

IMPREGLON® 410M

COATING FOR SEVERE SOUR AND ACID GAS SERVICE

Introduction

IMPREGLON® 410M is a thin-film fluoropolymer coating designed to improve the performance of ANSI valves in sour and acid gas environments.

IMPREGLON® 410M reduces or eliminates the need for:

- Stainless valves & fittings
- Liners
- Chemical inhibitors
- High-build coatings

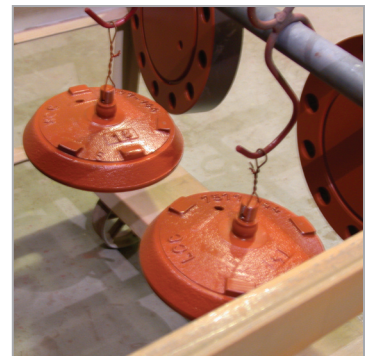
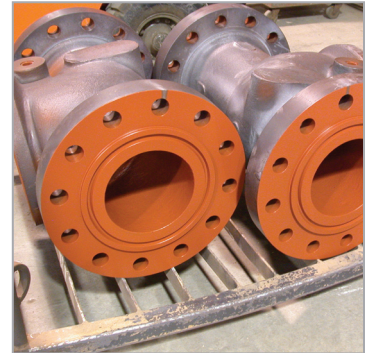
Track Record

IMPREGLON® 410M has been field-proven in numerous applications across Western Canada since its introduction in 1999. Please contact our sales department for specific examples.

Impreglon Coatings, incorporated in 1974, is Western Canada's leading applicator of thin-build fluoropolymer coatings for the production segment of the petroleum industry.

Typical Applications

- ANSI valves & strainers (ball, gate, check, control, etc.)
- API Wellhead components (valves, tubing hangers, adapter flanges etc.)
- Fittings (nipples, elbows, tees, flanges, etc.)



Recommended Services

| | |
|------------------|---|
| Corrosion | Sour Gas above 10% H ₂ S (Acid Gas – Hydrochloric, Carbonic, Sulphuric, Nitric) |
|------------------|---|

Chemical Resistance

| Immersion (50 days of immersion @ 203°F) | Results |
|---|-----------|
| 36% Hydrochloric Acid | Excellent |
| 60% Nitric Acid | Excellent |
| 98% Sulphuric Acid | Excellent |
| 28% Ammonium Hydroxide | Excellent |
| Acetone | Excellent |
| Diethyl Amine | Excellent |
| Toluene | Excellent |

Physical Properties

| | |
|-------------------------------|---|
| Thickness Range | 1.25 – 2.5 mils / 0.00125" / 0.0025" / 31.75 – 63.5 micron |
| Maximum Operating Temperature | 500°F Continuous |
| Salt Spray Test - ASTM B117 | 1000+ hours @ 5% concentration |
| Colour | Dark Orange |

IMPREGLON® 410M

Labratory Testing

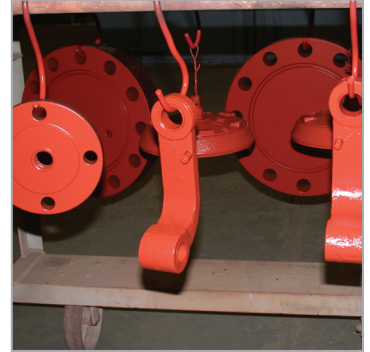
IMPREGLON® 410M was autoclave tested* in a laboratory to determine its potential effectiveness as a corrosion resistant coating.

Autoclaves are pressurized vessels used to re-create downhole conditions. Using representative pressures, temperatures, and chemicals, autoclave tests are designed to accelerate corrosion and act as an initial screen, thereby minimizing the need for expensive downhole testing.

Following exposure in the autoclave, the coating is submitted to EIS** testing. EIS (Electrochemical Impedance Spectroscopy) is a sensitive test for evaluating a coating's permeability to corrosive agents on an accelerated basis. Higher values indicate increased resistance to permeation. Ratings of 6.0 or greater are considered good to excellent.

* Autoclave testing for IMPREGLON® 410M was conducted by an independent lab, Charter Coating Services Ltd. of Calgary, Alberta.

** EIS testing was conducted by the Alberta Research Council Corrosion and Electrochemistry Laboratory.



Test Parameters

Test Medium #1,2

Duration: 96 hours

Temperature: 250°F

Pressure: 5000 psi

Gas: 10% H₂S, 10% CO₂, 80% CH₄

Hydrocarbon: Kerosene/Toluene @ 1:1 by volume

Water: 1% NaCl in distilled water for test medium #1,
25% NaCl in distilled water for test medium #2

Test Medium #3

Duration: 96 hours

Temperature: 284°F

Pressure: 3,000 psi

Gas: 50% H₂S, 10% CO₂, 40% CH₄

Molten: Elemental Sulphur

Water: 1% NaCl in distilled water

Results

| Test Medium | Pressure Release Time | Coating Thickness Tested @ | Blister Rating ASTM D714 | EIS Permeability Rating: Gas/HC/H ₂ O |
|-------------|-----------------------|----------------------------|--------------------------|--|
| #1 | 1.5 hour | 1.2 mils | None | 10.59 / 10.58 / 10.57 |
| #2 | 1 hour | 1.6 mils | None | 10.10 / 10.14 / 10.27 |
| #3 | 0.75 hour | 1.6 mils | None | 8.86 / 7.62 / 8.76 |

NOTE: The information presented is based on the research and understanding of Impreglon Coatings. For new, unproven applications, we recommend lab testing, followed by a field trial, in order to ensure your complete satisfaction. Impreglon Coatings is the registered owner of the IMPREGLON® trade name in Canada and the exclusive applicator of IMPREGLON® coatings.