UPC 2.0 PREMIUM HFO

TECHNICAL DATA SHEET & SPRAY GUIDELINES **CCRR-0375**

UPC 2.0 PREMIUM HFO LOW GWP CLOSED-CELL SPRAY FOAM

UPC 2.0 PREMIUM HFO is a two-component, medium density, one to one by volume spray polyurethane foam (SPF) system. UPC 2.0 PREMIUM HFO system consists of an "A" component (ISO) and a blended "B" component (Resin) in separate drums. UPC 2.0 PREMIUM HFO contains low GWP 1233zd blowing agent technology. UPC PREMIUM HFO is a medium-density foam in compliance with ICC 1100 and ICC AC 377.

Physical Properties					
Core Density	ASTM D1622	2.20 pcf ± 0.10	**Closed-Cell Content**	ASTM D1940	93%
R-Value @ 1"	ASTM C518	8.1	**Shear Strength**	ASTM C273	45 psi
R-Value @ 2"	ASTM C518	16	**Tensile Strength**	ASTM D1623	45 psi
R-Value @ 3"	ASTM C518	23	**Air Permeance @ 1"**	ASTM E2178 @ 75 PA	< 0.031 L/sm²
R-Value @ 4"	ASTM C518	31	**Dimensional Stability**	ASTM D2126	<7%
Water Vapor Permeance	ASTE 96	0.73 @ 1 inch	**Compressive Strength**	ASTM E1621	27 psi
Water Resistance	AATCC TM 127-2014	Pass	**Shelf Life**	4.5 months when stored between 50°F - 75°F	
Liquid Properties		**A-SIDE: PMDI Isocyanate**		**B-SIDE: UPC 2.0 HL HFO Resin**	
Color		Brown		Light Amber	
Viscosity (Brookfield cps) @ 77°F		200 ± 30		650 ± 150	
Specific Gravity		1.24		1.22	
Mixing Ratio (volume)		1:1		1:1	
Fire Test Results					
Flammability: Class A (Class 1)		ASTM E84 @ 4"		<25 Flame Spread | <200 Smoke Development	
Large Scale Fire Testing: Ignition Barrier		AC 377 Appendix X*		PASS: NO COATING	
Large Scale Fire Testing: Thermal Barrier		NFPA 286*		PASS: 16 Wet Mils DC 315	
Large Scale Fire Testing: Thermal Barrier		NFPA 286*		PASS: 14 Wet Mils No Burn Plus ThB	
UPC 2.0 PREMIUM meets or exceeds the IBC requirements for exterior walls in type I, II, III, IV and V construction. This includes NFPA 285 and NFPA 259 testing with Intertek Listings (GWL/FIP 30-02, GWL/FIP 30-03).					

Reactivity Profile							
Cream Time	0-1 seconds	**Gel Time**	2 seconds	**Tack Free**	3-4 seconds	**End of Rise**	3-5 seconds

• See Intertek CCRR-0375 for additional instructions or consult with UPC's Technical Department for details at 203.760.0025.

PROCESSING PARAMETERS

Pressure (Dynamic)
• 1000-1400 psi, depending on mix chamber

Machine Temperature
• A-Side: 105° to 125°F (41° to 52°C)
• B-Side: 105° to 125°F (41° to 52°C)

Hose Heat Temperature
• 105° to 125°F (41° to 52°C)

Substrate Temperature
• UPC 2.0 PREMIUM HFO Regular: 60° to 90°F (16° to 32°C)
• UPC 2.0 PREMIUM HFO Summer: 90° to 120°F (32° to 49°C)
• UPC 2.0 PREMIUM HFO Winter 30° to 60°F (-1° to 16°C)

Drum Temperature
• A-Side: 50° to 75°F (10° to 24°C)
• B-Side: 50° to 75°F (10° to 24°C)

• **MAXIMUM PASS THICKNESS: 2.0 INCHES**
• Optimal temperature and pressure setting are affected by the equipment being used, as well as ambient and substrate temperatures.
• **Important**: Many factors affect yield, including substrate temperature, substrate type, and pass thickness. Multiple passes will significantly reduce yield. Larger mixing chamber sizes and higher pressure settings will also reduce yield.

PROCESSING INSTRUCTIONS - READ CAREFULLY

Agitation	DO NOT agitate.
Drum Temperatures & Recirculation	DO NOT RECIRCULATE. Starting chemical temperatures in the drums should be between 50°-75°F for both the A-Side & B-Side drums. Use IR thermometer or inlet temp gauge to measure drum temp (A-Side drum should NEVER be warmer than B-Side drum). If drum is below 50°F, then slowly raise temp with warming blanket or heated storage. NEVER super-heat with portable heater. If drum is too hot then blowing agent will boil-off.
Substrate Condition	Substrate must be clean, dry, and moisture content <19%. Substrate temp should be >5°F above dew point. When substrate temperature is below 45°F, pre-heat building may be necessary. When heating with portable heaters, if concrete or metal substrate only heat to 50°F, otherwise condensation may form. Never use portable propane heaters. When substrate temperatures vary, please refer to the processing parameters section (under substrate temperatures) for proper selection of foam grade.
Contamination	B-Side is sensitive to contamination from other products. Never combine this product with any other product and never combine open-cell with closed-cell products. Transfer pumps must be properly cleaned between product.
Spray Technique	Spray up-and-down approx 18" from surface. The further away you spray, the colder the chemical will be when reaching substrate. Layering will reduce yield, but make smoother. When substrate temp is below 35° F, may need ½" priming layer to improve adhesion.
Metal | Concrete Applications	When applying on metal or concrete you may need a ½" priming layer. Increase temperatures by 2°-5°F to account for heat loss from these surfaces.
Max Pass Thickness	Max pass thickness is 2". If the foam is applied too hot or too thick, will overheat foam and cause burnt or "fishy" odor, result in future shrinkage, or possibly lead to fire hazard (including spontaneous combustion). 2nd layer may be applied after 1st layer is hard to the touch. **Important: Core foam temp should never exceed 270°F.**

PROCESSING INSTRUCTIONS (CONTINUED)

Temperature Settings	As a general rule of thumb, the hose temperature is the most important setting and should be set first. The A-Side is set 2°-5°F higher than the hose. The B-Side is set 2°-5°F higher than the A-Side.
High Altitude	At higher elevations, A-Side & B-Side temps may have to be set the same as the hose. Foam expands better at high elevation, be careful to control pass thickness
Heated Hose	A poorly insulated hose may not be able to maintain adequate hose heat and drastically change required temp settings on primary heaters. Never Increase hose temp above 145°F, you can burn the hose.
Maximizing Yield | Dialing-In Temps	Dozens of factors affect yield, but properly dialing in temps and # of layers is critical. Ideal core temp should be 240°-260°F, this is the yield sweet spot (use a digital meat thermometer to test the core temp). DO NOT exceed 270°F. For experienced sprayers, start temperatures cold enough that the rising foam sags slightly, then increase temps 5°F at a time until sagging stops. Many thin layers will reduce yield significantly.
Pressure Settings	Mix pressure settings to the Gun for 01 mix chamber should be @ 1000 psi, for 02 @ 1200 psi. Higher fluid pressure settings create more mist and require greater distance from the cavity, resulting in more overspray. Higher pressure will generally lower yield. Air purge pressure set 80 - 100 psi.

TROUBLESHOOTING GUIDE

Delamination	If foam delaminates from substrate, it may be from cold substrate. Apply an initial ½" priming layer to improve adhesion. Another cause may be excess moisture in substrate; try reducing A-side temps by 5°-7°F to reduce Iso reactivity. Spraying over uncured foam may also cause delamination.
Blistering	If foam creates voids and blisters behind foam, it may be from too much moisture in substrate. Apply a flash layer pass to the substrate, then apply regular pass as normal. IF spraying on metal and blisters form, try increasing thickness of initial pass (no less than ½").
Elongated Cell Structure	If the foam has stretched or elongated cells, then it is likely too hot. Try reducing all temps by 5°F.
Large Cell Structure	If the foam has consistently large cell structure,then the B-Side Resin may be contaminated with open-cell resin or contaminated or worn out mix chamber.
Crunchy or Gummy	If foam is crunchy and amber in color, then foam may be Iso rich and off-ratio. If "gummy" consistency, then foam may be resin rich. Check equipment. Cured foam should be snappy in consistency when broken apart.
Chalky | Brittle	Too hot. Lower all heaters by 5°-7°F. If problem does not resolve, lower temperature by another 5°F, and repeat.
Curing Too Fast	If the closed-cell is curing too fast, then it is too hot and could result in future cracking. Lower temperatures by 3°F or as needed.
Curing Too Slow	If the closed-cell is curing too slow, then it is too cold and you may see a narrow spray pattern. Raise temperatures by 5°-7°F or as needed.
Gun is Clogging Often	If the mixing chamber needs constant cleaning, then foam may be too hot. Lower temperatures by 3°-5°F or as needed. Also check gun air settings.
Poor Yield	Too Cold: substrate, process temp or too large mix chamber. If temperatures are dialed-in too cold, then lack of heat will generate poor chemical reactivity & poor yield (See "Drum Temperatures" & "Maximizing Yield" under Processing Instructions). Check chemical expiration.
Pulls Away From Studs	If pulls away or "shrinks" from studs over time, then foam was applied too hot, too thick, or second layer applied over hot foam.
Important	Minimum drum temperature of 50°F is necessary to bring viscosities of A-Side & B-Side in alignment to prevent off-ratio foam and increase yield; setting chemical temperatures above recommendations may result in B side frothing. If the B-Side drum is over 85°F, then the blowing agent may boil and cause imbalance pressure in proportioner.
Frothing	UPC 2.0 PREMIUM HFO contains a dissolved blowing agent. If the B-Side drum is overheated or excessively agitated, the chemical may froth out. Using winter formula in summer temps may also contribute to frothing or imbalance pressure in proportioner.

Cautions and Recommendations

UPC 2.0 PREMIUM HFO is designed for installation in most standard construction configurations using common materials such as, concrete, metal, and wood products. The foam should not be used when the continuous service temp of the substrate is >180°F. Foam plastic installed in walls or ceilings may present a fire hazard unless protected by an approved, fire-resistant thermal barrier with a finish rating of not less than 15 minutes as required by building codes. Rim joists/header areas in accordance with the IRC® and IBC®, may not require additional protection. Foam plastic must also be protected against ignition by code-approved materials in attics and crawl spaces or as code approved alternatives apply.

As with all SPF systems, improper application techniques should be avoided and any defective product replaced with properly installed materials. Examples of improper application techniques include but are not limited to, excessive application thickness, off-ratio material and spraying into or under rising liquid foam. Additionally, off-ratio materials can result in offensive odors that may not dissipate. It is the responsibility of the applicator to understand how their equipment works.

Job-site Warnings

Applicators should ensure the safety of the job-site and construction personnel. SPF Insulation is combustible and appropriate signs shall be posted warning that all "hot work" such as welding, soldering, and cutting with torches should not take place until a thermal barrier or approved equivalent is installed over any exposed polyurethane foam.

Contractors should communicate with other trades working in proximity to the spray application area. Appropriate warning signs at each entryway must be posted that clearly indicates that spray foam activity is taking place and proper respiratory protection is required to enter. Non SPF personnel and occupants should be vacated from the building during the application of SPF. Proper Ventilation during spraying and afterwards at minimum 10 Air changes per hour. **Re-Entry:** Ventilate for 2 hours before personal protective equipment is no longer required for trades and inspectors.

Re-Occupancy: After 24 hours of continuous ventilation, building may be re-occupied.

Health and Safety Information

Before working with this product, you must read and become familiar with available information, including the Safety Data Sheet (SDS), regarding the risks, proper use and safe handling. All contractors and applicators must use appropriate respiratory, skin and eye Personal Protective Equipment (PPE) when handling and processing spray foam systems.

Refer to the Center for the Polyurethanes Industries (CPI): "Guidance for Developing a Written Respiratory Protection Program", "Guidance on Best Practices for the Installation of Spray Polyurethane Foam", and "Spray Polyurethane Foam Product Stewardship Guidance". Available at www.spraypolyurethane.org and www.upcfoam.com.

Shelf Life and Storage

UPC 2.0 PREMIUM HFO has a shelf life of approximately 4 months from the date of manufacture when stored in original, unopened containers at 50°-75°F. This material should be stored in a secure location and never in direct sunlight. Storage temperatures above the recommended range will shorten shelf life.

Vapor Retarder

When installed at a minimum of 1.5-inch, UPC 2.0 PREMIUM HFO is considered a Class II vapor retarder. Consult with local code officials for specific requirements Climate zone tables are available in current IBC® and IRC® publications.

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