



H2Foam Lite Plus

PRODUCT APPLICATION GUIDE

In order to properly process H2Foam Lite Plus and to maximize yield, please adhere to the following guidelines.

In case of questions contact support@icynene-lapolla.eu

APPEARANCE

H2Foam Lite Plus is cream (off-white) in colour. The resin (also called component B) is brown in colour and the HBS isocyanate (also called Component A) is dark brown in colour.

STORAGE

- Once received, H2Foam Lite Plus drums should be stored at 15 °C to 30 °C. This will allow for quicker warm up of materials and will keep the resin from degrading prematurely.
- Do not store material on rigs other than what is required for current application needs, as materials left inside of rigs can easily exceed these recommended storage temperatures.
- H2Foam Lite Plus resin has a 6-months shelf life if stored as stated.
- Follow FIFO (First-In-First-Out) stock rotation.

MIXING

- You must firstly paddle mix the resin for 5 to 10 minutes depending on the age of the material. If the material is over 1 month old then 10 minutes is required
- A drum mixer must be used for constant agitation of the resin drum.
- A blade or auger type mixer should be run at low to medium-speed but not fast enough to cause frothing and pull air into the resin as this could cause off-ratio foam.

NOTE: If changing to H2Foam Lite Plus from another product, follow the changeover procedure below.

CHANGEOVER

- Before spraying H2Foam Lite Plus you should remove any previous material from your system by slowly pumping it into the correct resin (component B) and isocyanate (component A) drums. It is important not to mix one resin with another. The resins are chemically different and should not be mixed together.
- Turn off/disconnect air supply to the transfer pump and the resin mixer.
- Remove the drum pumps from the resin and isocyanate drums and wipe pump/dip tube clean. Also, make sure the drum pump housing is emptied of any resin.
- Allow some air into the drum pump or dip tube.
- Place the drum pumps/dip tubes in to the H2Foam Lite Plus drums
- Remove the gun from the manifold or side blocks.
- Reconnect or turn on the air to the drum pumps or diaphragm pumps.
- Use the drum pumps or diaphragm pumps to pump the current resin and isocyanate materials back to their corresponding drums or into containers for reuse. Watch for a color change from the current resin to the new resin or until you reach the air pocket in the line. Count the strokes and use this for purging the isocyanate as there is no color difference to note the change.

NOTE: If you currently have another HBS spray foam product in your system, you do not have to changeover the HBS isocyanate (Component A) as it is the same for all HBS spray foam products.

- Once the H2Foam Lite Plus has pushed the previous material out of the spray hose, you will now see a brown colored liquid.
- Remember to also remove the old material from the re-circulation/pressure-relief hoses to avoid contaminating the new drum with the previous material that was left in these lines when you re-circulate for heating or relieve pressure.
- Spray out into a bag or onto card / polyethene to ensure material isn't contaminated with previous product.

Always check and clean the A and B side Y-strainer screens prior to commencing the spray application.

NOTE: Hose must be warm during flushing as blowing agents can imbed in the hose cell wall when hot and will stay trapped when hose cools – only to come out again when hose re-heats.

NOTE: If the first foam sprayed shows curling at the edges or shrinkage, there may still be some combined material in the spray hose and more material will need to be cleared from the hose prior to spraying.

You are now able to spray H2Foam Lite Plus.

Follow the same procedure if you are switching back to another HBS spray foam product.

HEATING

- The ideal drum temperature for processing H2Foam Lite Plus (Resin and isocyanate) is 27 °C.
- If available, use circulation lines to warm up the chemicals to 27 °C by using the proportioner pre-heaters. The machine heaters should be set no higher than 42°C and agitate the “resin” using a drum mixer during this operation. Be careful not to overheat the chemicals.
- If not equipped with a circulation system, electrically heated drum blankets can be used to warm and maintain the drum temperatures at 27°C. Non-heated drum blankets can be used with a circulation system to maintain drum temperatures at 27 °C. In all cases, be careful not to overheat the drums (over 35 °C).
- If you have a hose circulation block, it is also good practice to circulate the hose for about 10 minutes before spraying.

In all cases, be careful not to overheat the drums (over 35 °C).

PROCESSING TEMPERATURE AND PRESSURE

Drum Processing Temperature (before and during application):

- During processing, HBS Isocyanate (Component A) and H2Foam Lite Plus Resin (Component B) temperatures need to be in the range of 54 °C to 68 °C.

NOTE: Be careful not to exceed 32 °C in the drum. The Component B (resin) shelf life will be affected above this temperature.

- If the resin (Component B) has been subjected to cold temperatures below 5 °C you must make sure the resin drum is thoroughly mixed and circulated to 27 °C to ensure all components are mixed before processing.

Equipment Processing Temperature (A + B + Hose – while spraying):

- The primary A and B heaters as well as the hose heat for H2Foam Lite Plus should be set between 54°C and 68°C for optimum foam quality.
- For the best yield and performance in moderate ambient temperatures of between 15 °C to 27 °C, 54 °C to 68°C for A, B and hose heat is recommended for H2Foam Lite Plus.
- The temperature settings will mostly depend on the time of year and current ambient conditions as well as substrate temperature. All three heater temperatures are usually set to the same temperature.

In standard ambient conditions of 15 °C to 30 °C, HBS recommends the following for processing H2Foam Lite Plus :

HBS RECOMMENDATIONS FOR STANDARD AMBIENT CONDITIONS OF 15 °C TO 30 °C	
Drum Temperatures	27 °C
A and B Primary Heaters	54 – 68 °C
Hose Heat	54 - 68 °C
Mix Chamber	AR5252 (02 round)
Pressure (dynamic)	1200 psi / 82 bar
Spray Distance	35-45 cm

- Ideally the foam should stop rising in about 6 to 7 seconds.
- In cold weather (below 15°C) increase the A, B and Hose heats in 3 degrees increments (up to 57°C) to achieve this rise time.
- In hot weather (above 27°C) decrease the A, B and Hose heats in 3 degrees increments (down to 65°C) to achieve this rise time.
- To maximize yield HBS recommends using an AR5252 (02 round) at 1200 psi / 82 bar dynamic pressure.

If it is necessary to use another sized chamber, use the following guidelines:

OTHER SIZED CHAMBERS				
Mix Chamber Size	00 (2929)	01 (4242)	02 (5252)	03 (6060)
Pressure (dynamic)	700-900 psi 48 – 62 bar	900-1100 psi 68 – 76 bar	1100-1500 psi 76 - 103 bar	1500-2000 psi 103 – 138 bar

Please be aware that altering recommended settings may cause poor foam quality and a substantial reduction in yield.

Material Troubleshooting

The most common reasons for substandard material are mix related. This is the ratio of the material that is coming out of the end of the spray gun. If the ratio is not a 1:1 ratio of the "A" and "B" components you will have material that looks and reacts differently.

Visually these problems will look like the following

1. Resin Rich – Material that has more Resin "B" than isocyanate "A"
2. Very White in colour
3. Rubbery surface feel
4. Skin thicker – shiny
5. Adhesion poor – air pockets

ISO Rich – Material that has more isocyanate "A" than Resin "B"

1. Darker in colour
2. Crusty – coarse cell structure
3. Friable – brittle and powdery to touch
4. Rough skin
5. Shrinkage

Most of these off-ratio issues are attributed to these common problems at the gun: Plugged screens, build up in the chamber, build up around or in the side seals.

- Not as common but will cause the same problems are running out of material, having plugged y-strainers, pinched supply hose or a faulty transfer pump.
- These issues cause a pressure imbalance which allows one material to flow better than the other. The pressure imbalance can be seen on the pressure gauges for each spray line on the proportioner. Use these gauges to help you identify and correct the problem.
- You can also have material problems if the Resin gets "Cooked". This is when during storage, the material exceeds the recommended temperature for any length of time or if you have allowed material in the drum on the rig to be mechanically heated past 35°C for an extended period of time. This will also happen in the equipment if set to spray temperatures and have left it alone without spraying for more than a half hour. This chemical breakdown of the Resin will produce the following problems:

1. Change of material odor
2. "Snap, crackle and pop" type sound after application
3. Shrinkage and shriveling after application
4. More rigid type of foam, increase in density
5. Slower to cure

SURFACES FOR APPLICATION

The product is for use as a thermal insulation and air barrier in: roofs, wall cavities, floor assemblies, ceiling assemblies, attics (vented and unvented), basements (vented and unvented). Can be sprayed onto: concrete, masonry, wood, gypsum board, particle board, OSB board, metal, diffusion foil, asphalt, modified bitumen membrane.

- **Minimum temperature of the surface* during application: 0°C**
*No humidity on the surface of the substrate
- **Minimum temperature of the ambient during application: 0°C**

NOTE: Do not apply to a dirty surface (it is necessary to remove: sand, dust, remains of concrete, wood shavings, it is necessary to clean greasy surfaces).

All timber surface should have a moisture content no greater the 19%.

SPRAY TECHNIQUE

H2Foam Lite Plus is a 1:1 ratio by volume rapid expanding foam that requires proper setup and sprayer technique in order to apply consistently and efficiently. If you have not sprayed this type of foam before we recommend contacting HBS Technical Services to get initial training on proper procedures and techniques for a good install.

The three main factors in proper application will be the choice of mixing chamber, the material pressure on the spray lines you set and the correct application technique according to the surface type. H2Foam Lite Plus is applied in one layer to the agreed thickness for all types of substrates. In the case of minor repairs, it is necessary to wait 10 to 20 seconds before the main layer cools down slightly to achieve the best possible bonding of the layers.

The installation of H2Foam Lite Plus on solid surfaces occurs primarily using two main spray techniques: The first is the standard side to side motion (technique 1) and the second side to side motion with spraying in the middle and applying the vertical drags on sides (technique 2)

- 1) In the standard **side to side motion** you should use a round pattern. You will work this pattern in a side to side motion just barely touching the stud or joist with your pattern, this is what is referred to as wetting the studs and is as integral part of the installation. This material on the stud is pushed up with the growing foam and provides the seal and bond. If you do not do this correctly, you may see a small gap left between the stud and the foam as the foam cools. As you work this motion back and forth you will overlap your last pass by 30 to 50%. This will help the foam grow at a more constant rate and the surface will be smoother. If your passes are farther apart, you will notice a zigzag pattern to your foam which will leave gaps on the side against the studs.

- You also want to try and keep your gun as close to a 90° angle as possible to the substrate. This along with holding a consistent distance and not getting too close while spraying will help limit the formation of air pockets behind the foam. These air pockets behind the foam can also be caused by spraying too cold, or on a substrate that is very wet. It may also happen when the foam reacts with a substrate chemically, though this is not common.
 - If an air pocket is noticed, you may poke a hole in the area and inject foam into it, which will fill the void that was left. This is why it is important to check your work as you install to verify that adhesion is consistent.
 - The key to this method of install is the rhythm of your motion on the gun. It needs to be consistent. You want to be doing the same motion every time. The only thing that will change will be the speed of this rhythm depending on the thickness of foam you need. The slower you move the thicker the foam, the quicker you move the thinner.
- 2) **Side to side motion with spraying in the middle and applying the vertical drags on sides** requires the use a round spray tip. You will work this pattern in a side to side motion leaving about 4 cm of space between the foam and the stud or joist. The foam must not touch the stud or joist! As you work this motion back and forth you will overlap your last pass by 30 to 50%. This will help the foam grow at a more constant rate and the surface will be smoother. If your passes are farther apart, you will notice a zigzag pattern to your foam which will leave gaps on the side against the studs.
- You also want to try and keep your gun as close to a 90° angle as possible to the substrate. This along with holding a consistent distance and not getting too close while spraying will help limit the formation of air pockets behind the foam. These air pockets behind the foam can also be caused by spraying too cold, or on a substrate that is very wet. It may also happen when the foam reacts with a substrate chemically, though this is not common.
 - If an air pocket is noticed, you may poke a hole in the area and inject foam into it, which will fill the void that was left. This is why it is important to check your work as you install to verify that adhesion is consistent.
 - Wait till the foam fully rises and work vertical drags no longer than 1m from the bottom to the top, bonding the previous layer to the studs or joists.
 - The key to this method of install is the rhythm of your motion on the gun. It needs to be consistent. You want to be doing the same motion every time. The only thing that will change will be the speed of this rhythm depending on the thickness of foam you need. The slower you move the thicker the foam, the quicker you move the thinner.

Setting the proper temperature for spraying is also very important. The proper temperature gives you good adhesion, proper density, and good yields. You will work with the H2Foam Lite Plus in the range between 54 °C and 68 °C. For the best yield and performance in moderate ambient temperatures of between 15 °C to 27 °C. There could be some extreme cases where you would need more or less heat, but for normal year-round applications this is the range you will use. Do not be afraid to adjust temperature, you will need to raise and lower your temperatures according to what you see during application.

The installation of H2Foam Lite Plus on diffusion foil occurs using a side to side motion with spraying in the middle and applying the vertical drags on sides (technique 2). While applying the vertical drags pull the previously sprayed central layer towards you with your other hand. This will ensure the foil does not get pushed into the ventilation gap. To prevent closing the ventilation gap it is also necessary to pay extra attention when applying foam at the supporting walls. The same technique is used at purlins and the ridge beam.

NOTE: Incorrect technique of application can result in foil bulging out into the ventilation air gap. Insufficient air circulation inside the roof causes faster foil degradation and moisture penetrating into the insulation layer!

- 3) **Material too Cold** – Slow to cure, runs and drips more, denser, loss of yield.
- 4) **Material too Hot** – Rapid cure, popcorn look, crater type holes, excessive settling.

Regardless of chosen technique and temperature used the desired goal is to always install H2Foam Lite Plus to the desired thickness in the first initial pass. If thickness is not at the desired level, you can spray H2Foam Lite Plus over itself but note that material will not spray as smooth on itself as on the original substrate.

YIELD

In the respect of all conditions listed above and in regular application, yield of this product is 35 m³ per set.

HEALTH AND SAFETY

First aid kit and Water station should be available in the truck. In case of spills refer to MSDS.

Homeowners

Need to know: HBS spray foam insulation products have an excellent health and safety record. Nonetheless, safe handling practices during and immediately following installation are required to eliminate the possibility of health effects from exposure to isocyanates. Asthma, other lung problems, and irritation of the nose and throat can result from inhalation of isocyanates. Direct contact with the skin and eye can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others. Everyone (other than HBS-certified spray technicians) must vacate the job site, remaining completely out of the building or keep a distance of at least 15 meters from the area where the foam is applied for at least 24h after spraying is completed. It is necessary to allow active ventilation of the job site and to ensure the foam chemicals are completely cured. No exceptions.

Certified sprayer

Need to know: Direct contact with the skin and eyes can result in irritation. Different individuals will react differently to the same exposures; some will be more sensitive than others. Severe asthma attacks have been reported in some sensitized workers exposed repeatedly to isocyanates while not wearing proper protective equipment. Some reports indicate a reaction and sensitization can occur following a single, sustained occupational exposure to isocyanates without proper protective equipment above the permissible exposure limit. But sensitization might not occur immediately in some individuals. Consistent use of personal proper protective equipment to prevent exposure during spraying and within the 2 hours** – period after spraying

is completed is critical to eliminating the health hazard. Once sensitization has occurred, a worker might not be able work safely with spray foam insulation again. Sprayers helpers, and anyone else present during spraying or within 2 hours** after spraying is complete: You must ventilate at 40ACH and must wear proper Personal Protective Equipment (PPE) at all times during spray, including full-body-coverage, chemical-protective clothing and a certified respirator with fresh air supply. While spraying and for 2 hours** after spraying is completed, no one must be allowed within 15 meters of the application area without wearing this type of PPE at all times.

The certified sprayer is obliged to use the ventilation device when applied in closed areas.

For ventilation, you must use a fan with sufficient power. The minimum required change in room air volume is 30 times in 1 hour.

** Re Occupancy of the work site without respiratory equipment is 2 hours providing the correct ventilation rates have been used for the area sprayed.

HBS Technical Services

Before spraying H2Foam Lite Plus, as with all HBS products, please do not hesitate to contact support@icynene-lapolla.eu