ENVERGE® | PROFILL® OPEN CELL SYSTEM

RETROFIT APPLICATION GUIDE

PRODUCT USAGE

Enverge® ProFill Open Cell System is a two-component open cell polyurethane foam designed specifically for injection into a variety of empty cavities in both residential and commercial applications. The two components leave the gun as a liquid and react inside the cavity to create foam.

SAFETY

PERSONAL PROTECTIVE EQUIPMENT (PPE)

SKIN - Wear gloves, coveralls, apron and boots as necessary to prevent contact of liquid components or partially-cured spray foam with skin. When handling liquid components, gloves should be made of nitrile, neoprene, butyl, or PVC.

EYES - Protect eyes while handling liquid components or spraying with safety goggles or safety goggles combined with a face shield. During spray application, eye protection may be provided by a full-face or hood respirator.

RESPIRATION - Contractors engaged in the application of Enverge spray foam must have a written respiratory protection program for employees handling or applying Enverge spray foam materials. Depending on the situation, respiratory protection may include dust masks, air-purifying respirators (APR), powered air-purifying respirators (PAPR), or supplied-air respirators (SAR).

VENTILATION - Provide ventilation and other engineering controls to exhaust vapors from work areas and to protect building occupants and other workers on site.

HANDLING OF LIQUID COMPONENTS

Applicatiors should use engineered controls and proper PPE before handling liquid components. Use caution in removing bungs from 55-gallon drums. Loosen ¾-inch bung and let gas escape before completely removing. In case of chemical contact with eyes, flush with water for at least 15 minutes and get medical attention. For further information refer to “Working with MDI and Polymeric MDI: What You Should Know,” Reference No. AX 205, published by Alliance for the Polyurethanes Industry, 1300 Wilson Boulevard, Arlington, VA 22209, www.polyurethane.org.

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START UP & APPLICATION PROCEDURES

AMBIENT CONDITIONS

For best results, ambient air should be less than 85% relative humidity and not within 5ºF (-15ºC) of dew point.

APPROVED SUBSTRATES

Approved for application to gypsum, wood, concrete, metal, and masonry.

SUBSTRATE REQUIREMENTS

Prior to installation, all substrates must be secure, dry, and free of foreign materials, oil, grease, rust, or other contaminants. Check substrates with Moisture Detection Paperstrips (MDP) for metal or a mositure meter for wood to verify dryness. Primers should be used where necessary. Mask off all areas not to receive spray foam with masking tape and plastic sheeting. Recommended substrate temperatures are 0°F to 120°F (-17°C to 48°C). Temperatures colder than what are recommended can result in the foam cracking and popping off of the substrate.

MIXING

Mix on high speed to achieve a milky solution prior to application or recirculation. If Enverge ProFill Open Cell System resin is in the line from the previous spray day, it must be recirculated into the drum and mixed before spraying can take place. **Enverge ProFill Open Cell System must be continuously mixed during application.**

DRUM TEMPERATURE REQUIREMENTS

Drum temperature for application should be a minimum of 70°F (32°C).

SPRAY RIG & DRUM PREP

If this installation requires changing the spray rig system from a closed cell product to an open cell product ***OR*** an open cell to a closed cell, flush B-side (resin) with soapy water to remove the product first. Then flush the water in the system out with the new open cell or closed cell product. Remember to flush the entire B-resin side including recirc lines, proportioner, and spray hose. For additional information on air purge visit **EnvergeSprayFoam.com/XXXXXXXXX**

In order for the drum to be ready for use, the drum must be in a temperature range where your proportioner can reach required spray temperatures.

PLEASE REFERENCE THE EQUIPMENT SETTINGS AND TEMPERATURE SETTINGS EXAMPLE ON THE NEXT PAGE FOR PROPER APPLICATION TEMPERATURES.

START UP & APPLICATION PROCEDURES (CONT.)

EQUIPMENT SETTINGS

Pre-Heaters - Iso (A)	115°F to 145°F (46°C to 63°C)
Pre-Heaters - Poly (B)	115°F to 145°F (46°C to 63°C)
Hose Heat	115°F to 145°F (46°C to 63°C)
Recommended Spray Pressure	1,000 to 1,200 psi (dynamic)
Shelf Life	A side, 12 months – B side, 6 months

*The values in the Equipment Settings chart show initial optimum settings. Actual operating temperatures vary as ambient air, humidity, moisture, and substrate temperatures vary. Extreme conditions will affect the adhesion, cured physical properties, and yield of the foam. Applicator must make adjustments depending on conditions.

TEMPERATURE SETTING EXAMPLE

> If your drum temperature is 80°F (27°C) and you have a rig with a delta T of 50°F (10°C), your max spray temperature can only be 130°F (54°C). With this information it is important to know the delta T of your proportioner and drum temperature to achieve the proper spray temperature. Do NOT recirculate or agitate Enverge Profill.

OVERSPRAY & LEAK PREVENTION

Inform the owner or builder of the need to take preventive measures that will prevent property damage due to potential overspray. Explain the precautionary measures you'll take to protect windows, doors, floors, HVAC equipment, vents or other equipment. Take preventative measures to isolate HVAC equipment, especially in retrofit applications.

It is highly recommended to lay down polyethylene film underneath the trailer and hoses to prevent damage in the event of hose rupture.

REQUIRED EQUIPMENT

Same Proportioner, Hoses and Gun as used for Gaco's Open Cell and Closed Cell Foam.
Pour Cap for gun.
Hard Tubing – recommended size: 1/4" interior diameter & 3/8" exterior diameter; approximately a dozen pieces depending on job size, cut at 4" to 6" length.

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REQUIRED TOOLS FOR PREPARATION & CLEANUP

Zip Tool for vinyl siding removal. (i.e. Malco Products SideSwiper II < $10)
Borescope to see inside of cavity and ensure it is empty. ($100-$350)
Measuring Device to determine stud width, i.e. metal wire.
Cat's Paw for removing nails to get sheeting off if you need to remove old insulation.
Circular Saw if you need to cut sheeting out to remove old insulation.

SUGGESTED ADDITIONAL TOOLS

InfraRed Thermal Imaging Camera, i.e. FLIR
This shows value of the insulation and provides proof that cavities have been filled.

Suggestion: Use thermal imaging camera images to prepare a before and after photo package to present to homeowner with project invoice.

It is also a valuable tool during installation to help ensure you are completely filling each cavity. The best images are often obtained from the inside – it only takes one to two minutes for the heat signature to show through the sheetrock or plaster and lath.

Blower Door - arrange for Blower Door availability to document air sealing of the house.
Suggestion: Cultivate relationship with energy auditor and/ or www.resnet.us has an app on their website.

PRE-INSPECTION

Prior to Bidding Job Do NOT just measure the house.
Become familiar with the types of housing in your area and inspect entire house to ensure you know what all will be required for a successful installation.
WARNING: Do not install GacoProFill in walls with Knob & Tube wiring, it will create a fire hazard. Do not install over other products like fiberglass, vermiculite and other insulation materials besides foam.

GENERAL PROCEDURES

JOBSITE SAFETY & SET UP

Upon jobsite arrival, locating the spray rig can sometimes be a challenge. Avoid parking on concrete driveways or other surfaces where drips, leaks or spills would be damaging. Avoid areas where the generator exhaust or noise will cause problems. Safe egress to the spray rig is very important as is the security of the equipment from persons other than the trained spray crew.

Use Lock Out / Tag Out program to ensure HVAC equipment cannot be operated during the spray foam process. For added safety, turn off all power.

Jobsite ventilation is required during and for a period after the spray foam process. Keep the house under positive pressure (air needs to be coming IN to the house) to keep fumes out. ***Suggestion: Open windows and use a Blower Door to bring air IN to the home.***

Personal Protective Equipment (PPE) is essential. Ensure all workers involved in the installation of Enverge ProFill are assigned the appropriate PPE and have it available when arriving on jobsite.

PPE for Installation from INTERIOR of Home - Applicators and Assistants should wear:

- A NIOSH-approved full face or hood-type supplied air respirator (SAR) as outlined in your company's Respiratory Protection Program
- MDI-resistant chemical gloves (e.g., nitrile), or fabric gloves coated in nitrile, neoprene, butyl, or PVC
- Chemically resistant long-sleeve coveralls or chemically resistant full body suit with hood
- MDI-resistant fitted boots/booties

PPE for Installation from EXTERIOR of Home - Applicators and Assistants should wear:

- A NIOSH-approved full face-piece Air Purifying Respirator (APR) with organic vapor/particulate (P100) cartridges or a supplied air respirator (SAR).
- Safety goggles (where respirator does not cover the eyes)
- MDI-resistant chemical gloves (e.g., nitrile), or fabric gloves coated in nitrile, neoprene, butyl, or PVC
- Chemically resistant long-sleeve coveralls or chemically resistant full body suit with hood
- MDI-resistant fitted boots/booties

When drilling through Asbestos siding, additional safety measures need to be adhered to, including specific PPE. **Please visit www.spraypolyurethane.org for additional information.**

GENERAL PROCEDURES (CONT.)

JOBSITE PREPARATION

Exterior Installation: Many types of exterior cladding are able to have holes drilled through the outside to allow for installation of foam and then be satisfactorily repaired. Some types of siding such as Vinyl may be removed and replaced. (Do not attempt to remove/replace Aluminum or Steel siding – installation will need to be done from the interior).

Regardless of exterior cladding type, contractor must ensure he/she has sufficient knowledge to perform the necessary repairs to meet high expectations of homeowners. Exterior installation is not suitable for Brick.

Installation will need to be done from the interior, taking care to not fill the air gap between the substrate and the exterior brick.Hang plastic below the holes you need to fill. This is to prevent getting foam on the siding remaining on the house.
Suggestion: Use a 3M M3000 Hand Masker Dispenser that applies the plastic and tape in one step – you can run it right down the house and attach to the top lip of the siding.

Interior Installation: Move furnishings away from wall to allow easy access and cover them with plastic; remove carpet, or cover with plastic. Use a ZipWall or ZipDoor system to protect inner areas of the home (www.zipwall.com). Ensure path from spray rig to the home's interior is clear of any obstacles.

Prepare Areas Where Foam Should Not Go: Do not allow foam to enter electrical boxes, recessed lights, drop soffits and open penetrations such as hose bibs, gas lines, telephone and cable lines, etc.

Electrical Box Prep*:
- Remove all cover plates for electrical switches and outlets.
- Remove screws holding the switches and outlets and pull the switches and outlets out of the box (leave the wires attached).
- Stuff the electrical box full of newspaper so foam cannot enter the box.
- Use can foam or tape around the box and sheetrock.

*While it is not necessary to shut off the electricity at the circuit breaker in the main electrical panel, please make arrangements with homeowner to do so if you are uncomfortable completing this step.clear of any obstacles.

GENERAL PROCEDURES (CONT.)

Penetrations

Drill holes at 4' intervals in each cavity – drill with caution to avoid hitting a duct, etc. For an 8' height wall, drill one hole 4' from the floor, and another at the top of the wall. Holes should be a minimum of 1/2" in diameter; there is no maximum size as long as the hole can be repaired. NOTE: Larger holes will be needed if any existing material needs to be removed from the cavity. ***Suggestion for Easy Patching and Repair of Penetrations: Use a Hole Saw and save the core for patching hole; replace the core and seal the opening. Grace Vycor® Self-Adhered Flashings are ideal for sealing holes in wall sheathing systems.***

Cavities and Substrate Limitations

Ensure wall cavity is empty, or remove anything that is inside prior to installation.
Locate Fire Blocking – many older homes have 10' or 12' ceilings with fire blocking at different heights.

- Locate fire blocking within the walls when drilling the first few holes and adjust addition al hole locations within each cavity accordingly.
- In buildings w/Balloon Framing, inspect entire cavity to determine if there are fire breaks or just a continuous empty cavity.

Application

Always perform a test spray into a trash bag first to check for mix and rise before installation in walls. NOTE: It will splatter if a trash bag is not used. With pour cap and tube installed on gun, place tube into lowest hole in cavity; ensure it is pointed straight down, not tilted to the side. Pull trigger to engage chemical so it drops to bottom of cavity.

Approximate spraying time to fill cavity: 1 second per foot Ensure foam extends past lower hole by at least 1" prior to moving to next higher hole; repeat the process in next higher hole within each cavity to completely fill cavity from bottom to top. 8' wall cavity example: It will take approximately 4 seconds to fill from bottom to first hole located 4' up from the bottom; then approximately 4 seconds to fill from the middle to the top hole.

Inspect hole to look for proper rise and fill in the cavity.

Use thermal imaging camera to help ensure you are completely filling each cavity.
The best images are often obtained from the inside – it only takes one to two minutes for the heat signature to show through the sheetrock or plaster and lath. Adjust spraying time as needed for a complete fill.

GENERAL PROCEDURES (CONT.)

Check interior walls frequently for popped or cracked drywall, and make installation adjustments as needed.
Suggestion: Fill every other cavity then go back and do the rest – this will avoid putting too much pressure on the drywall on both sides of the framing and decrease the chances of a blow out.

Final Inspection
To help ensure successful installation, check walls with thermal imaging camera.

Clean Up/Job Completion
Re-check interior walls for popped or cracked drywall, and make repairs as necessary. Replace cores from holes and/or seal holes with Grace Vycor® Self-Adhered Flashings. Replace any siding that was removed, or make proper repairs to exterior cladding; touch up paint as necessary; clean up overall jobsite.