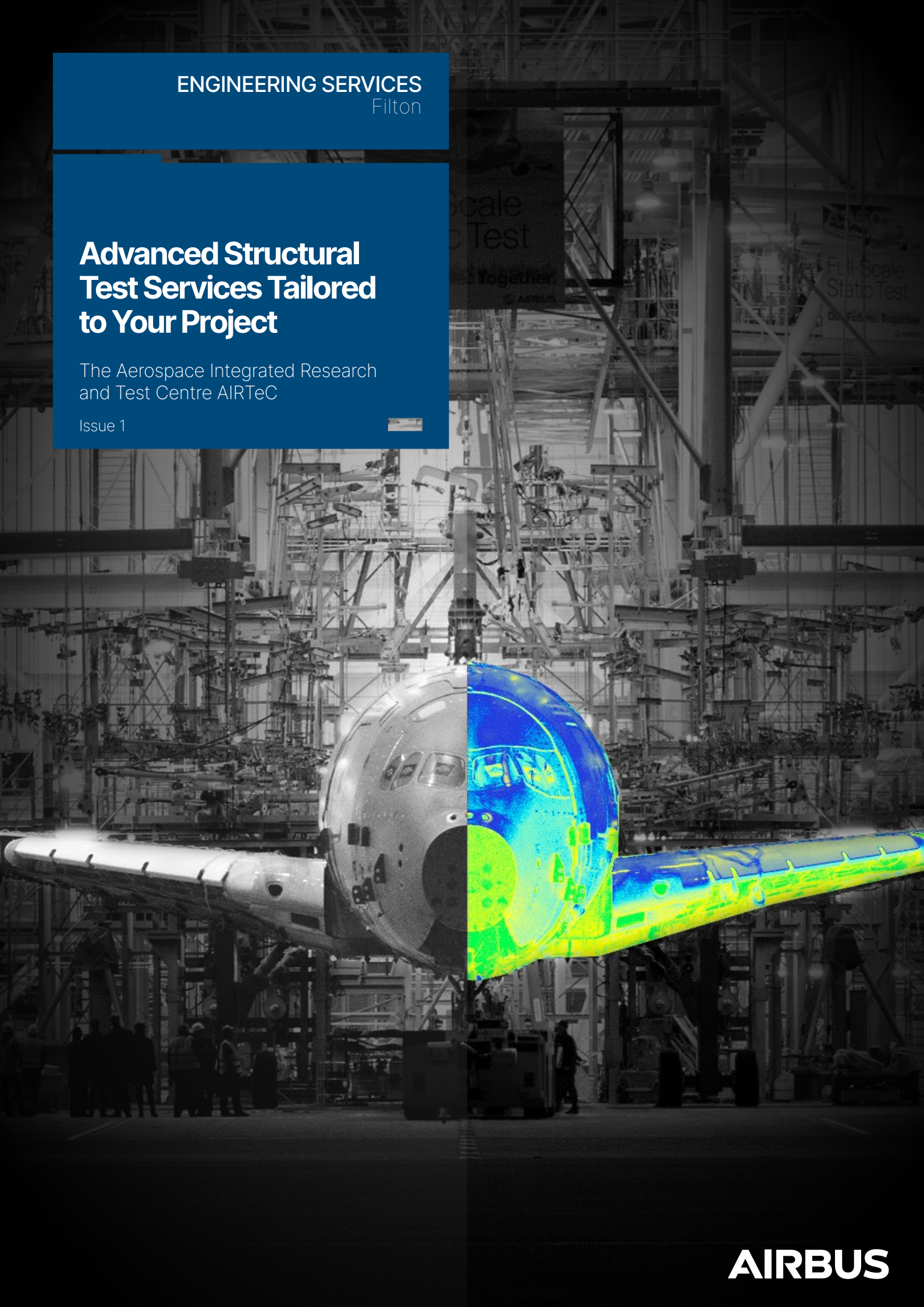
ENGINEERING SERVICES
Filton

Advanced Structural Test Services Tailored to Your Project

The Aerospace Integrated Research and Test Centre AIRTeC

Issue 1



AIRBUS

Welcome to AIRTeC

Meet our Structures Test team...

Pete Smith
Head of Airframe Structures Test, Airbus Commercial and Building Custodian AIRTeC

The Aerospace Integrated Research and Test Centre (AIRTeC) provides comprehensive research and testing facilities and capabilities for evaluation of materials and structures. While wholly owned and operated by Airbus, the facility is available for external & collaborative use.

Explore our brochure to discover how AIRTeC can support your organisation or project. AIRTeC can also be a gateway to other Airbus facilities located elsewhere in the UK or Europe.

Adam Fallon
Head of Structures Test Filton

I am a firm believer that innovation is rarely a straight journey, and it certainly shouldn't be a lonely one.

The Aerospace Integrated Research & Test Centre (AIRTeC) is where ambition meets infrastructure. We've built more than just a world-class facility: we've built a collaborative powerhouse designed to bridge the gap between "what if" and "what can be". While our roots are firmly planted in the rigorous standards of aerospace, the physics of high performance doesn't care what industry you're in.

Whether you are navigating the transition to renewable energy, pushing the boundaries of automotive electrification, ruggedising technology for defence and security applications, or refining the next generation of aerospace supply chain technologies, we invite you to leverage our ecosystem.

Why Partner with AIRTeC?

- Bespoke at our Core: We don't do "off-the-shelf" testing. Every project is tailored to the specific variables of your industry and your goals.
- Expert Insight: Our greatest assets aren't the machines; they're the people. Our engineers add value by troubleshooting, optimising, and thinking with you, as an extension of your own R&D team.
- Materials & Structural Mastery: From coupon-level material development to full-scale structural validation, we provide the data you need to de-risk your investment.
- Total Flexibility: We are as comfortable working from a sketch on the back of a napkin as we are with a fully formed technical blueprint.

The bottom line: We exist to turn complex engineering challenges into competitive advantages. If you have a problem that needs solving, a material that needs pushing to its limit, or a structural concept that needs proving, let's talk. Your industry's next breakthrough is waiting to be tested.

Let's build the future, one test at a time.

Airbus Structural Test Services

Launched in 2021, the **UK's newest advanced structural testing hub**, the Aerospace Integrated Research and Test Centre (AIRTeC) at Airbus' Filton site represents a £40 million investment in the UK's cutting-edge engineering industry. Jointly funded by the Aerospace Technology Institute and Airbus, this modular facility encompasses 65,000m² of specialist test and laboratory space **able to cover the whole test pyramid - from coupons to full-scale installations** - in a wide range of environmental conditions. As well as being used to test in-house structures, Airbus actively opens up these facilities for research & test activities outside of the aerospace sector, **offering state of the art structural test services tailored to your specific project needs**.

Core to AIRTeC's capability is a **40-metre strong floor and dual strong wall setup**, designed to test multiple large-scale structures simultaneously for both ultimate strength and life under realistic operating conditions. Complementing this modular facility is a **high-capacity loading machine** capable of applying tensile and compressive forces equivalent to the weight of 240 double-decker buses.

The site further includes a **refurbished test hangar** featuring a Cryogenic Structures Test Facility, an Environmental Chamber, a rapidly reconfigurable T-slot test area and a large scale bespoke test space for high-load test rigs. We also have **extensive laboratory capabilities** to condition test articles pre-test and examine them to the molecular level post-test.

So whether you are a company, an educational institution, or a government organisation, **contact us today** to experience the benefits of working with Airbus, a world leader in aerospace technology.

AIRTeC focuses on providing **Certification, Qualification and Development data** to Aircraft programmes and R&T projects across the entire structural test pyramid. The large and versatile facility offers a multitude of test resources and infrastructures **adaptable to your aerospace or non-aerospace project needs**, ranging from structural testing on metallic and composite components and materials to design & delivery of bespoke test benches and tailored test programmes.

What truly differentiates us is our **world-leading consulting services and bespoke, unique solutions**. We are not an off-the-shelf generic test centre; when you partner with AIRTeC, you gain access to the **whole Airbus resource pool** and decades of expertise. This includes a deep understanding of structures and proximity to advanced FEA/FEM analysis. Furthermore, many of our test staff have previous backgrounds in all realms of engineering, ensuring we speak the same technical language as you and making us a **true extension of your R&D team.**

17025:2017
Testing and Calibration Accreditation

9001:2015
Quality Management Systems Certification

14001:2015
Environmental Management Systems Certification

5204
Calibration and Measurement Capability (CMC) Accreditation

ILAC
Accreditation

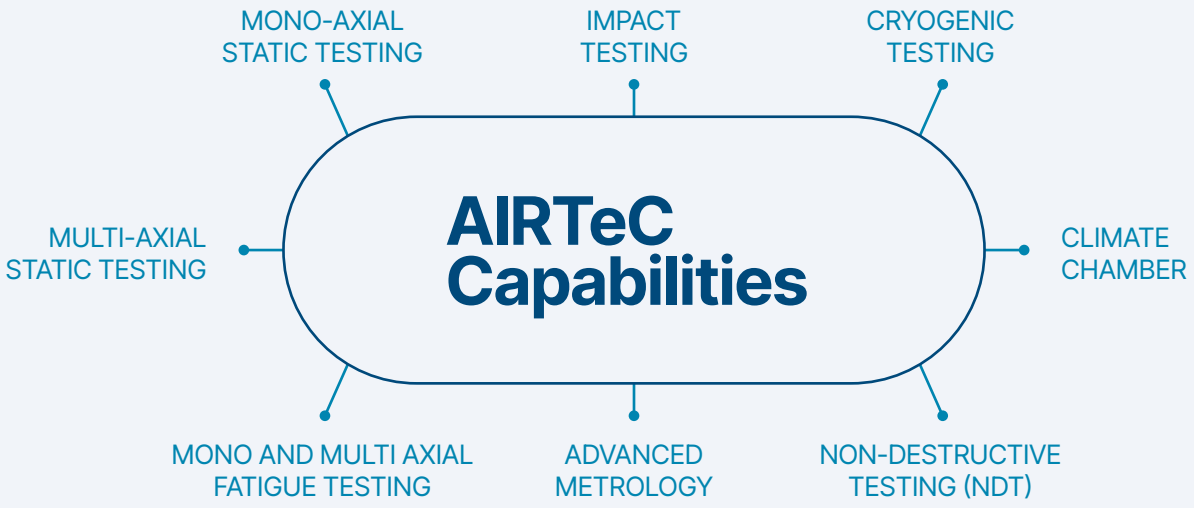
6,500m²
of Structural Test Facilities

Test Centre Competencies

- Mono and multi axial static and fatigue tests
- Impact Testing
- Cryogenic Component Testing
- Environmental Testing
- Major Tests
- Mechanical Testing
- Data Acquisition
- Advanced Metrology
- Non Destructive Testing
- Calibration
- Space Testing
- Advanced Measurement Led Testing for Validation of Modelling & Simulation

Test Centre Facilities

- Strong Floor and Strong Walls
- High Capacity Test Machines
- Universal Test Machines
- 3 Test Control Suites
- Customer Data Suite
- 2 Hydraulic Pump Rooms
- Experimental Mechanics Lab
- Calibration Laborator
- 07Q Adaptable Test Space
- Private/Collaborative Office Space



Core Competencies

Mono-axial static and fatigue tests

The test center showcases a multitude of mono-axial tension and compression machines for static and fatigue tests on a large spectrum of metallic and composite components. AIRTeC's capabilities include a **high-capacity loading machine** with a static rating of +/-25MN (equivalent to 240 double-decker buses) and a fatigue rating of +/-20MN. The facility also features **universal test machines** ranging from 63kN to 2.5MN.

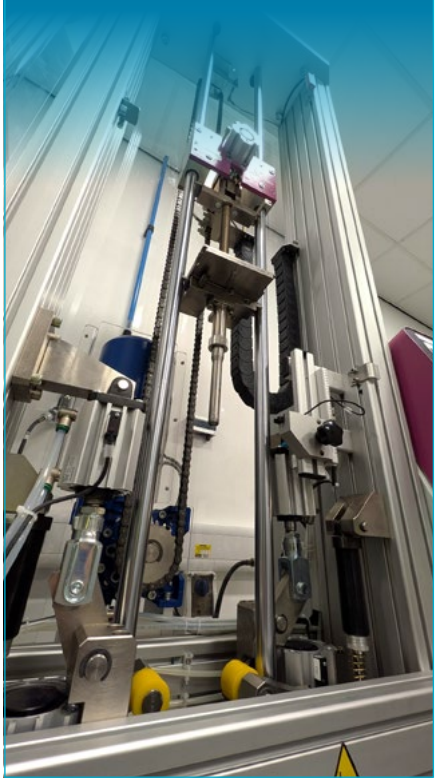
Multi-axial static and fatigue tests

Our secondary 07Q building houses a vast bespoke test space for **large high-load test rigs**. We specialise in the design, manufacture and commission of self-reacting high load and multi-axial structures for static and fatigue campaigns running into **hundreds of thousands of test cycles at any load limit**. Such rigs are used internally for static and fatigue tests on wing, engine pylon and landing gear integration structures for Airbus aircraft programs.

Environmental Testing

The test center has the ability to perform a variety of tests in hot/cold & dry/wet environments using a **large bespoke climatic chamber**. This can be filled with structural test equipment for tests in a temperature range between -65°C and +70°C. Furthermore, universal test machines in our mechanical laboratory allow for small-scale testing at temperatures from -55°C to 200°C. AIRTeC also makes use of **vacuum chambers** for both cryogenic and environmental test means, with vacuum pumps able to achieve pressures as low as 10^{-6} mbar.

Impact Testing



The test center has the capability to perform impact tests using gas guns as well as a drop-weight impactor machine. We have the ability to deliver up to **250 joules of impact** energy on every space axis to simulate manufacturing and in-service damages. We also have extensive experience defining, designing and executing bespoke tests with our collaborative audited partners in external laboratories to conduct **particular risk tests**. These include Uncontained Engine Rotor Failure and Bird Strike assessments, as well as crashworthiness and wheel/tyre failure testing.

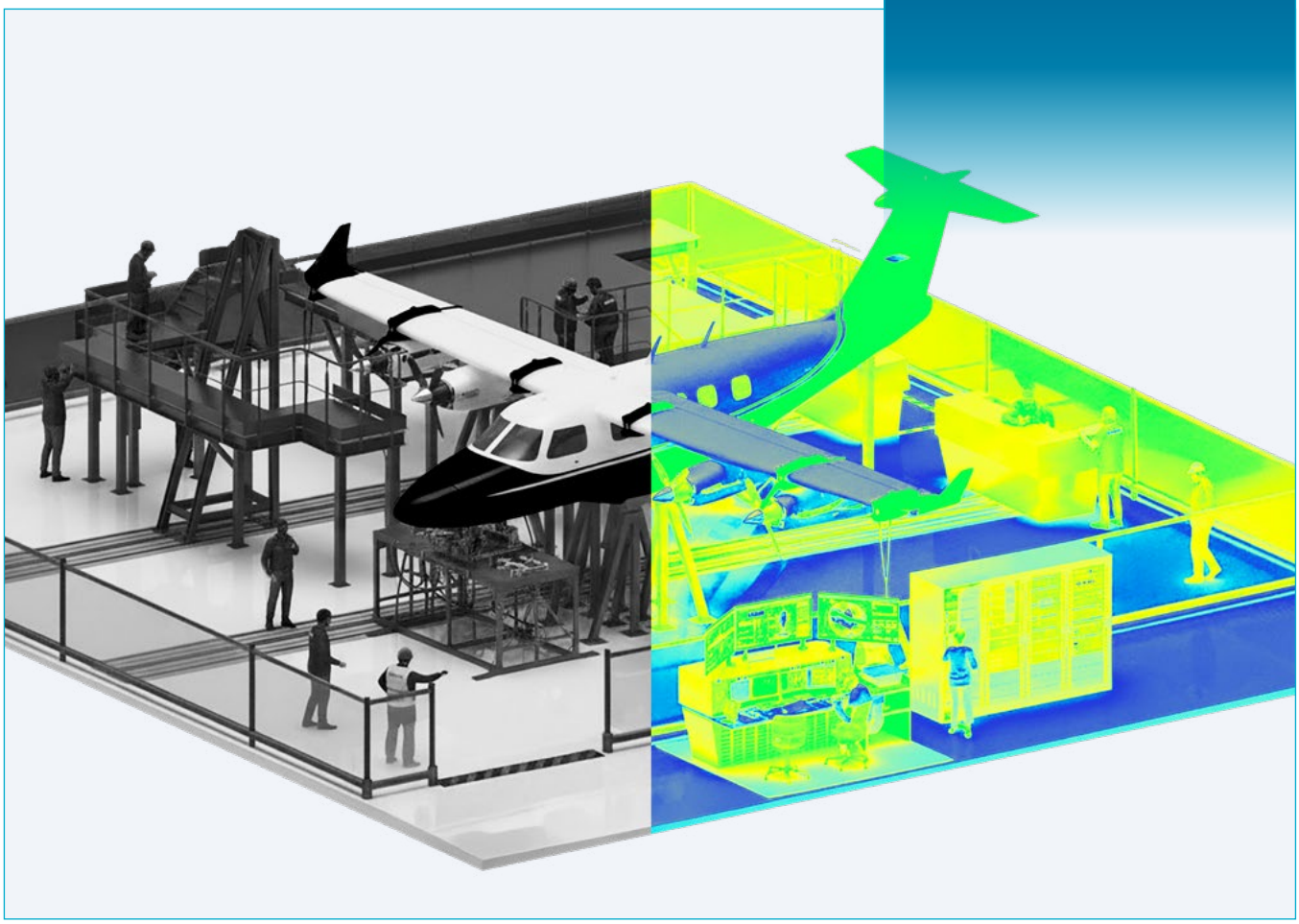
Cryogenic Component Testing

AIRTeC's technological advancements have moved component level testing beyond material qualification and screening. Our newly refurbished 07Q test space offers a **large, segregatable and secure area** for bespoke cryogenic tests to take place using **Liquid Nitrogen and Liquid Helium**. We can facilitate low volume static and fatigue tests as well as high volume, high pressure and high cycle fatigue testing, which is currently used to support the development of hydrogen-powered flight.

Mechanical Testing

The Mechanical Laboratory at AIRTeC conducts **coupon testing and failure analysis** on composites and metals. It develops new test methods and performs surface analysis on various materials such as paints and coatings. The lab also has **expertise** in assembly testing, in-house composite manufacturing and material ageing. This lab is equipped with **universal test machines** of 10kN, 50kN, 100kN, and 200kN capacity, as well as **drop weight impactors**. It can perform tests in environmental chambers from -55 to 200 degrees Celsius, with all tests accredited by **UKAS to ISO/IEC 17025:2017** standards.

Major Tests
Full scale static and fatigue

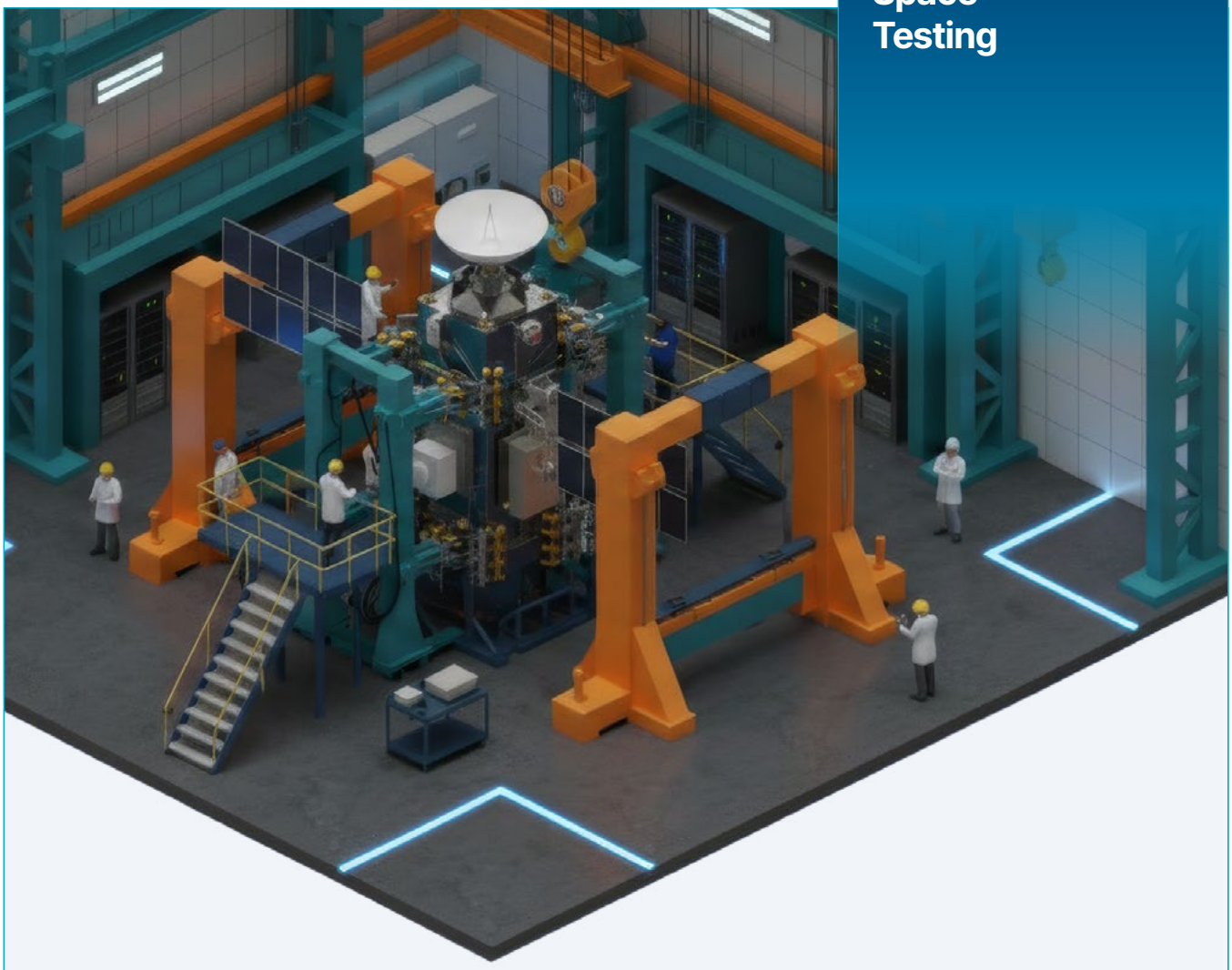


The AIRTeC test centre can support you in developing **tailored test equipment** to support your individual project requirements. We can cover any form of structural test at **any level of the test pyramid**. Our experienced team of engineers - including designers, stress specialists and test experts - can advise you on test bench capabilities, load control systems, test monitoring and test data acquisition in order to **optimise your specific solution**.

AIRTeC specialises in conducting large scale static and fatigue tests for Airbus aircraft using its **high capacity, state of the art facilities**. Our employees have gained extensive experience from conducting these tests, representing a significant internal capability which can now be **leveraged for external customers**.

Numerous dedicated areas within our facility are able to accommodate full-scale structural tests. This can include aerospace products such as **utility aircraft, eVTOLS or advanced military trainers** as well as sea, land and space vehicles - and anything else in-between.

Space Testing



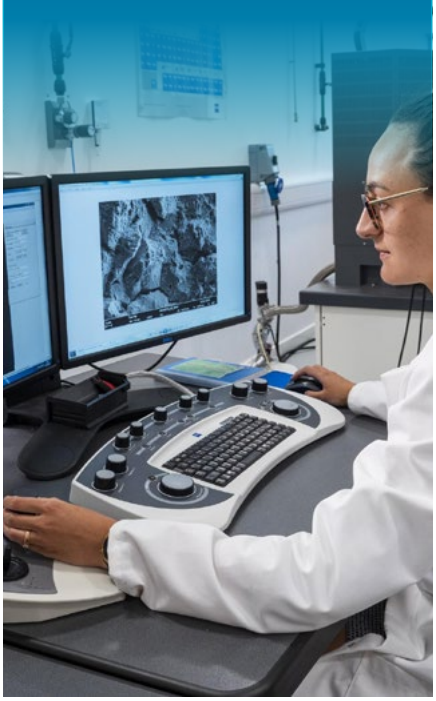
Filton also has a growing client base and experience in structural testing for the space sector. Our partnership with Airbus Defence and Space in Stevenage has continued to build on our heritage and skills in AIRTeC.

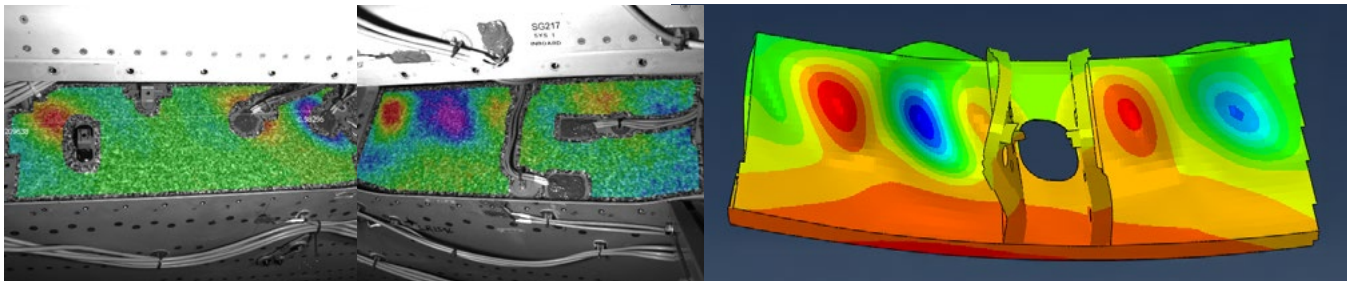
We now carry out static structural tests on **partial structural spacecraft components** either for qualification and validation of models or for production component validation. These tests are often to qualify the primary structure for the qualification-level quasi-static environments generated during launch.

We have a **variety of modular rig components** for rapid test means commissioning. Our team also has the experience and rigour of working with FOD and ISO clean environments.

We can support bespoke projects where niche test means can be designed, integrated and sourced to support your test needs. Integration of advanced measurement and combinations of environmental test conditions are also tailored to the test needs.

Advanced Metrology and Analysis



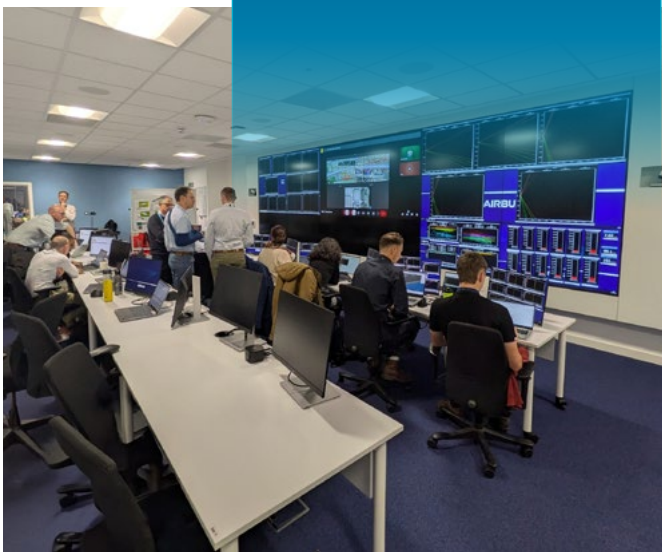


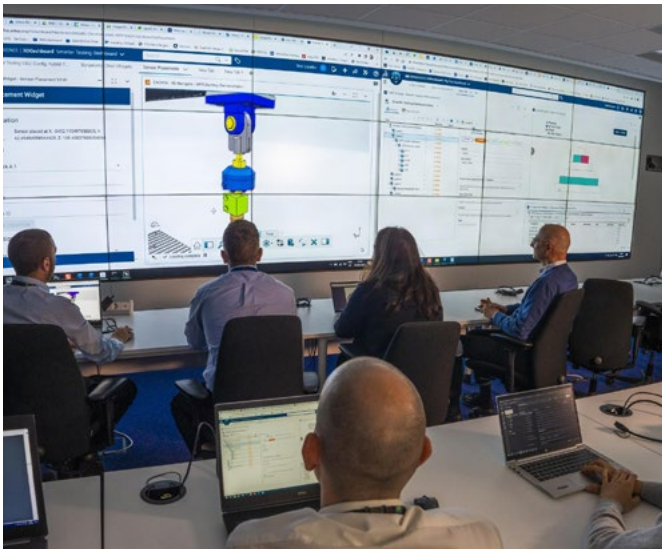
Metrology is an essential capability at AIRTeC, providing critical insights into material behavior and model validation. Our facility utilises a **comprehensive suite of technologies**, ranging from conventional extensometers, clip gauges, LVDTs and strain gauges to **innovative measurement means** like high-speed cameras and laser tracking.

Furthermore, we are actively developing and deploying even more advanced non-contact techniques to measure complex phenomena of interest during testing. These methods are crucial for capturing transient events such as damage initiation, delamination and crack propagation in real-time. This **advanced diagnostic portfolio** includes Digital Image Correlation (DIC), Acoustic Emissions (AE), and Thermoelastic Stress Analysis (TSA).

Our cutting edge **Failure Analysis laboratories** are also located on site, giving you access to cutting edge techniques including optical microscopy, thermal analysis, optical emission spectroscopy, X-ray fluorescence and IR spectroscopy to investigate failure modes **as soon as testing is completed**.

Data Acquisition

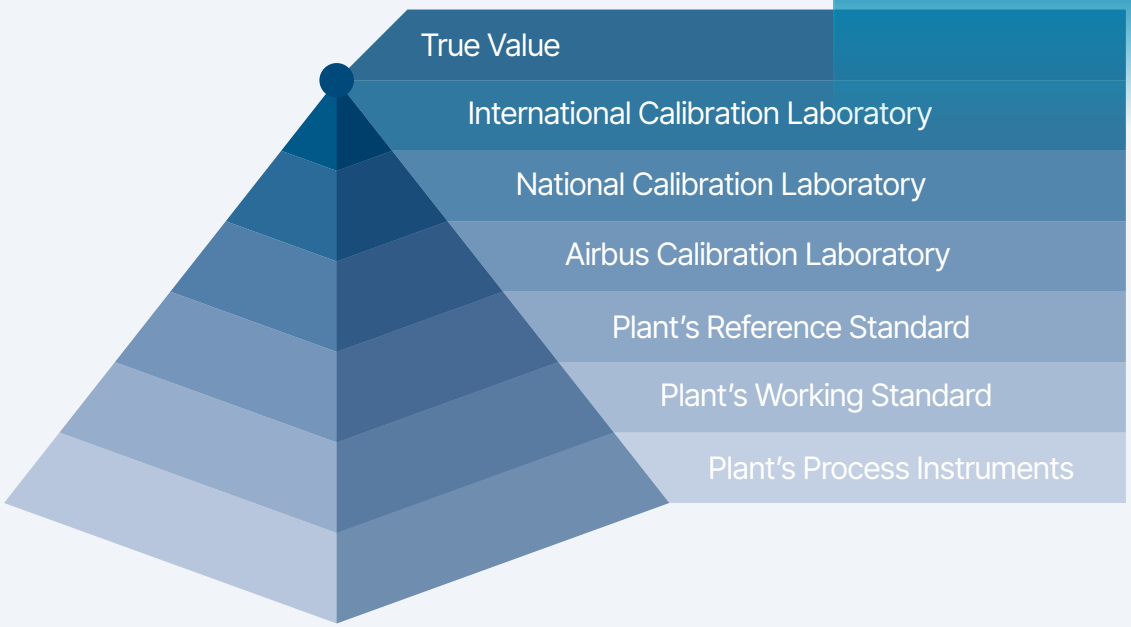


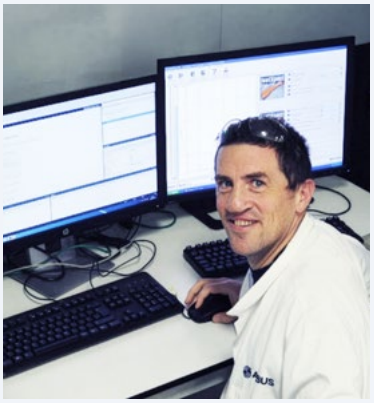


Our **state-of-the-art control rooms** at AIRTeC provide facilities to remotely control test rig operation and data collection systems. We have the capacity to manage 10 test rigs simultaneously, with **over 80 control channels** and more than **6000 instrumentation channels** for both static and dynamic measurements. We also offer customer/client live monitoring in the CDF Suite, data processing and distribution directly to the test customer, IP video monitoring of live tests for health and safety and data collection, and remote health monitoring and notification via mobile devices.

Our brand new data acquisition suite in our secondary 07Q building provides our clients with a **dedicated remote control room and office space**, which makes the facility ideal for any external or more sensitive testing needs.

Calibration



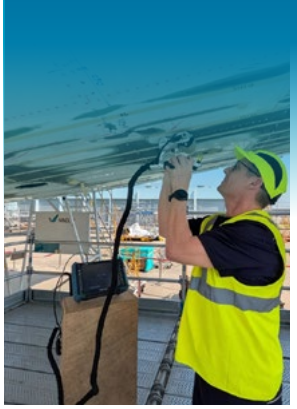


Our specialist Calibration Laboratory at AIRTeC manages the **complete calibration process** using automated procedures. We can calibrate a wide variety of instruments, with our main fields of expertise being:

- Temperature
- Humidity
- Pressure
- Electrical
- Force
- Dimensional

Our Asset Management System controls instruments across the Filton site and beyond. Calibrations are performed in-house in our **purpose-built laboratory** by experienced engineers, delivering readings you can rely on. We are **UKAS 5204 Calibration and Measurement Capability Accredited to ISO/IEC 17025** and part of the ILAC Mutual Recognition Arrangement. For inquiries, you can reach us at Calibration@Airbus.com.

Non Destructive Testing

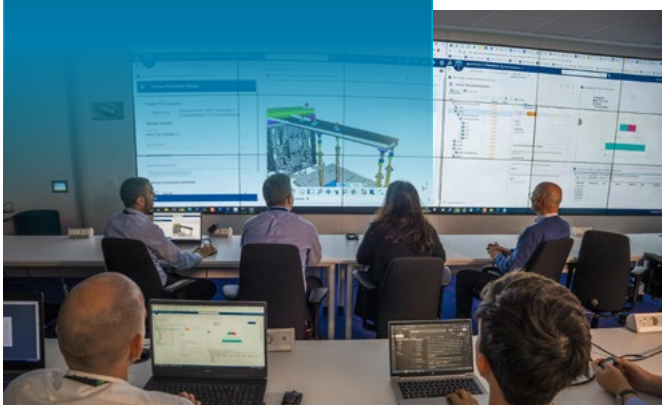


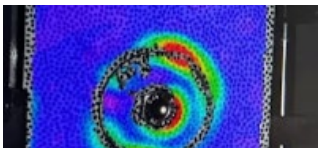
Non-Destructive Testing (NDT) at AIRTeC is pivotal for evaluating materials and structures during manufacture, testing and in-service life. We:Utilise **semi-automated and manual testing methods** during the entire structural test process;

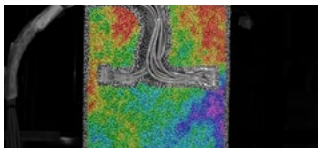
- Provide support for cyclic fatigue test operations;
- Conduct **field inspections** for in-service aircraft to detect fatigue and damage;
- Use our expertise to advise our customers and suppliers on methodologies and best practices.

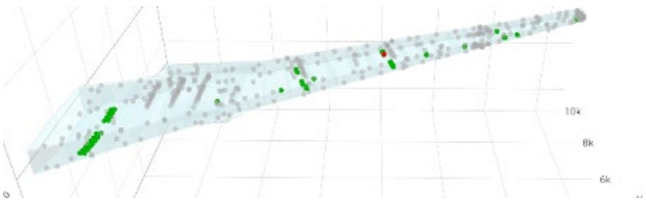
AIRTeC's NDT methods can detect cracks, porosity, delamination, corrosion, debonding, heat damage and fluid ingress using techniques such as Ultrasonic, Eddy Current, Penetrant, Acoustic Emissions and Visual testing.

Hybrid Testing









Hybrid testing at AIRTeC involves testing for the validation of computational modeling and simulations. Our facility is pioneering a proactive, data-driven ecosystem designed to support the replacement of full-scale physical tests with validated virtual testing. We are **actively developing data approaches**, including machine learning for anomaly detection and automated ingestion pipelines, to create a single digital thread that links design, manufacturing, and test data. By establishing this single source of truth, we enable live monitoring and quicker decision-making through the contextualisation of data within a master Digital Mock-up.

To validate **complex virtual test twins**, we are maturing **advanced measurement capabilities** such as Europe's largest Digital Image Correlation (DIC) system, fiber optics, and acoustic emissions. We use rigorous Uncertainty Quantification (UQ) to quantitatively correlate full-field physical data against simulations, ensuring the credibility of our digital twins. This integrated approach **optimizes test execution** and drives our transition toward condition-led inspections and accelerated physical testing.

Key Facilities

Strong Floor and Strong Walls

Our uniquely modular and reusable strong walls and load reaction floor are engineered to enable **comprehensive testing of large structures**, assessing both ultimate strength and operational life. The expansive 40m x 18m structural strong floor features 663 reusable anchor points arranged on a 1m x 1m grid, providing **unparalleled flexibility** for diverse test setups. This impressive foundation was created with a continuous 24-hour concrete pour, incorporating 54km of reinforcement steel. Complementing this, our reconfigurable, movable strong walls offer adaptable configurations, including a single 13m x 10m x 4m setup or dual 6m x 10m x 4m arrangements. These reusable building block test structures can be precisely adapted to **virtually any test configuration**, ensuring versatility for a wide range of aerospace and other industrial applications.

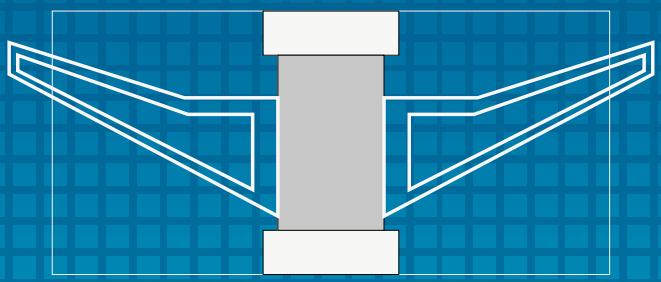
Strong floor

40m long,
18m wide,
2m thick containing
1450m³ of concrete

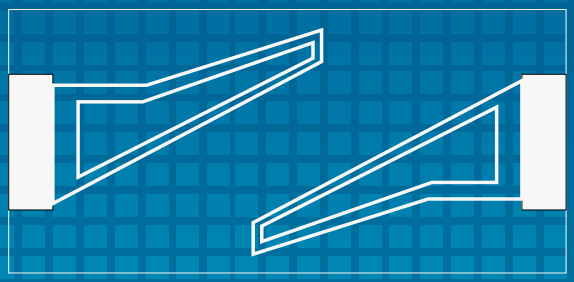
Strong wall

13m wide,
10m high

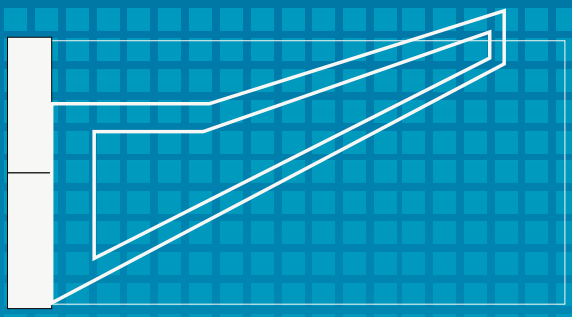
Strong Floor



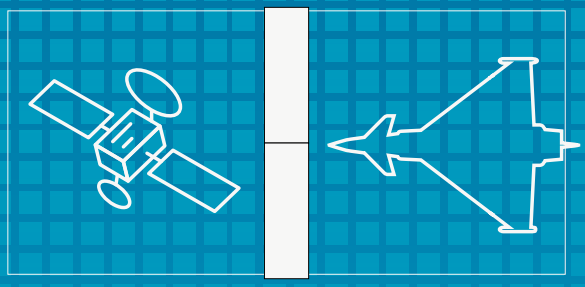
Major Fatigue - EF2



Two short-haul aircraft wings



One long-haul aircraft wing



Aerospace Vehicle Tests

One of Europe's largest and most versatile mechanical test spaces

High Capacity Test Machine

Our High Capacity Test Machine features a **25MN MTS Universal Test Frame**, capable of static ratings of +/-25MN and fatigue ratings of +/-20MN. It boasts a 300mm actuator stroke which can operate on samples **1-9m tall** that fit within a 3.0m x 1.4m floor area. The system boasts a lift & lock hydraulic crosshead for easy specimen installation and handling, and has a high stiffness frame with universal load introduction enabling quick specimen change-overs. This creates a highly versatile interface for a **large variety of test specimens**.

The machine is calibrated in line with ISO 7500 regulations, equivalent to Class 0.5 for precise measurements between -2.5MN to -25MN in compression and +4MN to +16.5MN in tension. An integrated anti-buckling device is fitted, capable of reacting up to 1MN, whilst test space access platforms and a specimen lifting system ensure **efficient operation**.

Universal Testing Machines

Our Universal Test Machines offer a highly versatile testing range from 63kN to 2.5MN, and are capable of performing both fatigue and static tests. These servo-hydraulic machines feature **multiple control modes** and integrated data acquisition capabilities. Equipped with hydraulic grips, they are ideal for **coupon and element testing**, and can accommodate component and sub-component tests using interface fixtures. The larger machines are reconfigurable, with T-slot bases, demountable grips and load cells, allowing for the accommodation of large and complex specimens.

The test centre also houses a 'Large Press' Universal Test Machine, capable of static compression up to 20MN. **Environmental testing** using all of these test machines can be facilitated. Tests regularly performed include Fracture Toughness, Fatigue, Crack Propagation and R-Curve analysis.

Hydraulic Pump Rooms

Both AIRTeC and our secondary Structures Test Building, 07Q, feature **powerful hydraulic supply systems** which feed the workspace floor.

AIRTeC's hydraulic supply system features Bosch Rexroth pumps which are able to generate **2.4MW** of power and deliver **4200LPM** of hydraulic fluid to the shop floor at **350bar**. The system also comprises an 18,000L main reservoir, a sub-system for oil conditioning, 750L of accumulation, heaters and air blast coolers.

Our independent 07Q building features Hawe Hydraulik piston pumps capable of generating up to **1000LPM at 250Bar**, driven by a **200kW** electric motor, with a pressure capability of up to **350Bar**. Supporting this system is an 8,000L main reservoir, 50L of accumulation, a twin cooling system with air blast coolers, a bespoke pump control system and an independent E-Stop system.

Our robust hydraulic power systems deliver the immense energy required to perform your **most demanding**, extremely high-load, large-scale structural tests. This consistent power ensures **maximum precision and reliability** in load and displacement control, providing you with the most accurate data for structural validation.

07Q Adaptable Test Space

The 07Q Test Hangar is our second building used exclusively for structures testing at AIRTeC. The recently refurbished 1,500 square meter space offers a large, **rapidly transformable and secure environment** for a variety of bespoke tests. It also houses our new Cryogenic Structures Test Facility, which is supporting the development of hydrogen-powered flight through its **Liquid Nitrogen testing capabilities**.

A **reconfigurable test space** for rapid, low-cost test campaigns sits in one corner of the building, which has already proven its worth supporting Airbus research programs and external customers from the Space and eVTOL communities.

Additionally, a large environmental test chamber for dynamic multiphysics testing has recently been introduced, coupled with a **dedicated remote control room and office space**, which makes the facility ideal for any external or more sensitive testing needs.

Airbus Filton

Pegasus House, Aerospace Avenue, Filton, Bristol BS34 7PA • +44 (0) 117 969 3831 • www.airbus.com

By Road (satnav BS34 7PA)

Travelling on the M5

Exit motorway at junction 16 joining A38 to Bristol. Proceed along the A38 tor 2.5 miles to the second roundabout. Take the fourth exit back onto the A38. At the second set of traffic lights tur left on to Aerospace Avenue. Visitors Reception (Barnwell House) is signed to the left and Visitors parking is on the right hand side. For AIRTeC continue down the A38, bear left at the bottom of the hill before the traffic lights next to the Airbus Wing Monument.

Travelling on the M4 from Wales

At M4 junction 20, join the M5 to the South West and follow above directions from M5.

Travelling on the M4 from London

Take exit 19 onto the M32. Exit M32 at Junction 1, take third exit A4174 to Filton. Proceed for 2 miles to the second roundabout (A4174 junction with A38) and take the take third exit onto the A38. At the second set of trafic lights turn left on to Aerospace Avenue. Visitors Reception (Barnwell House) is signed to the left and Visitors parking is on the right hand side. For AIRTeC continue down the A38, bear left at the bottom of the hill before the traffic lights next to the Airbus Wing Monument.

Travelling from Bristol City Centre

Take the A38 from the city centre. Follow this for approx 6 miles towards Filton until you come to a large roundabout. Proceed straight across (second exit A38/M5). At the second set of traffic lights turn left on to Aerospace Avenue. Visitors Reception (Barnwell House) is signed to the left and Visitors parking is on the right hand side. For AIRTeC continue down the A38, bear left at the bottom of the hill before the traffic lights next to the Airbus Wing Monument.

By Air

Bristol Airport is to the south of Bristol, approximately 15 miles from Filton. From the airport, turn left onto the A38 and follow the signs for the M5. Join the M5 at Easton-in-Gordano (Junction 19). Follow directions to Filton from M5, see opposite.

Heathrow Airport is approximately 2 hours drive. Follow directions to Filton from M4, see opposite.

By Rail

Bristol Parkway and Filton Abbeywood stations are a couple of miles from the site. Taxis are available outside Bristol Parkway but would need to be booked in advance if arriving at Filton Abbeywood.

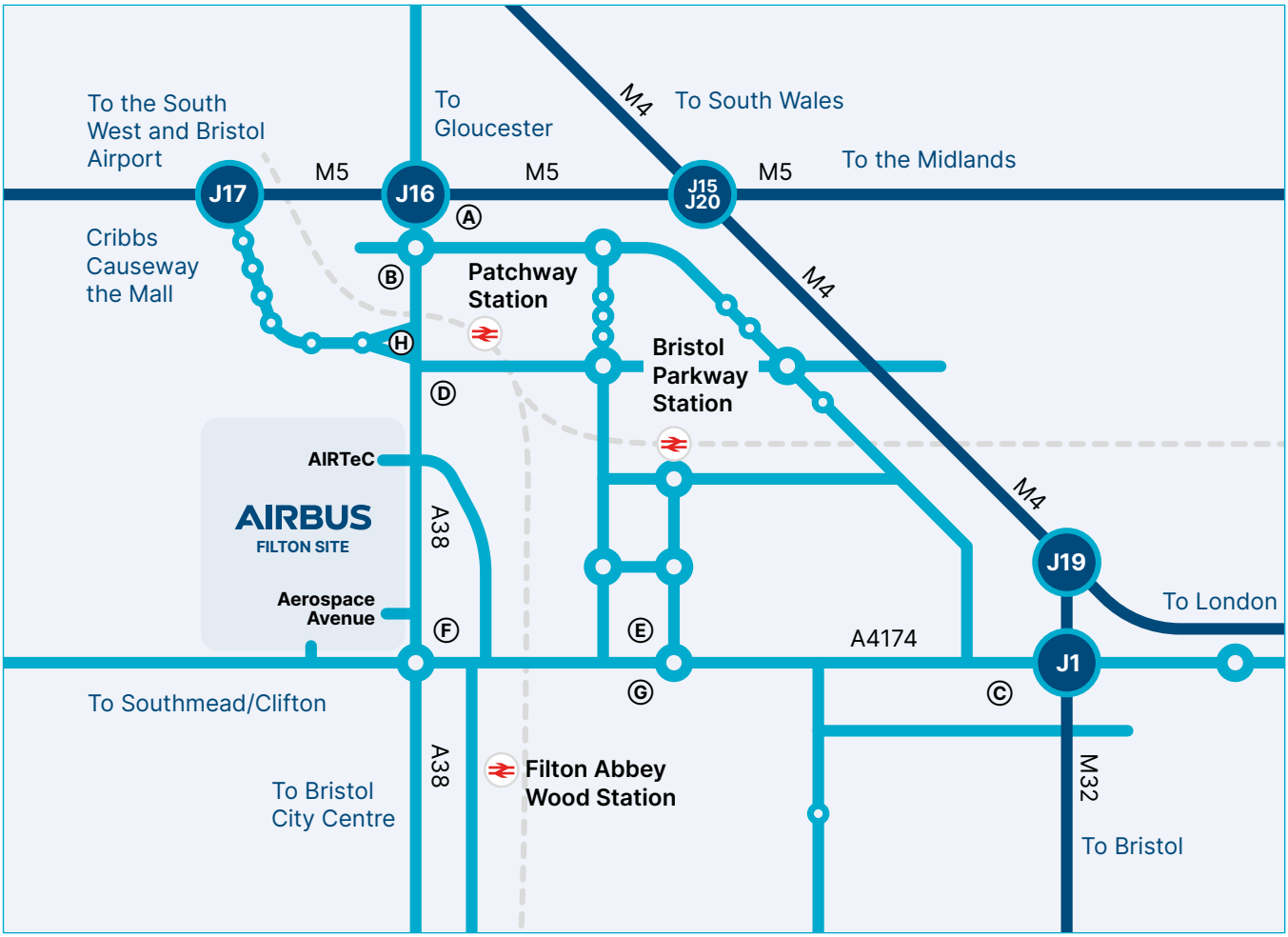
Bristol Temple Meads station in the city centre is approximately 6 miles away from the site. Taxis are available outside. Bristol Brabazon Station will be operational on the Airbus Filton Site from 2027.

Taxis

Arrow Cars:
book@arrowcarsbristol.co.uk;
01179 555 777

EuroTaxis:
info@eurotaxis.com;
01454320101

UBER Services are also available and serve the local area.



Local Hotels

Ⓐ ★★★★
DoubleTree by Hilton Bristol North
Woodlands Lane
Bradley Stoke
Bristol BS32 4JF
Tel:+44 (0)1454 201144

Ⓑ ★★★★
Aztec Hotel & Spa
110 Aztec West
Almondsbury
Bristol BS32 4TS
Tel:+44 (0)1454 201090

Ⓒ ★★★★
Holiday Inn Bristol Filton
Filton Road
Winterbourne
Bristol BS16 1QX
Tel:+44 (0)871 942 9014

Ⓓ ★★★★
Village Hotel Bristol Filton
Bullfinch Close
Filton
Bristol BS34 6FG
Tel:+44 (0)117 456 3434

Ⓔ ★★★
Holiday Inn Express
Parkway Business Park
New Road
Stoke Gifford
Bristol BS34 8TJ
Tel:+44 (0)871 902 1604

Ⓕ ★★★
Premier Inn Bristol
Shield Retail Park
Gloucester Road North Filton
Bristol BS34 7BR
Tel:+44 (0)871 527 8164

Ⓖ
Travelodge Bristol Abbey Wood
Abbeywood Retail Park
Station Road
Stoke Gifford
Bistrol BS34 7JL
Tel:+44 (0)871 984 6626

Ⓗ
Travelodge Bristol Filton
Concorde Roundabout
Hayes Way
Patchway
Bristol BS34 5GN
Tel:+44 (0)800 640 3691

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