SiMPore
Precision Membrane Technologies™

# How to Choose a TEM Window Grid

Application Note: Guidelines for selecting a TEM Window Grid

## Slots or squares?

Our TEM windows are available in an assortment of geometries including standard two slot or nine square formations. Due to the geometry, the squares will be slightly more robust and more likely to survive rigorous sample preparation. The slots allow larger uninterrupted viewing windows

## 100 or 200 micron thick frames?

All of our grids are designed to fit into standard 3 mm TEM sample holders. Our 200 micron thick frames fit into most standard holders. Additionally, we produce 100 micron thick frames that fit holders designed for high tilt or thin carbon grid applications.

## Membrane thickness and type?

The choice of membrane thickness and type is dependent on many variables, including:Thinner membranes (5-10 nm) are more suitable for higher resolution imaging, while thicker membranes (15-50 nm) are better for demanding sample preparation procedures.

Consider using a thicker membrane for method development and moving to thinner membranes for final imaging.The nature of the specimen preparation may determine the choice of membrane. The thermal and chemical stability, surface hydrophobicity, and plasma cleanability differ among the various membranes and should be taken into consideration for each application.

| | **Amorphous Silicon** | **Porous Nanocrystalline Silicon** | **Silicon Dioxide** | **Silicon Nitride** | **Standard Carbon** | **Ultrathin Carbon** |
|---|---|---|---|---|---|---|
| **Actual Thickness (nm)** | **5,9** &15 | 15 | 20 & 40 | **10**, 20 & 50 | 20-50 | **~10** |
| **Image Quality** | **Excellent** | Good | OK | Good | OK | Good |
| **Plasma Cleanable** | **Yes** | **Yes** | **Yes** | **Yes** | No | No |
| **Elemental Analysis Background** | **Si Only** | **Si Only** | Si, O | Si, N | C, H | C, H |
| **Thermal Stability** | ~600 C | **>1000C** | **>1000C** | **>1000C** | ~400 C | ~400 C |
| **Chemical Stability** | Avoid Strong Bases | Avoid Strong Bases | Good | **Excellent** | Good | Good |
| **Tolerates High Beam Currents** | **Excellent** | **Excellent** | OK | OK | **Excellent** | **Excellent** |
| **Potential Contamination Source** | **None** | **None** | **None** | **None** | Carbon | Carbon |
| **Open Nanoscale Pores** | No | **Yes** | No | No | No | No |
| **Background** | **Featureless** | Nanocrystalline | **Featureless** | **Featureless** | **Featureless** | **Featureless** |