NCFI 12-008 InsulStar® Light OPTIMAXX

PRECONDITIONING

Material Temperature: 70-90°F

Starting chemical temperatures should be between 70-90°F to ensure proper processing through the spray equipment. If the material has been exposed to high temperatures or nearing its shelf life, mixing the resin for 5-10 minutes can improve performance.

For mixing, NCFI recommends Graco's collapsing blade agitator #26C818 or #26C150. The mixer shaft should have at least two 6" folding blades. The top blade should be approximately 8" below the collar of the shaft and 4" below the liquid level. The bottom blade should be 0.5-1" above the bottom of the shaft. All blades should be folded downward and blade fasteners tightly secured. DO NOT mix the resin while spraying. Allow mixed material to settle for 20 minutes before processing.

APPLICATION SETTINGS

The "Recommended Processing Parameters" listed below are suggested starting parameters; adjustments will vary depending on temperature, humidity, elevation, substrate type, hose condition, sprayer speed, and mix chamber. Additional adjustments during the day may be necessary as ambient conditions change. The applicator must continuously observe the characteristics of the sprayed foam and adjust processing temperatures, pressures, spray pattern, and pass thickness to maintain proper cell structure, adhesion, cohesion and general foam quality.

Recommended Processing Parameters	
Primary Heater Temperature	115 - 135°F
Hose Heat Temperature	115 - 135°F
Material Temperature	70 - 90°F
Dynamic Pressure	1000 min, 1100-1300 psi
Substrate Temperature	50-120°F

Target Rise Time: 4 seconds

Test sprays should be performed to ensure that the proper processing temperatures and pressures are set. You are dialed in when the foam has a ~4 second rise time. Rise time is defined to be from the time you release the trigger to the time the foam is fully expanded. If the temperatures are set too high, the foam could shrink. Turn your temps down in 2–3° increments until you have a correct rise time. If your temperatures are set too low, the foam could sag or drip. Bring your temps up in 2–3° increments until your rise time is dialed in.

For optimal pressure settings, target a dynamic pressure of 1100-1300 psi while spraying as a starting point. Higher pressures may be required for longer hoses and larger mix chambers. Actual pressure drops vary based on hose length, viscosity of the material, material temperature, mix chamber, flow rate, restrictions and hose diameter. If the actual mix pressure is too low, it can result in poor atomization, incomplete mix, off-ratio foam, and poor cell structure.

SUBSTRATE PREPARATION

Substrate Temperature: 50-120°F

Substrate temperatures should be between 50-120°F. 12-008 is suitable for application to most construction materials including wood, masonry, concrete, and metal. To ensure proper adhesion, substrates should be clean of dust or flaking surface, loose scale, dry, and free from oil, grease, rust or wax. Do not spray foam when substrate moisture is ≥18% or surface temperatures are less than 5°F above the dew point. Flashing is recommended at lower temperatures.

SPRAY TECHNIQUE

Distance: 18-24" @ 90-degree angle

Always hold spray gun perpendicular (90-degree angle) to the substrate. Spraying at an angle can cause a lack of adhesion and an irregular surface of the foam. Hold the gun approximately 18-24" away from the substrate. The ideal distance is ~18" away to maximize the heat to the foam. Apply the foam by spraying ahead of the rising foam, with a 60-80% overlap in passes. Avoid spraying onto rising foam as this can lead to poor quality foam and blowoff. Adjust the speed of your application to place sufficient chemical to just fill the cavity and reduce waste from trimming. To improve adhesion and reduce trapped steam, especially in colder environments, it is recommended to spray from the top of the substrate and down. This will prevent extra moisture from collecting on the substrate.

APPLICATION PASS THICKNESS

Recommended: 4-6 inches **Minimum: 3 inches** **Maximum: 8 inches**

The maximum practical pass thickness for 12-008 is 8 inches before resulting in splash-back. Spraying sections too thick will generate more heat and may result in poor quality foam, splitting foam, charring foam, or spontaneous combustion in extreme conditions.

The minimum recommended pass thickness for 12-008 is 3 inches except where a flash-coat is needed. Thin foam layers often result in poor physical properties, lower yields and poor chemical reaction due to the lack of exothermic heat generated from the chemical reaction.

When spraying more than 6 inches in a single pass, the applicator must closely monitor the foam's adhesion and cell structure. Wait 10 minutes or allow the surface temperature of the foam to cool below 100°F before applying the second layer to ensure good cohesion. Multiple layers can be applied to reach the desired thickness and R-value.

COLD WEATHER PROCESSING

For temperatures below 50°F, NCFI recommends heating the area with an indirect heater. Never use open flame or direct heaters during the spraying process. For lower substrate temperatures or application to highly conductive materials such as concrete or metal, a 1-inch flash pass is recommended. Spray a test area approximately 25 square feet and check for proper adhesion and cell structure. If both are satisfactory, the spray application may continue.

STORAGE & SHELF LIFE

B-12-008 Resin- 6 months
A2-000 Isocyanate- 24 months

Keep drums tightly closed when not in use. Do not store in direct sunlight or high temperatures. High temperatures above 110°F for more than one week could cause the material to separate and mixing is recommended to ensure the material is still a dispersion.

SPRAY EQUIPMENT

The system should be processed through spray equipment capable of delivering the proper 1:1 ratio by volume. Ensure the equipment can maintain a temperature of up to 140°F and a minimum dynamic pressure of 1000 psi. NCFI recommends 2:1 transfer pumps for supplying the liquid components to the proportioner. The use of an impingement mix type spray gun is required and static mixers are not sufficient to properly mix the product. It is the responsibility of the applicator to thoroughly understand all information related to their equipment for safe operating procedures.

For optimal performance, NCFI recommends the following mix chambers or equivalents. If you are spraying with the Graco FX gun, you will need to step down one on the mix chamber size for the same performance.

Mix Chamber	Orifice Size (in.)
AR4242	0.042
AR4747	0.047
AR5252	0.052
FX37RD	0.037
FX42RD	0.042
FX47RD	0.047

CHANGING OVER TO 12-008 INSULSTAR LIGHT

Before loading the B-12-008 chemicals into equipment that has been used to spray other brands/types of chemicals, purge the previous material from your system. Never flush water through the A-side (iso side). Failure to properly flush will result in off-spec foam and does not comply with the Code Evaluation Report. Refer to NCFI's Technical Bulletin on "2025 NCFI TECH BULLETIN- SPF-CHANGEOVER PROCEDURE USING COMPRESSED AIR.pdf" for more detailed instructions.

CODE-COMPLIANT FIRE RESISTANCE

Building Codes require foam plastic insulation, such as 12-008, to be separated from the interior of the building by a 15 minute thermal barrier of ½" gypsum wallboard or other approved material. Refer to CCRR-0323 for details. When Fire Resistive Wall Assemblies are required, contact NCFI Polyurethanes for specific alternate approvals for InsulStar® Light.

VENTED ATTICS AND CRAWL SPACES

Building codes require an ignition barrier material over foam plastic insulations installed in attics and crawlspaces. The 12-008 system is approved for use with DC315 intumescent coating in lieu of the code prescribed ignition barrier in attics and crawlspaces. The foam can be installed up to 8 inches thick on vertical surfaces and up to 14 inches thick on horizontal and overhead surfaces when covered with 7 wet mils of DC315.

UNVENTED ATTICS

The 12-008 system was tested per IBC Section 2603.9 and IRC Section R316.6 to qualify for application in an unvented attic with no ignition barrier covering. The attic space must be constructed in a specific manner with the attic access designed and installed in the attic floor. The 12-008 must be applied within the limitations of the approval. Refer to Intertek CCRR - 0323 for specific details of the construction requirements. The 12-008 spray foam installed in unvented attics should be in compliance with Section R806.5 of the 2021 IRC.

APPLICATION AROUND PLASTIC PIPES

The 12-008 foam can be applied in contact with PVC, CPVC, ABS, PP-R and PEX plastic pipes. Refer to the NCFI Applicator Bulletin "2025 NCFI TECH BULLETIN- SPF TO CPVC AND OTHER PLASTIC PIPES.pdf" for the required application technique. The pipes must not be pressurized during the foam application.

APPLICATION AROUND ELECTRICAL WIRES

The 12-008 system can be applied in contact with electrical wires. Refer to the NCFI Applicator Bulletin "Spray foam Application Around Electrical Wires" for the required application technique. Applicators must spray the foam in such a manner that the expanding foam does not stretch or distort the wires. When encapsulating light gauge wires in the foam, a foam layer should be installed behind the wires, then allow time for the foam to cool before applying the foam that covers the wires.

VAPOR RETARDER

The 12-008 should be installed in accordance with the provisions of the 2021 IRC for walls and attics. For applications in colder climates, building codes may require a vapor retarder on the warm side of the open cell foam. Consult the local building codes for the specific requirements.

LIMITATIONS

The 12-008 foam shall not be applied in electrical outlets, in junction boxes, to substrates over 120°F, or in direct contact with water. 12-008 should not be used when the continuous service temperature of the substrate is >180°F.

HEALTH AND SAFETY HANDLEING

When spraying or handling InsulStar® Light OPTIMAXX Iso and resin, the following protective steps and equipment are recommended:

Protective Measures

- Adequate ventilation
- Safety training for installers
- Use of appropriate personal protective equipment
- Medical surveillance program

Protective Equipment

- Coverall (non-porous)
- Nitrile gloves
- Protective eyewear
- Supplied full face fresh air respirator

Exposure

- Avoid all contact with skin
- Avoid all contact with eyes
- Do not ingest
- Do not inhale vapors



Complete free health and safety training before applying this product.

The NCFI's Product Stewardship Manual contains additional information and should be reviewed by all spray foam applicators. The American Chemistry Council (ACC) www.polyurethane.org , the Center for Polyurethanes Industry (CPI) www.spraypolyurethane.org, and the Spray Polyurethane Foam Alliance (SPFA) www.sprayfoam.org are good resources for additional information regarding the safe handling and application of spray foam chemicals.

Applicators should ensure the safety of the jobsite and other personnel in the area. Insulation is combustible and no hot work such as welding and soldering should take place until the foam is covered with an approved barrier.

VENTILATION OF SPRAY AREA

Spraying foam will generate a mist and airborne particulates. For interior applications, the building area must be vented with fresh air to dissipate the particulates. The amount of air flow and time for venting will vary based on each situation. Refer to the NCFI Technical Bulletin "NCFI TECH BULLETIN- VENTILATION REQUIREMENTS FOR REENTRY AFTER SPF APPLICATIONS REV 4-15-26.pdf". SPF contractors should refer to this guidance prior to beginning any spray foam application project. Other workers and occupants should remain out of the immediate area during this venting time.

Reentry = 4 hour @ minimum 20 ACH
Reentry of trades without PPE can be achieved after 4 hours, with 20 ACH ventilation rates. Do not allow anyone to enter the work area without equivalent PPE to the applicator both during application and for 4 hours after application with 20 ACH ventilation to avoid exposure to MDI.

Commercial Reoccupancy = 24 hours @ minimum 0.3 ACH
Reoccupancy of the space can be achieved 24 hours, with 0.3 ACH ventilation rates. Do not allow premature re-occupancy of the work area. This system has a 24-hour reoccupancy time before building occupants can return.

Residential Reoccupancy = 24 hours @ minimum 0.3 ACH
Reoccupancy of homeowners can be achieved at 24 hours after application, with a minimum mechanical ventilation rate of 0.3ACH for the duration. Do not allow premature re-occupancy of the work area.

BACTERIA AND FUNGUS RESISTANCE

InsulStar® Light is naturally able to inhibit the growth of bacteria and fungus (mold) per the ASTM C1338 test. The anti-microbial properties do not protect occupants of spaces insulated with InsulStar® Light from potential deleterious effects of molds, mold spores, or disease organisms that may be present in the environment.

ENVIRONMENTAL PRECAUTIONS

Do not allow liquid material to enter sewers, drains or ground water systems. Notify the relevant authorities in the case of accidental release of product that has caused environmental pollution.

MATERIAL SPILL CONTAINMENT AND CLEAN UP

Contain the spilled material if possible, then isolate the area to prevent personnel from walking into the material. Ensure there is adequate ventilation. Absorb the material with materials such as: absorbent clay, vermiculite, cat litter, sand, or sawdust. Collect the absorbed material in suitable and properly labeled container. Dispose of the material through a licensed disposal facility or contact local and state government for disposal procedures.

For MDI spills, the majority of the MDI then use a neutralization solution that consists of 2% liquid detergent, 10% sodium carbonate 88% water to decontaminate the spill.

WASTE DISPOSAL

Dispose of liquid chemical in a licensed disposal facility. Do not discharge into waterways or sewer systems. Contact Chemtrec (800) 424-9300 or Clean Harbors (800) 444-4244. Small quantities of resin and isocyanate can be mixed in an open top bucket or large trash bag in a well-ventilated area. Always wear appropriate PPE when mixing chemicals. Keep quantities small to avoid excessive heat build-up. Once cool, it can be disposed of in a landfill.

CONTAINER DISPOSAL

Steel drums must be emptied (as defined by RCRA, Section 261.7 or state regulations that may be more stringent) and can be sent to a licensed drum re-conditioner for reuse, a scrap metal dealer, or an approved landfill. Drums destined for a scrap dealer or landfill must be punctured or crushed to prevent reuse. Do not torch cut, weld, or heat drums. All NCFI labels should be removed, covered with spray paint, or wiped with solvent to remove all label content before disposal. The Reusable Industrial Packaging Association (RIPA) can help you find a drum recycler www.reusablepackaging.org .

Some metal recyclers or re-conditioners may require the drums to be decontaminated prior to accepting the drum. "A"-side drums can be neutralized with a solution that consists of 2% liquid detergent, 10% sodium carbonate and 88% water. Neutralizer solution can be stirred rapidly into the waste isocyanate in a well-ventilated area. Keep the drum open – remove all closure bungs. Separate the solid waste from liquid, the collected neutralizer solution may be stored and reused. Check with your local landfills to determine if the solid waste may be considered hazardous.

TECHNICAL ASSISTANCE

For assistance, please contact NCFI's Technical Services dept. at (336) 783-3491 or techservice@ncfi.net

DISCLAIMER

The information on our data sheets is to assist customers in determining whether our products are suitable for their applications. The customers must satisfy themselves as to the suitability for specific cases. NCFI warrants only that the material shall meet its specifications. This warranty is in lieu of all other written or unwritten, expressed or implied warranties, and NCFI expressly disclaims any warranty of merchantability, fitness for a particular purpose, or freedom from patent infringement. Accordingly, buyer assumes all risks whatsoever as to the use of the material. Buyer's exclusive remedy as to any breach of warranty, negligence or other claim shall be limited to the purchase price of the material. Failure to adhere to any recommended procedures shall relieve NCFI of all liability with respect to the material or the use thereof.

TROUBLESHOOTING

Drippy & Runny Foam – (1) Temperatures are set too low, and the material is cold. Increase setpoints in 3-5°F increments. (2) The substrate temperature is too cold. Prewarm the substrate or apply a ½-1 inch flash pass.

Blowoff- (1) You are spraying too close, and the foam is blowing off. Adjust your distance away from the substrate. (2) The speed that you are spraying is too slow and causing blow off. Increase the speed of your application.

Poor Adhesion – (1) Substrate temperature is too cold. Prewarm the substrate or apply a ½ -1 inch flash pass. (2) – Substrate moisture is too high and should not be sprayed. (3) – Wrong side is being sprayed. OSB can sometimes be installed with the incorrect side facing towards the interior and the foam will have poor adhesion to this surface. (4) Steam from the reaction is collecting on the substrate. Spray from the top of the substrate then down.

Poor Cohesion – Subsequent layer was applied too quickly and there may be trapped steam. Allow the foam to cool between subsequent passes.

Voids Behind Foam – (1) If there are stringy hairs between the substrate and foam, it may be too cold. Increase setpoints in 3-5°F increments. (2) If the skin of the foam is crusty, the foam may be too hot. Decrease setpoints in 3-5°F increments. (3) Substrate temperature is too cold. Prewarm the substrate or apply a ½ -1 inch flash pass. (4) Substrate moisture is too high and should not be sprayed.

Large Voids, Large Cell Structure, & Marbling– (1) Temperatures are too low. Increase setpoints in setpoints in 5°F increments. (2) Cold material. Machine ΔT may be too low and you should heat the material in the drums.

Blistering or Fish Eye – Too much moisture in the substrate. Check the substrate moisture and bring in indirect heaters to dry out the substrate.

Dark Brittle Foam – Material is off ratio and iso rich. (1) There is a blockage on the resin side. Check in-line filters on the proportioner and spray gun. Check for an empty drum. Check for blocked side seal. Check ball valves on transfer pump, then ball valves and seals on the proportioner unit. (2) Cold material. Heat the material in the drum to >65°F.

Light Spongy Foam - Material is off ratio and resin rich. There is a blockage on the iso side. Check in-line filters on the proportioner and spray gun.

Gun Clogging – (1) Material temperature is set too high. Lower setpoints in 3-5°F increments. (2) Air pressure is insufficient. You should have an inlet air pressure of 80-130 psi.

Poor Yield – (1) Temperatures are set too low. Increase setpoints in 3-5°F increments. (2) The substrate temperature is too cold. Prewarm the substrate or apply a 1-inch flash pass. (3) Lifts are too thin. Spray the maximum amount per pass and avoid excess touch-ups. (4) Overfilled cavities and too much scarfing. Adjust application speed or mix chamber to properly fill cavities. (5) Off-ratio foam. Check for blockages or cold material.

Pulls Away from Studs – (1) The foam is too hot and is shrinking. Lower primary heaters and hose temperatures by 3-5°F increments. (2) Substrate moisture is too high and should not be sprayed. (3) Substrate temperature is too cold. Prewarm the substrate or apply a 1 inch flash pass.

Air Pockets– (1) Cold resin material. (2) Inadequate spray heat (3) Not spraying at 90° angle (4) Spraying too close or too far from the substrate. (5) Improper spray pressure

Overspray– (1) Spraying too far from the substrate. (2) Pressures set too high. (3) High wind