



Mounting Application Guide

A complete line of Mounting Systems, Equipment and Accessories

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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 envirionments

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

PhenoCure™













ProbeMet





Compression Mounting Tips

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

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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.

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

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
- EpoHeat™CLR

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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.

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.

VariKleer™



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

VariDur 3003



VariDur 3003 is a threepart 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 evaucate air trapped in epoxy systems and samples. This reduces or elimates the gap at the sample/epoxy interace, 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.

Water-based spray release agent for use

Mold Release Spray

on castable mounting molds

Release Agent

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





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]

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]

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

Specimen Support Clip



Best for castable mount systems.[†]

Material: Plastic Weight: 0.145g Oty:1000 Size: 0.25 H x 0.290 W x 0.375in L [6 x 7 x 9.5mm]

UniClip Support Clip



For use with all mounting systems. Orient with "legs" upward for compression mounting.[†] Material: Plastic Weight: 0.290g Oty: 100 Size: 0.4 H x 0.360 W x 0.500in L [10 x 9 x 13mm]

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

Color: Clear or Black



Mounting Cups

Mounting cups are used with castable systems and selection dpends 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





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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



TECHNotes



SUMNotes

Buehler® SumMet^{**} The Sum Of Our Experience A Guide to Materials Preparation & Analysis Second Edition



Solutions for Materials Preparation, Testing and Analys

MOUNTING ORDERING INFO Compression Mounting Compounds

General Purpose Compounds

	Color	Part Number	Size
		20-3100-080	5 lbs [2.3kg]
		20-3100-400	25 lbs [11.3kg]
e r	Black	20-3100-500	40 lbs [18.1kg]
de de		20-3200-080	5 lbs [2.3kg]
ov vo		20-3200-400	25 lbs [11.3kg]
L L L	Red	20-3200-500	40 lbs [18.1kg]
		20-3300-080	5 lbs [2.3kg]
		20-3300-400	25 lbs [11.3kg]
	Green	20-3300-500	40 lbs [18.1kg]
		20-3111-501	1in [25mm]
		20-3112-501	1.25in [32mm]
	Black	20-3113-501	1.5in [38mm]
noCure emolds		20-10090	1.75in [45mm]
		20-3212-501	1.25in [32mm]
Phe	Red	20-3213-501	1.5in [38mm]
		20-3312-501	1.25in [32mm]
	Green	20-3313-501	1.5in [38mm]
U		20-3380-064	4 lbs [1.8kg]
/let		20-3380-160	10 lbs [4.5kg]
Νος	Black	20-3380-400	25 lbs [11.3kg]
ш		20-3380-500	40 lbs [18.1kg]
Diallyl Phthalate	Blue	20-3330-080 *	5 lbs [2.3kg]
		20-3340-080*	5 lbs [2.3kg]

specially compounds					
	Color	Part Number	Size		
щ		20-3381-070	4 lbs [1.8kg]		
oMet	oMet	20-3381-160	10 lbs [4.5kg]		
Ep	Black	20-3381-400	25 lbs [11.3kg]		
ctoMet		20-3375-016	1 lbs [.45kg]		
Kondu	Black	20-3375-400	25 lbs [11.3kg]		
TransOptic	O Clear	20-3400-080	5 lbs [2.3kg]		
ProbeMet	Copper	20-3385-064	4 lbs [1.8kg]		

*Glass Filled •Mineral Filled

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]

Mold Release Powder 20-3048 2oz [45g]

Release Agent 20-8186-004[†] 4oz [120mL] 20-8186-032[†] 32oz [950mL]

20-8186-032[↑] 32oz [950mL] **Flat Edge Filler** 20-8196 1lb [0.45kq] 20-3046 202[43

 Mold Release Spray

 20-3050-008
 8oz [0.24L]

Conductive Filler 20-8500 2 lb [0.9kg]

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Castable Mounting Systems

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

† Restricted article, requires special packaging

Mounting Cups

SamplKup™	EPDM Moun	iting Cups	EPDM Rectar	ngular Molds
(qty 12)	(qty 5)		(qty 1)	
20-9178 1in	20-8181	1in	20-7185 2.2	x 1.2 x 0.9in [55 x 30 x 22mm]
20-8180 1.25in	20-8182	1.25in	20-6185 2.5	x 1.4 x 1.8in [63 x 25 x 46mm]
20-9181 1.5in	20-8183	1.5in	20-7186 2.8	x 1.6 x 0.9in [70 x 40 x 22mm]
20-9184 2in	20-8184	2in	20-6186 6 x 4	4 x 2in [150 x 100 x 50mm]
20-9177 25mm	20-7183	40mm	20-6187 6x3	3 x 1in [150 x 76 x 25mm]
20-9179 30mm	20-7184	50mm		
20-9182 40mm			Mixing Cups	& Stirring Sticks
20-9183 50mm	Ring Forms		20-81//-100	Non Graduated Paper
	(qty 100)			5oz [148mL] (qty 100)
Disposable Mounting Cups	20-8151-100) 1in	20-8176-100	Graduated Plastic
(qty 50)	20-8152-100) 1.25in		8.5oz [250mL] (qty 100)
20-8280 1in	20-8153-100) 1.5in	20-8175	Wooden Stirring Sticks
20-8281 1.25in	20-8154-100) 2in		(qty 1000)

20-8282 1.5in

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BUEHLER

Solutions for Materials Preparation, Testing and Analysis

BUEHLER

41 Waukegan Road, Lake Bluff, Illinois 60044 P: 847 295 6500 | 800 BUEHLER (800 283 4537) W: www.buehler.com | E: info@buehler.com

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North America-South America Offices

BUEHLER Worldwide Headquarters P: 847 295 6500 | 800 BUEHLER (800 283 4537) W: www.buehler.com | E: info@buehler.com

Europe Offices

BUEHLER Germany - Esslingen European Headquarters P: +49 (0) 711 4904690-0 E: info.eu@buehler.com

BUEHLER France - Dardilly P: +33 (0) 800 89 73 71 **E:** info.eu@buehler.com

BUEHLER United Kingdom - Coventry P: +44 (0) 800 707 6273 E: info.eu@buehler.com

Asia-Pacific Offices

BUEHLER Japan P: +81 03 5439 5077 | F: +81 03 3452 7220 E: info.japan@buehler.com

BUEHLER Asia-Pacific - Hong Kong P: +852 2307 0909 | F: +852 22721 6659 E: info.asia@buehler.com

 BUEHLER China - Shanghai

 ITW Test & Measurement (Shanghai) Co., Ltd.

 P: +86 400 000 3418 | F: +86 21 6410 6671

 E: info.cn@buehler.com

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