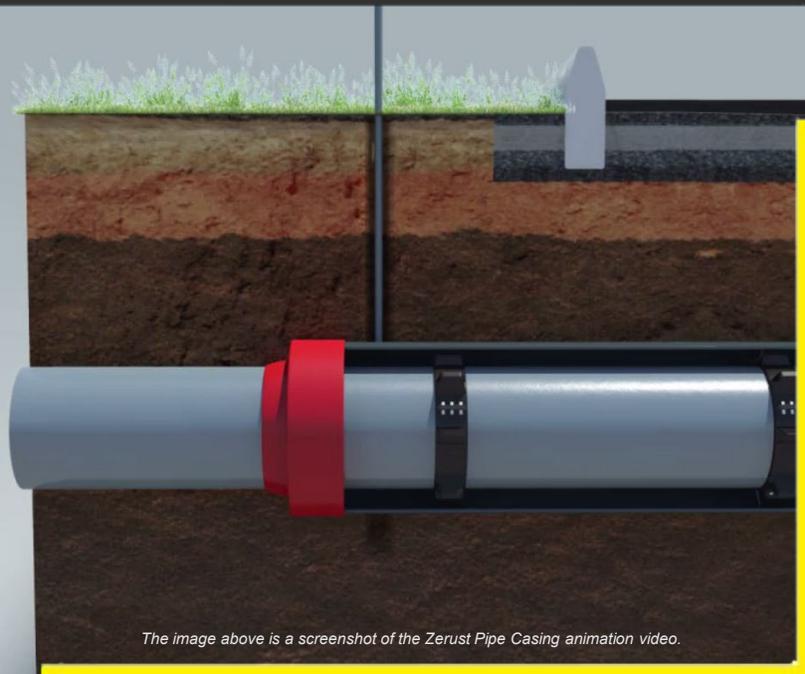


Zerust® Pipe Casing Corrosion Inhibitor Injection

Zerust® OIL & GAS
WORLDWIDE CORROSION SOLUTIONS



The image above is a screenshot of the Zerust Pipe Casing animation video.

CLIENT APPLICATION Pipe Casing Injection | October 2018

Project Summary:

- Zerust Oil & Gas was awarded a project encompassing the introduction of a corrosion inhibiting solution in the annulus of two (2) pipe casings, however due to permitting issues the second pipeline casing was not available for injection at the time.

Goals and Objectives:

- Installation of corrosion inhibitor in the annulus of pipe casings via gel inhibitor slurry injection.

Project Specifics:

- Pipeline 1
 - Product: Hydrogen
 - Dimensions: 10" Pipe Casing Diameter, 6" Carrier Pipe Diameter, 60-ft. Length
 - Zerust's Solution: None (pipeline not suitable for application, see project summary to the right.)
- Pipeline 2
 - Product: Hydrogen
 - Dimensions: 16" Pipe Casing Diameter, 10" Carrier Pipe Diameter, 353-ft. Length
 - Zerust's Products Used:
 - Zerion® FVS-B15 Corrosion Inhibitor Powder
 - Zerion PGH-300 Corrosion Inhibitor Gel
 - Zerion PGH-400 Corrosion Inhibitor Gel

Project Summary:

- Pipeline 1
 - Prior to the injection, a pressure test was to be performed. Upon arrival to the site, there was some immediate concern as the area of the vent pipe had standing water. The contractors removed the elbow of the vent pipe, and the stack was filled with water.
 - Unfortunately, as there was only one vent, it was not possible to remove that water or perform a pressure test. The contractors notified the site official for the client, and it was agreed that the best idea would be to perform rehabilitation on the casing ends, which could include excavation, water removal, and seal replacement.
 - The injection was not completed but is recommended for slurry injection once it is brought to the applicable conditions.
- Pipeline 2
 - A day before the injection, the contractors and the Zerust team arrived on site to conduct a pressure test.
 - There were two casings to be filled with the gel/inhibitor slurry. The elbows were removed and the vents were threaded, and a cam/grove fitting was placed on the vent. The opposite end had the elbows removed, the vent end threaded, and a cap placed on top.
 - Using an air compressor, the vents were filled to 5 PSI, and the pressure held at 3-5 psi. This test was performed three times to verify the results. The injection did have some problems. The proposal called for a total of 20 pails of gel to be added: 10 PGH 300 and 10 PGH 400.
 - After 500 gallons of the thousand gallon tank were pumped, excessive pressure built up in the hoses, and the eductor could not generate a vacuum powerful enough to draw any additional PGH 400. Soon, water began to fill the hopper. At this point, the addition of PGH 400 gel was abandoned.
 - Fortunately, the pump was able to displace the slurry in the tank, which included the prescribed amount of PGH 300 gel.
 - The pipeline was completed successfully and it is recommended that this pipeline be monitored and VCI reapplied as necessary.