

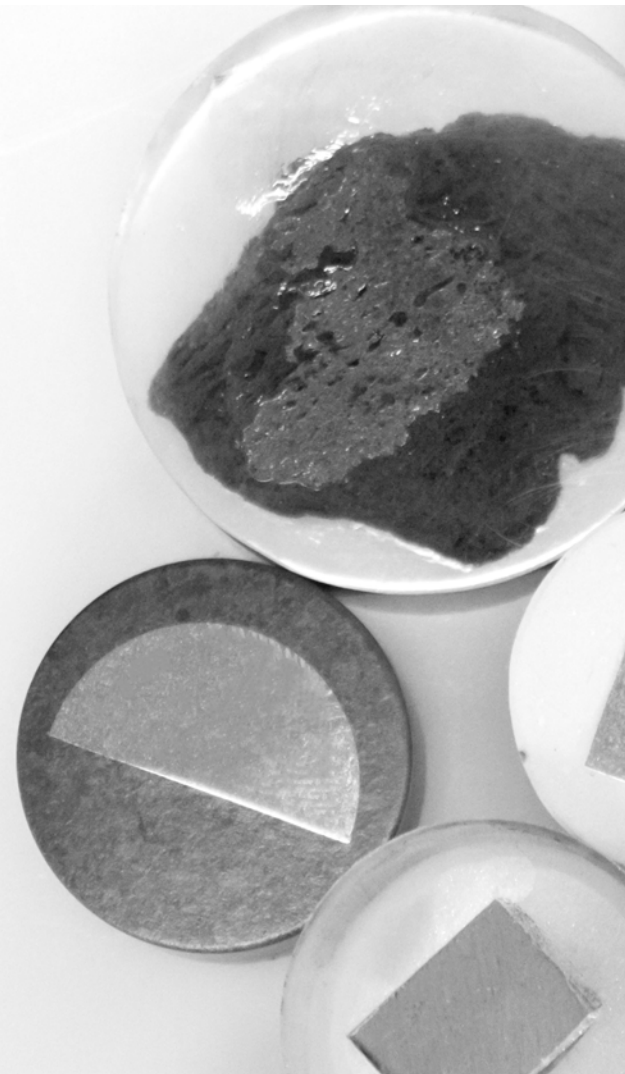
A background image showing various mounting systems and equipment. In the foreground, there are several cylindrical containers in different colors (black, blue, yellow, green) with white logos. Some containers have lids with patterns or text. In the background, there are yellow trays and other equipment, all slightly out of focus.

# Mounting Application Guide

A complete line of Mounting Systems, Equipment and Accessories



# WHY IS MOUNTING IMPORTANT?



## Edge Retention

Mounting metallographic samples helps to protect and preserve edges during metallographic preparation. Maintaining specimen edges is crucial when evaluating the surface for structural integrity.

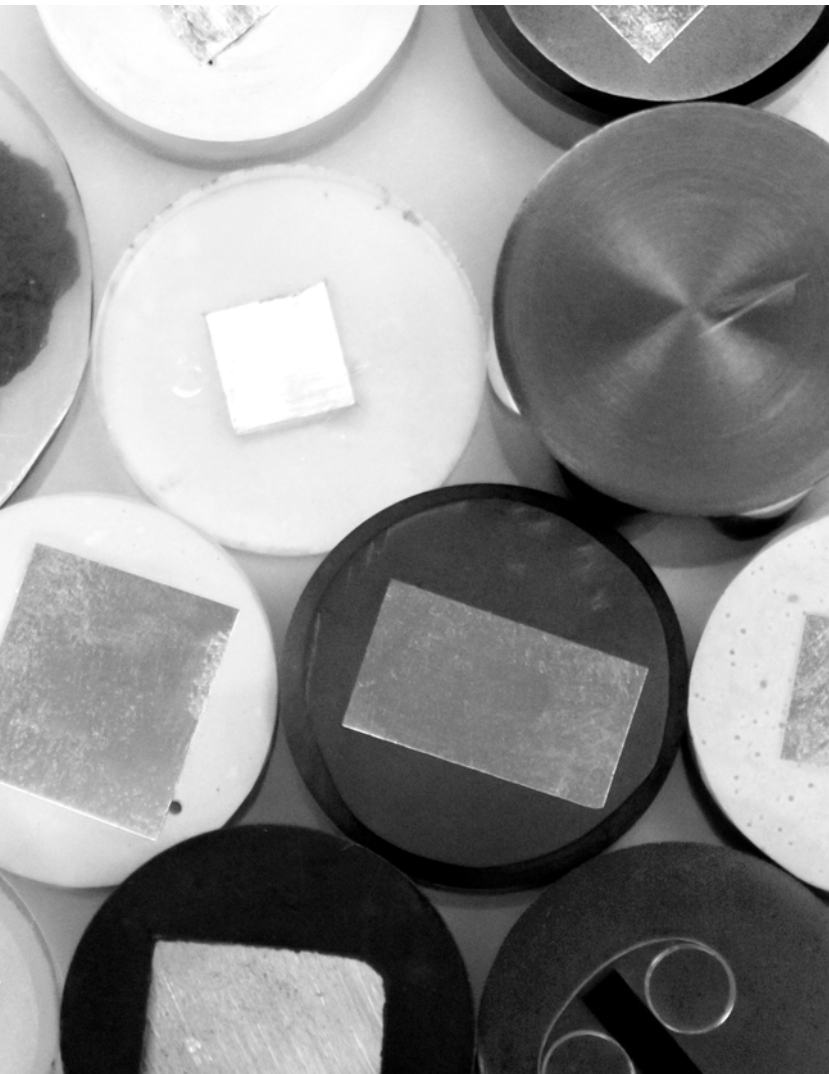
## Ease of Handling

A secondary benefit of mounting is ease of handling during the preparation process. Mounted samples are easier to handle for manual polishing and can be processed using an automated grinder-polisher.

## What is Proper Mounting?

The mounting process should not cause any damage to the microstructure of the specimen. Pressure and heat are the most likely sources of damage during the mounting process. It is important to understand the material being mounted and choose an appropriate method.





# MOUNTING Methods

## Compression Mounting

Compression mounting uses a mounting press to apply heat and pressure to encapsulate the sample in a mounting compound. This technique provides excellent edge retention which protects and preserves the edges during the preparation process. Compression Mounting is the preferred method for processing a high volume of **samples that are not susceptible to heat or pressure.**

## Castable Mounting

Epoxy and acrylic castable mounting systems involve mixing of components and pouring into mounting cups. Standard systems do not require pressure or external heat to mount specimens although some specialty systems do. A variety of products are available to meet different needs for hardness, edge retention and cure time. Castable Mounting is recommended **for specimens that can be damaged by high temperatures or pressures** and labs processing a lower volume of samples.

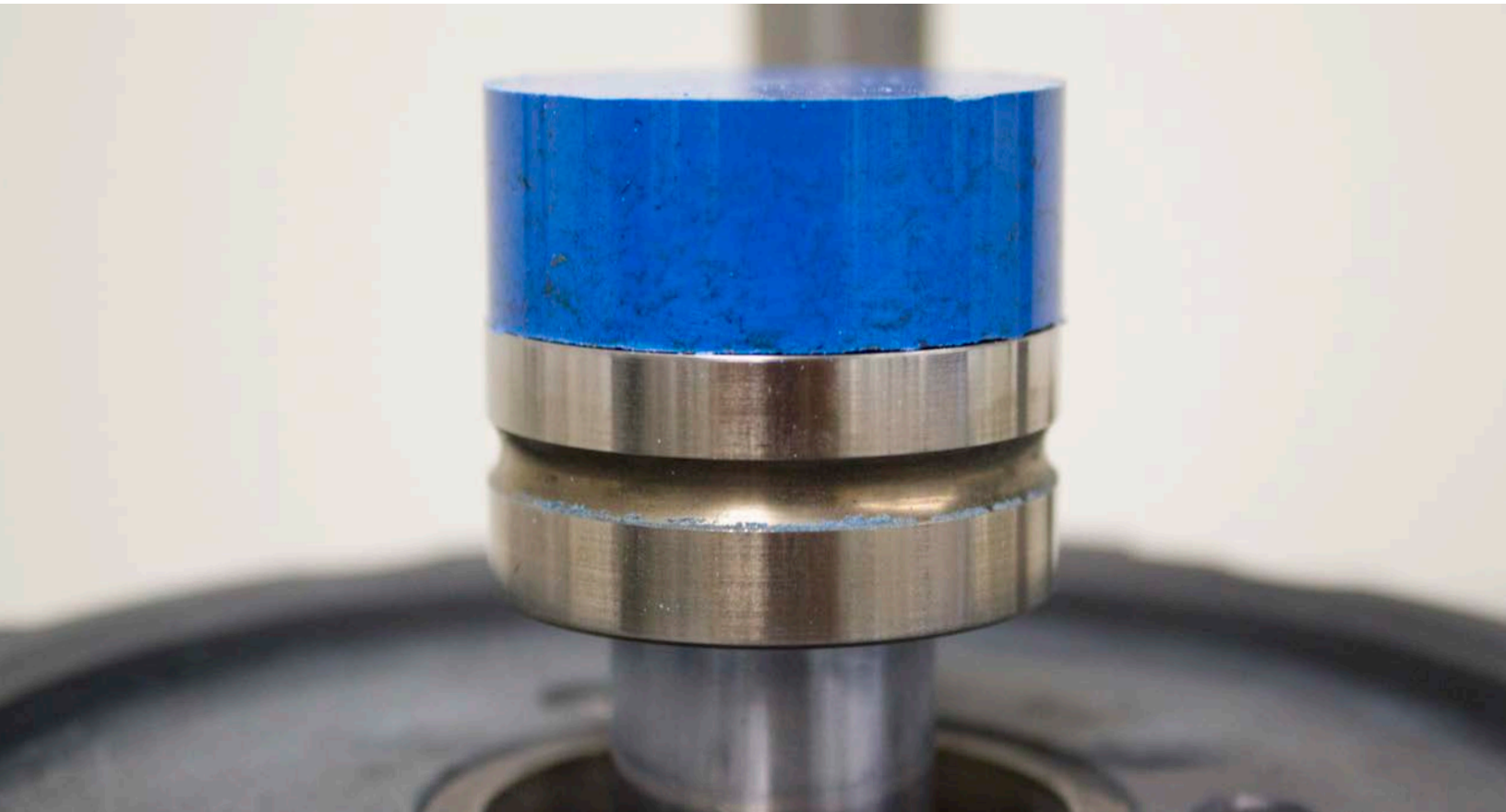
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# COMPRESSION MOUNTING

Compression Mounting is the preferred method for optimal edge preservation and highest process throughput. Buehler carries compression mounting equipment and compression mounting compounds designed to fit the varying needs of different labs.



## Compression Mounting Equipment



### SimpliMet™ 4000

#### High reliability in 24/7 use environments

The SimpliMet 4000, was tested in extreme conditions, and simulated the duty cycle of the busiest labs in the world, providing high reliability in continuous use environments.

#### Optimize Productivity in Your Space

The SimpliMet 4000 packs fast mounting cycles into limited bench space, optimizing productivity. Fast duplex mounting allows two mounts to be made during the same cycle with negligible increase in cycle time.

#### Ease of use saves time and protects sample quality

Simple user interface eliminates errors and protects the quality of your sample prep. Everything you need is right on the front panel. Use your press out of the box without the wait.

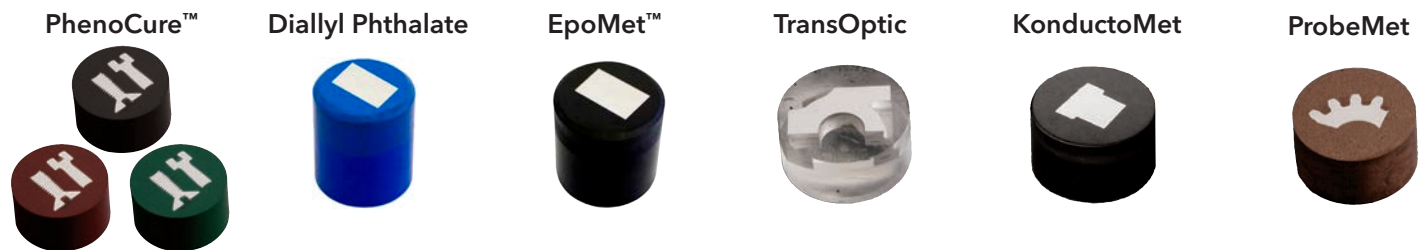


# Compression Mounting Compounds

## Selecting the Right Compression Compound

When selecting a compression mounting compound, it is important to consider the hardness of the material, conductivity requirements, further analysis needs and clarity level.

Material	Recommended Use	Color	Hardness (Shore D)	Edge Retention
PhenoCure™	General purpose metallography	Black, Red, Green	~88	Good
Diallyl Phthalate - Mineral Filled	Moderately hard material	Blue	~91	Better
Diallyl Phthalate - Glass Filled	Moderately hard material for etching	Blue	~91	Better
EpoMet™ G (Granular)	Very hard material	Black	~94	Best
EpoMet™ F (Fine)	Very hard material with complex geometries	Black	~94	Best
TransOptic™	When transparency of the mount is useful	Clear	~80	Good
KonductoMet™	SEM analysis when carbon is not the object of analysis	Black	~88	Good
ProbeMet™	SEM analysis when copper is not of interest	Copper	~94	Better



## Compression Mounting Tips



You can minimize shrinkage and improve edge retention by cooling the mount to room temperature under pressure before removing it from the mounting press.



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. Round off sharp corners and move the specimen farther from the edge of the mount.



Bulging or soft mounts are caused by insufficient cure times. Increase the cure time.



Unfused or frosted mounting compound is often a sign of insufficient molding temperatures or pressures. Ensure the temperature and pressure settings on the mounting press match the recommendations for the compression compound being using.

# CASTABLE MOUNTING

Epoxy and Acrylic castable systems are recommended for mounting specimens that are sensitive to high pressures and temperatures. Epoxy systems provide good physical adherence, low shrinkage and excellent infiltration into pores and cracks. Acrylic systems are typically selected for their short cure times.

## Epoxy Systems

### EpoKwick™ FC



**Spend less time preparing and more time analyzing.**

- Combines very low viscosity and extremely low shrinkage with good hardness and a fast cure.
- Obtain the best sample prep quality even with highly porous samples.
- Recommended for Aerospace coatings and other applications with porous samples.

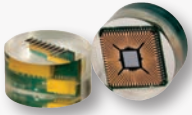
### EpoThin™ 2



**Protect samples with this gentle low cure temperature epoxy**

- Combines low viscosity and low cure temperature
- Provides strong adherence and good pore penetration.
- Can be used with larger mounting cups

### EpoxiCure™ 2



**General purpose epoxy system optimized for routine application**

- A balanced formula providing good hardness and low shrinkage
- Can be used with larger mounting cups

### EpoHeat™ CLR



**Save time with long pot life**

- Can remain mixed at room temperature for 3 hours and cures in 60 minutes in the oven.
- Water-like viscosity when heated

Material	Cure Time	Viscosity*	Shrinkage*	Shore D Hardness	Peak Exotherm
EpoKwick™ FC	2hrs @ room temperature	Best	Best	~82	250°F [121°C]
EpoThin™ 2	9hrs @ room temperature	Better	Better	~78	149°F [65°C]
EpoxiCure™ 2	6hrs @ room temperatures	Good	Better	~80	104°F [40°C]
EpoHeat™ CLR	1hr @ 149° F(65°C)	Best	Good	~82	324°F [162°C]

\*values compared with other epoxies



## Cast N' Vac Vacuum System

This vacuum system offers excellent pore impregnation. As a result, edge retention is enhanced and friable samples are supported during grinding and polishing.

### Optimized pore impregnation

- The unique dispensing mechanism with a built in rotating turn table allows pouring epoxy while under vacuum.

### High efficiency

- Large vacuum chamber allows for 11, 1.5in molds to be processed simultaneously.
- The rugged vacuum pump supplies ample vacuum pull down to quickly evacuate trapped air from any porous specimen while the patented, high strength plastic chamber maintains vacuum throughout the impregnation period.





## Acrylic Systems

### SamplKwick™



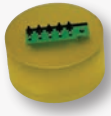
SamplKwick offers quick cure times and excellent wetting characteristics making it ideal for electronics and PWB applications.

### VariKleer™



VariKleer produces a crystal clear mount when cured under pressure making it ideal for applications where clarity is required.

### VariDur™ 10



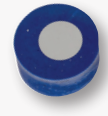
VariDur 10 is a general purpose acrylic system offering a semi-transparent mount with a reduced odor while curing.

### VariDur 200



VariDur 200 is a quick curing acrylic with good edge retention that is ideal for mounting hard materials.

### VariDur 3003



VariDur 3003 is a three-part acrylic with minimal shrinkage and high hardness making it ideal for edge retention applications.

Material	Cure Time	Viscosity*	Shrinkage*	Shore D Hardness	Peak Exotherm
SamplKwick™	5-8min @ room temperature	Better	Good	~85	~179°F [81°C]
VariKleer™	5-15min @ room temperature	Better	Good	~84	~212°F [100°C]
VariDur™ 10	8min @ room temperature	Good	Good	~80	~212°F [100°C]
VariDur 200	5-8min @ room temperature	Good	Better	~85	~212°F [100°C]
VariDur 3003	15-30min @ room temperature	Good	Best	~90	~252°F [122°C]

\*values compared with other acrylics

## Castable Mounting Tips

### Epoxy Tips

- Some epoxies can be cured more quickly by gently heating, typically at 30-40° C. Use caution as higher cure temperatures can cause excessive heating during curing.
- When mixing, tilt the cup containing the resin and hardener slightly and gently work the resin and hardener together using a lift and stir motion.
- 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.
- Epoxies are sensitive to the ratio of resin and hardener. Be sure to follow the recommended ratio for each product.

### Acrylic Tips

- Acrylics cure quickly so it is recommended to pour the mixture into the mold immediately after mixing to prevent "gelling".
- Acrylic systems are not for use with Vacuum Systems or Disposable Mounting Cups.
- To improve edge retention for acrylic systems, coat the sample in the liquid hardener before pouring in mixed compound.

# MOUNTING ACCESSORIES

A wide variety of mounting accessories are available depending on the specimen being mounted, the mounting method chosen, and the goals of final analysis.

## Release Agent

Release agent is used with both compression and castable mounting systems for easier removal of mounts.

### Release Agent

Liquid release agent for rapid application and drying on castable mounting molds or compression mounting presses.



### Mold Release Spray

Water-based spray release agent for use on castable mounting molds



### Mold Release Powder

Powder release agent for use on mounting presses



## Pigments & Filler

Pigments and fillers are added to castable mounting systems to change the color or performance of the systems.

### Pigments for Castable Systems

For color coding or creating contrast between the specimen and the mount



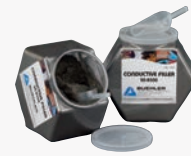
### Flat Edge Filler

Enhances edge retention in castable mounting systems.



### Conductive Filler

Nickel-based filler makes castable mounting systems conductive



## Support Clips

Support clips are used to support specimens during mounting. The material, size and weight of the clips should be considered when selecting a clip.

### SamplKlip Support Clip



For use with all mounting systems.\*

**Material:** Stainless Steel

**Weight:** 0.575g

**Qty:** 100

**Size:** 0.25 H x 0.550 W x 0.350in L  
[6 x 14 x 9mm]

### Specimen Support Clip



Best for castable mount systems.†

**Material:** Plastic

**Weight:** 0.145g

**Qty:** 1000

**Size:** 0.25 H x 0.290 W x 0.375in L  
[6 x 7 x 9.5mm]

### SamplKlip I Support Clip



Best for castable mounting systems.\*

**Material:** Plastic

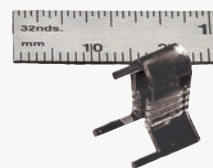
**Weight:** 0.230g

**Qty:** 100

**Size:** 0.25 H x 0.475 W x 0.3in L  
[~6 x 12 x 8mm]

**Size:** 0.25 H x 0.425 W x 0.25in L  
[~6 x 11 x 6mm]

### UniClip Support Clip



For use with all mounting systems. Orient with "legs" upward for compression mounting.†

**Material:** Plastic

**Weight:** 0.290g

**Qty:** 100

**Size:** 0.4 H x 0.360 W x 0.500in L  
[10 x 9 x 13mm]

**Color:** Clear or Black

\* Compatible with specimens up to 0.200in [5mm] thick

† Compatible with specimens between 0.0035 - 0.090in [0.9 - 2.3mm]





## Mounting Cups

Mounting cups are used with castable systems and selection depends on the size and shape of the mount.

### SamplKup™

Best dimensional stability and suitable for use with all Buehler castable systems.  
\*not for use in ovens\*



### Disposable Mounting Cups

Best for mounting low exotherm castable systems like EpoxiCure™ 2 and EpoThin™ 2



### EPDM Round & Rectangular Molds

Suitable for use with all Buehler castable systems. Best choice for large, rectangular mounts and for curing mounts in ovens



### Mixing Cups & Stirring Sticks

For mixing and stirring castable mounting systems



# Buehler is Your Lab Partner

Buehler Solution Centers provide materials preparation and analysis techniques and trainings to our customers worldwide. Our mission is to deliver valuable application solutions by applying Buehler products and methodologies.

- Worldwide customer support labs
- Buehler SumMet Guide
- TechNotes and SumNotes
- Seminars, Webinars and Classes



# MOUNTING ORDERING INFO

## Compression Mounting Compounds

### General Purpose Compounds

	Color	Part Number	Size
PhenoCure Powder	Black	20-3100-080	5 lbs [2.3kg]
		20-3100-400	25 lbs [11.3kg]
		20-3100-500	40 lbs [18.1kg]
	Red	20-3200-080	5 lbs [2.3kg]
		20-3200-400	25 lbs [11.3kg]
	20-3200-500	40 lbs [18.1kg]	
Green	20-3300-080	5 lbs [2.3kg]	
	20-3300-400	25 lbs [11.3kg]	
	20-3300-500	40 lbs [18.1kg]	
PhenoCure Premolds	Black	20-3111-501	1in [25mm]
		20-3112-501	1.25in [32mm]
		20-3113-501	1.5in [38mm]
		20-10090	1.75in [45mm]
	Red	20-3212-501	1.25in [32mm]
		20-3213-501	1.5in [38mm]
	Green	20-3312-501	1.25in [32mm]
		20-3313-501	1.5in [38mm]
EpoMet G	Black	20-3380-064	4 lbs [1.8kg]
		20-3380-160	10 lbs [4.5kg]
		20-3380-400	25 lbs [11.3kg]
		20-3380-500	40 lbs [18.1kg]
Diallyl Phthalate	Blue	20-3330-080*	5 lbs [2.3kg]
		20-3340-080*	5 lbs [2.3kg]

\*Glass Filled \*Mineral Filled

### Specialty Compounds

	Color	Part Number	Size
EpoMet F	Black	20-3381-070	4 lbs [1.8kg]
		20-3381-160	10 lbs [4.5kg]
		20-3381-400	25 lbs [11.3kg]
KonductoMet	Black	20-3375-016	1 lbs [.45kg]
		20-3375-400	25 lbs [11.3kg]
TransOptic	Clear	20-3400-080	5 lbs [2.3kg]
ProbeMet	Copper	20-3385-064	4 lbs [1.8kg]

## Mounting Accessories

### Mounting Clips & Clamps

#### SamplKlip Support Clip

20-4000-100 Stainless Steel (qty 100)

#### Specimen Support Clip

20-4001-000 Plastic (qty 1000)

#### UniClip Support Clip

20-5100-100 Clear Plastic (qty 100)

113043 Black Plastic (qty 100)

#### SamplKlip I Support Clip

20-4100-100 Standard Plastic (qty 100)

20-4100-100S Small Plastic (qty 100)

### Additives

#### Pigments for castable systems

20-8505 Black, 1.5oz [3mL]

20-8506 Red, 1.5oz [3mL]

20-8507 Blue, 1.5oz [3mL]

#### Release Agent

20-8186-004† 4oz [120mL]

20-8186-032† 32oz [950mL]

#### Flat Edge Filler

20-8196 1lb [0.45kg]

#### Mold Release Powder

20-3048 2oz [45g]

#### Mold Release Spray

20-3050-008 8oz [0.24L]

#### Conductive Filler

20-8500 2 lb [0.9kg]

† Restricted article, requires special packaging



# Castable Mounting Systems

## Epoxy Systems

Material	Small Resin & Hardener		Large Resin & Hardener	
	Resin	Hardener†	Resin	Hardener†
EpoKwick™ FC mix ratio 4:1 by volume			20-3453-128 128oz [3.8L]	20-3453-032 32oz [0.95L]
EpoThin™ 2 mix ratio 2:1 by volume	20-3440-032 32oz [0.95L]	20-3442-016 16oz [0.48L]	20-3440-128 128oz [3.8L]	20-3442-064 64oz [1.9L]
EpoxiCure™ 2 mix ratio 4:1 by volume	20-3430-064 64oz [1.9L]	20-3432-016 16oz [0.48L]	20-3430-128 128oz [3.8L]	20-3432-032 32oz [0.95L]
EpoHeat™ CLR mix ratio 4:1 by volume	20-3423-064 Resin 64oz [1.9L]	20-3424-016 16oz [0.48L]		

† Restricted article, requires special packaging

## Acrylic Systems

Material	Powder		Liquid†		Kit†	
	Part Number	Size	Part Number	Size	Part Number	Size
SamplKwick™	20-3562	1 lb [0.45kg]	20-3564	12oz [0.36L]	20-3560	Powder 1 lb [0.45kg] Liquid 12oz [0.36L]
	20-3566	5 lbs [2.3kg]	20-3568	64oz [1.9L]		
	20-3562-025	25 lbs [11.3kg]	20-3564-320	2.5gal [9.5L]		
	20-3562-100	100 lb [45kg]	20-3564-640	5gal [19L]		
VariKleer™	20-3591	2.2 lbs [1kg]	20-3592	16.9oz [500mL]	20-3590	Powder 2.2 lbs [1kg] Liquid 16.9oz [500mL]
	20-3591-002	4.4 lbs [2kg]	20-3592-001	33.8oz [1L]		
	20-3591-010	22 lbs [10kg]	20-3592-005	1.3gal [5L]		
VariDur 10	11-1027	2.2 lbs [1kg]	11-1029	16.9oz [500mL]	11-1037	Powder 2.2 lbs [1kg] Liquid 500mL
	11-1031	22 lbs [10kg]	11-1033	1.3gal [5L]		
VariDur 200	11-1030	2.2 lbs [1kg]	11-1029	16.9oz [500mL]	11-1039	Powder 2.2 lbs [1kg] Liquid 33.8oz [1L]
	11-1034	22 lbs [10kg]	11-1033	1.3gal [5L]		
VariDur 3003 3-part system	20-3531	3.3 lbs [1.5kg]	20-3532	16.9oz [500mL] Liquid 1 33.8oz [1L] Liquid 2	20-3530	Powder 1.7 lbs [750g] Liquid 1 8.4oz [250mL] Liquid 2 16.9oz [500mL]
	20-3534	16.5 lbs [7.5kg]				
			20-3535	33.8oz [2.5L] Liquid 1		
			20-3536	1.3gal [5L] Liquid 2		

† Restricted article, requires special packaging

## Mounting Cups

### SamplKup™

(qty 12)  
20-9178 1in  
20-8180 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

### EPDM Mounting Cups

(qty 5)  
20-8181 1in  
20-8182 1.25in  
20-8183 1.5in  
20-8184 2in  
20-7183 40mm  
20-7184 50mm

### Ring Forms

(qty 100)  
20-8151-100 1in  
20-8152-100 1.25in  
20-8153-100 1.5in  
20-8154-100 2in

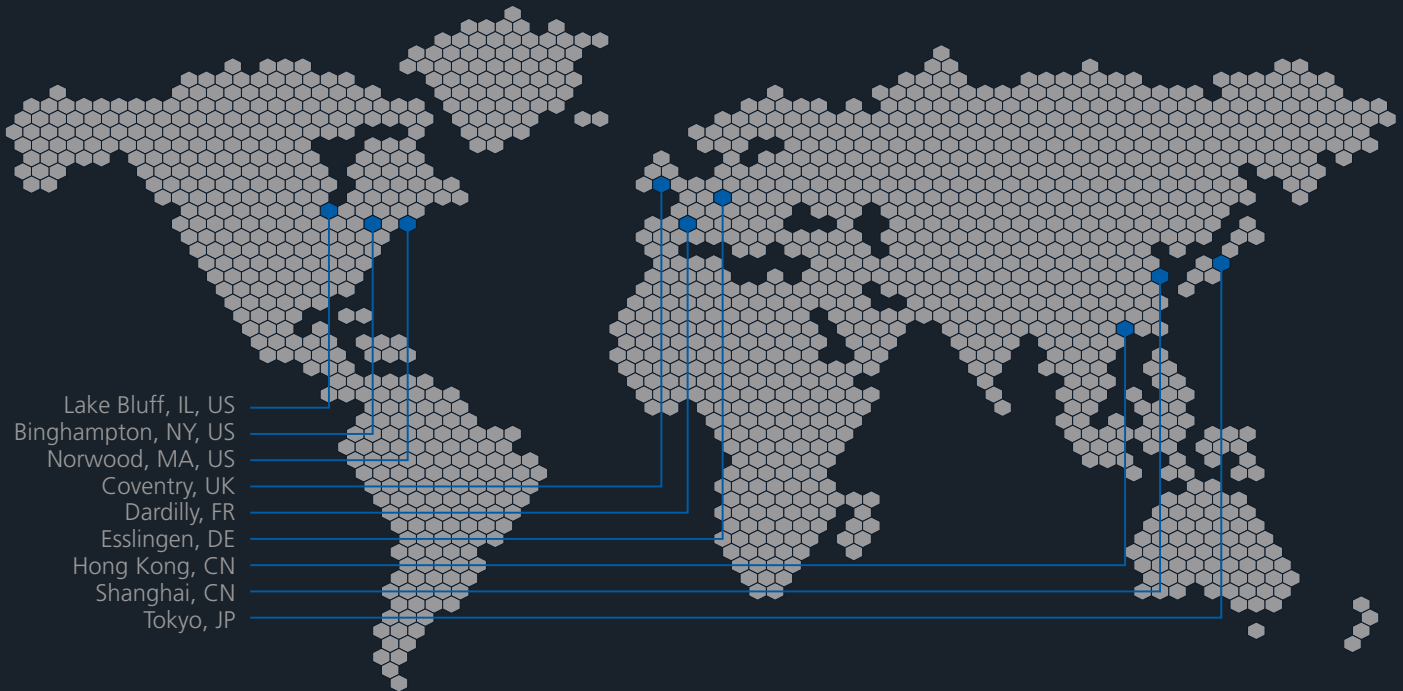
### EPDM Rectangular Molds

(qty 1)  
20-7185 2.2 x 1.2 x 0.9in [55 x 30 x 22mm]  
20-6185 2.5 x 1.4 x 1.8in [63 x 25 x 46mm]  
20-7186 2.8 x 1.6 x 0.9in [70 x 40 x 22mm]  
20-6186 6 x 4 x 2in [150 x 100 x 50mm]  
20-6187 6 x 3 x 1in [150 x 76 x 25mm]

### Mixing Cups & Stirring Sticks

20-8177-100 Non Graduated Paper  
5oz [148mL] (qty 100)  
20-8176-100 Graduated Plastic  
8.5oz [250mL] (qty 100)  
20-8175 Wooden Stirring Sticks  
(qty 1000)

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