Mounting

The two primary reasons for mounting are ease of handling and edge retention. Edge retention is the preservation of the edge of the specimen and is crucial if you are evaluating that surface for structural integrity. Ease of handling comes into play both for manual polishing as well as placing the mounts into an automated polisher. When deciding on which mounting technique to use consider the size and geometry of your part, the part’s susceptibility to heat and pressure, the number of samples that must be prepared routinely and the time you have to achieve the task.

![Micrograph of mount showing good edge retention and no visible shrinkage gap.](image1)

![Micrograph of a mount showing poor edge retention.](image2)

**Compression Mounting**

Compression mounting uses heat and pressure to encapsulate the sample in a mounting compound. This technique minimizes shrinkage thereby protecting and preserving edges as well as surface defects during preparation steps. Many presses include a controlled cool down cycle to further enhance the edge retention while decreasing the overall mounting cycle time. The resulting mount is consistent in size and shape and can be readily labeled. Compression mounting is more economical than castable mounting for high volume labs.

**Castable Mounting**

Epoxy and acrylic castable mounting systems are recommended for mounting specimens that are sensitive to high pressures and temperatures. Epoxy mounting systems provide good physical adherence, low shrinkage and excellent infiltration into pores and cracks. Acrylic mounting systems are typically selected for their short cure time. Dyes can be added to either system to enhance pores and highlight the interface between the media and specimen. Fillers can allow epoxy mounting systems to be used in an SEM without additional processing and can improve the abrasion resistance of all castable systems, and therefore edge retention, when preparing hard materials. Castable systems are more economical than compression mounting systems in low volume labs.

Vacuum systems are used to evacuate air trapped in epoxy systems and specimens. This reduces or eliminates the gap at the specimen/epoxy interface, fills pores in the specimen with epoxy and enhances the end results.

**Steps for Castable Mounting**

1. Measure hardener & resin separately
2. Coat SampKup with Release Agent
3. Mix for 2 minutes
4. Pour into third cup, scraping sides
5. Pour into SampKup
6. Pour hardener into resin
Each material, application and need can require specialized mounting methods. When selecting a mounting consumable, consideration should be given to the following: abrasion resistance of the material, conductivity requirements, further analysis needs, clarity level required, single or central force grinding and polishing.

When selecting a material for your application take into account your needs for edge retention, time, clarity and vacuum infiltration before you select a mounting compound. The best system for each targeted characteristic is shown below.

### Method Selection

<table>
<thead>
<tr>
<th>Hardness</th>
<th>Compression Mounting Compounds (Shore D)</th>
<th>Castable Systems (Shore D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harder</td>
<td>EpoMet™ (96)</td>
<td>VariDur™ 3000 (90)</td>
</tr>
<tr>
<td></td>
<td>EpoVit™ (94)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ProbeMet™ (94)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diallyl Phthalate (91)</td>
<td>VariDur 200 (90), SamplKwick (85), VariDur (85), VariDur 10 (85)</td>
</tr>
<tr>
<td></td>
<td>PhenoCure™ (88)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>KondutoMet™ (88)</td>
<td></td>
</tr>
<tr>
<td>Softer</td>
<td>TransOptic™ (80)</td>
<td>EpoThin™ 2 (78), EpoHeat™ 2 (75)</td>
</tr>
</tbody>
</table>

#### Edge Retention
- Acrylic: VariDur 3000
- Epoxy: EpoCure 2
- Compression: EpoMet

#### Time
- Acrylic: SamplKwick 5-8 min
- Epoxy: EpoHeat 2 60 min
- Compression: PhenoCure

#### Clarity
- Acrylic: VariKleen
- Epoxy: EpoHeat 2
- Compression: TransOptic

Visit our website at www.buehler.com for more information.
Compression Mounting Compounds

The most common type of mounting used is compression mounting, using heat and pressure to encapsulate the specimen, minimizing shrinkage, protecting and preserving edges as well as surface defects during the following preparation steps.

**Tips, Tricks & Techniques:**

To permanently label specimens when using opaque mounting compound:
- Place specimen in mold
- Fill most of the mold cylinder with mounting compound
- Add a thin layer of TransOptic™ Powder
- Place a typed label over the TransOptic Powder
- Cover the label with a second layer of TransOptic Powder
- Run the mounting cycle as usual

**Did You Know:**

Compression mounting compounds can be used in either single or central force mode of grinding and polishing.

For easy loading and the best edge retention, you can fill the bottom of the mold with EpoMet and then place a PreMold on top.

- **PhenoCure™**
  - Wood-flour filled phenolic thermoset resin, provides good edge retention and moderate shrinkage. ~88 Shore D

- **PhenoCure PreMolds**
  - Preformed PhenoCure, reduces mess and saves time. ~88 Shore D

- **EpoMet™**
  - Mineral filled epoxy thermoset recommended for preserving edge information and mounting very hard materials, available in F (fine) for enhanced flow and G (granular) for general use. ~96 Shore D

- **ProbeMet™**
  - Copper and mineral filled epoxy thermoset, conductive with good edge retention, for use when copper is not of interest, can cause galvanic coupling with aluminum samples. ~94 Shore D

- **EpoVit™**
  - Mineral and glass fiber filled epoxy thermoset, for preserving edge information. ~94 Shore D

- **KonductoMet™**
  - Graphite and mineral filled phenolic thermoset, conductive with moderate edge retention, for use when carbon is not of interest. ~88 Shore D

- **TransOptic™**
  - Transparant, thermoplastic acrylic, reheating mount allows for extraction of specimen, requires special cooling cycle. ~80 Shore D

- **Diallyl Phthalate**
  - Filled thermoset resin recommended for moderately hard materials, glass filled is recommended for etching; mineral filled is harder, provides good edge retention. ~91 Shore D

- **EpoCure PreMolds**
  - Preformed EpoCure, reduces mess and saves time. ~94 Shore D

- **PhenoCure PreMolds**
  - Preformed PhenoCure, reduces mess and saves time. ~88 Shore D

- **PhenoCure™**
  - Wood-flour filled phenolic thermoset resin, provides good edge retention and moderate shrinkage. ~88 Shore D

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- **TransOptic™**
  - Transparant, thermoplastic acrylic, reheating mount allows for extraction of specimen, requires special cooling cycle. ~80 Shore D
Compression Mounting Selection

- Specimens that are NOT sensitive to heat and pressure
- More than 20 specimens are prepared per day

Specific compression compounds are designed for your needs:

Did You Know:
- You can minimize shrinkage and improve edge retention by cooling the mount to room temperature before removing it from the mounting press.
- Unfused or frosted mounting compound is often a sign of insufficient molding temperatures or pressures. Ensure that the temperature setting on the mount press is 300°F [150°C] or higher.
- Uncured mounts can be caused by too much moisture in the mounting compound. Make sure to properly close the container between uses.
- Radial splitting of mounts is often caused by sharp edges on the sample or by samples that are too large for the mold size.
- Bulging or soft mounts are caused by insufficient cure times. Increase the cure time.
Epoxy and Acrylic castable mounting systems are recommended for mounting specimens that are sensitive to high pressures and temperatures. Epoxy mounting systems provide good physical adherence, low shrinkage and excellent infiltration into pores and cracks. Acrylic mounting systems are typically selected for their short cure times. Dyes and fillers can be added to either system. Dyes can enhance pores and highlight the interface between the media and sample. Conductive fillers allow epoxy mounting systems to be used in an SEM without additional processing. Fillers can improve the abrasion resistance of all castable systems.

### Acrylic Systems

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SamplKwick™</td>
<td>Translucent, general purpose acrylic system, 5-8 minute cure time, ~179°F [79°C] Peak Temperature. ~85 Shore D Hardness</td>
</tr>
<tr>
<td>VariKlear™</td>
<td>Clear, general purpose acrylic system, requires pressure vessel for clear mounts, 5-15 minute cure, ~212°F [100°C] Peak Temperature. ~84 Shore D Hardness</td>
</tr>
<tr>
<td>VariDur™ 10</td>
<td>Semi transparent, low odor system, low shrinkage, high viscosity, 8 minute cure time, 100°C Peak Temperature.</td>
</tr>
<tr>
<td>VariDur 200</td>
<td>Dark blue, low odor system, low shrinkage, high viscosity, 8 minute cure time, ~100°C Peak Temperature.</td>
</tr>
<tr>
<td>VariDur 3000</td>
<td>Blue, minimal shrinkage, high viscosity, 15-30 minute cure time, ~252°F [122°C] Peak Temperature. ~90 Shore D Hardness</td>
</tr>
<tr>
<td>VariKwick™</td>
<td>Blue, fast curing system, moderate shrinkage and viscosity, ~5 minute cure time ~85°C Peak Temperature. ~85 Shore D</td>
</tr>
<tr>
<td>VariDur</td>
<td>Grey, filled acrylic system, 10 minute cure time, ~170°F [77°C] Peak Temperature. ~85 Shore D Hardness</td>
</tr>
</tbody>
</table>

### Epoxy Systems

<table>
<thead>
<tr>
<th>System</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EpoFixCure™ 2</td>
<td>Clear, general purpose epoxy system, 6 hr cure time, &lt;104°F [40°C] Peak Temperature. ~80 Shore D Hardness</td>
</tr>
<tr>
<td>EpoThin™ 2</td>
<td>Clear, very low viscosity epoxy system, 9 hr cure, &lt;86°F [30°C] Peak Temperature. ~78 Shore D Hardness</td>
</tr>
<tr>
<td>EpoColor™</td>
<td>Red epoxy system to highlight pores and cracks, 90 min cure time, &lt;293°F [145°C] Peak Temperature. ~82 Shore D Hardness</td>
</tr>
<tr>
<td>EpoHeat™ 2</td>
<td>Transparent yellow epoxy system, long pot-life for mixing large batches, 60 min cure time in oven at 149°F [65°C], &lt;338°F [170°C] Peak Temperature. ~75 Shore D Hardness</td>
</tr>
<tr>
<td>EpoKwick™</td>
<td>Clear, fast curing epoxy system, 90 min cure time, &lt;293°F [145°C] Peak Temperature. ~82 Shore D Hardness</td>
</tr>
<tr>
<td>VariDur 3000</td>
<td>Blue, minimal shrinkage, high viscosity, 15-30 minute cure time, ~252°F [122°C] Peak Temperature. ~90 Shore D Hardness</td>
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<td>VariDur 200</td>
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<tr>
<td>VariDur</td>
<td>Grey, filled acrylic system, 10 minute cure time, ~170°F [77°C] Peak Temperature. ~85 Shore D Hardness</td>
</tr>
</tbody>
</table>

**Tips, Tricks & Techniques:**

- To get the best results, use a vacuum system to evacuate air trapped in epoxy systems and samples. This reduces or eliminates the gap at the sample/epoxy interface, fills pores in the specimen with epoxy and enhances the end result.
- To improve edge retention for acrylic systems, coat the sample in the liquid hardener before pouring in mixed compound.
**Castable Mounting Selection**

- Specimens are sensitive to heat and pressure
- Pores in a sample must be filled with media before grinding and polishing
- You want to mount many samples at the exact same time

Full selection of Acrylics, Epoxies for every application, and additives for to meet your needs:

**Acrylics**
- SamplKwick™ - translucent, general purpose
- VariKwick™ - moderate shrinkage and quick curing
- VariKleer™ - cures clear under pressure
- VariDur™ - lowest peak temperature
- VariDur 10 & 200 - low shrinkage, high viscosity
- VariDur 3000 - high hardness, excellent edge retention

**Epoxies**
- EpoxiCure™ 2 - general purpose
- EpoHeat™ 2 - long pot life
- EpoThin™ 2 - very low viscosity
- EpoKwick™ - fast cure
- EpoColor™ - fills pores

**Additives**
- Flat Edge Filler - to increase abrasion resistance
- Conductive Filler - for SEM - Nickel - not for use in acrylics
- Pigments - to add color

**Tips, Tricks & Techniques:**

**Acrylic**
- Quickly pour mixture into mold to prevent gelling in the mixing cup.
- Not meant for use with Vacuum Systems or Disposable Mounting Cups.

**Epoxy**
- Decrease cure times by gently heating epoxies in oven. Do not exceed 149°F [65°C]. Not recommended for EpoKwick and EpoColor.
- For best results, tilt the cup containing the resin and hardener slightly and gently work the resin and hardener together using a lift and stir motion.

**Did You Know?**
- EpoHeat 2 can be mixed in large batches
- The viscosity drops when placed in the oven at 149°F [65°C]
- Low viscosity causes fillers to fall to the bottom of the mount

Visit our website at www.buehler.com for more information.
Mounting Clips

Support clips are used to support samples during mounting. The weight and hardness of the clip should be considered when choosing a clip. For metallic samples that are to be etched after preparation, one of the polymer clips is best to avoid interference during etching.

**SamplKlip**
- Stainless Steel
- Dimensions: 0.25 H x 0.55 W x 0.35in L [6 x 14x 9mm]
  For use with all mounting systems

**SamplKlip I**
- Plastic, best when used in castable systems
- Available in 2 sizes
- Dimensions (large clip): 0.25 H x 0.475 W x 0.3in L [6 x 12 x 8mm]
- Dimensions (small clip): 0.25 H x 0.425 W x 0.3in L [6 x 11 x 8mm]

**Specimen Support Clip**
- Plastic, for use in compression systems
- Dimensions: 0.25 H x 0.29 W x 0.375in L [6 x 7 x 9.5mm]

**UniClip**
- Plastic, for use with all mounting systems
  When compression mounting, best when oriented with “legs” upward
- Dimensions: 0.4 H x 0.360 W x 0.500in L [10 x 9 x 12mm]

Ring Forms

- Consumable plastic ring strengthens castable mount
- Use with Epoxy or Acrylic of your choice
- Strengthens mount for polishing in central force mode

Tips, Tricks & Techniques:
Ring forms enable you to use castable mounting systems in central force mode. To use a ring form:
1. Place a ring form in an EPDM mounting cup
2. Place sample in cup
3. Fill with castable mounting compound of your choice
4. Remove EPDM up before grinding
Mounting Cups

**SampIKup™**
- Best dimensional stability
- Suitable for use with all Buehler castable systems
- Not for use in ovens

**Ethylene propylene diene monomer (EPDM) Cups & Rectangular Molds**
- Suitable for use with all Buehler castable systems
- Best choice when curing mounts in ovens
- Best choice for large, rectangular mounts

**Blue Mounting & Silicone Molds**
- Suitable for use with all Buehler castable systems
- Can be used in ovens

**Disposable Mounting Cups**
- Best when used for mounting low exotherm castable systems like EpoxiCure™ 2 and EpoThin™ 2
- Not for use in ovens

Did You Know?
Disposable mounting cups can also be used as a specimen cap to protect your sample.

Castable Mounting Additives

**Pigments**
- Pigments can be added to epoxy systems to enhance contrast between sample and mount
- Pigments are available in red, black and blue and are predispersed in an epoxy base
- Blue dye is also available for epoxy systems only

**Conductive Filler**
- Fine nickel-based filler makes epoxy mounting systems conductive
- Systems will be more viscous once mixed with filler

**Flat Edge Filler**
- Enhances edge retention in castable systems
- For use when castable mounting is required
- Ceramic powder falls to grinding surface to increase the abrasion resistance
- Not recommended for use with VariDur™ 3000

Visit our website at www.buehler.com for more information.
## Compression Mounting Compounds

<table>
<thead>
<tr>
<th>PhenoCure</th>
<th>20-3100-080  5lbs [2.3kg]</th>
<th>20-3100-100  25lbs [11.3kg]</th>
<th>112031  3kg</th>
<th>112034  10kg</th>
<th>112007  25kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>20-3200-080  5lbs [2.3kg]</td>
<td>20-3200-400  25lbs [11.3kg]</td>
<td>112032  3kg</td>
<td>112035  10kg</td>
<td>112008  25kg</td>
</tr>
<tr>
<td>Green</td>
<td>20-3300-080  5lbs [2.3kg]</td>
<td>20-3300-400  25lbs [11.3kg]</td>
<td>112033  3kg</td>
<td>112036  10kg</td>
<td>112009  25kg</td>
</tr>
</tbody>
</table>

### PhenoCure Premolds - 500 qty.


## Castable Mounting Systems

### EPOXY SYSTEMS

- **EpoxyCure™ 2**
  - Resin: 20-3403-064 64oz [1.9ℓ] 20-3432-016 16oz [0.48ℓ] 20-3430-128 1gal [3.8ℓ] 20-3432-032 32oz [0.95ℓ]
  - Hardener: 20-3432-016 16oz [0.48ℓ] 20-3432-032 32oz [0.95ℓ]

- **EpoThin™ 2**
  - Resin: 20-3440-032 32oz [0.95ℓ] 20-3442-016 16oz [0.48ℓ] 20-3440-128 1gal [3.8ℓ]
  - Hardener: 20-3442-032 6oz [0.18ℓ] 20-3442-064 64oz [1.9ℓ]

- **EpoHeat™ 2**
  - Resin: 20-3402-064 64oz [1.9ℓ] 20-3422-016 16oz [0.48ℓ]

### ACRYLIC SYSTEMS

- **SampiKwick™**
  - Kit: 20-3560 (includes 1lb [0.45kg] resin, 12oz [0.36ℓ] hardener, 5 paper cups, 10 stirring sticks and 5 paper cups)

- **VariKwick™**
  - Resin: 20-3596 1kg 20-3597 500mℓ
  - Hardener: 20-3597 500mℓ

- **VariDura 10°**
  - Resin: 111027 1kg 111031 10kg
  - Hardener: 111029 500mℓ 111033 5ℓ

- **VariDura 200°**
  - Resin: 111030 1kg 111034 10kg
  - Hardener: 111029 500mℓ 111033 5ℓ

- **VariDura 3000**
  - Resin: 203581 1kg 203583 10kg
  - Hardener: 203582 500mℓ 203584 5ℓ

◊ Product only available in Europe, Africa, Middle East and Asia.
Ordering Information
(available online at www.buehler.com)

Mounting Clips & Clamps

- **SamplKlip Support Clip – Stainless Steel (qty 100)**
  - 20-4000-100
  - 0.25 H x 0.550 W x 0.350in L [6 x 14 x 9mm], 0.575g

- **Specimen Support Clip – Plastic (qty 100)**
  - 20-4001-000
  - 0.25 H x 0.290 W x 0.375in L [6 x 7 x 9.5mm], 0.145g

- **UniClip Support Clip – Plastic (qty 100)**
  - 20-5100-100
  - 0.4 H x 0.360 W x 0.500in L [10 x 9 x 13mm], 0.290g

- **SamplKlip I Support Clip – Plastic (qty 100)**
  - 20-4100-100
  - 0.25 H x 0.475 W x 0.3in L [–6 x 12 x 8mm], 0.230g

- **Disposible Mounting Cups (qty 50)**
  - can also be used as specimen caps
  - 20-9178 1in
  - 20-9180 1.25in
  - 20-9181 1.5in
  - 20-9184 2in
  - 20-9177 25mm
  - 20-9179 30mm
  - 20-9182 40mm
  - 20-9183 50mm

- **Disposable Mounting Cups (qty 50)**
  - 20-8280 1in
  - 20-8281 1.25in
  - 20-8282 1.5in
  - 20-8283 2in

- **EPDM Mounting Cups (qty 5)**
  - 20-8181 1in
  - 20-8182 1.25in
  - 20-8183 1.5in
  - 20-8184 2in

- **EPDM Rectangular Molds (qty 1)**
  - 20-6185 2.5 x 1.4 x 1.8in [63 x 25 x 46mm]
  - 20-6186 6 x 4 x 2in [150 x 100 x 50mm]
  - 20-6187 6 x 3 x 1in [150 x 76 x 25mm]

- **Ring Forms (qty 100)**
  - 20-8151-100
  - 20-8152-100
  - 20-8153-100
  - 20-8154-100

- **Recessed Discs (qty 1)**
  - 20-3521 1in
  - 20-3513 1.25in
  - 20-3514 1.5in
  - 20-3517 2in

- **Silicone Molds (qty 1)**
  - 20-8483 60mm
  - 20-8486 55 x 30 x 22mm
  - 20-8485 70 x 40 x 22mm

Additives

- **Pigments for castable systems**
  - 20-8501 SO Blue, 1oz [3mℓ]
  - 20-8502 SO Black, 1oz [3mℓ]
  - 20-8504 SO Red, 1oz [3mℓ]

- **Conductive Filler**
  - 20-8500 2 lb [0.9kg]

- **Flat Edge Filler**
  - 20-8196 1 lb [0.45kg]

- **Release Agent**
  - 20-8185-002 SO 2oz [6mℓ]
  - 20-8185-008 SO 8oz [237mℓ]
  - 20-8185-016 SO 16oz [470mℓ]
  - 20-8185-032 SO 32oz [950mℓ]

- **EpoBlue**
  - 111068 SO 25g

Mounting Cups

SO - Special Order. Items may have long lead times and minimum orders.
† Restricted article, requires special packaging
◊ Product only available in Europe, Africa, Middle East and Asia.

SO - Special Order. Items may have long lead times and minimum orders.
Buehler products are used throughout the world in manufacturing facilities, quality laboratories, and universities to analyze all types of materials, including:

- Aerospace
- Automotive
- Biomedical & Medical
- Ceramic, Plastics, Composites
- Education, Defense, Government
- Electronics & Optics
- Energy & Construction
- Petrography
- Primary Metals

Other products from Buehler:

Sample preparation equipment includes: abrasive sectioning, precision cutting, mounting, grinding & polishing, electronics and petrography.

Consumables for sample preparation equipment include: abrasive wheels, precision blades, compression mounting compounds, castable systems, silicon carbide abrasive papers, diamond grinding discs, polishing cloths, diamond polishing suspensions, and final polishing suspensions.

Imaging & analysis and hardness testing equipment include: microscopes, cameras, imaging & analysis software, hardness testers, fixtures, test blocks and hardness software.

For a complete listing of consumables, visit our website at www.buehler.com or refer our Product Catalogue. Buehler continuously makes product improvements; therefore technical specifications are subject to change without notice.