

Assessment of Uhrig Kanaltechnik GmbH's Quick Lock System Localised pipe repair system



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1. Scope

1.1 To assess the performance of Uhrig Kanaltechnik GmbH's Quick Lock System which is a mechanical sleeve for the localised repair of circular gravity pipes conveying domestic sewage. Quick Lock sleeves are available in diameters ranging from DN 150 up to DN 700 and in lengths ranging from 400 mm to 500 mm.

1.2 The Quick Lock System consists of a rolled V4A stainless steel sleeve with an EPDM rubber gasket around the outside which has integral circumferential seals at either end.

1.3 The host pipe must be cleaned using high-pressure water jetting before installing the Quick Lock System. The stainless steel sleeve is rolled in such a way that it has a smaller diameter than the host pipe being repaired and is placed onto a wheel-mounted packer and guided into place with the aid of a CCTV camera. When in position the packer is inflated with compressed air and the Quick Lock repair expands against the host pipe wall.

1.4 Two metal tooth slots inside the sleeve serve to guide the sleeve when expanding during installation and the uni-directional locking mechanism prevents the steel sleeve from contracting after installation. These tooth strips lock in place permanently when the correct contact pressure is achieved between Quick Lock repair and host pipe. The Quick Lock repair is then locked in a circular shape, restoring the cross-section of the pipe.

1.5 After installation a leak tight seal around the repair is achieved via permanent surface pressure from the stainless steel sleeve compressing the EPDM rubber gasket against the host pipe inner wall. An optional hydrophilic (i.e. water swelling) seal can also be used to achieve leaktightness.

1.6 Installation can usually be undertaken during normal sewer operation, up to 20% of host pipe flow capacity.

1.7 The Quick Lock System can repair various host pipe defects, including:

- cracks (longitudinal, radial and transverse)
- missing sections of pipe wall
- leaking joints
- offset/displaced joints (maximum 15 mm offset for a single repair sleeve)
- infiltration/exfiltration
- vertical deformation (up to a maximum of 3%)
- host pipe in poor structural condition
- root ingress
- H₂S corrosion or pipe wall wear

Quick Lock sleeves can be positioned adjacent to each other, or be overlapped, to effect longer repairs.

1.8 Approval exclusions:

- Hydrophilic rubber seals (these are an option which may be used if groundwater is present)
- Mortar reinforcement.



2. Assessment schedule

2.1 The assessment comprises the following:

- Materials quality audit;
- Leak tightness of the Quick Lock System;
- Structural design of the Quick Lock System;
- Review of the quality systems for the manufacture, supply, materials handling and storage;
- Review of all instructions for pre-installation procedures, environmental, planning, site preparation, receipt and storage of the Quick Lock System on-site and installation of the system;
- Technical audit of the installation of the system on site in accordance with the Quick Lock System user manual⁽¹⁾, and;

3. Materials Quality Audit

3.1 The Quick Lock System consists of the following materials:

- rolled V4A stainless steel sleeve (1.4571 grade)
- EPDM rubber gasket shall meet the requirements of BS EN 681-1:1996 Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Vulcanized rubber⁽⁶⁾

3.2 Quality management systems for the materials shall be audited.

4. Performance testing

General Characteristics

4.1 Appearance – the internal surface of the repair shall be smooth and clean and free from defects that would prevent the Quick Lock System repair from meeting the general fitness for purpose requirement.

Mechanical Characteristics

4.2 Long term hydrostatic leaktightness testing shall be carried out in accordance with Appendix E of the Drain Repair Manual⁽²⁾. The Quick Lock repair shall not contain hydrophilic seals

4.3 Jetting resistance testing shall be carried out in accordance with DIN 19523⁽³⁾ and the Sewer Jetting Code of Practice⁽⁴⁾.

5. Repair structural design

5.1 The repair structural design⁽⁵⁾ shall be reviewed.

6. Review of Installation Instructions

6.1 Audit the installation instructions in the Quick Lock System user manual⁽¹⁾.

6.2 Two on-site installations shall be witnessed to check compliance with the Quick Lock System user manual⁽¹⁾.

7. Reference documents

1. Quick Lock System User Manual, Version: July 01, 2005.
2. Drain Repair Manual, 2nd Edition, WRC, 2005.
3. IRO GmbH Oldenburg Report, "Jetting resistance test according to draft DIN-standard 19523, August 2007".

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4. Sewer Jetting Code of Practice, Second Edition, WRC, 2005.
5. University of Applied Sciences Münster Report, March 2008, "External pressure tests on Quick-Lock Steel Sleeves DN 200 to DN 600 for Host Pipe State I
6. BS EN 681-1:1996 Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Vulcanized rubber I".