ENVERGE® | PROFILL® OPEN CELL SYSTEM

BEHIND ROUGHED-IN DRYWALL

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.

REQUIRED EQUIPMENT & ACESSORIES

Same Proportioner, Hoses and Gun as used for Gaco's Open Cell and Closed Cell Foam.

Pour Nozzle/Air-Cap Kit Assembly for Gun – recommended models include the following: Graco Fusion Air-Purge (AP) Pour Adapter Kit, Part # 248528. This kit includes an Air Cap, 2 Teflon Rings (1 for flat mixing chamber and 1 for round mixing chamber), and 2 feet of hose. Pour kits are also available for the P2, Probler and PMC guns.
Tips and Kits are available from your regular parts supplier.

Plastic Tubing – recommended hole size is ¾" to 1" in diameter (or larger).

Drill and Bits – 3/8" or 1/2" Drive Drills with 3/8" and 7/16" masonry bits are recommended for drilling holes for block fill applications; Use 3/8" to 1/2" wooden dowels to plug holes after filling. Drills, Bits and Dowels are available at your local hardware store.

Block Mortar Mix – Check with the masonry contractor on site for a block mortar mix and recommended tools for spot patching of holes made in the block and mortar joints. The masonry contractor can help you with your selection of materials and tools to make patching the holes fast and easy.

InfraRed Thermal Imaging Camera, i.e. FLIR
A thermal imaging camera is required to check the reliability and consistency of installation and to provide traceability and documented proof of the installation.

Enverge ProFill can reach temperatures up to 180°F (82°C) in a wall cavity during the installation and curing process.

PROPER PPE

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. 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

Please visit www.spraypolyurethane.org for additional information.

GENERAL PROCEDURES

INSTALLATION OF DRYWALL - COORDINATION WITH DRYWALL CONTRACTOR

The spray foam applicator and drywall contractor should both fully understand they are working together to accomplish a quality installation of both the drywall and the insulation. Scheduling is of prime importance. Close attention should be paid to the amount of time required to get a full cure on the drywall adhesive if one is used.

- Before hanging drywall that is going to be insulated with Enverge ProFill, a visual inspection should be made noting the location of any fire-blocking, electrical, plumbing or other obstructions in the wall. Mistakes can be avoided by locating these areas before the wall is injected. Location of fill holes may need to be adjusted to properly fill the wall cavity. This can be documented using a camera to define these locations.
- Any gaps, holes or openings in any part of the wall cavities that may allow foam to enter should be taped, caulked or sealed before any drywall is installed. Enverge ProFill foam will follow the path of least resistance and go through any opening.
- Drywall should be installed using recommended installation procedures that a drywall contractor typically uses for a reliable installation. Using the appropriate screws and fasteners with the correct spacing is vitally important. Drywall installations should always be screwed and never nailed when using Enverge ProFill foam. Glues and adhesives should be applied appr

DRILLING FILL HOLES

Locating and drilling holes is required before the foam can be injected into the wall cavities. The amount of fill holes and their location should be as consistent as possible so the applicator can get into a fill rhythm, timing his fill sequences and determining what amount of foam is required for filling each wall cavity.

Fill hole location should be on drywall seams whenever possible as these are easy to tape over and repair. Some prefer locating the fill hole in the center of a cavity and others prefer working the foam from an edge or corner hole.

On an 8-foot wall, we recommend placing one hole at 4-foot high level on drywall seam and one hole near top section of drywall near double upper plate.

Holes should be ¾” to 1” in diameter (or larger) to allow free movement of the gun and fill tubing as well as to allow space for foam pressure release in case of overfilling. More holes can be added as necessary.

NOTE: More fill holes may be required if obstructions present themselves in the wall. Keeping the number of fill holes to a minimum typically makes for fewer repairs, however not enough fill holes may increase the amount of repairs if fill hole placement is not considered when working around obstacles like firestops and fire blocking in the wall cavity.

GENERAL PROCEDURES (CONT.)

INSTALLATION OF ENVERGE PROFILL POLYURETHANE FOAM

Trial and error fills will help the applicator get a feel for wall thickness, substrate temperature and ambient temperature to help develop a timing sequence that fills the wall quickly and efficiently without applying too much pressure to the drywall.

It is important to know your equipment, nozzle sizes, temperatures and pressure settings and from there, getting to know the fill rates and just having a general feel for processing the chemical and performing the application will improve over time with experience.

Before filling any wall cavities, the foam should be sprayed out into a trash bag to check the cream time of the product. Cream time is the time it takes before the product actually begins to rise and expand to its final thickness.

- Spray 30 to 60 seconds' worth of foam into a trash bag to ensure that you are getting warm material to the gun before testing for cream time.
- Then, spray a 3 second blast of foam into the trash bag – the foam should start reacting and expanding just after you stop spraying.
- If the foam reacts prior to the end of the 3 second spray, it is reacting too fast and the temperatures should be reduced.
- If the foam is taking more than a second to react after the 3 second spray, then the temperature must be increased due to cold foam or cold substrate.
- Proper set up of Enverge ProFill cream time is required to obtain the best yields. A starting point for Enverge ProFill would be 105°F in summer cavities and 130°F in winter cavities. Checking the cream time will help you make these adjustments to the machine's A, B and hose heat settings.

NOW YOU ARE READY TO BEGIN INSTALLING THE FOAM

When spraying 2x4 wall cavities, you should be injecting using an AR4242 (01) Mixing Chamber and pressures between 1,000 and 1,200 psi to obtain a good mix at the bottom of the wall cavity. Make sure that the length of your tubing (4" to 6") allows you to be able to direct the injected foam towards the bottom of the stud cavity.

When spraying 2x6 wall cavities, you should be injecting using an AR5252 (02) Mixing Chamber and pressures between 1,100 and 1,400 psi to obtain a good mix at the bottom of the wall cavity. Make sure that the length of your tubing allows you to be able to direct the injected foam towards the bottom of the cavity.

GENERAL PROCEDURES (CONT.)

INSTALLATION OF ENVERGE PROFILL POLYURETHANE FOAM (CONT.)

- The rate of rise in these cavities is usually 1 foot of rise for every second of trigger pull in a 16" stud cavity.
- The object is to start applying the foam in 3 to 4 second trigger time cycles starting at the bottom of the cavity.
- It is wise to skip a cavity after injecting a cavity. This allows for a minimum amount of stress to be placed on the stud cavity adjacent to the one being injected.
- After the initial fill inside of the stud cavity, all subsequent fills will be on top of each preceding fill.
- It should take 2-3 trigger cycles to bring the foam up to the first fill hole. Repeat the process until all cavities are filled to the first fill hole level.

The fill process now moves up to the second hole that is located near the top of the double upper plate. Follow the same fill sequence as the lower 4 feet of wall, skipping a cavity in the fill process until all cavities are completely filled.

Extreme care must be taken when finishing the last fill shot in each cavity so as not to overfill. It is best to use short 1 to 2 second bursts to minimize cavity overfill.

NOTE: The applicator should make sure that the fill holes are clean enough for repair by the drywall contractor. Again, checking with the drywall contractor on this will save additional time and labor later.

GENERAL PROCEDURES (CONT.)

THERMAL IMAGING

Thermal imaging cameras are required as part of this application:

• They help the spray foam contractor ensure that the entire cavity is being filled.

• They provide a photographic record of the job proving that every cavity is filled. This will be a requirement for Building Code Officials since there will be no insulation inspection. This is currently going through the approval process with code officials in all code jurisdictions but should not be difficult to get approved once the process is accepted by architects and building designers.

A documented folder of the thermal imaging of all walls, floors and ceilings should be completed when using Enverge ProFill behind drywall as it provides a permanent record for each project.

Thermal imaging should be done immediately after the completion of each wall as the foam exotherms heat showing the contrast that can be documented. Polyurethane foam is a warm-applied product allowing you to use thermal imaging as an inspection tool. Cold-applied aminoplast foams cannot be checked immediately as they are cold-applied products and can only be inspected using thermal imaging when there is a temperature differential of 20 degrees or more from ambient temperature.

CLEANING AND PATCHING FILL HOLES

Once the filling has been completed and the fill holes are cleaned of any excess foam, the repairs can be made on the fill holes and the taping and mudding of the wall can now be completed. Any electrical switch, junction or receptacle boxes should be checked to make sure they are free of any residual foam that may have made their way into these areas. Check the interior and exterior of the structure for any Enverge ProFill that may have seeped out of any holes or gaps in the wall system.