

PT/305/0710 – AS (July 2010)
Assessment of the SPR™ EX Lining System for Gravity Pipes



independent certification of your products & services

1. Scope

1.1 This schedule sets down the requirements for assessing the SPR™ EX lining system for use in gravity pipes of any diameter between 150mm and 750mm.

1.2 SPR™ EX is a no-dig solution for the renovation of gravity pipes using a factory extruded PVC profile strip which is fed from a spool down into an access chamber and into a patented hydraulically driven winding machine at the base of the manhole. The winding machine spirally winds the plastic profile into a liner directly into the deteriorated pipe and the design of the winding machine enables the liner to be placed in close contact with the host pipe.

1.3 The PVC profile has interlocking edges which, when the profile is spirally wound, lock together to form a liner of high stiffness. The stiffness is achieved through integral 'T' ribs on the outer surface of the profile. A number of profiles are available with 'T' ribs of varying size so that pipe stiffness can be tailored to specific applications. The profiles are 56-7EX, 85-7EX, 85-8EX, 126-13EX and 126-20EX.

1.4 The SPR™ EX liner has a double locking configuration, the secondary lock is formed using hot melt adhesive which holds the liner at a constant diameter, which is smaller than the host pipe, as it is wound into the host pipe. The winding machine also inserts a high strength steel wire between the primary and secondary

locks as the edges of the profile are locked together.

1.5 After the liner is wound from one manhole to the next, the end of the liner is held in position and the secondary lock progressively severed by pulling the wire. The edges of the profile are then free to slide relative to each other, along the primary lock, as the winding machine continues to wind more profile which causes the liner to expand until it contacts the wall of the host pipe. The primary lock contains a slow setting lubricating sealant that, until it sets, aids the expansion process. This process of severing the secondary lock and expanding the liner is repeated until the whole length of the liner has been expanded.

1.6 The liner forms a close-fit with the host pipe so there is no need for grouting. Alternatively the liner can be wound at a fixed diameter, leaving an annular space between the liner and host pipe wall which is filled with cementitious grout.

1.7 When jetting within a SPR™ EX lining the maximum pressure should be 138 bar (2000 psi) at the pump.

1.8 Lateral connections can be made into the SPR™ EX system.

1.9 The SPR™ EX system installs a 'close-fit' thermoplastic lining which can be used as a partially or fully deteriorated structural lining.

1.10 The ends of the SPR™ EX lining are sealed against the host pipe by installing an end seal between the liner and existing pipe with a sealing

PT/305/0710 – AS (July 2010)
Assessment of the SPR™ EX Lining System for Gravity Pipes



independent certification of your products & services

material that is compatible with the liner pipe material.

1.11 The specification for the SPR™ EX system is provided in the SPR™ EX System Manual⁽¹⁾. Key items manufactured by SEKISUI Rib Loc Australia Pty Limited include:

- i. Winding machine.
- ii. PVC profile strip.

1.12 This assessment covers the following:

- i. Materials quality audit.
- ii. Review of the quality systems for the manufacture, supply, materials handling and storage.
- iii. Testing of the product against performance requirements.
- iv. Structural design of the lining.
- v. Audit of installation instructions and witnessing of installation on site.

Approval exclusions:

- i. Jetting at pressures above 138bar (2000 psi) at the pump.
- ii. The installation or reconnection of the laterals.
- ii. The liner end seals.

Product claims:evidence which are claimed include:

- High quality control, low risk: use of factory extruded profiles, no mixing of chemicals or curing required on site.
- Fully structural renovation technique: capable of withstanding external hydrostatic pressure and, if required, soil and live loads.

- Minimal environmental disruption: quiet hydraulically driven winding machine, trenchless (minimum excavation) technique.

2. Materials Quality Audit

2.1 The PVC profile is manufactured from Corvic 67R1/2 PVC-U cell class 13354 in accordance with ASTM D1784⁽²⁾ plus (proprietary) additives.

2.2 The secondary (sacrificial) lock uses an HB Fuller HMS 44/4 hot melt adhesive.

2.3 The primary lock uses a GE SCS2009 silicone rubber sealant.

2.4 Quality management system certification for the materials supply and strip manufacture shall be audited.

3. Performance Testing

3.1 Performance testing is listed below which is in accordance with relevant standards, including ASTM F1697⁽³⁾ and ASTM F1741⁽⁴⁾.

General Characteristics

3.2 Appearance – the internal surface of the lining shall be smooth, clean and free from scoring, cavities, wrinkling and other surface defects that would prevent the SPR™ EX liner from meeting the general fitness for purpose requirement.

Mechanical Characteristics Testing

3.3 Short term ring stiffness testing shall be carried out in accordance with BS EN ISO 9969⁽⁵⁾.

PT/305/0710 – AS (July 2010)
Assessment of the SPR™ EX Lining System for Gravity Pipes



independent certification of your products & services

3.4 The 50 year creep ratio shall be determined in accordance with BS EN ISO 9967⁽⁶⁾.

3.5 Joint tightness testing, both internal pressure and vacuum, shall be carried out in accordance with ASTM F1697⁽³⁾.

3.6 Jetting resistance testing shall be carried out in accordance with the Sewer Jetting Code of Practice⁽⁷⁾.

4. Lining structural design

4.1 The lining is structurally designed in accordance with ASTM F1741⁽⁴⁾.

5. Review of Installation Instructions

5.1 Audit the installation instructions in the SPR™ EX System Manual⁽¹⁾ and witness two on-site installations to check for compliance with instructions.

6. Reference Documents

1. SPR™ EX System Manual, REH OPM EX 017, 2006.

2. ASTM D1784-07, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds, 2007.

3. ASTM F1697-07, Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Strip for Machine Spiral-Wound Liner Pipe Rehabilitation of Existing Sewers and Conduit, 2007.

4. ASTM F1741-07, Standard Practice for Installation of Machine

Spiral Wound Poly (Vinyl Chloride) (PVC) Liner Pipe for Rehabilitation of Existing Sewers and Conduits, 2007.

5. BS EN ISO 9969:2007, Thermoplastics pipes. Determination of ring stiffness.

6. BS EN ISO 9967, Thermoplastics pipes. Determination of creep ratio, 2007.

7. Sewer Jetting Code of Practice, Second Edition, WRc, 2005.