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Technical Specifications X-Ray Computed Tomograph Phoenix Nanotom S Summary



The X-Ray computed tomography system Phoenix nanotom s was purchased in 2011 (C108733) and allows for X-ray computed tomography (CT) i.e. 3D imaging of a wide variety of materials.

Software

The datoslx 2.0 CT software controls all components of the CT system and all relevant steps during CT measurement. It allows also for automatic geometry calibration, beam hardening correction, ring artifact correction, optimisation of scans with linear drift effects and automated acquisition.

VGStudio Max 2.0 (by Volume Graphics) is a 3D visualization software which allows also for 3D image processing and dimensional measuring.

Imaging

The resolution of the equipment is ca. 1 μm . The minimum voxel size is < 0.5 μm . The equipment allows for edge enhancement by using phase contrast. The maximum field of view is 60 mm by 60 mm (for virtual enlargement of the field of view see 'Detector').

X-ray generator

The equipment includes a high power nanofocus X-ray tube xsl180nf with a maximum output power of 15 W and a maximum high voltage of 180 kV. The minimum distance between focus and sample is 0.4 mm.

X-ray detector

The 2D detector consists of 2300 x 2300 pixels and has an active area of 120 mm by 120 mm (corresponding to a pixel size of 50 μm x 50 μm). The dynamic range is 850:1.

The detector can be moved in horizontal direction for a virtual enlargement of the detector (travel range ca. 240 mm which corresponds to a virtual detector size of 360 mm by 120 mm).

Sample stage

The equipment includes a motorized and software controlled sample stage for motion in y and z direction and rotation around the y-axis (z-axis: direction of the X-ray beam; the y-axis is the axis of rotation for the CT scan and is perpendicular to the z-axis). The range of the rotation covers 0-360° with a maximum error in the rotation angle of 0.005°. The z-range is 300 mm, the y-range is 150 mm.

The maximum sample diameter is 120 mm and the maximum sample height is 200 mm (up to 150 mm the whole sample height can be imaged, for higher samples only the center of the sample). The maximum allowed sample weight is 2 kg.

The equipment allows for a fast sample exchange. Time for sample exchange (including sample setup, excluding mounting the sample on a holder) < 5 min.

Cabinet

The cabinet offers protection versus X-rays. The equivalent dose at each point at a distance of 10 cm of the equipment is less than 1 μ Sv per hour.

The cabinet contains two feedthroughs for further connections (e.g. for in-situ imaging). The diameter of the larger feedthrough is 20 mm.