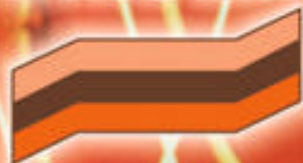
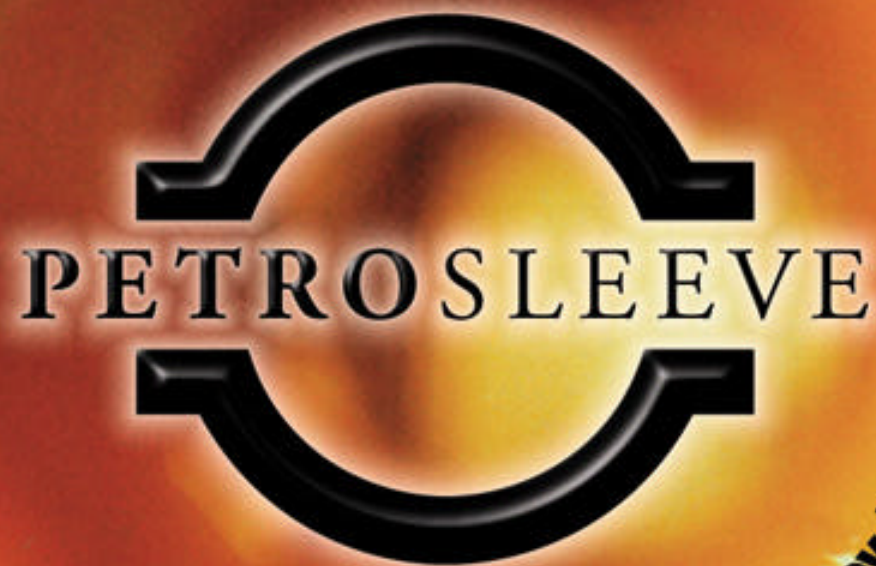


PETRO-LINE



"the PETROSLEEVE



System repairs your pipeline

without stopping the flow"

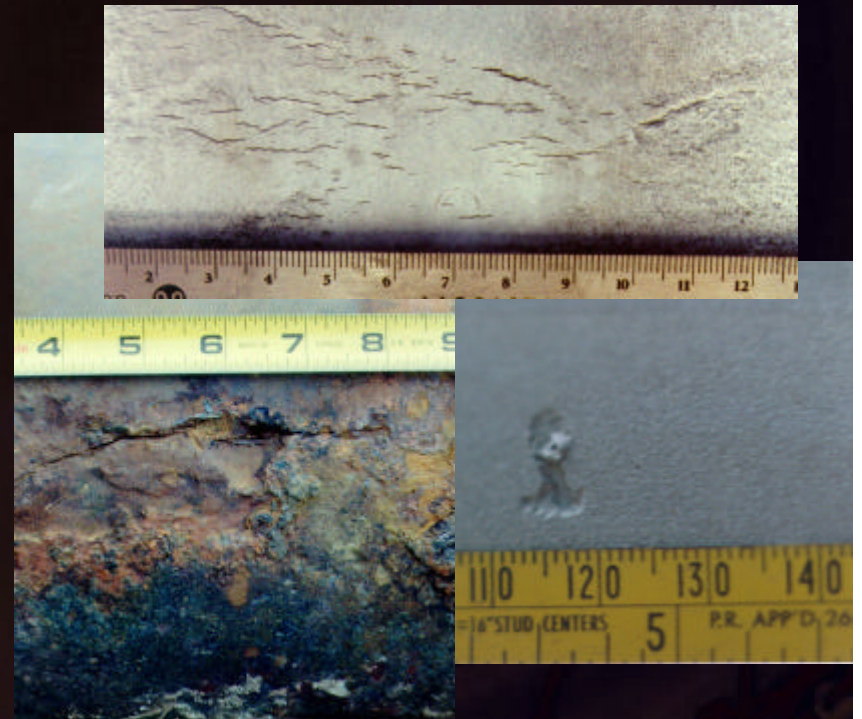




PETROSLEEVE

•Where & How has it Been Used

- Canada – USA – Mexico
- Over 1,500 Installations
- Variety of Pipeline Owners
- NPS 4 to NPS 42
- Gas, NGL, Oil, Sour Gas
- Corrosion, Cracks, Dents, Arc Burns





COST SAVINGS TO OWNERS

"Platte saved significant dollars by avoiding the time and expenses associated with nitrogen purges and pipe cutouts"*



*52nd Annual Pipeline Conference
San Antonio, Texas





COST SAVINGS TO OWNERS

- One NPS 36 **PETROSLEEVE** saved Foothills/TCPL Pipeline millions in shut-down & repair costs

August, 2001





PETROSLEEVE STEEL REINFORCEMENT SYSTEM



- Permanent Repair for Pipeline Defects
- Designed to be Installed without Interrupting Pipeline Service
- Designed to be Installed with **NO** Welding to the Carrier Pipe





ENGINEERING DESIGN

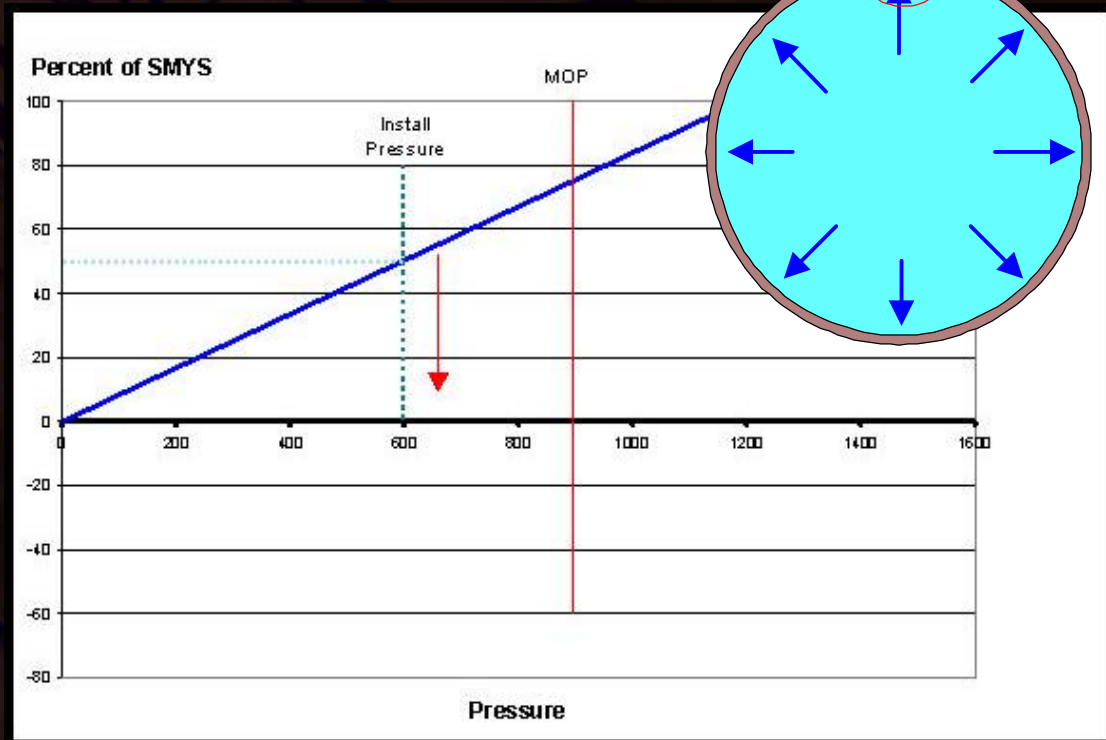


Compression has been used as an age old Engineering Solution





ENGINEERING DESIGN

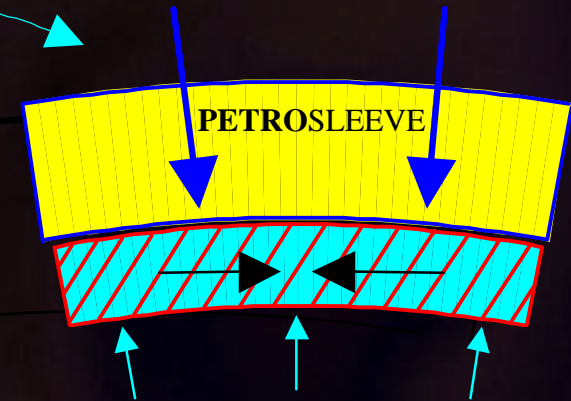
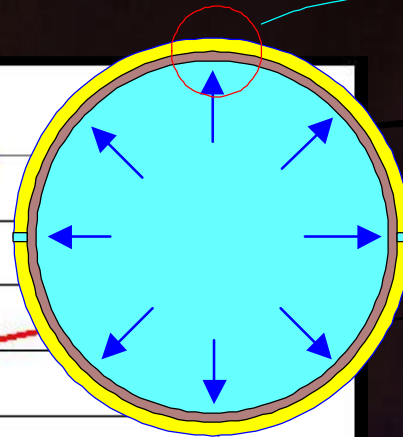
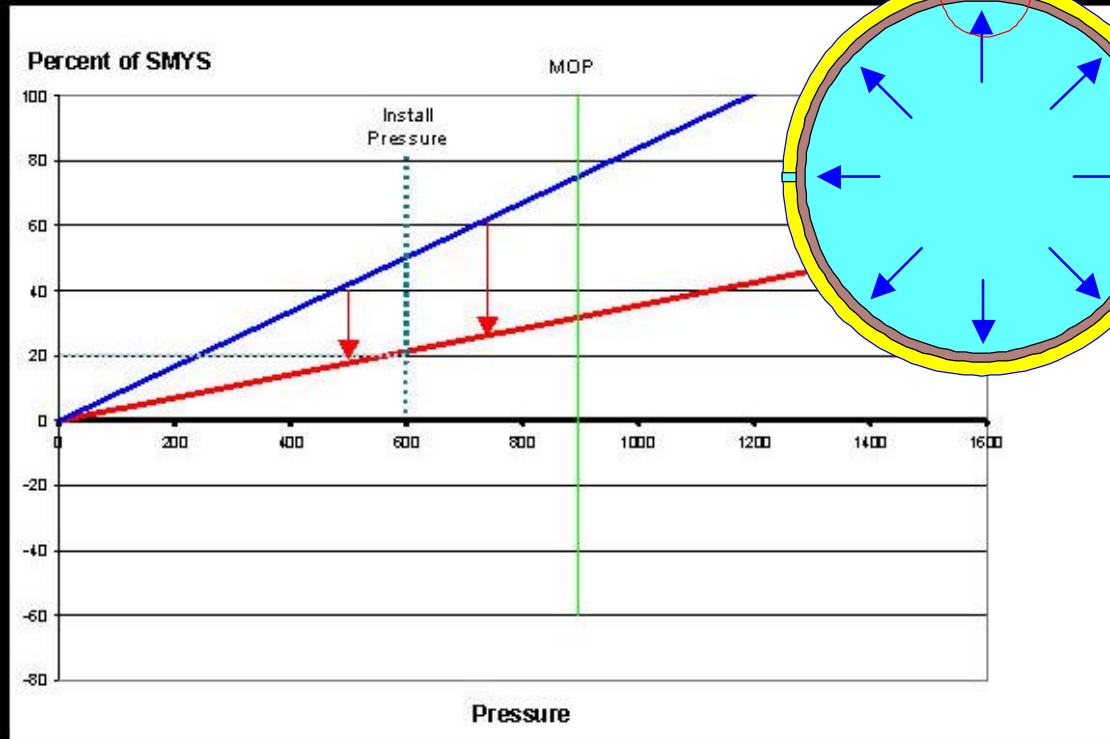


Operating Pipeline
Stress Condition

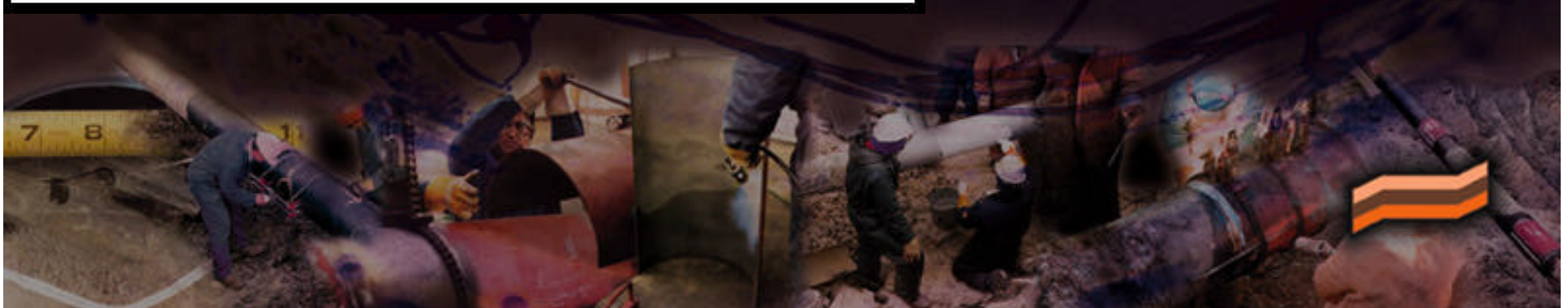




ENGINEERING DESIGN

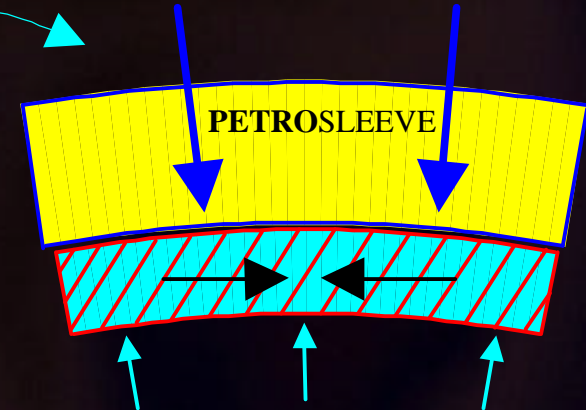
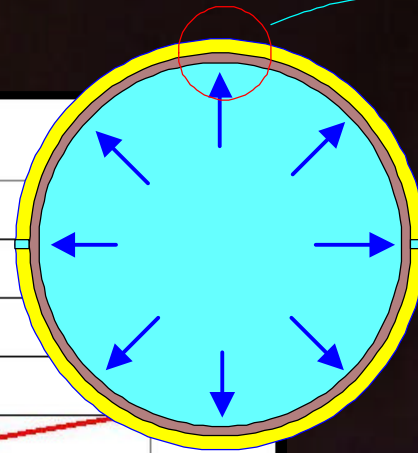
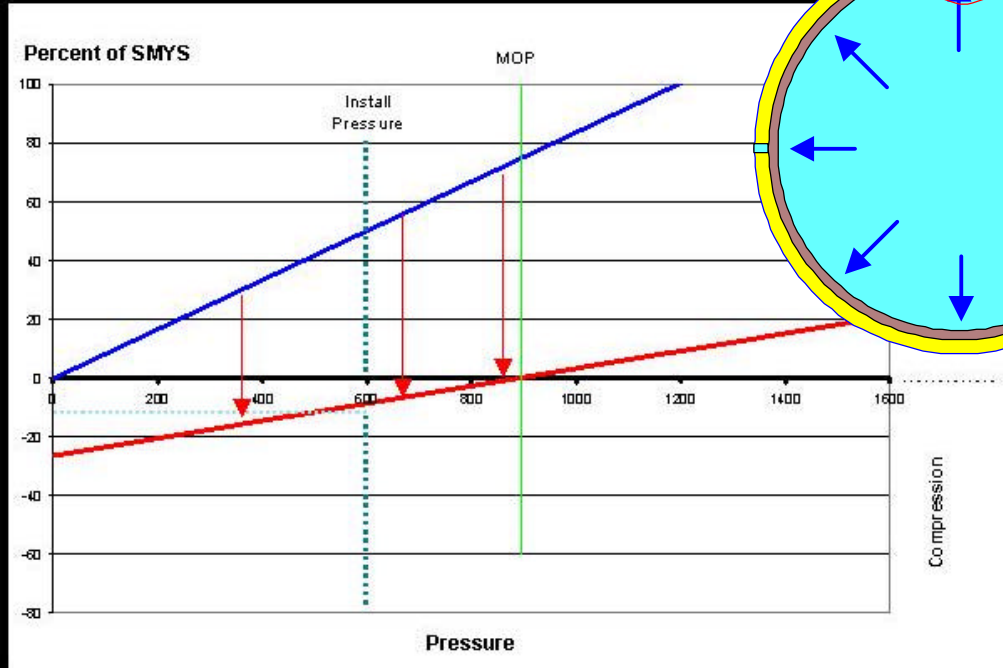


Forces are required to overcome pipe operating expansion





ENGINEERING DESIGN



PETROSLEEVE installation can achieve full compression throughout all operating ranges

Pipe Stress (red line) after Sleeve Installation (Stress Concentrating Defect)





INSTALLATION



- Application of Epoxy

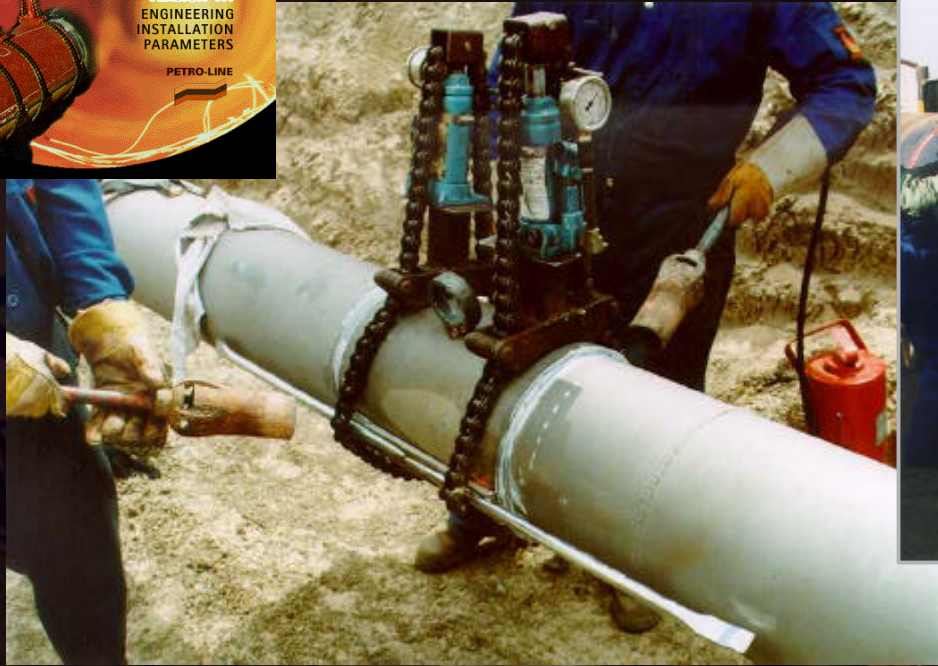
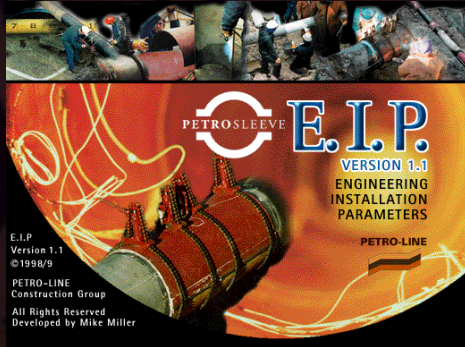


- Assembly





CALCULATED HEATING





WELDING





COMPLETED SLEEVE INSTALLATIONS

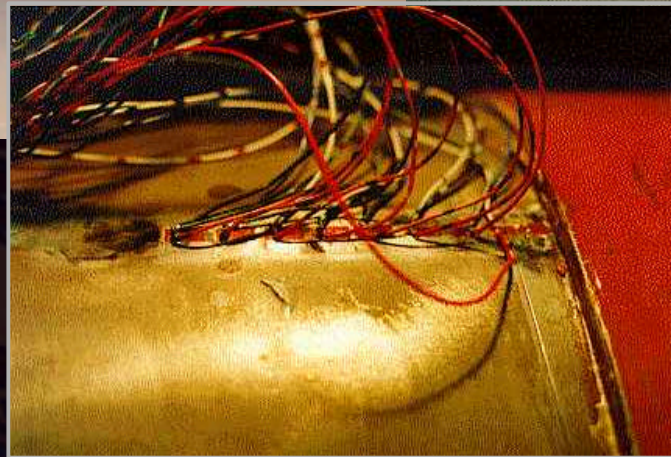
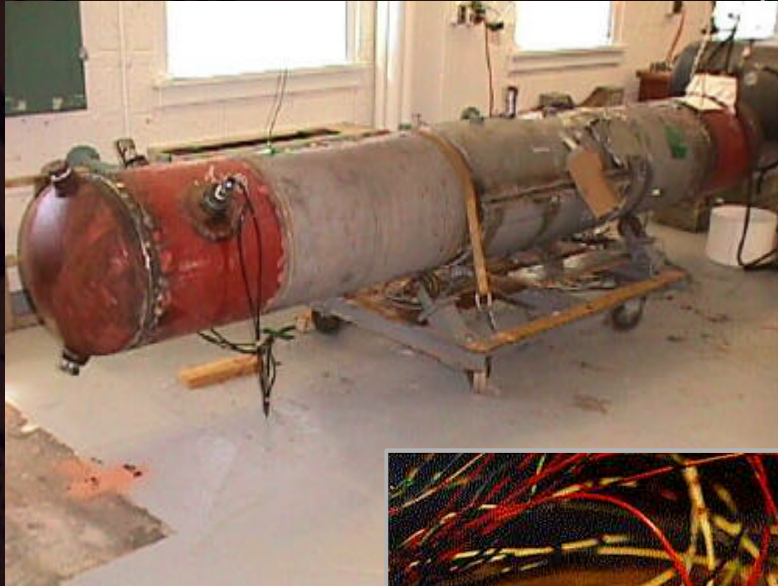


1 hour Installation time





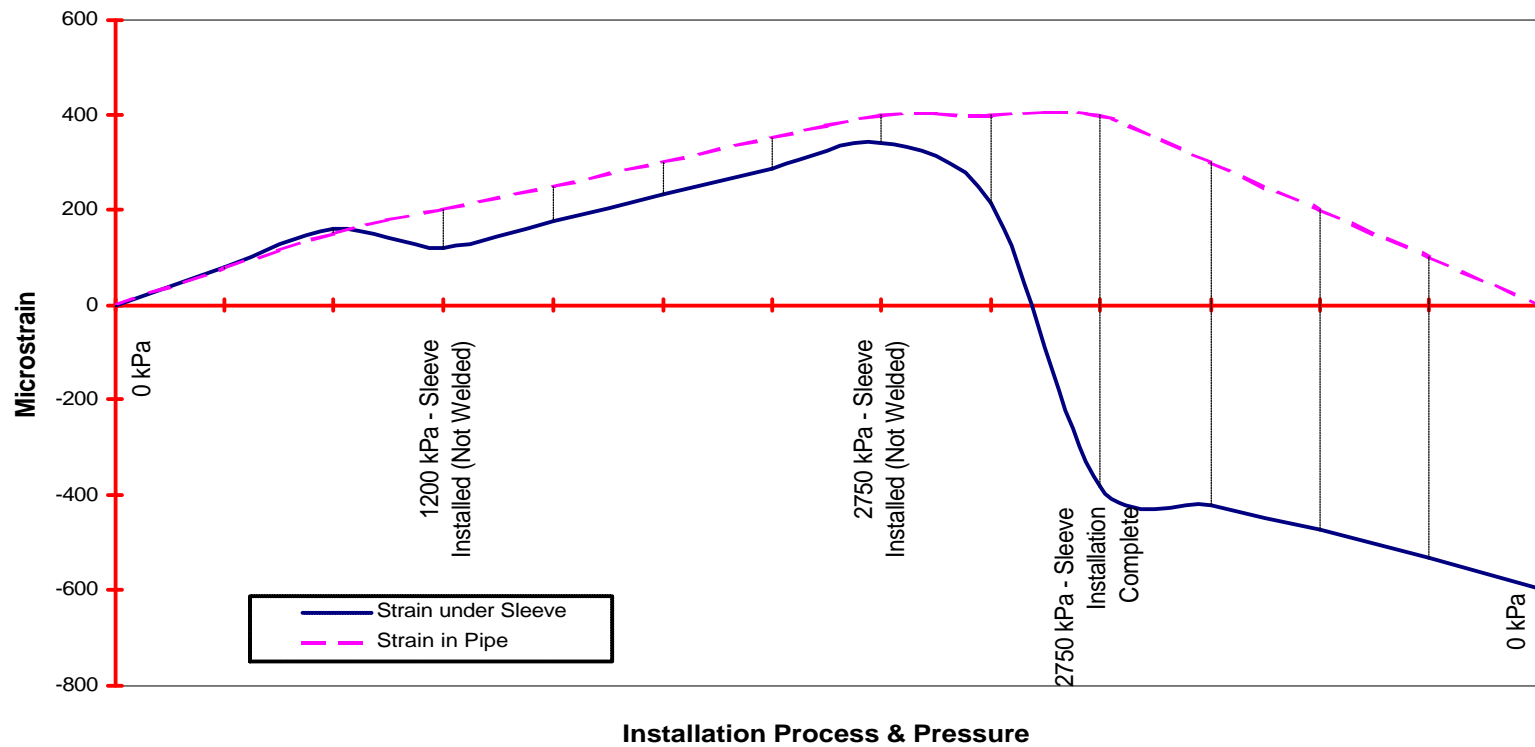
RIGOROUSLY TESTED





STRAIN ANALYSIS - DURING INSTALL

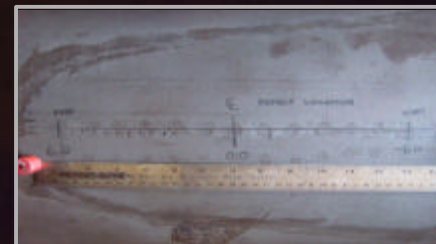
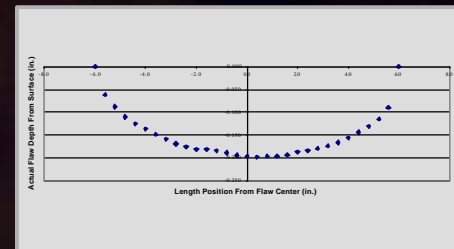
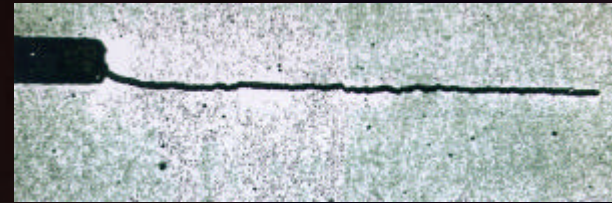
Strains Recorded During PETROSLEEVE Installation





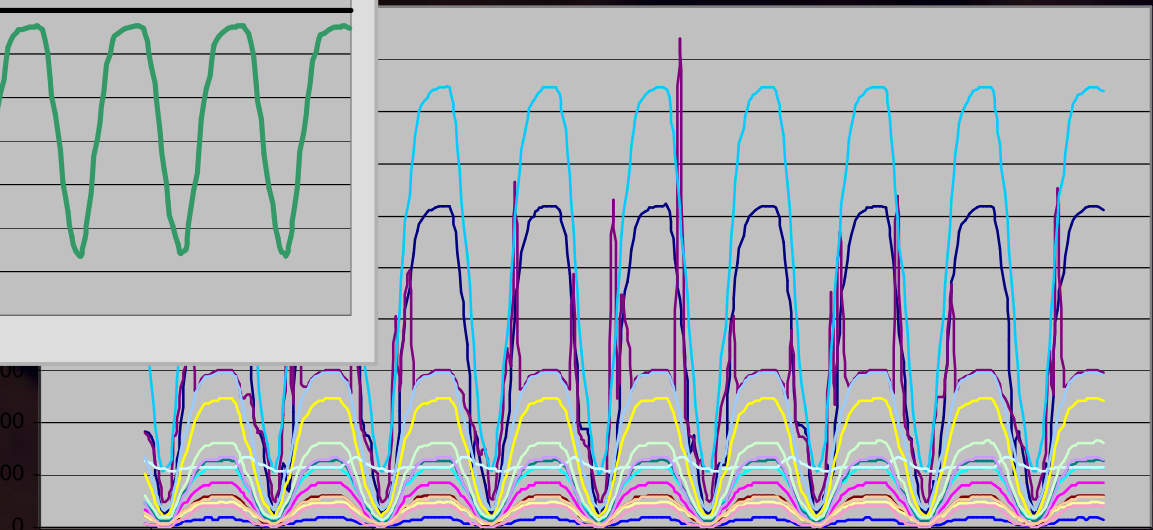
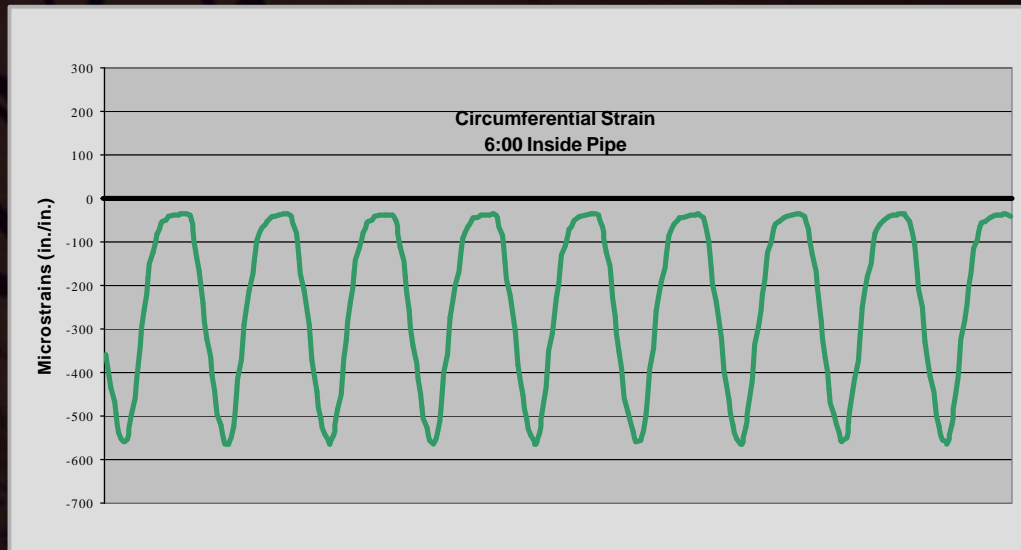
CYCLIC TESTING

- 36,000 Cycles (2 Tests)





PRESSURE CYCLING RESULTS



Strains Inside Pipe Under Sleeve at 6:00 Position

- 36,500 Cycles
- 100 psig to 1168 psig





PRESSURE CYCLING RESULTS

Post Metallurgical Exam
NO GROWTH

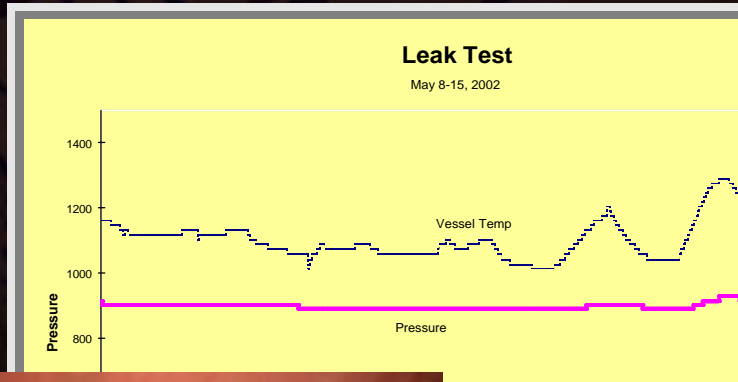




LONG TERM CONTAINMENT TESTING

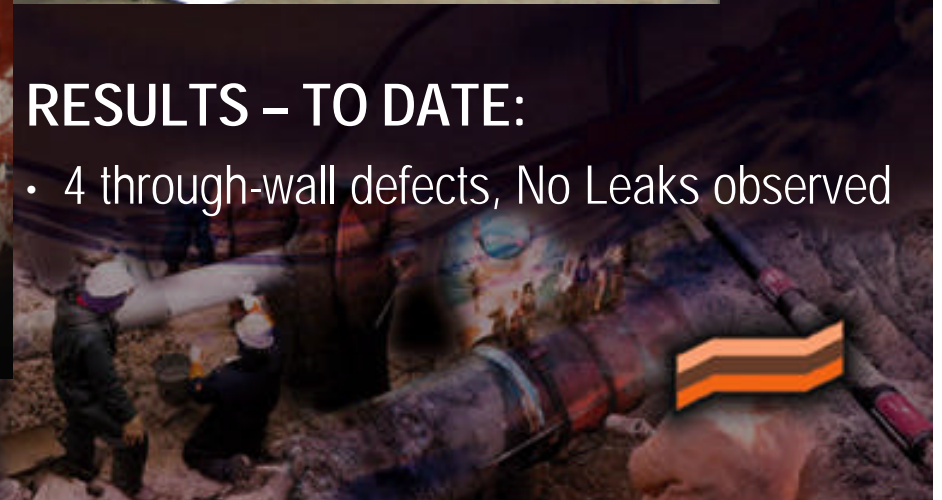
OBJECTIVES:

- 4 through-wall defects, covered by PETROSLEEVE
- Long Term Pressure Test



RESULTS – TO DATE:

- 4 through-wall defects, No Leaks observed





INSTALLATION OVER GIRTH WELDS



- Grooved Sleeve for Installation over Girth Weld





INSTALLATION OVER LONG SEAMS



- Spiral Seam Ground for Sleeve Installation

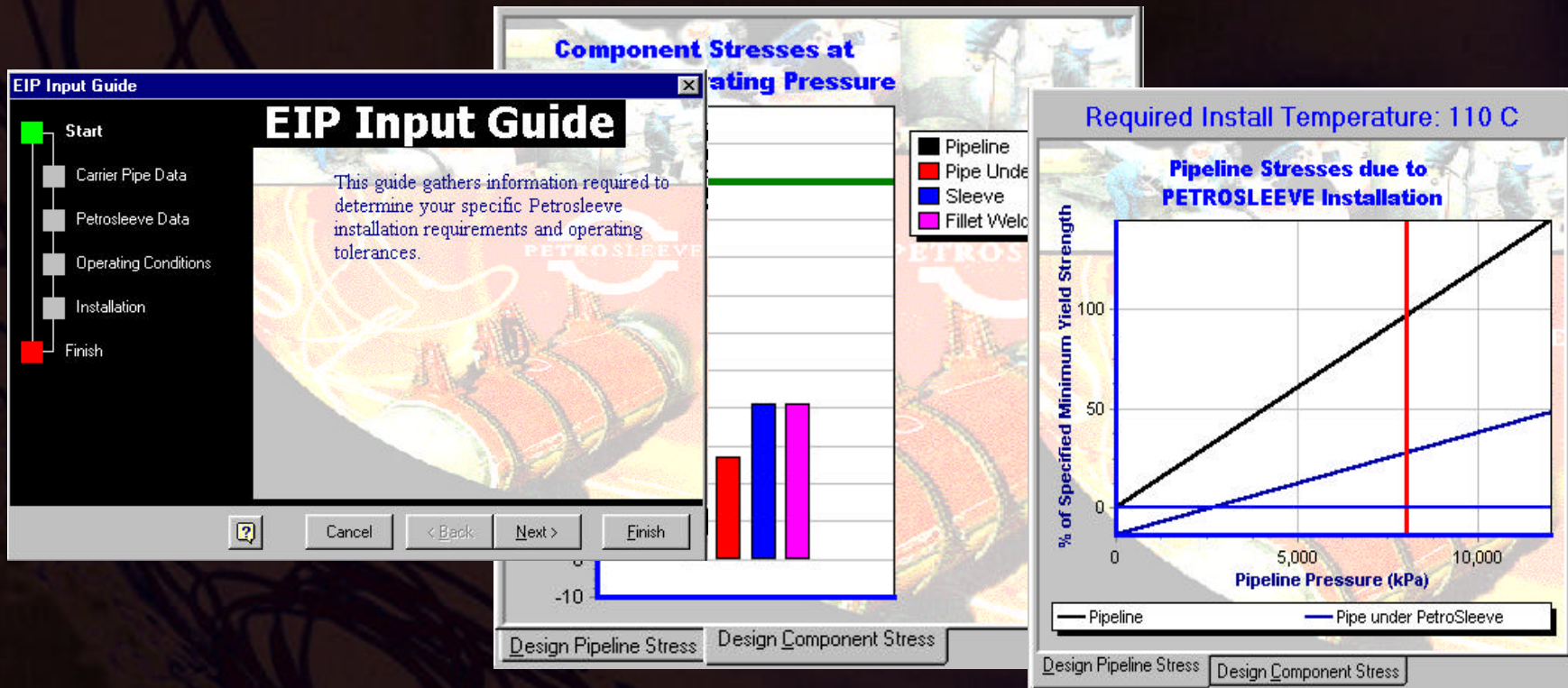


- Machined Groove in Sleeve for Protruding LongSeam





EIP MODEL SOFTWARE



- EIP provided @ no charge for licensed users



SLEEVE MANUFACTURING

- Strict QC Controls
- Easily Shipped Throughout North America





PETROSLEEVE – INSTALLATION KITS



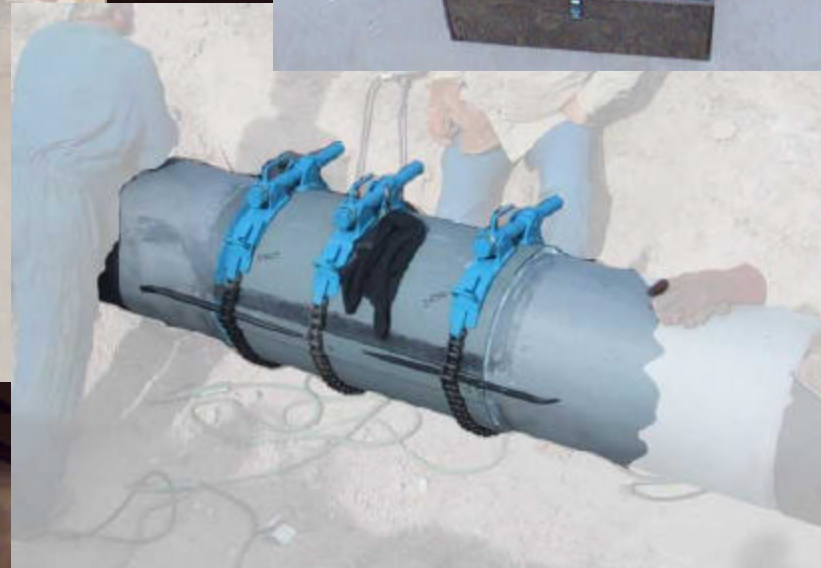
- Epoxy Kits
 - Installation Kits
- Provided with every sleeve



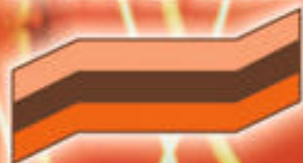


PETROSLEEVE - TOOLS

Specially designed tools to ensure an appropriate installation every time



PETRO-LINE



Petro-line Construction Group

Head Office

608-21 Avenue

Nisku, Alberta

T9E 7Y1 CANADA



TEL 780.955.2401
(24 HOURS A DAY/HORAS DIARIAS)

FAX 780.955.3466

WEB www.petroline.com

