

Part A – Rhino Extreme 11-70 FR Iso, Part # 60098-1

Part B – Rhino Extreme 11-70 FR Resin, Part # 60094-1

**DESCRIPTION:** Rhino Extreme™ 11-70 FR is a high-modulus thermoset spray-applied plural-component aromatic polyurea elastomer used as an abrasion, impact and moisture resistant coating for multiple substrates. This rapid curing, 1:1 volumetric ratio system is designed to be sprayed with high pressure plural component spray equipment. Rhino Extreme 11-70 FR forms a seamless, monolithic membrane that delivers water and chemical resistance along with superior stiffness and corrosion resistance. Its flame retardence makes it an ideal coating for numerous applications that require a Class I 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 on the finished product. Note: Ultimate flame retardence is dependent upon coated substrate, thickness and density. Thickness of the lining will vary depending on the application, typically from a minimum of 20 mils up to unlimited thickness.

**TYPICAL USES:**

- “Hard Coat” for EPS, PU and other foams
- Pipe lining interior and exterior
- Brush guards
- Saltwater corrosion such as protection for oil well platforms
- Various structural applications
- Base coat for EIFS systems

**FEATURES & BENEFITS:**

- Class I fire rated, flame spread  $\leq 25$  and smoke density  $\leq 450$
- Robust application window with ability to spray at low temperatures  $-20^{\circ}\text{F}$  ( $-29^{\circ}\text{C}$ ) and high humidity
- Excellent physical properties
- Excellent chemical resistance and corrosion resistance
- Excellent waterproofing characteristics
- High impact resistance
- Fast-set: handle within 60 seconds
- Excellent leveling properties
- Sprays out with a smooth, glossy surface to reduce filling and sanding.
- Durability extends substrate life.
- Bonds to virtually all substrates of any dimension, including metals, woods, concrete, fiberglass and geotextiles
- Stable from  $-40^{\circ}$  to  $230^{\circ}\text{F}$  ( $-40^{\circ}$  to  $110^{\circ}\text{C}$ )
- High temperature stability to  $220^{\circ}\text{F}$  ( $95^{\circ}\text{C}$ ) with intermittent temperatures to  $300^{\circ}\text{F}$  ( $148^{\circ}\text{C}$ ).
- 100% solids, zero VOCs, no solvents

<b>CHEMICAL PROPERTIES*:</b>	<b>Test</b>	<b>Isocyanate (A)</b>	<b>Resin (B)</b>
Specific Gravity (grams/cc)	ASTM D-792	1.15	0.99
Viscosity, CPS at $77^{\circ}\text{F}$ ( $25^{\circ}\text{C}$ )		550	650
Solids by Volume/Weight		100%	100%
Volatile Organic Compounds		0 lbs/gal	0 lbs/gal
Mix Ratio, parts per volume		1	1
Mix Ratio, parts per weight		110	100
Gel Time, seconds		3	
Tack Free, seconds		$12 \pm 5$	
Recoat, max		$\leq 4$ hrs	
Cure Time		72 hrs	
Theoretical Coverage (dft)		100 sqft @ 16 mil/gal	
Odor		mild	amine
Freezing Point		$40^{\circ}\text{F}$ ( $4.4^{\circ}\text{C}$ )	n/a
Color		amber	straw
Shelf Life - Unopened Containers @ $60 - 90^{\circ}\text{F}$ ( $15 - 32^{\circ}\text{C}$ )		12 months	12 months

\*Properties were tested at  $77^{\circ}\text{F}$  ( $25^{\circ}\text{C}$ ).

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**TYPICAL PHYSICAL PROPERTIES:**

	<b>Test</b>	<b>Result</b>
Hardness (Shore D)	ASTM D-2240	70±5
Tensile Strength (psi)	ASTM D-412	3300 ±200 (21.4 – 24.1 MPa)
Tear Resistance (pli) Die C	ASTM D-624	450 (78.8 KN/m)
Elongation (%)	ASTM D-412	80 ±5
Impact Resistance (in/lbs) @ 75° F (24° C)	ASTM D-256	160 (28.0 KN/m)
Density (lb/ft3)	ASTM D-1622	69 – 70 (1104 – 1120 Kg/m3)
Compressive Strength (psi)	ASTM D-695	>800 (5.5 MPa)
Taber Abrasion Resistance (mg of loss/1000 cycles) H-18 Wheel; 1000 grams weight	ASTM D-4060	48
Mandrel Bend, 180°, 1 inch mandrel	ASTM D-522	Pass
Coefficient of Friction on Steel:	-Static	.35
	-Kinetic	.5
Water Vapor Transmission:	ASTM E-96	
-Rate of Transmission (grains/hr/sqft)		0.53 (0.35 metric perm)
-Permeance (perm, in - lb)		1.63 (1.03 metric perm)
Water Absorption (%)	ASTM D-570	≤1
Glass Transition - Tg (°C)	ASTM D-7028	-40°F (-40°C)
QUV Weatherometer (black) 2000 hours (QUV-B)		No evidence of failure
Flammability FS≤25, Smoke≤450	ASTM E-84	Class I
	FMV-302	Pass (Uncertified)
	Cal 117	Pass (Uncertified)
	UL-94	V-O
Dielectric Strength (volts/mil)	ASTM D-149	300
Volume Resistancy (ohm/inches)	ASTM D-257	6 X 10 (12)
Dielectric Constant (MHz)	ASTM D-150	5.4
Dissipation Factor (MHz)	ASTM D-150	0.058
Cathodic Disbonding	ASTM G-8	Pass

**PROCESSING CHARACTERISTICS:** The system settings required to achieve quality spray sealant application will vary depending on environmental and substrate conditions. The following recommended parameters will help ensure optimum lining quality.

Equipment Used	Process Pressure	Spray Gun
Graco Reactor EXP-2	2000 psi (136 bar) - static	Fusion - Air Purge with AR2929 mix module

Process Temperatures

Iso & Resin Components	Hoses	Substrate Surface
140 – 160° F (60 – 71° C)	130 – 160° F (54 – 71° C)	40° F (5° C) and rising with 7° F (-13° C) above dew point

**Note:** A hose thermometer inserted under the insulation near the gun should read a minimum of 145 – 155° F (63 – 68° C). Pre-heater temperature should be at 130 – 160° F (54 – 71° C).

**DRY FILM THICKNESS:** Varies based on application, typically a minimum of 20 mil (0.5 mm) up to unlimited thickness

**SURFACE PREPARATION:** Apply Rhino Extreme 11-70 FR to only clean, dry, sound surfaces free of loose particles or other foreign matter. A primer may be required, subject to type and/or condition of the substrate. Consult technical service personnel for specific primer recommendations and substrate preparation procedures.

**APPLICATION INSTRUCTIONS:** This product is for professional use only. Rhino Extreme 11-70 FR can be sprayed over a broad range of substrate temperatures. Contact Rhino Linings account representative for specific recommendations, pricing, and availability of spray and auxiliary equipment. Apply a Rhino Extreme 11-70 FR when surface and air temperatures are above 40° F (5° C) and rising, and 7° F (-13° C) above dew point. Minimum material/container temperature for spray application is 70°F (21 °C). One to two coats is recommended and Rhino Extreme 11-70 FR should be sprayed in using a cross-hatch pattern (north-south/east-west) passes to ensure uniform thickness. The polyol “B” component must be thoroughly power mixed each day, prior to use. Contact a Rhino Linings technician regarding proper mixing equipment. Follow the instructions attached to “A” and “B” containers. It should be noted that Rhino Extreme 11-70 FR is an aromatic polyurea; therefore, as with all aromatics color change and superficial oxidation will occur.

**SUBSTRATES:** Bonds to virtually all substrates of any dimension, including metals, wood, concrete and fiberglass

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**COLOR OPTIONS:** Standard colors: industrial tan, light gray and black. Custom colors will be quoted upon request.

**HOW SUPPLIED:** Net weight per set is 910 pounds (412.7 kg). A set of Rhino Extreme 11-70 FR consists of one (1) 55 gallon (208 L) drum of 'A' component and one (1) 55 gallon (208 L) drum of 'B' component.

**STORAGE:** Rhino Extreme™ 11-70 FR components should be stored in sealed containers at 70 – 100°F (20 – 38° C) in a dry area. Avoid moisture contamination in containers. Containers should not be resealed if contamination is suspected, carbon dioxide (CO<sub>2</sub>) created pressure can develop. Do not attempt to use contaminated material.

**SAFETY PRECAUTIONS: Health Considerations: Consult the Rhino Linings® 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.

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