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with Flexible Seal Technology

Whole Home Insulation and Air Sealing System



Air Infiltration Barrier

with Flexible Seal Technology

Installation Guide

NOW INCLUDES
INSTRUCTIONS FOR
ALL WEATHER
FORMULA.



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INTRODUCTION

The EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology is a two-part, non-allergenic, high performance latex-based foam used to seal cracks and penetrations through a building envelope and from floor to floor in a house or building. These two components are to be used in the EnergyComplete™ sprayer by Graco, the sprayer that has been specifically designed for this foam sealant.

EnergyComplete™ Air Infiltration Barrier comes in 4-gallon pails. The liquids are pumped from the pails into the proportioner and then into the spray gun, where the two liquids mix and start to react.

After the PINK (red + white) foam leaves the gun and hits the target, it begins to rise. After about 20 minutes (depending on temperature and relative humidity), the foam is tack free and insulation can be installed.

The EnergyComplete™ Air Infiltration Barrier is safe to install and does not require a chemical mask or fresh air ventilation suit, and other trades can work in the house while the air infiltration barrier is being applied. Insulators can install fiberglass in the walls shortly after the foam is applied.

When applied correctly, EnergyComplete™ Air Infiltration Barrier has been shown to reduce air leakage into the house dramatically. Reduced air leakage can deliver up to one-third reduction in the energy to heat and cool a home throughout the year.



EVALUATING THE HOME

For an easy application, before starting the EnergyComplete™ Air Infiltration Barrier installation, inspect the job site to help the project go smoothly. There are several key things to consider when inspecting the site prior to installing the air infiltration barrier:

Access

It is important to evaluate access at the site before starting an installation:

- How accessible is the home for your truck? What accommodations may need to be made to allow easy access?
- Will you need to move materials a long distance by hand?
- Is it a multi-floor building? If you are working in a multi-floor building, make sure you have access to all floors.
- When are the basement and garage floors being poured? You will need access to these areas. You will also need full access to interior and exterior walls.

Fresh-air Makeup System

Owens Corning strongly recommends the use of mechanical ventilation with the EnergyComplete™ Air Infiltration Barrier because it tightens the building envelope. These mechanical ventilation systems are installed with the HVAC system. They are also frequently referred to as ERVs and HRVs (Energy or Heat Recovery Ventilator).

Power

You will need a convenient power source. Most homes under construction will have 110 VAC power either already installed or at a temporary utility pole. If power is not available, you will need a generator with a minimum of 5,000 watts running power and AVR (automatic voltage regulation). You will need power for the pump, compressor and potentially the heaters, which should be three separate, dedicated circuits rated at a minimum of 15 amps each. Make sure you have multiple extension cords to connect all of the equipment.

Material Estimation

It is not enough to know the overall size of the home. To get an accurate estimate of the materials you'll need, you can use one of the following methods:

| Approximate Yield of EnergyComplete™ Air Infiltration Barrier | |
|---|--|
| Take-Off Method | Yield per Set |
| Linear Footage This is the approximate length of joints/cracks that can be sealed per set. This is NOT the length of wall that can be sealed. Use the take-off sheet to calculate the approximate length of joints/cracks that you may have. | 2,900 linear feet of joints/cracks that can be sealed per set |

(1) One set of material is four pails of Part A and one pail of Part B.

(2) The above yields are based on the 121 spray tip and spray pressure between 1000-1200 psi. Different tips, pressures and installer experience can affect the coverage.

EVALUATING THE HOME



PREPARING FOR THE JOB

PREPARING FOR THE JOB

Temperature Requirements

Refer to the table below for temperature requirements regarding material storage, application, and post-application.

| | |
|-------------------------|---|
| MATERIAL STORAGE | Store away from extreme heat or cold. When planning to install in cold conditions, store the material overnight in a warm place, such as a heated warehouse or an office space, where the temperature would be 60°F or higher; then place the materials inside the bucket insulators before proceeding to the job site. |
| SPRAYER STORAGE | For periods of less than three days and when stored at temperatures above freezing, store the equipment with water in the A side and cleaner in the B side. For longer storage or when freezing is possible, store the equipment with Graco's hydraulic fluid for lubrication and corrosion/freezing prevention. |
| APPLICATION | The interior air temperature of the house needs to be at 20°F or above. When the interior air temperature is below 60°F, use the heater on the spraying equipment (see the Cold Weather Operation section). |
| POST APPLICATION | It is required that the air temperature where foam has been sprayed remain above 20°F for a minimum of one hour. This one hour window enables the foam to become resilient and allows for the installation of the insulation afterward. |



PREPARING FOR THE JOB

Checking the Equipment

Always check to make sure you have all the equipment you will need for the job. Missing items can cause expensive delays and prevent the job from being completed in a timely manner. Make sure you have the following items in working order:

All equipment should be carefully checked before leaving for the job:

- a. EnergyComplete™ Sprayer: Plug in the sprayer and turn it on to make sure it is in proper working condition.
- b. Extension cords: Inspect all cords for damage, and replace any that are worn or damaged. Plug in all cords and make sure they work.
- c. Compressor: Plug in the compressor and make sure it works.
- d. Ladders or Scaffolding: Make sure the ladder is the correct size for the job and is in good condition. Check for cracks or other damage and never use any damaged or unsafe ladders.

Equipment Checklist

- EnergyComplete™ Sprayer
- Part A and Part B materials to complete the job
- Cleaner for Part B
- Water for cleaning Part A
- Spare gun parts
- Gun cleaning kit
- Air Compressor (if not attached to machine)
- Extension cords, three (12 ga., 100 ft.)
- Broom
- Rags
- Goggles or face shield
- Chemical-protective gloves
- Hard-toed shoes
- Hard hat, if required
- Cardboard
- Plastic sheeting for any necessary masking of surfaces
- Adjustable wrenches (1½" minimum throat)
- Generator, if no power source
- Ladder (appropriate for the job) or scaffolding
- Drill
- Drill mixer
- Waste pails



PREPARING FOR THE JOB

Loading the Truck

Always securely load the air infiltration barrier equipment and chemicals last so that they can be taken off of the truck first.

Establish Scheduling

The house should be sealed after the plumbing, HVAC and electrical have been installed. The sealing professional should lead the insulator by at least 20 minutes (depending on the temperature and relative humidity) because the sealant must be tack free before installing the insulation.

Contact the Drywall Installers

It is always a good idea to contact the company installing the drywall to let them know that you are using EnergyComplete™ Air Infiltration Barrier and when you will be doing the application. This is especially important if you are spraying on stud faces. Let the drywall company know that you need full access to the exterior and interior walls and that this foam is very compressible and should NOT be removed from the face of framing members.

Safety

The EnergyComplete™ Air Infiltration Barrier does not require you to wear a chemical mask, and it is not necessary for other trades to leave the area during the Air Infiltration Barrier with Flexible Seal Technology application. When installing the air infiltration barrier, you will need to use chemical gloves, goggles or a face shield, a long sleeved shirt, and, if the installation site is dusty, a dust mask.



ARRIVING AT THE JOB

Temperature

Refer to the temperature section under “Preparing for the Job”

Cautionary Warnings (Right to Know)

1. Post the Material Safety Data Sheet for Part A, Part B and the cleaner in a prominent location before starting the job.
2. Let the site supervisor know that you are starting the application, and stress that EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology does NOT contain isocyanate to eliminate any concerns about isocyanate exposures.

Placing the equipment

Use the measurements taken in the site evaluation to determine the best location to place the equipment. Make sure that the spray hose (100') is able to reach all the areas to be treated. If needed, the machine can be moved or the hose can be extended to 150'. You may need to increase the pressure on the machine when using 150' of hose. **DO NOT EXTEND THE HOSE BEYOND 150'** This may cause damage to the sprayer.

PREPARING THE HOUSE AND EQUIPMENT ONSITE

It is important to make sure the areas to be sprayed are clean and nearby areas are protected during the application of EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology. Make sure to:

1. Cover all windows and doors with plastic sheeting.
2. Cover all bath tubs, toilets and sinks with plastic sheeting.
3. Fill medium-sized gaps (between 3/8" and 3") with fiberglass, which you will later spray over; and large gaps (greater than 3") with rigid, nonporous sheathing, which you will later spray around the perimeter. **AREAS TO LOOK FOR THAT MUST BE FILLED/BLOCKED INCLUDE:** Wall behind a fireplace, joist bays that connect the exterior to the conditioned space (e.g. garage, porch, or overhang), attic knee-walls, utility chases, and dropped soffits.
4. Place plastic sheeting under all equipment to help keep the area as clean as possible.
5. Decorative concrete floors or any final floor finish should be covered with plastic or resin paper.

Preparing the Equipment

Before you start, make sure everyone working on the installation is wearing proper personal protective equipment (PPE). This includes:

- All PPE required at the job site
- Chemical-protective gloves (to be worn when mixing and spraying the sealant)
- Protective eyewear: goggles or face shield (to be worn when mixing or spraying materials)
- A long sleeved shirt
- A dust mask, if the installation site is dusty

Setup of Equipment and Materials

Placing the equipment: During this set-up stage, to keep the inside areas of the residence as clean as possible, spraying equipment and waste pails should be placed on a conveniently-located, flat surface away from areas to be sprayed. The garage can be a good staging area. Make certain the area is free of excessive dust.

1. Lay down a protective plastic sheet or other drop cloth.
2. Place spray machine on top of protective sheet.
3. Connect the compressor, pump (and heaters if needed) to an electrical source.
4. Place Part A and Part B materials next to the equipment.

ARRIVING AT THE JOB

PREPARING THE HOUSE AND EQUIPMENT ONSITE

PREPARING THE HOUSE AND EQUIPMENT ONSITE



Preparing the Materials

1. Using a powered agitator with a blade that forces good circulation, mix Part B (red) until the material consistency is uniform throughout. Special attention should be paid to potentially settled material in the bottom of this pail. **Be sure to wear chemical-protective gloves and eye protection during this step. Do NOT allow water to come in contact with Part B. This will ruin the Part B material.**
2. Stir Part A (white) using a stick that has NOT been in contact with Part B. **Be sure to wear chemical-protective gloves and eye protection during this step. Should a skin form on the surface of the Part A material during use, remove the skin with a stir stick. Do NOT attempt to mix it into the liquid, as this may clog the inlet screen on the dip tube.**

Loading the Materials Under the Dip Tubes

1. Position Part A and Part B materials in front of the EnergyComplete™ sprayer per the labels on the spray machine. These are color coded to match the materials.
2. Detach the recirculation tubes from the dip tubes and place them in a waste pail.
3. Place the dip tubes into the pails by tilting the spray machine back.
4. Place pail covers over Part A and Part B (you will make these yourself by cutting a notch in the pail lid).

Setting the EnergyComplete™ Sprayer to Spray

1. Set the Part A and B valves at the pump to “Recirculation” mode.
2. Turn the pump on with the amber switch. Make sure the pump control function knob is in the “Stop” or “Park” position. (*all the way to the left*)
3. Turn the pump control function knob to the “Minus” position for slow recirculation. Run until consistent Part A and Part B materials are both coming out of the recirculation tubes into the waste pail. Consistent flow means continuous flow without voids or bubbles in the recirculation tubes.
4. When both Part A and Part B have been primed, turn the pump function control knob back to the “Stop” or “Park” position.
5. When each side is primed, place that recirculation line back into its proper pail.
6. Turn the Part A and B valves at the pump to the spray mode.
7. Disconnect the manifold from the gun.
8. Hold the manifold over the waste bucket. Open the valves and purge the lines (in recirculation mode) of cleaning fluid through the manifold until Parts A and B come out.
9. Close the manifold valves and reattach the manifold to the gun.
10. Increase the pump control function knob until the fluid pressure of at least one gauge reads 1,200 psi.
11. If Part A and Part B are not balanced (pressures within 200 psi of each other), reduce the pressure of the higher component by slightly turning the valve for that component toward recirculation until gauges show balanced pressures.
12. Adjust the function control knob to get 1,000-1,200 psi on both gauges.
13. Turn on the air compressor.
14. Open the air valve at the gun.
15. Select the tip you will use in the house and insert it into the gun.
16. Open both gun fluid manifold valves with the 5/16 inch nut driver.
17. Disengage the safety lock on the back of the gun.
18. Purge the gun of cleaning fluid by spraying the fluid through the gun into a waste pail or on to a piece of cardboard.

PREPARING THE HOUSE AND EQUIPMENT ONSITE

19. Spray into the waste pail until foam appears. If the spray pattern is not as expected, tip may be clogged. Rotate the spray tip a half turn a few times until proper spray pattern appears.
20. Test spray the material onto cardboard or plastic sheet. Continue until proper pink color and foaming appears and verify the pattern is consistent with the chosen spray tip and is uniform. Pressure at the function control valve may be adjusted to get a good spray pattern.
21. Any time the gun is not being used, the safety lock must be engaged and then manifold valves must be closed.
22. It might be necessary to operate heaters and increase the pressure in colder weather to get a good consistent spray pattern. (See Temperature Requirements)

Cold Weather Operation

See the Temperature Requirements section on page 6 for general information.

In addition, complete the following specific steps:

1. Upon arrival at the job site, setup the equipment immediately
 - a. Tilt back machine and place A & B buckets under machine dip tubes
 - b. Prop up the front of the machine approximately 1" (to account for bucket insulator bottom thickness) using a piece of wood block.
 - c. Attach hoses to recirculation manifold
 - d. Set heaters at maximum (setting #8)
 - e. Recirculate through hoses until all hydraulic fluid has been removed from machine
 - f. Recirculate through the machine until both the temperature at the machine reads above 70°F (but does not exceed 100°F) and pressure differential between A & B gauges is 200 psi or less
 - g. Connect gun with gun insulator and proceed to spray test
2. Begin to test spray
 - a. Select between 121 and 225 spray tip
 - b. Set machine spray pressures to 1200 psi
 - c. Perform a spray test and verify
 - i. Machine temperature gauges read 70°F or above, but does not exceed 100°F
 - ii. Pressure differential is 200 psi or less
 - iii. Spray pattern is approximately 2" wide when spraying approximately 12" away from substrate
 - iv. No visible "candy-stripping" (red and white in the spray rather than pink)
3. While spraying at or near 20°F:
 - a. There is no added procedure for pauses shorter than 15 minutes
 - b. If pausing for longer than 15 minutes, remove gun and place it in a warmer area, such as your truck. Recirculate through the hoses for 15 minutes or until both the temperature at the machine reads above 70°F (but does not exceed 100°F) and the pressure differential between A & B gauges is 200 psi or less.



APPLYING ENERGYCOMPLETE™ AIR INFILTRATION BARRIER WITH FLEXIBLE SEAL TECHNOLOGY

- c. Refill the A side bucket when bucket is ¼-½ full. This would prevent the excess “skin” that forms on top from getting into the pump and clogging the equipment.
4. After spraying follow the Machine Storage & Flushing Recommendation on page 17.

Note that it is important that the temperature at the machine does not exceed 100°F while spraying at or near a 20°F environment, because the foam could crack under these conditions.

Preparing to Spray

1. Place the hose and gun in a location where you can reach all of the areas to be sprayed.
2. Bring in a waste pail and place it in the spray area.
3. Make sure all windows and doors in spray area are protected.
4. Check to be sure both gun fluid manifold valves are open.
5. Disengage the safety lock.

APPLYING ENERGYCOMPLETE™ AIR INFILTRATION BARRIER WITH FLEXIBLE SEAL TECHNOLOGY

Spraying

- Do not install the air infiltration barrier within 3” of a heat source. An exception is a recessed light fixture. EnergyComplete™ Air Infiltration Barrier can be used to seal the juncture between the recessed light fixture and the drywall. This seal can be accomplished either pre-drywall or post-drywall. Under no circumstances should the EnergyComplete™ Air Infiltration Barrier be used to seal any openings on the recessed light housing. Any/all manufacturer’s provisions and code requirements are to be followed when using EnergyComplete™ Air Infiltration Barrier around recessed lights. For more information see the Owens Corning Bulletin, *The Use of EnergyComplete™ Air Infiltration Barrier with Recessed Lighting*.
- Before climbing ladders or handing the gun to someone else, engage safety lock.
- To begin spraying, disengage the safety lock, press the trigger on the gun all the way and spray per sealing guidelines. Pulling the trigger all the way is important to prevent clogging the gun.
- Close the fluid control valves at the gun manifold when not planning to use the gun for more than 5 minutes.
- For optimal results, the spray gun should be approximately 12 inches from the surface being sealed.
- The fan spray should be oriented in line with a crack/joint so that a bead is formed. If the foam is applied as a thin film, which is not the intended application, you may see voids in the foam.
- It is important to be aware that local codes may require a fire stop material to fill through-floor holes. The EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology DOES meet this requirement. Please see ICC Evaluation Services Report number 3110 for more information.

In order to achieve the best building envelope sealing, the following areas should be treated:

BASEMENT Figures 1 and 2

1. Seal band joist along the floor joist as in Figure 1.
2. Treat any penetrations through the band joist to the outside. The sill plate can also be treated at the same time.
3. The interface between the foundation and the sill plate should be sprayed.
4. Seal the band joist that is parallel to the floor joist as in Figure 2.

FIGURE 1



FIGURE 2



FIGURE 3

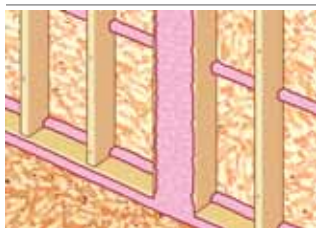
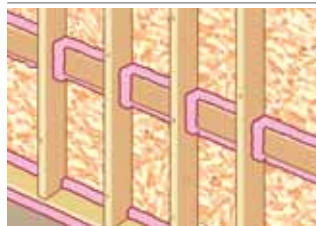


FIGURE 4



WALL CAVITIES

Figure 3

1. The exterior wall cavities should be sprayed at the intersection of the outside sheathing and the stud framing at the top and bottom plates. Spray only what is necessary to seal the intersection.
2. Treat the intersection of the bottom plate and the sub-floor (or concrete pad) on exterior walls.
3. Spray any horizontal joints between exterior sheathing sheets. If the gap is greater than 3/8 inch, stuff the gap with fiberglass insulation before spraying or tape it from the outside, then spray.
4. Spray any vertical intersection of the outside sheathing and the stud framing where a vertical sheathing joint is known to exist (e.g., adjacent to windows & doors).
5. Multiple studs commonly have gaps between the studs and should be treated. The fan spray should be oriented in line with a crack/joint so that a small bead is formed.

Figure 4

The joints between sheathing will sometimes have horizontal blocks installed. These must be treated on both the top and the bottom, as indicated in Figure 4.

Figure 5

1. Top plates are treated as shown in Figure 5.
2. The fan spray should be oriented in line with the joint between top plates so that a bead is formed that is roughly 1/4 inch thick. This bead will act as a gasket when the drywall is installed.
3. It is best to spray the top plate in a room all at once to prevent irregularities.
Treat all top plates on exterior walls and the top plates of interior walls of the top floor.
4. Treat all exterior wall corners.

Figure 6

If electrical boxes have a large gap between the back surface and the outside sheathing, stuff the gap with fiberglass insulation before spraying, and then treat the area with foam to form an air seal.

Figure 7

If the gap is small, just use the foam. The goal is to insulate behind the box and prevent air passage through the box.

Figure 8

Interior and exterior walls will generally have many penetrations through them. In Figure 8, a PVC pipe is shown going through the bottom plate. If the gap around this pipe is greater than 3/8 inch, stuff the gap with fiberglass insulation before spraying, and then treat the area with foam to form an air seal. If the gap is less than 3/8 inch, just spray the perimeter of the pipe.

Figure 9

Air ducting penetrations are frequently found with large gaps around the ducting. If the gap around this duct is greater than 3/8 inch, stuff the gap with fiberglass insulation before spraying, and then treat the area with foam to form an air seal.

Figure 10

Wire penetrations that pass through the bottom plate or top plates must be filled with foam. It is important to be aware that local codes may require a fire stop material to fill these holes. The EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology DOES meet this requirement. Please see ICC Evaluation Services Report number 3110 for more information.

FIGURE 5

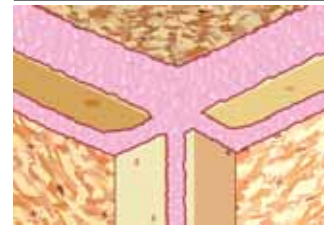


FIGURE 6



FIGURE 7



FIGURE 8



FIGURE 9

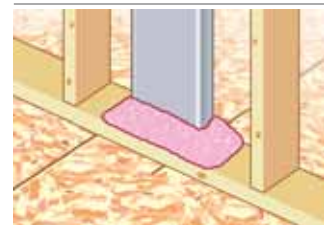


FIGURE 10



FIGURE 11

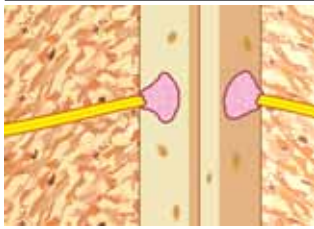


Figure 11

In general, penetrations through vertical studs do not have to be filled. However, if these penetrations are found in corners, they do need to be filled. Again some local codes may require all horizontal holes be filled.

FIGURE 12



Figure 12

A stud cavity will frequently be used as a return duct for the HVAC system. This type of configuration should be treated as shown in Figure 12. In addition, any studs that will contact the drywall to complete the conduit should be foamed on the face to create a seal.

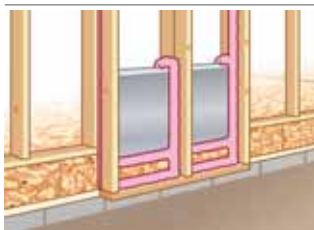
Figure 13

As in Figure 12, Figure 13 shows a “bump out” into a garage. The garage may contain bump outs for ducting or other features. The interior of a bump out should be considered as conditioned space, and it should be sealed.

Figure 14

Walkout basements or half-masonry walls can contain occasional unique double framing. Always seal the areas of the frame structure that are in contact with the outside sheathing. As with a normal wall, treat the top and sill plates and the intersection of the outside sheathing and the stud framing at the top and bottom plates.

FIGURE 13



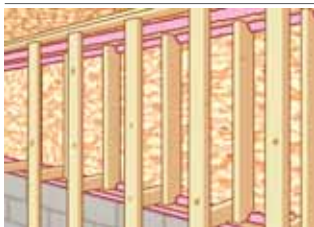
WINDOWS AND DOORS

Figures 15 and 16

Windows and doors present many air leakage opportunities. Therefore:

1. All multiple studs should be sprayed in the joint.
2. Headers are sometimes composites of multiple beams. Any gaps or interfaces between these beams should be sealed.
3. Gaps above and below a window should be treated in the same way as standard cavities. If the gap is less than $\frac{1}{8}$ inch, use high performance caulk to fill the gap. Larger gaps should be sprayed with foam using the special window and door nozzle for these areas.
4. The vertical seam in the cavity adjacent to window or door should be sealed.

FIGURE 14



Additional Areas to Seal

In addition to the areas you will seal with The EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology, you should also consider installing an air-tight gasket around the flange of recessed lights and ceiling-mounted HVAC duct boots.

FIGURE 15



CLEANING UP

Shutdown/Cleaning Procedure for the Part A and Part B materials

1. Begin by turning the pump's function control knob to the stop or park position.
2. Using a 5/16 inch nut driver, engage the safety lock before closing the gun manifold valves.
3. Rotate the pump valves to the “recirculate” position and place a waste bucket near the front of the machine.
4. Over your waste bucket briefly trigger the gun to depressurize the lines. Then engage the safety lock.
5. Turn off the air compressor.
6. Detach the gun from the manifold and from the air hose. The gun itself can be more easily cleaned when you return to your shop.
7. Take the lids off both material containers. Remove the recirculation tubes from the dip tubes and lower them into the waste container. It may be helpful to use a lid with a small opening to hold the tubes in place.

FIGURE 16



CLEANING UP

8. You will have different cleaning solutions for each side. Side A uses plain water, while side B uses a special cleaner. Position the containers near the front of the machine.
9. Tip the machine back so the fill tubes clear the material containers and roll the machine back. Remove the remaining material and place the cleaning solution containers in their place. Tightly cover any remaining material to protect it. Tip the machine back again and lower tubes into the solutions.
10. Turn the control valve to + or – . Continue to run until the fluid flowing into the waste container is essentially all cleaning solution.
11. When only cleaning fluid is coming from a tube stop the pump temporarily and place it back in the cleaning solution buckets. Then turn it back on till the second tube has been cleared and repeat the process.
12. Place the waste bucket back in front of the machine and open the manifold.
13. With the pump off turn the pump valves to spray.
14. Open the gun manifold valves over an open waste container and place the machine in the “plus” mode. The A side material will complete first. When the A side is flowing freely with cleaning material, turn the knob back to Stop or Park. Close the A side manifold valve on the gun holder and then put the recirculation hose back in the holder on the A pump or in the A Cleaning Material (water) bucket. Turn the A side valve to recirculation mode and then turn the machine back on to “minus” position and wait until the B side is flowing freely with cleaning solvent. Turn the pump control knob back to Stop or Park Position. Close the B side manifold valve on the gun holder and then put the recirculation hose back in the holder on the B pump or in the B Cleaning Material (solvent) bucket. Turn the B side valve to recirculation mode.
15. After the lines have been cleared close the manifold.
16. Turn the control valves to recirculate, which closes the pumps and then turn the machine off.
17. Now once again tip the machine back and roll it away from the cleaning solutions. Cover the unused chemicals and properly dispose of the waste materials.
18. The final step is to remove the filters on the end of each fill tube and replace with the protective caps. Ensure fill tubes and screens are wiped down and cleaned thoroughly in preparation for the next job. Then you'll be ready to make a final inspection and return the machine to your vehicle.

Gun Cleanup Procedure

- De-pressurize the system and to remove the spray gun from the hoses.
- Begin the cleaning by brushing away any loose sealant from the RAC tip.
- Then detach the entire tip and guard assembly by unscrewing it from the gun.
- Remove the RAC tip. Inspect it and clean as needed using the tools provided in the cleaning kit.
- Using an adjustable wrench, unscrew the Static Mixer housing from the fluid head.
- Remove the plastic static mixer from the static mixer housing. You can either use the cleaning kit metal pick tool to free the mixer from the back, or open end, or you can use a flat head screwdriver to press the mixer out from the front to the back.
- Thoroughly clean the static mixer using a soft brush. However, you may find it is easier to simply replace the mixer with a new one.
- Remove the filter screens from both side A and side B check valves using a small flat screwdriver. Clean them as needed and then place the screens in a container of water to soak overnight. (Again, if there is too much buildup just replace the screens with new ones.)
- Now, to disassemble the rest of the gun, unscrew and remove the air-cap.

CLEANING UP

- Using an adjustable wrench remove the mix module nut.
- Temporarily re-attach an air hose to the gun and open the valve to the compressor.
- Trigger the gun multiple times to eject the mix module from housing.
- Place it in water to soak overnight.
- With the gun housing held over a bucket, flush out the fluid housing. (For a more through cleaning slide the fluid housing from the purge rod and soak the parts overnight.)
- Once the gun parts have been thoroughly soaked, remove the fluid housing and clean the ports with a small brush from the cleaning kit.
- Next you'll disassemble the check valves. Take off the filter screen, remove the set screw, then the small spring and ball. Each of these parts should then be well cleaned, rinsed and dried.
- Repeat the process for the second check valve.
- Now, in reserve order, reassemble the valves. Be certain the set screw lines up with the top of the check valve.
- Clean the mix module ports using the pick tool and the small drill bit from the cleaning kit.
- At this point you'll begin to re-assemble the gun in the reverse order. Be sure all parts are completely dry before putting them back in place.
- You will want to use the gun grease on the threads of the fluid housing to help prevent the sealant material from sticking. You should also grease the check valve "O" rings before re-inserting.

Preventative Maintenance

- Replace the gun mix module after spraying every 10 sets of Energy Complete.™
This will help balance the pressures at the gun and ensure proper mixing of the chemicals.
- Check pump wet-cups fluid before starting the job. Keep wet-cups saturated with Graco ISO pump oil or Graco Throat Seal Liquid (TSL).
- Applying a light coat of Fusion Gun Lubricant to gun's o-rings, seals and threads will make cleaning easier.

Machine Storage & Flushing Recommendation (For temperatures above freezing/32°F)

| Less than 3 days | More than 3 days |
|---|--|
| Flush pumps only. Store equipment with water in the A side and cleaner in the B side. | Flush entire system including pumps and hoses with water (A side) and cleaner (B side). Store pumps with Graco's hydraulic fluid for lubrication and corrosion prevention. |



Machine Storage & Flushing Recommendation (For temperatures below freezing/32°F)

CLEANING UP

Flush entire system including pumps and hoses with water (A side) and cleaner (B side). Store entire system including pumps and hoses with Graco's hydraulic fluid for anti-freezing, lubrication and corrosion prevention.

Hydraulic oil can be reused.

B-side: As in the case of the cleaner, place oil/B-side mixture in container and allow any solid particles to settle; then, reuse the oil.

A-side: It is normal to have some A fluid present in the oil (dispersed); however, as long as the mixture is predominantly oil (mixture still looks amber), it would be okay to reuse the oil.

Amount of hydraulic oil required:

- The A side hose volume (100' hose + 6' whip hose) uses 0.6 gallons approximately.
- The B side hose volume (100' hose + 6' whip) use about 0.15 gallons approximately.

Waste Disposal

Part A

Disposal Information. EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology Part A can be disposed of as a non-hazardous waste in accordance with Local, State, Federal or Provincial regulations. Prior to disposal, solidify any liquid wastes by exposing the material to air. When dried, Air Infiltration Barrier with Flexible Seal Technology Part A and container can be disposed with household refuse. Wrap empty containers in several layers of newspaper prior to disposal to minimize releases to the environment.

Part B

Disposal Information : EnergyComplete™ Air Infiltration Barrier with Flexible Seal Technology Part B can be disposed of as a non-hazardous waste in accordance with Local, State, Federal or Provincial regulations. Prior to disposal, solidify any liquid wastes. Using an absorbent material (sawdust, cat box filler, paper towels, rags) soak up the liquid material. Using gloves, sweep or dispose of the absorbed material into a plastic bag, and then dispose of with other household garbage. Use this same procedure with the empty container.



Cleaner

Disposal Information: Air Infiltration Barrier with Flexible Seal Technology Cleaner can be reused. Store the Air Infiltration Barrier with Flexible Seal Technology Cleaner in a covered jar and when the solid particles have settled, strain and reuse. Air Infiltration Barrier with Flexible Seal Technology Cleaner should be disposed of as a non-hazardous waste in accordance with Local, State, Federal or Provincial regulations. Dispose of Air Infiltration Barrier with Flexible Seal Technology Cleaner by using an absorbent material (sawdust, paper towels, and rags) to soak up the liquid material. Using gloves, sweep or dispose of the absorbed material into a plastic bag, and then dispose of with other household garbage. Use this same procedure with the empty container.

TROUBLESHOOTING

1. Follow Pressure Relief Procedure, page 10, before checking or repairing gun.
2. Check all possible problems and causes before disassembling gun.

NOTICE



To prevent cross-contamination of the gun's wetted parts, do not interchange A component (white) and B component (red) parts.



The following chart refers to Manual #313294 – EnergyComplete™ Spray Gun





| PROBLEM | CAUSE | SOLUTION |
|---|--|--|
| Gun does not fully actuate when triggered. | Piston safety lock engaged. | Disengage piston safety lock, page 7. |
| | Plugged muffler (51). | Clean, page 14. |
| | Damaged air valve o-rings (24). | Replace, page 15. |
| Fluid does not spray when gun is fully actuated. | Closed fluid valves (42b). | Open. |
| | Plugged impingement ports. | Clean, page 15. |
| | Plugged check valves (36). | Clean, page 22. |
| Gun actuates slowly or with delayed action. | Plugged muffler (51). | Clean, page 14. |
| | Damaged piston o-rings (45, 48). | Replace, page 23. |
| | Dirty air valve, or damaged o-rings (37d). | Clean air valve or replace o-rings, page 24. |
| | Mix module nut (54) too tight. | Loosen nut, then retighten, page 20. |
| | Loose lock ring (37b). | Tighten, use tool if necessary. |
| | Loose lock ring (11). | Tighten, use tool if necessary. Adjust Purge Rod, page 15. |
| Purge rod will not actuate. | No air pressure. | Connect air supply. |
| | Low air pressure. | Set air pressure above 80 psi (0.56 MPa, 5.6 bar). |
| | Buildup on purge rod (34). | Clean purge rod. |
| Pressure imbalance. | Plugged impingement ports. | Clean, page 15. Reinstall mix module, page 20. |
| | Plugged check valves (39). | Clean, page 22. |
| | Viscosities not equal. | Adjust temperature to compensate. |
| Fluid does not shut off when fluid valves are closed. | Damaged fluid valves (42b). | Replace. |
| Air leakage around fluid housing. | Damaged or missing o-ring (49). | Replace. |
| Air leakage from piston safety lock. | Damaged or missing o-rings (47). | Replace, page 23. |
| Burst of air from muffler when gun is triggered. | Normal. | No action required. |
| Steady air leakage from muffler. | Damaged air valve o-rings (37d). | Replace, page 24. |
| | Damaged piston o-rings (45, 48). | Replace, page 23. |
| Air leakage from front air valve. | Damaged air valve o-rings (37d). | Replace, page 24. |

| PROBLEM | CAUSE | SOLUTION |
|---|---|---|
| Component B (resin) leak from fluid housing. | Worn rear rod seal. | Adjust Rear Rod Seal, page 21. |
| Cross Contamination of A and B components. | Worn out mix module. Sealing surface OD not clean. | Replace. Clean sealing surface on fluid housing. |
| Air leakage from holes on solvent purge assembly. | Cleanoff air valve open. | Close cleanoff air valve tightly. Cleanoff air valve should never be open when using solvent purge gun. |
| Fluid leakage from holes on solvent purge assembly. | Mix module nut is only hand tight. | Tighten mix module nut 1/12 with wrench. |

The following chart refers to Manual #313221 – EnergyComplete™ Sprayer

| | | | |
|---|--|---|---|
| OC 4:1 proportioner does not operate. | No power. | Plug in power cord. | |
| | | Cycle Motor Power off , then on to reset breaker. |  |
| Motor does not operate. | Power turned on with function knob set to a run position. | Set function knob to Stop/ Park , then select desired function. |  |
| | Loose connection on control board. | Check connection at J11 (120 V). See page 42. | |
| | Worn brushes. | Check both sides. Replace brushes worn to less than 1/2 in. (13 mm), see page 50. | |
| | Broken or misaligned brush springs. | Realign or replace, page 50. | |
| | Brushes or springs binding in brush holder. | Clean brush holder and align brush leads for free movement. | |
| | Shorted armature. | Replace motor, page 47. | |
| | Check motor commutator for burn spots, black pitting, or other damage. | Remove motor. Have motor shop resurface commutator, or replace motor, page 47. | |
| | Failed control board. | Replace board. See page 42. | |
| Fan not working. | Loose fan cable. | Check that cable is connected at fan and at J9 on control board. See pages 50 and 42. | |
| | Defective fan. | Test and replace if necessary, page 50. | |
| Pump output low. | Plugged fluid inlet strainer. | Clear, see page 24. | |
| | Plugged disposable mixer. | Clean or replace. | |
| | Leaking or plugged piston valve or intake valve in displacement pump. | Check valves. See pump manual. | |
| One side doesn't come up to pressure in spray mode. | Dirty or damaged Recirc/Spray valve. | Clean or repair, page 36. | |
| | Plugged fluid inlet strainer. | Clear, see page 24. | |
| | Pump intake valve plugged or stuck open. | Clean pump intake valve. See page 37. | |

| PROBLEM | CAUSE | SOLUTION |
|---|---|---|
| Pressure is higher on one side when setting pressure with function knob. | Pump intake valve partially plugged. | Clean pump intake valve. See page 37. |
| | Air in hose. Fluid is compressible. | Purge air from hose. |
| | Unequal size hoses or unequal hose construction. | Use matching hoses, or balance pressures before spraying. |
| Pressures are not balanced when running, but pressure is generated and holds on both strokes. | Unequal viscosities. | Change temperature setting to balance viscosities. |
| | | Change restrictor at mix point to balance back pressure. |
| | Restriction on one side. | Clean mix module. Clean gun check valve screens. |
| Fluid leak in pump packing nut area. | Worn throat seals. | Replace. See pump manual. |
| Pressure doesn't hold when stalled against gun in spray mode. | Leaking Recirc/Spray valve. | Repair, page 36. |
| | Leaking piston valve or intake valve in displacement pump. | Repair. See pump manual. |
| | Leaking gun shutoff. | Repair. See gun manual. |
| Pressure is higher on B side during startup of recirculation, especially in High Recirc mode. | This is normal. Component B is typically higher viscosity than component A until the material is heated during recirculation. | No action required. |
| One gauge shows half as many pulses as the other when pumps are cycling. | Loss of pressure on downstroke. | Intake valve is leaking or not closing. Clean or replace valve; see page 37. |
| | Loss of pressure on upstroke. | Piston valve is leaking or not closing. Clean or replace valve or packings; see page 37. |
| Status indicator (red LED) not lit. | Motor Power switch off. | Cycle Motor Power off ,  |
| | | then on to reset breaker.  |
| | Loose indicator cable. | Check that cable is connected at J10 pins 1 (red) and 2 (black) on control board. See page 42. |
| | Failed control board. | Replace board. See page 42. |
| A side rich; lack of B side. | A side gauge is low. | B side restriction downstream of gauge. Check gun check valve screen, mix module, or mix manifold restrictor. |
| | B side gauge is low. | B side material supply problem. Check B side inlet strainer and pump intake valve. |
| B side rich; lack of A side. | A side gauge is low. | A side material supply problem. Check A side inlet strainer and pump intake valve. |
| | B side gauge is low. | A side restriction downstream of gauge. Check gun check valve screen, mix module, or mix manifold restrictor. |

| PROBLEM | CAUSE | SOLUTION |
|---|---|--|
| No temperature display. | Loose display cables on control board. | Check cable connections to each display, page 42. |
| | Failed control board (displays get power from control board). | Remove access panel. Check if board LED is lighted. If not, replace board, page 42. |
| | Inadequate power to control board. | Check that power supply meets requirements. |
| | Loose power cable. | Check cable connections, page 42. |
| | Motor Power switch circuit breaker tripped. | Display is powered from Motor Power circuit breaker. Cycle Motor Power off ,  then on to reset breaker.  |
| Wrong temperature displayed. | °F/°C switch in wrong position. | Set switch, see page 39. |
| Temperature displays do not match at ambient temperature. | Displays need calibration. | Turn calibration screw on back of displays to correct reading, see page 39. |
| No heat, and heater indicator light is off. | Heater Power shut off, or circuit breaker tripped. | Cycle Heater Power off ,  then on to reset breaker.  |
| | Bad thermostat. | With power on, check for continuity at clicks of heater control knob. To replace thermostat, see 313445. |
| | Bad overtemperature sensor (this is a high temperature limit fuse and must be replaced if blown). | With power on, check for continuity at overtemperature sensor. To replace sensor, see 313445. |
| | Loose heater cable connections. | Check connections at Heater Power switch. See FIG. 13, page 43. |
| No heat, but heater indicator light is on. | Bad heater cartridge. | Check for continuity at heater cartridge connections: 16-18.6 ohms for 120 V. |
| B side pump is not priming. | Running pump too fast. | Put finger over recirculation tube while running, to build pressure, and release. Repeat as necessary. |
| | Piston ball check is stuck in open position. | |



| PROBLEM | CAUSE | SOLUTION | |
|---------------------------------------|--|--|---|
| Low air output at gun. | Air valve at gun may be closed. | Turn air valve counter-clockwise to open. | |
| | Sprayer air regulator may be closed. | Pull to unlock and turn air regulator clockwise to open. | |
| | Air connections may be loose. | Check all connections for leaking air. | |
| | Damaged (leaking) air supply hose. | Replace air supply hose. | |
| | Air intake filter clogged. | Clean or replace air intake filter kit. | |
| | Mechanical air unloader stuck open. | Replace mechanical air unloader. | |
| | Electrical air unloader stuck open. | Replace electrical air unloader. | |
| | Loose relief valve. | Turn relief valve until it locks in place at 100 psi. | |
| Air compressor does not run. | Power is not on. | Turn compressor power on. | |
| | Voltage to compressor below 105 Vac for 120 Vac. | Try another outlet. Reduce extension cord length or increase extension cord gauge. | |
| | Loose power connections. | Verify all connections are firm. | |
| | Excessive head pressure (compressor hums). | Moisture frozen in air supply line. | Wait for air pressure to bleed to zero. |
| | | Electrical air unloader stuck closed. | Replace electrical air unloader. |
| | | Open air regulator; install air line. | Complete Setup on page 14. |
| | Compressor thermal switch is open. Ensure ambient temperature is below 115°F (46°C). | Move sprayer to shaded, cooler area. | |
| Low compressor performance. | Worn compressor; replace compressor with Compressor Service Kit 256779. | | |
| Only red material comes out of gun. | "A" side out of material | Add more material to "A" side | |
| | Intake filter on dip tube plugged | Clean filter | |
| | Filter screen on gun plugged | Clean filter screen | |
| Only white material comes out of gun. | "B" side of material intake filter on dip tube plugged | Clean filter | |
| | Filter screen on gun plugged | Clean filter screen | |



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