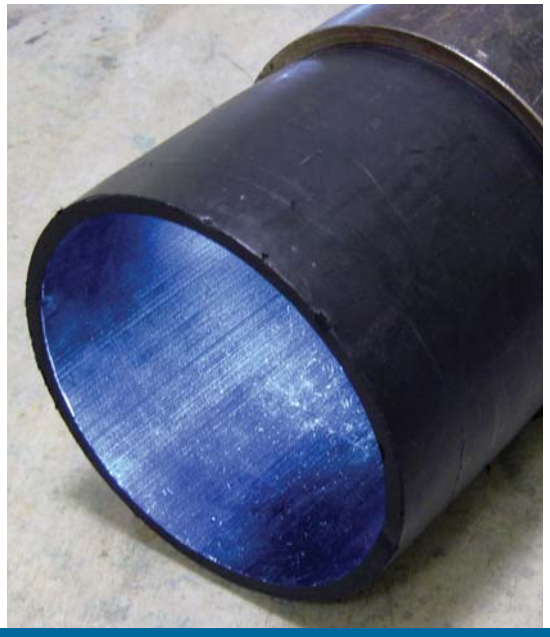
WATER & WASTEWATER

INSITUGUARD®

Non-disruptive, pressure pipe renewal systems



Much of the world's drinking water pipe infrastructure is long past its design life and is in need of repair. Complete replacement of these pipes using conventional dig and replace solutions can be time consuming and very disruptive to traffic, the general public and the environment. These problems can easily be avoided by choosing the InsituGuard® system — a close-fit, thermoplastic solution for pipe renewal using the InsituFlex® and InsituFold® installation methods.

The InsituGuard® system provides solutions for your pressurized pipe system

- Nominal diameter ranges from 4 to 48 inches
- Produces a continuous, close-fitting structural or interactive solution
- Pressure rated at 150+ psi
- Rapid installation
- Drinking water approved
- Negotiates sweeping bends
- Utilizes high-performance PE 4710
- Minimizes disruption

The InsituGuard® system is ideal for the renewal of distribution and trunk water mains up to 48-inches in diameter. The InsituGuard® system cuts down on digging and disruption while helping water companies and industries reduce water loss and improve water quality. The continuous thermoplastic liner is installed with a close fit against the inner wall of the host pipe by temporarily reducing the liner diameter using our proprietary installation processes. The thermoplastic liner isolates the flow stream from the host pipe wall, eliminating internal corrosion. Typically, InsituGuard® systems do not reduce flow capacity, unlike some rehabilitation methods that produce larger annular spaces between the liner and host pipe.

Insituform®
An Aegion Company

PE 4710 is the preferred material for InsituGuard® projects

- Offers all the benefits of PE 3408 and more
- Improves performance properties including long-term pressure rating, tensile strength and toughness
- Increases resistance to slow crack growth and provides an unparalleled resistance to failure by rapid crack propagation

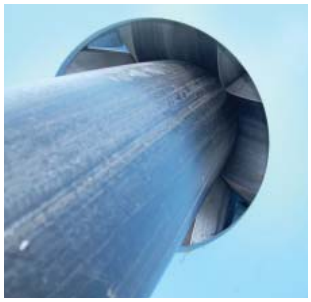
Testing and Certification

The following third-party tests have been performed on the InsituGuard® pipeline renewal system:

EN 14409-3, Section 7	Test Standard
Hydrostatic strength at 20° C, 100 hrs	EN 921/ISO 1167
Hydrostatic strength at 80° C, 1000 hrs	EN 921/ISO 1167
Hydrostatic internal pressure strength at 80° C, 165 hrs	EN 12201-5/ISO 1167
Tensile strength	EN 12201-5/ISO 13953
Geometrical characteristics	EN ISO 3126
Additional Testing	**Test Standard**
Notch Test - Determination of resistance to SCG, at 80° C, 500 hrs	EN ISO 13479

The thermoplastic pipeline materials used for InsituGuard® rehabilitation projects is certified to comply with drinking water requirements. Contact Insituform for additional information regarding certification to the NSF/ANSI Standard 61.

InsituFlex® Installation



STEP 1: Excavations are required for installation and to remove any existing fittings.

STEP 2: Sections of thermoplastic pipe are fused into one full length.

STEP 3: The fused pipe is driven through the InsituFlex® roller reduction machine (see picture). The resulting temporary diameter reduction of the thermoplastic pipe provides the clearance necessary for insertion into the host pipe.

STEP 4: The liner is inserted into the host pipe.

STEP 5: Once the liner is in place, it is pressurized with water to revert the liner back to its original diameter.

STEP 6: The liner is cut to length and all end and intermediate connections are installed using fused or mechanical fittings.

STEP 7: The completed line is pressure tested, disinfected and returned to service. Access points are backfilled and reinstated.

InsituFold® Installation

STEP 1: Excavations are required for installation and to remove any existing fittings.

STEP 2: Sections of thermoplastic pipe are fused into lengths suitable for installation (this can be the entire length or shorter segments to accommodate available work space). If shorter segments are used, they will be fused together prior to entering the InsituFold® machine.

STEP 3: The fused pipe is pushed through the InsituFold® machine (see picture), which alters the shape of the pipe. The resulting temporary reduction of the cross-sectional area of the thermoplastic pipe provides the clearance necessary for insertion into the host pipe. The shape is maintained by banding the folded pipe.

STEP 4: The liner is inserted into the host pipe.

STEP 5: Once the liner is in place, it is pressurized with water to break the bands and re-round the liner.

STEP 6: The liner is cut to length and all end and intermediate connections are installed using fused or mechanical fittings.

STEP 7: The completed line is pressure tested, disinfected and returned to service. Access points are backfilled and reinstated.

Insituform®
An Aegion Company

Insituform Technologies, LLC
17988 Edison Avenue
St. Louis, MO 63005
800.234.2992
www.insituform.com