MINIMIZE DAMAGE, AVOID OPERATION INEFFCIENCIES AND IN-SERVICE FAILURES

Materials operating in low-temperature service must retain suitable properties including elongation, yield, and tensile strength, and ductility. Element offers a full range of mechanical testing services on advanced materials at cryogenic temperatures to ensure they perform as expected in these extreme conditions.

OUR SERVICES

Materials operating at low service temperatures must maintain mechanical properties such as elongation, yield, tensile strength, and ductility appropriate to the service environment. Element offers a comprehensive range of mechanical testing at cryogenic temperatures on different types of materials to ensure that they will perform in particularly critical conditions.

Several industrial sectors are continuously exploring new materials in search of better performing chemical properties. Laboratories are therefore called upon to develop new test methods that include testing at very low temperatures in order to certify their compliance characteristics. With one of the most comprehensive materials testing ranges, Element has the expertise and experience in performing mechanical tests using low cryogenic fluids to provide thermal environments as low as 4 K (-268 °C/-450 °F).

We are able to follow our customers from sample design and prototyping, to test plan development and engineering analysis and consultancy, so that we can guarantee high quality, reliability and optimal performance of materials operating at low temperatures.

CRYOGENIC TESTING CAPABILITIES

Our state-of-the-art laboratories utilize the latest testing facilities and equipment to carry out cryogenic testing in Helium cooled down to as low as 4.7K and in liquid nitrogen (LN2).
We can evaluate and test such materials as austenitic stainless steels, steel alloys, aluminum alloys, composites, and Al-Li alloys. Using our most advanced computer systems, we are able to monitor control rooms and equipment for seat leakage, temperature, oxygen, and pressure.

CRYOGENIC TESTING SERVICES

Our testing services at cryogenic temparatures down to 4 Kelvin include:

- Mechanical Fracture Toughness
- Fatigue Testing
- Tensile Testing
- Charpy Impact Testing
- Fatigue Crack Growth Rate (FCGR)
- Surface Crack Tip (SCT)

Our cryogenic testing services not only assure the high performance of your materials but also help you optimize costs, improve operational safety, and reduce environmental impact in even the most challenging operating conditions.

STANDARDS AND GUIDELINES

The main guidelines and standards for testing include:

- ASTM E1450: Standard Test Method for Tension Testing of Structural Alloys in Liquid Helium
- JIS Z 2277: Method of tensile testing for metallic materials in liquid helium
- JIS Z 2283Method of low cycle fatigue testing for metallic materials in liquid helium
- JIS Z 2284 Method of elastic-plastic fracture toughness Jic testing for metallic materials in liquid helium
- ISO 6892-4 Method of test in liquid helium

We use the above test standards as guidelines, however; our Engaged Experts can work with bespoke dimensions, shapes, and test conditions and advise you on the most suitable test specification for your unique project needs.

ELEMENT

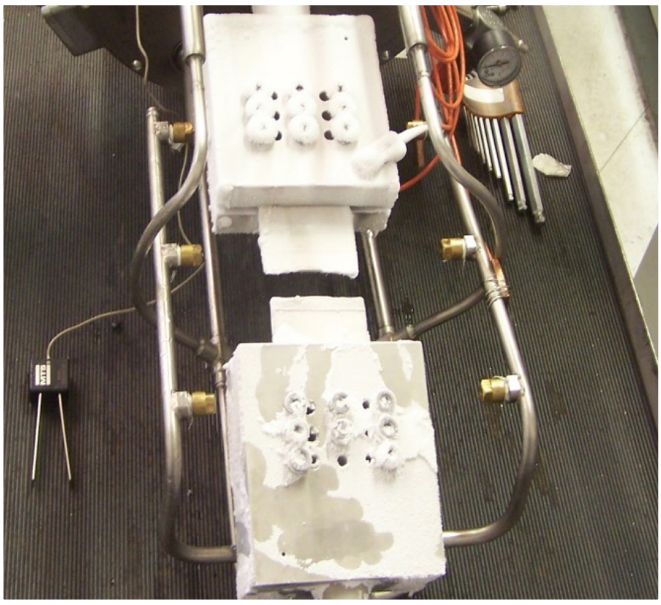
As one of the leading providers of testing services to the Energy sector, Element Milan has over 40 years' experience in supporting customers with a comprehensive range of materials testing, failure analysis, engineering consulting and welding services.

Working in ever-deeper waters and harsher environments, Element Milan specializes in qualifying materials and fabrication procedures to meet industry standards and to ensure that assets operate as expected when deployed and are safe, compliant and fit for purpose.

The qualification methods used include mechanical, corrosion, stress, creep rupture and fatigue testing, chemical analysis, fracture mechanics, and metallographic examination. Tensile tests, impact tests, SCT, CT and fracture mechanics and fatigue tests are also carried out using special chambers designed to keep temperature as low as (-269 °C).

The lab conducts Fracture Mechanics tests in sour service environments to provide customers with data for ECA/FFS and recreate the behavior of materials behavior in real operating conditions.

For a comprehensive list of our services, accreditations and approvals, please visit www.element.com



OUR ACCREDITATIONS AND CERTIFICATIONS

- UNI EN ISO 17025:2017
- UNI EN ISO 9001:2015
- UNI EN ISO 45001:2018

ELEMENT MILAN
Via della Pierina 9/11
Crema, 26013 CR

T: + 39 037 389 72 1
O: + 39 037 389 72 00
Email: info.milan@element.com