

# SKPS

Sap & Kaps Petroleum Services I.L.C

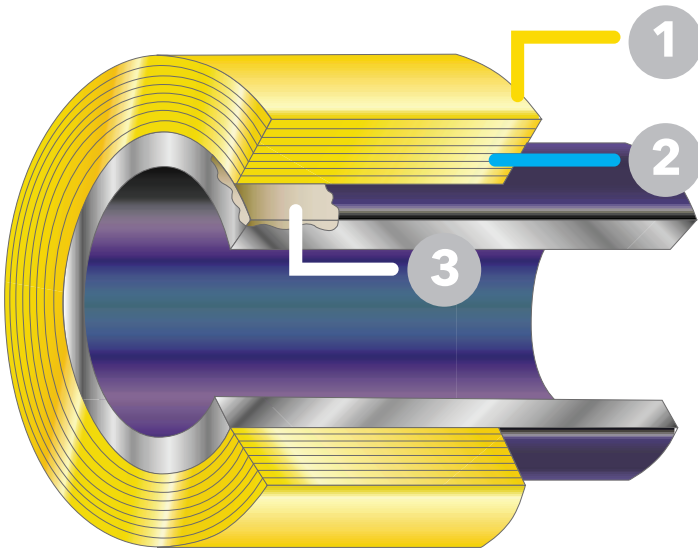


## Composite Sleeve Reinforcement System

# The Fast, Economical solution for **Permanent Pipeline Repair**

Highly effective, ingeniously simple, the Clock Spring® pipeline reinforcement system redefines the economics of pipeline repair. With the patented Clock Spring® system, permanent field repair and reinforcement of pipe sections weakened by corrosion or mechanical damage is easy, fast and inexpensive.

The Clock Spring® sleeve is a specially developed high strength composite material. Its unique coilshape allows the Clock Spring® to wrap tightly around pipe of virtually any size. Applied with a fast-curing, yet incredibly strong adhesive, it forms a composite wrap which actually exceeds the yield strength of the original pipe.



## **The Clock Spring System consists of:**

- 1 A patented, high-strength, unidirectional composite structure.
- 2 A patented, fast-curing, highperformance two-part adhesive system.
- 3 An extremely high compressive strength, proprietary load transferring component.

*Once installed, the three elements bond together to form an extraordinarily strong, durable repair.*

**Clock Spring®** is used to repair corrosion defects with up to 80% metal loss, as well as mechanical and third party damage. The repair is stronger than the pristine pipe allowing the pipeline to be returned to service at 100% of its maximum allowable operating pressure.

The system operates by transferring the hoop stress from the defect, through a high compressive strength filler, to the Clock Spring® composite sleeve. (The composite is unique in that all the e-glass fibers are continuous strands aligned in the hoop direction providing extremely high tensile strength.)

The resin in the composite protects the glass strands and provides the shape memory that aids in installation. **Clock Spring®** eliminates the need for welding or cutting the pipeline, increasing safety and eliminating environmental risk. Repairs can be made while the pipeline is fully operational eliminating costly down time.

**Clock Spring®** requires no special handling, lifting or installation equipment and can be installed quickly and easily by two technicians. It is simply the smartest pipeline repair decision you can make.

## **Quality, Safety and Reliability**

Clock Spring sleeves are available in a variety of sizes to fit pipe diameters from 4 to 56 inches.



# Proven Better - **Time After Time**

## Easier

Installing Clock Spring® is simple. Each kit contains everything needed to make permanent pipeline repairs. No machinery or highly skilled personnel are required. A two-man crew can be trained in just a few hours to install the Clock Spring® system.

## Economical

Clock Spring® is much less expensive to install and fits more closely to the carrier pipe than conventional steel sleeves. Compared to cut outs or pipe replacement, Clock Spring® is substantially cheaper. Because it installs quickly, time, equipment and labor costs are vastly reduced, and throughput is never interrupted.

## Safer

Clock Spring® is a composite, using an extremely durable, proprietary adhesive to bond to the pipe's surface, no welding or hot work is required. As a result, the dangers of burnthrough, metal embrittlement, and cracking in the weld zone are completely eliminated. In nearly all cases, installation can be completed while the line is in operation.

Since there is no need to cut and remove pipe, there are no environmental risks, release of greenhouse gasses or waste disposal problems.

## Elegant

The ease, economy, safety and durability of **ClockSpring®** stems directly from its elegant design. Manufacturing controls and installation procedures ensure an effective permanent repair that is not susceptible to field variations and will last more than 50 years. Quality, safety and reliability are designed into the system.

## Proven

**Clock Spring®** technology has been independently verified and approved for use in over 60 countries. The first units were placed in service in the 1980's. Over 50,000 permanent repairs have been made with **Clock Spring®** system.

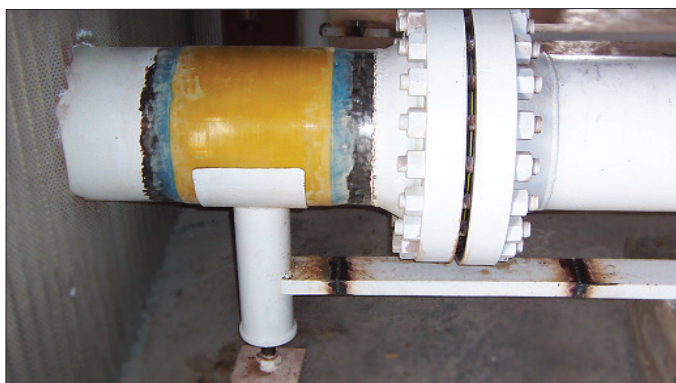


# DERIVATIVE **TECHNOLOGY**



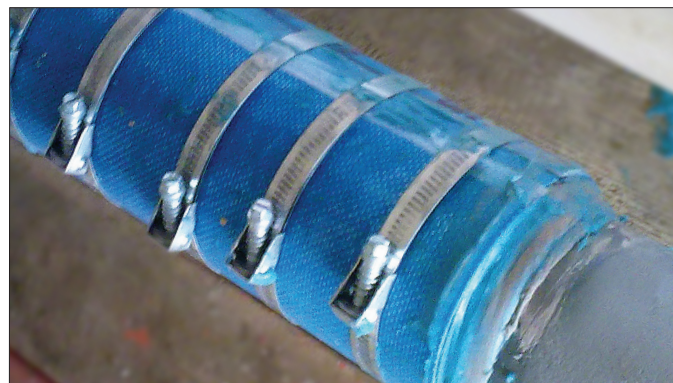
## **01** CONTOUR

**Contour** is an engineered repair system that employs bi-axial or quad-axial stitched fiberglass cloth applied in a wet-lay system using two-part epoxy and a filler material. It is ideal for repairs involving complicated geometry, including tees, flanges, and varying diameter pipe. Damage prevention to coatings from potential impact and abrasion. Installation on top of stopgap measures (plugs, banded patches and clamps) to provide a longlasting reliable repair.



## **03** PIPE SUPPORT

**Pipe Support** Provides effective protection at support or hanger locations and can be applied quickly and easily requiring no special tools or training. **Pipe Support** is a high-strength corrosion resistant fiberglass composite sleeve, a high performance adhesive and a filler material. The fiber glass composite sleeve is unique coil shaped and sized to wrap tightly around pipe diameters of 3/4" and larger providing two (2) individual layers bonded together.



## **02** SNAP WRAP

An economical repair alternative for low-pressure piping that can be applied quickly and easily requiring no special tools or training. **Snap Wrap** is a high strength corrosion resistant fiberglass composite split sleeve, a high performance adhesive and a filler material. The composite split sleeves are uniquely shaped and sized to wrap around pipe diameters of 3/4" and larger. The individual layers are bonded together and to the pipe surface to fully restore service ability.



## **04** LEAK STOP

**Leak Stop** is a repair technique for leaking pipelines based on the Clock Spring® composite technology. The system provides multiple seals. The leak is sealed with epoxy putty and covered with a flexible barrier. Spit-sleeve composite technology is used to compress the sealing barriers and fully reinforce the leak area.