

TECHNOLOGY

Smart Lock is a trenchless no-dig point repair system for the rehabilitation of damaged underground pipes. The technology uses a stainless-steel smooth bore sleeve encased in a fibreglass matting, impregnated with a silicate resin.

INDUSTRY UTILISATION

Utilized in gravity sewer and stormwater systems. Approved by WRc, WSAA and numerous authorities and councils for use in defective and damaged pipes.

DESCRIPTION OF MAIN FEATURES

Smart Lock is an expandable and self-locking, smooth bore, stainless steel sleeve. Combined with the application specific silicate resin impregnated fibreglass woven mat.

The fibreglass mat gives Smart Lock the ability to effectively seal pipes for root infestation, ground water ingress and joint displacements. The fibreglass matting can also be layered to improve sealing effectiveness and strength.

It is installed remotely from the nearest manhole or access chamber using an inflatable packer, so no excavation is required.

MATERIAL OF CONSTRUCTION

THE STAINLESS-STEEL SLEEVE AND LOCKING SYSTEM

316 grade, compliant with ASTM A 240, ASTM A 666 and EN1.4401.

THE APPLICATION SPECIFIC PROPRIETARY SILICATE RESIN

DIBt approved (DIBt is the German Institute for Structural Engineering) and specifically formulated for use in sewer systems, adhering to moist surfaces and having a high resistance to aggressive water both acid and alkaline.

THE FIBREGLASS MATTING

ECR fibreglass is used to create a heavy-duty two-way glass cloth. ECR fibreglass provides significant advantages in acid and alkaline environments and is compliant with ASTM D 578-00, ISO 2078 and DIN 1259-01.

DESIGN LIFE

The Smart Lock sleeve has a design life of 100 years. It is made of material known to be suitable for long term application in stormwater and sewer conditions.

SIZE RANGE

Smart Lock standard length is 400mm and is available in sizes DN100 to DN750, with larger sizes available on request.

NOMINAL DIAMETER	SUPPLIED DIAMETER	LENGTH (MM)	INTERNAL PIPE SIZE (mm)		REQUIRED PACKER
			minimum	maximum	
DN100	75	235/400	90	100	SLP 100
DN150	110	235/400	145	155	SLP 150
DN225	180	235/400	220	230	SLP 225
DN300	260	400	290	310	SLP 300
DN375	330	400	370	385	SLP 375
DN450	410	400	445	460	SLP 450 - 600
DN525	480	400	520	530	SLP 450 - 600
DN575	520	400	570	585	SLP 450 - 600
DN600	540	400	590	610	SLP 450 - 600
DN675	615	400	670	685	SLP 600 - 750
DN750	705	400	730	765	SLP 600 - 750

APPLICATIONS

Smart lock is compatible with all classes, jointing systems and materials including concrete, VC, PVC, steel, ductile iron, HDPE and composite piping.

Smart Lock is used to repair:

- Broken and damaged pipes
- Cracks, holes and splits
- Redundant lateral connections
- Decoupled and disconnected joints
- Voids and pipes needing structural form and integrity

MAIN BENEFITS

A trenchless no-dig spot repair which reinstates the structural strength and integrity of deformed and damaged pipes. Smart Lock enables fast and highly productive installation as the impregnated fibreglass matting is left to cure behind the stainless-steel sleeve.

Localised defects such as cracks and holes, root infestation, water infiltration, offset joints and redundant laterals are repaired by installing a Smart Lock directly at the location and thereby provide a cost-effective alternative to excavation, relining or pipe replacement.

Aggressive cleaning, root cutting, and relining can be undertaken in future without the concern of damaging the Smart Lock.

MAIN LIMITATIONS

It is not suitable for displaced joints where the vertical level of displacement is greater than 10mm. The Smart Lock cannot be launched in pipes with acute bends or major pipe deflections.

STRUCTURAL DESIGN STANDARDS

Can be designed as a stand-alone structural pipeline component applying AS/NZS 2566.1:1998 – Buried Flexible Pipes. Part 1: Structural Design.

MATERIAL PROPERTIES

The stiffness and effectiveness of the Smart Lock seal can be altered to meet structural requirements by varying the layers of fibreglass reinforcement.

Minimum material properties are:

- Tensile strength 258 Mpa
- Flexural strength 144 Mpa
- Flexural modulus 15,469 Mpa
- Hardness 13.3
- Maximum load 2.8 kN

These test results are based on the Smart Lock only. The tests were carried out without being inside a host pipe, so no other support is provided outside of the stainless steel sleeve and fibreglass wrap.

INSTALLATION STANDARDS

The Smart Lock is installed in accordance with the Standard Operating procedures developed by Smart Lock Group.

All installations must be carried out by licenced and certified installers. These qualifications are obtained by attending the Smart Lock training course and being certified as an Accredited Installer.

INSTALLATION METHODOLOGY

Installation uses an inflatable packer. Smart Lock has a range of these to allow the Smart Lock to be installed in pipelines from DN100 to DN750.

The packers have a hollow core to allow flow to pass through the centre, meaning Smart Locks can be installed in live flow conditions.

TESTING AND COMMISSIONING

CCTV inspection is used to confirm the Smart Lock has been successfully installed.

APPROVALS



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