



Rilsan® coating for drinking water, waste water and seawater treatment plants

New results

Content

- Resistance to High pressure cycles in salted water
- Resistance to salted water
- Resistance to membrane chemical cleaning agents
- Resistance to abrasive medium

High pressure cycles - Objectives

Evaluation of the resistance of Rilsan® coating systems to pressure cycles of salted water (35g/L)

● Experimental conditions

- Pressure increase up to **80 bars** followed by a **instantaneous depressurization**
- Number of cycles : **1000 and 2000 cycles**

● Rilsan® coating systems

- LAT 12035 + T gray 5161 MAC
- LAT 12035 + T blue 7174 MAC
- P23V40 + T blue 7174 MAC

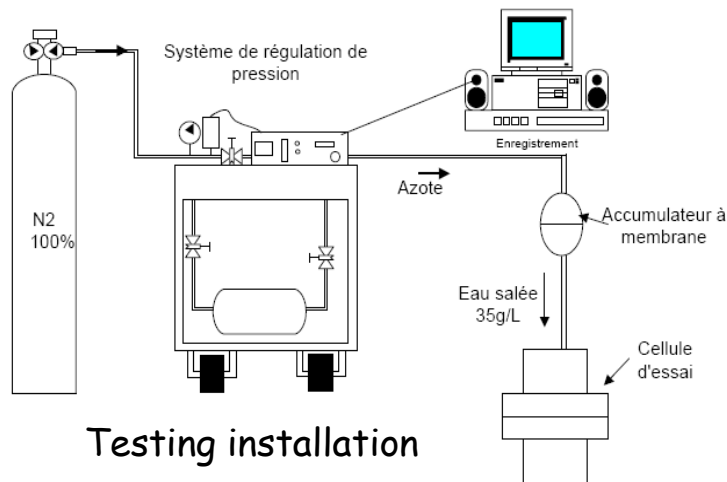
● Evaluation parameters

- Adhesion (NFT 58-112)
- Inherent viscosity to monitor the polymer degradation



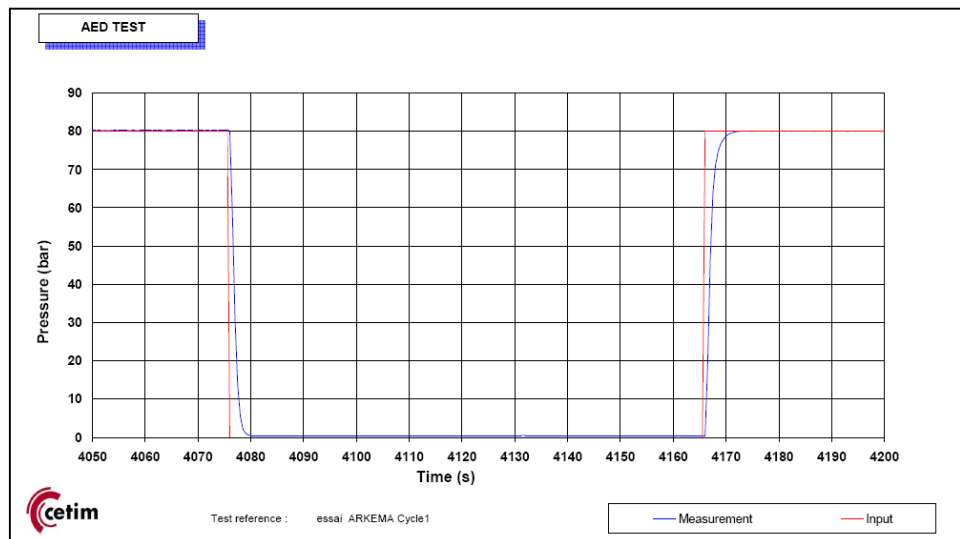
Autoclave

High pressure cycles - Parameters



Pressure cycle parameters

- Pressure increase up to 80 bar
- Stage (80 bar) during 7 minutes
- Fast decompression to atmospheric pressure < 6 seconds
- Stage (atm. pressure) during 90 sec
- Pressure increase up to 80 bar



Pressure cycle parameters

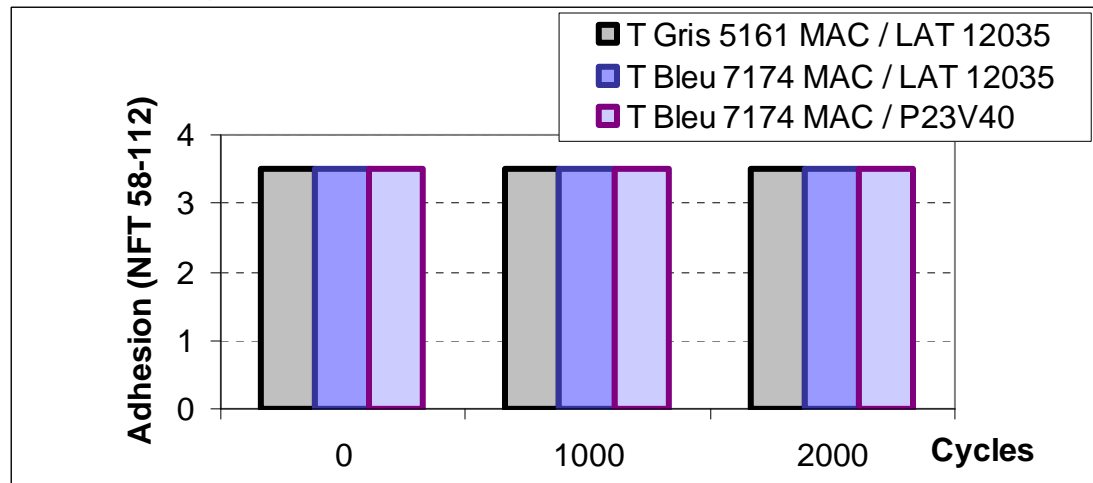
2 samplings: 1000 and 2000 cycles

High pressure cycles - Results

Rilsan® thickness = 300-350µm

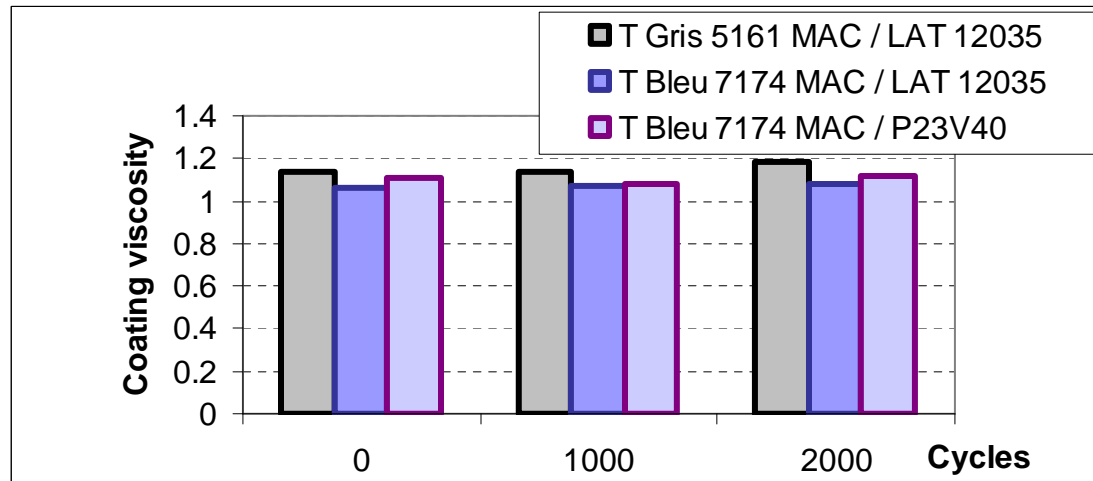
- Adhesion

Adhesion is kept after
2000 cycles



- Inherent viscosity

No modification



High pressure cycles - Conclusion



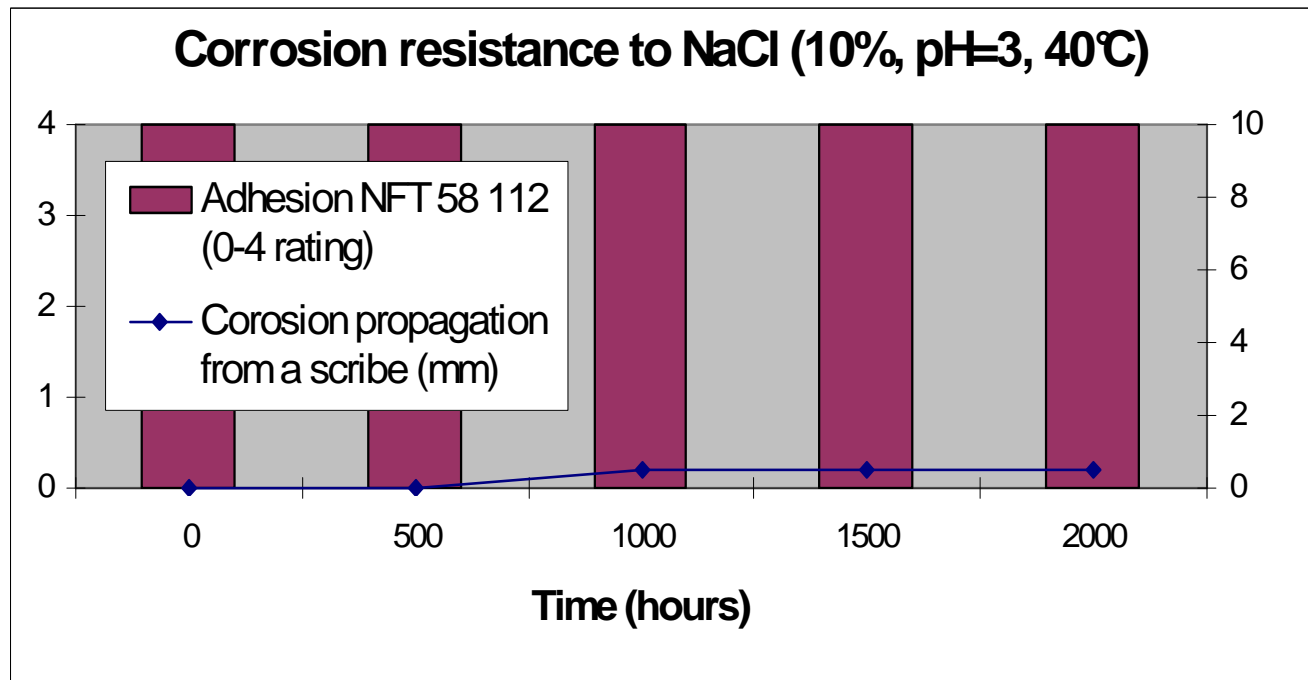
After 2000 pressure cycles (80 bar)
Rilsan® systems show:

- No loss of adhesion
- No polymer degradation
- No loss in mechanical properties

Seawater testing - parameters

- Water solutions (accelerated testing)
 - pH = 3
 - NaCl concentration = 10%
 - Temperature = 40°C
- Duration of the test
1000 and 2000h
- Evaluation parameters
 - Adhesion (NFT 58-112)
 - Corrosion propagation from a damaged area (Scribe) in mm
 - Inherent viscosity to monitor the polymer degradation
- Rilsan[®] system: Lat 12035 + Rilsan[®] T gray 5161 MAC

Seawater testing - Results



No change in inherent viscosity → No degradation

No loss of adhesion after 2000 hours

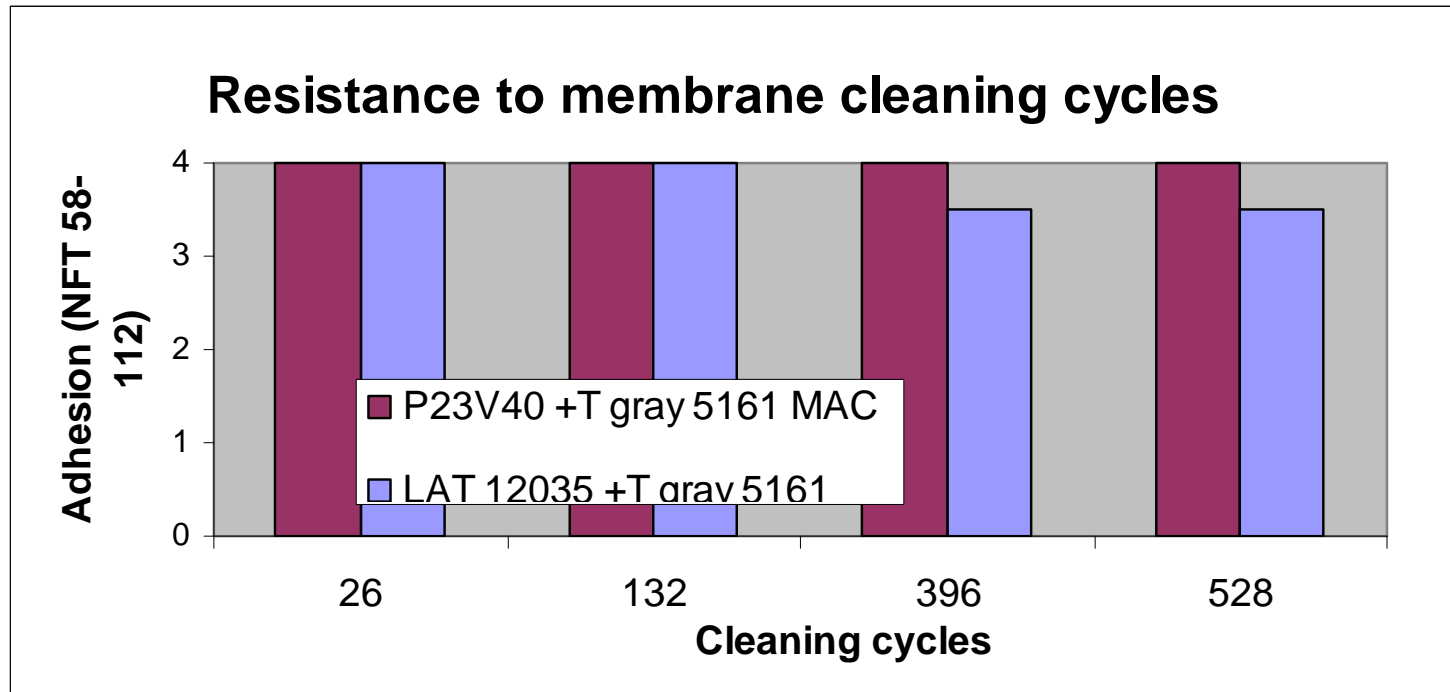
Very limited propagation from the damages area

Membrane cleaning cycles Parameters



- **Cycle parameters:**
 - Immersion in caustic Soda at pH 12 for 5 minutes
 - in Chlorhydric acid at pH 2 for 5 min
 - Immersion tap water at 20°C for the remaining
- **Duration of the test: 528 cycles**
- **Evaluation parameters:**
 - Adhesion (NFT 58-112)
 - Inherent viscosity to monitor the polymer degradation
- **Rilsan® system:**
 - Primgreen LAT 12035 + Rilsan® T gray 5161 MAC
 - Rilprim P23 V40 + Rilsan® T gray 5161 MAC

Membrane cleaning cycles- Results

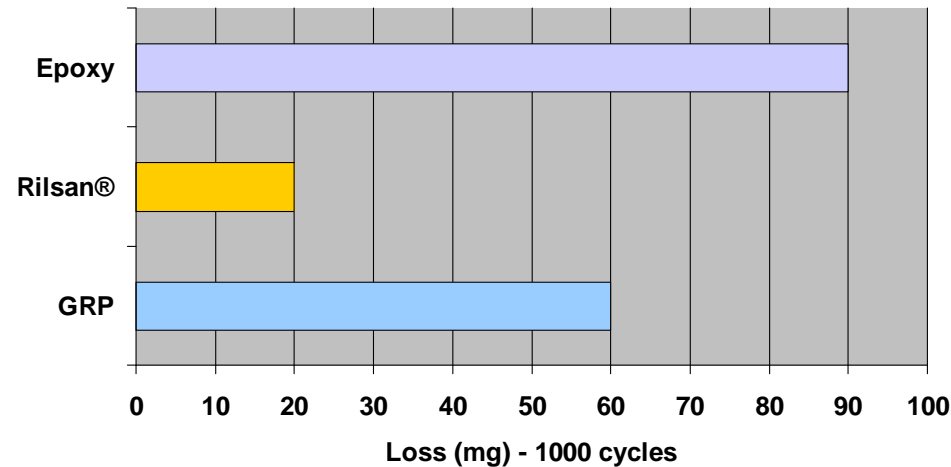


No change in inherent viscosity → No degradation

No loss of adhesion after 528 cycles hours

Wear resistance-1

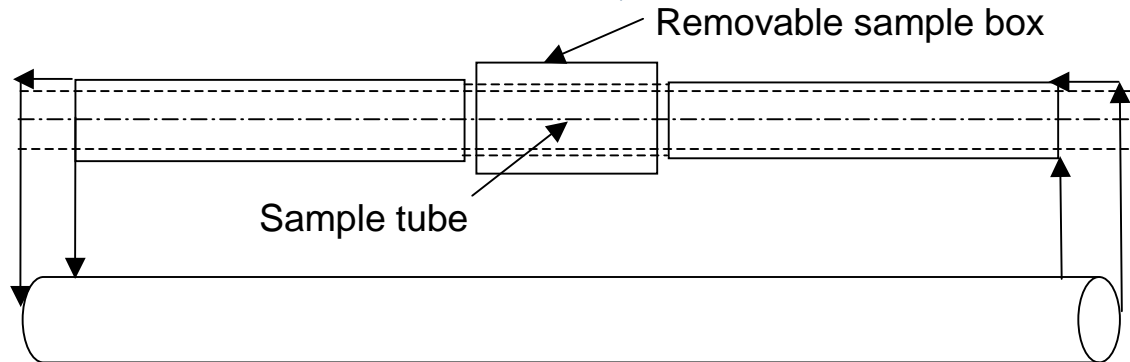
- Abrasion resistance (Taber test ISO 9352-1995, 1Kg, 1000 cycles)



- Silicate mud wear resistance (ASTM G6)
 - The coated sample are placed during 200h in a barrel containing a mix of silicates (13.6 Kg) and water (5.6 liter) and rotating at 30.5 m/min.
 - Thickness loss after 200 hours = < 1 micron
 - No porosity of the coating after 200 hours

Wear resistance-2

- Wear resistance- loop trials



- Medium:

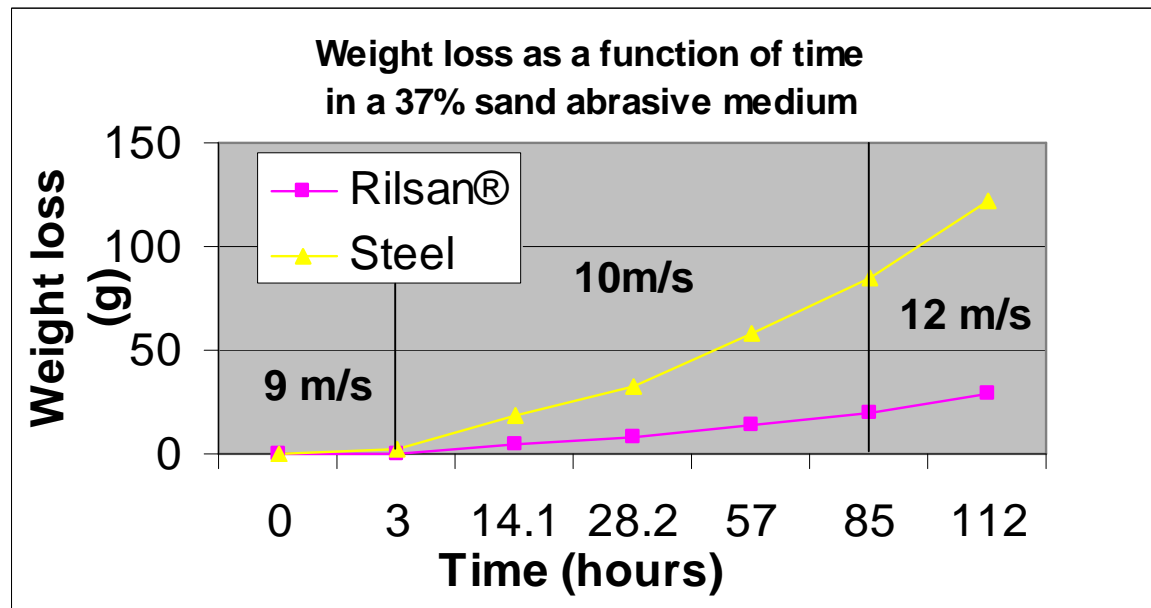
- water
- sand (37%)
 - Silica (70-76%)
 - 12% Aluminium
 - 4% ferric oxide
 - 4% Calcium oxide
 - 5% alkaline

- Flow velocity

- 9 m/s for 3 hours
- 10 m/s for 82 hours
- 12m/s for 27 hours

- Extrapolation

→ corresponds to two years at 2 m/s



Rilsan® has a 4 times better resistance than steel