

# Adhesives for TEM Sample Preparation

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Multiple adhesives are available for the following transmission electron microscope (TEM) sample preparation process steps: bonding multiple samples together, mounting the sample stack to the fixture and securing the thinned sample to a TEM grid. Since each step has different needs, the application and the sample material will determine which adhesive is best to use for each step.

For more detailed information on the TEM sample preparation process, please refer to Allied's applications lab report "TEM Wedge Preparation of Silicon."

## Bonding Samples

A thin bond line is necessary when bonding multiple samples together for TEM preparation to provide as much stability as possible during grinding and polishing. Alligator clips or other clamps/fixtures are used to squeeze the sample stack together while the adhesive cures to help create a thin bond line.

**M-Bond 610 (#71-20000)** is a permanent, 2-part adhesive that requires heat to cure. It is chemically resistant, provides a very thin glue line that ion mills evenly and will not outgas under vacuum.



**EpoxyBond 110 (#71-10000)** is a fast-curing, permanent, 2-part epoxy adhesive that requires heat to cure. Once cured, it is chemically resistant to most etchants and solvents, and will not outgas under vacuum. It has a higher viscosity than M-Bond 610, but a thin bond line is still achievable.

## Mounting Samples to a Fixture



Adhesives used to mount samples to a fixture are generally soluble in acetone so that they can be easily removed from the paddle once the sample has been thinned. While it must be easy to remove after processing, the adhesive must also be able to securely hold the sample during grinding and polishing.

**Mounting Wax (#71-10040)** can be used to securely hold small samples to fixtures during sample preparation. It is soluble in acetone and requires a hot plate.

**LOCTITE® 460™ (#71-40045)** is a fast-curing glue that does not need heat to cure. It is useful for heat-sensitive samples and is soluble in acetone.



## Mounting Samples to a TEM Grid

The chemical resistance and longevity of both **M-Bond 610** and **EpoxyBond 110** allow them to work well for bonding thinned, polished samples to grids for ion milling and TEM observation.

Please see Allied's "Mounting Thinned Samples to TEM Grids" applications note for detailed information.

## Comparison Chart

Adhesive	Usage			Characteristics		
	Bonding Samples	Mounting Samples to Fixture	Mounting Samples to Grid	Needs Heat to Activate	Chemically Resistant	Soluble in Acetone
<b>M-Bond 610</b> (#71-20000)	✓		✓	✓	✓	
<b>EpoxyBond 110</b> (#71-10000)	✓		✓	✓	✓	
<b>Mounting Wax</b> (#71-10040)		✓		✓		✓
<b>LOCTITE® 460™</b> (#71-40045)		✓				✓