



RHINO HYDE® URETHANE SHEETING

TECHNICAL INFORMATION

Rhino Hyde® sheets are tough, resilient elastomeric urethanes specifically designed for use in applications requiring abrasion resistance. Rhino Hyde® also provides lightweight, easy installation, excellent impact resistance, good low temperature properties, noise reduction, corrosion resistance and chemical resistance to aliphatic hydrocarbons, mild acids & bases.

Rhino Hyde® is recommended for use in material handling of any abrasive material including grain, soybeans, coal, taconite pellets, copper ore, phosphate rock, sand, gravel, salt and wood chips.

Appropriate application areas for Rhino Hyde® linings include:

- Round and square spouts
- Chutes, ducts, flumes
- Elbows
- Belt overshot areas
- Belt scrapers, skirt boards
- Truck beds
- Hoppers, bins, surge tanks
- Conveyor troughs
- Cyclones (velocities less than 4000 ft./min.)
- Distributors, turnheads, impact pads

PRODUCT OPTIONS, BACKINGS:

1. **Expanded Metal-Backed Rhino Hyde®:** Expanded metal backing provides a degree of rigidity, yet retains the desired flexibility of urethane to permit forming to shape. Attachment is recommended by bolting through the wear surface.

Metal gauges available:	18 ga. & 13 ga. flattened expanded
Thicknesses available 18 ga:	3/16", 1/4", 5/16" (Overall thickness)
13 ga:	5/16", 3/8", 1/2", 1", 2" (Overall thickness)
Standard size:	4' x 10'

2. **Solid Metal-Backed Rhino Hyde®:** Solid metal-backed Rhino Hyde® provides abrasion resistant Rhino Hyde® urethane with a 16 ga. or 2mm solid metal backing. Solid metal-backed is recommended where attachment through the wear surface is undesirable and flexibility is not required. The use of screws from the substrate into solid metal backing is the recommended method of attachment.

Metal gauges available:	16 ga. or 2mm
Thicknesses available:	3/16", 1/4", 5/16", 3/8", 1/2", 1", 2" (Overall thickness)
Standard size:	4' x 10'



3. **Ceramic Rhino Hyde®:** Ceramic Rhino Hyde® is a tough elastomeric polyurethane embedded with ceramic chips. This combination offers the outstanding abrasion resistance of alumina ceramic with the resiliency and impact resistance of Rhino Hyde® polyurethane. Our engineered process provides a consistent layer of chips throughout the surface.

Metal gauges available: 13 ga. expanded
Thicknesses available: 5/16", 3/8" 1/2" (Overall thickness)
Standard size: 4' x 10' (47" ceramic + 1 plain urethane)

4. **Fabric-Backed Rhino Hyde®:** Rhino Hyde® polyurethane with fabric backing is designed for attachment to a substrate with an adhesive. The fabric backing is recommended for areas where bolting is difficult or undesirable and formability in long runs of round spouting is required. All fabric backed product has a tolerance of $\pm 1/16"$.

Backing: Cotton fabric
Thicknesses available: 3/16", 1/4", 5/16", 3/8", 1/2" (Overall thickness)
Standard size: 4' x 10', 25', 50' & 100', custom sizes available

5. **Unbacked Rhino Hyde®:** Unbacked Rhino Hyde® is designed for applications where no backing is desired. It can be used for die cutting or stamping out different shapes or parts. The unbacked urethane also has the maximum degree of flexibility required for forming the sheets to desired shapes.

Thicknesses available: 1/8", 3/16", 1/4", 5/16", 3/8", 1/2", 1", 2"
Standard size: 4' x 10', 25' & 50', custom sizes available

PRODUCT OPTIONS, MATERIALS:

1. **Standard Rhino Hyde®:** Standard Rhino Hyde® is an abrasion resistant urethane lining designed for use in applications requiring excellent abrasion resistance. Standard Rhino Hyde® products exhibit superior wear resistance and sound attenuation.

Backings available: Flattened, expanded metal, solid metal, ceramic, fabric and unbacked
Standard color: Medium Blue

2. **High Energy Rhino Hyde®:** High Energy is an abrasion resistant urethane lining designed for use in high wear, high humidity and aqueous environments. High Energy exhibits superior hydrolytic resistance in addition to outstanding rebound and abrasion resistance and sound attenuation.

Backings available: Flattened, expanded metal, solid metal, ceramic, fabric and unbacked



Standard color: Orange

3. **High Temperature Rhino Hyde®:** High temperature Rhino Hyde® is designed for applications requiring abrasion resistance at elevated temperatures. Recommended operating conditions are from 180°F to 250°F.

Backings available: Flattened, expanded metal, solid metal, ceramic, fabric and unbacked

Standard Color: Green

4. **Fire Fighter Rhino Hyde®:** Rhino Hyde® Fire Fighter is designed to resist flame propagation and provide excellent abrasion resistance. Fire Fighter has passed ASTM E84-05 testing with a Class-II rating.

Backings available: Flattened, expanded metal, solid metal and ceramic

Standard color: Burgundy

NOTES:

- Different thicknesses and sizes are available upon request on all linings.
- Special chemistries and hardnesses are also available depending on the application and the environment.



RHINO HYDE® TECHNICAL SPECIFICATIONS

Tolerances: **Listed tolerances are for closed molded sheets. Any table poured product will have a thickness tolerance of $\pm 1/16$ "**

Thickness: $\pm .020$ " for 3/16", 1/4", 5/16" thicknesses
 $\pm .030$ " for 3/8", 1/2" thicknesses
 $\pm .040$ " for 1/8", 3/4", 1", 2" thicknesses
 $\pm 1/16$ " for all fabric backed product

Width: $\pm 1/2$ " for 4' x 10' sheets

Length: $\pm 1/2$ " for 4' x 10' sheets

Weights:

Typical weights in pounds for 4' x 10' sheets in the following thicknesses:

	1/8"	3/16"	1/4"	5/16"	3/8"	1/2"	3/4"	1"	2"
Rhino Hyde® (unbacked)	35	45	65	80	95	125	195	250	500
Rhino Hyde® (fabric backed)	NA	57	75	89	104	125	195	250	500
Rhino Hyde® (18 ga. exp. metal)	NA	85	95	105	NA	NA	NA	NA	NA
Rhino Hyde® (13 ga. exp. metal)	NA	NA	NA	115	130	160	227	285	535
Rhino Hyde® (16 ga. or 2mm solid metal)	NA	140	150	160	175	205	260	335	585
Ceramic Rhino Hyde® (13 ga. exp. Metal)	NA	NA	NA	135	150	180	NA	NA	NA

Actual weights are accurate within $\pm 10\%$ for 1/8", 3/16", 1/4", 3/8" thicknesses.

Actual weights are accurate within $\pm 5\%$ for 1/2", 3/4", 1", 2" thicknesses.

NA – not available

Hardness

80-85 Shore A durometer

High Temperature – 55 Shore D durometer at room temperature

Other durometers are also available.

Flammability Characteristics (Call for information on Fire Fighter)

Flash point None

Melting point 400°F

Decomposition temperature 500°F

ASTM D-635 (horizontal burn) – does not support combustion after removal of flame source.

Chemical Properties

Corrosion resistance Excellent

Resistance to mild acids Excellent

Resistance to bases Excellent

Resistance to aliphatic hydrocarbons Excellent



Rhino Hyde® urethane is not recommended for use in prolonged exposure to steam, aromatic hydrocarbons, ketones, strong acids, or bases.

FDA Compliance

Rhino Hyde® urethane liners are cleared under §177.1680 by the FDA for use as a food contact surface in contact with bulk quantities of dry food.

We also have Rhino Hyde® urethane that complies with §177.2600 by FDA for repeated use in contact with aqueous or fatty goods.



ILLUSTRATIONS OF TYPICAL SPOUT INSTALLATIONS



INSTALLATION SUGGESTIONS RHINO HYDE® POLYURETHANE SHEETING

HOW TO CUT

Rhino Hyde® polyurethane sheets may be cut to the desired size and shape using a 1/4" metal shear, Power jig saw or hand-operated nibbling tools. **DO NOT USE** high speed saws such as circular saws. The heat generated by the saw can cause decomposition of the urethane, emitting potentially toxic fumes.

Recommended Saws

Bosch Jig Saw (Electric; with orbital action & variable speed)

Bosch Jig Saw (Air powered, explosion-proof, with orbital action)

Recommended Blades

For expanded & solid metal backed Rhino Hyde®, use a bi-metal blade (1/4" steel cutting blade).

For expanded Ceramic Rhino Hyde®, use a carbide grit blade.

Recommended Protective Equipment

For protection against dust and metal slivers from the metal backing, wear goggles fitted with side shields, gloves and long-sleeved shirts.

To protect against inhalation of dust and/or organic vapors, use a NIOSH – approved respirator containing a cartridge for organic vapor **and** dust protection.

Recommended Respirator: 3M 9913

CUTTING CERAMIC RHINO HYDE®

It is recommended that the plain urethane edge be removed prior to installation to ensure ceramic-to-ceramic contact at butts and joints. Cut or shear Ceramic Rhino Hyde® with the adhesive paper remaining on the sheet to minimize sticking of the adhesive to the cutting tool. The sheet should be cut with the paper side up. The adhesive paper may be left on the sheet after installation. The flow of material across the sheet will quickly wear the adhesive paper away.

Cut the ceramic Rhino Hyde® using the recommended protective equipment and a 1/4" shear or recommended saws. **DO NOT USE** a circular saw to cut ceramic Rhino Hyde®.

HOW TO FORM

Rhino Hyde® sheeting can be formed to many complex shapes by hand-forming, with the use of break presses or rolls, or through the use of bolts to draw and form the sheet into place. It is recommended that 18 gauge expanded metal-backed sheets be used in round spouts and areas where substantial forming is required. It is more flexible than 13 gauge expanded metal sheets which are recommended for square or rectangular spouts and other flat areas. Fabric-backed and plain sheets have the greatest flexibility of all the Rhino Hyde® line of sheeting and are the easiest sheets to form.



The minimum diameter for bending expanded metal-backed sheeting is five inches. **DO NOT FORM SOLID METAL-BACKED RHINO HYDE® USING A BREAKPRESS OR ROLL.** SOLID METAL-BACKED RHINO HYDE® SHOULD BE CUT INTO THE DESIRED WIDTH AND LENGTH AND BOLTED INTO PLACE.

HOW TO INSTALL EXPANDED METAL-BACKED URETHANE

Recommended fasteners for attaching expanded metal-backed sheeting to a substrate include 1/4" and 5/16" diameter flat head elevator bolts, stove bolts, tapered head machine screws and urethane capped bolts. The length of the desired bolt used depends upon the application and the thickness of the material.

Fasteners should be placed often enough to ensure the liner is firmly attached to the substrate to prevent movement or vibration. Bolt centers should measure 12-14 inches along the sides and center and 6-8 inches on the butts and joints.

To ensure optimized wear life, bolt heads should be out of the main flow-path of the material and should not protrude above the surface of the liner. A protruding bolt head in the flow-path will wear quickly, causing the liner to loosen and wear prematurely. A protrusion at the surface of the liner may cause turbulence in the flow of the material, thereby accelerating the erosion process. A depression created by drawing a bolt in too tight may also create turbulence. Countersinking of the bolts is recommended. Use a wood bit to ream out the countersunk hole.

HOW TO INSTALL FABRIC-BACKED URETHANE

Fabric-backed sheeting is designed to be attached to a substrate with an adhesive. To ensure the sheet is securely attached, a limited number of flat head elevator, stove or urethane capped bolts should be used along the edges and seams.

METAL PREPARATION

Key to the successful installation of fabric-backed Rhino Hyde® is the proper preparation of the metal substrate. A fresh metal surface, free of rust or dirt buildup is essential. Mechanical sanding or sandblasting, followed by a solvent wipe to remove all oil, grease and dust is recommended shortly before application of the adhesive.

Worn areas or indentations in the metal surface should be filled with caulking to ensure the fabric-backed sheet will lie flat when installed.

APPLICATION OF THE ADHESIVE

A high-quality contact cement is recommended for installing fabric-backed Rhino Hyde®. Tandem Products stocks adhesive for this purpose as do most industrial adhesive suppliers. A contact cement effective in bonding cotton fabric to metal is desired.

Prepare both the metal substrate and the fabric-backed Rhino Hyde® prior to application of the adhesive. Ensure the adhesive bonds on clean surfaces, free of dust. Stir the adhesive prior to applying. Spread approximately a 10-mil layer of adhesive on the fabric with the coarse edge of the trowel. Apply an even layer of adhesive to the steel with the fine edge of the trowel. Allow the solvent time to



evaporate before positioning the polyurethane sheet. Place the polyurethane sheet carefully on the metal. The best bond is achieved if the fabric-backed sheet does not have to be moved after applying. The fabric-backed sheet should be free of any bumps or ripples. Bolt leading edges 6-8" on center, 1" from the edge. Supplementary bolts on the other edges may be used. Apply pressure using heavy objects or clamps for one hour, particularly along the edges to achieve optimal bonding.

Caution: The contact adhesive contains flammable solvents which are volatilized during the process. Use a NIOSH-approved respirator for organic vapors when applying.

FIRE SAFETY INFORMATION

Do not expose Rhino Hyde® to open flame situations such as welding. The polyurethane can ignite when temperatures exceed 800°F, generating toxic decomposition products. If a fire involving polyurethane sheeting occurs, use foam, carbon dioxide, or dry chemical fire extinguishers. Self-contained breathing apparatus is required when firefighting to avoid inhalation of toxic gases.

NOTICE: All of the above statements, recommendations, suggestions, and data concerning the subject material are based on our laboratory results and, although we believe the same to be reliable, we expressly do not represent, warrant or guarantee the accuracy, completeness or reliability of same, or the material or the results to be obtained from the use thereof, neither do we warrant that any such use, either alone or in combination with other materials shall be free of the rightful claim of any third party by way of INFRINGEMENT or the like, and TANDEM PRODUCTS, INC. DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE.