Motorized Tilt & Rotation Sample Holder
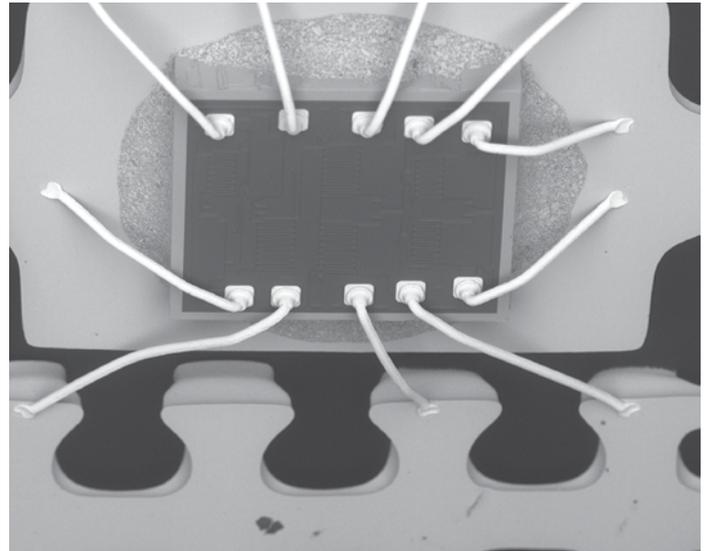

Tilt range –10° to +45°

Continuous 360° compucentric rotation

Controlled by dedicated Motion Control ProSuite software application

RTilt adapted focus

PHENOMWORLD

Every sample has its own specific demands. The shape of some samples requires flexible manipulation to obtain optimum imaging results. Samples can contain lines, holes, multi-layer structures or other specific features. To obtain the best image of these features, the operator needs to position the sample such that the opening angle towards the detector is optimized. The Motorized Tilt & Rotation Sample Holder provides the solution for imaging these features by tilting and rotating the sample.

The Motorized Tilt & Rotation Sample holder is controlled via a dedicated ProSuite application. The computer-controlled operation enables smart rotation and tilting movements.

Compucentric rotation

Rotating a feature that is off-center requires three-axial control. With the compucentric rotation function in the Motion Control software, this happens fully automatically. Tilting a feature causes a change in working distance and physical Y-position.

Pseudo-eucentric tilt

The pseudo-eucentric tilt function auto-corrects the Z-height by adjusting the focus distance. The Y-position of the Phenom stage is corrected simultaneously, driven by the Motion Control software with these automated sample manipulation capabilities, it is possible to image any feature on any sample in an intuitive and convenient way.

The combination of motorized tilt and rotation introduces a new, wide range of sample–analysis options:
> Creating 3D images by using a +/– 5° tilt is the fastest way to get stunning 3D image.
> Accurate tilting of the sample is mandatory to obtain quantitative 3D results.
> Collecting 3D data is now within reach, whereas the align X and Y functions help to align your feature with just two mouse clicks.

The Motorized Tilt & Rotation Sample holder is a so-called smart sample holder that does not have any cables attached. The sample holder interface board automatically identifies the sample holder type and will directly transfer tasks to the holder. This feature is completely in line with the well-known Phenom philosophy of creating easy-to-use and intuitive products.

Navigation camera

The Motorized Tilt & Rotation Sample holder can be operated in the navigation camera and SEM position, with a tilting range of –10° to +45° and endless 360° rotation. Both the tilt and rotation range can be adjusted in small steps of 0.2°. The 360° rotation function is built on top of the tilt axis. This enables the sample to be viewed from all sides, while keeping the tilt angle fixed. Rotating the specimen in the tilted position allows the feature to be viewed from all sides, extending the virtual tilting range from –45° to +45°.

The operator can load the sample in any orientation, as the sample can be aligned fast and easily inside the microscope.
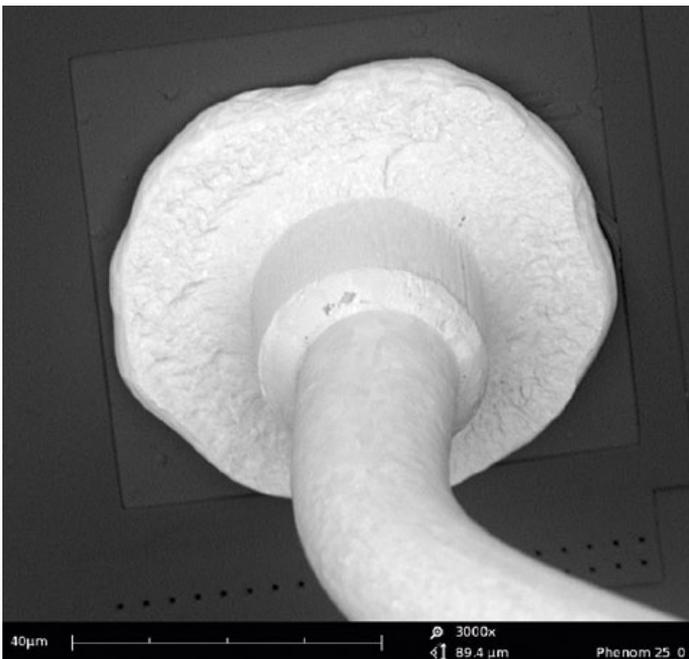
The Motorized Tilt & Rotation Sample holder was developed in close cooperation with our development partner Deben UK Ltd, experts in delivering motion systems for electron beam equipment.
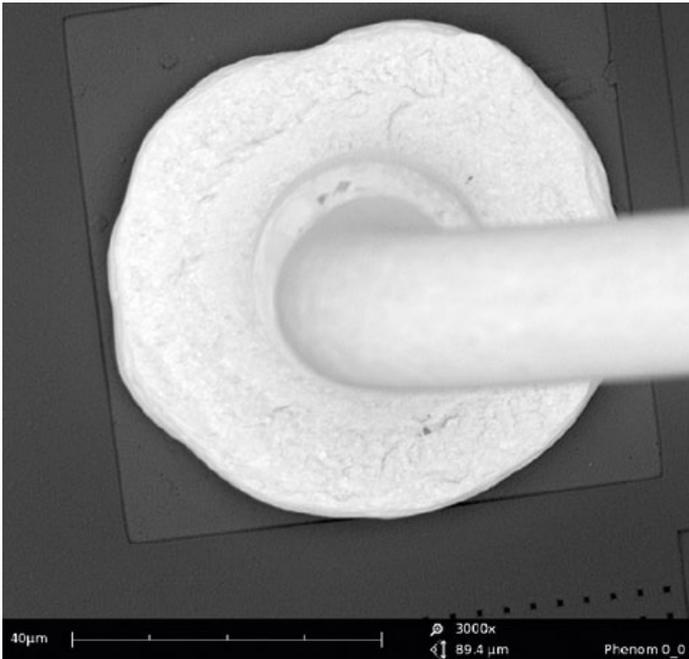
Silver bond pad on chip: Zero tilt, zero rotation.
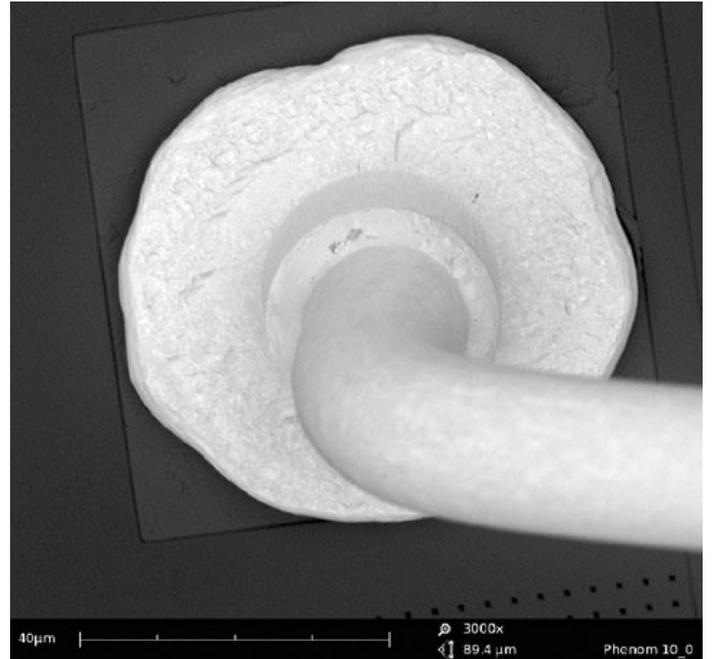
Silver bond pad on chip: 10° tilt, zero rotation.

Silver bond pad on chip: 25° tilt, zero rotation.

Silver bond pad on chip: 45° tilt, zero rotation.

Target applications

> X-sectional imaging of multi-layer devices
> MEMS
> Surface analysis
> Laser markings
> Characterization of edged surfaces
> Coating inspection
> Particle 3D and shape classification

Specifications

Tilt range	-10° to + 45° (step size 0.2°)
Rotation continuous	360° (step size 0.2°)
Max. sample diameter	12 mm
Max. sample height	5 mm
Max. sample weight	60 g
Vacuum level	high vacuum

Controlled by dedicated Motion Control ProSuite application
Compucentric rotation
Pseudo-eucentric tilting
Tilt-adapted focus
Storage of stage locations in map and coordinates
Align X and Y