



## DESCRIPTION

**DRAGONSHIELD™ BC UB represents a breakthrough in plural-component spray applied polymer technology. This ultra high-strength polymer was developed specifically for blast mitigation and fragment/spall containment. Tests conducted on DRAGONSHIELD™ BC UB protected surfaces compared to unprotected surfaces document that DRAGONSHIELD™ BC UB will significantly reduce damage caused by blast effects.**

## FEATURES

- DRAGONSHIELD™ BC UB is available with SPI's cutting-edge Ultra Bond™ technology. SPI's advanced Ultra Bond™ chemistry is coined "the duct tape molecule". Ultra Bond™ has the unique advantage of adhering to most properly prepared organic and inorganic (new and aged) surfaces without requiring a primer. Like duct tape, DRAGONSHIELD™ BC UB with Ultra Bond™ gains adhesion over time.
- As with most coatings, there is a re-coat window that presents a lack of inter-coat adhesion. The UB™ molecule mitigates this risk during installation.
- 100% solids, no solvents, and no VOCs.
- Fast-set: handle in five minutes or less.
- Hydrophobic, therefore unaffected by humidity and extreme temperatures during application.
- Extended tack time to allow deep surface penetration.
- High dry temperature stability to 200°F (121°C).

## RECOMMENDED USES

- Coating for steel or other substrate exposed to corrosion.
- Liner for concrete tanks, ponds, lagoons, reservoirs, dikes, tunnels, barges, etc.
- Replace or repair failed existing sheet membrane liners.
- Steel tanks, silos, and pipes.
- Encapsulation material for EPS or other types of flotation materials.
- Encapsulation material for asbestos, lead paint, or other dry hazardous material (Consult SPI).
- Earthen containment used with or without geotextile.

## COLORS

DRAGONSHIELD™ BC UB is available in SPI standard colors (Black, Military Tan, Olive Drab, and Medium Grey). Custom colors available upon request.

Note: DRAGONSHIELD™ BC UB is an aromatic polyurea; therefore, as with all aromatics color change and superficial oxidation will occur. Aliphatic urethane and other suitable topcoats can be used where long-term color stability and increased longevity in full sun exposure are of critical importance.

## TYPICAL PHYSICAL PROPERTIES\*

<b>Tensile Strength ASTM D638</b>	± 5,579 psi (35.77 MPa)
<b>Elongation ASTM D638</b>	± 344%
<b>Hardness (Shore A) ASTM D2240-81</b>	95 ± 5
<b>Hardness (Shore D) ASTM D2240-81</b>	59 ± 5
<b>100% Modulus ASTM D412</b>	1,650 psi (11.47 MPa) ± 100
<b>200% Modulus ASTM D412</b>	2,602 psi (18.08 MPa) ± 100
<b>300 % Modulus ASTM D412</b>	4,426 psi (30.76 MPa) ± 100
<b>Tear Resistance ASTM D624</b>	735 PLI (128.70 KN/m) ± 50
<b>Exposure Temperature**</b>	-40°F - +200° (-40°C - +93°C)

All samples for above tests were force cured 48 hours or aged for more than three weeks. It is recommended that the user perform their own independent testing. The samples for tests were sprayed with SPI Long Shot @2500 psi (172 MPa) dynamic pressure at the gun. Proportioning machine primary heater and hose heat 170°F (77°C) Gusmer Gap Gun with 00 chamber.



Note: Due to the many variables involved with blast and ballistic events, all SPI polymer solutions must be tested and validated prior to installation for the purpose of hardening structures, barriers, vehicles, etc.

## CURING SCHEDULE

<b>Gel</b>	± 15 sec.
<b>Tack Free</b>	± 55 sec.
<b>Post Cure***</b>	48 hour
<b>Recoat</b>	15 min. - 12 hours

\* All cured film properties are approximate since processing parameters, ad-mixture types, and quantities change physical properties of the cured elastomer. Elevated temperatures will accelerate the curing process and shorten the re-coat window.

\*\* Test performed in a dry, static environment.

\*\*\* Complete polymerization to achieve final strength can take up to several days or weeks, depending on a variety of conditions or product type. All samples for above tests were force cured 48 hours or aged for more than three weeks. **It is recommended that the user perform their own independent testing.**

## WET PROPERTIES

<b>Solids by Volume</b>	100%
<b>Solids by Weight</b>	100%
<b>Volatile Organic Compounds</b>	0 lbs/gal (0 g/l)
<b>Theoretical Coverage DFT</b>	100 sq. ft. @ 16 mils/gal
<b>Weight per gallon (approx)</b>	8.6 lbs. (3.9 kg)
<b>Number of coats</b>	1 - 2
<b>Mix Ratio</b>	1 "A" : 1 "B"
<b>Viscosity (cps)</b>	A: 1800 ± 25 mPa.s B: 300 ± 25 mPa.s
<b>Shelf Life Unopened Containers @ 60 - 90°F (15 - 32°C)</b>	6 Months

Minimum material/container temperature for application is 70°F (21°C).

## TEST INFORMATION

<b>Mandrel Bend Test ASTM D522-93a</b>	Passed	Mandrel Size 1" Test Temp -60°F (-51°C)
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## MIXING & THINNING

Thoroughly agitate the "B" components of this product prior to application. Use a SPI folding blade mixer or equivalent equipment approved by SPI. Install mixer through the extra air specific 2" bung hole provided on all "B" drums. Care must be taken not to cross contaminate the individual components with the mixing equipment; for best mixing results, supply the SPI mixer with 25 cfm of air at 100 psi. Thinning is not required. Using any thinner may adversely affect product performance.

## PACKAGING

This product is sold in standard 110 gallon drum and 550 gallon tote sets. Available in other container sizes. Contact SPI sales representative for further information. Non-standard containers may require a longer lead time.

## GENERAL APPLICATION INSTRUCTIONS

Apply DRAGONSHIELD™ BC UB only to clean, dry, sound, surfaces free of loose particles or other foreign matter. DRAGONSHIELD™ BC UB can be sprayed over a broad range of ambient and substrate temperatures. It is recommended that DRAGONSHIELD™ BC UB be sprayed in multi-directional (north/south - east/west) passes to ensure uniform thickness.

Contact SPI technical service personnel for specific surface preparation for your application.

### COMMON SUBSTRATES:

**STEEL:** 4-5 mil anchor profile is best for maximum adhesion and varies per application and conditions; adhere to proper SSPC standards.

**WOOD:** Apply polyurea onto a clean, dry, and sanded surface; free from burrs, splinters and loose debris. (It is recommended to prime wood and other porous surfaces before application of heated, fast-set polyureas to reduce pin holing).

**CONCRETE:** Prepare concrete in accordance with SSPC/NACE Standards and SPI Concrete Prep Guide.

**PREVIOUSLY APPLIED COATINGS:** SPI recommends UB™ (ULTRA BOND™) products over existing coatings that are past the recoat window and/or application over other coatings. Contact SPI for additional information.

**NOTE:** It is recommended that existing surfaces be power washed with 2500—3500 psi water pressure to enhance adhesion of DRAGONSHIELD™ BC UB. If there is a possibility of surface contamination, scrub with a solution of 1/4 tsp Dawn detergent and 1 tbsp of vinegar, per 1 gallon of warm water. Follow with a thorough water rinse. If there is oxidation on the surface of the existing substrate; it must be removed prior to application of DRAGONSHIELD™ BC UB. Removal of oxidation can be done via mechanical methods to insure the DRAGONSHIELD™ BC UB has a sound substrate to adhere to. The use of SPI Prep Wipe™ solution will tack up the existing polyurea coating and help promote bonding of the DRAGONSHIELD™ BC UB.

On all above listed substrates and others, please contact SPI Sales or Technical Support for more information specific to your application, including industry standards such as SSPC and NACE. **Adhesion tests are always recommended prior to application.**

## PROCESSING EQUIPMENT & SETTINGS

### MACHINES:

<b>GRACO</b> (Gusmer, Glass-craft)	• A-25*	• H-50*
	• A-XP1	• HV-20/35
	• E-10 HP	• H-XP2
	• E-20*	• H-XP3
	• E-30*	• Reactor2 E-XP2
	• E-XP1	• Reactor2 H-XP2
	• E-XP2	• Reactor2 H-XP3
	• H-20/35 Pro	• Reactor2 E-30*
	• H-25*	• Reactor2 H-30*
	• H3500	• Reactor2 H-40*
	• H-40*	• Reactor2 H-50*

<b>PMC</b>	<ul style="list-style-type: none"> <li>• GH-25*</li> <li>• GH-40*</li> <li>• PA-25*</li> <li>• PAX-25</li> <li>• PH-2*</li> <li>• PH-25*</li> </ul>	<ul style="list-style-type: none"> <li>• PH-40*</li> <li>• PHX-2</li> <li>• PHX-25</li> <li>• PHX-40</li> <li>• PMCA-20</li> </ul>
<b>SPRAY FOAM EQUIP &amp; MFG</b>	<ul style="list-style-type: none"> <li>• 5/12K*</li> <li>• 6/6K*</li> </ul>	<ul style="list-style-type: none"> <li>• 6/12K</li> </ul>
*2,000 psi machines		
<b>GUNS:</b>		
<b>GRACO (Gusmer, Glass-craft)</b>	<ul style="list-style-type: none"> <li>• Fusion AP</li> <li>• Fusion MP</li> <li>• GAP Pro</li> <li>• GX7-DI</li> <li>• GX-8 Pro</li> </ul>	<ul style="list-style-type: none"> <li>• GX7-400</li> <li>• P2</li> <li>• P2 Elite</li> <li>• P2 Elite "C"</li> <li>• D7</li> </ul>
<b>PMC</b>	<ul style="list-style-type: none"> <li>• AP-2</li> </ul>	
<b>SPRAY FOAM EQUIP &amp; MFG</b>	<ul style="list-style-type: none"> <li>• Boss</li> </ul>	

## RECOMMENDED EQUIPMENT SETTINGS

- Standard 1:1 ratio, heated, plural-component equipment developing a minimum of 2500 psi (17 mpa) dynamic pressure at the gun with heating capabilities to 175°F (79°C) will adequately spray this product.
- Machines capable of producing a higher dynamic psi may be required depending on the service environment the DRAGONSHIELD™ BC UB will be exposed to. Consult SPI technical service personnel for additional information.
- Proportioning machine primary heater temperature for application is 70°F (21°C).
- Hose temperature 160-170°F (71-77°C). A hose thermometer inserted under the insulation near the gun should read a minimum of 145-155°F (63-68°C).
- Physical properties will be enhanced when sprayed at higher pressure (3000 psi or more); utilizing an impingement mix gun such as MP Fusion or GX7-DI gun.
- Do not use mixing chambers with output greater than 1.5 gallons per minute. Consult SPI technical service personnel for additional information.

If you own a machine that is not listed above please contact your SPI representative for information and instructions.

## PARAMETERS & LIMITATIONS

- DRAGONSHIELD™ BC UB is for professional use only. User must be proficient in the application of DRAGONSHIELD™ BC UB and the use of the high pressure heated plural component equipment used to apply it.
- DRAGONSHIELD™ BC UB must be stored at temperatures between 60° - 90°F (15° - 32°C).
- Liquid temperature in containers/drums during application 70° - 100°F (21° - 38°C).
- Apply DRAGONSHIELD™ BC UB when surface and air temperatures are above 40°F (5°C) and the surface temperature is at least 5°F (3°C) above dew point and

rising.

- Avoid moisture contamination in containers. Containers should not be resealed if contamination is suspected, CO<sub>2</sub> created pressure can develop. Do not attempt to use contaminated material
- Undried air exposed to liquid components will reduce physical properties of the cured coating.

Note: The material supplied is two components (Component "A"/Component "B") used to formulate DRAGONSHIELD™ BC UB. The quality and characteristics of the finished polymer is determined by the mixture and application of the

## GENERAL SAFETY, TOXICITY, & HEALTH

Safety Data Sheets are available for this coating material. Any individual who may come in contact with these products should read and understand the S.D.S. **CHEMTREC EMERGENCY NUMBER 1-800-424-9300**

**WARNING:** Contact with skin or inhalation of vapors may cause an allergic reaction. Avoid eye contact with liquid or spray mist. Hypersensitive persons should wear protective clothes, gloves and use protective cream on face, hands and other exposed areas.

**CONTAMINATION:** Avoid moisture contamination in containers. Containers should not be resealed if contamination is suspected, carbon dioxide created pressure can develop. Do not attempt to use contaminated material.

**EYE PROTECTION:** Safety eye wear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield.

**SKIN PROTECTION:** Personal protective equipment for the body should be selected based on the task being performed, the risks involved, and should be approved by an industrial hygiene specialist before handling this product. Chemical resistant gloves complying with applicable health and safety standards shall be worn when handling this product. Cover as much of the exposed skin area as possible with appropriate clothing. Refer to safety data sheet (SDS).

**RESPIRATORY PROTECTION:** Harmful if inhaled and may cause allergy or asthma symptoms. Ensure adequate ventilation. If the respirator is the sole means of protection, use a full-face supplied respirator. Use respirators and components tested and approved under appropriate government standards such as OSHA 29CFR 1910.134, NIOSH (US), or CEN (EU). Consider the application and environmental concentrations when deciding if additional protective measures are necessary.

**INGESTION:** Do not take internally. It is believed that ingestion of polymeric isocyanates would not be fatal to humans, but may cause inflammation of mouth and stomach tissue.



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### WARRANTY & DISCLAIMER

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