



Part A – Tuff Grip™ 21-90 Iso – Part # 60016

Part B – Tuff Stuff® FR 21-85-120 Resin – Part # 60058

### DESCRIPTION:

Tuff Stuff FR is a two component, flame retardant, elastomeric polyurethane coating system. Its flame retardency makes it an ideal coating for numerous applications that require a flammability rating. Because of the large number of flammability ratings and the large array of surfaces that can be coated, it is highly recommended that testing, certification and approval be considered prior to any application of this coating. Note: Ultimate flame retardency is dependent upon coated substrate, thickness and density.

### FEATURES & BENEFITS:

- Maximum thickness – unlimited.
- Excellent abrasion resistance.
- Excellent impact resistance.
- High tensile strength, elongation and tear strength
- Excellent fire retarding-self extinguishing, low dripping.
- Excellent weather resistance.
- Excellent corrosion resistance.
- Excellent casting material.
- Good chemical resistance.
- Provides vibration and acoustic dampening.

### APPLICATIONS:

- Excellent fire retardent protective lining for abrasion, impact and corrosion resistance.
- Spray-on application creates a monolithic, seamless lining which conforms to any shape and size.
- Tough, durable lining for military applications such as:
  - Tactical vehicles and equipment requiring abrasion, corrosion and impact protection.
  - Foot traffic areas requiring non-slip surfaces.
- Excellent blast mitigation properties for military barracks, vehicles, temporary structures and buildings.
  - High tensile and elongation properties contains and reduces schrapnel in vehicles and buildings.
- Can withstand tracked vehicle traffic and heavy loads with proper thickness build.
- Reduces noise from vibration and impact.
- Spray-on application creates a monolithic, seamless lining which conforms to any shape and size.
- Can withstand vehicle forklift traffic and heavy loads with proper thickness build.

### TYPICAL PHYSICAL PROPERTIES:

Hardness (Shore A)	85±5	ASTM D-2240
Specific Gravity	1.10 – 1.12 g/cc	ASTM D-792
Tensile Strength (psi)*	1100 – 1300	ASTM D-412
Elongation (%)*	325 – 375	ASTM D-412
Taber Abrasion Resistance (mg of loss/1000 cycles) CS17 Wheel; 1000 grams weight	10 – 15	ASTM D-1044
Secant Modulus @ 200% elongation (psi)	800 – 900	ASTM D-412
@ 400% elongation (psi)	1200 – 1300	ASTM D-412
Tear Resistance (pli)* Die C	140 – 150	ASTM D-624
Ross flex (% crack growth per 50,000 cycles)	0	FIA-308
Flexural Modules	5600 – 6400	ASTM D-790
Water Absorption – 24 hours	1.0%	ASTM D-570
Flammability	Does not ignite	MVSS 302
	Pass (Uncertified)	Cal 117
	94 V-O	UL-94
	Pass	FMV 302
Dielectric Strength	300 volts/mil	ASTM D-149
Volume Resistance (ohm-inches)	6 x 10 (12)	
Dielectric Constant	5.4 MGh	ASTM D-150
Dissipation Factor	0.058 MGh	ASTM D-150
Cathodic Disbonding	Pass	ASTM G-8
Elcometer Adhesion Pull Test	Pass	ASTM D-4541

\*Properties were checked of Tuff Stuff FR polyurethane lining, 1/8" (125 mils), (3.18 mm) thick stock.

### SUBSTRATES:

Metals, wood, concrete, fiberglass and most plastics.

## COLOR OPTIONS OF TUFF STUFF® FR 21-85-120:

Full color range available. Standard colors - black, indigo blue, graphite and flame red. Custom colors available by special order.

## CHEMICAL RESISTANCE:

(Guidelines only: Fume, splash, spillage as noted. Individual testing required for immersion).

Acetic Acid to 10%	Excellent	Ammonia to 5%	Excellent
Formic Acid to 5%	Excellent	Caustic Soda Lye to 50%	Excellent
Sulfuric Acid to 10%	Excellent	Potash Lye to 20%	Excellent
Tannic Acid to 20%	Excellent	Oils	Excellent
Solvents	Moderate		

Properties were checked from polyurethane lining, 1/8" (125 mills), (3.18mm) thick stock.

## PROCESSING CHARACTERISTICS:

	Part A (Iso)	Part B (Resin)
Specific Gravity	1.19	1.12
Viscosity, cps @ 77°F	175 – 225	900 – 1000

## PROCESSING RECOMMENDATIONS:

	Low Pressure	High Pressure
Component Temperature	75°F – 85°F	120°F – 150°F (hose heat 140°F)
Surface Temperature of substrate to be coated	60°F – 110°F	60°F – 110°F
Coating thickness	0.125 – .5"	0.125 – .5"
Ratio:		
– A/B by weight	60/100	60/100
– A/B by volume	1/1.88	1/1.88
Reactivity: (tested in cups 160 gms combine at 75°F – 85°F)		
– Gel	150±30 seconds	60 – 90 seconds
– Tack-free/solid	180±30 seconds	130±30 seconds
– 95 – 99% cure	24 hours	24 hours

## VOLATILE ORGANIC CONTENT:

None. 100% solids. No solvents.

## DRY FILM THICKNESS RANGE:

Varies based on application, typically used at a minimum of 1/16" (62.5 mils; 1.5 mm) up to unlimited thickness.

## SHELF LIFE:

**Part A - Isocyanate:** Six months, unopened.

**Part B - Resin:** Twelve months, unopened.

## BASE MATERIAL COLORS:

**Isocyanate** - clear amber liquid. **Resin** - pale yellow liquid.

## STORAGE AND HANDLING:

**TuffGrip Part A (Isocyanate)** like other organic isocyanates, can react with water to form insoluble ureas and carbon dioxide gas with can result in a pressure buildup inside closed containers. Therefore, extreme care must be taken to assure containers used for Part A remain dry. Part A should be stored at temperatures between 75° F and 80° F under a dry nitrogen atmosphere. **Tuff Stuff Part B - FR (Resin)** is hygroscopic and should be stored in sealed containers to prevent ingress of moisture. If stored at temperatures between 75° F and 80°F, the storage life of this product is 6 months. Part B - FR Resin will separate upon storage. This material must be thoroughly mixed just prior to use. For additional information, refer to Rhino Linings Safety Data Sheet.

## SAFETY PRECAUTIONS: Health Considerations: Consult the Rhino Linings® Material Safety Data Sheets (SDS)

This chemical system requires the use of proper safety equipment and procedures. Please follow the Rhino Linings® product SDS and Safety Manual for detailed information and handling guidelines.

**For Your Protection:** The information and recommendations in this publication are, to the best of our knowledge, reliable. Suggestions made concerning the products and their uses, applications, storage and handling are only the opinion of Rhino Linings Corporation. Users should conduct their own tests to determine the suitability of these products for their own particular purposes and of the storage and handling methods herein suggested. The toxicity and risk characteristics of products made by Rhino Linings Corporation will necessarily differ from the toxicity and risk characteristics developed when such products are used with other materials during a manufacturing process. The resulting risk characteristics should be determined and made known to ultimate end-users and processors. Because of numerous factors affecting results, **Rhino Linings Corporation makes no warranty of any kind, express or implied**, other than that the material conforms to its applicable current Standard Specifications. Rhino Linings Corporation hereby disclaims any and all other warranties, including but not limited to those of merchantability or fitness for a particular purpose. No statements made herein may be construed as a representation or warranty. The liability of Rhino Linings Corporation for any claims arising from or sounding in breach of warranty, negligence, strict liability, or otherwise shall be limited to the purchase price of the material.

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