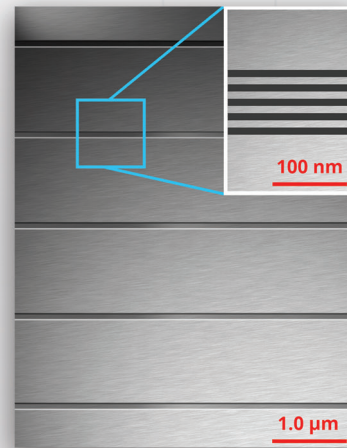


MAG*I*CAL®

Traceable Transmission Electron Microscopy
Calibration Sample



This unique calibration sample is directly traceable to the crystal lattice constant of silicon and can be used to perform the three major instrument calibrations in all Transmission Electron Microscopes (TEMs):

- ✓ Image magnification at all magnification ranges
- ✓ Camera constant
- ✓ Image/diffraction pattern rotation calibrations

APPLICATION

The magnification calibration is the most common calibration in electron microscopy, since it is important to know if the magnification value on the microscope console or on the image is accurate, if not how to correct the value. With the unique MAG*I*CAL® calibration sample you can perform this calibration in the entire range of magnification in a TEM from about 1000x up to 1,000,000x. Since the sample itself is a single crystal, it can also be used to perform camera constant calibration and also image/diffraction pattern rotation calibration. Although the MAG*I*CAL® calibration sample was developed by materials scientists, life scientists doing TEM will find the use of MAG*I*CAL® to be equally useful.

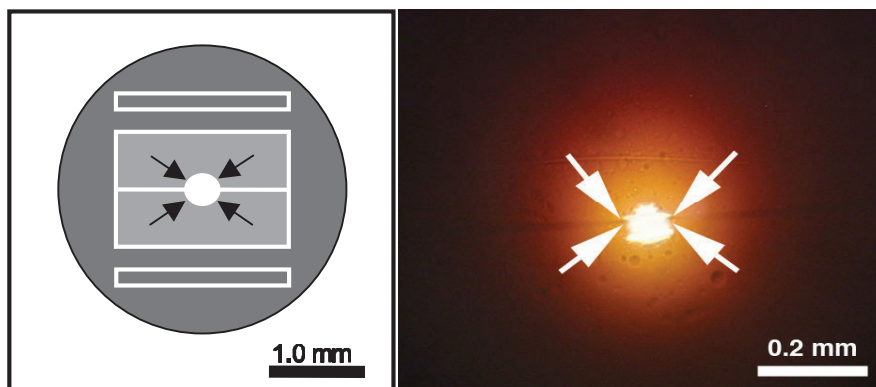


Diagram and photograph of the MAG*I*CAL® reference standard. The arrows on the drawing and photograph indicate the four regions on the standard where the calibration marks may be found.

DESCRIPTION

The MAG*I*CAL® calibration reference standard is an ion milled cross-sectional TEM sample of silicon-based semiconductor multilayer. It consists of four sets of five ~10 nm thick SiGe alloy layers, alternating with ~13 nm thick pure silicon layers. The device quality epitaxial layers were grown by Molecular Beam Epitaxy (MBE) as strained layers on a single crystal silicon <001> substrate. The four sets of alternating layers (superlattices) provide dark and light contrast in the TEM and were directly calibrated by high resolution transmission electron microscopy (HRTEM) in reference to the {111} lattice spacing of silicon, as measured on the single crystal silicon substrate. The calibration marking on the standard are directly referenced to a natural constant, namely to the lattice constant of silicon, this way MAG*I*CAL® provides unbroken traceability to a fundamental constant of nature.