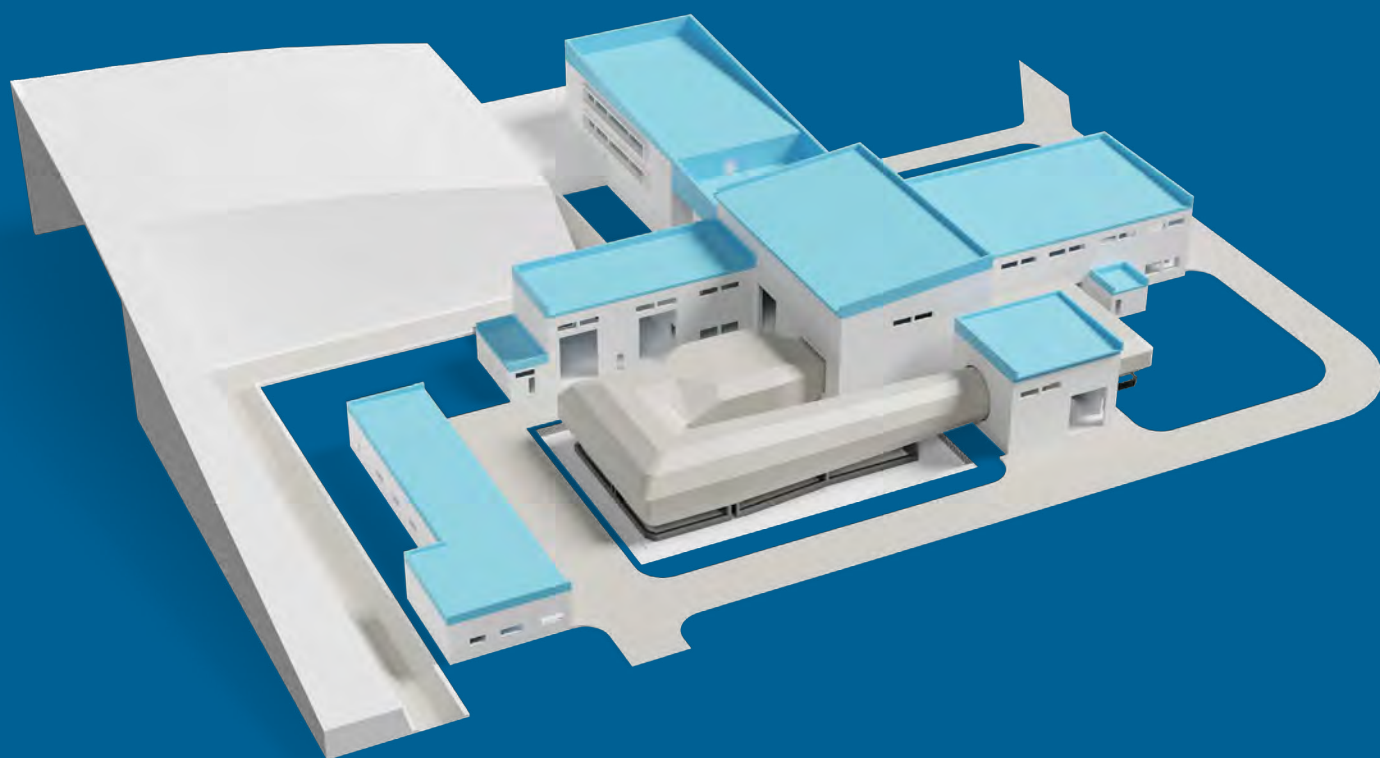


WIND TUNNELS FOR INDUSTRIAL CUSTOMERS



WTTECH.CZ SPECIALIST IN WIND TUNNELS

WTtech.CZ specializes in the **development, design, and construction of wind tunnels**, including special models for industrial applications and large research organizations by a well-established team of engineers, designers, constructors, and specialists in aerodynamics and mechanical engineering. With expert know-how and many years of experience, we offer solutions for every specialized project under complicated circumstances.

WTtech.CZ wind tunnels (WT) can be used in many different areas from aviation research to the automotive industry to skydiving and university teaching. Our services are not limited to tunnels; we offer testing and measuring equipment, software, data processing, consultancy, project management, and research project preparation.

In addition to WTs, WTtech.CZ specializes in advanced aerodynamic calculations, design work in the Creo 3D CAD system, CFD and FEM simulations, and developing accessories such as manipulators and aerodynamic balances. They also offer specialized measurement and control software, data processing, and analysis to optimize design and efficiently solving aerodynamic challenges.

WTtech.CZ was founded in 2009 and is an official National Instruments system integrator and the exclusive representative of Scanivalve Corp. for the Czech Republic, Slovakia, and Poland. As such, we have access to the latest technologies and cutting-edge research and measurement tools.

WIND TUNNELS FOR INDUSTRIAL CUSTOMERS

Wind tunnels are a key tool for many industries, especially research and development organisations. They enable precise measurements of various objects' and structures' aerodynamic properties to optimize their design, increase safety standards and efficiency in various applications.

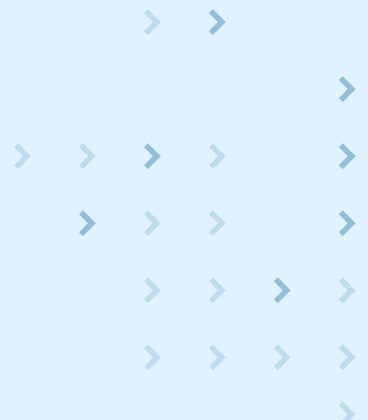
Industrial wind tunnel construction is designed to meet the specific requirements of each industry and application. The wind tunnel properties and parameters can be modified to fit a wide range of test scenarios including extreme flow and turbulence.

STUDIES, PROJECTS, AND INVESTMENT COSTS

WTtech.CZ will provide comprehensive studies, proposals, projects, and investment cost calculations for constructing wind tunnels, which can be based on a simple assignment.

Studies typically include:

- Tunnel parameters
- Definition of tunnel sections and associated equipment
- Different solution possibilities
- Space requirements and location options
- Energy requirements
- Budget estimation
- Implementation schedule
- Drawing documentation
- Equipment dimension calculations



TYPES OF WIND TUNNELS FOR INDUSTRIAL CUSTOMER

Wind tunnels are divided into **open-circuit tunnels** (where test airflow doesn't return into the tunnel duct after passing through the Test section) and **closed-circuit tunnels** where the same air enters the test section without significant pressure and kinetic energy losses. In the vast majority of cases, the closed-circuit is the go-to choice in industrial settings thanks to its lower operating costs and guaranteed air parameter quality.

TYPES OF WIND TUNNELS ACCORDING TO THE TEST AIRFLOW SPEED

WTtech.CZ offers WTs of various airflow speeds. The usual WT types are:

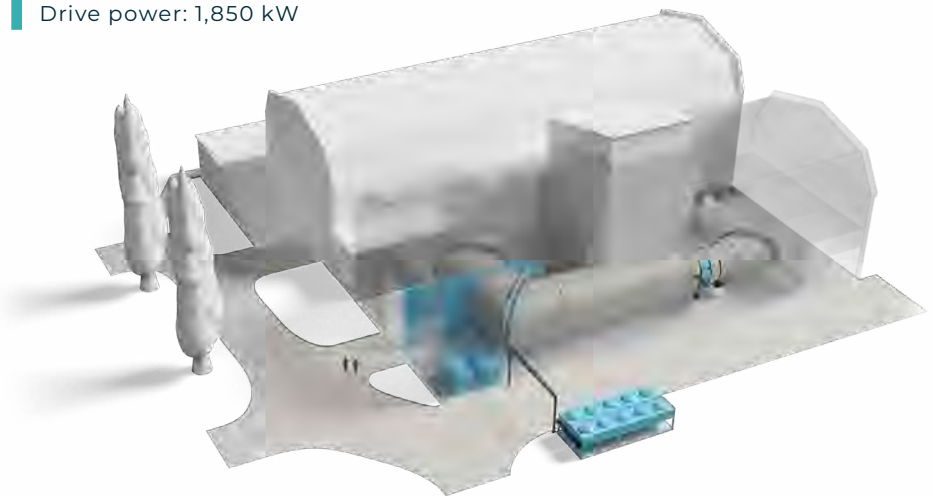
- Low-speed WTs** with no air compression, or a negligible effect of compressibility on measurement results
- High-speed WTs** with a speed at which air compression occurs
 - Subsonic WTs** with velocities below the local air velocity, or $< 0,6 M$ in the measurement area
 - Transonic WTs** which allow tests in both subsonic and transonic modes for $Mach\ 0,5 < M < 1,3$
 - Supersonic WTs** with adjustable M-value in the velocity range of $1,3 < M < 4,2$

However, speed is not the only value to be considered. WTtech.CZ implements WTs tailored to other requirements, such as circuit concept, measuring area dimensions, airflow quality and parameters, and sensor integration, implementing them with regard to the laboratory dimensions and power supply possibilities. Thus, we deliver an exact instrument perfect for your conditions.

SELECTED COMPLETED PROJECTS

RESEARCH WIND TUNNEL FOR THE AEROSPACE INDUSTRY WIND TUNNEL UPGRADE

- Test Section dimensions: 3,000 mm diameter, length 3,000 mm
- Maximum air speed: 80 m/s
- Drive power: 1,850 kW



The upgrade of the entire facility required upgrades of the low-speed WT sub systems. The study also included designs of several new cooling systems proposal, an increase in power input drive, and the installation of additional equipment in the flow channel.

MULTI-PURPOSE LOW-SPEED WIND TUNNEL

TURNKEY WIND TUNNEL DELIVERY

Test Section dimensions: 3,600 x 2,520 x 8,500 mm

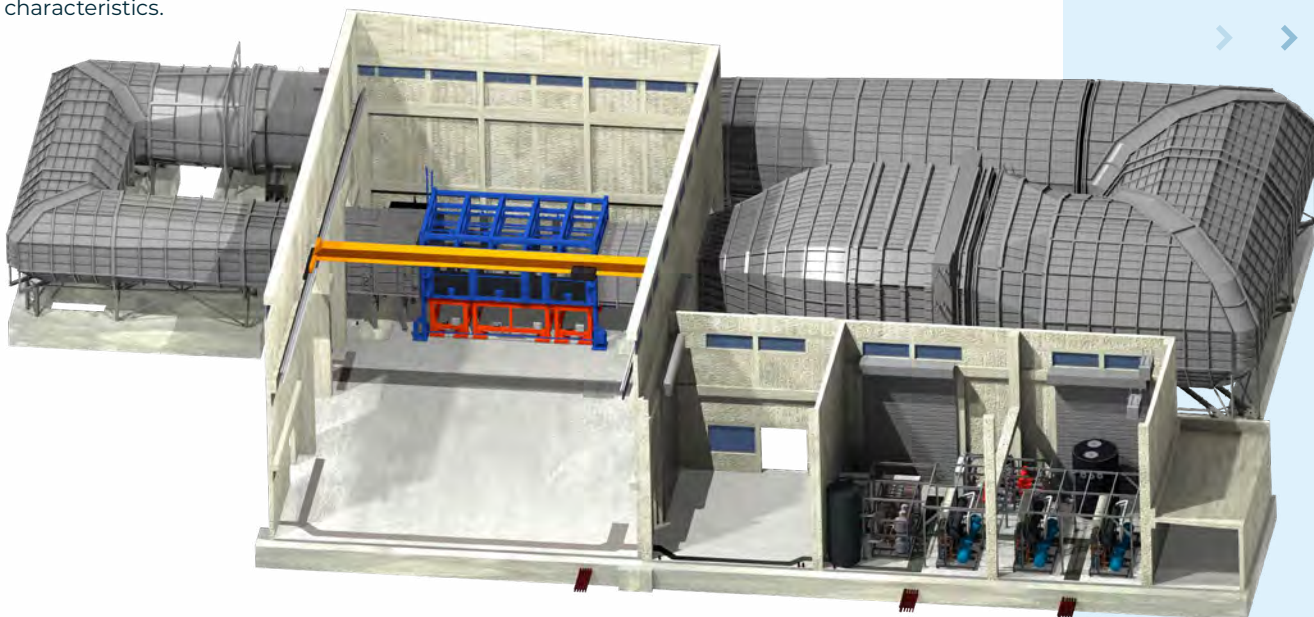
Maximum air speed: 110 m/s in the open measuring area
85 m/s in the enclosed measuring area

Drive power: 2,500 kW

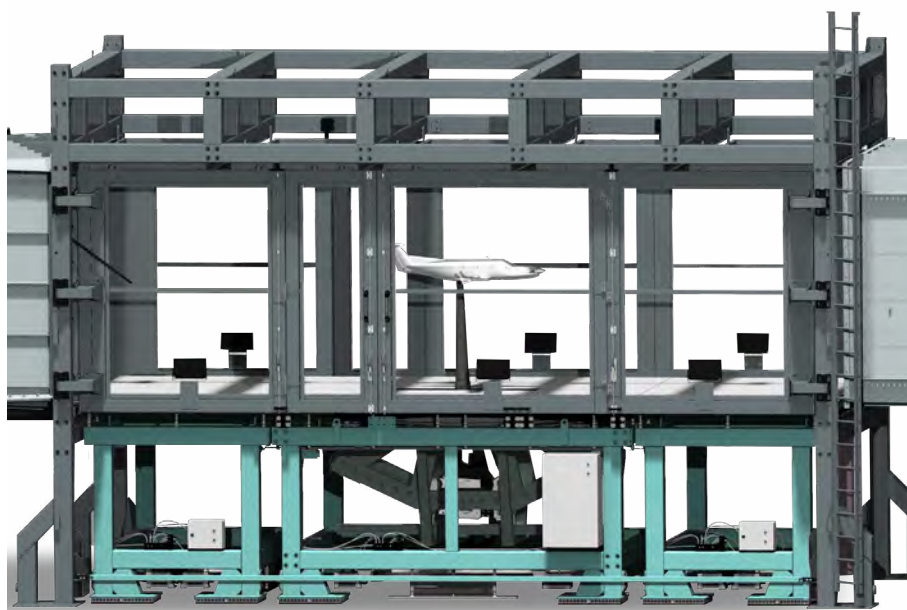
Specifications: possibility to configure the measuring area as both closed and open interchangeable measuring equipment system allowing measurement of different product types (aerospace, automotive, a 2,750-kW cooling system, etc.)



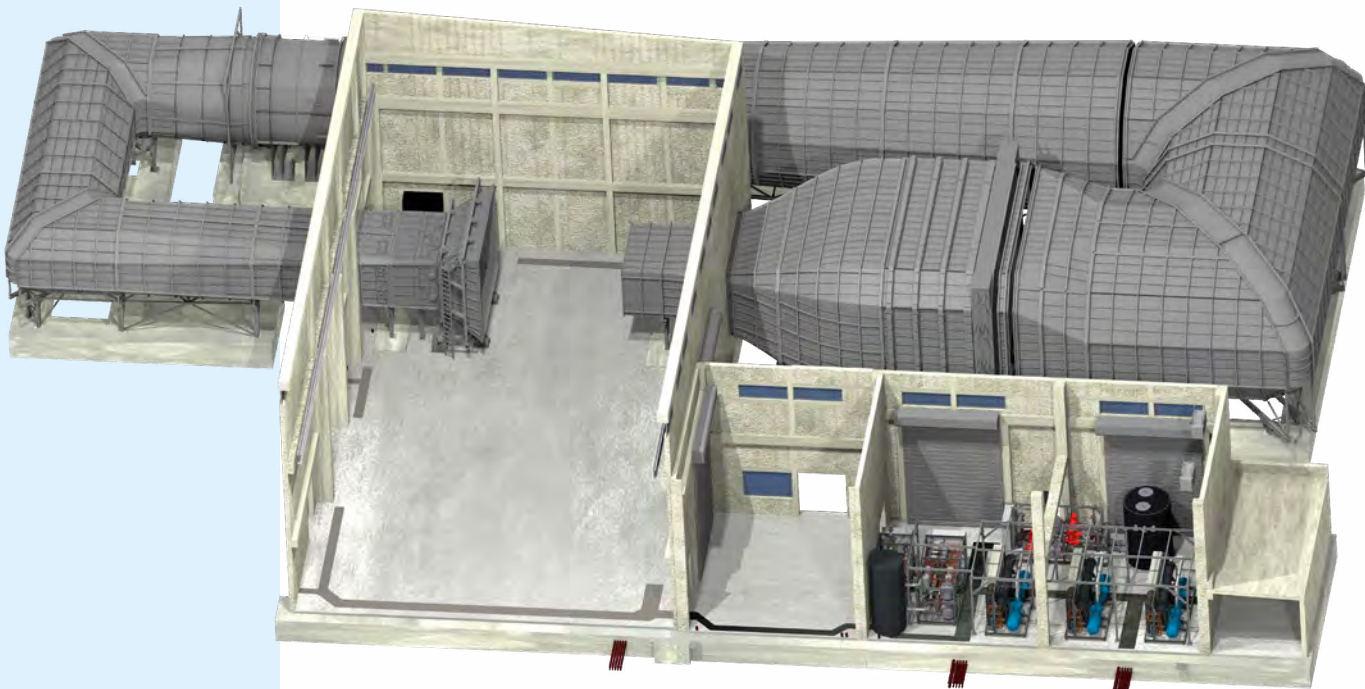
The delivery of a complex aerodynamic laboratory included a closed tunnel configuration measurement space suitable for measuring model aircraft and automobiles' aerodynamic characteristics.



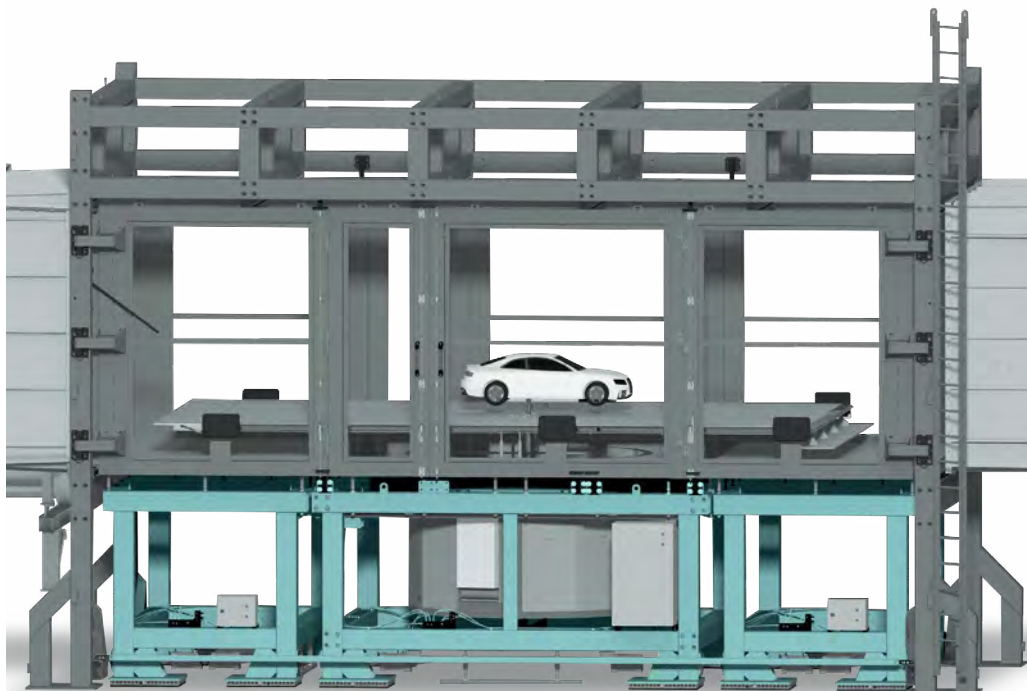
A typical transport aircraft model for measuring in a low-speed tunnel. The model is mounted on a mechanism that varies the yaw and attack angle on six-component aerodynamic scales.



Tunnel configuration with an open measuring space suitable for propellers' aerodynamic characteristic measurements, the effect of flow on actual products, and the wind resistance of various bodies.



A model car mounted on an external aerodynamic balance together with the measurement area equipped with a plate simulating the effect of the ground on aerodynamic characteristics.



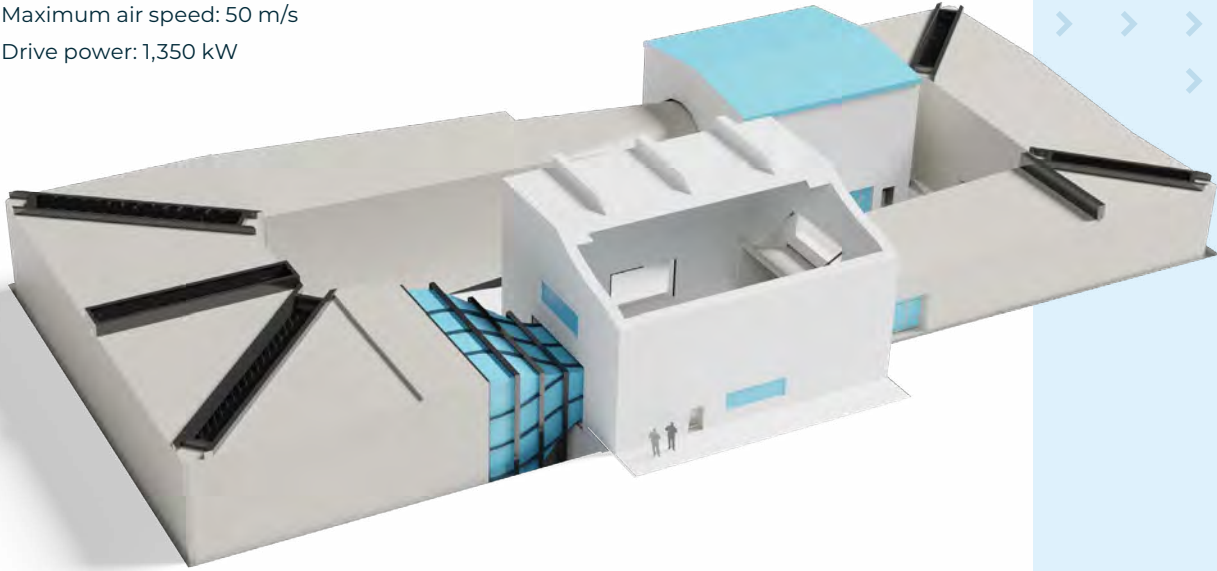
WIND TUNNEL FOR AUTOMOTIVE TESTING

PROJECT FOR AN AUTOMOTIVE RESEARCH CENTRE

Test Section dimensions: 6,000 x 4,000 mm

Maximum air speed: 50 m/s

Drive power: 1,350 kW



The wind tunnel project for an automotive research centre included designing the WT, implementing the design, and supervising the tunnel construction including control and measurement systems and installing the equipment.

The flow channel was designed as a concrete duct, taking into account the future installation of noise barrier measures, which would allow it to be used as an aeroacoustic tunnel after being enlarged.

AEROACOUSTIC AND CLIMATE TUNNEL RESEARCH COMPLEX

STUDY AND PROJECT PROPOSAL FOR A WT COMPLEX

AEROACOUSTIC TUNNEL

Test Section dimensions: 6,700 x 4,200 mm

Maximum air speed: 65 m/s

Drive power: 4,000 kW



CLIMATE TUNNEL

Test Section dimensions: 3,800 x 3,200 mm

Maximum air speed: 55 m/s

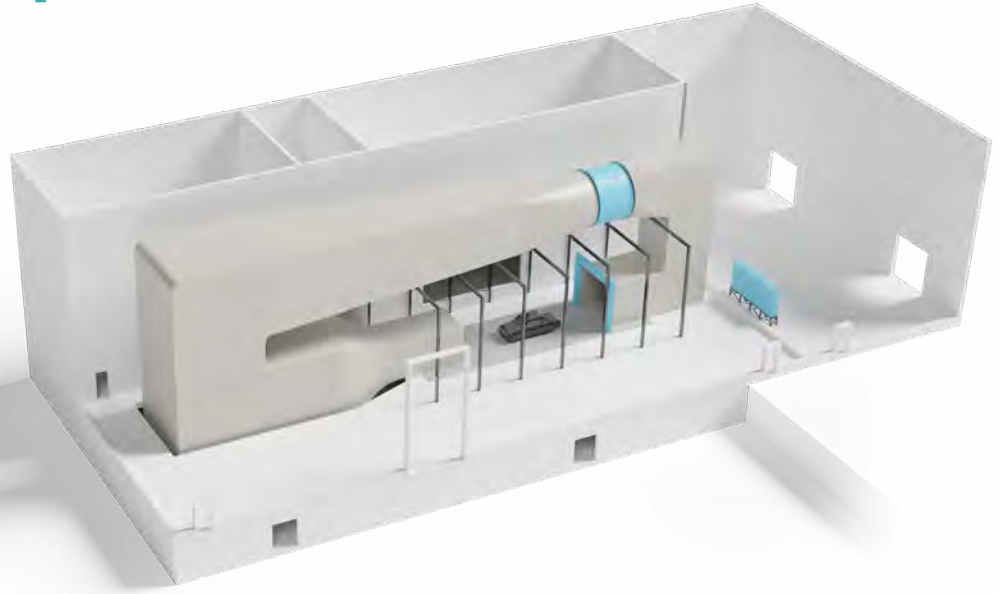
Drive power: 1,800 kW

Study and project proposal for a wind tunnel complex for an automotive aerodynamics research centre included the WT design, a detailed design of the buildings and laboratories, and all equipment and accessories.

CLIMATE TUNNEL FOR AN AUTOMOTIVE DEVELOPMENT CENTRE

STUDY AND PROJECT PROPOSAL

Test Section dimensions: 3,600 x 3,300 mm
Maximum air speed: 50 m/s
Drive power: 750 kW



The WT study and project proposal for an automotive development centre included a proposal for a climate WT and accessories.

ACCESSORIES & SERVICES

ACCESSORIES FOR WIND TUNNELS

Model manipulators and turntables
Multi-component aerodynamic balances
Calibration fixtures
Probes and traversing devices
Measurement and control systems
Models
Pressure and temperature sensors
Scanivalve products

WTTECH.CZ SERVICES

A wide range of WT adaptations to specific conditions
Design and manufacture of customized parts
Personnel training and education
Project management
Strategic research support
Expert consultation in aerodynamics and specific testing
Maintenance

ADDITIONAL WTTECH.CZ SERVICES

Tunnel upgrades and technical improvements
Design and manufacture of individual tunnel components

