



# FOAMLOK® 450

## MIXING & APPLICATION GUIDELINES

**Product Design**

FOAM-LOK® 450 is a High Yield OC spray applied foam when installed following application guidelines, adheres tenaciously to framing members and substrates. FOAM-LOK® 450 is a low density, open celled, flexible, 100% water-blown polyurethane foam insulation. It is capable of being installed in unvented attics without an ignition barrier or coating.

FOAM-LOK® 450 is a two component system which sprays 1:1 by volume through standard high pressure spray equipment that does not require constant agitation.

**Product Use**

FOAM-LOK® 450 forms a completely sealed air barrier in wall cavities and can be used to fill 2" x6" stud wall construction in a single application. Its performance is superior to commonly used fiber-glass batt or blown-in insulation. It adheres well to most building materials and will provide a continuous barrier against air infiltration for the life of the building. As a component of a "systems" approach to proper building envelope construction, FOAM-LOK® 450 provides exceptional performance in reducing heat transfer.

**Recommended Product Applications**

- Unvented or Vented Attics
- Cavity Walls
- Critical Insulation Areas

AR 42/42 Mix Chamber



AR 52/52 Mix Chamber



Fusion AP Spray Gun



Processing Application Method	
Recommendations	FOAM-LOK 450
Spray Gun	Fusion AP Spray Gun Equivalent
Mix Chamber	AR 42/42 or AR 52/52

Processing Mixing Requirements	
Recommendations	FOAM-LOK 450
Recommended Drum Agitator/Mixer	Expanding Blade Bung-Mounted High Viscosity Agitator Graco (part # 26C150)
Recommended Agitator Speed	500 rpm
Max Agitator Working Pressure	100 psi
Recommended Air Compressor	22 cfm or rated higher

Recommended Processing Parameters	
Processing Designation	FOAM-LOK 450
Ambient Temperature	20 - 120°F (-6 - 49°C)
Equipment Pressures	1,200 - 1,400 psi (dynamic)
Preheat Temperature (Hose, A&B)	128 - 135°F (53 - 57°C)
Drum Preheat Temperature (prior to use)	70 - 85°F (21 - 29°C)
Storage Temperature (warehouse)	50 - 85°F (10 - 27°C)

## START-UP PROCEDURE

FOAM-LOK® FL 450 material drum temperature should be no less than 70°F and should not exceed 85°F. Recommended temperature of 80°F for optimum processing to occur. Temperature in excess of 90°F may decrease performance and produce cosmetic defects within the foam structure and surface. Once the resin line has been purged, recirculation may be used to increase temperatures but it is preferred that drum blankets be used prior to beginning the changeover process to insure uniform drum temperature. If application stops for longer than 30 minutes, the hose material should be recirculated back into the drum to insure no separation in the hose has occurred. Maximum temperature during recirculation should not exceed 110°F.

FL 450 must be mixed at high speed for 30 minutes with agitator prior to use. After initial mixing is complete, agitation may be reduced to a medium speed at quarter turn. Mixing must continue through-out application process to maintain a uniform blend. Recirculate through proportioner and hose to preheat material in drum to 70°F (85°F recommended) and ensure that product is well blended.

Note: 3/8th inch hose diameter airline is needed going to draw mixer to ensure enough CFM is provided to the mixer. May need to turn off air to other parts of equipment during the initial 30 minute mix time to ensure enough CFM is provided to the mixer. Airline needs to be connected to the draw mixer and turned slightly before tightening to the drum lid so that the blades on the shaft are spinning. Otherwise, the drum blades will make contact with the bottom of the barrel and the draw mixer will not be able to be screwed into the lid of the drum. Angled adapters are not needed with three (3) hole drum lids. Mixer must run counter clockwise; needle valve/exhaust fittings may be switched on air motor in order to get mixer to run counter clockwise.

IMPORTANT: FL 450 MUST be constantly agitated throughout the recirculation and application process in order to maintain a uniform blend and to avoid any separation of the resin.

When there is 1/3rd material left in drum, draw mixer can be pulled and put into new drum of material to restart mixing procedure. DO NOT circulate or mix other supplier's "A" or "B" components into FL 450 containers.

## FLUSHING PROCEDURE

Before FL 450 is introduced to any equipment, purge any previous material from your system. Turn off and disconnect air to all transfer pumps. Remove the drum pumps from the ISO and Resin drums and wipe pumps and dip tubes clean. Ensure Resin drum pump housing is emptied. Place the drum pumps and dip tubes in Huntsman Building Solutions ISO and FL 450 drums. Reconnect or turn on the air to the drum pumps. Use the drum pumps to purge the ISO and Resin supply and recirculation hoses back to their respective drums or into containers for reuse. One to two gallons of material are normally purged, depending on hose length. When finished and changing into another system, flush the "B" Side (resin side) with 3-4 gallons of water.

## PROPORTIONER

Use only fixed ratio (one-to-one), volumetric positive displacement pumps connected to a common drive or gear driven systems insuring a one-to-one ratio. B-side drum mixer: Mix only the FL 450 B-side resin material during chemical circulation and the spraying process. The A-side material should not be mixed.

## RATIO ASSURANCE TYPE SOFTWARES

Huntsman Building Solutions concurs with allowing a setting of a maximum ratio variance of 5%. Any deviance from that should be addressed immediately before continuing the installation. It should be noted that such tools and information are merely aids to spray foam contractors. \*

\*Foam application temperatures and pressures can vary widely depending on temperature, humidity, elevation, substrate, equipment and other factors. While processing, the applicator must continuously observe the characteristics of the sprayed foam and adjust processing temperatures and pressures to maintain proper cell structure, adhesion, cohesion and general foam quality. It is the sole responsibility of the applicator to process and apply this product within specification.

## APPLICATION GUIDELINES

FL 450 may be applied in single and multi-family residential buildings as well as commercial and agricultural buildings. FL 450 may be applied to all wall, ceiling and floor spaces for the purpose of thermal insulation and air leakage control. FL 450 may be applied to any typical construction materials, including but not limited to wood, metal, masonry and concrete substrates.

## AGITATION PROCESSING EQUIPMENT

### Expanding Blade Bung-Mounted High Viscosity Agitator

- Graco Part #26C150



### Expanding Blade Shaft Assembly

- Graco Part #17V342



## APPLICATION CHARACTERISTICS

Properly blended material will result in uniform cell structure and color throughout the application. FL 450 should not be applied to materials with surface moisture content of 20% or greater. If the foam appears to run, sag or drip, the hose and preheat temperatures should be increased in 3°F increments until the issue is corrected. At no time should the temperatures exceed 150°F for the A, B or hose. In some cases the machine pressure may need to be reduced to minimize the amount of material being applied and decrease the possibility of blowing reactive material off of the substrate. When applying more than one lift of material, (15) minutes between passes is recommended particularly in cold weather to allow surface moisture to evaporate prior to the next application occurring. If the second application shows separation between passes or delamination, the time between passes should be increased.

## SHUTDOWN PROCEDURE

To prepare for shutdown overnight, park proportioner system according to manufacturer procedures. This should include greasing spray gun according to manufacturer procedures. If shrinkage or delamination of the sprayed material is observed, there are 4 possible issues:

### #1. Improper Mixing of the Material:

Check the gauges for balance. If the gauges are balanced there may still be the possibility of a clogged screen or partial obstruction in the mixing chamber.

### #2. Shrinkage & Delamination:

An indication of inconsistent material that is not fully mixed would be the appearance of intermittent pocketing or substrate voids which may change from every (2) to (4) bays. If this is noted during application, more mixing of the material is required. Please stop the application and mix on high for an additional (30) minutes, then recirculate to clear the lines and start the application again.

### #3. The Material Is Too Hot:

Resolved by decreasing the temperature in 3°F increments until the issue stops.

### #4. High Moisture Content of the Substrate:

The moisture content (surface moisture) should be less than 20% maximum and preferably less than 17%. Surface moisture is very common in cold weather applications and is the result of quickly heating an area for application.

Huntsman Building Solutions recommends heating an area in cold weather prior to an application to insure optimum material performance as well as using the proper ventilation for the process. As the air will heat more quickly than the substrate and the substrate has a cold exposure to the outside, condensation of humidity can occur on the substrate. Even low levels of moisture can contribute to shrinkage of an open cell product. Simply continue to heat the area and wait a short time for the condensation to evaporate can resolve this issue.

## COLD WEATHER APPLICATIONS

In most cases, the best application technique for cold weather, is to work from the bottom to the top of the intended target. This allows the material to build and maintain heat as the material reacts and helps overcome cold ambient and substrate conditions. Minimum pass thickness per pass in cold weather should result no less than 2 to 3 inches of foam to insure proper temperature is developed by the reaction to attain complete reaction of all materials.

## CREDENTIALS/CERTIFICATIONS

ICC ESR-4242

## UNVENTED ATTICS

Huntsman Building Solutions FOAM-LOK® 450 can be applied to the underside of the roof deck to a maximum of 20 inches and be left bare if its thickness is a minimum of 3 1/2 inches at roof decking. Consult Huntsman Building Solutions Technical Department for details.

Ventilation Rate (Air Changes Per Hour)	Re-Entry Period For: Sprayers, Helpers, Informed, Trade Workers & Contractors	Re-Occupancy Period For All Others
At 10.0 ACH	1 Hour	2 Hours

## MATERIAL SHELF LIFE

Six (6) months when stored within the recommended temperature range.

## WAREHOUSE STORAGE REQUIREMENTS

Materials stored in warehouses which will not be used immediately, both A&B components should be stored between 50°F and 90°F.

THESE VALUES REFER TO THE TOTAL THICKNESS OF THE PRODUCT TESTED NOT THE MAXIMUM THICKNESS ALLOWED PER PASS OR APPLICATION. THE FOAM SHOULD BE ALLOWED TO COOL FOR 10 TO 20 MINUTES OR UNTIL THE SURFACE TEMPERATURE HAS RETURNED TO AMBIENT BEFORE ADDITIONAL APPLICATIONS OF FOAM ARE ATTEMPTED. FOAM APPLIED IN EXCESS OF 8 INCHES OR WITHOUT ALLOWING FOR COOLING MAY RESULT IN, BUT NOT LIMITED TO EXCESS BUILD-UP AND COULD RESULT IN FIRE OR THE GENERATION OF OFFENSIVE ODORS THAT MAY NOT DISSIPATE WITH TIME.

## THERMAL BARRIER

IRC and IBC codes require that SPF be separated from the interior of a building by an approved fifteen (15) minute thermal barrier, such as 1/2" gypsum wall board or equivalent, installed per manufacturer's instructions and corresponding code requirements. There are exceptions to the thermal barrier requirements: (1) Code authorities may approve coverings based on fire tests specific to the SPF application. For example, covering systems that successfully pass large scale tests may be approved by code authorities in lieu of a thermal barrier; (2) SPF protected by 1" thick masonry does not need a thermal barrier. Certain materials that offer protection from ignition, called "ignition barriers," may not be considered as thermal barrier alternatives unless they comply with NFPA 286 or other full-scale burn tests. Applicators should request test data and code body approvals or other written indications of acceptability under the code to be sure that the product selected offers code-compliant protection.

## Handling and Safety

Respiratory protection is MANDATORY! Huntsman Building Solutions requires that supplied air and a full face mask be used during the application of any spray applied foam system. Contact Huntsman Building Solutions for a copy of the Model Respiratory Protection Program developed by CPI or visit their website at [www.polyurethane.org](http://www.polyurethane.org). Persons with known respiratory allergies should avoid exposure to the "A" component. The "A" component contains reactive isocyanate groups. The materials must be handled and used with adequate ventilation. The vapors must not exceed the TLV (0.02 parts per million) for isocyanates. Avoid breathing vapors. Wear a NIOSH approved respirator. If inhalation of vapors occur, remove victim from contaminated area and administer oxygen if breathing is difficult. Call a physician immediately. Avoid contact with skin, eyes, and clothing. Open containers carefully, allowing any pressure to be relieved slowly and safely. Wear chemical safety goggles and rubber gloves when handling or working with contact, wash area with soap and water. Wash clothes before reuse. Applicators should ensure the safety of the jobsite and construction personnel by posting appropriate signs warning that all "hot work" such as welding, soldering, and cutting with torches should take place no less than 35 feet from any exposed foam. If "hot work" must be performed all spray polyurethane foam should be covered with an appropriate fire or welder's blanket, and a fire watch should be provided.

### **In Case of Spills or Leaks**

- Utilize appropriate personal protective equipment (PPE).
- Contain and cover spilled material with a loose, absorbent material such as oil-dry, vermiculite, sawdust or Fuller's earth.
- Shovel absorbent waste material into proper waste containers.
- Wash the contaminated areas thoroughly with hot, soapy water.
- Ventilate area to remove vapors.
- Report sizeable spills to proper environmental agencies.

### **In Case of Fire Extinguishing Media**

Dry chemical extinguishers such as mono ammonium phosphate, potassium sulfate and potassium chloride. Additionally, carbon dioxide, high expansion (proteinic) chemical foam or water spray for large fires. Positive pressure ventilation of the work area is recommended to minimize the accumulation of vapors in the work area during the application. Improper application techniques of this foam system must be avoided. This includes excessive thickness, off ratio material, and spraying into rising foam. The potential results of improperly applied materials may include but is not limited to excessive heat build-up, and may result in a fire or offensive odors which may not dissipate with time and/or poor product performance due to improper density of the applied material. Large masses of sprayed materials should be avoided. When large masses are generated they should be removed from the area, cut into small pieces and allowed to cool before disposal. Failure to follow this recommendation may result in a fire. It is recommended that a fire extinguisher be located in an easily accessible portion of the work area.

### **DISCLAIMER**

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