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ICYNENE CLASSIC™ INSTALLATION INSTRUCTIONS

ICYNENE Classic™ is a Low Density completely water blown open-cell spray foam insulation and air barrier material. Completely free of any HFC's and PBDE's, ICYNENE Classic™ can reduce energy consumption and related greenhouse gas emissions by as much as 50%. This product has a density of 0.5 lb/ft³ with an R-Value of 3.7 per inch, this equates to R-13 @ 3.5 inches and R-20 @ 5.5 inches.

Appearance:

- **ICYNENE Classic™** finished foam is cream (off-white) in color. The **ICYNENE Classic™** Resin (B-side) is white in color and the Base Seal® (A-side) is dark brown in color.

Storage:

- For **ICYNENE Classic™** (Component A and Component B) the recommended storage temperature is between 60°F and 85°F. Do not store material on rigs other than what is required for current application needs. Material left inside of rigs can easily exceed these recommended temperatures, especially in warmer months. This excessive heat will degrade the Component B (Resin) material and shorten its usable shelf life.

Mixing:

- **ICYNENE Classic™** requires an initial mix of the **Resin** or "**B**" drum **before each use** by hand with a "**boat type paddle**" to make sure all the components are well mixed. A circular mixing motion lifting from the bottom of the drum up is required. This motion is done until all noticeable color swirls in the material are mixed in. The **ICYNENE Classic™** resin requires constant agitation after this hand mix since it is an emulsion and not a solution. This agitation can be accomplished with either an electric mixer or pneumatic mixer attached to the drum lid. You do not need to mix or agitate the **Isocyanate (MDI)** or "**A**" drum.

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Note: The older the material (time from manufacture date on drum) the more important the hand mix and agitation is as certain components in the resin material will have settled more toward the bottom of the drum.

Changeover:

- Before spraying **ICYNENE Classic™** you should remove any previous material from your system by slowly pumping it in to the correct resin (B-side) and MDI (A-side) drum. It is important **not** to mix one Component B (resin) in to the other. The resins are chemically different and should not be mixed together
- Turn off/disconnect air to Resin transfer pump.
- Remove the drum pumps from the Resin and ISO 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 **ICYNENE Classic™** drums.
- Remove the gun from the manifold or side blocks.
- Re-connect 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 ISO materials back to their corresponding drums or in to containers for re-use. Watch for a colour change from the current resin to the new resin (white) or until you reach the air pocket in the line. Count the strokes and use this for purging the ISO (MDI) as there is no colour difference to note the change.

Note: If you currently have another ICYNENE product in your system, you do not have to changeover the Base Seal® (Component 'A', Isocyanate) as it is the same for all ICYNENE products.

- Once the **ICYNENE Classic™** has pushed the previous material out of the spray hose, you will now see white coloured liquid.
- There will be a 1 to 2 gal. mixture of materials during the changeover.

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- 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.
- **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 **ICYNENE Classic™**.
- Follow the same procedure if you are switching back to another ICYNENE product.

Drum Processing Temperature (before and during application):

- During processing, both the Base Seal[®], (Component A, Isocyanate) and **ICYNENE Classic™ Resin (Component B)** temperatures need to be in the range of 80°F to 100°F. **90°F is recommended for ICYNENE Classic™**. Be careful not to exceed 100°F as the Component B (resin) shelf life will be affected above this temperature. **If the resin (Component B) has been subjected to cold temperatures (below 40°F) you must make sure the resin drum is thoroughly mixed then circulated to at least 80°F 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 **ICYNENE Classic™** should be set between 120°F and 160°F for optimum foam quality. **For the best yield and performance in moderate temperatures (60°F to 80°F), 135°F for A, B and hose heat is recommended for ICYNENE Classic™**. The temperature settings will mostly depend on the time of year and current ambient

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conditions as well as substrate temperature. All three heater temperatures are usually set to the same temperature.

Application:

- **ICYNENE Classic™** 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 Icnene-Lapolla Technical Services to get initial training on proper procedures and techniques for a good install.
- The two main factors in proper application will be the choice of mixing chamber and the material pressure on the spray lines you set. Below is a chart outlining recommended pressures and distances from the substrate to achieve a smooth spray surface:

<u>Mix Chamber Size</u>	<u>Pressure (psi)</u>	<u>Distance</u>
00	700-900	10" - 12"
01	900-1100	12" - 14"
02	1100-1500	12" - 14"
03	1500-2000	15" - 18"

****Most common chambers size used:***
(.01) for 2x4 (.02) for 2x6

- These are recommended starting points. As you spray you will find that you may need to adjust one or both of these to get your desired yield for the project you are working on.
- The installation of **ICYNENE Classic™** occurs primarily using two main spray techniques: The first is the standard side to side motion and the second and less common is a drag motion.
- In the side to side motion you can use a round or fan style pattern. If you use the fan pattern you will have it in the vertical orientation. 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

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seal and bond. If you do not do this correctly you may see 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.
- The drag motion requires the use of a fan pattern spray tip on your gun. This fan tip will be in the horizontal orientation. You will work this pattern from the bottom of a cavity to the top in one consistent dragging motion that is centered in the middle of the cavity bay.
- Though this motion seems simpler it is harder to master. You will start with the gun centered at the bottom of the cavity and once the trigger is pulled you will adjust your pattern with distance as to be just barley touching each stud on the sides and then begin to smoothly drag the pattern up the cavity. You will need at least an 02 (5252) size chamber behind the fan tip to provide a wide enough pattern that it will work correctly.
- The key to this method is the ability to hold a constant distance, speed and gun angle, which is usually slightly less than 90° at a slight down angle. Any change in any of these will lead to rippling of the foam and pocketing. Once mastered though, it will leave a smoother surface than the side to side motion.

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- 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 **ICYNENE Classic™** in the range between 120° and 160°F. **For the best yield and performance in moderate temperatures (60°F to 80°F), 135°F for A, B and hose heat is recommended for ICYNENE Classic™.** 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 you temperatures according to what you see during application.

Material too Cold - Slow to cure, runs and drips more, more dense, loss of yield.

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 **ICYNENE Classic™** to the desired thickness in the first initial pass. If thickness is not at the desired level you can spray **ICYNENE Classic™** over itself, but note that material will not spray as smooth on itself as on the original substrate.

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" component you will have material the looks and reacts differently.

Visually these problems will look like the following:

Resin Rich - Material that has more Resin "B" than Iso "A"

1. Very White in Color
2. Rubbery surface feel
3. Skin thicker - shiny
4. Adhesion poor - air pockets

Iso Rich - Material that has more Iso "A" than Resin "B"

1. Darker in color
2. Crusty - course cell structure
3. Friable - brittle and powdery to touch

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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 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 100°F 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

Procedures to Remember:

- Keep material stored properly. Ideally 60 to 85°F.
- Do not open drums until needed
- Thoroughly mix resin by hand, then continuously with mixer
- Pre-heat material when cool to at least 80°F in the drum
- Adjust spray temperatures for conditions
- **Maintain the Equipment.** Keeping the equipment in proper operating condition will give you fewer problems and better foam.

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As with all of our products, if you have any questions, please do not hesitate to contact Icnene-Lapolla Technical Services and ask to speak to an Icnene-Lapolla Technical Services Representative.

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