

GacoProFill®

Retrofit Installation Guide

EQUIPMENT AND ACCESSORIES

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 Tools for Prep/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 sheathing off if you need to remove old insulation.

Circular Saw if you need to cut sheathing 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 and 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.

Ensure jobsite is unoccupied.

Homeowners and other persons and pets must vacate the property prior to installation, and should not return for 24 hours after completion.

Create a Protected Work Zone. Install warning signs and isolation tape.



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 GacoProFill 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

WARNING:

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 (Continued)

Jobsite Prep

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.



Protect 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.



GENERAL PROCEDURES (Continued)

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 additional 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.

The substrate should be clean, dry and warm. While clean, dry, empty cavities give us the best success for a proper fill, warmer substrates give us better yields. The colder the substrate the lower the yields we can expect. Do not spray if surface temperatures are within 5 degrees of the dew point. Substrate moisture levels should be below 18%.

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.

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.

APPLICATION PROCEDURES

Drum Storage

Store GacoProFill Poly drums at 50°F to 100°F (10°C to 38°C) when not in use.

Drum Prep

Prep GacoProFill Poly drums to 60°F to 80°F (16°C to 27°C). In order for the drum to be ready to use, it must be in a temperature range where the proportioner can take it the rest of the way to spray temperature. *Example: If your drum temperature is 80°F and you have an E-20 with a delta T of 50°F, your maximum spray temperature can only be 130°F. With this information it is important to know the delta T of your proportioner and drum temperature to achieve the proper spray temperature. For those of you with Recirc capabilities, you can recirculate GacoProFill Poly to raise the drum temperature, but do not recirculate the product over 100°F.*

Mixing

GacoProFill Poly must be mixed on high speed to achieve a milky solution prior to application or recirculation. It must be continuously mixed during application. If GacoProFill Poly is in the line from the previous spray day, it must be recirculated into the drum and mixed before spraying can take place.

Flushing

When changing from a closed cell product to GacoProFill, pre-mix the GacoProFill Poly drum prior to flushing. Purge the Poly side of the system with water to get the closed cell product out of the system, then come in behind with pre-mixed GacoProFill Poly to flush out the water. Remember to flush the entire Poly system including recirc lines, proportioner and spray hose. Use water again to flush the GacoProFill Poly out of the system before you go back to the closed cell product. Follow steps 1-5 on Tech Tip 028, *Eliminate Cross Contamination by Flushing with Water.* For a more detailed step by step flushing procedure refer to Tech Tip 045, *12 Proper Flushing Techniques.* Tech Tips can be found on gaco.com.

Substrate Limitations

Substrates should be clean, dry and warm. While clean and dry offers the best success for adhesion, warmer substrates provide better yields. The colder the substrate the lower the yields we can expect. Do not spray if surface temperatures are within 5 degrees of the dew point. Substrate moisture levels should be below 18%. Use Psychrometer for exact measurement of temperature, humidity and dew point.

Spray Pressures

1,000 to 1,200 psi for optimal performance.

At 70°F (21°C) ambient temperature:

- **Recommended starting pressure setting is 1,000 psi using an AR-4242 (01) mixing chamber.**
- **Recommended starting pressure setting is 1,200 psi using an AR-5252 (02) mixing chamber**

Spray Temperatures

110°F to 135°F (43°C to 57°C). The lower temperature spectrums are used in warmer climates/seasons and the higher temperature spectrums are used in colder climates/seasons. If the foam is reacting too fast, then it is too warm and temperatures need to be dialed down and possibly the pressure reduced if needed. If the foam is reacting too slowly, then you need to increase temperatures and possibly pressures.

At 70°F (21°C) ambient temperature:

- **Recommended starting temperature setting for A, B & Hose Heat is 120°F (48°C).**

<u>Equipment Settings</u>		<u>Reactivity Time</u>	
Pre-Heaters - Iso (A):	110°F to 135°F (43°C - 57°C)	Cream Time:	2 - 3 seconds
Pre-Heaters - Poly (B):	110°F to 135°F (43°C - 57°C)	Tack Free Time:	6 - 10 seconds
Hose Heat:	110°F to 135°F (43°C - 57°C)	Cure Time:	4 hours
Recommended Spray Pressure:	1,000 to 1,200 psi (dynamic)		