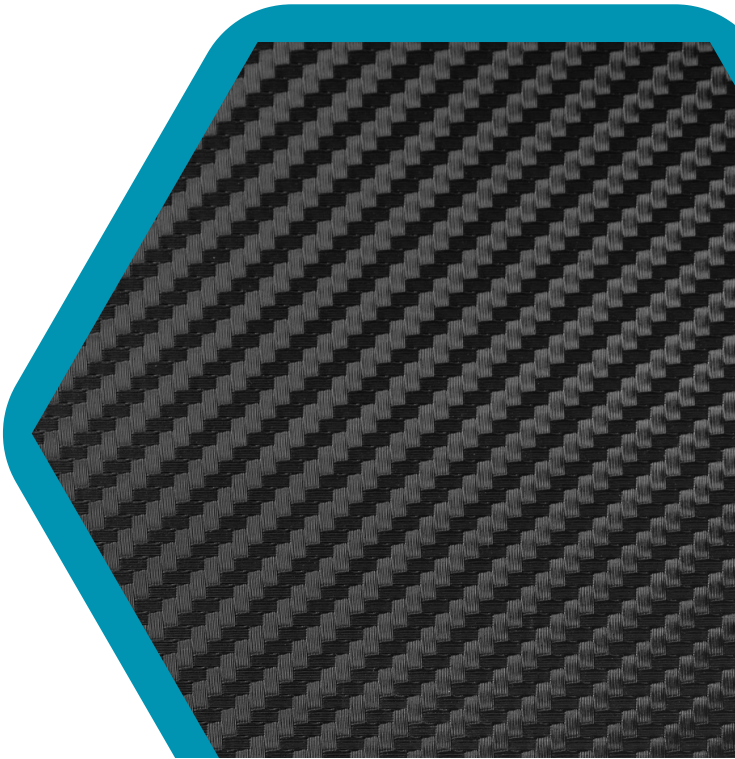
COMPOSITE MATERIALS TESTING CENTER



TEC·Eurolab

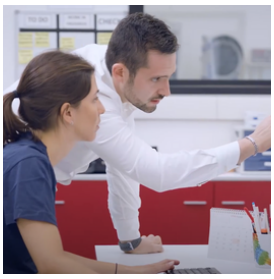
WE MAKE YOU FEEL SURE

TEC Eurolab is a third-party materials testing laboratory: independent, impartial and UNI CEI EN ISO/IEC 17025:2018 and NADCAP accredited.

A center of excellence for laboratory testing and non-destructive testing, we are able to support every manufacturing company in their quest to achieve the highest standards of quality and safety of their products and processes.

We can help you on any specific request.

TESTING



TRAINING

CERTIFICATION

COMPOSITE MATERIALS TESTING CENTER

YOUR CHALLENGE

What tests determine the best performance of a composite material designed and manufactured specifically for a certain application? What are the manufacturing technologies that result in increasingly high-performance components?

The use of composite materials in modern design is going through a phase of increasing complexity. The industrial sectors where composites find their application are very heterogeneous: automotive, aerospace, marine, sport & leisure are strongly impacted by the development of new and increasingly high-performance material combinations, such as the introduction of new production technologies. TEC Eurolab, through destructive and non-destructive testing, accompanies customers in the design and validation of materials that meet specific requirements such as; light weight, mechanical strength, impact energy absorption fatigue resistance, chemical resistance and atmospheric aging. The main goal for TEC Eurolab is to support R&D, design and production departments to be increasingly confident in the selection and use of new materials and technologies.

OUR SOLUTION

Thanks to the transversality of our services, TEC Eurolab is the ideal partner to support companies operating in the various sectors working in the composite materials supply chain, from manufacturers of resins and prepregs, to laminators and final users, to engineering companies that are constantly called to redesign components produced with traditional materials and technologies using composite materials.

TEC Eurolab lab activities can support all production phases: from the R&D, to industrialization and production optimization, working together with the customer to outline a validation test plan for the entire production process.

QUALITY ACCREDITATIONS

- NADCAP: SAE Aerospace Standard AS7003 for Material Testing, Non Destructive Testing, Aerospace quality systems
- EN 9100:2018 for test laboratory for the aeronautical and aerospace industry - UNI EN ISO 9001:2015 (SAI GLOBAL)
- UNI CEI EN ISO/IEC 17025:2018 - material testing laboratory UNI CEI EN ISO/IEC 17024:2012 -UNI CEI EN ISO/IEC 17065:2012 , certification of personnel and services (welding, ATP, NDT, F-Gas, ISO 3834) - (ACCREDIA)
- NOTIFICATION BODY NB2770: as per Regulation (EU) 305/2011 for FCP Certification.

CUSTOMER APPROVALS

- GE AVIATION
- SAFRAN LANDING SYSTEM
- LEONARDO SPA
- AVIO AERO
- AVIO SPA
- ELBIT SYSTEMS
- THE BOEING COMPANY

COMPOSITE MATERIALS TESTING CENTER

WHAT'S YOUR PRODUCT?

TEC Eurolab can support you in conducting destructive, non-destructive and functional testing depending on the type of your product.

COMPONENTS

- CT SCAN
- 2D X-RAY
- METROLOGICAL INSPECTION
- ULTRASONIC TEST
- CUSTOM FUNCTIONAL TEST
- AGING TEST
- ENVIRONMENTAL TEST
- FAILURE ANALYSIS
- MECHANICAL TEST
- CHEMICAL-PHYSICAL TEST
- THERMAL ANALYSIS

MATRIX

- FAILURE ANALYSIS
- MECHANICAL TEST
- CHEMICAL-PHYSICAL TEST
- THERMAL ANALYSIS

LAMINATES/PREPREGS

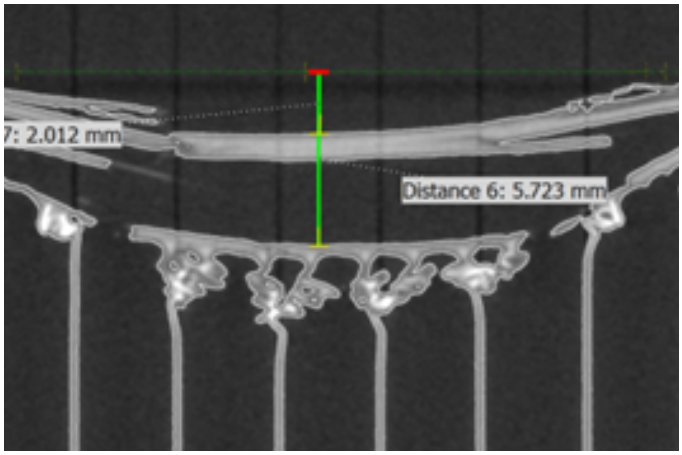
- CT SCAN
- 2D X-RAY
- METROLOGICAL INSPECTION
- ULTRASONIC TEST
- CUSTOM FUNCTIONAL TEST
- AGING TEST
- ENVIRONMENTAL TEST
- FAILURE ANALYSIS
- MECHANICAL TEST
- CHEMICAL-PHYSICAL TEST
- THERMAL ANALYSIS

REINFORCEMENTS

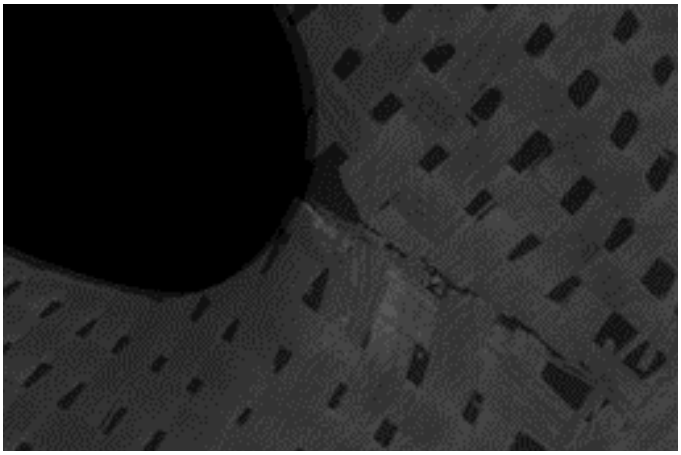
- CHEMICAL-PHYSICAL TEST
- THERMAL ANALYSIS

PERSONNEL QUALIFICATIONS

- UT-Pulse Echo and UT-Phased Array checks performed by personnel qualified to Level II and III ISO 9712 (general industry)
- RT Film and RT Non Film (Computed Radiography / Computed Tomography) checks performed by personnel qualified to Level II and III ISO 9712 (general industry) - NAS 410 / EN 4179 (aerospace)



Damage depth analysis after impact by tomographic volume post processing



Glass fiber and carbon fiber. Fracture propagation through the fibers

AGING AND ENVIRONMENTAL TESTS

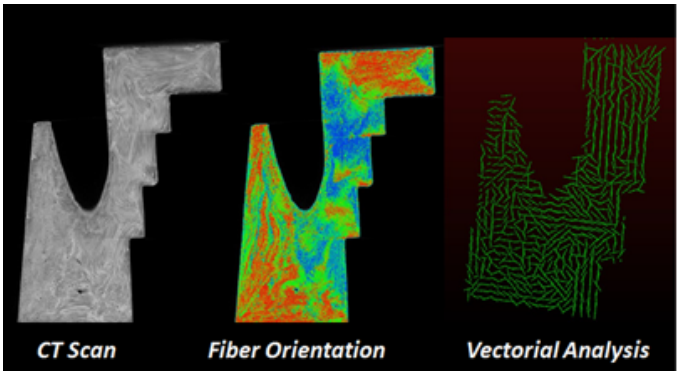
- Extended static thermal conditioning or dynamic thermal cycling (-75 °C to + 180 °C and humidity control from 10%RH to 94%RH)
- Thermal shock (-80 °C to + 220 °C in t <10s)
- Humidistatic chamber (up to 55 °C 100%HR with condensing humidity) ASTM D5229
- UV condenser and xenon lamps
- Neutral, acetic and cupro acetic salt spray chambers
- Fluid contact resistance
- Coating adhesion resistance to substrate
- Pencil hardness
- Gloss values and colometric parameters
- Measurement of coating thickness by non-destructive methods
- Micrographic observations

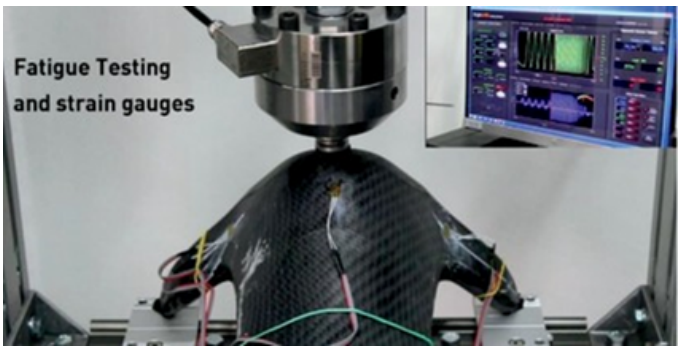
NON-DESTRUCTIVE TESTS

- **Computed Tomography Analysis**: Internal and surface defect analysis, dimensional analysis and CAD comparison, fiber orientation evaluation, lay up analysis, and damage depth analysis after impact
- X-ray inspection (RT, CR, DR)
- Ultrasounds phased array
- **Metrological Inspection**: coordinate measurements machine (CMM) analysis, optical VMM, and laser probing anthropomorphic arms

FUNCTIONAL ENDURANCE TESTS

- Servohydraulic system for dynamic testing of large components (up to 60Hz and 500kN)
- Electromechanical systems static load up to 13kN and dynamic load up to 15kN, Vmax 480m/s, equipped with climatic cell -35°C to +180°C
- Multiaxial dynamic and static test bench with pneumatic actuators. Applicable loads from 500N to 18 kN.
- Pressure benches with air, fluids and inert gases to perform burst tests, pulsating pressures, leak tests (Std. MIL - ISO - DIN - SAE)



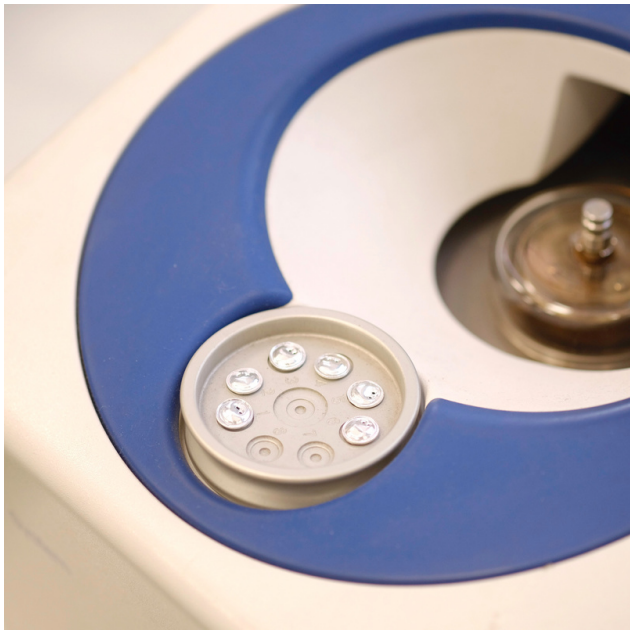


CHEMICAL-PHYSICAL ANALYSIS

- FTIR infrared spectroscopy ASTM E1252, ASTM E168
- Differential scanning thermal analysis (DSC) ISO 11357-1, ASTM D3418, ASTM E1269, ASTM D1356
- Thermogravimetric Analysis TGA)ASTM E1131, ISO11358-1
- Inorganic filler determination ASTM D5630
- Density with hydrostatic balance ASTM D792, ISO 1183-1
- Barcol Hardness ASTM D2583
- Gel time ASTM D3532
- Resin flow ASTM D3531, EN 2332
- Resin-fiber content ASTM D3529, ASTM D3171, ISO 1172
- Fiber areal weight ASTM D3776, EN2329
- Volatile Content ASTM D3530, EN2330
- Void content ASTM D2734
- High Performance Liquid Chromatography HPLC EN 6040
- Thermal diffusivity and conductivity with LFA from RT to + 1000°C ASTM E1461
- Specific heat (CP) ISO 11357-4, ASTM E1269
- Coefficient of Thermal Expansion Linear (CTE) -150°C To + 1000°C ASTM E228
- Moisture content by titration (Karl Fisher Method)
- Dynamic-Mechanical Analysis (DMA) ASTM D4065, ASTM D7028, ASTM D5023, ASTM D5024, ASTM D5026, DIN 53442, EN ISO 6721

MECHANICAL TESTS

- Tensile test ASTM D3039, ASTM D638, ISO 527
- Compression test ASTM D3410, ASTM D6641, ASTMD695, D695 Mod., SACMA SRM-1, ISO 14126
- In-plane shear test ASTM D3518,ISO 14129, EN 6031 (± 45° tension shear)
- Bend test 3/4 points ASTM D790, ASTM D7264, ISO 178, ISO14125
- Compression test after impact (CAI), ASTM D7137, SRM 2R, ISO 18352
- Mode 1 failure test - Double cantilever beam ASTM D7137, SRM 2R, ISO 18352
- Mixed mode fracture test 1-2 - Interlaminar fracture ASTM D6671
- Bearing Test ASTM D5961, ISO 12815
- Open-hole tensile test ASTM D5766, EN6035, ASTM D6742
- Sandwich: flatwise tension ASTM C297, AMS-STD-401
- Sandwich: flatwise/edgwise compression ASTM C365, ASTM C364
- Sandwich panel shear ASTM C273
- Sandwich panel: long beam flexure ASTM D7249, ASTM D7250
- Climbing drum peel – Floating roller peel test ASTM D1781
- Interlaminar shear strength (ILSS) ASTM D2344, ISO 14130
- V-Notched beam test method ASTM D5379



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