

Use of the ASCEND Xtreme Access manipulator for TEM specimen lift out

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Xtreme Access system

The „Xtreme Access“ manipulation system can be used for lift out of TEM samples. The main part is the extractor rod which allows in combination with the air lock a continuous sample preparation without the need for venting the chamber. The rotation and the coarse in/out motion is implemented by a stepper motor drive. The fine motion is performed by a piezo drive for x, y and z relative to the SEM stage. On the tip of the extractor rod a carrier is placed which includes an end effector. The TEM sample will be lifted out by welding the lamella at the tip of the end effector using FIB deposition.

This flat end effector is made of a ductile material. Its tip can be bent by 180° after the TEM sample is fixed on the tip. Then the outer diameter of the end effector is 3 mm so it can directly be transferred into the TEM. Another application of the end effector is to cut a small slit into the tip and use it as an elasto-plastic gripper made of metal. The cut is easily made with a FIB.

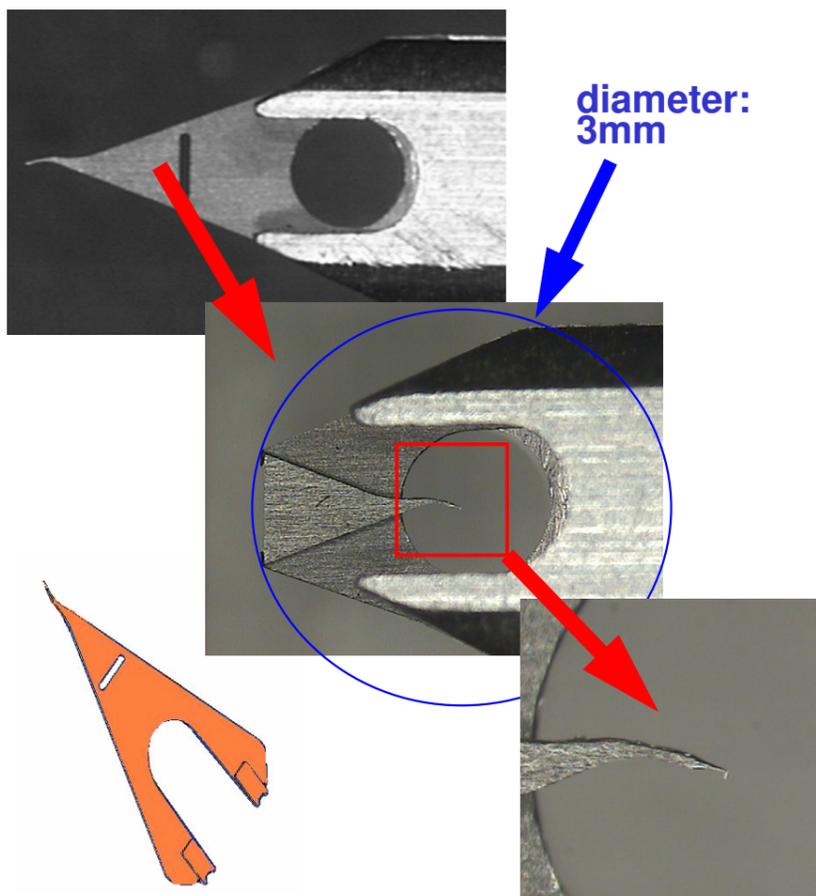


Fig. 1: end-effector before and after bending by 180°

First Results with Xtreme Access

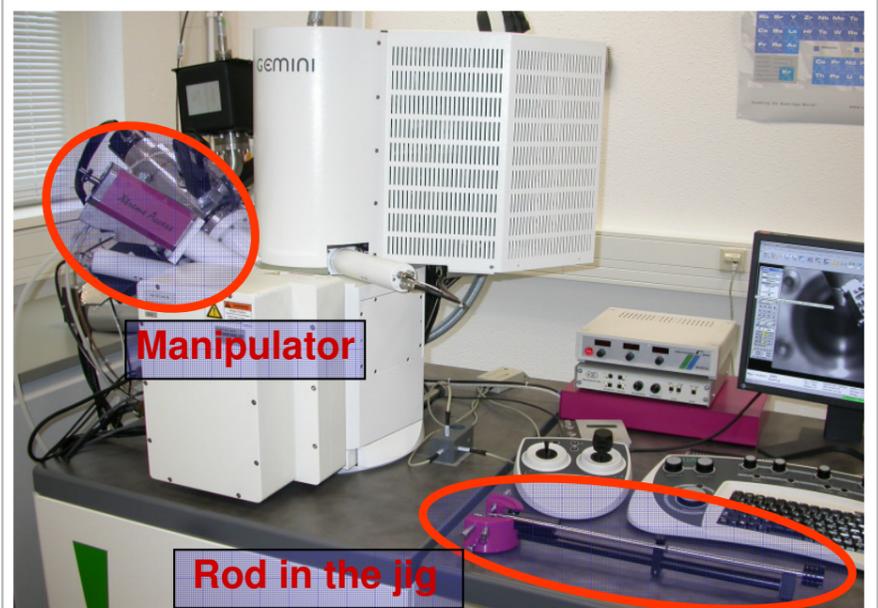


Fig. 2: Xtreme Access mounted on the EDS port of our Crossbeam ZEISS 1540XB

The manipulator is easy and fast in use. It takes about 30 minutes for a TEM lamella lift out. The integrated rotation allows the use of slit grippers for the lift out, Fig.3. The possibility of taking the end effector directly into the TEM after lifting the sample in the FIB station is a time saving method.

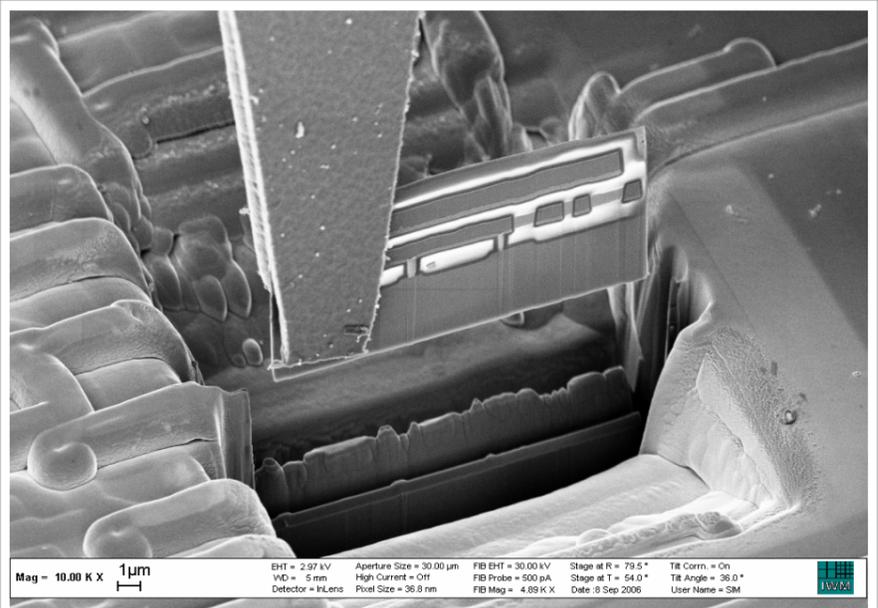


Fig. 3: TEM lift out with slit gripper

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