

# Laboratory of X-ray computer tomography

Institute of Geonics of the CAS



## Contact

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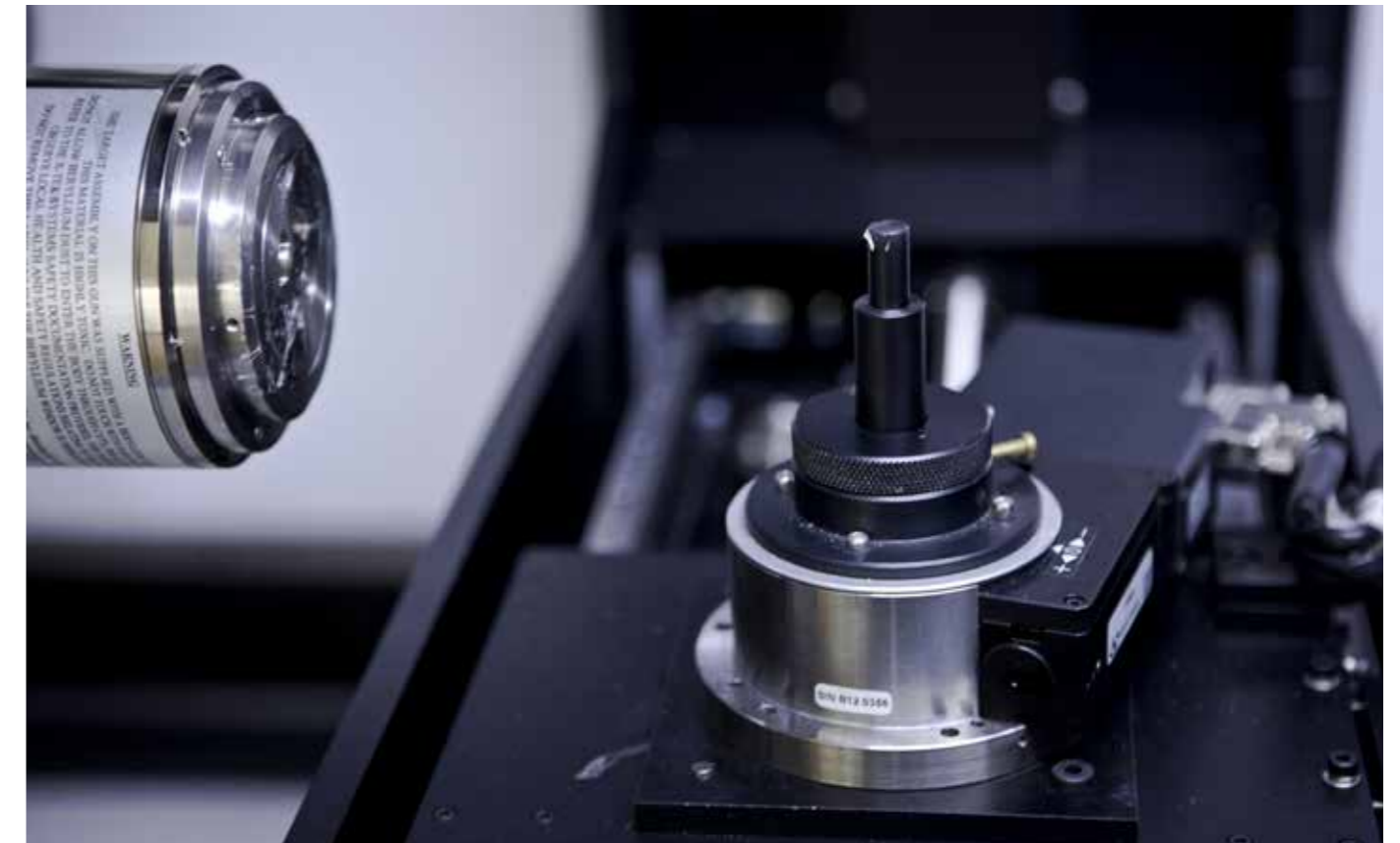
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The XT H 225 ST X-ray CT system



The XT H 225 ST X-ray CT system, transmission X-ray source with a rotary stage for samples under analysis

## Competences

The Laboratory of X-ray computer tomography was established in 2012 within the framework of the Institute of Clean Technologies for Extraction and Use of Energy Resources, based on an agreement among VŠB TU Ostrava, Faculty of Mining and Geology and a partner Institute of Geonics of the Academy of Sciences of the Czech Republic. The importance of the workplace lies above all in the possibility of non-destructive way of analysis and study of internal construction and time-space changes in different types of geomaterials in relation to the influence of external factors. The workplace is equipped with the two X-ray micro-focal industrial

computed tomography systems XT H 450 2D/3D and XT H 225 ST, reconstruction software by NIKON Metrology NV and visualization software VGStudio Max.

Basic technical specification of the laboratory equipment

- Tomograph XT H 450 2D/3D is a system with max. operating voltage and power output of X-ray source: 450kV/450W, X-ray focal size at 200W/600W: 80µm/300µm, max. weight, average and height of the scanned samples: 100 kg/ca. 0,6 m/ca. 0,8 m, max. X-raying thickness of the analysed samples: 395kg/m<sup>2</sup>, max.

- X-raying thickness of the analysed samples: 395kg/m<sup>2</sup>, X-ray detectors (16 bit contrast resolution): flat panel (400x400mm, 200µm per pixel, 4 mil. pixels), line detector (400 µm per pixel, 2 000 pixels)
- Tomograph XT H 225 ST is a system with max. operating voltage and power output of X-ray source: (reflex. Mode): 225kV/225W, max. operating voltage and power output of X-ray source (transmission mode): 180kV/20W, X-ray focal size (reflex. mode/transmission mode): <3µm/<1µm, max. weight, average and height of the scanned samples: 50kg/ cc.0,35m, max. X-raying thickness

- of the analysed samples: 237 kg/m<sup>2</sup>, X-ray detectors (16 bit contrast resolution): flat panel (400x400mm, 100 µm per pixel, 16 mil. pixels)

## Target groups

Target groups for contract research are industrial enterprises, technology centres and national or international research institutions. Another target group can be, for example, project partners from both the university and industrial and application environments, institutions active in the field of geomaterial research in relation to their internal structures.

## Our services

The laboratory can provide the following expert analyses:

- Research and analysis in the field of surface and spatial density of the inhomogenities, non-destructive research of structure and content of rocks, geomaterials, composites, building and construction materials
  - Visualization of the interior structure of materials
  - Study of other types of materials (steel, alloys, biological materials, etc.) Control of equipment, machines and their components
- Research on the character of the

- failure, defects and the formation and propagation of cracks in the studied materials
- Using the tomographic data analysis software, we offer the possibility of co-ordinate measurement of the geometric shapes of the analysed objects
- Investigation of the pore space of rocks, the character of penetration of fluids into the porous, disrupted environment
- Radiography - taking x-ray images