Oil & Gas Production
Stress Corrosion Cracking
Corrosion Fatigue
H₂S Corrosion Tests

Research and Development,
Failure analysis, Corrosion testing, etc.

The French Corrosion Institute, a subsidiary of SWEREA KIMAB (Sweden) is one of the leading organizations in Europe in the field of corrosion and corrosion protection. It includes two sites located in Brest and Saint-Etienne, with a task force of 40 engineers and technicians. Together with SWEREA KIMAB, more than 80 employees work in the area of corrosion protection.

The site in Saint-Etienne is specialized in corrosion resistance of materials used for oil & gas production, which requires specific facilities such as H₂S and ATEX laboratories.

Partner and coordinator of numerous R&D projects in collaboration with the Industry, our objectives are:
- Evaluate the resistance of materials to environmental cracking in H₂S containing environments (SSC, CSC)
- Evaluate the resistance of materials to corrosion fatigue in H₂S environments
- Use and develop monitoring techniques for mechanistic studies and improve test method reliability

We can offer

- Participation to cost-shared projects

- Consultancy and Advices
  - Selection of materials
  - Failure analysis

- Laboratory tests
  - Standard NACE tests (HIC, SSC), fit for purpose tests with CO₂-H₂S gas mixtures and controlled pH
  - Specific tests following specifications in different conditions:
    - At atmospheric or high pressures (up to 300 bar)
    - Temperature (up to 350°C)
    - With applied stress using various loading devices
  - Specific tests for polymers
Facilities

Laboratory testing

• H₂S laboratory (600 m²) including an ATEX laboratory for tests using explosive gases, oil, etc (for metallic and polymer materials)

• Corrosion fatigue test machines
  - Alternate bending (atmospheric pressure, up to 40 bar)
  - Rotary bending (atmospheric pressure, temperature up to 100°C)

• Environmental cracking (SSC, SCC up to 300 bar)
  - Static:
    - 4 points bending devices (up to 300 bar)
    - Constant load tensile tests (limited to 40 bar, capacity up to 100 kN)
    - C-rings (up to 300 bar)
    - Other loading methods (U-bends, spring loaded specimens), atmospheric pressure or in autoclaves (300 bar)
    - Fracture mechanics specimens DCB, WOL (up to 300 bar), CT (atmospheric pressure)
  - Dynamic:
    - Slow-strain-rate tensile tests (limited to 40 bar)

• Autoclaves for high pressure tests
  - High capacity 15 and 12 liters autoclaves:
    300 bar (2 autoclaves), 40 bar (4 autoclaves), 20 bar (10 autoclaves).

• Immersion tests with electrochemical measurements (up to 40 bar)

Methods of analysis

• Electrochemical techniques
• Mechanical tests
• Optical microscopy and image analysis
• Scanning electron microscopy (SEM)
• X-ray diffraction
• Raman spectroscopy

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