

Material and structural engineering

Our strength: double expertise in materials engineering and NonDestructive Testing & Evaluation



Offers / expertise

Mechanical tests and analyses

to assess all aspects of product quality and safety at all stages of the product life cycle.

Characterization and qualification programs

on specimens and complete small & full scale structures, from the simplest to the most complex configurations and boundary conditions.

Wide range of modular test benches

allowing to carry out standardized or specific tests, in static conditions (tension, compression, hydraulic pressure,...) or in dynamic conditions (fatigue,...), as well as the simulation of different load scenarios that the industrial equipment under test is subjected to.

Our expertise

- Support of manufacturers (from the energy sector in particular), in mechanical validation of materials and structural parts subjected to extreme environmental conditions
- Expertise on the analysis of the behaviour of new materials, composites, metals, hybrid structures....
- Specialization in cryogenic tests (temperature below -150°C) on specimens and structures

Dedicated instrumentation

Approach associating Acoustic Emission monitoring to the design and mechanical engineering, in particular for composite parts and structures conforming the adopted solutions.

The combined use of standard and Acoustic Emission instrumentation allows the evaluation of the mechanical behavior and damage tolerance of materials and structures, respectively.

Cybernetix presents a large variety of equipment allowing the measurement of :

- Load - Effort
- Displacement
- Strain
- Vidéo (Infrared, surveillance,...)
- Pressure
- Temperature
- Macro & microscopic damage threshold by acoustic emission

Test under controlled environment

Equipped with standard environmental chambers, we are also able to develop new test equipment (specific tests on structures)

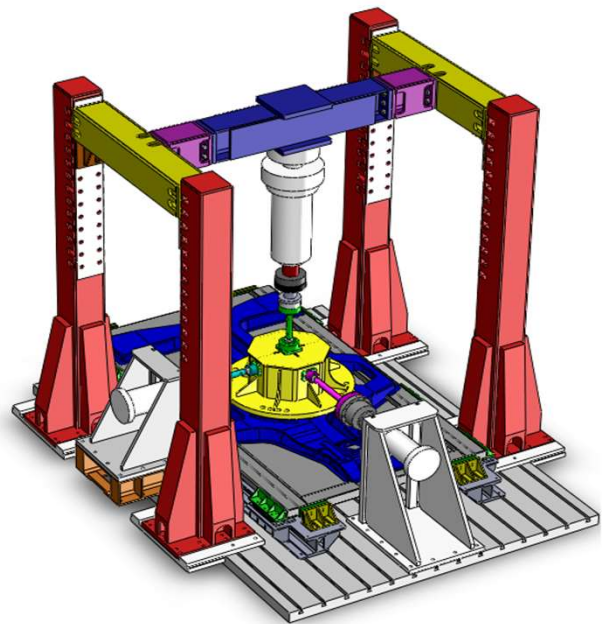
- Long term ageing tests (pressure-temperature combination)
- Mechanical tests at controlled temperatures ranging from -170°C to +300°C (development of specific conditioning chambers)
- Pressure tests (cycling, hydraulic bursting... up to 2000 bars)



Our resources

Our machinery park allows us to carry out tests from specimens to full scale structures:

- Fatigue test benches instrumented with 10 to 600 kN force cells
- Universal static testing machines equipped with various test fixtures
- Instrumented Charpy test bench (3 m/s and 50 Joules)
- Falling weight impact testing machine (6 m/s et 200 Joules)
- Creep and relaxation test benches, adapted to composite materials, reinforced and virgin polymers
- Hydraulic pump (2000 bars)
- Pressurization skids (max. 100 bars)
- Ultrasonic inspection tanks for specimens control before and after testing
- Internally developed benches for specific needs (fatigue testing, resistance to cryogenic conditions)
- Outdoor test facilities



Main application

- Specific or standard tests according to customer specifications
- Loading types : tension, bending, torsion, compression,...
- Static testing
- Impact testing
- Fatigue testing
- Creep and Relaxation testing
- Low and high temperature testing (from -170°C to +300°C)
- Hydraulic pressure tests up to 2000 bars
- ...

Tri-axial mechanical test platform

- Fully modular and adaptable to the specific needs of our customers
- Tri-axial platform (5x4 meters) capable of characterizing samples and structures up to full scale
- Platform equipped with actuators of capacities up to 600 kN that can operate independently or simultaneously (servo, master/slave), allowing complex combined mechanical loading, in static and dynamic (up to 100Hz) modes as well as under specific environment.