

# Composite Materials Testing

Expert material characterization for each and every composite material, helping you to optimize your components, products and processes.



Incorporating composite materials makes for lighter and more resistant products and components, two key parameters for improving competitiveness and differentiation. However, the more companies search for advanced material properties, the more variations we have available. As a result, it is becoming harder and harder to predict each material's in-service behaviour.

For optimum use of composite materials in your products, components and manufacturing processes, you need experts to test and characterize these materials to really know if they are fit for purpose.

## A NETWORK OF FULLY ACCREDITED COMPOSITE MATERIALS LABORATORIES

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Applus+ Laboratories has a network of NADCAP and ISO/IEC 17025 accredited laboratories and experts who specialize in advanced composites and their applications in industries such as aerospace, defense, automotive, railway or renewable energies. As a well-recognised part of the composite material supply chain, we have customer approvals from leading companies like Airbus, Safran and Comac, and a wide service offering covering:

- Support in RandD programs
- Characterization testing
- Qualification testing
- [Manufacturing quality control](#)

We perform tests under the main standard (EN, ISO, ASTM, GB and MIL-STD, amongst others) or tests designed according to the client's specific regulations, like AITM, SP or GD. Our experts test everything from household names to advanced materials with specialised applications, such as polymer matrix composites, reinforced plastics, sandwich type materials (foam core, honeycomb core), carbon fiber composites or fiberglass composites.

## Composites Testing Capabilities

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### **Composites Mechanical Testing (under different environmental conditions):**

- Tensile Testing (Tensile Strength and Modulus, Flatwise, PT, OHT, FHT)
- Compression Testing (Compression Strength and Modulus, PC, OHC, FHC, CAI)
- Flexural/Bend Testing
- Shear Testing
- Fracture Toughness Testing (GIC, GIIC)
- Peeling Testing
- Bearing and Pull-Through Testing
- Impact Testing
- Fatigue Testing (S-N curves)

### **Composites Thermal Testing:**

- Dynamic Mechanical Analysis (DMA)
- Differential Scanning Calorimetry (DSC)
- Thermomechanical Analysis (TMA)
- Thermogravimetric Analysis (TGA)

### **Composites Physical Testing:**

- Resin/Fiber/Void Content (FVC) on Cured Material
- Fiber Areal Weight (FAW)
- Prepeg Areal/Adhesive Film Weight (PAW)
- Resin Content (RC)
- Volatile Content (VC)
- Resin Flow (RF)

### **Composites Fractography and Metallography:**

- Macroscopic and Microscopic examination
- Determination of film thickness
- Fractography (SEM)

### **Composites Non-Destructive Testing (NDT):**

- Automated Ultrasonic Inspection
- Manual Ultrasonic Inspection
- [Immersion Ultrasonic Inspection](#)

## **TEST SPECIMEN AND TOOLING MANUFACTURING CAPABILITIES**

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- Design and manufacture of test tooling
- Manufacture of CFRP specimens, coupons and prototypes
- Test specimen machining