

ENERTITE® X Open-Cell Low Density Spray Polyurethane Foam Insulation Preparation, Processing and Application Guidelines

ENERTITE X is a two-component, low-density open cell spray polyurethane foam (ocSPF) insulation system, created by the chemical reaction between an Isocyanate and a resin. ENERTITE X can only be processed with BASF's ELASTOSPRAY® 8000A Isocyanate. When these materials are combined in the spray gun's mixing chamber, a chemical reaction occurs, generating heat. This heat, or exothermic reaction, causes the chemicals to expand creating foam. The final cured ENERTITE X product is yellow/off white. ENERTITE X is a water-blown formulation that comes in one reactivity grade and requires mixing before and during processing.

TO BE INSTALLED ONLY BY PROPERLY TRAINED CONTRACTORS USING PROPERLY FUNCTIONING EQUIPMENT

Installation of BASF spray foams requires special equipment and training. Only individuals that have completed training through verifiable sources (i.e., ABAA, Third-party Training, BASF TTC Training, CPI Online Health & Safety Training, SPFA Professional Certification Program [PCP]) can install ENERTITE X spray foam.

These Application Guidelines are for general reference only. Qualified individuals must be familiar with one or more of these industry guidelines: [Spray Foam Coalition Guidance on Best Practices for the Installation of SPF](#), SPFA PCP Manuals or [ASTM Standard C1848](#). For any additional guidance on proper use of ENERTITE X spray foam, please refer to the Technical Data Sheet and Code Compliance Research Report (CCRR) 1032 or Evaluation Service Report (ESR) 3102. To speak to BASF regarding further open-cell foam application and processing guidelines, call 1-800-706-0712 Option 2 (CST) or email spf.techsales@basf.com. In addition, BASF Technical Data Sheets, Quick Reference Guides and other technical resources are accessible here: [BASF Technical Documents](#)

SHELF LIFE AND STORAGE CONDITIONS:

NOTE: ENERTITE X resin has a shelf life of approximately six (6) months and ELASTOSPRAY 8000A Isocyanate has a twelve (12) month shelf life from the date of manufacture when stored in original, unopened containers at 50 – 85 °F. As with all industrial chemicals, this material should be stored in a covered, secure location and never in direct sunlight. Storage temperatures outside the recommended range will shorten shelf life. Using product past its shelf-life will produce a non-credentialed product.

PROPER APPLICATION PARAMETERS

Weather and Environmental Conditions

Before beginning an application, ensure the surrounding environment meets the following conditions:

Wind	When applying outdoors, wind speed must not be higher than 10 MPH unless windscreens are used. Do not spray unless tented if the wind speed is over 15 mph.
Humidity & Dew Point	No spraying should be done when the ambient temperature is within 5 degrees of the dew point. When the relative humidity (RH) is above 80%. Spray foam applications must be monitored and inspected frequently for adequate adhesion. High RH could cause blistering problems and weaken foam adhesion.
Ambient Temperature	ENERTITE X should be installed in an AMBIENT temp. range between 45 °F to 120°F.

Substrate Temperature Conditions

Before beginning an application, ensure the continuous substrate temperature onto which ENERTITE X is to be applied remains within the following range at all times:

Normal substrates (i.e. wood, wood-based products)	Heat sink substrates (i.e. concrete, metal)
45°F to 120°F	55°F to 120°F

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SUBSTRATE PREPARATION

Prior to beginning application, determine if the substrate can be used with spray foam by conducting an adhesion test in accordance with ABAA, Third-party Training, BASF TTC Training, CPI Online Health & Safety Training, SPFA PCP Training, and/or ASTM C1848 Standard. All substrates to be sprayed must be free of frost, dew, moisture, dust, oil, wax, mold release, grease, oxidization (rust), loose particles, and any other element that may inhibit proper adhesion of the SPF to the substrate.

Metal surfaces (i.e., ferrous, or galvanized metals) may require the application of a primer or may require specialized treatments i.e. wire brush, chemical treatment, or commercial sand blasting prior to priming. Other surfaces may require additional preparation – pay special attention to substrates with high moisture content (concrete less than 28 days cured, and wood with moisture content over 18%, etc.). See training material for further information.

PASS THICKNESS AND MULTIPLE PASSES

The heat created by the exothermic reaction during application creates a risk of scorching and/or fire, as well as irritating odors. This risk increases with greater pass thickness.

All ENERTITE X must be applied to a minimum of ½” (15mm) pass thickness and to a 6” (180 mm) maximum thickness in one pass or lift. Pay close attention to areas where thick pockets of foam may develop during application, such as rim joists, header spaces, exterior wall corners, small stud spaces, and wall intersections, to ensure that no section of a pass exceeds the maximum thickness in a pass/lift.

If you spray a pass more than the maximum pass thickness, those areas must be immediately removed from the substrate using a non-flammable tool such as a crowbar – do not use your hands. After removal, break up large pieces of foam on a non-flammable surface using the non-flammable tool. Large masses of SPF should be removed to an outside safe area, cut into smaller pieces, and allowed to cool before discarding into an appropriate trash receptacle.

When spraying multiple passes, a cooling/dwell time of 5 minutes (minimum) per pass applied must be allowed for the dissipation of heat. Not allowing adequate cooling/dwell time raises the risk of scorching and/or fire or odor. Once the installed material has cooled, it is possible to add additional passes to increase the overall installed thickness of SPF. Install a maximum of four passes, at the maximum allowable pass thickness, per 12-hour period. The odor level of spray polyurethane foam is dependent on proper application using the recommended processing parameters and proper ventilation during the application.

The table below is designed to indicate the minimum and maximum application rate. Applications less than the optimal pass range could lead to increased density and reduced yield.

	ENERTITE X - water blown, open cell SPF
Minimum pass thickness	½”
Maximum lift thickness per pass	6”
Optimal thickness range	4” – 6”

IMPACT OF EXOTHERM ON CONSTRUCTION MATERIALS

In addition to temperature control within the foam itself, care must be given to applications over materials that the foam contacts, and/or encapsulates. Maximum service temperature of SPF is 180°F. Common construction materials such as wiring (both NM (non-metallic) electrical wiring and low-voltage wiring (security, electronic, etc.), as well as plastic pipes, including but not limited to PEX, PVC, cPVC and ABS, typically have maximum exposure temperature of 140 – 220°F. If spraying on a heat sensitive product, adequate heat mitigation techniques include the use of a flash coat, applying SPF so that the product does not end up in the point of hottest exotherm, and shielding the material from encapsulation.

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Warning: These products can be used to prepare a variety of polyurethane products. Polyurethanes are organic materials and must be considered combustible.

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RESIN MIXING, HEATING AND RECIRCULATION INSTRUCTIONS

STEP 1: Mix the resin drum for a minimum of 10 – 15 minutes.

- Use a minimum 500 RPM speed agitator (mixer) with 3 sets of collapsible blades:
 - Bottom blade should be about 1-2" off bottom of the drum.
 - Middle blade positioned 10" above the bottom set of blades.
 - Top set of blades positioned 10" above the middle set of blades.

STEP 2: Ensure a minimum resin temperature of 85 - 95°F prior to spraying.

- If resin drum is <85°F, recirculate/blanket heat until resin material is 85 – 95°F.
- **If resin drum is ≥85°F, no recirculation or blanket heating is necessary.**

STEP 3: Maintain medium speed mixing of resin throughout application process.

- When mixing is halted for more than 30 minutes, repeat STEPS 1 – 3 and spray off-target for 30 seconds before proceeding to install SPF.
- Material may separate in the hose if left unattended for extended period without pressure and temperature. If so, bleed material back into drum until the line is filled with homogenous resin mix. Then repeat Steps 1 – 3 and spray unwanted product off-target until producing suitable material.

DO NOT MIX ENERTITE X WITH ANY OTHER PRODUCT

APPLICATION INSTRUCTIONS

- A small "test area" of spray foam should be applied and inspected prior to commencing the project.
 - Check the reactivity, density, spray pattern, mix quality, and foam cell quality by test spraying onto a disposable piece of substrate.
 - This simple, low-cost test area can indicate inadequate adhesion, improper surface preparation and/or primer requirements, surface contamination, improper substrate and/or ambient conditions, equipment malfunctions, material contamination, or improper application technique.
 - Visual inspection of a sample cut from first test area and periodic job samples can reveal potential problems that may be due to one or more of the above conditions.
- Hold the spray gun perpendicular 18-24 inches from the substrate if spraying a cavity and 18-36 inches from the substrate if spraying an open wall or underside of a roof. Arm extension and stretching beyond perpendicular should be minimized while spraying.
- The thickness of a pass depends on the speed of the arm movement while spraying and the overlap of the spray pattern. Smooth, steady movements ensure proper application and uniform density.
- If trimming is required, it is recommended to use an electric saw 15 minutes after installing foam.

EQUIPMENT SETTING & PROCESSING RECOMMENDATIONS

High Pressure Proportioning Equipment	1:1 by Volume	Various Manufacturers
Hose and Primary Heaters, °F	125 - 150	Adjust ± 3 degrees
Static Pressure, psi	1150 – 1500	All Climates, ± 50 psi
Dynamic Pressure, psi	900 – 1300	All Climates, ± 50 psi

- The optimum temperature may vary with the type of equipment used, the application conditions, and the climate zone. For more information on equipment consult the Spray Polyurethane Foam Alliance (SPFA) technical document AY-137.
- BASF's SPF systems are formulated to produce foam with physical properties representative of our published data sheets within the factory set tolerances of commercially available fixed ratio proportioner units.
- When the material level gets below the mixing blade, the applicator will need to be cautious of foam quality. The lack of mixing could produce poor quality foam where the material could separate. The remainder of the low-level drum should be poured over to a new drum and mixed with the new drum before using. If there is any poor-quality foam applied, it MUST be removed and the area resprayed.

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PROPER VENTILATION, REENTRY AND REOCCUPANCY

Application space must be properly ventilated during and after application of SPF. Consult the [EPA's "Ventilation Guidance for Spray Polyurethane Foam Application" document](#), the [American Chemistry Council's "Ventilation Considerations for Spray Polyurethane Foam" documents](#) for specific requirements, and the [BASF Technical Tip #20 Jobsite Ventilation Re-occupancy & Re-entry time for Open & Closed cell Spray Polyurethane Foam](#). A 24-hour reentry and re-occupancy time without proper ventilation rates is advised. In the American Chemistry Council – Center for the Polyurethanes Industry website you will find two open cell studies conducted by BASF, "[Spray Polyurethane Foam Monitoring and Re-Occupancy of High-Pressure Open Cell Applications to New Residential Constructions](#)" and "[Open Cell Monitoring, a Follow-up After Reformulation](#)." It is within these studies that the suggested values of the table below were extrapolated.

BASF Product	Reentry @ 20 ACH*	Reentry with minimal ventilation	Reoccupancy
ENERTITE X	2 hours	4 hours	24 hours
*Ventilation rates based upon ventilation used DURING the time of application and for the time frame listed.			

Properly designed work zone containment including, but not limited to, controlled negative pressure, contained air flow/movements, appropriate air supply /exhaust system together prevent contaminants from moving into adjacent spaces and provide a way to eliminate lingering odors and contaminants. Provide proper ventilation and isolation of the spray area in order to ensure no entry or exposure by other trades or occupants, during the spray period and after completion while the materials cure. Consult appropriate design professionals.

PROCESSING AND APPLICATION INSTRUCTIONS IN COLDER CONDITIONS

ENERTITE X can be applied in cooler conditions (45-60°F), with special attention to the substrate and ambient temperature guidelines as well as the following important additional instructions.

- Start by not allowing product to freeze as B-side material can separate and A-side can form crystals. Ensure drums are stored between 50 – 85°F, never in direct sunlight. This may require keeping drums off floor and conditioning the storage area.
- Material should be brought to minimum of 85°F before beginning processing to ensure proper heating of both components. If warming of material is required, it may take hours or days to heat up from low temperatures. Material colder than 65°F may be difficult to pump.
- Preheat spray area and substrate in advance (45°F). Properly address "heat sink" materials such as concrete or metal. Stay away from heaters that produce moisture/condensation (i.e., propane, kerosene). Inspect substrate for visible moisture (i.e., condensation, frost, ice or snow). Frequently re-inspect during the spraying process.
- Picture framing technique in studs in addition to "flash pass coating" help prevent curling and shrinkage.
- Spraying terminations and allowing proper cooling before tying in the remainder of the foam will help reduce strain from curing.
- Friability (powdery surface on SPF during cold weather conditions) results from lack of heat during the foaming reaction which extends the timeline for both curing and polymerization of the plastic foam. During this time the foam is in a fragile state but will firm up with time. Thermal Shock (when the exotherm of the spray foam is subject to rapid cool down because it is applied to a cold target or exposed to cold air after application) may lead to separation before the foam fully cures to obtain all its physical properties, including a firm bond to the target.
- Quality control – small scale test areas provide an opportunity to see how all materials are installed and evaluate their properties prior to proceeding. Stop and correct any issues before continuing.

For additional detailed spray instructions, refer to Training materials.

IT IS STRONGLY ENCOURAGED TO COMPLETE A QUALITY CONTROL DAILY REPORT AND AN INSULATION CARD FOR EACH PROJECT

DIRECTIONS FOR FLUSHING MATERIALS

- Mix resin before pushing through the line.
- If equipped to do so, purge resin line with air and followed with warm-water flush,
- When flushing ENERTITE X out of the line, using 5-gallons of warm water to flush out the resin (B-side) is recommended before switching to any other BASF foam.
- Every 50 ft of 3/8" hose contains approximately 1/2 gallon of material (1/4 gallon resin and 1/4 gallon isocyanate). For 300 ft of hose, approximately 3-gallons of material will need to be purged from the lines to get to fresh material.
- If material is **bled out**, please note that where one is pushing out, there will be some cross contamination of the two resins. The bled material can be re-used, if cross contamination has not occurred. Please note that the same isocyanate (A-side) material is used for both BASF closed and open cell SPF and therefore, the resin (B-side) is the only side that is required to be bled out. If competitor materials are in the line, then both the A-side and B-side must be bled out.
- If material is **sprayed out**, purge the cross-over material out onto polyethylene plastic or cardboard until you get to the material

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you are intending on spraying. Once you have all the first material out of the system, you will need to do a quality check prior to spraying the foam into cavities. **DO NOT** spray too thick of pass to reduce the chance of starting a fire due to exotherm heat.

- CROSSOVER MATERIAL SPRAYED IN THE WALL CAVITY SHOULD BE REMOVED IMMEDIATELY BEFORE CONTINUING. Dangerous exotherm could occur if the crossover material is sprayed too thick (>2 inches in a single pass).
- If transitioning from ENERTITE X to another manufacturer's open or closed cell resin, flushing is required. Follow any flushing or processing guidelines required by that manufacturer. Both the isocyanate (A-side) and the resin (B-side) should be flushed out. If sugar foam is in the line a 5-gallon water flush out of the resin (B-side) is recommended.

POUR OVER INSTRUCTIONS

- **If there is material in the current resin drum, below the mixing blade, resin from current drum can be poured over into the next ENERTITE X drum to use. The combined resin MUST be mixed (minimum 20-minutes) after this transfer.**

EXPOSED FOAM

Spray foam is combustible and is required by building codes and the insurance industry to be covered for fire protection. Nearly all applications of spray foam inside a home or building are required to be protected by either a thermal barrier or ignition barrier, unless special approval or assemblies are otherwise cited in code compliance reports. The thermal or ignition barrier coatings approved for application over BASF SPF's can be found on the open cell Evaluation Reports [ESR 3102 / CCRR 1032](#). For more information regarding these requirements, you can consult with BASF Technical Advisors, [SPFA Technical Document AY-126](#) or www.spraypolyurethane.org. In addition, sunlight adversely affects urethane foams. For this reason, it is recommended that a UV protective coating be applied over the finished foam if it is to be exposed longer than 90 days. This would help protect against the deteriorating effects of ultraviolet radiation and atmospheric moisture.

DISPOSAL

Disposal of containers or unused chemical must be done in compliance with all applicable Federal, State, County or Municipal guidelines. Do not burn materials in drums containing residue. Empty containers that have been properly prepared should be recycled by contacting RIPA – The Reusable Industrial Packaging Association at www.reusablepackaging.org for the nearest drum reconditioner near you.

TECHNICAL ASSISTANCE

For more detailed information, contact Inside Technical Sales at Toll-Free: 1-800-706-0712, Option 2 (CST)

Email: spf.techsales@basf.com

Website: <https://spf.basf.com/>

Technical Resources: [Contractor Resource Center](#)

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