UPC 500 Classic ESR-3803 | CCRR-0358

TECHNICAL DATA SHEET & SPRAY GUIDELINES

UPC 500 Classic OPEN-CELL FOAM

UPC 500 Classic is a two component, water blown (zero ozone depleting chemical) light density, open cell spray polyurethane foam insulation that is designed to improve the performance of the building envelope for interior commercial, residential and industrial applications.

Physical Properties					
Core Density	ASTM D1622	0.5 pcf ± 0.05	**Tensile Strength**	ASTM D1623	3.35 psi
R-Value @ 1"	ASTM C518	3.9	**Air Permeance @ 3.5"**	ASTM E2178 @ 75 PA	0.00431
Water Vapor Permeance	ASTM E96	8.4 Perms at 2"	**Dimensional Stability**	ASTM D2126	< 3.8%
Intertek Certified Clean Air Gold: Conforms to California Department of Public Health (CDPH) Standard Method v1.2: Private Office and School Classroom				CDPH 01350 v1.2: PO, SC, R for VOC emissions and formaldehyde	

Liquid Properties	**A-PMDI Isocyanate**	**UPC 500 Classic Resin**
Color	Brown	Amber
Viscosity (Brookfield cps) @ 77°F	200 ± 30	360 ± 100
Specific Gravity	1.24	1.07
Mixing Ratio (volume)	1:1	1:1

Fire Test Results			
Flammability	ASTM E84 @ 4"	15 Flame Spread | 200 Smoke Development	
Large Scale Fire Testing: Ignition Barrier	AC 377 Appendix X*	PASS: 6 Wet Mils DC 315	
Large Scale Fire Testing: Thermal Barrier	NFPA 286*	PASS: 18 Wet Mils DC 315 | 14 Wet Mils No-Burn	
Alternative Unvented Attic Assembly*: End Use Configuration Testing	Conforming to IBC Section 1202.3 or IRC Section R806.5	Approved for certain attics without a prescriptive ignition barrier or intumescent coating*	
NFPA 259	1,796 Btu/ft² @ 3.5"	**NFPA 285**	PASS

Reactivity Profile							
Cream Time	1-2 seconds	**Gel Time**	3-4 seconds	**Tack Free**	6-7 seconds	**End of Rise**	6-7 seconds

*See Intertek CCRR-0358 for additional instructions or consult with UPC's Technical Department for details: 203-760-0025

SPRAY PARAMETERS

This chart is a **starting guide** to set temperatures based on environment, mixing chamber size. Adjustments should be made to account for substrate temp/type, hose insulation condition, speed of sprayer, wind factor, etc. A smaller mixing chamber, like a 4242, will give you the best quality foam at optimal speed-to-yield ratio.

Select Mixing Chamber:	4242 | -01			5252 | -02			6060 | -03		
Select Ambient Temp and Match to Mix Chamber	Temperature Set ±			Temperature Set ±			Temperature Set ±		
	Hose†	A	B	Hose†	A	B	Hose†	A	B
Substrate Temperature for standard wood (Starting Drum Temperature Must be Minimum of 75 °F)									
> 90°F	*119°F*	*122°F*	*125°F*	*120°F*	*123°F*	*126°F*	*121°F*	*124°F*	*127°F*
80°F	*121°F*	*124°F*	*127°F*	*122°F*	*125°F*	*128°F*	*123°F*	*126°F*	*129°F*
70°F	*123°F*	*126°F*	*129°F*	*124°F*	*127°F*	*130°F*	*125°F*	*128°F*	*131°F*
60°F	*125°F*	*128°F*	*131°F*	*126°F*	*129°F*	*132°F*	*127°F*	*130°F*	*133°F*
50°F	*127°F*	*130°F*	*133°F*	*128°F*	*131°F*	*134°F*	*129°F*	*132°F*	*135°F*
40°F	*129°F*	*132°F*	*135°F*	*130°F*	*133°F*	*136°F*	*Not Recommended*		
CAUTION: Below 40°F a 1/4"-1/2" initial flashing layer may be applied to substrate to eliminate voids in cold weather.									
30°F	*130°F*	*133°F*	*136°F*	*Not Recommended*			*Not Recommended*		
20°F	*132°F*	*135°F*	*138°F*						
15°F	*133°F*	*136°F*	*139°F*						
10°F	*134°F*	*137°F*	*140°F*						
< 0°F	*Not Recommended*								
Pressure Setting	1200 +/- psi			1200-1400 +/- psi			1300-1400 +/- psi		

*Important notice regarding yield and density. 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	Agitation not required, but for optimal performance or older drum, we recommend high speed for 20-30 mins prior to spraying. Agitation NOT needed during application. Recommended agitators: Graco collapsing blade Agitator ##26C818 or #26C150
Drum Temperatures & Recirculation	Recirculate as needed to achieve chemical temperatures in the drums of 75°F-95°F for both the A & B-drums (this is necessary to bring viscosities of A&B in alignment to prevent off-ratio foam and increase yield). When recirculating, set the primary heater for the A-Side to 100°F and B-Side to 130°F. Use laser thermometer or inlet temp guage to measure drum temp (A-Drum should NEVER be warmer than B-Drum).
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. When heating with portable heaters, if concrete or metal substrate only heat to 50°F, otherwise condensation may form. Never use portable propane heaters.
Spray Technique	Spray side-to-side approx 18" from surface recommeded. The further away you spray, the colder the chemical will be when reaching substrate, and potential for voids. Reverse picture frame technique is also suggested if desired.
High Humidity	When the dew point is greater than 65°F, reduce the A-Side temperature by 5°F +/- to reduce Iso reactivity/blowbacks.
Contamination	B-Side is sensitive to contamination from other products. Never recirculate another product into the UPC 500 Classic. Never combine different products. Transfer pumps must be properly cleaned between product. Recirculating lines must be properly flushed before recirulating.
Max | Min Pass Thickness	Max practical pass thickness is 6-8" before resulting in splash-back. Min recommended pass thickness is 3", except when flash-coat needed.
Proper 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 3-10°F higher than the A-Side depending on humidity levels. If ambient conditions are hot and dry, all temps may be set the same.

PROCESSING INSTRUCTIONS *(continued)*

High Altitude	At higher elevations, A & B temps may have to be set the same as the hose.
† Heated Hose	The hose temp is the most important setting and should be set first to desired final chemical temp at gun. Hose temp should rarely be adjusted. Primary heaters should be increased if chemical is too cold. A poorly insulated hose may compromise adequate heating and drastically change required temp settings. 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 has the biggest impact. For open-cell, start temperatures hot enough that the foam shrinks slightly from the studs, then lower temps 3°F at a time until shrinkage stops - this is the yield sweet spot."
****Pressure Settings**	Higher fluid pressure settings create more mist and require greater distance from the cavity, resulting in more overspray. Higher pressure will generally lower yield. As a rule-of-thumb, you should practice spraying as close to 1000psi as practical.

TROUBLESHOOTING GUIDE

Poor Adhesion Between Layers or 'Fish Eye' Cells	If the foam does not adhere to itself and/or contains large random cells that appear like “fish eyes”, it may be caused by trapped steam between layers. Allow the 1st layer to cool before applying 2nd layer.
Pulls Away From Studs or Deflates	If pulls away or "shrinks" from studs within a few seconds, then foam is too hot. Lower primary heaters and hose temperatures by 3°F. Spray out chemical in hose (approx 2-3 gallons) until reduced temp is achieved. If problem does not resolve, lower temp by another 3°F, and repeat process until resolved. If foam pulls away from studs several minutes after application, then chemical may be contaminated.
Voids Behind Foam or Delamination	4 possible causes: 1. If “stringy hairs” between the substrate and foam (“coconut hairs”), the foam may be too cold. Increase all heaters by 5°F. Spray out chemical in hose until new increased temps achieved. Repeat process until problem is resolved. 2. If not “stringy” and skin of foam is “crusty”, then foam may be too hot. Decrease temps in 5°F. 3. Substrate moisture content may be too high. Try lowering A-side 5°F and call Tech Support. 4. Substrate too cold, try a 1/8-1/4” initial flash coat.
Voids & Shrinking	If foam creates voids and shrinks from studs at the same time, then increase B-side drum temp only to 100°F. Machine ΔT may be too low.
Beehive Cell Structure	If the foam has cosistently large cell structure, like a "beehive", then the foam may be too cold. Increase all heaters by at least 10°F to 15°F. If problem persists, chemical may be contaminated.
Color	If the foam appears yellowish or "marbling", then it is too cold. Primary heaters should be increased 3 to 5°F. Should appear "white".
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.
Poor Yield	Many factors affect yield, including low substrate temp, metal or concrete substrates, thin layers, multiple layers, larger mixing chamber sizes, higher pressure settings, and off-ratio foam. 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). B-Side may not be thoroughly mixed, may need agitating. Check chemical expiration.
Important	Regardless of proportioner heating capacity, never spray from cold drum chemical. Powerful primary heaters may scorch B-side polyols. Follow "DrumTemperatures & Recirculation" procedures under Processing Instructions.

Cautions and Recommendations:

UPC 500 Classic is designed for installation in most standard construction configurations using common materials such as, concrete, metal, and wood products. 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 my be re-occupied.

Health and Safety Information:

Before working with this product, you must read and become familiar with available information (e.g., Safety Data Sheet (SDS)) on its 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 500 Classic has a shelf life of approximately six months from the date of manufacture when stored in original, unopened containers at 50-80°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:

UPC 500 Classic is intended for indoor applications, and is a Class III vapor retarder. It is vapor semi-permeable and will allow for some diffusion of moisture through the insulation. The following considerations are needed:

(1) An additional vapor retarder may be needed in certain building envelopes in climate zones 5 and higher when not meeting the conditions of IRC Table 402.5.1. Refer to local building codes.

(2) A vapor retarder also needs to be considered where high interior humidity conditions exist.