GURIT TESTING CAPABILITIES

Gurit Composite Engineering is a specialist consulting company, providing independent services within the field of Structural Engineering for Fibre Reinforced Polymers (FRP), Carbon Fibre Reinforced Polymers (CFRP), and Mechanical Testing with extensive experience in the design of composite structures for over 35 years.

Significant to the design and engineering of composite structures is understanding how the material behaves and performs. Gurit engineering runs an internationally accredited mechanical testing laboratory from the Auckland site, which specialises in the mechanical testing of FRP composites for our customers. The laboratory has been operating since 2005, and holds independent accreditation by IANZ (International Accreditation New Zealand).

Mechanical testing can be done for a number of purposes:

- Design certification and third party approval of as-built properties
- Post build surveys, forensics or to establish repair specifications
- Establish baseline material properties for design
- Research and development to test new ideas, validate concepts and build methods

Key to the success of this laboratory, is that it is run by experienced composite design engineers who have an integrated skill set of engineering analysis, materials and processing knowledge, and are able to design, carry out and interpret testing accurately. This includes design of test specimens for standard programs, design and implementation of customised and specific tests, interpretation and reporting on the results to enable them to be applied to your project or process. This unique service is critical in the modern testing laboratory environment and provides Gurit customers the assurance that test programs and individual custom tests can be relied upon for the design and certification of composite structures.

Mechanical testing laboratory set up with:

- Instron 50kN Universal Test Machine. A-Grade annual calibration report available
- LVDT (Linear Variable Displacement Transducer) - Large scale displacement measurement
- Extensometer - Initial modulus/strain measurement
- Strain gauge controller - Calibrated Vishay 2 Channel Controller. Direct strain measurement including strain to failure.

In addition to the mechanical testing at the Auckland site the test lab is also linked with the Gurit UK test lab for a variety of testing for Tg (DSC and DMTA), fibre weight fraction (by burnoff and microscopy) environmental exposures and additional mechanical testing, as well as links to universities and commercial laboratories for specialised testing.
GURIT PROVIDES TESTING TO THE FOLLOWING STANDARDS UNDER OUR IANZ ACCREDITATION:

a) Tensile tests in accordance with the following standards up to 50 kN force
   - ASTM C 297/C 297M  Flatwise tensile strength of sandwich constructions
   - ASTM D 1623  Tensile and tensile adhesion properties of rigid cellular plastics
   - ASTM D 3039/D 3039M  Tensile properties of polymer matrix composite materials
   - ISO 527-5  Plastics Determination of tensile properties – Part 5: Test conditions for unidirectional fibre-reinforced plastic composites

(b) Compression tests in accordance with the following standards up to 50 kN force
   - ASTM C 365/C 365M  Flatwise compressive properties of sandwich cores
   - ASTM D 695  Compressive properties of rigid plastics
   - ASTM D 1621  Compressive properties of rigid cellular plastics
   - ASTM D 6641/D 6641M  Compressive properties of polymer matrix composite materials using a combined loading compression (CLC) test fixture
   - ISO 844  Rigid cellular plastics – Determination of compression properties

(c) Flexure and stiffness in accordance with the following standards
   - AS 3572.10  Determination of the initial ring stiffness of glass filament reinforced plastic pipes (constant deflection test only)
   - ASTM D 790  Flexural properties of unreinforced and reinforced plastics and electrical insulating materials
   - ASTM D 2344/D 2344M  Short-beam strength of polymer matrix composite materials and their laminates
   - ASTM D 2412  Determination of external loading characteristics of plastic pipe by parallel-plate loading
   - ASTM D 6272  Flexural properties of unreinforced and reinforced plastics and electrical insulating materials by four-point bending
   - ASTM D 7249/D 7249M  Facing properties of sandwich constructions by long beam flexure
   - ASTM D 7250/D 7250M  Determining sandwich beam flexural and shear stiffness

(d) Shear strength in accordance with the following standards
   - ASTM C393/C 393M  Core shear properties of sandwich constructions by beam flexure
   - ASTM D 3165  Strength properties of adhesives in shear by tension loading of single-lap-joint laminated assemblies
   - ASTM D 3528  Strength properties of double lap shear adhesive joints by tension

(e) Density and specific gravity in accordance with the following standards
   - ASTM C 271/C 271M  Density of sandwich core materials

(f) Constituent tests in accordance with the following standards
   - ASTM D 3171  Constituent content of composite materials (weight fraction test only)

(h) Other tests
   - ASTM D 5961/D 5961M  Bearing response of polymer matrix composite laminates (ultimate bearing strength test only)

OTHER CUSTOM & SPECIALITY TESTING*

- ISO 8521  Hoop Tensile Strength of Pipe
- ISO 8513  Longitudinal Tensile Strength of Pipe
- AS 4257.6 (Plastic roof and wall cladding materials – determination of impact resistance)
- Screw retention in composite panels
- Indentation resistance
- Curved beam flexure (through thickness tension)
- Peel

*Further specialist testing is available, please contact us to discuss your project and testing requirements.

CONTACT US

Call or e-mail to discuss your project.

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