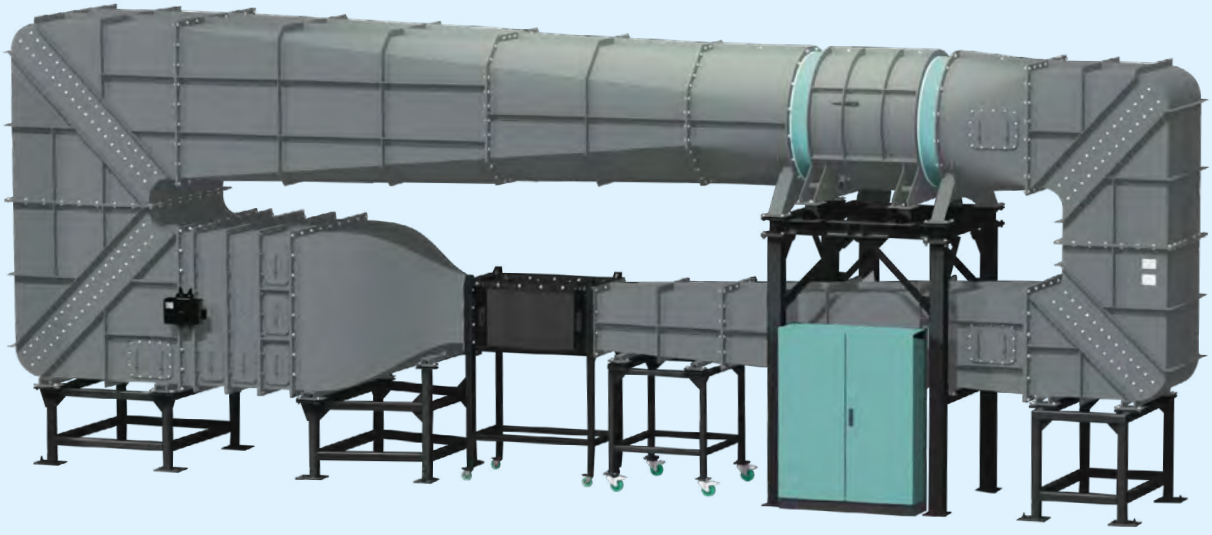
WTTECH.CZ

CLOSED CIRCUIT WIND TUNNELS



WWW.WTTECH.CZ

WTTECH.CZ SPECIALISTS IN WIND TUNNELS

WTtech.CZ specializes in the development, design, and construction of wind tunnels, including closed models. The company comprises a well-coordinated team of engineers, designers, constructors, and aerodynamic specialists. With expert know-how and many years of experience, WTtech.CZ can offer solutions for highly specific projects executed under complex conditions.

Wind tunnels by WTtech.CZ have a wide range of applications, from aerospace research and the automotive industry to skydiving and university education. Their services are not limited to the tunnels themselves but also include testing and measuring equipment, software, data processing, consulting, project management, and checking research project controling.

In addition to wind tunnels, WTtech.CZ engages in advanced aerodynamic calculations, 3D CAD system Creo design work, CFD and FEM simulations, and the development of accessories such as manipulators and aerodynamic balances. They also offer specialized measuring and control software, data processing, and analysis for optimizing design and efficiently solving aerodynamic challenges.

WTtech.CZ has been operating since 2009. It is an official system integrator for National Instruments and the exclusive representative of Scanivalve Corp. for the Czech Republic, Slovakia, and Poland. This allows WTtech.CZ access to the latest technologies and top-tier research and measurement tools.

CLOSED CIRCUIT WIND TUNNELS

Closed circuit Wind Tunnels (WT) are a fundamental tool for specialized research and development in aerodynamics and fluid mechanics. Thanks to their closed loop design, they allow for high control of airflow conditions, minimizing pressure and kinetic energy losses. This enables high precision achievement and reproducibility of test results.

The higher investment is balanced by more precise results and lower operating costs, as they do not require as much power as open circuit tunnels. Additionally, they allow the Test section to be configured as both closed and open.

Closed WTs are the ideal choice for companies and research institutions requiring a high level of experiment control and result accuracy. They are suitable wherever it is necessary to minimize external influences and ensure consistent test conditions.

WTtech.CZ will design, manufacture, and deliver WTs tailored to your requirements: from the size of the test section to the quality and speed of airflow, to the integration of sensors and data output interfaces. And this is implemented considering the laboratory dimensions and power input possibilities. Thus, you will get an exact tool customized to your conditions.

HOW DOES A CLOSED CIRCUIT WIND TUNNEL WORK

In a closed circuit wind tunnel (also referred to as a circulation WT), air is circulated within a closed loop. Circulation eliminates the need to draw additional air from the environment and eliminates losses caused by the energy of outgoing flow. An optimized duct circuit with a settling chamber featuring honeycomb, screens reducing turbulence and balancing the velocity profile, and a nozzle ensure uniform, low-turbulence, and linear airflow. Losses due to friction and pressure losses in the tunnel piping are compensated for by an axial fan.

Typical Wind Tunnel Delivery Includes:

- Temperature and pressure sensors
- Control and measurement unit
- Interface for computer communication

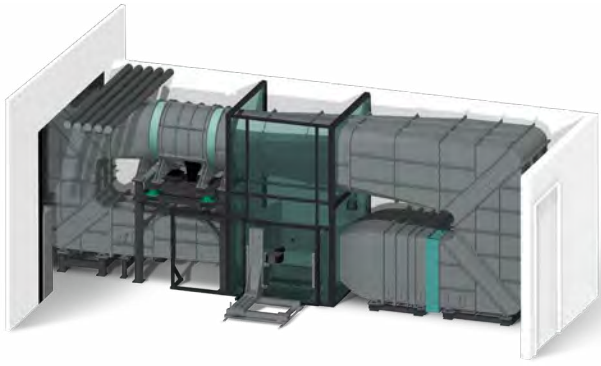
Closed WTs not only provide more precise measurements also allow for a wider range of testing conditions to be simulated and a more detailed analysis of aerodynamic forces and moments compare to open circuit one. Thanks to the closed system's stable environment, tests are reproducible with a high level of reliability, ensuring consistent results unaffected by external factors. Additionally, closed WTs are less demanding not only in terms of power but also in terms of operation and maintenance.

ADVANTAGES OF CLOSED WIND TUNNELS

- High measurement precision
- Elimination of external influences to the test
- Low airflow turbulence
- Configurable test section as closed, open, or ¾ open
- Possibility of smoke/visualization particle visualization
- Lower operating costs
- Temperature control of airflow
- Minimal noise and impact on the surroundings

EXAMPLES OF SELECTED REALISATIONS

CALIBRATION TUNNEL FOR ANEMOMETERS AND SPEED PROBES IN AN ACCREDITED LABORATORY TEST SECTION: 600 MM × 500 MM

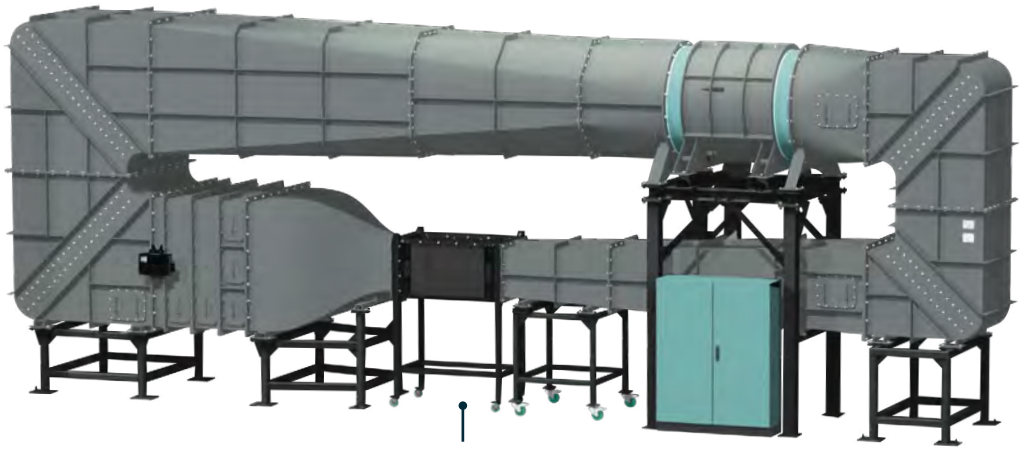


- Airflow velocity: 50 m/s for Open test section
- LDA system installed and 3D traverse mechanism including particle generator
- Engine power: 15 kW
- Installed airflow cooling system

EDUCATIONAL / RESEARCH TUNNEL

CLOSED & OPEN TEST SECTION

TEST SECTION: 500 MM × 500 MM



Closed test section

- Airflow velocity: 70 m/s for Closed and 50 m/s for Open test section
- Possibility of 2 configurations – Open & Closed test section
- Engine power: 11 kW
- High quality of the test airflow

RESEARCH TUNNEL – CALORIMETRIC TEST RIG

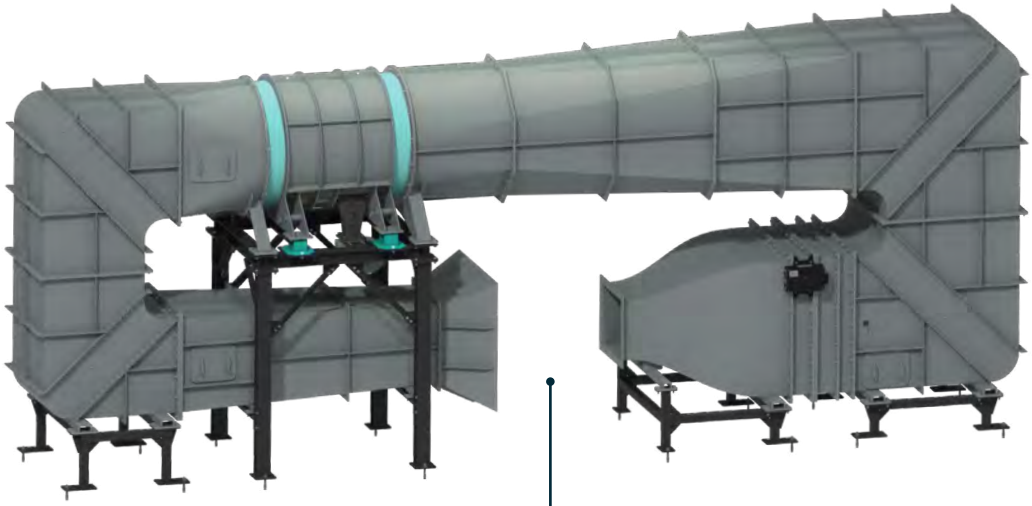
TEST SECTION: 700 MM × 500 MM

- Airflow velocity: 60 m/s
- Modular measuring/test section space with multiple traversing mechanisms
- Installed airflow cooling system (in total 110 kW)
- Engine power: 55 kW
- Can be used as a calometric test rig, additional 55 kW water heating system in the test cooler is installed

EDUCATIONAL / RESEARCH TUNNEL

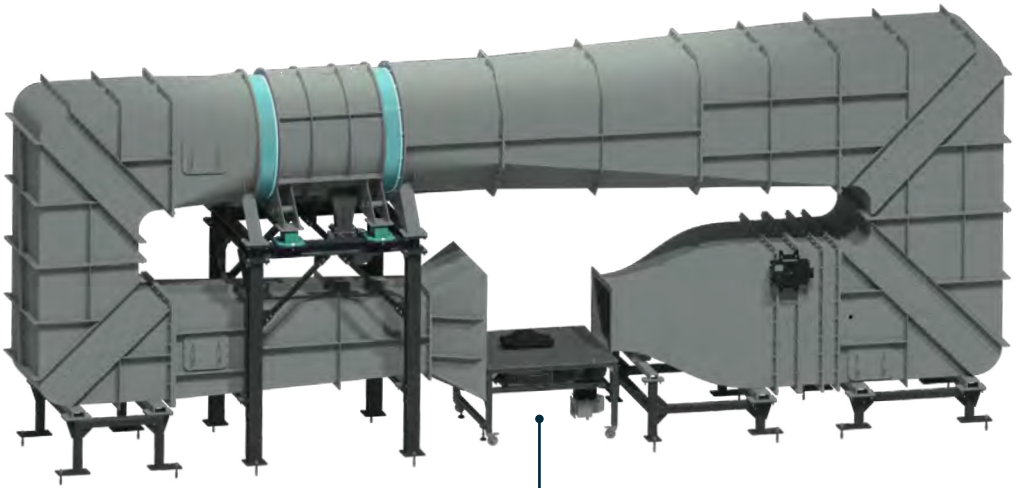
OPEN & ¾ OPEN TEST SECTION

TEST SECTION: 500 MM × 450 MM



Open test section

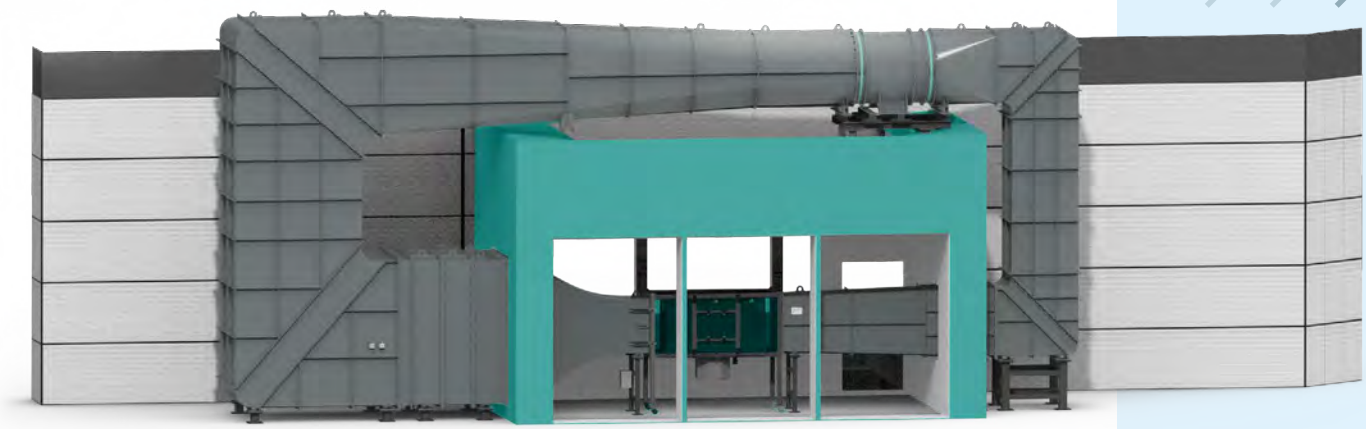
- Airflow velocity: 50 m/s for both configurations
- Possibility of 2 configurations - Open & ¾ Open test section
- Engine power: 11 kW
- The contract includes the delivery of aerodynamic balances
- Suitable for aircraft and car model tests
- Boundary layer suction system on the floor for measuring the aerodynamic characteristics of cars



¾ Open test section (automotive)

RESEARCH TUNNEL

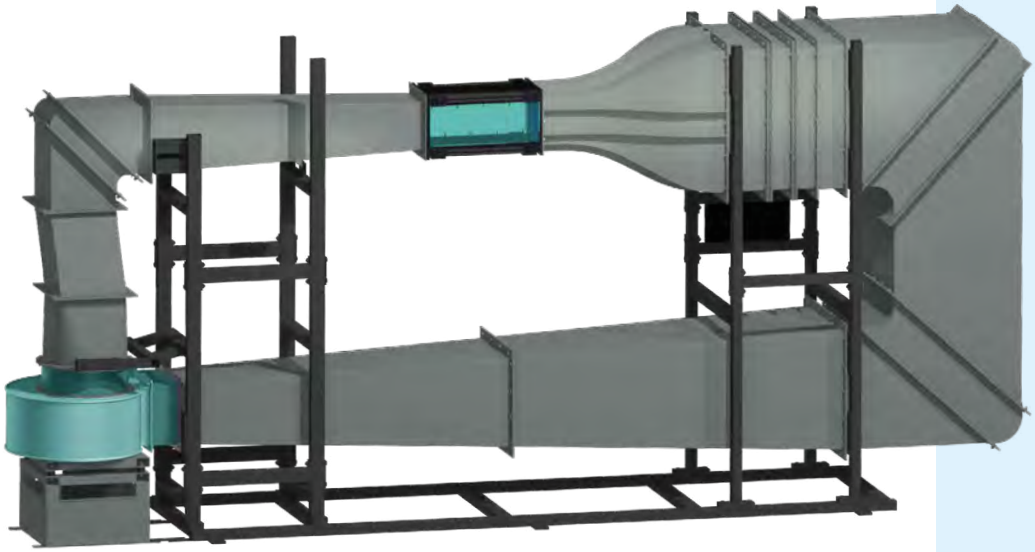
FOR MEASURING 2D PROFILE CHARACTERISTICS
TEST SECTION: 600 MM × 800 MM



Airflow velocity: 50 m/s
Partial tunnel location outside the building
Engine power: 18 kW

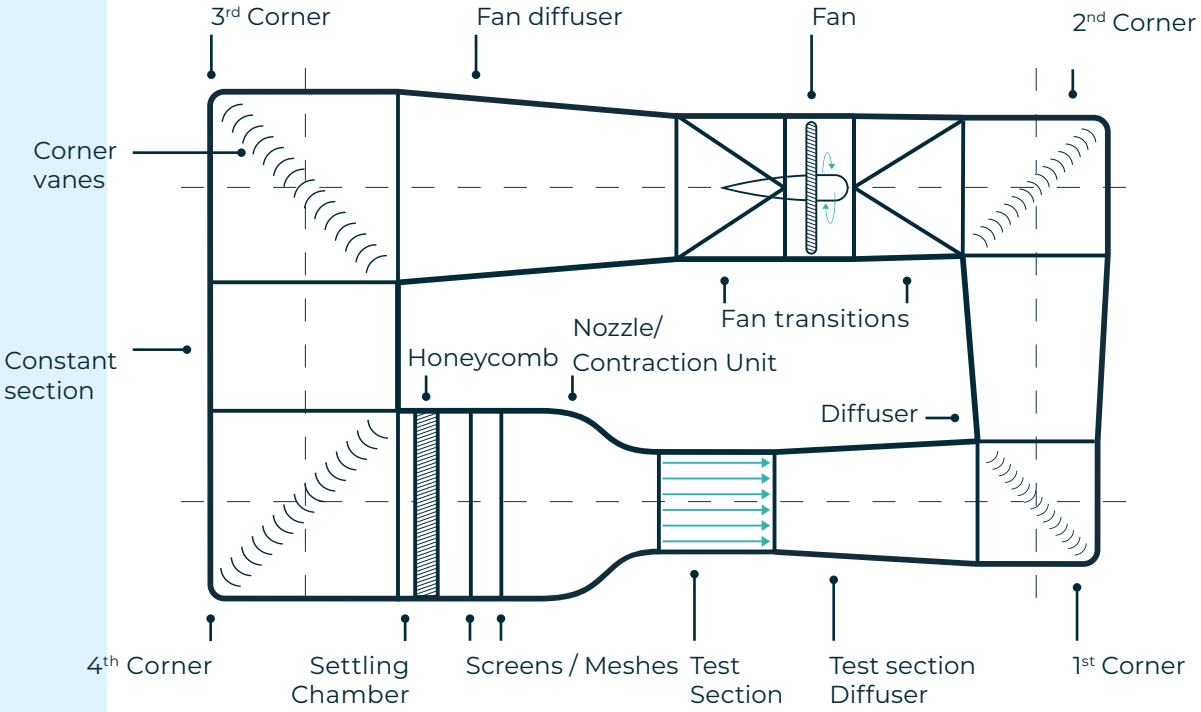
EDUCATIONAL DEMONSTRATION TUNNEL

TEST SECTION: 250 MM × 250 MM



Air flow velocity: 30 m/s
Engine power: 2,2 kW

CLOSED CIRCUIT WIND TUNNEL SCHEME



WT ACCESSORIES & SERVICES

WIND TUNNEL ACCESSORIES

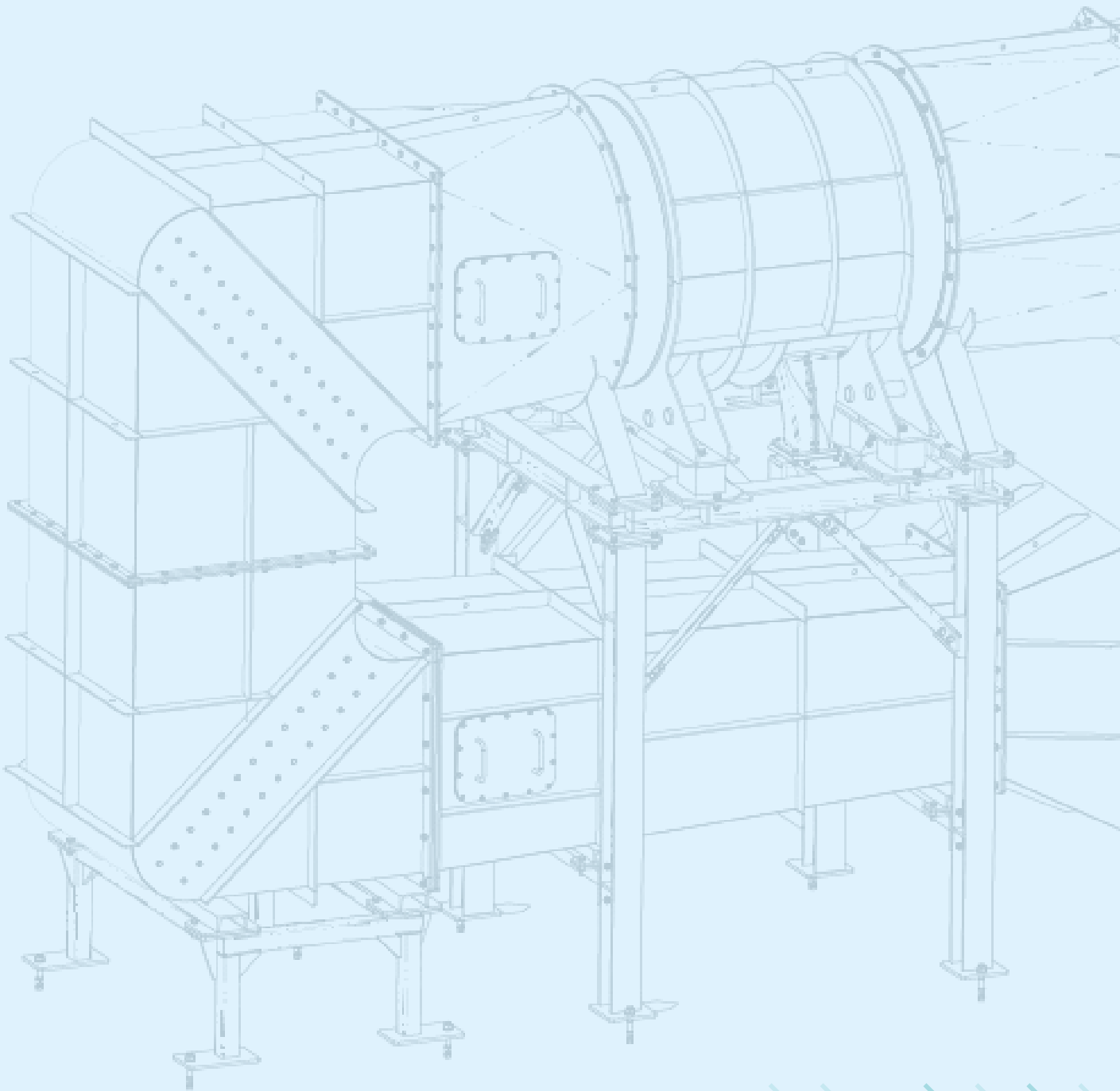
- Model manipulators and turn tables
- Aerodynamic multi-component balances
- Calibration devices
- Probes and traversing equipment
- Measuring and control systems
- Models
- Pressure and temperature sensors
- Scanivalve products

WTTECH.CZ SERVICES

- A wide range of WT customizations for specific conditions
- Custom design and manufacturing of parts
- Personnel training and education
- Project management
- Strategic research support
- Expert consultations in aerodynamics and specific testing
- Maintenance
- Modernization and improvement of existing WTs

WTTECH.CZ FURTHER SERVICES

- Modernization and technical improvement of wind tunnels
- Design and production of individual tunnel components



More products and our range of services can be found at **www.wttech.cz**