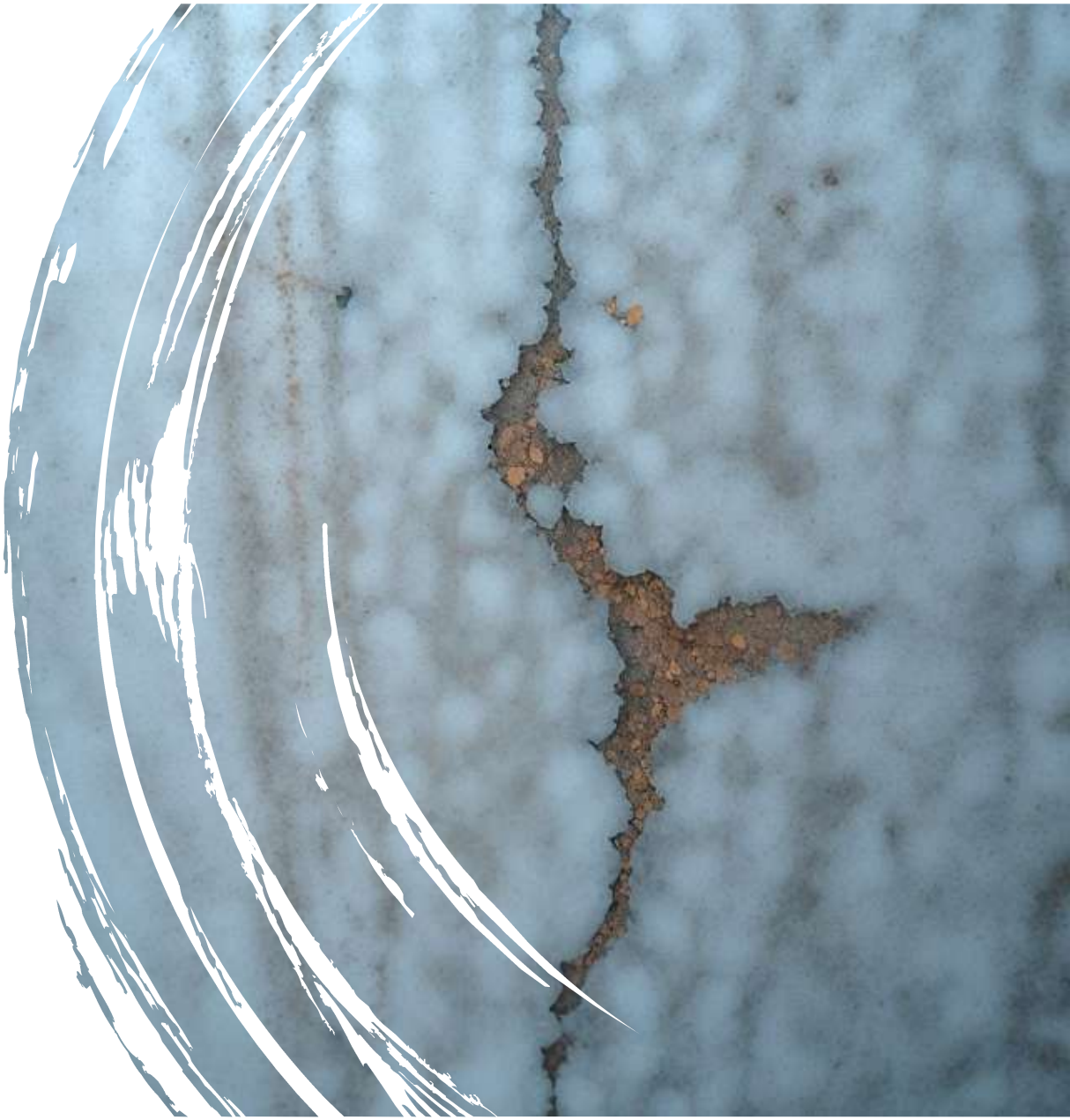
FRENCH
CORROSION
INSTITUTE

FRENCH CORROSION INSTITUTE

GENERAL PRESENTATION

2026-Ed.1



SUMMARY

01 French Corrosion Institute

- General information
- Sources of funding

02 ARCOR Association

03 Focus on some industrial applications

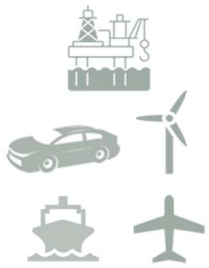
- Oil&Gas
- Gaseous Hydrogen
- Ammonia
- CCUS/ CCS
- Offshore
- Atmospheric Corrosion – Indoor/Outdoor
- Corrosion in chemical and process industries

French Corrosion Institute
(Private Research Lab belonging to RISE)

Non-Profit Organization

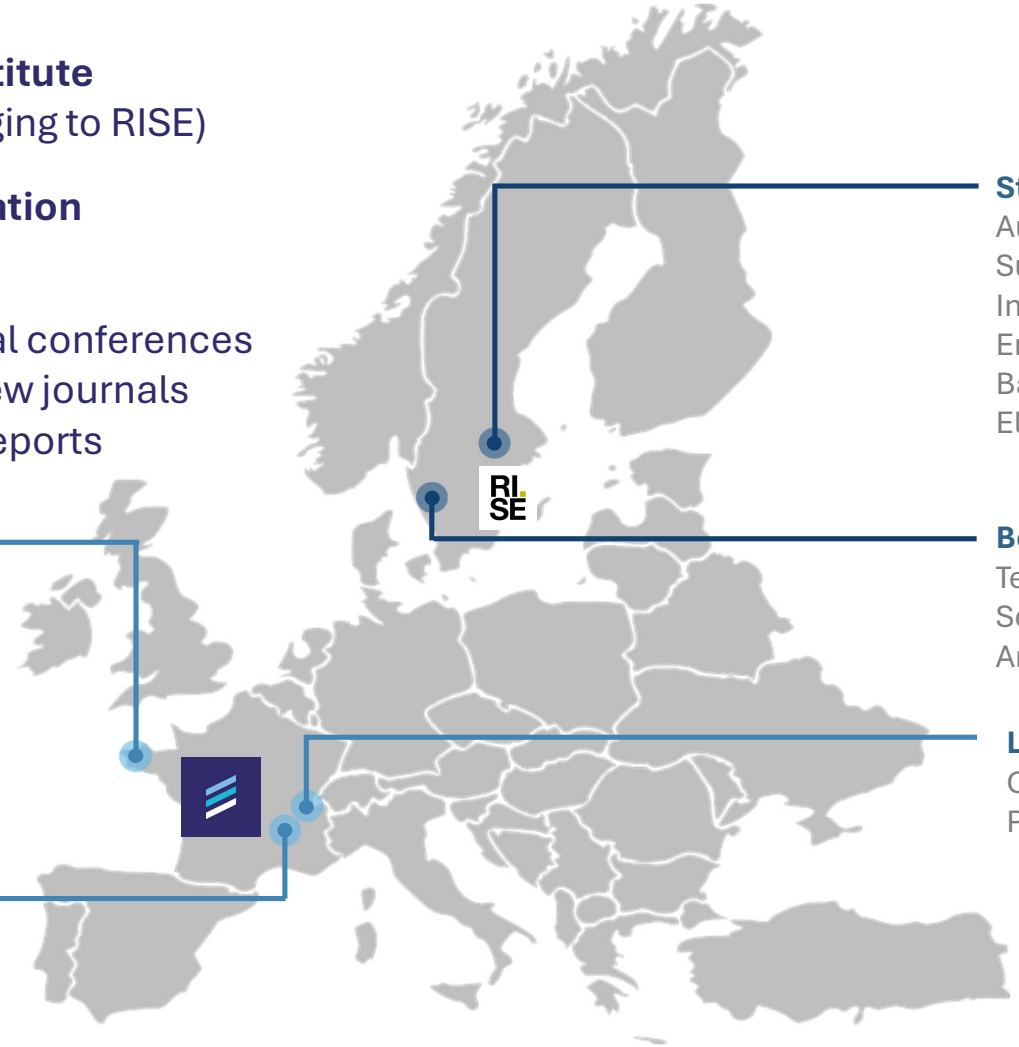
5 last years

92 presentations in international conferences
71 publications in peer review journals
50 industrials project reports



Brest
Transport
Building
Seawater& Offshore
Soil
Sensors
Training

Saint Etienne
Hydrogen
Methanol / NH_3
CCUs
Nuclear
Oil & Gas
High Temperature
Low C Energies
Harsh media



Stockholm
Automotive
Surface analyses
Infrastructure
Energy
Battery
Electrolysers

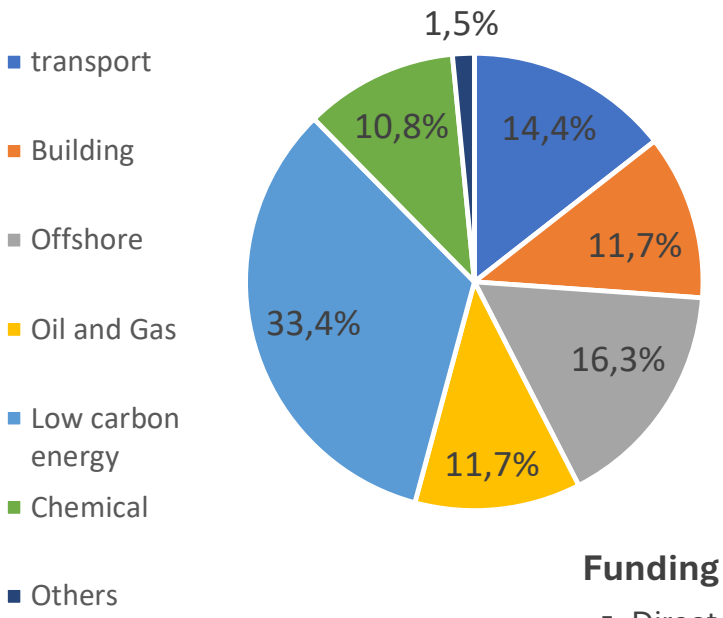
Borås
Testing (salt, UV, Gas)
Seawater
Anti-fouling

Lyon
Chemistry
Process engineering

Employees (France): 70
Annual Turnover: 10M€
Lab surface: ~2000 m²

Industrial Sectors and Funding

Turnover 2024



Different types of Funding

- Direct consultancies
- Frame agreement with some clients
- Joint Industrial projects
- EU or French agencies funding
- ARCOR association

Funding Breakdown

- Direct Industrial (JIP or PO) and training courses : 83%
- ARCOR : 7%
- Public : 10%

Strong Background in Test bench development or adaptation to specific requests

Our Soul

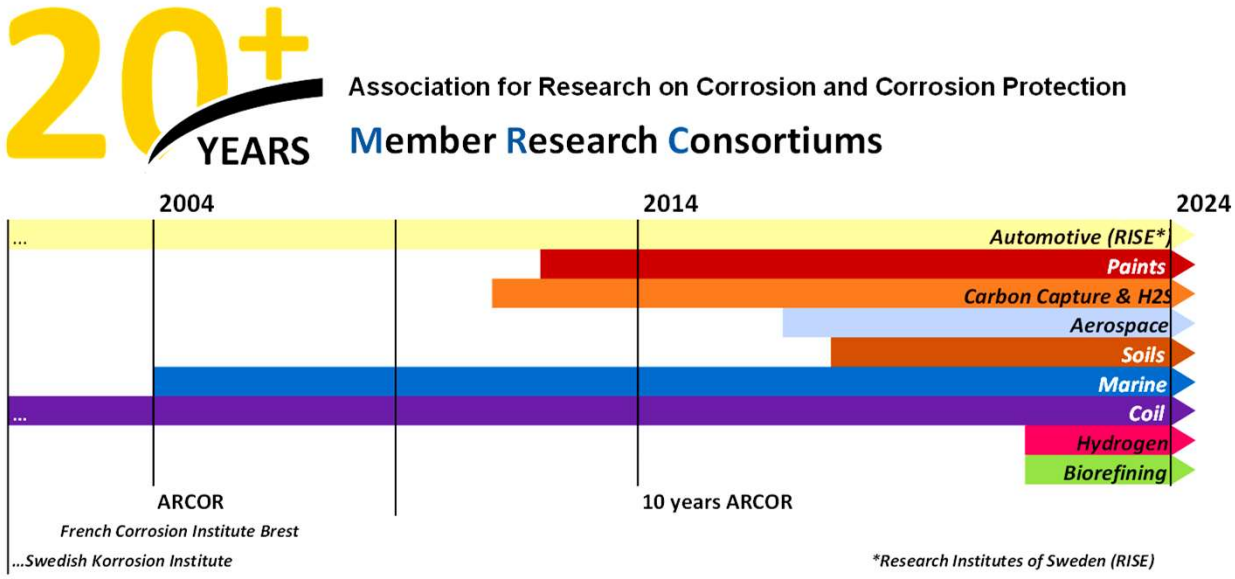
- We do no make standard things
- We always try adapt to inquiries

Upon client's request, FCI can **design and develop dedicated test benches** tailored to specific needs.

Investment need for an inquiry?

- The test bench could be funded through the internal FCI budget, provided it is financially viable
- Alternatively, it could be financed by the client and operated by IC

Member Research Consortiums



Membership Benefits

- Cost-shared research
- Networking with other actors from the same industry (2 meetings / year and per MRC)
- Discount on the price rate applied to consultancies coming from ARCOR members

Recent MRC (2025-2026)

- Naval Paints
- Electrolyzers
- Brines

New MRC created upon request if enough members participating

Research leading

- MRC studies are animated by someone from FCI
- Can be in collaboration with an industrial

Decision taking

- Members vote how to use the budget based on program proposals
- FCI does not vote

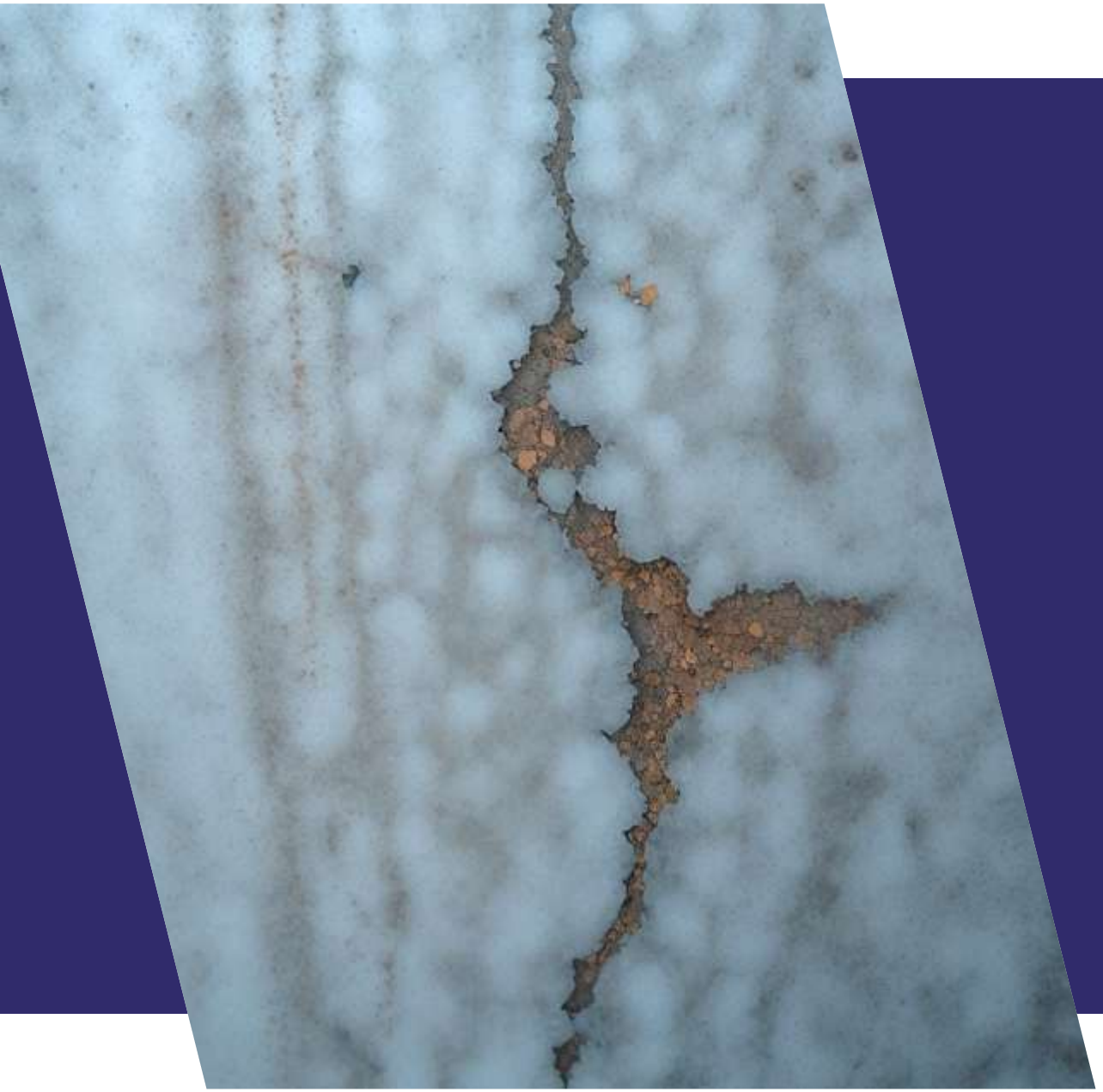
Technical application

- FCI manages and realizes the works
- Some task can be subcontracted if needed

Budget

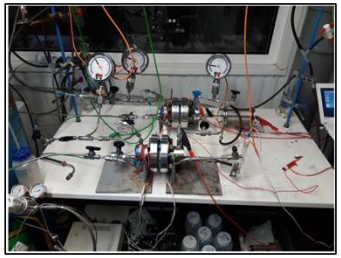
- Participation fee is 7000 euros / year
- Project budget equal the number of member time the fee (full consumption of the budget)

Membership opens 20% discount on every direct inquiry with FCI (only on the workforce)



OIL&GAS

Oil&Gas



HP-Permeation

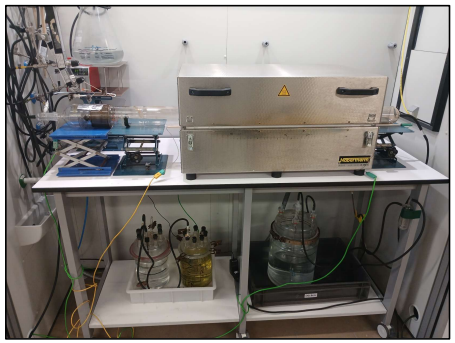
HP-Exposure

Autoclave tests

Test room for tensile test (constant load, SSRT, Ripple load....)

HP Corrosion fatigue test benches

Full-size pipe test



Dry corrosion tests

TGA

Electrochemistry

SSC-HIC test / H2S

HP- SCC with Electrochemical monitoring

Tensile test under pressure

Facility adapted to handle explosive and toxic gases

Exposure under $H_2S/CO_2/CH_4$ mixes under pressure

Equipments

Around 40 Autoclaves
- **Max 700 bar / 350°C**
- **Up to 30 L**

Mechanical tests
- **9 lines 100 kN / 3 lines 250 kN**
- **6 SSRT test benches**
- **Around 25 proof-rings**

Standard glass vessel for NACE tests

High Pressure (HP)-Electrochemical tests
- Up to 100 bar
- Possibility to apply load

HP-Devanathan & Stachuski test
- **Permeation from liquid through metals (250 bar)**
- **Polymer permability (400 bar)**

Dry corrosion: up to 1800°C
- Tubular furnaces
- TGA

Oil&Gas – Example of Industrial Projects

JIP on corrosion and H_2S cracking
(Operated in partnership with the IFPEN)

In Collaboration with: IFP Energies nouvelles

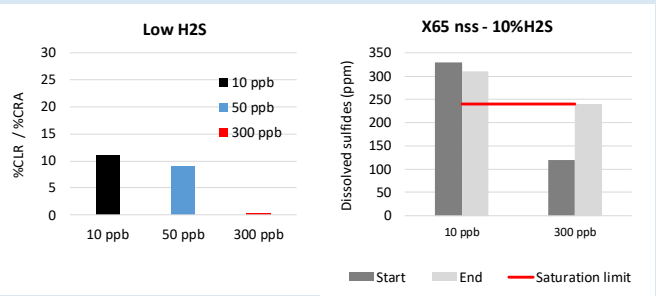
JIP-Oxygen

2015-2018

Impact of O_2 contamination on hydrogen charging in steels. Effects on HIC – SSC qualification tests

Type of test	Grade	< 10 ppb	50 ppb	300 ppb
4PB	Gr60 1bar H2S	No SSC	No SSC	No SSC
	X65ss 1bar H2S	No SSC	No SSC	No SSC
UT	C110 1bar H2S	No SSC	Failed (1/3)	Failed (3/3)
	C125 30 mbar H2S	No SSC	Not done yet	Failed (3/3)

SSC test results various levels of O_2



HIC test results various levels of O_2

Dissolved H_2S content at various level of O_2 before and after test

TechnipFMC · ArcelorMittal · TOTAL · GE Oil & Gas · SALZGITTER MANNESMANN FORSCHUNG · vallourec

Key figures

- On the SSC, oxygen contamination has a detrimental effect on the result – The results remains conservative,
- On HIC, it can lead to non conservative results. This trend is mainly due to the difficulty to saturate the solution in presence of O_2.

Papers serie

- **M. Deffo et al. NACE 2018 – paper 10931**
- **M Deffo et al., Corrosion 74 (11) (2018) 1192-1202**
- **M. Deffo et al., Corrosion 75 (4) (2018) 389-397**
- **C. Mendibide et al., NACE 2019 paper 12894**
- **G. Joshi et al., Corrosion 77 (9) 2021 961-975**

Oil&Gas – Example of Industrial Projects

JIP on corrosion and H_2S cracking
(Operated in partnership with the IFPEN)

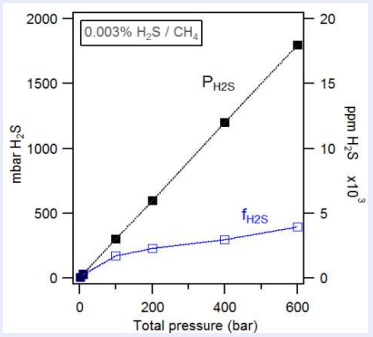
In Collaboration with: IFP Energies nouvelles

JIP-Fugacity

2019-2021

Impact of H_2S fugacity on hydrogen charging in steels

Hydrogen permeation at high pressure (up to 300 bar)



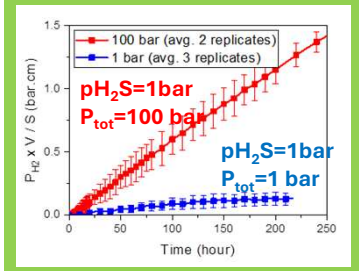
SALZGITTER MANNESMANN FORSCHUNG · ConocoPhillips · vallourec · TOTAL · Shell · NOV · BR PETROBRAS · Tenaris · أرامكو السعودية saudi aramco · TechnipFMC · Chevron · bp

G. Joshi et al. – NACE 2024 – Paper 20951

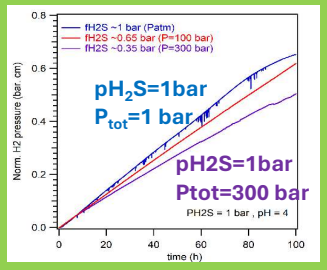
Key figures of Phase I

- Reaching the saturation under pressure takes time
- At pH<5, the trend is the one expected – correletion between permeation and cracking
- At pH>5, opposite trend due to scaling

pH=5.5

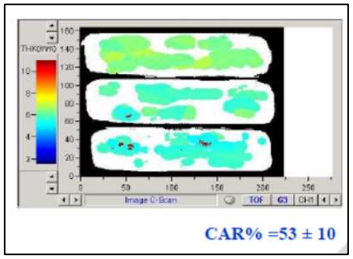


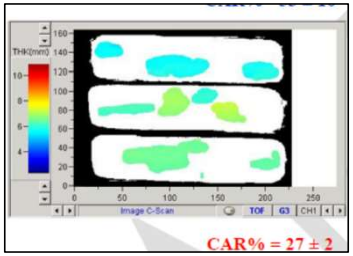
pH=4

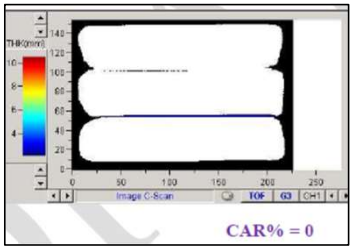


Phase II - Ongoing

2023-2026







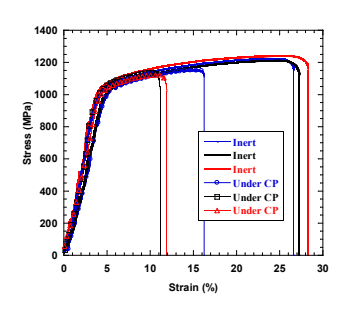
Oil&Gas – Example of Industrial Projects

JIPs on corrosion HISC of Ni-based alloys

JIP-BaseNi

2014-2018

SSRT for CRA qualification vs HISC



- 0.5M Sulfuric acid
- Saturation with Ar+10%H_2 at atmospheric pressure
- Cathodic protection : -5 mA/cm^2
- T=40 ± 2°C

bp, Shell, Petrobras, ConocoPhillips, Eni, Statoil, Anadarko, Total, CSM, SwRI

C. Duret et al. - NACE 2019 – Paper 13284

I. Salvatori et al. – NACE 2019 Paper 13365

Key figures

- Material qualification for HISC acc to API6CRA is not conservative (in-service failures on Inc718)
- Development of a more accurate qualifcation test method (SSRT)

2010-2014 : Work on the methodology on alloy 718 under the support of TotalEnergies

2014-2018 : Validation of the method within a JIP

☐ Inter-laboratory tests

☐ Evaluation of the other Ni-based grades

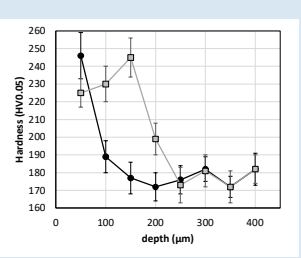
2019 -2020 : Standardization of the method (NACE TM0198-appendix C)

E. Trillo at al. – NACE 2019 – Paper 13455

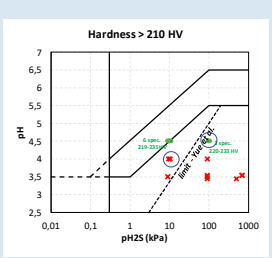
Oil&Gas – Example of Industrial Projects

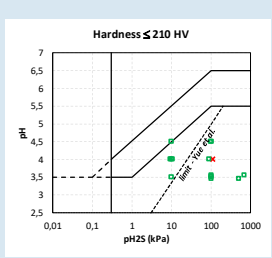
Direct collaboration with Industrial partners through a Framework agreement agreement

SSC risk in TMCP pipeline steels



Industrial sample characterization





SSC test on Gleeble treated specimens

Main result : The hardness threshold for SSC resistance should be decreased (From 245 to 210-220 HV), if lower bainite is present in the microstructure

Key figures

- Failure of X65 pipeline steels due to SSC
- Attributed to the presence of local hard zones mainly containing lower Bainite

2017 : Characterization of a failed pipeline section

2018 : First autoclave testing of specimens with LB

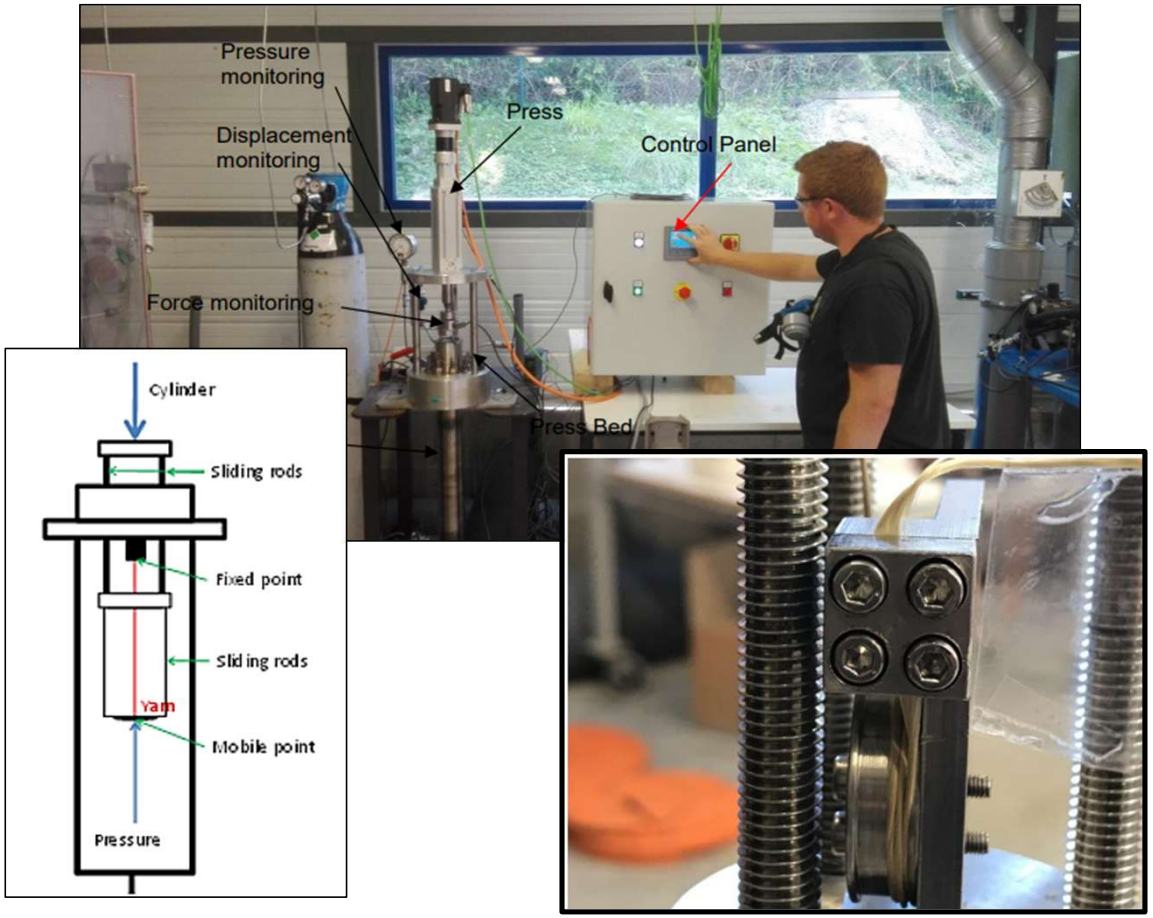
2019-2022 : Work of Gleeble thermomechanical simulations

☐ Heat-treatment with or w/o straining to simulate rolling

☐ Work on the effect of the recristallization kinetic

C2023-18943: H. Marchebois et al.

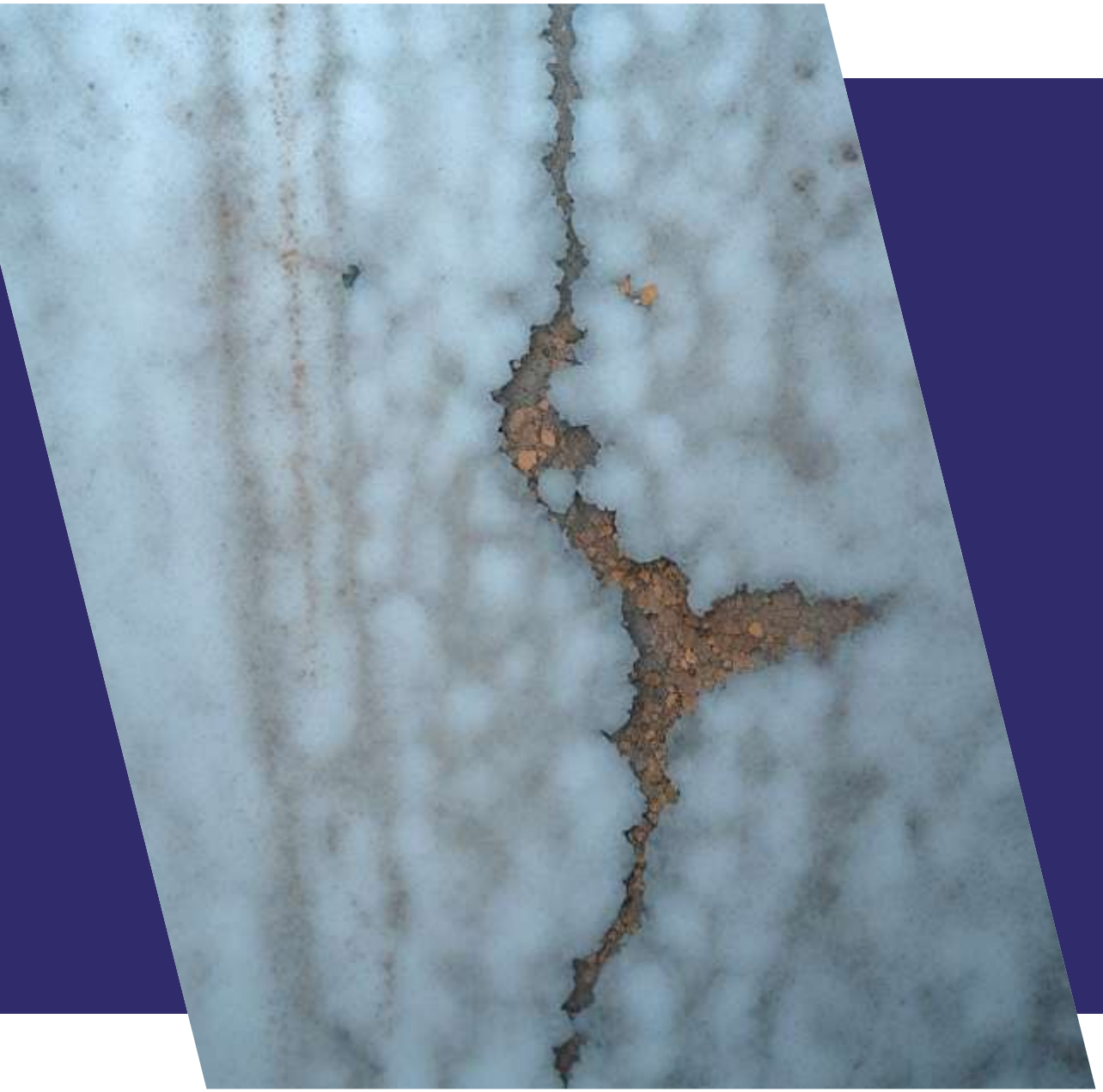
Example of a Tailor-Made Test Method



Development of a test bench for Polyaraminde yarn testing

Inquiry : Determine the strain-stress plots of a yarn after ageing in $CO_2/CH_4/H_2S$ mix under pressure

Need to load in-situ



Hydrogen (H_2)

Gaseous Hydrogen

A position on the full value chain

P – Production

Material compatibility
Electrolyzer application

Capabilities:

- T : (-40 / 300°C)
- P : 700 bar max
- V : 0.6 – 30

Case of study

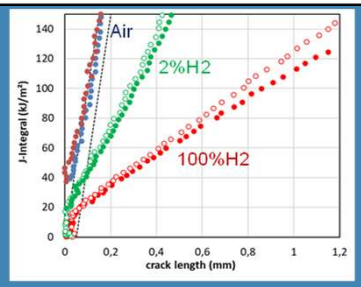
- Coatings evaluation under 40 bar H2 – PEM technology
- Material testing in KOH under Alkaline systems

T – Transport

Material qualification
Fracture mechanics
Hydrogen pressure

Capabilities:

- T : (-40 / 185°C)
- P : 700 bar max
- Different standards



Cases of study

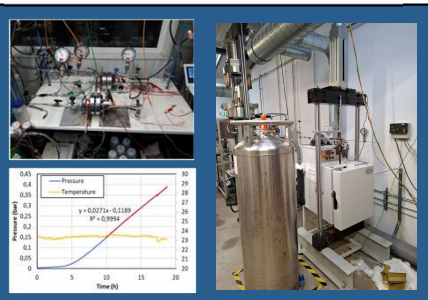
- Fracture toughness evaluation
- Fatigue testing ASTM E647
- Different pH with contamination (H_2O, H_2S...)

S – Storage

Material integrity

Capabilities:

- Permeation : T(20/300°C) / P: 300 b
- CRAs : T(-150/ 300°C) / P: up to 700 bar



Cases of study

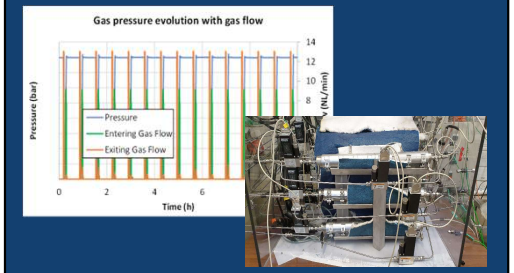
- Compression mechanics
- Permeation test in material
- Properties of CRAs under H_2 gas at -100°C or elevated temperatures

U – Uses

Component qualification
Fit for purpose

Capabilities:

- On-demand test bench development



Cases of study

- Pressure-fatigue on real components in fit-for-purpose test conditions

H_2 – capabilities

- Fracture toughness & FCGR (700 bar / -40°C to +180°C)
- Slow strain rate test and Ripple load (150 bar)
- Cryogenic tensile (-150°C / 1000 bar)
- Permeation (200 bar / 300°C)
- Thermo Desorption Spectroscopy

Fracture Mechanics
KJ and FCGR

Permeation

2nd machine for KJ
(For High H2S contamination)

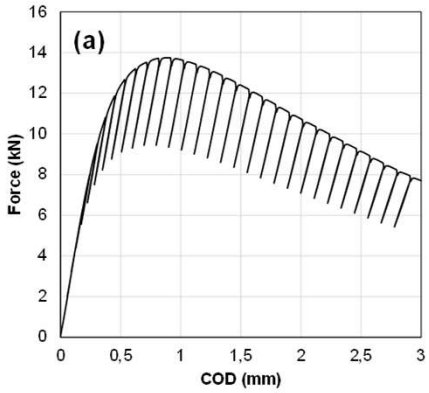
Loading in a glove box

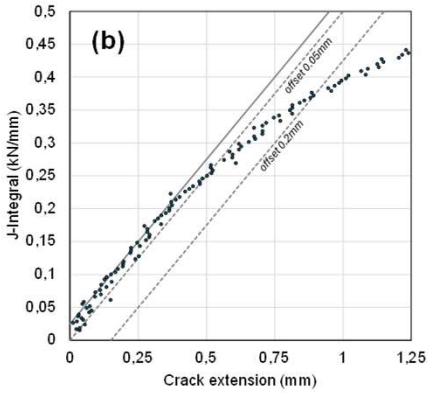
TDS

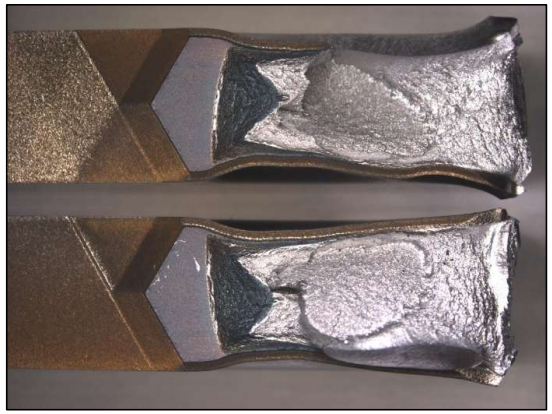
Ripple load and other types of loading

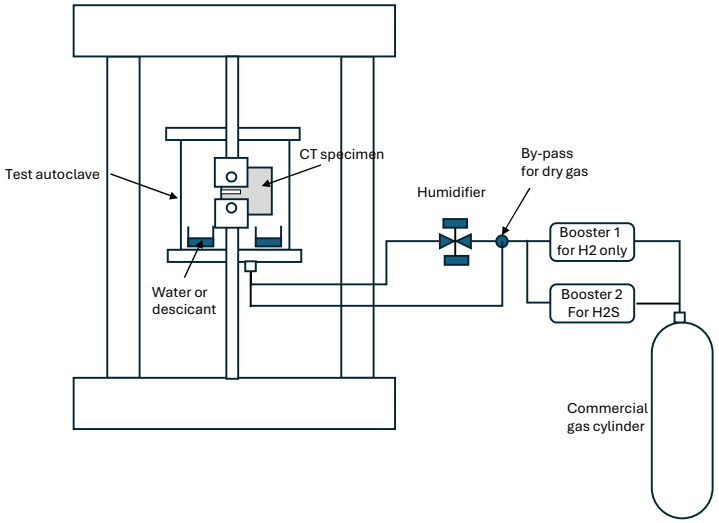
SSRT at cryo-Temperatures

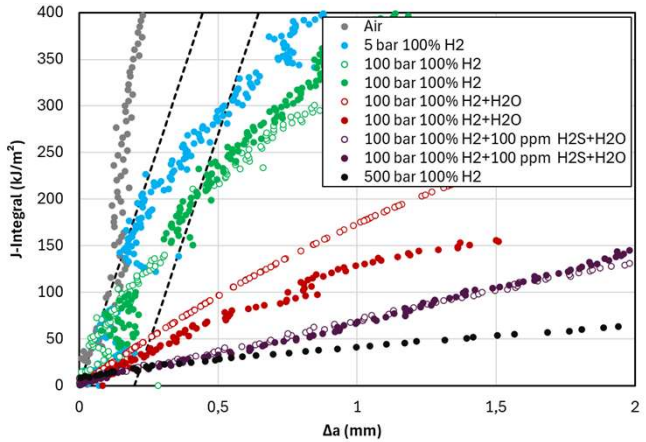
Hydrogen – Industrial Projects











Hydrogen storage is made in aquifers, depleted oilfield or salt cavity

Storage in aquifers

- Presence of Moisture
- H_2S release from bacterial activity

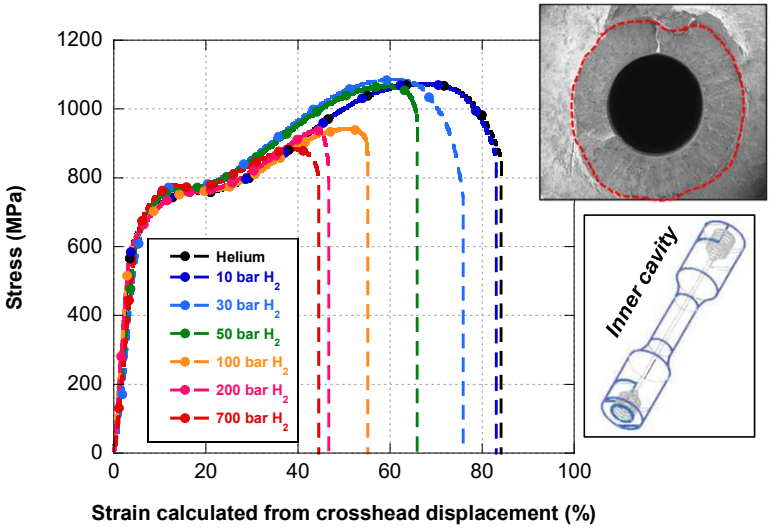
Aim: Address impact of the environment on the fracture toughness of a X65 pipeline steel

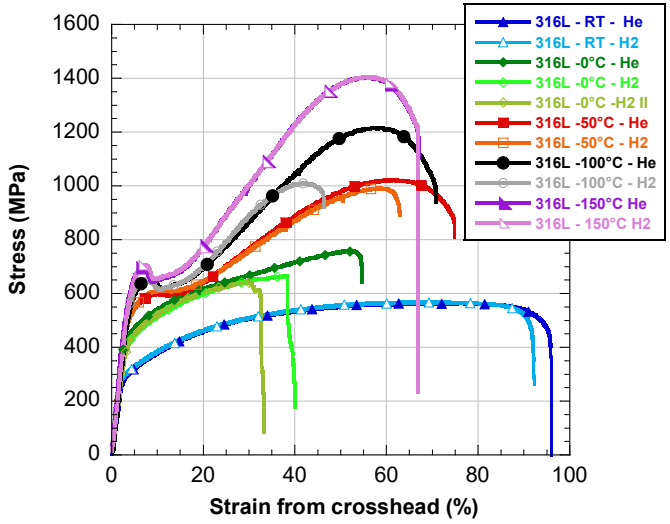
Main outcomes

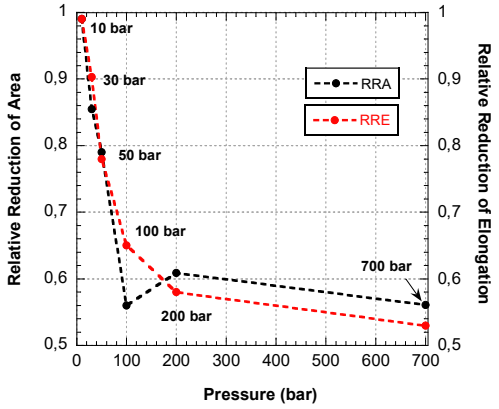
- Contamination with 100 ppm H_2S has an equivalent effect as raising the pressure from 100 to 500 bar
- Different trends depending if the water can condense or if the experiment are only conducted in humid gas

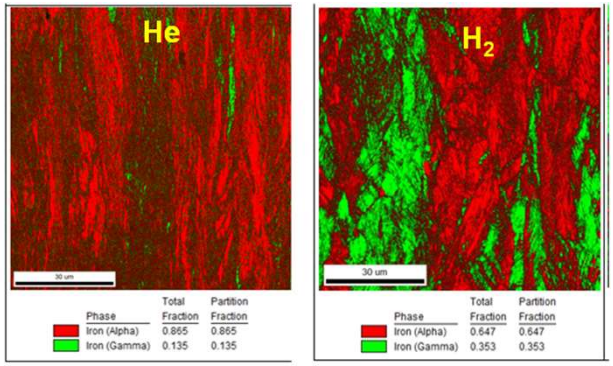
Work funded by ARCOR-MRC13

Hydrogen – Industrial Projects









Resistance of 316L produced through different production route (Conventional, Additive manufactured and Welded) to gaseous hydrogen at cryogenic temperatures

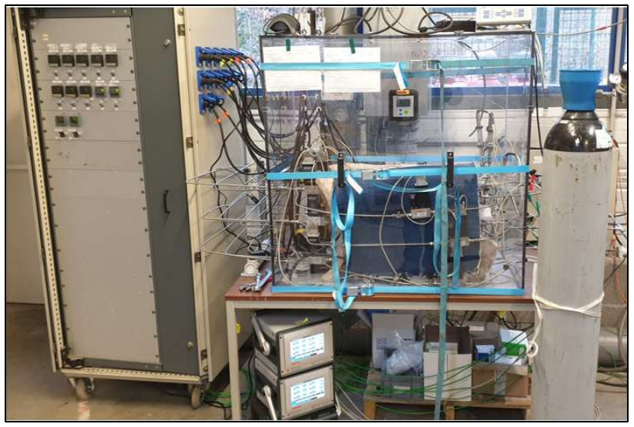
Approach: Pressurized Hollow tensile specimen testing

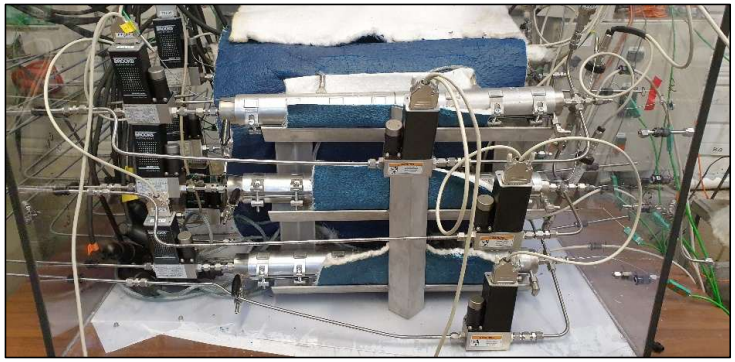
Main outcomes

- Nickel equivalent is a first order parameter
- 316L is very susceptible when the pressure is gradually increased from 10 to 200 bar but the resistance does not change from 200 bar and above
- Strain-induced martensite transformation is not the only parameter affecting the resistance
- Hydrogen seems to act as an austenite stabilizer limiting the formation of martensite

Work funded by ARCOR-MRC13

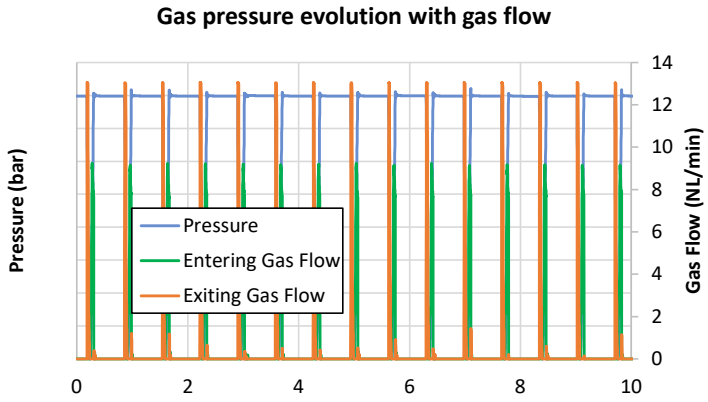
Hydrogen – Industrial Projects

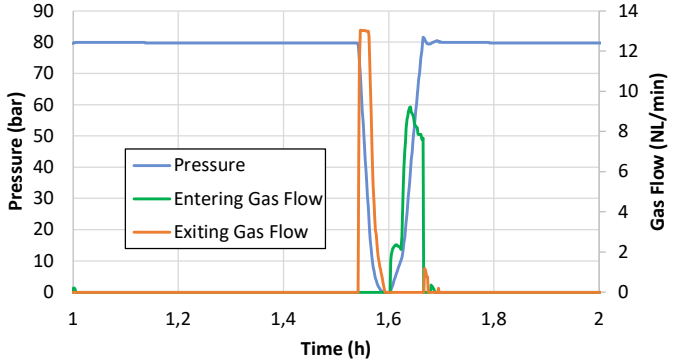




Test Setup in a cabinet interted with N_2

- Control of the O_2 content
- Monitoring of the H_2 content





Inquiry for the qualification of a full-scale component

Application: Small diameter tubing distributing gaseous hydrogen

Need to qualify the material for a whole industrial lifetime

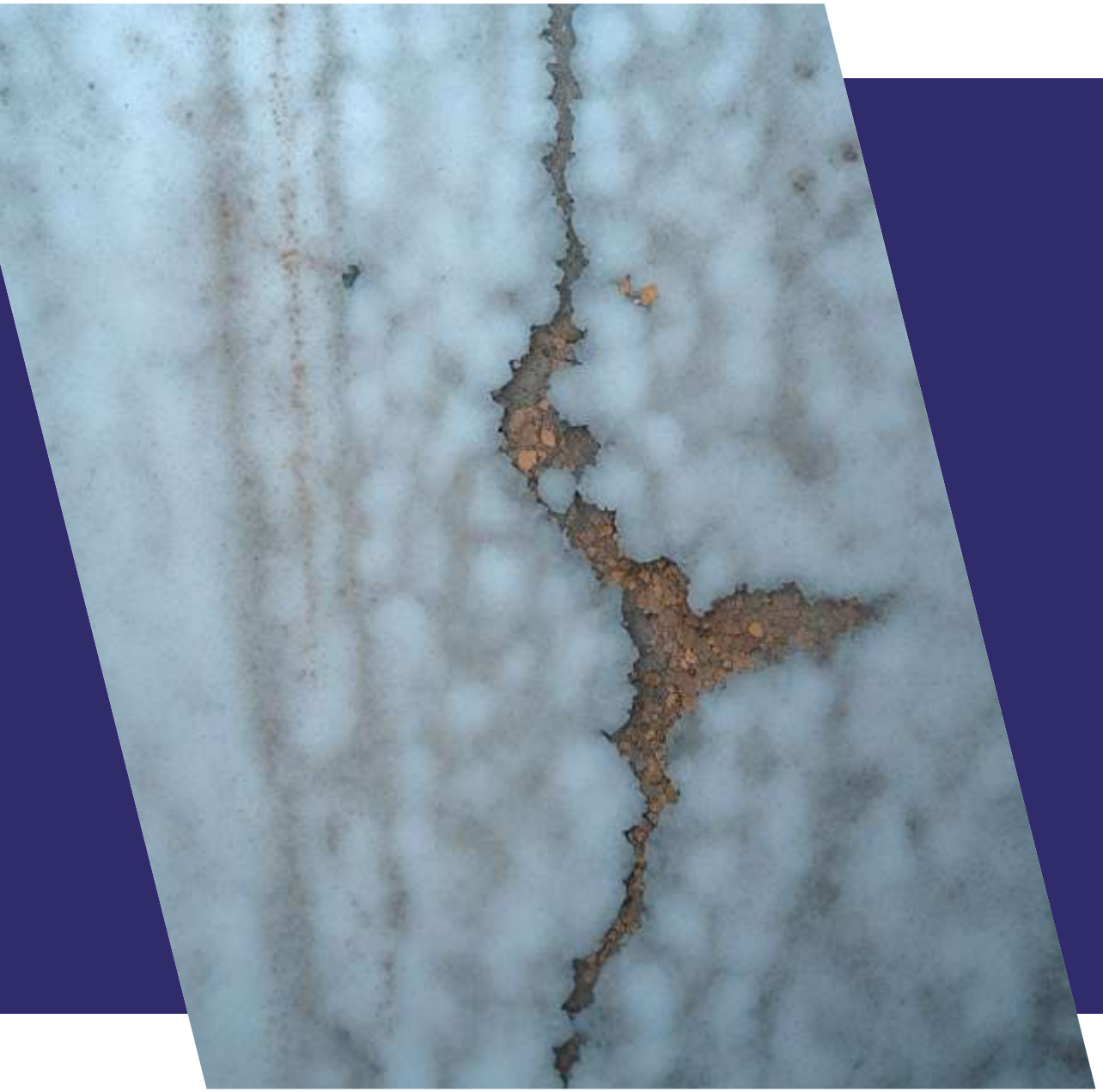
Approach

- Reproduction of the pressure cycles possible in service

- Fatigue cycling to mimic the real loading in service

- Post-test anlayzed of the component in comparison with a reference tested without Hydrogen

- Burst test to evaluate the residual rsistance



AMMONIA (NH_3)

Ammonia

A position on the full value chain

P

Production

High temperature
Material compatibility

Capabilities:

- T : 1200°C
- C : 15% NH_3 max
- Higher contents to be defined

Case of study

- Material testing in NH_3 under O_2 and/ or H_2O pressure
- Gas combustion simulation

T

Transport

Material integrity
Subzero condition

Capabilities:

- T : (-40 / 70°C)
- P : 40 bar max
- Different standards

Cases of study

- Compression/Traction
- Different pNH_3 with contamination (H_2O, O_2...)- SCC / Fatigue

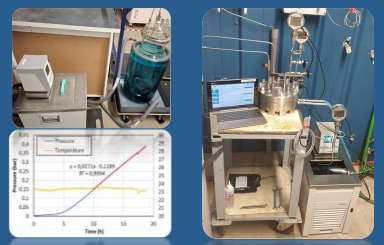
S

Storage

Low temperature
permeation

Capabilities:

- Permeation :
- T (-20/300°C) / P: 300 b



Cases of study

- Compression mechanics
- Permeation test in material
- Properties of CRAs under NH_3 gas at -20°C or elevated temperatures

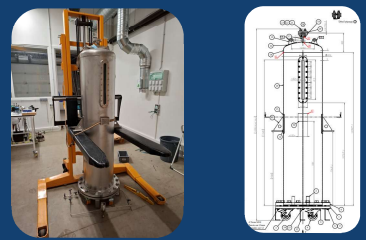
U

Uses

Fit for purpose

Capabilities:

- T : on demand
- C : 100% NH_3



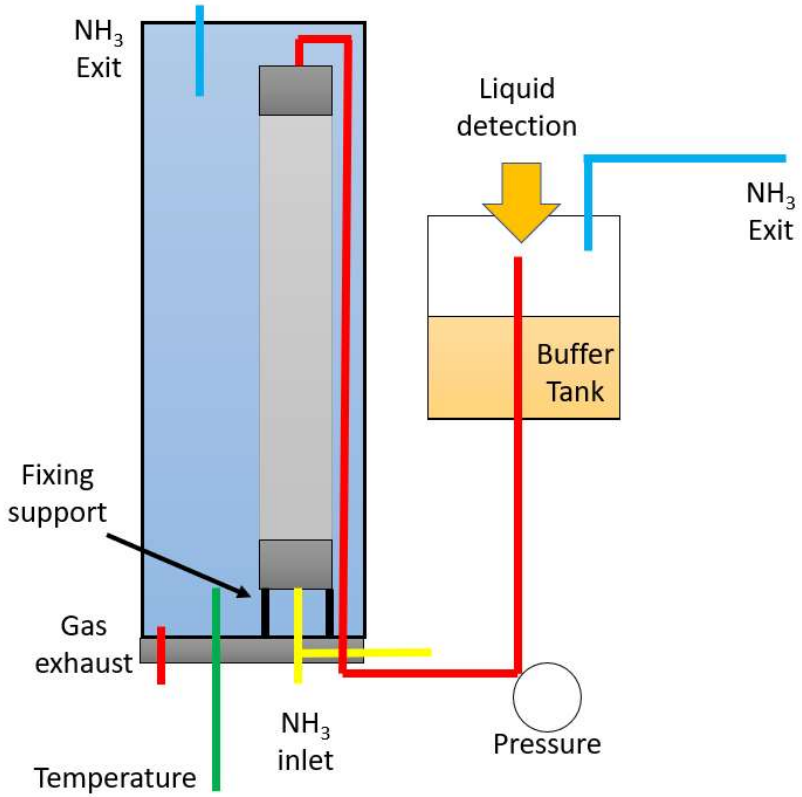
Cases of study

- Fit for purpose test rig
- Test bench design
- Liquid NH_3 exposure
- RGD cycling aging

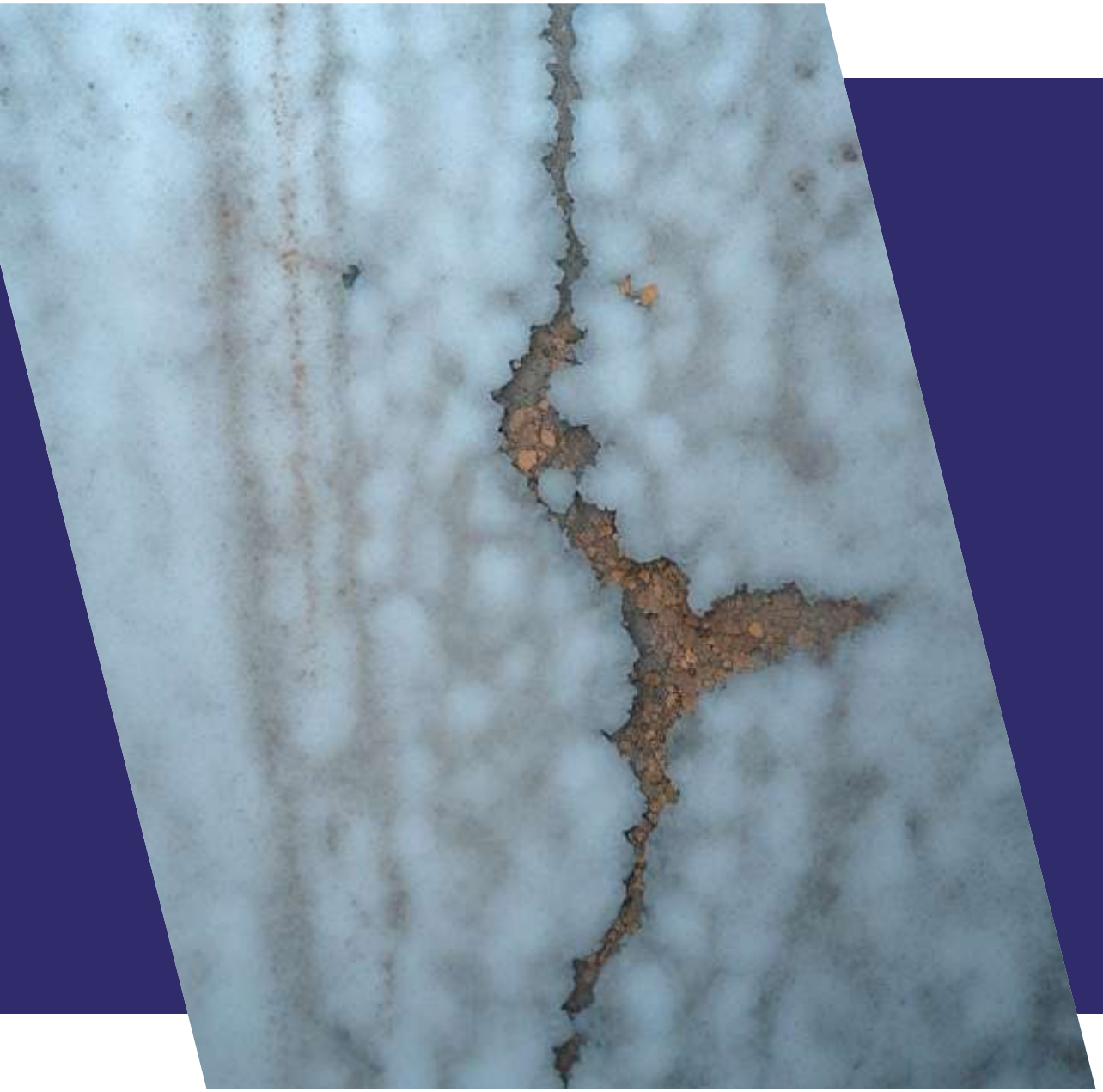
Ammonia – Test Benchs

A part of the equipment is the property of a customer and is operated by the French Corrosion Institute in a full invested test room

Ammonia – Example of Industrial Projects



Fit for purpose development: Full scale NH_3 immersion test



CARBON CAPTURE, UTILIZATION AND STORAGE (CCUS)

CCUS – Test Benchs under HP CO_2

Batch autoclave for pre-soaking at HP/HT

SSRT at high/ low temperatures

Gas analysis

Fracture Mechanics – KJ and FCGR

Permeation

HP-Exposure

HP- Immersion tests in small autoclaves

HP- Immersion tests in large-volume autoclaves

HP electrochemistry tests

CCUS – Ongoing projects

COscc (JIP)

2023-2026

Operated by

Sponsors

Topic:
Evaluation of the risk of SCC of Carbon steel pipeline TRANSPORTING CO_2 with CO impurity

CRA_{Inject} (JIP)

2023-2026

Operated by

Sponsors

Topic:
Corrosion risk of CRAs in STORAGE operation – Different Industrial scenarios

IMPACT-EUCO2

2026-2028

Operated by

Sponsors

Topic:
Impurity impacts on CO_2 TRANSPORT in CCUS applications

SPECS

2024-2026

Operated by

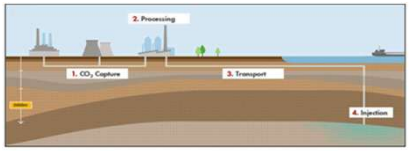
Sponsors

Topic:
Impurity impacts on CO_2 STORAGE in CCUS applications

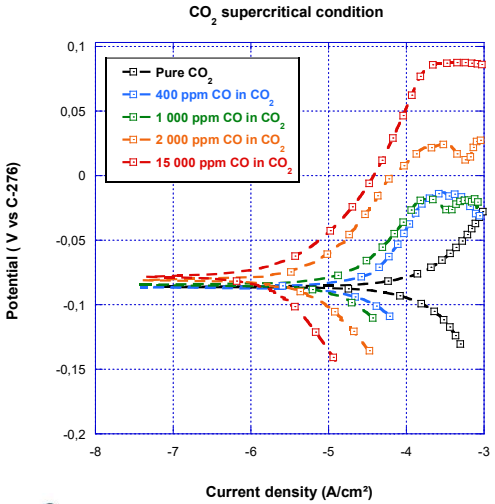
…and direct inquiries or frame agreements with specific clients….

CCUS – Industrial Project

Case study: ***Effect of CO on the risk of SSC of pipeline steels***



1. CO_2 CAPTURE → 2. INDUSTRIAL PROCESSING → 3. CO_2 TRANSPORT → 4. CO_2 STORAGE



Paper No.
C2025-00044

AMPP ANNUAL CONFERENCE + EXPO
APRIL 6-10, 2025 | NASHVILLE, TENNESSEE

Assessment of the risk of SCC of pipelines transporting CO_2 in presence of CO contamination

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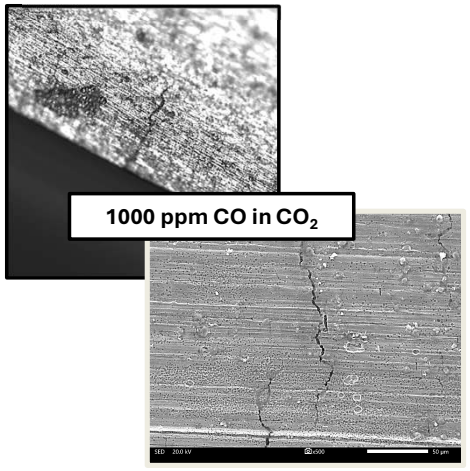
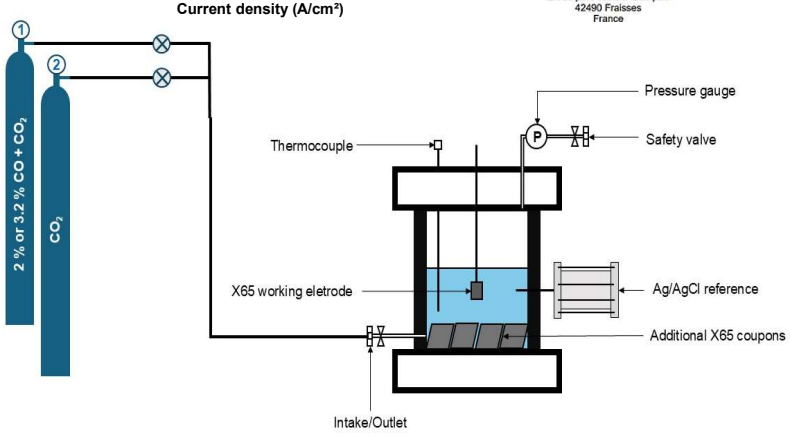
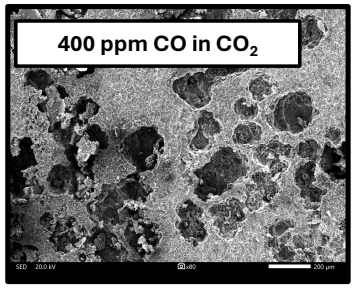
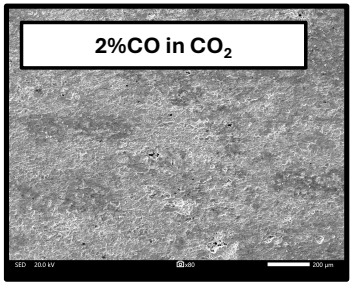








Electrochemistry at high pressure

- Pressure 40 to 100 bar CO2+CO
- Temperature 25-40°C
- Duration 7 days

Main outcomes

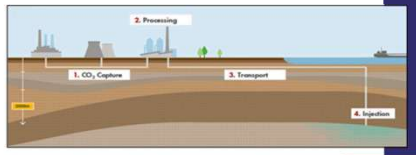
- CO contamination can generate pseudo-passivity of pipeline steel
- The critical content is in the range of existing CO2 stream specification
- Cracking is possible in service for CO possible as per current specifications
- SCC test ongoing to build an engineering diagram

Work funded by ARCOR MRC10 group

Next communications : Eurocorr 2026 / AMPP2027

CCUS – Industrial Project

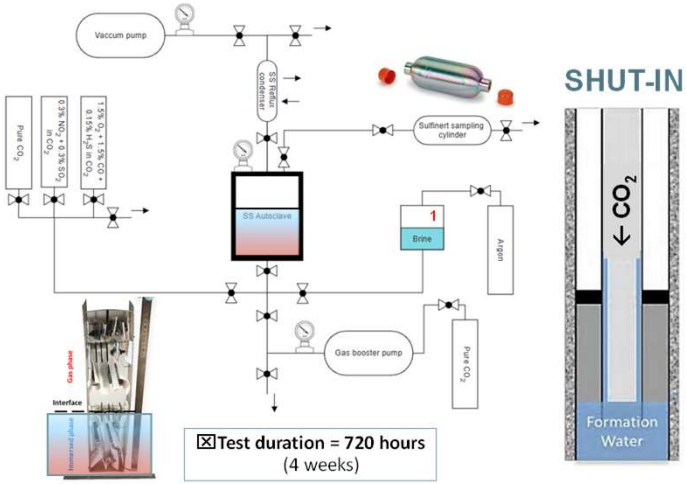
Case study: ***Corrosion of CRAs during storage***



Starting Point: 2 possible scenarios

Formation water flowback
→ Brine saturated with CO2 + impurities
→ Large V/S - Moderated acidity

Water drop out
→ Droplets of strong acids
→ Low V/S – Very low pH

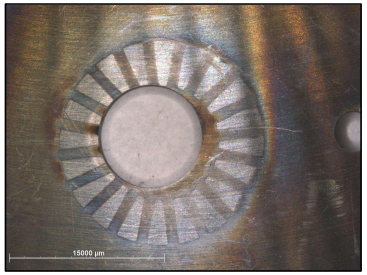


☒Test duration = 720 hours
(4 weeks)

CO_2+100 ppm O_2+100 ppm CO + 10 ppm H_2S + 20 ppm SO_2/NO_2

Scenario 1: Water Flowback during Shut-In

Batch test



Renewal test

Test	Grade	Production route		Supplier	PREN	GAS PHASE			IMMERSED PHASE			PARTIAL IMMERSED PHASE	
						U-bend	Crevice	Corrosion rate (µm/year)	U-bend	Crevice	Corrosion rate (µm/year)	Corrosion rate (µm/year)	Crevice
BATCH AUTOCLAVE TEST	2205	Cold rolled	2E	A	36	PASS	PASS	PASS	PASS	PASS	PASS		
			-	B		PASS	PASS	PASS	PASS	PASS	PASS		
		Hot rolled	1D	A		PASS	PASS	PASS	PASS		PASS		
			1D	C		PASS	PASS	PASS	PASS		PASS		
REPLENISHMENT TEST IN AUTOCLAVE		Cold rolled	2E	A	36	PASS		PASS	PASS		PASS		
			-	B		PASS		PASS	PASS		PASS		
		Hot rolled	1D	A		PASS		PASS	PASS		PASS		
			1D	C		PASS		PASS	PASS		PASS		

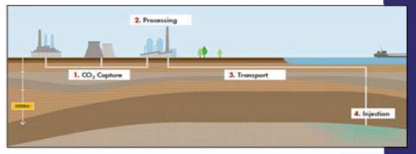
Main outcome – Scenario 1

- 13%Cr not acceptable
- Duplex can be acceptable
- Criticality of gas renewal
- No significant impact of production route
- Work on deconvulution of impurities effect

Work funded by ARCOR MRC10 group

CCUS – Industrial Project

Case study: ***Corrosion of CRAs during storage***

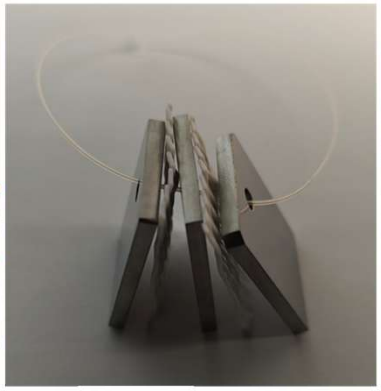


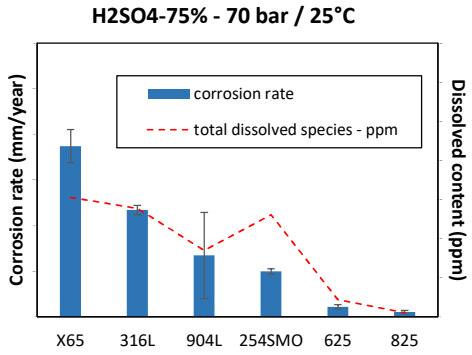
Scenario 2: Water Dropout

- No standardized practices for testing
- Uncertainty on th formation of corrodant at the surface of the coupons

Testing approach:

- Calculation of the acid composition forming in the field
- Work directly in this acid, saturated with CO_2 + impurities at the (P,T) of interest





Insights given by TotalEnergies at EUROCORR 2025 Stavanger, Norway 7 - 11 September

Starting Point: 2 possible scenarios

Formation water flowback
→ Brine saturated with CO2 + impurities
→ Large V/S - Moderated acidity

Water drop out
→ Droplets of strong acids
→ Low V/S – Very low pH

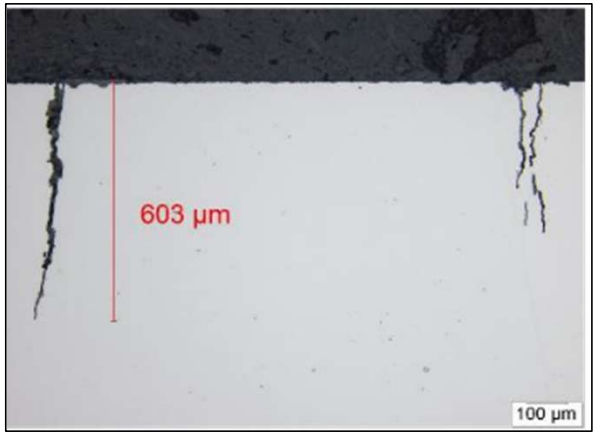
Main outcome – Scenario 2

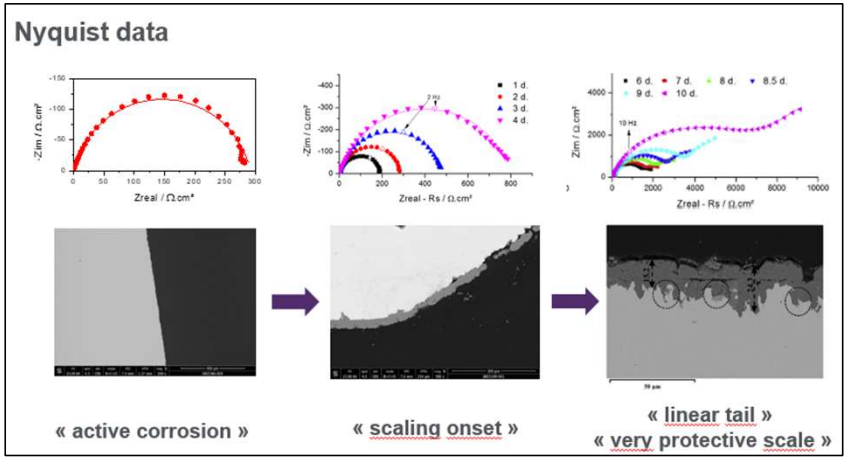
- Ongoing

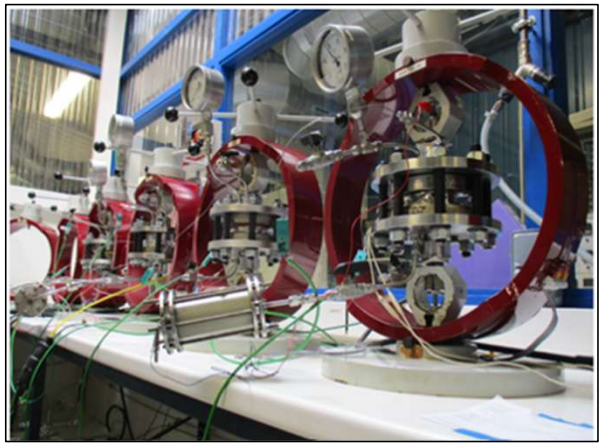
Work funded by ARCOR MRC10 group

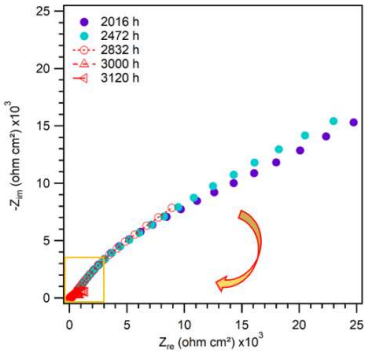
CCUS – Industrial Project

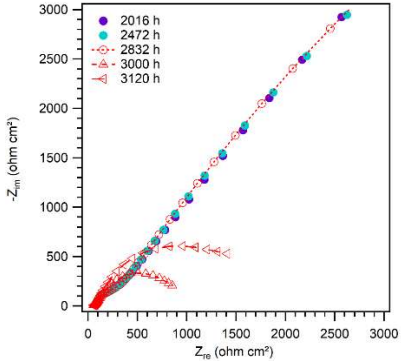
Case study: ***CO_2 SCC of Flexible pipeline***











Starting point

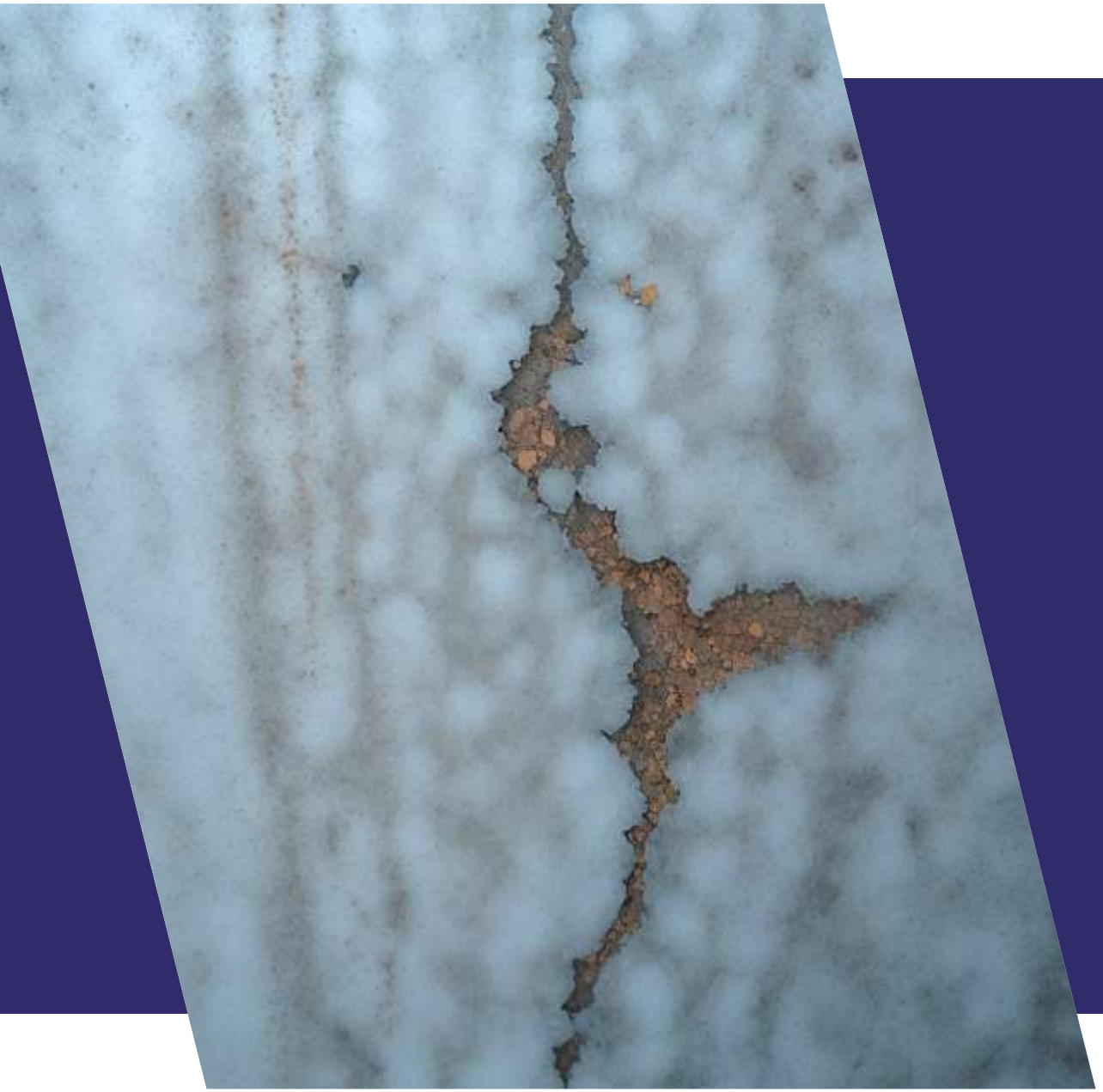
- Flexible pipes have evidenced CO_2-SCC failure of the armor wires
- Annulus = Confined environment, prone to generate scaling and pseudo-passivity
- FCI has worked on reproducing the phenomena in laboratory

Objective

- Develop an experimental technique allowing to follow the different steps of CO_2-SCC initiation and failure

Results

- CO_2-SCC takes place only once a pseudo-passive film has formed
- A change in EIS monitoring is seen when cracking initiates
- Allow to tackle the early stage of crack initiation

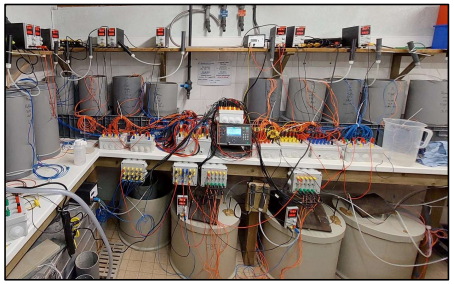


OFFSHORE & SEAWATER

Testing Facilities for Seawater

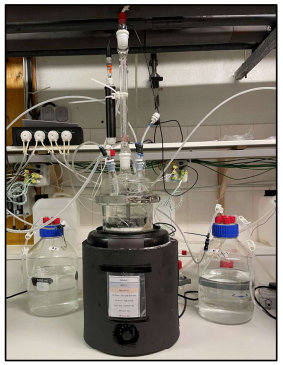
Immersion natural seawater

Cathodic disbondment tests



Exposure and CP in soils

Heated/cooled seawater



Microbially influenced corrosion

Oxygen, Chlorine, Temperature

Fatigue and stress

Natural Flowing Seawater

- Immersion, splash, tidal zone…
- Temperate and Tropical zones

Natural seawater regulated from 4°C to 90°C

- Chlorination, regulation systems
- Oxygen control pollution

In-situ corrosion monitoring

- Measurement of electrochemical potentential, current, cathodic protection

From Lab to Full scale

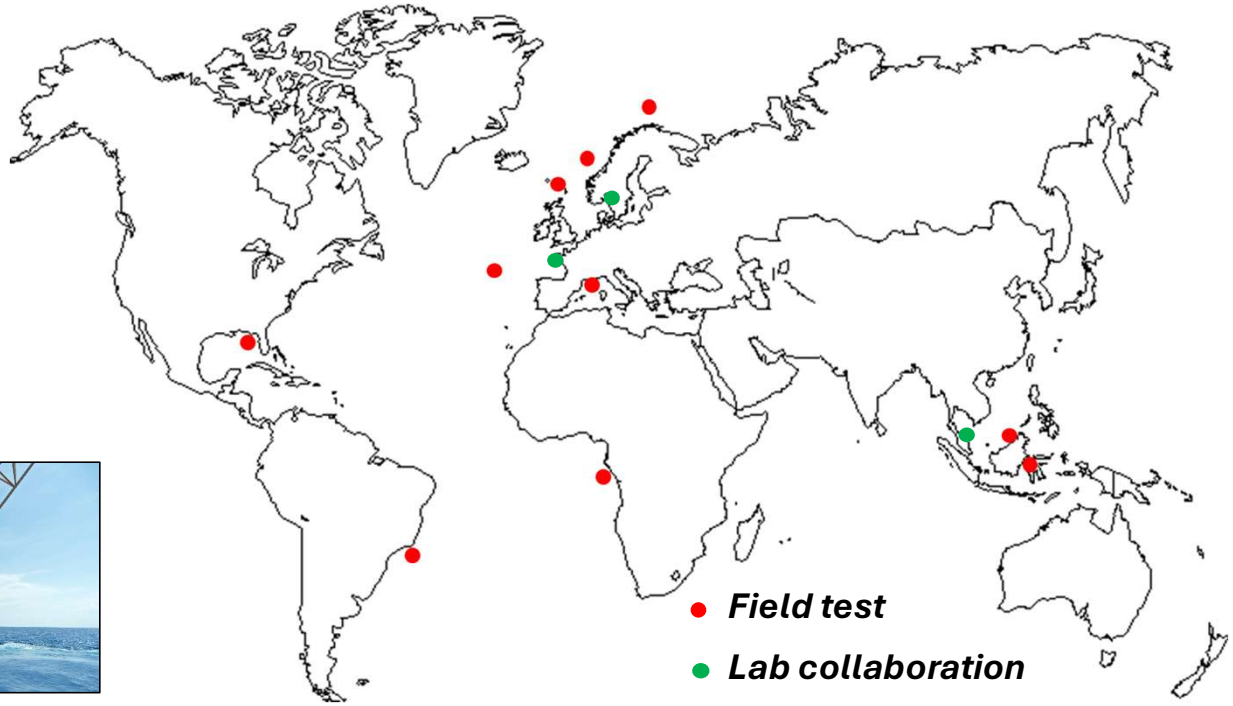
- Instrumented array – anchored lines

Cathodic disbanding tests

Training/courses

- Marine Corrosion and Cathodic protection (EN ISO 15257)

Seawater exposures



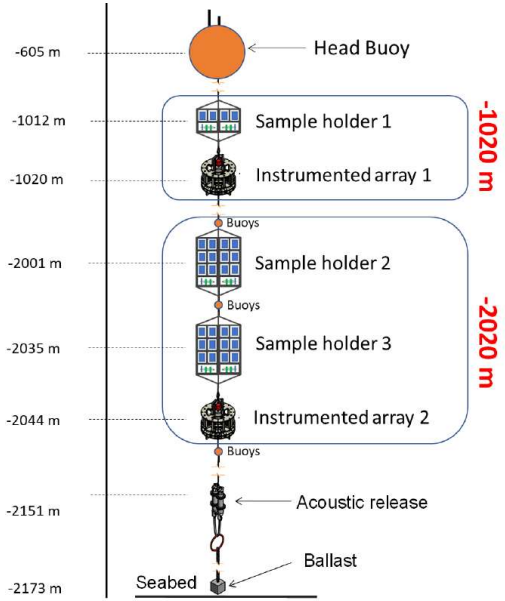
Data monitoring

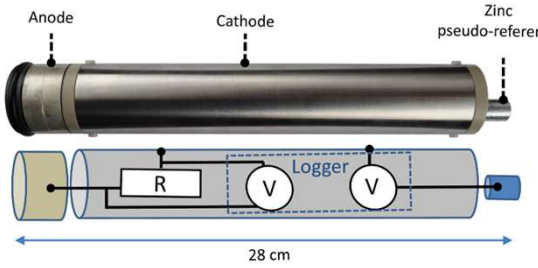
- Data available from many ocean around the world
- Soon in Australia

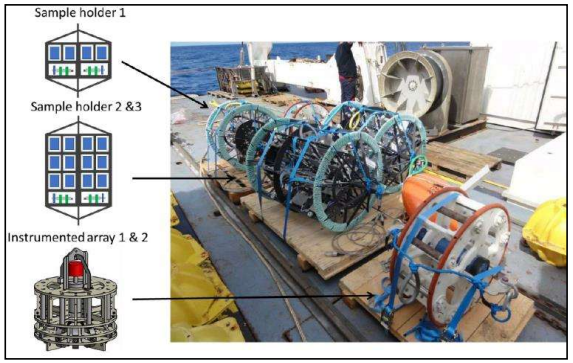
Unique expertise in Anchoring lines

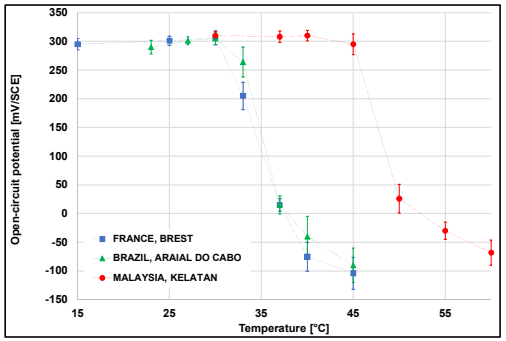
Anchored line

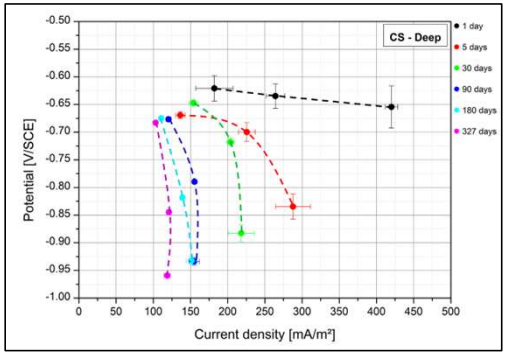
Anchored lines











Pseudo polarization curves for CP design

Data monitoring

- Flow Velocity
- Dissolved O_2
- Temperature
- Conductivity
- Salinity
- Corrosions coupons (crevice, general corrosio,, coating…)
- Biofilm sensor
- SCPC sensor

SCPC Sensor

- Continuous measure of the cathode potential and the coupling current between a cathode and galvanic anode
- Automous monitoring and recording using data loggers and collected after exposure
- Selecting different combination of galvanic anodes and resistors allows for the production of “pseudo-polarization plots”

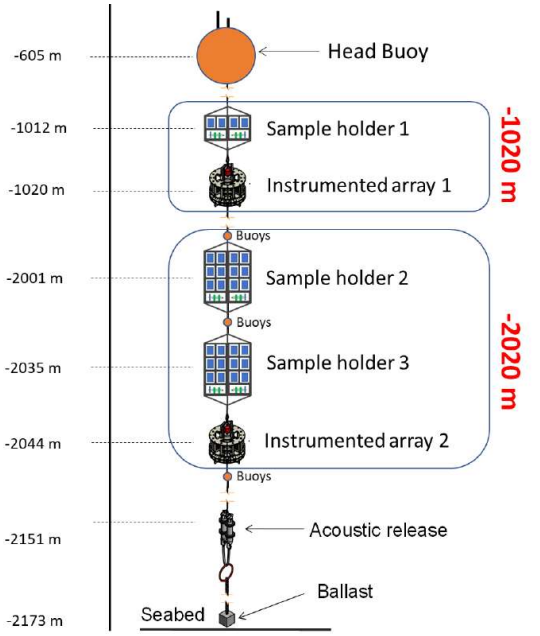
All data together allow for the selection of the appropriate current density demand and CP optimization (e.g. to avoid calcareous deposit formation)

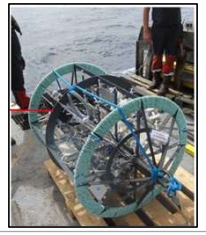
Seawater – Industrial Projects

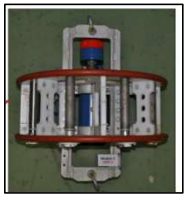
Crevice Corrosion of Subsea Connectors made of superduplex stainless steel (SDSS)

Connection to Cathodic Protection to mitigate the corrosion

« Cementation » of the connection due to calcareous deposits







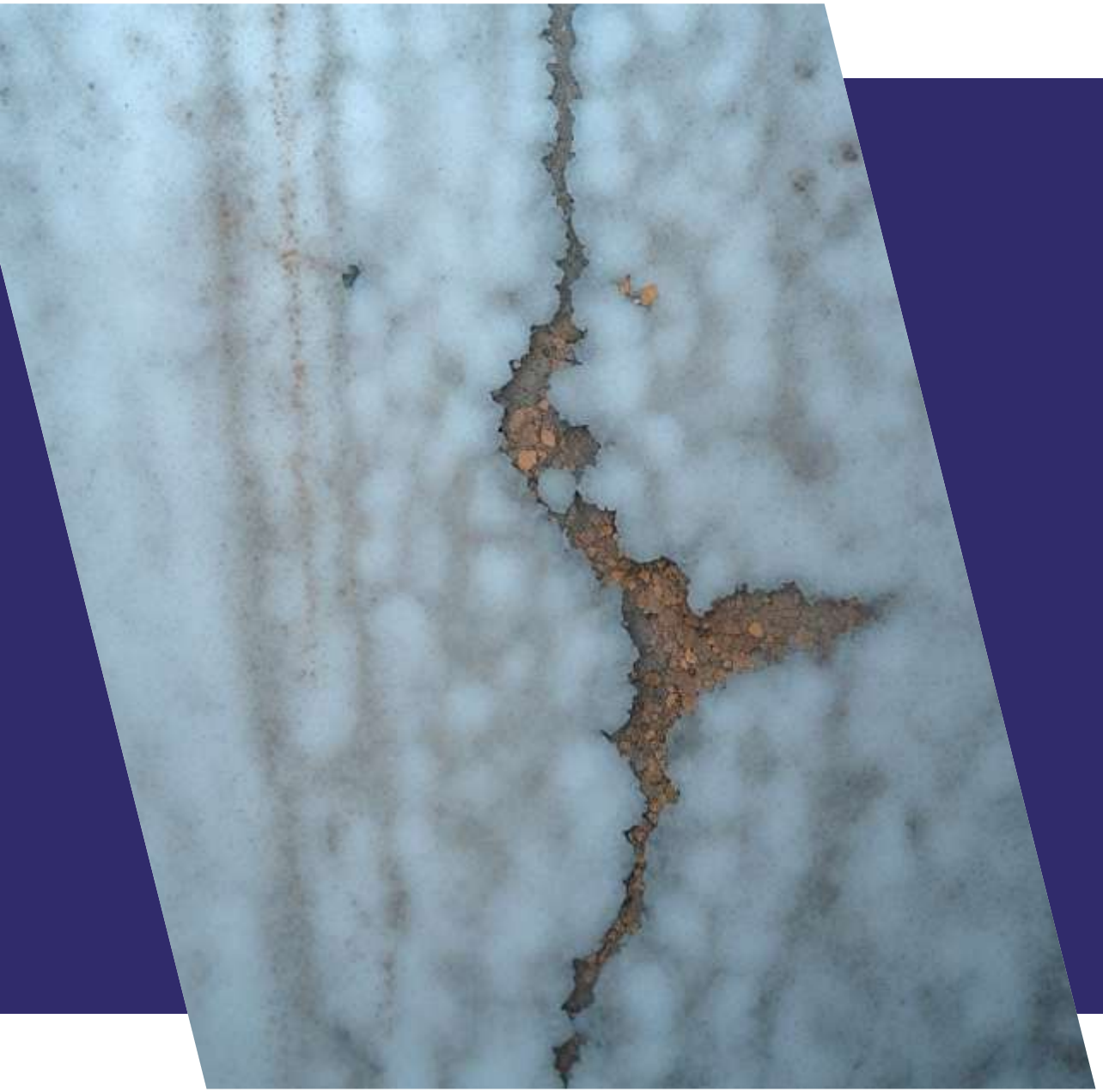
New JIP starting october 2025 – 2 years

- Sponsors :
- Partners

Aim: Is it possible to mitigate both corrosion and calcareous issue of 25%Cr connectors for both new and corroded equipment ?

- Determine the actual critical cathodic potential to mitigate crevice corrosion
- Quantify the benefit of limiting the applied potential on calceous deposit formation
- Test of various coatings
- Evaluate the impact of (DC) strai current on localized corrosion enhancement

Anchored lines will be deployed during the project



ATMOSPHERIC CORROSION

INDOOR & OUTDOOR TESTS

Test Facilities/ Indoor

Standard Tests

- Climatic chambers (-40°C/+200°C)
- Salt spray chambers
- Combined salt spray/rain and climatic chambers
- UV & Condensation
- Corrosive gas chamber (SO_2, NO_2, NH_3, H_2S, Cl_2)

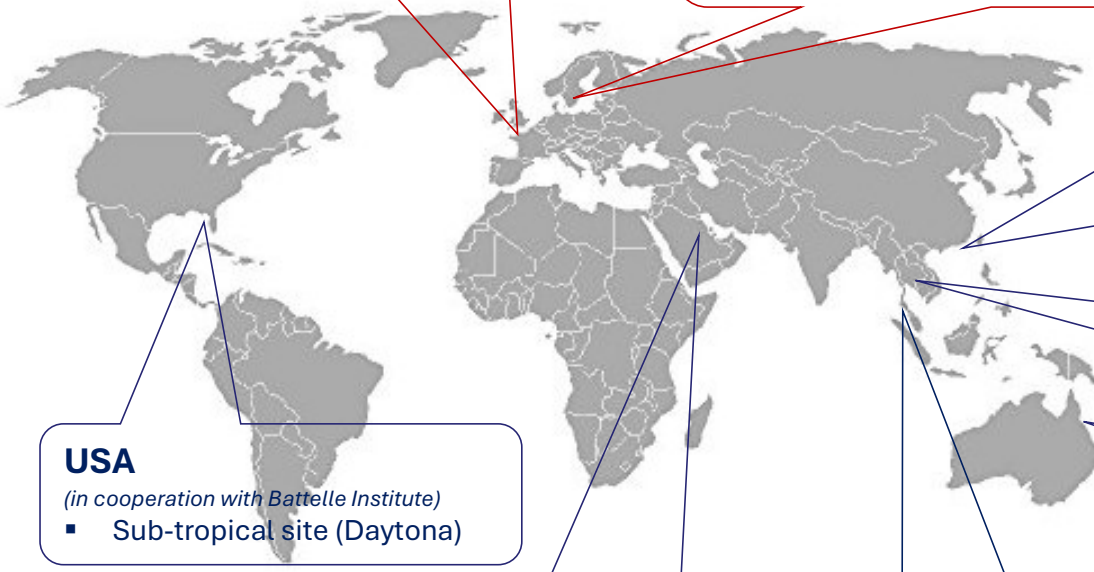
Walkin-Chamber

- Possibility to test full size components
- Internal size: 2000 x 3000 x 2400 mm
- Volume : 12 m^3

Test Facilities/ Outdoor

France
- Marine field sites - Brest
- Rural site – Center of Brittany

Sweden
- Marine field sites - Bohus-Malmön (west coast)
- Rural site - Ryda (Enköping)
- Subarctic site - Gällivare



China
(in cooperation with Qingdao Marine Corrosion Institute & China Weathering Test and Research Institute)
- Marine/industrial site - Qingdao
- Marine tropical site- Wanning

Thailand
(in cooperation with TISTR)
- Urban site - Bangkok

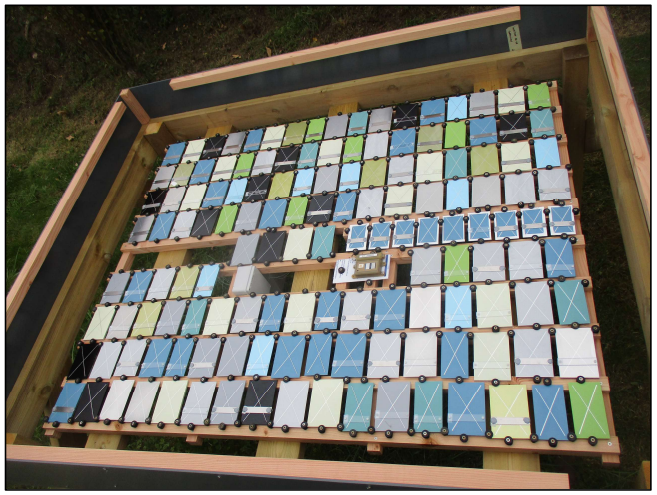
USA
(in cooperation with Battelle Institute)
- Sub-tropical site (Daytona)

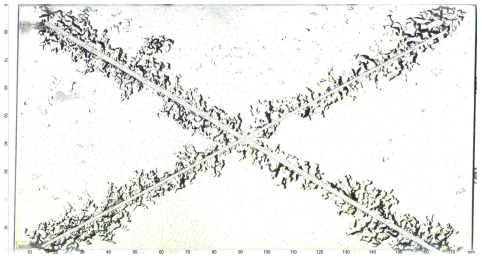
Australia
(in cooperation with Allunga lab.)
- Wet site (High T, RH, rain)- Tully

Qatar (Doha)
(in cooperation with QEERI)
- Dry, UV & sand abrasion site

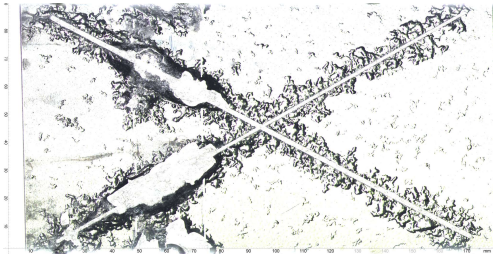
Singapore
(in cooperation with NUS)
- Marine tropical site

Current Projects in Aerospace



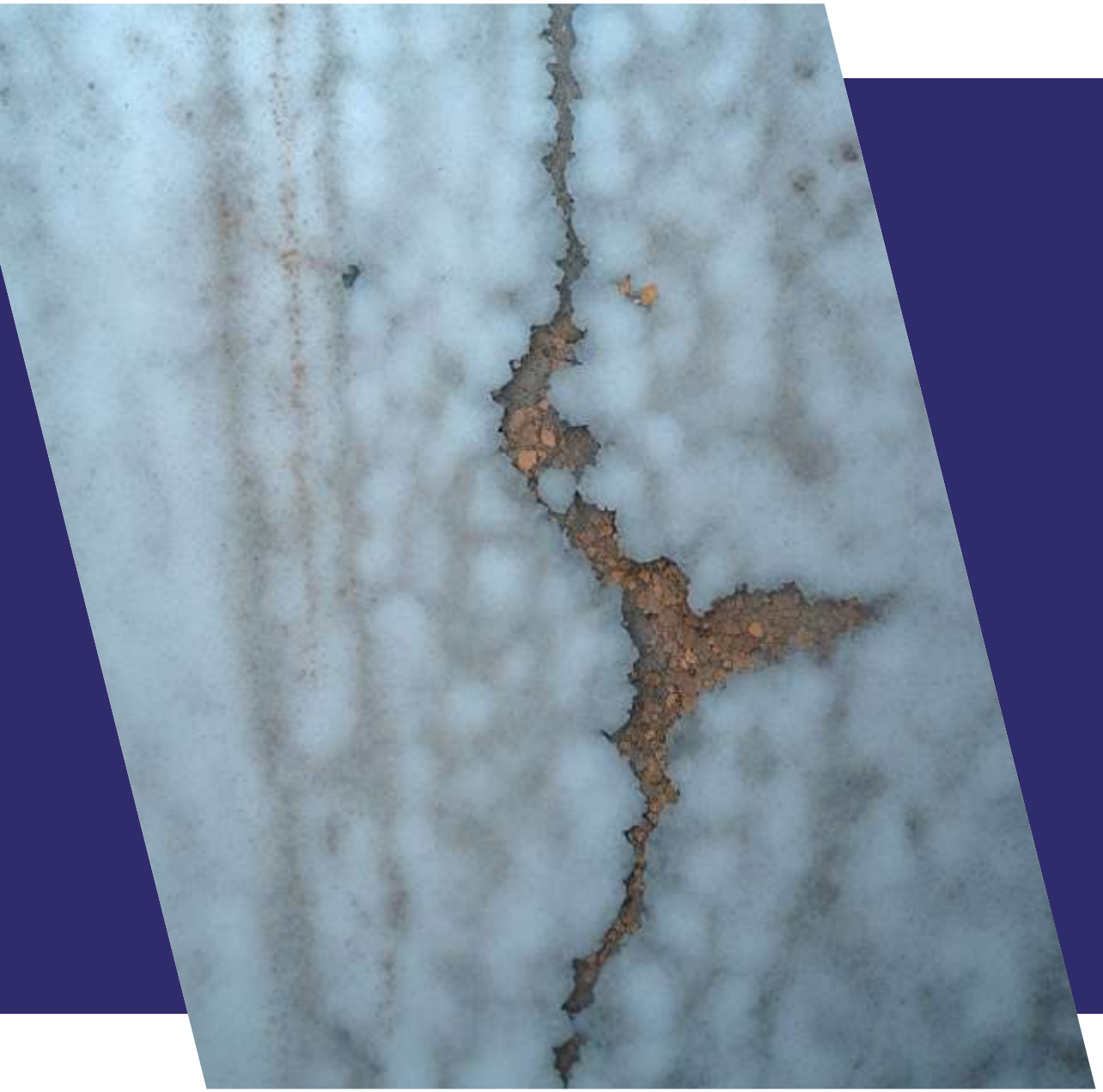


Effect of galvanic coupling



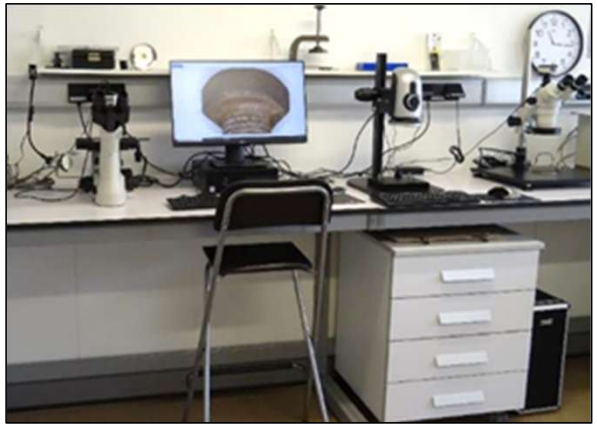
"PerfPaintAlu" Project: Investigation of the corrosion performance of indoor reach materials

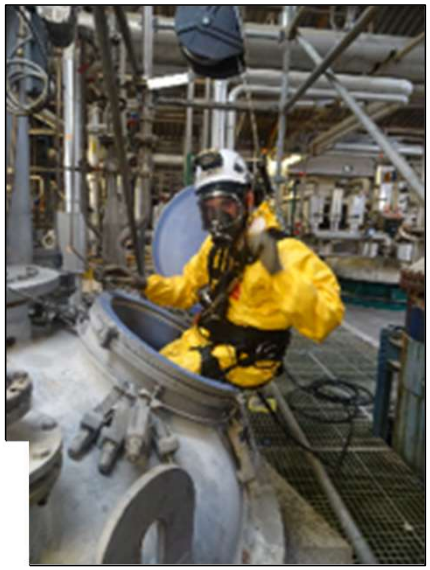
- Development of a testing protocol for indoor Cr free coating (with different configurations : confined, galvanic coupling)
- Assessment of the long-term durability and corrosion performance of indoor reach systems
  → Development of a "greenhouse" to study condensation

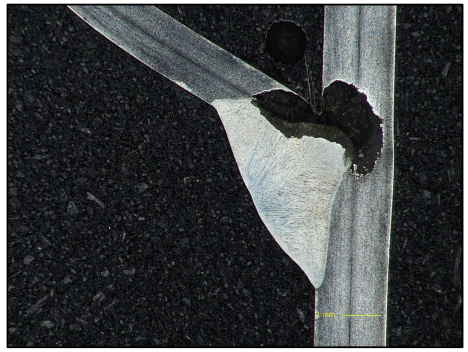


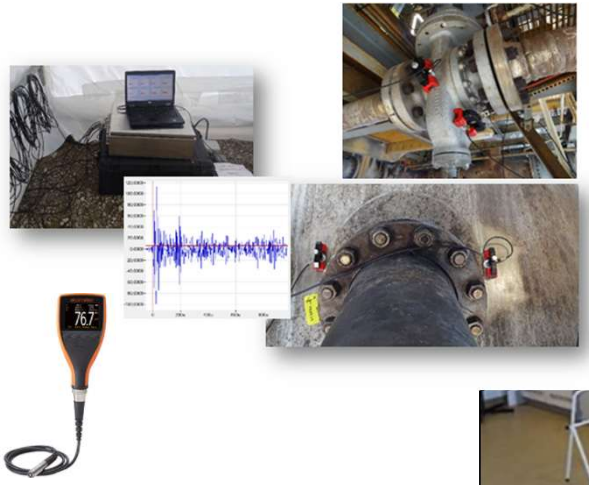
CORROSION IN CHEMICAL AND PROCESS INDUSTRIES

An Industrial Support in Process









A team working at the industrial level

- Analysis of corrosion in relation with the process
- Inspection, diagnosis and on-site studies
- Laboratory evaluations
- Material selection adapted to the process
- Capitalisation of knowledges
- Recommendation after corrosion observation on site

Equipments adapted to our industrial support

- Ultra-sonic monitoring
- Coating thickness measurements
- Composition analyses and replicas
- On-site macro and micro-observations
- In-lab failure analyzes
- X-Ray fluorescence
- Portable hardness tester
- Metallography laboratory
- Autoclaves and ovens
- Testing tailored to the industrial support

THANK YOU

FRENCH
CORROSION
INSTITUTE