NUCLEAR RESEARCH INSTITUTE

Mechanical and Corrosion Testing Department
Integrity and Technical Engineering Division

CORROSION MECHANICAL TESTS IN AUTOCLAVES FOR IRRADIATED AND NON-IRRADIATED MATERIALS

High temperature autoclave with water loop (ÚJV design)

Value for customers
- Comprehensive services in the field of corrosion mechanical testing in accredited laboratory (in close collaboration with the other accredited laboratories within the UJV Integrity and Technical Engineering Division)

Applications
- Corrosion mechanical testing and evaluation of properties of materials exposed in the primary circuit environment or gas environment (pressure, temperature, chemistry) and others

What we offer
- 7 autoclaves in operation with water loop for unirradiated and irradiated properties quantification
- Undertaking corrosion mechanical tests on irradiated and non-irradiated structural materials and analysing the results in accordance with various international standards:
  - Crack growth rate (CGR) test, stress corrosion cracking (SCC) initiation test in a corrosive environment on irradiated RCT and unirradiated 0,5T-CT specimens
  - Slow strain rate tests (SSRT) on both irradiated and unirradiated mini tensile specimens (diameter 2 mm), evaluation of the sensitivity of material to environmentally-assisted fatigue (EAF) and irradiation assisted stress corrosion (IASCC) testing

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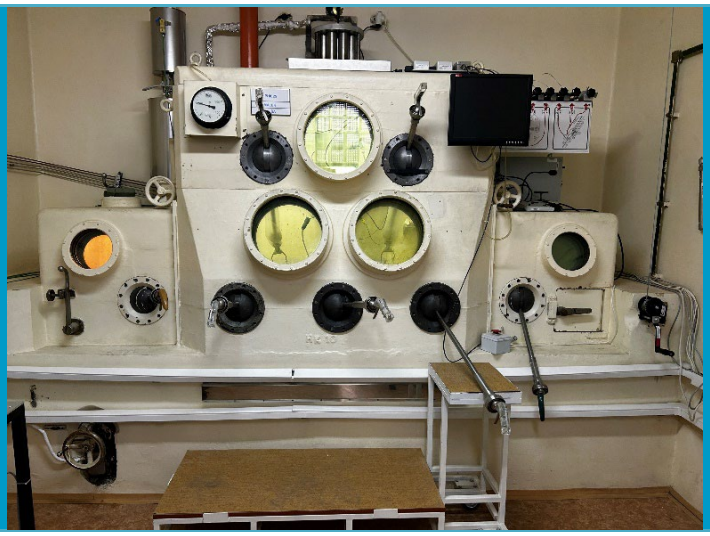
- Low cycle fatigue (LCF) test in a corrosive environment on unirradiated tensile specimens (diameter 5 mm)
- Exposition tests of self-loaded unirradiated specimens

- A standard test temperature range - 280 to 320 °C
- A standard test pressure range - 9,0 to 12,5 MPa
- Loading parameters: frequency 0,001 to 0,1 Hz, triangular, sine, saw teeth, holds and delays, constant loads
- Online monitoring during tests: temperature, pressure, load, flow rate, displacement, conductivity (outlet/inlet), O_2 concentration, H_2 concentration, electrochemical potential, oxidation-reduction potential, dc potential drop technique for crack length measurements

Our references

- Assessing the impact of radiation damage on the corrosion mechanical properties of WWER 440 and WWER 1000 reactor pressure vessels
- Evaluation of materials from surveillance programmes of WWER 440 and WWER 1000 reactors
- Participation in international projects on LCF Incefa PLUS, Incefa SCALE and a national project for TACR (Technology Agency of the Czech Republic)
- CGR tests on irradiated samples performed within EPRI projects



High temperature autoclave in hot cell for CGR test with water loop (ÚJV design)