from the WSAA Members Website.

TABLE C1

TRELLEBORG PIPE SEALS – MANAGEMENT SYSTEMS

Dr Alfred Herrhausen Allee 36, DE-47228 Duisgurg, Germany	
Quality Systems Standard	ISO 9001:2015
Certification licence no.	NL016252-1
Certifying agency	Bureau Veritas
First date of certification	29 July 016
Current date of certification	29 August 2019
Expiry date of certification	29 July 2022

BUREAU VERITAS

Certification

Awarded to

Trelleborg Pipe Seals Duisburg GmbH

Dr.-Alfred-Herrhausen-Allee 36, DE-47228 Duisburg, Germany

Bureau Veritas Inspection and Certification The Netherlands B.V. declares that the Quality Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below.

Standard

ISO 9001:2015

Scope of supply

Storage, distribution, production, development and sales of pipe and manhole rehabilitation products.

Original cycle start date:	**29 July 2016**
Expiry date of previous cycle:	**29 July 2019**
Certification / Recertification Audit date:	**15 April – 14 May 2019**
Certification / Recertification cycle start date:	**29 August 2019**

Subject to the continued satisfactory operation of the organization's Management System, this certificate is valid until: **29 July 2022**

Certificate No: **NL021150/1** Version: **1** Revision date: **30 August 2019**
This certificate is part of certificate number NL021150 in name of Trelleborg Pipe Seals Lelystad B.V.

Sebastiaan ter Horst
Director Certification

Kantoor hdsvc: Bureau Veritas Inspection & Certification The Netherlands B.V., Computerweg 2, 3821 AB Amersfoort, The Netherlands
Kantoor uitgifte: Bureau Veritas Inspection & Certification The Netherlands B.V., Computerweg 2, 3821 AB Amersfoort, The Netherlands

MGMT. SYS.
RvA C 248

APPENDIX D – SUPPLIER CONTACTS

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E: sydney@seca.com.au

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Carrum Downs
VIC 3201
T: 03 9708 2233
E: melbourne@seca.com.au

Queensland
2/14 North Road
Wynnum West
QLD 4178
T: 07 3396 1777
E: brisbane@seca.com.au

Website: www.seca.com.au

Melbourne Office
Level 8, Suite 8.02
401 Docklands Drive
Docklands VIC 3008

Sydney Office
Level 9 420 George Street
Sydney NSW 2000
GPO Box 915
Sydney NSW 2001

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