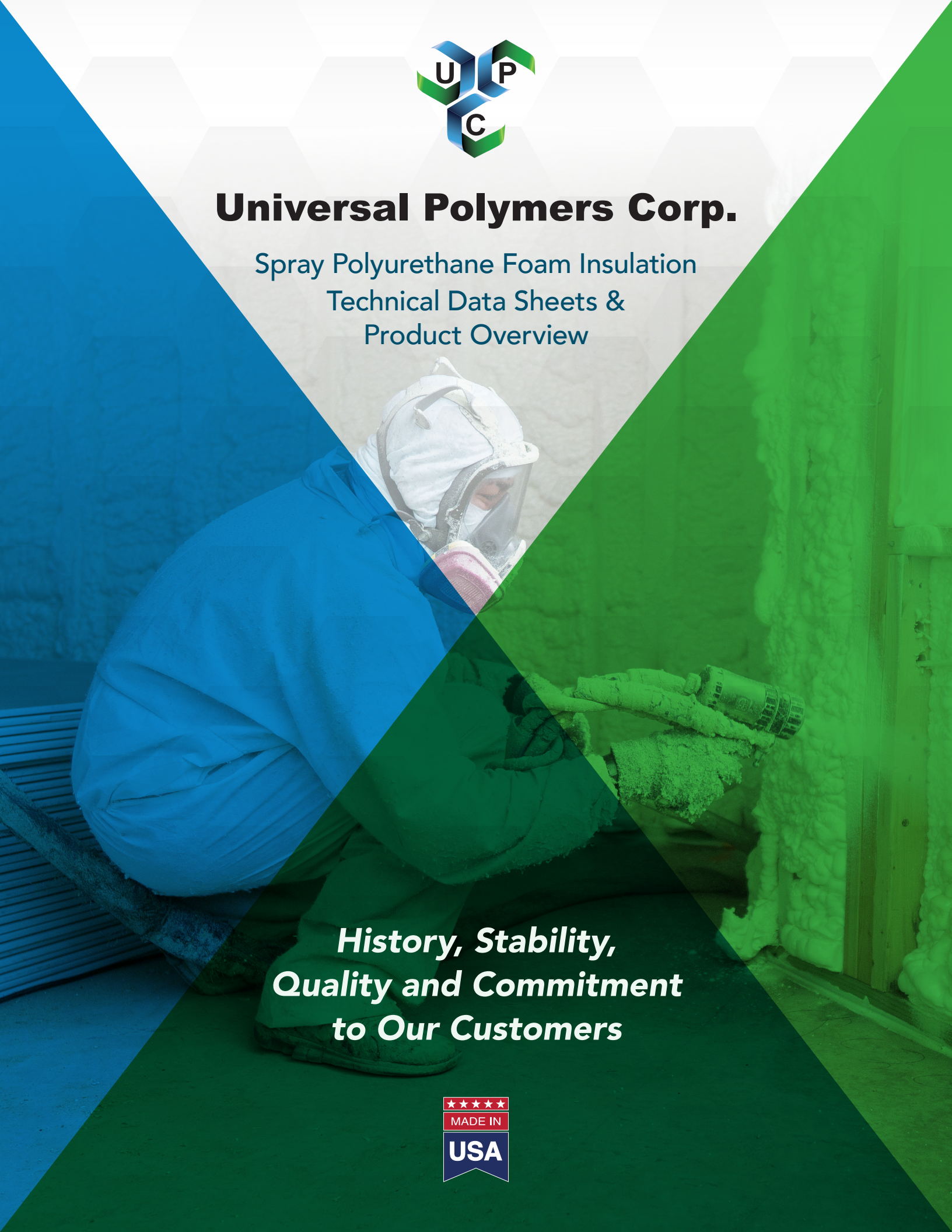
Universal Polymers Corp.

Spray Polyurethane Foam Insulation Technical Data Sheets & Product Overview



History, Stability, Quality and Commitment to Our Customers

MADE IN USA

OUR HISTORY

Universal Polymers Corporation (UPC) was incorporated in Texas on October 11, 1977 and acquired by the current ownership in 2018. The current owners are a family that has been in the chemical manufacturing industry for nearly 40 years and controls several other independent companies. We have six manufacturing facilities with locations in California, Texas and Illinois, with nearly 1,000,000 square feet of manufacturing, office, and warehousing areas. These companies manufacture hundreds of formulations comprising a whole spectrum of polyurethane, polyurea, polyaspartic, epoxy, acrylic, and silicone products serving the needs of residential, commercial, institutional, industrial, and OEM markets. Our customer list extends from Fortune 500 companies, to national and international distributors, all the way to applicators and contractors. After joining the new ownership, UPC and affiliated manufacturing facilities have invested heavily in talented people, R&D, plant and machinery, and testing and certifications by independent agencies such as ICC ES, UL, FM, etc. All these efforts have paid off handsomely, as UPC is now able to extend its product offering nationally and internationally through individual applicators, national contractors, and regional and national distributors.

PRODUCTION CAPABILITY

UPC products are manufactured in facilities located in California and Texas. We have recently begun manufacturing from a newly commissioned state-of-the-art plant set-up in Arlington, Texas within a 200,000 square feet manufacturing and warehousing facility. Our group of companies is recognized as one of the largest independent polyurethane, polyurea and other specialty products system houses in the world. This substantial volume affords UPC strategic advantages, including economies of scale and key partnerships with large, reputable raw material suppliers globally; as a result, UPC is able to offer the most competitive prices for all it offers.

STABILITY

Given the history of UPC and our broader affiliation of companies, stability has been a key driver of our success. Large corporations choose to source chemicals from UPC because of our proven steadfast and conservative nature, even in the face of challenging macro and micro economic climates. We are known for our consistency, reliability and stability — characteristics that are paramount when choosing a chemical partner. Being a family-owned business means UPC is not driven by quarterly results and shortsighted shareholder demands; instead, our long-range outlook is measured in years and decades, making UPC a staunch bellwether and reliable partner for your business.

RELATIONSHIPS

Being a family owned business means we understand the value of relationships. Every customer, no matter how big or small, is an important partner to us. Our size and scale ensures exceptional quality, consistency and capabilities, but our nature is still rooted in our humble small business origins. Every customer, whether you have one or one thousand rigs, is invited to tour our manufacturing plants, meet our ownership and the team that delivers superior UPC products. We believe the highest level of respect we can offer you, our customer, is delivering you consistent, quality products. This is a hallmark belief we have carried for nearly four decades.

QUALITY CHEMISTRY FIRST

At our core, we are a chemical R&D company owned and operated by chemists. Chemistry is in our blood. Quality chemistry and consistent manufacturing of quality products drives our business, reputation and sales. This starts with top-tier chemical engineers and chemists that work out of dedicated laboratories at every one of our manufacturing facilities to develop industry leading chemistry and formulations. Every production facility houses all the equipment necessary to test chemical and physical properties for each batch produced.

QUALITY CONTROL FROM START TO FINISH

Quality polyurethane production starts with superior raw ingredients. Like any plastic product, there are cheap and inferior ways to produce - UPC, however, consistently chooses higher quality methods. Sourcing superior raw materials is paramount to quality finished products. UPC has a commitment to never sacrifice the quality of products by sourcing poor quality, less expensive raw materials. We pride ourselves in conducting the maximum number of QC checks during various phases of manufacturing stages, which provides consistent quality products from batch to batch. Every batch goes through vigorous quality checks, as well as chemical and physical testing before being released to our customers. A sample of every single manufactured batch is retained for storage for 12 to 18 months. Therefore, if customers have any issues in the field, our team of chemists are able to check the physical and properties at any time.

INDEPENDENT VERIFICATION

ISO 9001:2015

All UPC products are manufactured in ISO 9001:2015 certified facilities in Texas and California, complying with the exacting standards required to maintain a Quality Management System that consists of constant review and improvement. These standards demonstrate our ability to consistently provide quality products necessary to meet rigorous customer and regulatory requirements. We are accustomed to delivering products to many of the largest companies in the world, where nothing short of consistency and near perfection is demanded. While ISO 9001:2015 verifies our quality control measures, UPC further subjects its chemistry to independent third-party testing for further assurance of quality and physical properties. ES Reports by trusted organizations are obtained to document and verify these independent tests.

UPC 1.7 & 2.0 CCRR-0345 | ESR-3805

TECHNICAL DATA SHEET & SPRAY GUIDELINES

ULTRA-HIGH YIELD & STANDARD CLOSED-CELL SPRAY FOAM

UPC 1.7 & 2.0 CLOSED-CELL FOAM High-Lift Formulas Available

UPC 1.7 and 2.0 are two-component, medium density, spray applied polyurethane foam systems. UPC 1.7 and 2.0 systems consist of an "A" component (ISO) and a blended "B" component (RESIN) in separate drums. UPC 1.7 and 2.0 systems are HFC-245fa based and contains ZERO OZONE depleting agents.

UPC 1.7		
Viscosity (Brookfield cps) @ 77°F	A Side: 200 ± 30	B Side: 650 ± 50
Core Density	ASTM D-1622	1.7 pcf
Tensile Strength	ASTM D-1623	50 psi
R-Value @ 1"	ASTM C-518	6.6
Compressive Strength	ASTM C-1621	35 psi
Water Vapor Transmission	ASTM C-355	0.96 Perm @ 1.5 inch
Closed Cell Content	ASTM D-1940	93%
Dimensional Stability	ASTM D-2126	-20°F : N/C 158°F @100%RH: <7% 158°F @Dry: <0.5%
Flammability (Class 1)	ASTM E-84	25 Flame Spread 175 Smoke Development
ACC 377 Appendix X*	No Additional Coating	6 Wet Mils
NFPA 286* (Large Scale Fire Testing)	DC 315 | No-Burn	18 Wet Mills | 14 Wet Mils

UPC 2.0		
Viscosity (Brookfield cps) @ 77°F	A Side: 200 ± 30	B Side: 650 ± 50
Core Density	ASTM D-1622	2.0 pcf
Tensile Strength	ASTM D-1623	35 psi
R-Value @ 1"	ASTM C-518	6.6
Compressive Strength	ASTM C-1621	35 psi
Water Vapor Transmission	ASTM C-355	0.98 Perm @ 1.5 inch
Closed Cell Content	ASTM D-1940	93%
Dimensional Stability	ASTM D-2126	-20°F : N/C 158°F @100%RH: <7%
Flammability (Class 1)	ASTM E-84	25 Flame Spread 165 Smoke Development
ACC 377 Appendix X*	No Additional Coating	6 Wet Mils
NFPA 286* (Large Scale Fire Testing)	DC 315 | No-Burn	18 Wet Mills | 14 Wet Mils

*See ICC CCRR-0345 for additonal instructions. Note: ACC 377 Meets Requirements of Appendix X With NO Additional Coating

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 **> 90°F**	*107°F*	*110°F*	*113°F*	*108°F*	*111°F*	*114°F*	*109°F*	*112°F*	*115°F*
80°F	*108°F*	*111°F*	*114°F*	*109°F*	*112°F*	*115°F*	*110°F*	*113°F*	*116°F*
70°F	*110°F*	*113°F*	*116°F*	*111°F*	*114°F*	*117°F*	*112°F*	*115°F*	*118°F*
60°F	*111°F*	*114°F*	*117°F*	*112°F*	*115°F*	*118°F*	*113°F*	*116°F*	*119°F*
50°F	*112°F*	*115°F*	*118°F*	*113°F*	*116°F*	*119°F*	*114°F*	*117°F*	*120°F*
40°F	*113°F*	*116°F*	*119°F*	*114°F*	*117°F*	*120°F*	*Not Recommended*		
30°F	*115°F*	*118°F*	*121°F*	*Not Recommended*					
	CAUTION: Switch to (W) Winter formula below 30°F. (R) Regular formula may crack in temperatures below 30°F.								
20°F	*115°F*	*118°F*	*121°F*	*Not Recommended*			*Not Recommended*		
15°F	*116°F*	*119°F*	*122°F*						
10°F	*117°F*	*120°F*	*123°F*						
< 0°F	*Not Recommended*								
E30 | H30 | G2 | PH-2	1200 +/- psi			1200 +/- psi			1300 +/- psi		
H40 | H50 | PH-40/55	1200 +/- psi			1200 +/- psi			1200 +/- psi		
E20	1200 +/- psi			1400 +/- psi			N/A		

*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.

ADDITIONAL INSTRUCTIONS For Technical Support Call 203-760-0025

Agitation	DO NOT agitate.
Starting Temperatures & Recirculation	DO NOT RECIRCULATE. Starting chemical temperatures in the drums should be between 55°F-75°F for both the A & B-drums. Use a laser thermometer to measure drum temperature towards bottom (A-Drum should NEVER be warmer than B-Drum). If drum is below 55°F, then slowly raise temperature with warming blanket or in overnight heated storage. NEVER super-heat with torpedo heater or the like. If chemical is too thick then you may recirculate with NO primary heaters to thin-out. If drum is too hot then blowing agent will boil-off.
Substrate Condition	Substrate must be clean and dry and substrate moisture must not exceed 18%. When heating up a house with portable heaters, only heat up to 50°F, otherwise condensation may form on plywood. If metal substrate, only heat up to 45°F. Never use a portable propane powered heater.
Metal | Concrete Application	When applying on metal or concrete you may need a priming flash coat. Increase temperatures by 2-5°F to account for heat loss from these surfaces.
Winter Conditions	When indoor air temperature is below 45°F, care should be taken to heat the building up to, but no more than 50°F.
Humidity	When humidity levels exceed 50% and temperatures are below 85°F, reduce the A-Side temperature by 5°F +/-.
Contamination	The B-Side is sensitive to contamination from other products. Never combine different products. Make sure transfer pump is cleaned between different products before putting into B-Drum. If the foam over-expands then deflates or the cells are very large this is an indication of possible contamination.
Max|Min Pass Thickness	Max pass thickness is 2" for standard, 4" for high-lift. Too thick will overheat foam, cause burnt odor, result in future shrinkage, or lead to fire hazard.
Proper Temp. Sets	As a general rule of thumb, the hose temperature is the most important and should be set first. The A-side is set 2-5°F higher than the hose. The B-Side is set 3-10F higher than A-Side depending on humidity levels.
†Heated Hose	The hose temperature should always be set first to the desired final chemical temperature at gun and should rarely be adjusted. The primary heaters should be increased if chemical is too cold. A poorly insulated hose may compromise heating and drastically change required temperature settings.
Spray Technique	Spray side-to-side for better yield. Layering will reduce yield, make smoother. For a 16" on-center cavity spray 16" from surface, 18" for 24" on-center.
Pressure Settings	Higher 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 dynamic as possible.

UPC 500 ESR-3803 | CCRR-0358

TECHNICAL DATA SHEET & SPRAY GUIDELINES

STANDARD OPEN-CELL

UPC 500 OPEN-CELL FOAM

UPC 500 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 commercial, residential and industrial applications.

Viscosity (Brookfield cps) @ 77°F	A Side: 200 ± 30	B Side: 360 ± 100
Core Density	ASTM D-1622	0.5 pcf ± 0.05
Tensile Strength	ASTM D-1623	3.35 psi
R-Value @ 1"	ASTM C-518	3.9
Water Vapor Permeance	ASTM E-96	8.4 Perms
Air Permeance @ 3.5"	ASTM E-2178 @ 75 PA	0.00431
Dimensional Stability	ASTM D-2126	< 3.8%
Flammability	ASTM E-84 @ 4"	15 Flame Spread | 200 Smoke Development

Large Scale Fire Testing: UPC 500 is tested and approved in accordance to AC 377 (NFPA® 286) Appendix "X" with 6 wet mils, 4 dry mils of DC 315® ignition barrier. *UPC 500 is tested and approved in accordance to NFPA® 286 with 18 wet mils, 12 dry mils of DC 315® thermal barrier. See ICC ESR-3803 for additional instructions.

SPRAY PARAMETERS

This chart is a **starting guide** to set temperatures and static pressures based on environment, mixing chamber size, and equipment. Adjustments should be made to account for substrate temp/type, hose insulation condition, speed of sprayer, wind factor, etc. A smaller mixing chamber, like Graco Fusion 01, 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 **> 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*								
E30 | H30 | G2 | PH-2	1200 +/- psi			1200 +/- psi			1300 +/- psi		
H40 | H50 | PH-40/55	1200 +/- psi			1200 +/- psi			1200 +/- psi		
E20	1200 +/- psi			1400 +/- psi			N/A		

*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.

ADDITIONAL INSTRUCTIONS

Agitation	Agitation is recommended at medium speed for 15-20 minutes prior to spraying (until turns light yellow). DO NOT agitate during application. Recommended agitators are Graco Low Viscosity Agitator #24C728 or Graco High Viscosity Agitator #26C150.
Starting Temperatures & Recirculation	Recirculate as needed to achieve chemical temperatures in the drums of 70°F-90°F for both the A & B-drums. When recirculating, set the primary heater for the A-Side to 85°F and the B-Side to 130°F. Monitor inlet temp sensors, if not available use a laser thermometer to measure drum temperature towards bottom (the A-Drum should NEVER be warmer than the B-Drum).
Substrate Condition	Substrate must be clean and dry and substrate moisture must not exceed 18%. When heating up a house with portable heaters, only heat up to 50°F, otherwise condensation may form on plywood. If metal substrate, only heat up to 45°F. Never use a portable propane powered heater.
Spray Technique	Spray side-to-side. For a 24" on-center cavity spray 18" from surface. For a 16" on-center cavity spray 16" from surface.
Winter Conditions	When the indoor air temperature is below 45°F, care should be taken to heat building up to, but no more than 50°F.
Humidity	When humidity levels exceed 50% and temperatures are below 85°F, reduce the A-Side temperature by 5°F +/-.
Contamination	The B-Side is sensitive to contamination from other products. Never recirculate another product into the UPC 500. Never combine different products. Make sure transfer pump is properly cleaned between different products before putting into B-Drum. Shrinking foam that pulls away from the studs (that doesn't deflate much) is an indication that it may be contaminated. Large open cells is another indication of possible contamination.
Max|Min Pass Thickness	Max practical pass thickness is 3.5-6" before resulting in splash-back. Min recommended pass thickness is 1".
Proper Temp. Sets	As a general rule of thumb, the hose temperature is the most important 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 A-Side depending on humidity levels.
†Heated Hose	The hose sensor is one of the most important assessment indicators. The hose temperature should always be set first to the desired final chemical temperature at gun. The hose temperature should rarely be adjusted. The primary heaters should be increased if chemical is too cold. A poorly insulated hose may compromise adequate heating and drastically change required temperature settings.
Pressure Settings	Higher 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 dynamic as possible.

UPC 500 MAX CCRR-0358

TECHNICAL DATA SHEET & SPRAY GUIDELINES

ULTRA-HIGH YIELD OPEN-CELL SPRAY FOAM

UPC 500 MAX OPEN-CELL FOAM

UPC 500 MAX is a cutting-edge, high-yield, two component open-cell spray polyurethane foam. Its unique solution based chemistry does not require aggressive agitation like other ultra-light density foams. It is water blown (zero ozone depleting chemical) SPF that will improve the performance of the building envelope for commercial, residential and industrial applications. When installed, expands, seals voids, gaps and crevices creating a custom fit air barrier.

Viscosity (Brookfield cps) @ 77°F	A Side: 200 ± 30	B Side: 380 ± 100
Core Density	ASTM D-1622	0.45 pcf ± 0.05
Tensile Strength	ASTM D-1623	5 psi
R-Value @ 1"	ASTM C-518	3.8
Water Vapor Permeance	ASTM E-96	9.0 Perms
Air Permeance @ 3.5"	ASTM E-2178 @ 75 PA	0.00431
Dimensional Stability	ASTM D-2126	< 14.7%
Flammability	ASTM E-84 @ 4"	10 Flame Spread | 250 Smoke Development

Large Scale Fire Testing: UPC 500 MAX is tested and approved in accordance to AC 377 (NFPA® 286) Appendix "X" with 6 wet mils, 4 dry mils of DC 315® ignition barrier.
*UPC 500 MAX is tested and approved in accordance to NFPA® 286 with 21 wet mils, 14 dry mils of DC 315® thermal barrier.

SPRAY PARAMETERS

This chart is a **starting guide** to set temperatures and static pressures based on environment, mixing chamber size, and equipment. Adjustments should be made to account for substrate temp/type, hose insulation condition, speed of sprayer, wind factor, etc. A smaller mixing chamber, like Graco Fusion 01, 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 **> 90°F**	*119°F*	*122°F*	*125°F*	*122°F*	*125°F*	*128°F*	*123°F*	*126°F*	*129°F*
80°F	*121°F*	*124°F*	*127°F*	*124°F*	*127°F*	*130°F*	*125°F*	*128°F*	*131°F*
70°F	*123°F*	*126°F*	*129°F*	*126°F*	*129°F*	*132°F*	*127°F*	*130°F*	*133°F*
60°F	*125°F*	*128°F*	*131°F*	*128°F*	*131°F*	*134°F*	*129°F*	*132°F*	*135°F*
50°F	*127°F*	*130°F*	*133°F*	*130°F*	*133°F*	*136°F*	*131°F*	*134°F*	*137°F*
40°F	*129°F*	*132°F*	*135°F*	*132°F*	*135°F*	*138°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*								
E30 | H30 | G2 | PH-2	1200 +/- psi			1200 +/- psi			1300 +/- psi		
H40 | H50 | PH-40/55	1200 +/- psi			1200 +/- psi			1200 +/- psi		
E20	1200 +/- psi			1400 +/- psi			N/A		

*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.

ADDITIONAL INSTRUCTIONS

Agitation	Agitation is recommended at medium speed for 15-20 minutes prior to spraying (until turns light yellow). May agitate at low speed during application. Recommended agitators are Graco Low Viscosity Agitator #24C728 or Graco High Viscosity Agitator #26C150.
Starting Temperatures & Recirculation	Recirculate as needed to achieve chemical temperatures in the drums of 70°F-90°F for both the A & B-drums. When recirculating, set the primary heater for the A-Side to 85°F and the B-Side to 130°F. Monitor inlet temp sensors, if not available use a laser a laser thermometer to measure drum temperature towards bottom (the A-Drum should NEVER be warmer than the B-Drum).
Substrate Condition	Substrate must be clean and dry and substrate moisture must not exceed 18%. When heating up a house with portable heaters, only heat up to 50°F, otherwise condensation may form on plywood. If metal substrate, only heat up to 45°F. Never use a portable propane powered heater.
Spray Technique	Spray side-to-side. For a 24" on-center cavity spray 18" from surface. For a 16" on-center cavity spray 16" from surface.
Winter Conditions	When the indoor air temperature is below 45°F, care should be taken to heat building up to, but no more than 50°F.
Humidity	When humidity levels exceed 50% and temperatures are below 85°F, reduce the A-Side temperature by 5°F +/-.
Contamination	The B-Side is sensitive to contamination from other products. Never recirculate another product into the UPC 500 Max. Never combine different products. Make sure transfer pump is properly cleaned between different products before putting into B-Drum. Shrinking foam that pulls away from the studs (that doesn't deflate much) is an indication that it may be contaminated. Large open cells is another indication of possible contamination.
Max|Min Pass Thickness	Max practical pass thickness is 3.5-6" before resulting in splash-back. Min recommended pass thickness is 1".
Proper Temp. Sets	As a general rule of thumb, the hose temperature is the most important 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 A-Side depending on humidity levels.
†Heated Hose	The hose sensor is one of the most important assessment indicators. The hose temperature should always be set first to the desired final chemical temperature at gun. The hose temperature should rarely be adjusted. The primary heaters should be increased if chemical is too cold. A poorly insulated hose may compromise adequate heating and drastically change required temperature settings.
Pressure Settings	Higher 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 dynamic as possible.

UPC 500 OCX

TECHNICAL DATA SHEET & SPRAY GUIDELINES

APPENDIX X OPEN-CELL SPRAY FOAM

UPC 500 OCX OPEN-CELL FOAM

UPC 500 OCX 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 commercial, residential and industrial applications.

Viscosity (Brookfield cps) @ 77°F	A Side: 200 ± 30	B Side: 650 ± 200
Core Density	ASTM D-1622	0.5 pcf ± 0.05
Tensile Strength	ASTM D-1623	3.91 psi
R-Value @ 1"	ASTM C-518	3.9
Water Vapor Permeance @ 1.5"	ASTM E-96	8.4 Perms
Air Permeance @ 3.5"	ASTM E-2178 @ 75 PA	0.00152
Dimensional Stability	ASTM D-2126	< 0.03%
Flammability	ASTM E-84 @ 4"	15 Flame Spread | 200 Smoke Development

Large Scale Fire Testing: UPC 500 OCX has been tested and approved in accordance to AC 377 (NFPA® 286) Appendix "X" with NO additional coating. UPC 500 OCX has been tested and approved in accordance to NFPA® 286 with 20 wet mils – 13 dry mils of DC 315® thermal barrier from International Fireproof Technology, Inc.

SPRAY PARAMETERS

This chart is a **starting guide** to set temperatures and static pressures based on environment, mixing chamber size, and equipment. Adjustments should be made to account for substrate temp/type, hose insulation condition, speed of sprayer, wind factor, etc. A smaller mixing chamber, like Graco Fusion 01, 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 **> 90°F**	*139°F*	*142°F*	*145°F*	*140°F*	*143°F*	*146°F*	*141°F*	*144°F*	*147°F*
80°F	*141°F*	*144°F*	*147°F*	*142°F*	*145°F*	*148°F*	*143°F*	*146°F*	*149°F*
70°F	*143°F*	*146°F*	*149°F*	*144°F*	*147°F*	*150°F*	*145°F*	*148°F*	*151°F*
60°F	*145°F*	*148°F*	*151°F*	*146°F*	*149°F*	*152°F*	*147°F*	*150°F*	*153°F*
50°F	*147°F*	*150°F*	*153°F*	*148°F*	*151°F*	*154°F*	*149°F*	*152°F*	*155°F*
40°F	*149°F*	*152°F*	*155°F*	*150°F*	*153°F*	*156°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	*151°F*	*154°F*	*157°F*	*Not Recommended*			*Not Recommended*		
20°F	*153°F*	*156°F*	*159°F*						
15°F	*154°F*	*157°F*	*160°F*						
10°F	*155°F*	*158°F*	*161°F*						
< 0°F	*Not Recommended*								
E30 | H30 | G2 | PH-2	1200 +/- psi			1200 +/- psi			1300 +/- psi		
H40 | H50 | PH-40/55	1200 +/- psi			1200 +/- psi			1200 +/- psi		
E20	1200 +/- psi			1400 +/- psi			N/A		

*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.

ADDITIONAL INSTRUCTIONS

Agitation	Must agitate at high speed for 30 mins prior to spraying (until turns light yellow). Agitate on medium during application. Recommended agitators are Graco Low Viscosity Agitator #24C728 or Graco High Viscosity Agitator #26C150.
Starting Temperatures & Recirculation	Recirculate as needed to achieve chemical temperatures in the drums of 85°F-100°F for both the A & B-drums. When recirculating, set the primary heater for the A-Side to 85°F and the B-Side to 130°F. Monitor inlet temp sensors, if not available use laser thermometer to measure drum temperature towards bottom (the A-Drum should NEVER be warmer than the B-Drum).
Substrate Condition	Substrate must be clean and dry and substrate moisture must not exceed 18%. When heating up a house with portable heaters, only heat up to 50°F, otherwise condensation may form on plywood. If metal substrate, only heat up to 45°F. Never use a portable propane powered heater.
Spray Technique	Spray side-to-side. For a 24" on-center cavity spray 18" from surface. For a 16" on-center cavity spray 16" from surface.
Winter Conditions	When the indoor air temperature is below 45°F, care should be taken to heat building up to, but no more than 50°F.
Humidity	When humidity levels exceed 50% and temperatures are below 85°F, reduce the A-Side temperature by 5°F +/-.
Contamination	The B-Side is sensitive to contamination from other products. Never recirculate another product into the UPC 500 OCX. Never combine different products. Make sure transfer pump is properly cleaned between different products before putting into B-Drum. Shrinking foam that pulls away from the studs (that doesn't deflate much) is an indication that it may be contaminated. Large open cells is another indication of possible contamination.
Max|Min Pass Thickness	Max practical pass thickness is 3.5-6" before resulting in splash-back. Min recommended pass thickness is 1".
Proper Temp. Sets	As a general rule of thumb, the hose temperature is the most important 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 A-Side depending on humidity levels.
†Heated Hose	The hose sensor is one of the most important assessment indicators. The hose temperature should always be set first to the desired final chemical temperature at gun. The hose temperature should rarely be adjusted. The primary heaters should be increased if chemical is too cold. A poorly insulated hose may compromise adequate heating and drastically change required temperature settings.
Pressure Settings	Higher 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 dynamic as possible.

TROUBLESHOOTING GUIDE

Frothing	**Applicable to UPC 1.7:** contains a dissolved blowing agent. If the B-side drum is overheated or excessively agitated, the chemical may froth
Delamination	If the foam does not adhere to itself, then allow the first layer to cool off before applying the next pass.
Pulls Away From Studs	Lower the primary heater and hose temperatures by 3°F. Spray out chemical in hose (approx 2.5 gallons) until reduced temperature is achieved. If problem does not resolve, lower temperature by another 3°F, and continue to repeat process until resolved. Chemical may be contaminated.
Voids Behind Foam	The foam may be too cold. Increase all heaters by 5°F. Spray out chemical in hose (approx 2.5 gallons) until new increased temperature is achieved. Repeat process until problem is resolved.
Deflates | Cells Too Large	Contamination from open-cell may be present. Improper switch over from open-cell. Lower the primary heater and hose temperatures by 3°F. Spray out chemical in hose (approx 2.5 gallons or 1,000 board feet) until new reduced temperature is achieved. If problem does not resolve, lower temperature by another 3°F, and continue to repeat process until problem is resolved.
Color	If the foam appears yellowish, then it is too cold, primary heaters should be increased 3 to 5°F. Should appear "white."
Chalky | Brittle	**Applicable to UPC 1.7 and 2.0:** Too hot. Lower the primary heater and hose temperatures by 3°F. If problem does not resolve, lower temperature by another 3°F, and repeat.
Curing Too Fast	**Applicable to UPC 1.7 and 2.0:** 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.
Cells Very Large	**Applicable to UPC 500, 500 Max, and 500 OCX:** Lower temperature on A-side primary heater by 3 to 5°F. Chemical may not be thoroughly agitated, try agitating further. If problem persists then contamination may be present.
Important	**Applicable to 1.7 and 2.0:** Minimum drum temperature of 55°F is necessary to bring viscosities of A&B in alignment to prevent off-ratio foam and increase yield; setting chemical temperatures above recommendations may result in B side frothing or loss of foam yield.
Important	**Applicable to UPC 500, 500 Max, and 500 OCX:** Regardless of proportioner heating capacity, a minimum starting drum temperature of 85°F is necessary to bring viscosities of A&B in alignment to prevent off-ratio foam and increase yield; spraying from cold drum chemical may scorch B-side polyols with primary heaters that are too powerful. B-side chemical should change from clear to "creamy" color when properly mixed and recirculated.
Poor Yield	**Applicable to UPC 500, 500 Max, and 500 OCX:** B-Side may not be thoroughly mixed, may need agitating longer. Make sure a collapsing blade agitator is being used.

Cautions and Recommendations:

UPC 1.7 and 2.0 are designed for an application rate of 1 inch minimum to 2 inches maximum per pass. Once installed material has cooled, it is possible to add additional layers to achieve the required installed thickness. UPC 1.7 is not designed for use as an exterior roofing system.

UPC 500, 500 MAX, and 500 OCX are designed for an application rate of 1 inch minimum to 6 inches maximum per pass. Once installed material has cooled, it is possible to add additional layers to achieve the required installed thickness. UPC 500, 500 MAX, and 500 OCX are not designed for use as an exterior roofing system.

UPC 500, 500 MAX, and 500 OCX are designed for installation in most standard construction configurations using common materials such as, concrete, metal, wood 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, except where Appendix X approved conditions are permitted.

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. Potential hazards of excessive application thickness are dangerously high cure temperatures that may result in fire. Any large masses of SPF should be removed to an outside safe area, cut into smaller pieces and allowed to cool before discarding into trash receptacle. Additionally, off-ratio materials can result in offensive odors that may not dissipate. SPF insulation is combustible and must be kept away from high-intensity heat sources, such as welding, or cutting torches.

Job Site Warnings:

Applicators should ensure the safety of the job-site and construction personnel by posting appropriate signs 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: 2 hour ventilation period before personal protective equipment is no longer required for trades and inspectors. Re-Occupancy: after 24 hours.

Health and Safety Information:

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling or processing any UPC spray foam system. 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 Spray Polyurethane Foam Alliance (SPFA®) :AX-171 Course 101-R Chapter 1: Health, Safety and Environmental Aspects of Spray Polyurethane Foam and Coverings. www.spraypolyurethanefoam.com

Refer to the Center for the Polyurethanes Industries (CPI): Model Respiratory Protection Program. www.spraypolyurethane.org

Shelf Life and Storage:

UPC 1.7, 2.0, 500, 500 MAX, and 500 OCX have 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:

When installed at a minimum of 1.5-inch UPC 1.7 and 2.0 are considered vapor retarders. Consult with local code officials for specific requirements Climate zone tables are available in current IBC® and IRC® publications. Conditions exist.

UPC 500, 500 Max, and 500 OCX are intended for indoor applications, and is not a vapor retarder. It is vapor permeable and will allow for some diffusion of moisture through the insulation. The following considerations are needed:

(1) A vapor retarder needs to be considered in the design of the building envelope in cold climates, such as zones 4 and higher in the U.S., as defined in 2004 Supplement to the IRC®, Table N 1101.2;

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

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