

Mechanical Testing

– fast, precise and cost-effective solutions



A unique cooperation between the four Scandinavian locally based laboratories within the FORCE Technology Corporation provides a wide range of test facilities and fast, precise, and cost-effective solutions.

General information about Mechanical Testing

Mechanical Testing covers a wide range of disciplines from conventional tensile testing of materials or products to advanced test methods such as Fracture Mechanical Testing.

Designers, manufacturers, users or owners will often benefit from having quality checks on mass produced materials or products to a detailed knowledge of material fracture behavior whether it is a ductile, brittle or fatigue fracture tendency.

In order to fulfill your quality requirements, as well as fulfilling the rules and regulations of material strength and ductility, mechanical tests often provide necessary documentation.

Using conventional test methods such as bend, tensile or impact testing will support you with the required minimum documentation.

Benefits and Accreditations

A deeper understanding of material behavior under influence of loads – tension, compression or fatigue loads – as well as temperature is provided by fracture mechanic and fatigue testing.

No matter if you hold in-house expertise in the field or not, you will always benefit from working close together with our design experts.

Accredited testing ensures a high quality in the testing performed and reliable results.

All FORCE Technology laboratories are accredited according to national accreditation schemes:

- DANAK, the Danish Accreditation body
- SWEDAC, the Swedish Accreditation body
- NA, the Norwegian Accreditation body.

Test methods and equipment

Tensile Testing



Tensile Testing

Manufacturers, suppliers, owners, and authorities often benefit from having the strength of materials or joining methods determined by physical tensile testing.

Verification is typically performed when:

- Material properties must be documented
- Material certificates are upgraded – e.g. from 3.1 to 3.2 material certificates according to EN 10204
- Welding Procedure Testing (WPQR)
- Type testing – e.g. reinforcement steel materials or welded reinforcement steels.

With the advantage of having internal workshops for machining of test specimens, it is ensured that the delivery time is reduced and adjusted to your wish.

Capacity and options:

- Hydraulic test machines with capacity of <math><1 - 1000\text{kN}</math>
- Computerized with advanced data analysis options
- Stress/strain curves available on all tests.

Typical testing standards:

- EN ISO 6892-1 and ASTM A370
- EN ISO 15614-series
- EN 10080 and EN ISO 15630
- EN ISO 6259

FORCE Technology offers tensile testing of:

- steels
- other metals
- Welding procedure (WPQR)
- Reinforcement steels
- plastics and composites.

Fracture Mechanic Testing



Fracture Mechanic Testing using clip gauge and cameras

By using the possibilities in Fracture Mechanic Testing, brittle fracture, crack growth or material defects are analyzed and most likely avoided. Huge structures require huge knowledge by engineers, designers or developers no matter if the structure is a:

- Wind farm
- Offshore platform
- Oil Tank
- Foundation onshore or offshore
- etc.

The most up-to-date software to analyze fracture mechanic test results is at your disposal in the mechanical laboratory.

Typical Fracture Mechanic Testing provides:

- CTOD testing (Crack Tip Opening Displacement)
- Fracture toughness testing determine KIC or J-integral
- Crack Growth Rate

Benefits:

You receive first class data in your test results.

Our team of experienced Design and Stress Analysis Experts are always ready to guide you, or calculate consequences based on the received test results.

Test methods and equipment

Fatigue Testing of materials and joints



Full scale Fatigue Testing of conrods

The need for understanding of materials, joints or products ability to withstand continuous influence of stresses and corrosion environment are increasing these years as designs are being more and more advanced.

As a manufacturer, owner or authority you may wish to get this understanding in the most efficient way minimizing the time and costs during the design phase, under operation or in worst case after failure.

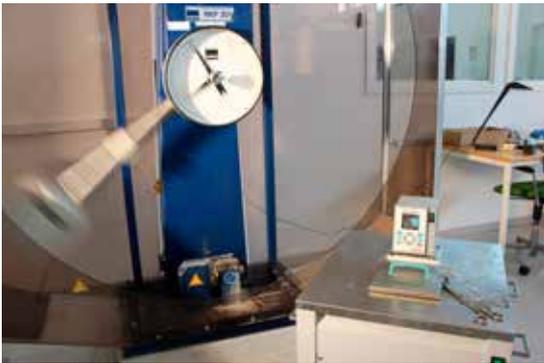
By using our well equipped test machines operating with high as well as low frequencies we can provide you with fatigue curves within few days.

The fatigue testing may be performed by:

- Fatigue testing with a specific load for a specific number of cycles
- Determination of S/N-curves
- Determination of Vöhler-curves
- Determination by staircase method.

With the advantage of having an internal workshop for CNC-machining of test specimens it is ensured that the delivery time is reduced and adjusted to your request.

Toughness Testing



Charpy-V Impact Testing at low temperature

Toughness testing or Charpy-V testing is performed on e.g.:

- steels
- other metals
- Welding procedure (WPQR).

Standards used, e.g.:

- EN ISO 148-1
- ASTM A370.

With the capacity up to 450J

Welding Procedure Testing



Monitoring of weld data and subsequent Mechanical Testing

FORCE Technology offers welding procedure testing (WPQR) of:

- Steels or aluminum
- other metals
- Welding procedure (WPQR)
- Reinforcement steels.

Standards used:

- EN ISO 15613
- EN ISO 15614-1
- EN ISO 15614-2
- EN ISO 15614-7
- ASME IX
- NORSOK
- DNV
- MOGS.



Laboratories and contacts:

Your local laboratories including workshops for machining of test specimens are based in:

Denmark:



Broendby:

Arne Stenbæk Jørgensen

Tel: +45 2269 7589

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