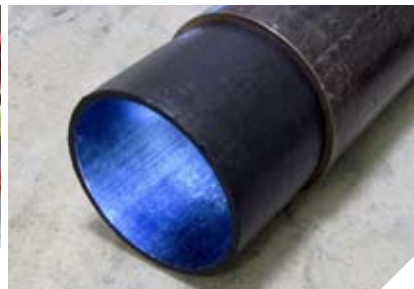




## InsituGuard™

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 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, high-density polyethylene solution for pipe renewal using the InsituFold<sup>SM</sup> and InsituFlex<sup>SM</sup> installation methods.

### InsituGuard™ provides solutions for your pressurised pipe system:

- Normal diameter ranges from 100 to 1600 mm
- Produces a continuous, close-fitting structural or interactive solution
- Pressure rated at 10+ bar
- Rapid installation
- Drinking water approved
- Negotiates sweeping bends
- Utilises high-performance PE 100
- Minimises disruption

InsituGuard™ systems are ideal for the renewal of distribution and trunk water mains of up to 1600 mm in diameter. InsituGuard™ systems cut down on digging and disruption while helping communities reduce water loss and improve water quality. Inserted into an existing pipeline by our proprietary installation processes, the continuous polyethylene liner is installed with a close-fit against the inner wall of the host pipe. The polyethylene liner isolates the flow stream from the host pipe wall, eliminating internal corrosion. Typically, InsituGuard™ systems do not reduce flow capacity, unlike other rehabilitation methods which produce larger annular spaces between the liner and host pipe.

### PE 100 is the preferred material for InsituGuard™ projects.

- Offers all the benefits of PE 80 and more.
- Offers improved performance properties including long-term pressure rating, tensile strength and toughness.
- Provides improved resistance to slow crack growth and an unparalleled resistance to failure by rapid crack propagation.



### Testing & Certification

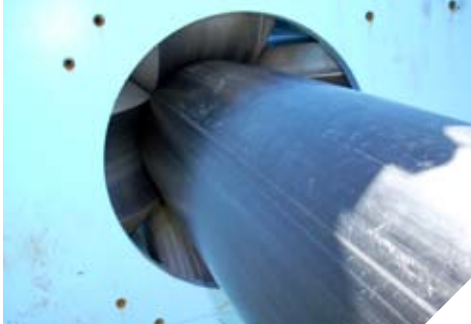
The following third-party tests have been performed on InsituGuard™ pipeline renewal systems:

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 EN 921/IHydrostatic s, SCG, at 80° C, 500 hrs	EN ISO 13479

*The high-density polyethylene piping used in InsituGuard™ projects meets AWWA C906 and AWWA Standard for PE Pipe and Fittings, and is certified by NSF to comply with the requirements of ANSI/NSF Standard 61.*

## InsituFlex™ Installation



- Step 1:** Excavations are required for installation and to remove any existing fittings.
- Step 2:** Sections of PE pipe are welded into one full length.
- Step 3:** The welded pipe is driven through the InsituFlex<sup>SM</sup> roller reduction machine (see picture on the left). The resulting temporary diameter reduction of the PE 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 PE pipe are welded 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<sup>SM</sup> machine.
- Step 3:** The welded pipe is pushed through the InsituFold<sup>SM</sup> machine (see picture on the left), which alters the shape of the pipe. The resulting temporary reduction of the cross-sectional area of the PE 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 Technologies Ltd.  
Unit 6, Roundwood Ind Estate,  
Ossett, West Yorkshire, WF5 9SQ  
Tel: 44 (0) 1924 277076  
Fax: 44 (0) 1924 265107  
uksales@insituform.com

Insituform Environmental Techniques  
Unit 17, 1st Avenue,  
Cookstown Industrial Estate  
Tallaght, Dublin 24  
Tel: 00 353 (0) 1 6670077  
Fax: 00 353 (0) 1 4517190  
iet@insituform.com

Insituform Environmental Techniques  
1 Flush Park,  
Knockmore Road  
Lisburn, BT28 2DX, N. Ireland  
Tel: 44 (0) 2892 673111  
Fax: 44 (0) 2892 660618  
iet@insituform.com