ENCORE® FoamBoard
Technical Guide

The diverse types of EnCore® Foam Boards are applicable to a wide range of end uses. This guide was compiled based on our experience and is designed to give you advice on fabricating and finishing techniques to use for everything from cutting to final finishing, whatever the product or project at hand.

Methods and materials used to manufacture EnCore Foam Board yield superior performance capabilities. By stressing variety, versatility and value, we give you more choices: clay-coated and kraft paper, rigid, firm and crushable polystyrene cores. All varieties are free of toxic chemicals such as ozone depleting gases and formaldehyde. In addition, our products contain an industry-leading percentage of recycled content. These properties serve to maintain the integrity of the board and its uniform surface – both indispensable for a professional look in your finished projects.

It is the responsibility of the user to test EnCore® Foam Board in their application with all third-party materials and process methods (such as adhesives, die-stamping / cutting and heat/higher temperatures) before a production run. We are not responsible for the performance of other materials used independently or in conjunction with EnCore® Foam Board. EnCore® Foam Board is not recommended for outdoor use or for use with solvent-based materials.

The instructions in this guide call for the use of third-party tools and equipment. It is the responsibility of the user to take any necessary precautions and properly use such tools and equipment. Please refer to the manufacturer's instructions prior to use. Although we have tested the tools and equipment identified in this guide on EnCore® Foam Board, we do not guarantee, and we are not responsible for, the performance of such third-party tools and equipment. In addition, we are not responsible for any damage to any such tools or equipment resulting from the use of EnCore® Foam Board.

WARNING: EnCore® Foam Board is flammable and may constitute a fire hazard. Do not expose to an open flame or other ignition source.

ENCORE®
FOAM BOARD

MANUAL CUTTING

Straight Cuts

We recommend using the X-Acto #1 knife with #11 blades for simple, straight cuts. Other suitable manual cutting tools include the: X-Acto Utility Knife, single-edge razor blades, mat cutters and powered cutters.

The tool choice isn't as critical as keeping the blade clean of adhesive or paint residue and changing blades frequently. A dulled, burred, or broken tip will damage the foam and tear the paper facing. Using a soft surface support under the foam board, like the X-Acto Self-Healing Mat (X7760), which shrugs off the effects of cutting with sharp X-acto blades due to its special surface and core, is a great way to prolong the life of the blade.

To make a cut, use a straightedge or metal ruler as a guide. Hold the blade at a 30° angle to allow more of the cutting edge to do the work. Use steady pressure, pulling the knife along the entire length of the cut. Don't use a sawing motion or force the blade back and forth. Sometimes, it may be necessary to make more than one pass, particularly with ½" boards.

Holes

To cut out a circular hole, penetrate through the board with your knife blade, cutting carefully. Unless a circular hole is mandatory, you'll find it easier to cut a square opening. Proceed as you would for making a straight line cut, as described above.

V-Groove Cuts

To cut a V-groove, we recommend using the Logan WC-2001 FoamWerks V-Groove Cutter. First, lightly mark the board to indicate the center of the desired V-groove, then align the front and rear tick marks to the previously marked line. Proceed by pushing the cutting head downward and pulling the V-Groove Cutter backwards along the length of the foam board. Remember to test the blade height on a scrap piece of foam board prior to your final cut.

Circles and Curves

To cut circles, use an X-Acto Knife with a #11 blade and circular guide or template to help maintain a smooth, even edge throughout the cut. For curves, first draw a guide line on the board surface. Make a shallow cut, then gradually and smoothly deepen the cut through the other side of the board. Remember, let the sharp edge of a clean blade do the work for you.

* We recommend performing a trial before a production run.

MACHINE CUTTING

Die-Cutting

You can achieve a variety of effects by adjusting the various aspects of the process. It's a good idea to make a test run before working on the actual piece. Ideally, the die should be constructed with a ½" die board, 2-3 point center bevel. For embossing, to add dimension within an image, use a 2-3 point blunt or creasing rule with a medium-hard temper. The choice of ejection rubbers depends on the particular EnCore® Foam Board you're using and the type of finished edge you want:

- White Foam Board: soft-density ejection rubber for open edges
- PilloCore®: hard-density ejection rubber for closed edges and embossing
- ¼" MightyCore®: medium-density ejection rubber for open edges

For Black-on-Black® PilloCore® Foam Board, use a double-rule die to add embossing within an image. Up to one-third the thickness of the board may be compressed.

DIE-CUTTING RECOMMENDATIONS			
EnCore® Product	Process	Rule	Ejection Rubber
Foam Board	Die-Cutting	2-3 pt.	Soft Center Bevel
PilloCore® Foam Board	Die-Cutting	2-3 pt.	High Center Density Bevel
PilloCore® Foam Board	Embossing*	Blunt or Creasing	High Density
All	Scoring	Blunt or Creasing	N/A

We do not recommend die cutting 3/8" or 1/2" thickness Foam Board. For best results, use 1/8" or 3/16" thickness.

* We recommend performing a trial before a production run.

Embossing effects on EnCore® White Foam Board and MightyCore® Foam

RECOMMENDED CUTTING TOOLS			
Tool	Part #	Blade	Part #
X-ACTO® #1 Knife	X3201	X-ACTO® #11	X11
X-ACTO® #8 Knife	X3208	X-ACTO® #8R	X208 changing this
X-ACTO® #2 Knife	X3202	X-ACTO® #2	X202
Standard Utility Knife		Single-Edge Razor	
Logan® 2000 Mat Cutter		Logan® 270	
Fletcher® 2200 Mat Cutter		Utility Blades	

Board are not recommended because of the boards' resilient and extra-rigid foam characteristics.

Guillotine Cutting
In general, guillotine cutting is not recommended. Satisfactory results may be obtained by cutting 3 or 4 sheets at a time with a sheet of cardboard on top of the stack to dissipate blade pressure and minimize surface marking. Proper machine upkeep and a sharp cutter blade are essential.

* We recommend performing a trial before a production run.

Machine Cutting
For intricate patterns we suggest using the Black & Decker® Piranha carbide saw blade-40 teeth, fine crosscutting (www.blackanddecker.com) on a table, radial, or circular saw. You can also use a band saw with a very fine blade or the Helmold K-12 Cutawl Saw for intricate cuts. Corrugated board or chipboard placed beneath the Foam Board will minimize rough edges. It's a good idea to sand the cut edges with fine-grit paper for a cleaner finish.

* We recommend performing a trial before a production run.

Flatbed Cutting
When cutting shapes, V-grooves and digitally printed materials, EnCore® White, Colors, PilloCore® and MightyCore® Foam Board all craft desirable results when using a flatbed cutter.
- AXYZ International Trident -https://www.axyz.com/us/product/trident
- Zund G3 - https://www.zund.com
- Mimaki CF22-1225 - http://www.mimakiusa.com
- Esko Kongsberg X or C Series - https://www.esko.com
- AGFA Acorta -https://www.agfagraphics.com/global/en.html

Routing
In general, routing is not suitable for all laminated paper products, but you can produce a clean finished edge with the proper bit. A "compression spiral" or an "up shear/ down shear" router bit will work best. Additionally, cutting foam board with a router can be easy if you're using the right kind of knife tool. An oscillating knife will deliver clean-cut edges without fraying any of our foam board products. For heavier and thicker foam board products, a more robust cutting tool, like a tangential knife, is recommended. For more information on router bits visit www.cronsrud.com. For more information on knife tools visit https://www.cncroutershop.com or https://www.axyz.com

* We recommend performing a trial before a production run.

SCREEN PRINTING

Screen Printing
The brilliant white surfaces of EnCore Foam Boards are perfect for screen printing, roller coating, flexography, and many other printing processes designed for flat board stock. The EnCore Foam Boards' clay-coated surfaces make them very receptive to printing inks, providing sharp definition, superior ink holdout, and exceptional coverage. The ripple-free, ultra-smooth surface does not require any preparation or priming. Be sure that the surface is clean and free of dust or debris, especially for boards that have been cut down to size.

Major screen-printing ink manufacturers have recommended the following types of ink for use with our EnCore® Foam Board:

- Water soluble inks
- Acrylic water-based inks
- UV inks
- Gloss vinyl inks
- Puff inks
- Poster inks

Choose screen mesh sizes according to the fineness of line detail required. (Your ink supplier or manufacturer is a good source for recommendations.) Air drying generally takes about 30 minutes or less, while jet drying takes only seconds. Gloss enamels will require longer drying times. Use solvent-based inks with caution to avoid damaging the polystyrene core.

When printing on EnCore® Foam Board with darker surface colors, you may need a white base coat to endure opacity.

* We recommend performing a trial before a production run.

DIGITAL FLATBED PRINTING

Digital Flatbed Printing
The Print Service Provider can print any image directly to rigid surfaces within a matter of seconds. Solvent inks, UV curable inks and latex inks can all be used to form a thin layer on the surface of the board.

EnCore has worked with major flatbed manufacturers to test our foam board for print quality and machine compatibility. Manufacturers who EnCore has worked with include:

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FOAM BOARD

- HP
- Mutoh
- Mimaki
- Canon
- FujiFilm
- EFI
- Roland
- MCT Digita
- CET Color

For specific foam board/machine capability information, please visit our website at https://www.encoreproducts.com/print-ready-foam-board and download our Print-Ready Chart. Or call Customer Service at 1-800-873-4868.

* We recommend performing a trial before a production run.

MOUNTING & LAMINATING

You can use wet glues, spray adhesives or, with suitable equipment, adhesive tissues and films having various activating temperatures. Custom Framers also use hinge-mounting for original art, signed limited edition prints, etc. **For more information, visit our website, www.encoreproducts.com.**

When mounting large, oversize items, it's good practice to use a counter-mount of comparable size and strength on the reverse side of the mounting board to help maintain flatness.

If you notice a slight bow, turn over the board and mount artwork to the other side.

* We recommend performing a trial before a production run.

Wet glues
Wet glues can be applied to EnCore® Foam Board with a spray gun, brush or roller system. Manual equipment, such as cold mechanical and vacuum presses, are useful to provide consistent, even pressure. Automated equipment is available that will efficiently coat boards and mount images.

Whether you use manual or automated methods, the glue you select should have a low-water content and high-solids content to avoid bowing the board from excessive moisture. PVA glues are recommended.

* We recommend performing a trial before a production run.

Pressure sensitive mounting
There are several methods appropriate for pressure sensitive mounting. EnCore® Pressure Sensitive Foam Board, with its "built-in" pressure sensitive adhesive, is a time saving option. EnCore® MightyCore® Pressure Sensitive also offers a time saving option while providing MightyCore's rigidity. For non-adhesive coated boards, apply pressure sensitive adhesive with a squeegee or roller press. A roller laminator, used with EnCore® Pressure Sensitive Foam Board will greatly facilitate pressure-sensitive mounting of wide format images.

* We recommend performing a trial before a production run.

Spray adhesives
Carefully follow the instructions on the can for successful, problem-free mounting. Use a cold vacuum press with such products as Elmer's® Multi-Purpose Spray Adhesive, Elmer's® Extra Strength Spray Adhesive, CraftBond® Extra Strength Spray Adhesive, 3M™ Vac-U-Mount™ Adhesive, or 3M™ Super 77 Multipurpose Adhesive. All greatly facilitate spray mounting.
* We recommend performing a trial before a production run.

Dry Mounting
The first consideration is choosing the right adhesive for the particular artwork to be mounted. This is usually determined by the artwork and the substrate being used.

The four keys to successful mounting are:

- Time
- Temperature
- Pressure
- Moisture reduction

We do not recommend dry mounting with MightyCore® or PrintPro™. High temperatures can deform the product and cause it not to perform as intended.

Mechanical Presses require an operator's attention to all of the preceding elements. However, temperature, once set, is held constant by a thermostat; mounting pressure may need adjustment when mounting extra-thick materials. Adjustments to the pressure are possible by following the instructions located in your Owner's Manual.

Vacuum Presses control all four elements in one step, using a digital control panel for setting time, temperature and pressure; moisture content is automatically reduced in the first 30-45 seconds while the vacuum is being created. That's why the dwell time for given adhesive is longer for vacuum presses than it is for mechanical presses.

* We recommend performing a trial before a production run.

After-mounting cool-down
Immediately upon removal from the press, the mounted materials should be

cooled under a weight or plate glass for 30-60 seconds. This improves the bond and keeps the board flat, minimizing the tendency to bow. The weight or glass should entirely cover the mounted materials to prevent denting them.

Laminating
Heat-activated laminating films eliminate the need for glass and prevent fading caused by ultraviolet light. Ideal for ink jet, photographs, and plain paper images.

Mounting and laminating in dry mount presses can be done in one easy step in 5-7 minutes at 215°F (102°C).

* We recommend performing a trial before a production run.

Roller Laminators
EnCore® Foam Boards, with their ultra-smooth surface papers, are well suited for hot or cold roller laminating equipment.

• For heated laminators, use a heat-activated adhesive foam board, such as SingleStep.

• For cold laminators, use a pressure sensitive adhesive foam board. EnCore® offers Permanent Adhesive and Premium Tac Repositionable Adhesive Foam Boards.

The nip between the rollers of the laminator should be set to accommodate the thickness of the board being used. Roller pressure, tension, speed and temperature (if applicable) should be set in accordance with the manufacturer's recommendations found in your Owner's Manual.

* We recommend performing a trial before a production run.

Using EnCore® Heat-Activated SingleStep®

This board enhances dry-mount productivity and convenience and is applicable to both mechanical and vacuum presses. Guidelines for its use are summarized here:

ENCORE® SINGLESTEP® FOAM BOARD
Specifications Recommended

Temperature: 180°F (82°C)

(Mech. Press) Recommended Time*: 2 minutes

(Vacuum press) Recommended Time*: 3 minutes

Bond: Permanent

Adhesive pH: 7.0–8.0

Foam Board pH: 6.5–7.5

* We do not recommend dry mounting for original art, signed or numbered prints, Ilfochrome® (Cibachrome®) photographic prints or anything of exceptable value. Dry mounting is not intended for archival, conservation or preservation practices. We do not recommend SingleStep for resin coated (RC) photographs.

GLUING

Gluing
Most glues work well with EnCore® Foam Boards for edge-to-edge and surface-to-surface joining. These are the most commonly used glues:

• Hot Melt
• Contact Cement
• Carpenter's Glue
• Craft Glue
• Rubber Cement
• Spray Adhesives

Modeling cements and "super" adhesives should be used with caution. Solvent-based adhesives may react with and damage the polystyrene core.

Edge-to-Edge Applications
Apply a thin coat of glue to one edge and press firmly against the edge of the other piece to be joined. Hot glue will set up almost immediately. Wet glues, which will have variable drying times, require clamping or use of straight pins to secure the edges in place until the glue has dried. Curves, angles, and corners should be reinforced with interior supporting ribs, when possible.

Surface-to-Surface Applications
Apply sufficient adhesive for a firm bond and press one surface firmly against the other, using a clamp or weight to maintain good contact between the two pieces. Also, if the surface area is large, you should counter-mount a similarly sized board on the back to prevent bowing. If you use rubber cement or contact cement, be sure to use a slip sheet between the surfaces to prevent accidental gluing before the pieces are properly positioned. Do not attempt to reposition surface-mounted materials after the glue has set. The paper face of the Foam Board will be damaged.

* We recommend performing a trial before a production run.

ENCORE®
FOAM BOARD

FINISHING

Painting

EnCore® White Foam Board and PilloCore® Foam Board can be painted to a perfect finish using a sprayer, roller or brush, without any special surface preparation. Suitable paints include flat, semi-gloss and enamel acrylics, poster paints, tempera, acrylic lacquers, latex paints, 3-dimensional and glitter paints. Airbrush inks, India ink, traditional markers and oil paint markers also yield excellent results on the boards' clay-coated paper surfaces.

When applying spray lacquers and enamels, it's best to seal the surface with a light coat initially, then apply a second and even a third coat to assure thorough coverage. If the project will be subjected to frequent handling or other sources of potential soiling, you might want to protect the finish with a clear acrylic varnish.

We recommend performing a trial before a production run.

Flame Control Coatings

You can apply fire-retardant coatings. Two appropriate products are Flame Control 10-10 and 20-20® Flat Latex Fire Retardant Paints. Both are recommended for EnCore® Foam Board by the manufacturer, Flame Control Coatings, Inc. **(www.flamecontrolcoatings.com)** If you want to use other products of this type, be sure to get the specific fire-retardance data from the manufacturer.

To minimize bowing, apply light coats on both sides to balance the two paper liners.

We recommend performing a trial before a production run.

Decorative Covering

Contact papers, coated papers, wallpapers and fabric can be applied to EnCore® Foam Board with spray adhesive, contact cement, rubber cement, white glue and by dry mounting. As with other processes described in these pages, large size projects should have a counter-mount on the back of the board to minimize bowing.

We recommend performing a trial before a production run.

PROPER HANDLING

The information summarized here will help you keep your company's EnCore® Foam Board products in peak condition, both in inventory and in the intended end use.

Storage

- Store Foam Boards flat, not leaning on edge or standing vertically.
- Keep boards in the original shipping box, with the lid closed or store wrapped and sealed on a pallet until delivered to the end user.
- Store away from loading docks and exterior doors.
- Ideally, store in a controlled environment at 68°F - 75°F (20°C-24°C) and at a relative humidity between 45-50% to prevent excessive expansion and contraction of the board's paper fibers.
- Allow approximately 24 hours to acclimate to a new workplace.
- Pre-cut foam board before direct printing.
- Clean the working area and cover the materials to avoid dust and static electricity.

Display

- Use structural supports for larger sized items to minimize the potential for bowing.
- Keep out of extended exposure to direct sunlight.
- Don't install close to heating and cooling units or sources of moisture.
- Avoid installing near exterior doors or open windows.
- Don't use near an open flame or other ignition source.

Paper by its very nature, is an absorptive medium. In high humidity, as typically experienced in summer months, paper will absorb moisture from the atmosphere. As a result, the paper swells; it grows in all three dimensions creating a waviness which we call cockling. To protect from humidity, boards should be stored in a controlled environment.

If you have additional technical questions or for basic product information, sales literature or the name of a distributor near you, please call our Customer Service Department at 1-800-873-4868.

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