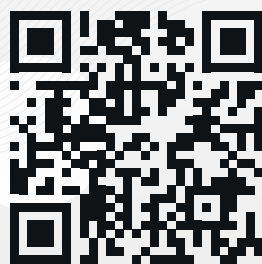


# MECHANICAL TESTING IN GASEOUS HYDROGEN ENVIRONMENT UP TO 1500 bar

Testing facilities for the characterization of materials and welds in a wide range of testing conditions (type of gas, pressure, temperature, loading conditions, specimen geometry) to fulfill the needs in different fields of industry and to propose services and support for research and development.



The **Italian Institute of Welding (IIS)** and **SIDER TEST** merged their skills and knowledge to set up a new laboratory dedicated to testing under gaseous hydrogen environment up to 1500 bar:  
**H2 IIS SIDER.**



✉ [info@h2iis-sider.it](mailto:info@h2iis-sider.it)

🌐 [www.h2iis-sider.it](http://www.h2iis-sider.it)

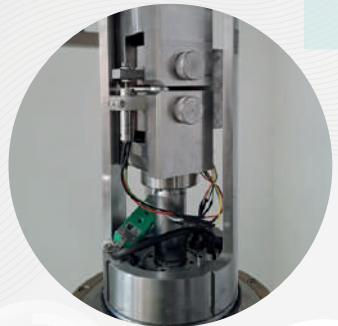


## HYDROGEN TESTING FOR INDUSTRY

System Pressure



Through advanced facilities, a wide range of technical proposals can be offered to the industry: qualification of materials, research and development, tailor made studies, technical support and anything to meet your technical needs.



### STATIC TESTS

- Slow Strain Rate Test (SSRT) on smooth or notched specimens, according to ASTM G129, ASTM G142.
- Fracture mechanics tests ( $K_{IC}$ ,  $J_{IH}$ ), according to UNI EN ISO 11114-4 method B, ASTM E399 and ASTM E1820.
- Test on hollow or tubular specimen (regulatory reference under development).

### LONG-TERM TEST

- Determination of resistance to Hydrogen assisted cracking (threshold value) on fracture mechanics specimens,  $K_{IH}$  (constant deformation tests), according to UNI EN ISO 7539-6, UNI EN ISO 11114-4, method C and ASTM E1681.
- Measurement of hydrogen embrittlement by step-loading, according to ASTM F1624.
- Constant load tests on smooth and notched specimens.

### FRACTURE MECHANICS TESTING

TEST UP TO 1500 bar in

### CYCLIC TESTS, FATIGUE

- Determination of Fatigue Crack Growth Rates ( $da/dN$  vs.  $\Delta K$  curves) according to ASTM E647.
- **Fatigue** tests (S-N curves,  $\epsilon$ -N curves) both on standard or notched specimens and on hollow or tubular specimens.

### CUSTOMIZED TEST

H2 IIS SIDER was born to perform tests under H<sub>2</sub> gaseous environment up to 1500 bar on specimens with different geometries: smooth, notched, fracture mechanics specimens and hollow or tubular specimens.

The execution of tests is performed side by side with engineering support particularly during the review of technical specifications, test planning and interpretation of results.



Different testing environments thanks to a set of equipped autoclaves for static, cyclical and long-term tests.

