Structural Test and Qualification

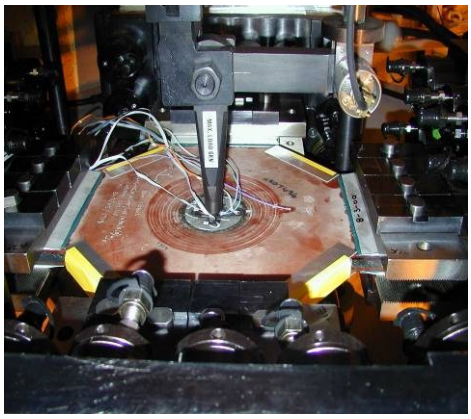
QinetiQ offers a comprehensive mechanical testing service for materials and structures. Experience includes testing of composite, metallic and hybrid structures for a diverse set of international customers. Projects range from certification of advanced aerostructures, to automotive gearboxes, wind turbine health monitoring systems and solar panel arrays.

Specialist composite materials testing

QinetiQ's wide range of jigs & fixtures enable simulation of in-service conditions (under load) for specimens from test coupons to large-scale structural components. For example, the modular wing box facility comprises two independently operated actuators permitting the box to be placed in compression, tension or torsion.

We have a proud history of working with customers to develop bespoke test solutions that improve the performance of their products.

Our experience in test fixture design and manufacture, for use in bespoke or standard test frames (frames up to 2MN with 3m daylight are available), combined with our professional



project and technical management standards, allow us to accommodate complex and technically challenging test requests.

We have a long track record in turn-key services, managing all aspects of test programmes from test definition to test execution and analysis, thus removing the burden on our customers to manage multiple sub-contracts.

Managing the more routine aspects of test programmes through a network of approved suppliers helps us to deliver best value for money, whilst maintaining the required level of technical assurance.

Multiaxial testing service

QinetiQ offers multi-axial testing of materials and structures, including test specimen design guidance to achieve accurate representation of 3D structures. In addition an out-of-plane loading fixture and a fatigue testing capability is available.

The two, purpose built, four actuator biaxial test machines enable load capacities up to 1500kN to be accommodated, whilst the unique 2-axis bolt hole loading mechanism permits the simulation of realistic bearing failure.

Our unique cruciform specimen design developed for use with fibre reinforced composites, has enabled us to test many hundreds of specimens, from planar specimens to joints and bolted structures, in the full biaxial performance envelope (tension-tension, tension-compression, compression-compression). This enables us to offer a fully comprehensive, multi axial testing service.

Fatigue testing service

Fatigue testing is conducted to international standards in accordance with the requirements of our customers and their industries with dynamic load capacities from 25kN to 2000kN and temperature controlled environments: (-70°C to +250°C). Fatigue life and crack growth testing can subject test pieces, joints & components to complex spectrum loading or fretting fatigue.

Testing summary

- Extensive capability in the evaluation of polymer composites, metals and hybrid materials from coupons to structures.
- Experience of certification programmes for composites
- Tension / compression (up to 2 MN)
- Fatigue / fatigue crack growth
- Custom multi-axial test facilities
- Fracture toughness
- High strain rate testing on material coupons
- Instrumented impact
- Bending after transverse impact tests
- Bending, edge tension after impact (TAI) and compression after impact (CAI) tests
- Unsupported single lap shear tests
- Generation of lamina design values
- Bearing by-pass tests
- Design values for damage tolerance CAI
- Generation of plain, open hole and filled hole strength design values
- Generation of thermal expansion (CTE) design values
- Environmental conditioning
- Many recent developments in the design / manufacture of test apparatus for sub-components and structural features

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