

## DESCRIPTION

**FULL METAL JACKET™ PLUS is an economical, state-of-the-art, spray applied 100% pure polyurea thermoset elastomer. It is designed for spray in bed liners and other similar applications, 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).
- Fast gel time allows high build on overhead and vertical surfaces.
- Moisture and temperature insensitive during application, allowing for application in most conditions.
- Remains flexible in cold temperatures.
- Nice texturability, stipple.
- High tensile strength and elongation.
- Elastomeric properties allow for application to surfaces subject to vibration, expansion, contraction, movement, flexing, abrasion, and impact.
- Compliant with FDA/USDA for incidental food contact. Contact SPI for more information.

## RECOMMENDED USES

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

## 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, as 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.

## TYPICAL PHYSICAL PROPERTIES\*

@ 70 mils ± 20 (1.7 mm)	
<b>Tensile Strength ASTM D412-06a</b>	> 4,250 psi (29.3 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% (8.6 MPa)
<b>300 % Modulus ASTM D412</b>	2,300 psi ± 100% (15.8 MPa)
<b>Tear Strength ASTM D624</b>	420 PLI ± 50 (73.6 KN/m)
<b>Exposure Temperature**</b>	-60° - +250°F (-50° - +121°C)

## 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

\* 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.**

The samples for tests were sprayed with Graco HXP3 @ 2,800 psi (19 MPa) dynamic pressure at the gun. Proportioning machine primary heater and hose heat 170°F (77°C) Graco MP Fusion gun with 29/29 mixing chamber with .040 ceramtip.

## PACKAGING

This product is sold in standard 110 gallon drum sets 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.

## 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 mPa.s B: 350 ± 25 mPa.s
<b>Shelf Life Unopened Containers @ 60 - 90°F (15 - 32°C)</b>	12 Months

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

## 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.

On 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:** 4-5 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:** 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).

**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; for the 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.

## PROCESSING EQUIPMENT & SETTINGS

### MACHINES:

<b>GRACO (Gusmer, Glass-craft)</b>	<ul style="list-style-type: none"> <li>A-25*</li> <li>A-XP1</li> <li>E-10 HP</li> <li>E-20*</li> <li>E-30*</li> <li>E-XP1</li> <li>E-XP2</li> <li>H-20/35 Pro</li> <li>H-25*</li> <li>H3500</li> <li>H-40*</li> </ul>	<ul style="list-style-type: none"> <li>H-50*</li> <li>HV-20/35</li> <li>H-XP2</li> <li>H-XP3</li> <li>Reactor2 E-XP2</li> <li>Reactor2 H-XP2</li> <li>Reactor2 H-XP3</li> <li>Reactor2 E-30*</li> <li>Reactor2 H-30*</li> <li>Reactor2 H-40*</li> <li>Reactor2 H-50*</li> </ul>
<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

### GUNS:

<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>	

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 1700 psi (11.72 MPa) dynamic pressure at the gun with heating capabilities to 170°F (77°C) will adequately spray FULL METAL JACKET™ PLUS.

- Machines capable of producing a higher dynamic psi may be required depending on the service environment the FULL METAL JACKET™ Plus will be exposed to. Consult SPI technical service personnel for additional information.

- Proportioning machine primary heater temperature 160-170°F (71-77°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

FULL METAL JACKET™ PLUS is for professional use only. User must be proficient in the application of FULL METAL JACKET™ PLUS and the use of the high pressure heated plural component equipment used to apply it.

FULL METAL JACKET™ PLUS 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 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.

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.

For the most up to date technical data sheet and/or safety data sheet visit our website at [www.specialty-products.com](http://www.specialty-products.com).

## 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, CO<sub>2</sub> 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.

## 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	8.6 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

VF Specialty Products has no role in the manufacture of the finished polymer other than to supply its two components. It is vital that the person applying this product understands the product, and is fully trained and certified in the use of plural-component equipment. VF Specialty Products warrants only that the two components of this product shall conform to the technical specifications published in the product literature. The quality and fitness of the product are dependent upon the proper mixture and application of the components by the applicator. There are no warranties that extend beyond the description on the face of this instrument. Failure to apply the product within the parameters stated on this document shall void the warranty. VF SPECIALTY PRODUCTS MAKES NO WARRANTY OF MERCHANTABILITY OF THE PRODUCT OR OF FITNESS OF THE PRODUCT FOR ANY PARTICULAR PURPOSE. VF Specialty Products makes no warranty as to the quality of any product modified, supplemented, tinted, or altered in any way after it leaves the manufacturing plant. VF Specialty Products does not warrant that this product is suitable for use as a liner for potable water containers. Use of this product in a potable water container could be hazardous to health if it is improperly processed or applied. The liability of VF Specialty Products for any nonconformity of the product to its technical specifications shall be limited to replacement of the product. The sole exclusive remedy of buyer, which is to have VF Specialty Products replace any nonconforming product at no cost to buyer, is conditioned upon buyer notifying VF Specialty Products or its distributor in writing of such defect within thirty days of the discovery of such defect. VF Specialty Products shall not be liable for any direct, incidental, or consequential damages resulting from any breach of warranty. The data presented herein is intended for professional applicators or those persons who purchase or utilize this product in the normal course of their business. The potential user must perform any pertinent tests in order to determine the product's performance and suitability in the intended application, since final determination of fitness of the product for any particular use is the responsibility of the buyer. The aforementioned data on this product is to be used as a guide and is subject to change without notice. The information herein is believed to be reliable, but unknown risks may be present. VF Specialty Products makes no warranties, expressed or implied, including patent warranties or warranties of merchantability or fitness of use, with respect to products or information set forth herein. Nothing contained herein shall constitute permission or recommendation to practice any invention covered by a patent without a license from the owner of the patent. Accordingly, the buyer assumes all risks whatsoever as to the use of these materials and buyer's exclusive remedy as to any breach of warranty, negligence, or other claim shall be limited to the purchase price of the materials. Failure to adhere to any recommended procedures shall relieve VF Specialty Products of all liability with respect to the materials and the use thereof.

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**Product & Equipment Technical Assistance**  
**24 hours - 7 days a week 800 627 0773**



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SPI Media



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