

TEM Grid Holders for SEM & STEM Observations

Imaging TEM samples in the SEM

Thin TEM samples cannot exhibit signals originating from bulk which results in improved surface imaging and increased spatial resolution from these specimens. These are clear advantages for SEM/EDX studies of thin films, fine dispersions, inclusions, precipitations and low-Z materials. An SEM (or rather FESEM) can also be used to check TEM samples or lamellas made with a FIB before inserting into a TEM.

There are two methods of imaging TEM samples and they require different types of TEM grid holders:

- surface imaging and investigation require TEM grid holders
- STEM imaging which requires a special TEM grid holder with integrated conversion plate

They are intended for use in table top SEMs, high-end SEMs, FESEMs, Auger, SIMS and light microscopes. The grid holder can also be used to quickly check the sample (after FIB procedures) before investigating it with a TEM. They are all precision machined from vacuum grade aluminium.

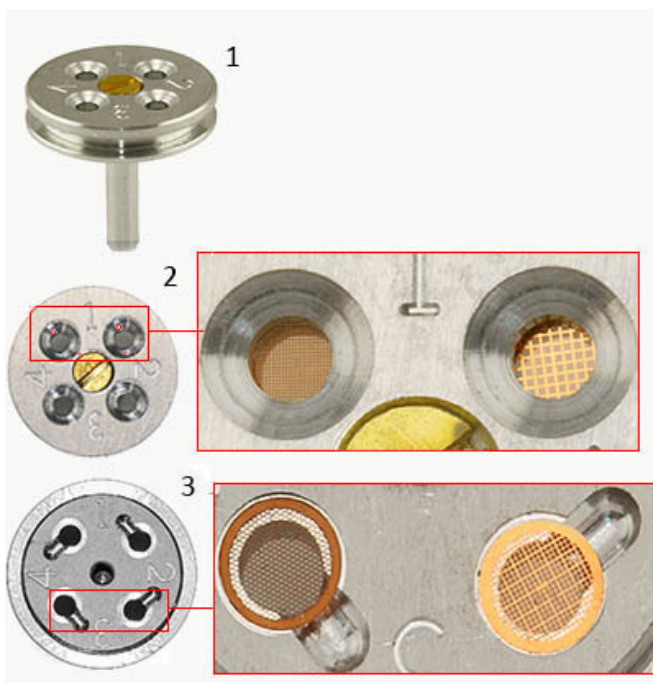
There are three types of TEM grid holders:

TG4 pin stub based TEM grid holder for up to four grids. Numbered positions with machined pockets and side grooves for loading/unloading the grids. Grids are clamped by the top plate and a central brass screw. The hole size is 2.1mm \varnothing with a 60° side angle on top and base to reduce electron and X-ray scattering interference from the holder. Available in aluminium and copper. Overall size is 18 x 3.2mm \varnothing with a 15mm long standard 3.2mm pin. The longer pin creates a distance from the stage adapter to reduce electron and X-ray signals from the SEM stage. Additionally available with stub adapters for Hitachi M4 thread and JEOL 12.2 \varnothing and 25mm \varnothing stubs.

PS11 mini pin stub holder for a single TEM or FIB grid. TEM grid rim rests on a ledge; in the middle of the cavity there is dimple to provide a non-touching area for the mesh of the grid. A groove is provided for easy loading/unloading of the TEM grid with fine tweezers. The grid is not clamped. This holder is used for quickly checking a TEM grid in the SEM or as a TEM grid holder for a carbon evaporator.

PS14 mini pin stub holder for four TEM or FIB grids. The rim of TEM grid rests on a ledge and in the middle of each cavity there is dimple to provide a non-contact area for the mesh of the grid. Grooves are provided for easy loading/unloading of the grids with fine tweezers. The TEM grids are not clamped (gravity is sufficient) as this holder is used for quickly checking up to four grids in the SEM or as a grid holder for a carbon evaporator.

All three grid holders come with a standard 3.2mm pin They can be used on other SEMs with our appropriate stub adaptor.



1) TG4 pin stub based TEM grid holder for up to four grids. The longer pin creates a distance from the stage adapter to reduce electron and X-ray signals from the SEM stage.

2) The TEM grids are clamped down by the top plate and a central brass screw. Hole size is 2.1mm \varnothing with a 60° side angle on top and base to reduce electron and X-ray scattering interference from the holder.

3) Top plate removed; numbered positions with machined pockets and side grooves in the base to facilitate loading/unloading the TEM grids with fine pointed tweezers.



S400 TG4 TEM grid holder securely holds up to 4x TEM grids, 18 x 3.2mm Ø, aluminium, pin base



S401 TG4C TEM grid holder securely holds up to 4x TEM grids, 18 x 3.2mm Ø, copper, pin base



S798 PS14 mini TEM grid holder securely holds up to 4x TEM grids, 12.7 x 3.2mm Ø, aluminium, pin base



S793 PS11 mini TEM grid holder securely holds 1x TEM grid, 12.7 x 3.2mm Ø, aluminium, pin base



S794 TG4H TEM grid holder securely holds up to 4 TEM grids, 18 x 3.2mm Ø, aluminium, pin base with Hitachi M4 stub adaptor



S795 TG4J TEM grid holder securely holds up to 4 TEM grids, 18 x 3.2mm Ø, aluminium, pin base with JEOL 12.2mm Ø stub adaptor



S796 TG4J2 TEM grid holder securely holds up to 4 TEM grids, 18 x 3.2mm Ø, aluminium, pin base with JEOL 25mm stub adaptor



The STEM imaging holder is a cost effective method of adding STEM capabilities to your SEM at a fraction of the cost of a dedicated STEM holder and detector. The holder provides a genuine signal from the converted transmitted electrons, resulting in high contrast STEM imaging. The limiting factors are sample thickness and the accelerating voltage of the SEM. The height of the holder is 29.5mm; with the electron absorption sleeve this increases to 37.5mm

STEM Imaging Holder for TEM/FIB Grids

The ST1 STEM imaging holder facilitates STEM imaging of TEM samples in an SEM or FESEM. The holder uses the Everhart-Thornley SE detector in the SEM chamber. The TEM grid is placed in the STEM imaging holder and the holder is positioned under the electron beam (typically in the centre of the SEM stage). The TEM sample is scanned with the electron beam and the STEM image is formed by converting the transmitted electrons which hit the platinum conversion plate, into secondary electrons. The secondary electrons (holding the STEM image information) are collected by the SE detector in the sample chamber. It is advised to use high accelerating voltages (25-30kV) and thin samples to increase the transmitted electron signal. The STEM imaging detector is provided with a black conductive plastic electron absorption sleeve which is placed between the pole piece and the ST1 STEM imaging holder. The sleeve absorbs the secondary and backscattered electrons emitting from the sample surface. Constructed from vacuum grade aluminium, brass TEM grid holder, platinum electron conversion plate and conductive plastic sleeve. Platinum is used for the conversion due to its high secondary electron signal, stability and corrosion resistance.

- S735** ST1 Stem Imaging holder for 1 x 3mm grid on standard 3.2mm pin base
- S736** ST1 Stem Imaging holder for 1 x 3mm grid on M4 thread base