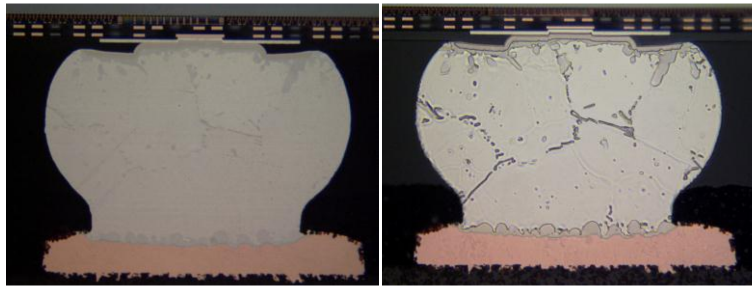
Ion Milling: Improving sample preparation

Analytical Services

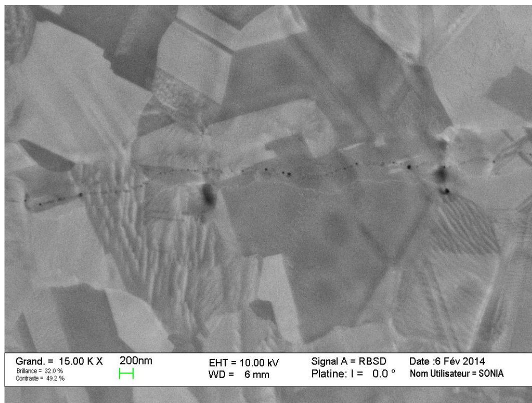
The C2MI ion milling tool is mainly used as the final preparation step for metallographic cut (cross-section). 1-2 mm wide argon ion beam is used mechanically to etch the sample surface by removing material. Since the etch rate is related to the material and its crystallographic orientation, it is possible to increase the contrast between different materials and reveal grain structure. The etch rate is also related to the angle between the beam and the surface. The ion beam can be used to obtain flat surfaces or to remove undesirable polishing scratches.



Lead-free solder bump observed by optical microscope before and after ion milling

One of the many advantages offered by the ion milling is that it can remove smearing of soft material as commonly observed when using mechanical polishing. It offers the possibility to observe cross-sections of fine layers of soft materials such as gold without the defects caused by mechanical polishing.

The samples can be observed after ion milling with both optical microscope and scanning electron microscope. Ion milling can also be used for EBSD sample preparation, cross-sections such as FIB and thin TEM layer sample preparation.



Copper via observed in cross-section by scanning electron microscope. No details were visible prior ion milling