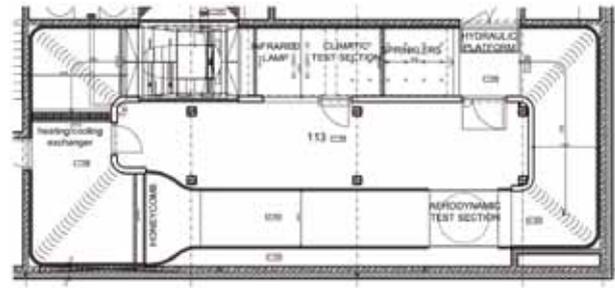


CET – Climatic wind tunnel “Vincenc Strouhal”

CWT – designed as a closed circuit with controlled wind velocity and temperature conditions. It consists of climatic and aerodynamic parts. While the aerodynamic part provides well-fitted conditions to study wind effects on scaled model of prototypes, an equipment of the climatic part is suited for investigation of influences of weather including the wind, temperature, rain and heat radiation. Integral part of the tunnel equipment consists of instruments for airflow diagnostic, data acquisition system, direct pressure surface measurement, precise thermometry and of many other types of handy accessories for instant use. Workshops for manufacturing of testing models are available in the same building.

Using the cooling/heating exchanger, cycle temperature changing of the airflow is available in the whole tunnel within the range of -5 to 30 °C in a relatively short time period. In this section (2.5×3.9 m), the wind speed ranges from 0.8 to 18 m/s (depending on the position of the vertically moveable ceiling and flow nozzle). The rain intensity together with the size of drops is regulated to simulate the effects corresponding to drizzle or heavy rain. The radiation system with four infrared lamps with 8 kW power and maximal incidence of 60° to the floor is available.

Ice created on a bridge cable (1) and water penetration in a gothic pinnacle during wind driven rain (2).

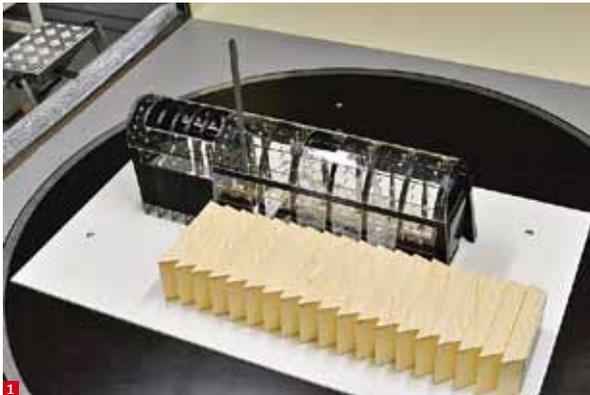


Aerodynamic section

Experiments in the field of wind effects on structures, wind characteristics, local wind environments, pedestrians comfort, aero-elastic structural response, diffusion, pollutant dispersion and matter transport, wind effects on building heat losses and ventilation, wind effects on transport systems, wind power generation.

The aerodynamic section consists of the converging nozzle with a honeycomb and the working part with turning table. The working part is in a rectangular cross-section area of 1.9×1.8 m. The total length of the working part is 11.0 m, including the turbulent generators. The simulation of the atmospheric boundary layer with demanded characteristics is based upon turbulent elements, such as spires, grids, barriers and floor roughness. The wind speed range for empty working section is 1.5–33.8 m/s or with special condition up to 50 m/s.

Scaled model tests of modern architecture. (1) Turbulence generators. (2)



Laboratory of the X-ray radiography and computed tomography

Largest single photon counting detector of the ionizing radiation in the world

Physical camera resolution (pixel size): $55 \times 55 \mu\text{m}^2$

Number of pixels: 2560×2560 (6.5 MegaPixels)

Sensitive area: $14 \times 14 \text{ cm}^2$

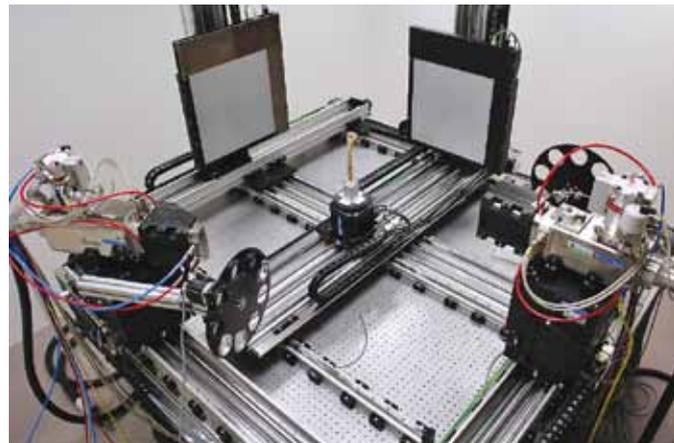
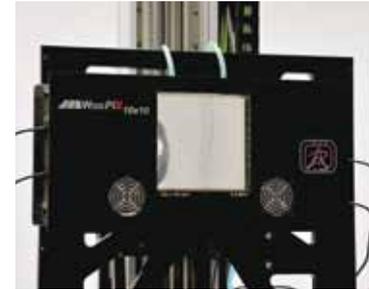
Readout speed: 1.5 fps

Combines both the Dual Source CT and the Dual Energy CT advantages

- * two different spectra
- * two different magnifications
- * speeds up CT measurements – 2×

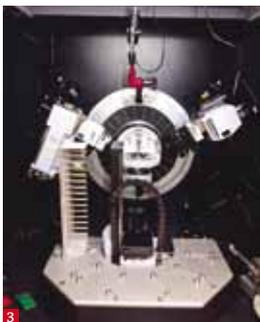
- * 2× X-ray tube
- * 2× detector – exchangeable
- * 16 position axes – controlled in real-time
- * Absolute measuring system – accuracy $< 1 \mu\text{m}$
- * High precision rotation stage – accuracy $\sim 200 \text{ nm}$
- * HW & SW for beam hardening correction
- * CT reconstruction software Volex – EZRT (Fraunhofer-Entwicklungszentrum Röntgentechnik)

Laboratory is fully available for collaborative projects as well as for research contracts.



Laboratories for material analyses

Thin section preparation. (1) Raman and FTIR microscopy. (2) XRD analyses. (3) SEM microscopy. (4) Thermal analysis. (5)



Laboratories for study of physical material characteristics and durability

Climatic chambers. (1) Porosimetry. (2) Nanoindentation. (3) Biaxial loading frame (tension/compression/torsion). (4) Dilatometry. (5) Salt chamber. (6)



1



2



3



4



5



6

Centre excellence Telč – review of laboratories

WP1 Climatic wind tunnel

Research supervisor: Assoc. Prof. Ing. Stanislav Pospíšil, Ph.D.

Climatic wind tunnel “Vincenc Strouhal”

Head of Laboratory: Prof. Ing. Sergii Kuznetsov, DrSc.

WP2 Radiography and neutrography

Research supervisor: Ing. Kateřina Kreislová, Ph.D.

Laboratory for material degradation and protection

Head of Laboratory: Ing. Jiří Frankl, Ph.D.

Research supervisor: Ing. Daniel Vavřík, Ph.D.

Laboratory for X-ray and neutron radiography

Head of Laboratory: Ing. Ivana Kumpová

WP3 Historic materials, structures and sites

Research supervisor: Ing. Zuzana Slížková, Ph.D.

Laboratory for porosimetry, microscopy and optical methods

Head of Laboratory: Denis P. Flynn, Ph.D.

Laboratory for physical-chemical analyses and material innovations

Head of Laboratory: Dr. Alberto Viani, Ph.D.

Mobile laboratory for diagnostics and wood research

Head of Laboratory: Ing. Michal Kloiber, Ph.D.

Laboratory for mechanical analyses and monitoring of materials and structures

Head of Laboratory: Ing. Petr Šašek, Ph.D.

Laboratory for sustainability of monuments and historic sites

Head of Laboratory: MgA. Dana Macounová

WP3 Lime kiln – Centre for research of traditional lime production

Head of the Centre: Ing. Jan Válek, Ph.D.