

## DESCRIPTION

**FULL METAL JACKET™ PLUS is an economical, state-of-the-art, spray applied pure polyurea thermoplastic elastomer. It is designed for material delivery systems where a seamless flexible system is essential. It is fast-set, rapid curing, flexible, and can be sprayed to any desired thickness. FULL METAL JACKET™ PLUS provides a resilient, tough, abrasion resistant monolithic membrane. It is excellent for pick up truck bed liners, undercarriage coatings, and other vehicle protection.**

## FEATURES

- 100% solids, no solvents, and zero VOCs.
- Fast-set: handle in one minute or less.
- High dry temperature stability to 250°F (121°C) with intermittent temperatures to 300°F (148°C).
- Fast gel time allows high build on overhead and vertical surfaces.
- Moisture and temperature insensitive, allowing for application in most conditions.
- Remains flexible in cold temperatures.
- Nice texturability, stipple.
- High tensile strength and elongation properties.
- Elastomeric properties allow for application to surfaces subject to vibration, expansion, contraction, movement, flexing, abrasion, and impact.

## RECOMMENDED USES

- Bed liners for pick up trucks.
- Abrasion resistant, monolithic coating for trailer or vehicle floors, vertical applied surfaces, walls, overhead.
- Ambulance and utility box lining.
- Automotive undercoating material.
- Theatrical and theme foam props protection.
- Encapsulation of flotation foams.
- Temporary building repair.
- Encapsulation of rust on steel surfaces.
- Sound deadening and vibration deadening material.
- Industrial furniture.
- Low cost rigid mold making material.
- Non-potable water containment applications.
- FRP alternative for structural molded parts.

## TYPICAL PHYSICAL PROPERTIES\*

@ 70 mils ± 20 (1.7 mm)	
<b>Tensile Strength ASTM D412-06a</b>	> 4,250 psi (17 mPa)
<b>Elongation ASTM D412-06a</b>	> 350%
<b>Hardness (Shore A) ASTM D2240</b>	97 ± 5
<b>Hardness (Shore D) ASTM D2240-81</b>	47 ± 5
<b>100% Modulus ASTM D412</b>	1,250 psi ± 100% (8 mPa)
<b>300 % Modulus ASTM D412</b>	2,300 psi ± 100% (15 mPa)
<b>Tear Strength ASTM D624</b>	420 PLI ± 50 (73 KN/m)
<b>**Exposure Temperature</b>	-60° - +250°F (-50° - +121°C)

\*All cured film properties are approximate since processing parameters, ad-mixture types, and quantities change physical properties of the cured elastomer. 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.

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

## CURING SCHEDULE

<b>Gel</b>	± 6 sec
<b>Tack Free</b>	± 9 sec
<b>Post Cure**</b>	24 hour
<b>Recoat</b>	0 - 12 hours

\*\*Complete polymerization to achieve final strength can take up to several days or weeks, depending on a variety of conditions or product type. The samples for tests were sprayed with Graco HXP3 @ 2,800 psi dynamic pressure (19 mpa). Primaries/Hose Heat 170°F (77°C) Graco MP Fusion Gun with 29/29 mixing chamber with 040 ceramtip.

## INDUSTRIES

- **OEM Engineering** - Bedliners & Equipment Coatings

## TEST INFORMATION

<b>Abrasion Resistance ASTM D4060 1000 g - 1000 cycles</b>	CS-17	8.6 mg loss
	H-18	161 mg loss
	H-22	136 mg loss

## 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>	8.8 lbs. (4.0 kg)
<b>Number of coats</b>	1 - 2 as needed
<b>Mix Ratio (by volume)</b>	1 "A" : 1 "B"
<b>Viscosity (cps)</b>	A: 450 ± 50 cPs B: 325 ± 25 cPs
<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).

## COLORS

FULL METAL JACKET™ PLUS is available in SPI high pigment Black). Custom colors available upon request. Note: FULL METAL JACKET™ PLUS is an aromatic polyurea. Therefore, with all aromatics, color change and superficial oxidation will occur. Aliphatic polyurea urethane, polyaspartics, and other suitable topcoats can be used where long-term color stability and increased longevity in full sun exposure are of critical importance.

## PACKAGING

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

## GENERAL APPLICATION INSTRUCTIONS

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

**BED LINER SURFACE PREPARATION:** Clean and dry surface; Remove the majority of the clear coat exposing the painted surface so the material will bond to the paint. Proper surface preparation is evidenced by removal of gloss and generation of a light powder on the surface. (use following or equivalent: DA air sander with 60-80 grit paper; Electric 4" grinder with 36 grit alum oxide pad; There are stiff bristled plastic pads also that attach to 4" grinder that are available in the industry.

Perimeter near Fiber Line tape - Hand sand to edge of filament line with 120-180 grit paper. THIS AREA IS IMPORTANT AS INADEQUATE PREP WILL BE THE FIRST LOSS OF ADHESION ON THE LINER. Using compressed air, blow OFF all prepped surface areas. See SPI 'FMJ/FMJ Plus Prep & Installation Guidelines' for additional details.

**OTHER COMMON SUBSTRATES:**

**STEEL:** 2-5 mil anchor profile is best for maximum adhesion and

varies per application and conditions; adhere to proper SSPC standards.

**NON-FERROUS METALS:** (minimum recommended surface preparation) Prepare surface in accordance to SSPC-SP16 (Brush-off Blast Cleaning of Non-Ferrous Metals)

**WOOD:** Clean, dry and sanded for a smooth (to remove burs, splinters, loose debris) surface in which to apply polyurea onto. (It is recommended to prime wood and other porous surfaces before application of heated, fast-set polyureas to reduce pin holing)

**PREVIOUSLY APPLIED COATINGS:** SPI recommends UB™ (ULTRA BOND™) products over existing coatings that are past the recoat window and/or application over other coatings. The use of SPI Prep Wipe™ solution will tack up the existing polyurea coating and can help promote bonding of the FULL METAL JACKET™ PLUS. Contact SPI for additional information.

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.

## 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. Thinning is not required. Using any thinner may adversely affect product performance.

## PROCESSING EQUIPMENT & SETTINGS

<b>MACHINES:</b>		
<b>GRACO (Gusmer, Glass-craft)</b>	<ul style="list-style-type: none"> <li>H-XP2</li> <li>Reactor2 H-XP2</li> <li>H-XP3</li> <li>Reactor2 H-XP3</li> <li>*H25</li> <li>*Reactor2 H-30</li> <li>*H-40</li> <li>*Reactor2 H-40</li> <li>*H-50</li> <li>*Reactor2 H-50</li> <li>20/35</li> <li>20/35 Pro</li> </ul>	<ul style="list-style-type: none"> <li>*E-XP1</li> <li>E-XP2</li> <li>Reactor2 E-XP2</li> <li>E-XP2i</li> <li>*E-30</li> <li>*E-30i</li> <li>*Reactor2 E-30</li> <li>*E-10hp</li> <li>A-XP1</li> <li>*A-25</li> <li>H3500</li> <li>HV 20/35</li> </ul>
<b>PMC</b>	<ul style="list-style-type: none"> <li>PAX-25</li> <li>*PMCA-20</li> <li>*PA-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> </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 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>D</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 AP</li> </ul>	

- Equipment other than those listed above may be used by configuring spray gun with different mixing components as long as minimum pressure and temperature requirements can be met to ensure adequate mixing and dispensing. Contact SPI for additional information.
- Standard 1:1 ratio, heated, plural-component equipment developing a minimum of 1500 psi (10 mpa) dynamic pressure with heating capabilities to 170°F (76°C) will adequately spray FULL METAL JACKET™ PLUS.
- Primary heater temperature should be at 160-170°F (71-76°C).
- Hose temperature should be at 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.

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

## PARAMETERS & LIMITATIONS

- FULL METAL JACKET™ PLUS is for professional use only.
- FULL METAL JACKET™ PLUS must be stored at temperatures between 60—90°F (15—30°C).
- Liquid temperature in drums during application 70—100°F (21—38°C).
- Apply FULL METAL JACKET™ PLUS 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.
- Minimum material/container temperature for spray application is 70°F (21°C).
- 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 a two component system (component “A”/component “B”, which is used to formulate

this product. The quality and characteristics of the finished polymer is determined by the mixture and application of the two components by the person applying polyurea by the person applying polymers.

## 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 INT’L 1-703-527-3887.**

**WARNING:** Contact with skin or inhalation of vapors may cause an allergic reaction. Causes eye damage/irritation. 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 are recommended. Cover as much of the exposed skin area as possible with appropriate clothing.

**RESPIRATORY PROTECTION:** Harmful if inhaled and may cause allergy or asthma symptoms. Use a respirator approved for isocyanates and organic vapors. If you are not sure, or not able to monitor levels, or if you are spraying in an enclosed/indoor area, use MSHA/NIOSH approved supplied air respirator. 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.

## SPRAY-ON BEDLINER COMPARISON CHART

	FMJ™ PLUS	RHINO® EXTREME™ HP 11-50	LINE-X® XS-100™
<b>LIMITED LIFETIME WEAR WARRANTY</b>	Yes	No	No
<b>TRANSFERABLE WARRANTY</b>	Yes	No	No
<b>MINIMUM THICKNESS</b> For Limited Lifetime Warranty	90 mils	125 mils	120 mils
<b>GALLONS/BEDLINER</b> Estimated	4.2 approx.	5.0 approx.	5.0 approx.
<b>ABRASION RESISTANCE</b> ASTM D 4060	1 mg lost (CS-17 Wheel)	11 mg lost (CS-17 Wheel)	N/A
<b>TENSILE STRENGTH (psi)</b> ASTM D 412	> 4,000	2,800 - 3,200	2,147
<b>ELONGATION</b> ASTM D 638	> 300%	400 - 500%	91%
<b>TEAR STRENGTH (pli)</b> ASTM D 624	> 400	500 - 600	295 lbs/in
<b>SHORE HARDNESS</b> ASTM D 2240	+55 D	50 ±5 D	50 ±1 D
<b>FULL RETURN TO SERVICE</b>	12 hrs	95 - 99% Cure/24 hrs	24 hrs
<b>BEDLINER COATING TYPE</b>	Pure Polyurea	Pure Polyurea	Hybrid (Polyurea/Polyurethane)
<b>APPLICATION METHOD</b> Heated Plural, High Pressure	Yes	Yes	Yes
<b>FRANCHISE COST</b>	No	Yes	Yes
<b>PROTECTED TERRITORY</b>	Yes	Yes	Yes
<b>BUSINESS ESTABLISHED</b>	1974	1988	1982

The above information is based on technical data sheets of Rhino and LINE-X, and input from their dealers.



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### WARRANTY & DISCLAIMER

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