



EXPERIMENTAL FACILITIES FOR THE AEROSPACE INDUSTRY



WTTECH.CZ SPECIALISTS IN THE DEVELOPMENT, DESIGN, AND SUPPLY OF TEST RIGS AND TEST EQUIPMENT

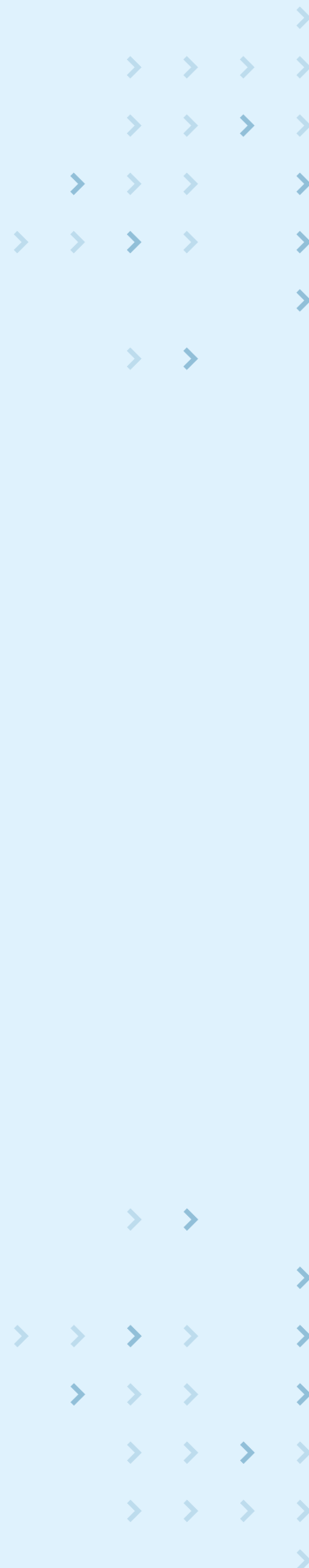
WTtech.CZ offers **unique test rigs and equipment**, including research and development equipment in mechanical engineering, hydraulic engineering, and aerodynamic testing—the WTtech.CZ team consists of committed designers, engineers, constructors, and mechanical specialists. Thanks to our expert know-how and many years of experience, we can offer solutions for **any specialized project** completed under difficult circumstances.

WTtech.CZ manufactures experimental facilities and test equipment for many industries including the most demanding ones, such as **the aerospace industry**. Our test equipment and components, as well as their implementation at customer sites, meet the highest quality, safety, and maximum test reliability requirements. Recently, we have completed test equipment to measure the performance and reliability of aircraft engine components, as well as hydraulic and fuel systems. Testing these devices is often necessary to verify the safety and efficiency of aerospace applications.

We supply **experimental facilities developed and designed by us** with modifications and construction completely **tailored to customer conditions and requirements**. Apart from the facilities, we offer a comprehensive service, including delivering all equipment, programming the measurement and control software, project management, preparation of research projects, and expert consultation.

In addition to the design and construction of experimental facilities, WTtech.CZ is also well-versed in design using the **Creo 3D CAD system as well as CFD and FEM simulations**. We also offer specific measurement and control software, data processing and analysis for design optimization, and effective solutions to challenges in the testing facilities field and beyond.

Founded in 2009, WTtech.CZ became an official National Instruments system integrator and the exclusive representative of Scanivalve Corp. for the Czech Republic, Slovakia, and Poland. This allowed us access the latest technologies and cutting-edge research and measurement tools.



THE USUAL PROCESS OF TEST EQUIPMENT IMPLEMENTATION

WTtech.CZ provides customers with a comprehensive testing equipment implementation service. This process usually consists of the following steps:

1. Project analysis

- Project study, feasibility study, budget estimate

2. Assignment analysis

- Identification of the requirements and standards that the experimental facility must meet
- Technology design proposal for all parts (mechanical, propulsion, measurement, control)

3. Identification of the construction project and its requirements

- Definition of the building requirements for the laboratory (foundations, spatial layout, air conditioning, soundproofing, control room)
- Definition of resource requirements (electricity, water, air, hydraulics)
- Preparation of a detailed building design or detailed specifications

4. Design

- Design in the Creo 3D CAD system, FEM, and CFD analysis
- Selection of sub-components (mechanical parts, sensors, pneumatic and electrical parts, etc.)
- Simultaneous preparation of electrical documentation and pneumatic/hydraulic schematics
- Risk analysis

5. Purchase of materials and components, production

- After customer approval, purchase of material, components/parts, and production, basic assembly and partial recovery of subsystems at the WTtech.CZ premises begins

6. Production of electrical parts

- Production of switchboards, measuring, and control systems
- Programming of measuring and control software (PLC, DAQ systems)

7. Installation and launch

- Transportation, installation, and launch of the test equipment at the customer's site
- Electrical inspections
- Calibration of the measuring chain in an accredited laboratory

8. Trial operation and handover

- Trial operation and training of customer operators
- Launch of live operation

9. Documentation

- Preparation of operating documentation, operating and maintenance manuals
- CE certificate issuance

10. Support

- After-sales support and consultation on all operation-related matters
- Remote device management and user support via a dedicated VPN connection

Structured management of each WTtech.CZ project ensures careful planning and execution of all steps and minimal risks, as well as excellent condition and reliability of the test equipment.

TECHNOLOGIES USED TO DEVELOP AND CONSTRUCT EXPERIMENTAL FACILITIES

During development and construction, WTtech.CZ uses the latest technologies to ensure the test equipment's high quality, robustness, and accuracy.

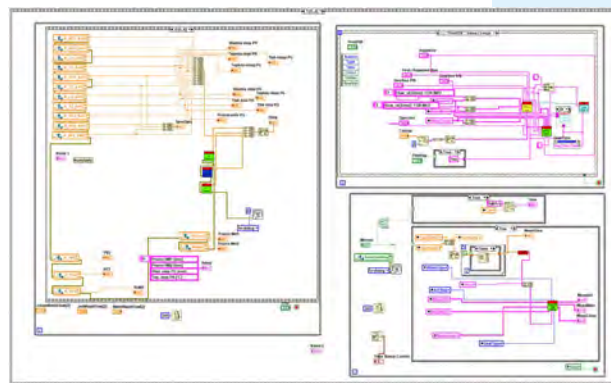
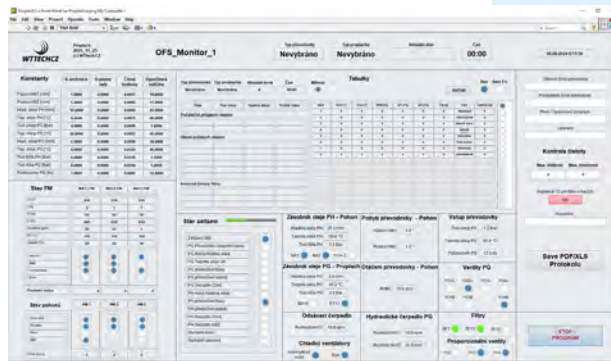
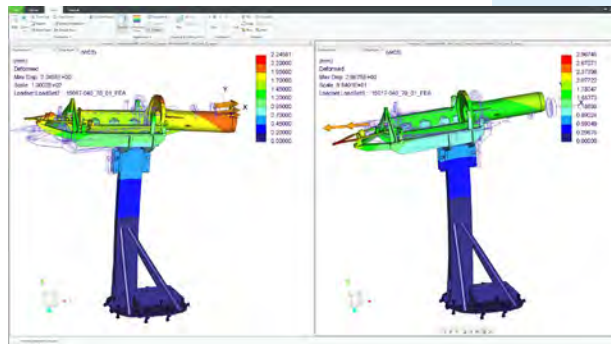
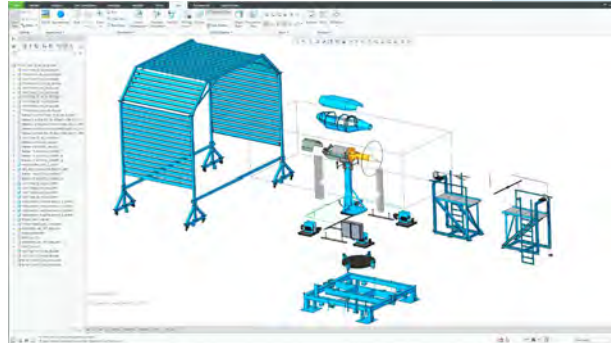
1. Construction at WTtech.CZ is conducted exclusively in a 3D CAD system using Creo software, which enables detailed design and modeling of all testing facility components. The design data is stored and managed in the **Windchill PDM system**, ensuring efficient product lifecycle management and easy access to all necessary information.

2. Design optimization includes **FEM** (Finite Element Method) and **CFD** (Computational Fluid Dynamics) analyses. These analyses allow the simulation of the mechanical and fluid behavior of components before they are manufactured, resulting in high product quality and reliability.

3. WTtech.CZ control and measuring systems are based on the **PLC** (Programmable Logic Controller) technology and the measurement of selected parameters by industrial computers. This guarantees the resulting products' exceptional accuracy and reliability.

4. Testing facility control and measurement is usually implemented in the **LabVIEW** user interface. This enables efficient test automation, minimizes the need for human intervention, and increases efficiency and measurement accuracy while offering intuitive visualization and analysis of measured data.

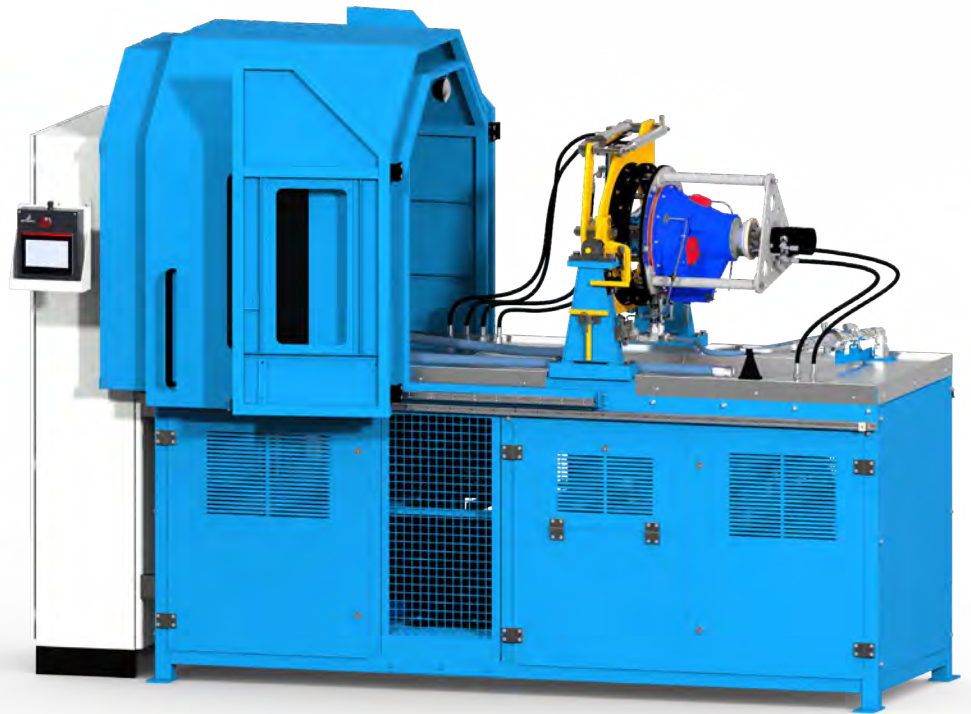
All WTtech.CZ devices meet the standards corresponding to the testing facilities and relevant industry standards. WTtech.CZ is ISO 9001 certified and is regularly audited by customers.



SELECTED COMPLETED PROJECTS

TEST RIG FOR GEARBOX FLUSHING

This device is designed to ensure maximum cleanliness in the gearboxes' internal oil reservoirs. This uniquely designed equipment uses an oil flushing station to wash the complete gearbox assembly. During this process, the gearboxes are washed with a special oil, which ensures the impurities are effectively washed out and subsequently captured in the filter. The gearbox is angularly adjustable and tilted in 2 axes. It is powered to simulate normal operation. The temperature and oil properties are controlled according to specific customer requirements.



The device can be easily controlled through the control panel located on the side of the switchboard. The flushing process takes several hours and is fully automated and controlled via PLC. The operation of the equipment is simplified by its touchscreen display, which is protected by a synthetic oil-resistant film, ensuring high durability and longevity in industrial conditions.

Test equipment for gearbox flushing

- Ensures the cleanliness of internal gearbox components
- Facilitates their preparation and maintenance and extends their lifetime

This results in higher reliability, minimized risk of operational failures, and an extended gearbox lifetime.

HYDRAULIC PUMP TEST RIG

This equipment performs run-in and flow measurements of pumps under pre-set hydraulic resistances.

Access to the cabinet's interior is provided by a door at the rear and on the right side; the left side contains a separate control cabinet with PLC, motor inverter, and other electrical components. The control panel with controls, including a foil-protected touchscreen display with a synthetic oil-resistant film, is located at the front of the equipment.

The test procedures are fully automated and PLC controlled, allowing the pressure conditions of installing the pump into the engine to be simulated. The hydraulic resistances are adjustable and, together with the speed pump speeds, the oil flow can be measured accurately, ensuring high test accuracy and repeatability.

Pumps are tested by changing in hydraulic resistance at pre-set speeds. Every time the speed setting and hydraulic resistances are changed, the flow through the pump or pump stage is measured. Depending on the pump type tested, various parts of the hydraulic system differing in their clearance both at the inlet (suction) and at the outlet (discharge) are used. The measurement is fully automated, which guarantees high quality and reliability of the entire process. The system also allows the generation of detailed measurement reports, which are crucial for maintaining the quality system and for accurate evaluation of the tested pumps' performance.

Its high flexibility and automation make the test equipment for hydraulic pump testing a key tool for verifying the performance and reliability of hydraulic systems in various applications.



OIL TEST STATION

The WTtech.CZ oil test station is designed for measuring oil flow through aircraft engines. The purpose of the device is to provide accurate data on the oil flow rate. All impurities are captured by a filter, ensuring maximum cleanliness of the engines' internal oil compartments.

The intuitive touchscreen display on the station's top surface enables easy control. All processes, including flushing, are fully automated and PLC-controlled. In addition, the touch screen is protected by a synthetic oil-resistant film.

The oil test station is a key tool for ensuring optimal performance and safety of aircraft engines and a source of essential information for maintenance and service.





TEST EQUIPMENT FOR MEASUREMENTS OF AERODYNAMIC PROPELLER CHARACTERISTICS

This equipment is designed to measure the aerodynamic characteristics of propellers with a maximum diameter of 1,8 m. The device has a power input of 110 kW and reaches up to 3000 RPM. It allows precise measurement of thrust, torque, power, and propulsion efficiency of both adjustable and fixed propellers.

The measurement and control system automatically processes the data and displays the results online using its characteristic curves, providing an instant overview of the performance and efficiency of the propellers under different operating conditions.

The device is capable of measuring both static and dynamic thrust in flight simulation speeds in a wind tunnel. This allows complex propeller tests including not only their basic characteristics but also their behavior at different flight speeds.

The high degree of adaptability and accuracy of the measurements makes this device an essential research and development tool in the field of propeller aerodynamics.



WTTECHCZ

**DESIGN, CONSTRUCTION, AND DELIVERY OF TEST EQUIPMENT FOR YOU:
TAILORED TO YOUR SPECIFIC REQUIREMENTS AND CONDITIONS!**

