BUEHLER
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INSTRUCTION SHEET

EpoKwick™ FC Fast Cure Epoxy System

DESCRIPTION

Epoxy Systems provide good physical adhesion; low shrinkage; infiltration of voids, pores and cracks; better edge retention, wear and hardness properties than acrylic systems.

EpoKwick FC is intended for rapid (<2 hour) encapsulation of metallographic, petrographic, and other material science specimens. Due to the sensitive nature of this product, read and follow these instructions carefully.

- **20-3453-128:** EpoKwick FC Resin, 128oz [3.8L]
- **20-3453-032:** EpoKwick FC Hardener, 32oz [0.95L]

These instructions will cover the normal range of recommended use, as well as some special techniques to extend the usability of the product.

Note: Materials sensitive to temperature should be mounted in EpoxiCure™ 2 or EpoThin™ 2 which have low peak temperatures.

SPECIFICATIONS

For 15-30 grams (1in – 1.5in mounts)

Mixing Ratio (by weight):	4.4 parts resin to 1 part hardener
Mixing Ratio (by volume):	4 parts resin to 1 part hardener
Working Time:	3 minutes for 20 grams at 72° F (22°C)
Cure Time:	120 minutes at 72°F (22°C) for 20 grams
Peak Exothermic Temperature:	250-285°F (120-140°C)
Hardness:	80-83 Shore D
Shelf Life:	1 year (Store closed container in cool, dry place when not in use)

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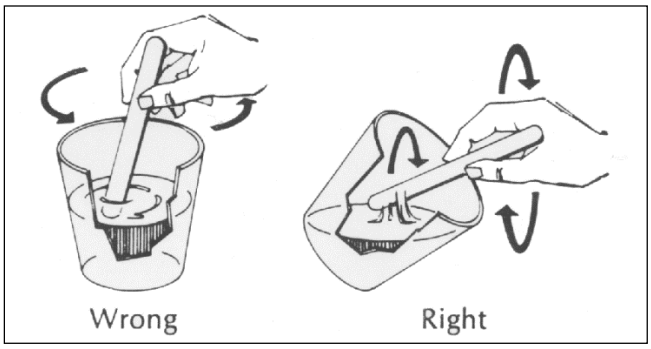
SAFETY INFORMATION

Carefully read and understand the contents of this instruction sheet. Improper operation, handling, or maintenance can result in equipment damage or personal injury. View the current Safety Data Sheet (SDS) for this product at www.buehler.com.

Note: EpoKwick FC may reach higher temperatures during curing if used in larger quantities, warmer environments or mixing times are extended.

STANDARD USAGE INSTRUCTIONS

1. Thoroughly clean and dry samples before encapsulation.
2. Coat the inside of the SamplKup (or other mounting cup) with Release Agent (20-8186-004) to ensure easy removal of the mount from the mold. Allow excess liquid to evaporate prior to use.
3. Place the specimen in the center of the SamplKup with the surface of interest facing down.
4. Using a scale, mix by weight 4.4 parts EpoKwick FC Resin to 1 part EpoKwick FC Hardener OR mix by volume 4 parts EpoKwick FC Resin to 1 part EpoKwick FC Hardener.
5. Blend the mixture thoroughly for approximately 1 minute.
    - For best results tip the cup containing the resin and hardener slightly and using a stirring stick, gently work the resin and hardener together using a lift and stir motion until the mixture is thoroughly blended.



    - The mix will start out cloudy as the resin and hardener are blended together. Keep blending the mixture until it becomes clear, indicating it is thoroughly mixed. Avoid mixing longer than 2 minutes as this can lead to increased cure temperatures and discoloration.
    - Avoid violent stirring to prevent the formation of air bubbles.
6. Once the mixture is clear, pour the mixture into the SamplKup (or other mounting cup).
7. Allow the mold to cure at room temperature for 90-120 minutes or until fully solidified and cool.
    - Cure times may be affected by ambient room temperatures, size of the specimen, humidity, type and size of cup used, mixing time and thermal resistance of the sample.
8. After curing, remove the mount from the mounting cup.

CURING INFORMATION

EpoKwick FC should cure without special attention. Place the cast molds in an area with good air circulation. Use of a fume hood is recommended. If the work area is very cool or if the mounts have not cured in the normal time, place the mounts in an oven at 104° F (40° C) for 1-2 hours.

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CURE TIME REDUCTION

The benefits of reducing EpoKwick FC cure time include quicker evaluation of specimens and reduced viscosity which enhances infiltration of pores and cracks within a specimen. Two methods for reducing the cure time of EpoKwick FC are explained below.

Method 1

This method pre-heats the resin prior to mixing. This will result in higher exothermic temperature during curing, but is the fastest way to make a mount.

1. Thoroughly clean and dry samples before encapsulation.
2. Using a scale, in a paper Buehler cup measure out by weight 4.4 parts EpoKwick FC Resin. Measure by weight 1 part of EpoKwick FC Hardener in a separate cup.
3. Place the paper cup with the measured resin on a hot plate between 104-122°F (40-50°C) for two to three minutes. When the viscosity of the resin becomes watery, remove the paper cup from the hot plate.
4. Add the one part EpoKwick FC Hardener to the warmed resin and stir for 30 seconds
5. Pour the mixture into the cup used for measuring hardener and continue stirring for another 30 seconds or until the mixture is clear (not more than two minutes in total).
6. Pour the warm epoxy mixture into the SamplKup.
7. Let the SamplKup stand at room temperature until the epoxy is fully cured (about 15 minutes).

Recommendations for 1.25in [25.4mm] Mount

Resin Temperature	Peak Exothermic Temperature	Cure time (min)
Room Temperature: 72°F (22°C)	284 - 320°F (140 - 160°C)	90 - 120
86°F (30°C)	320 - 356°F (160 – 180°C)	30 - 40
104°F (40°C)*	410 - 446°F (210 – 230°C)	15 - 25
122°F (50°C)*	446 - 482°F (230 – 250°C)	10 - 15

* Discoloration of the epoxy due to temperature can be expected

Method 2

If extremely low pouring viscosity is not needed and shortening the cure time is the main goal, then simply mix according to the standard instructions and place the sample in a curing oven. As temperature is raised, cure time decreases but peak exothermic temperature increases.

Recommendations for 1.25in [25.4mm] Mount

Oven Temperature	Peak Exothermic Temperature	Cure time (min)
Room Temperature: 72°F (22°C)	284 - 320°F (140 - 160°C)	90 - 120
86°F (30°C)	320 - 356°F (160 - 180°C)	60 - 90
104°F (40°C)	356 - 392°F (180 - 200°C)	30 - 45
Above 104°F (40°C)	Not recommended	

Notes:

- Exact settings may change for different volumes of EpoKwick FC used.
- Use of oven temperatures above 104°F (40°C) is not recommended due to the potential of overheating.
- Discoloration (yellowing) at the center of the sample or the formation of bubbles and gas channels in the sample indicate overheating.

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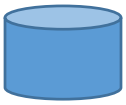
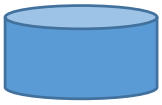
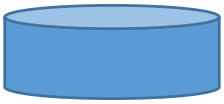
MOUNTING SMALLER OR LARGER SAMPLES

During curing, the exothermic reaction will vary with the volume of material used. For smaller samples, this can mean that curing times are excessively long or in extreme cases, the specimen may remain soft and not cure fully. For larger samples, the reaction can be too rapid and overheating may occur.

Adjusting the mix ratio will balance out the exothermic reaction and result in proper curing. See the table below for recommended mix ratios by mount size along with the expected cure time and exothermic temperature.

Mount Diameter or Approximate Volume	Mix Ratio (by weight)	Cure Time	Approximate Exothermic Temperature*
1in SamplKup or Volume < 15g 	3.9 Resin: 1 Hardener	90-120min	250 - 285°F (120 - 140°C)
1.25in SamplKup or Volume 15g-25g 	4.4 Resin: 1 Hardener	90-120min	250 - 285°F (120 - 140°C)
1.5in SamplKup or Volume 25-40g 	4.6 Resin: 1 Hardener	80-100min	356 - 392°F (180 - 200°C)
2in SamplKup or Volume 40g-50g 	5 Resin: 1 Hardener	80-100min	356 - 392°F (180 - 200°C)
6 x 3 x 1in EPDM or Volume ~ 300g 	5.4 Resin: 1 Hardener	60-80min	356 - 392°F (180 - 200°C)

***Note:** Mount material, surface area, type of sample and environmental effects can all influence exothermic temperature and cure time, as well as volume and mix ratio.