



# TECHNICAL DATA SHEET

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## Reliobond 1500 Series Friction Adhesives

Reliobond 1500 series products are phenolic resin solutions designed for bonding friction material to metal. These resins offer excellent bond strength across a wide range of temperatures and are resistant to oil, grease, transmission fluid, and brake cleaning fluid.

### PROPERTIES:

	RB1501	RB1502	RB1503	RB1503NT
Solids	30-34%	32-36%	37-41%	37-41%
Viscosity (Brookfield RVF)	2200-2600 cps (#4 @ 20 rpm)	2100-2700 cps (#4 @ 20 rpm)	1700-2300 cps (#4 @ 20 rpm)	1700-2300 cps (#5 @ 4 rpm)
Density	7.80 #/gal 0.936 g/L	7.96 #/gal 0.955 g/L	8.31 #/gal 0.997 g/L	8.39 #/gal 1.006 g/L
Color	Amber/Tan	Amber/Tan	Amber/Tan	Amber/Tan

### CHOOSING A PRODUCT:

RB1501 and RB1502 are economical, general purpose friction adhesives. RB1503 provides highest bond strength of this category of phenolic resins. RB1503NT is a toluene free version of RB1503.

### SURFACE PREPARATION:

All metal surfaces must be free of moisture, oils, dirt, and other contaminants. Typical cleaning processes include aqueous alkaline cleaners, solvent vapor cleaners, or burning or baking contaminants off of the surface. After cleaning, a surface preparation process like phosphating, grit blasting, or wheel abrading will enhance the bond. RB1500 series products will bond very well to a clean, bare metal surface, but preparing the surface with one of these methods will improve the consistency and overall strength of the bond.

### APPLICATION:

Mix adhesive well before use. RB1501, 1502, and 1503 can be reduced to a desired viscosity/solids using a 60:40 blend of toluene and ethanol. RB1503NT should be reduced with a 75:25 blend of ethyl acetate and ethanol. Any of these products can be reduced with methyl ethyl ketone or acetone in small quantities.

Apply to either the friction material or metal surface of the part. Depending on the application, dry film thickness of the coating can range from 0.5-5 mils. Due to variations in friction material density and composition and part size and configuration, experimentation is required to determine the optimal coating thickness. 1-3 mils of dry resin is a good starting point for most friction bonding applications.

### DRYING:

Coating must be fully dried before curing. Residual solvent in the coating can cause a weak, "spongy", "blown" bond. Environmental conditions, coating thickness, and drying equipment type all significantly affect dry time. Here are some general guidelines for drying:

- Drying oven temperatures can range from 100°F-250°F. Do not exceed 250°F as higher temperatures can prematurely cure the adhesive or cause blistering of the adhesive film.

- Air flow in the drying oven is crucial to achieving fast dry times. More air flow will reduce dry time.
- Contact Ruscoe Technical Service for a test procedure to determine if your part is fully dried.

#### CURING:

Phenolic resins generate water vapor during cure. This water vapor must be forced out of the coating using pressure during the cure cycle. Most bonding problems with this type of resin are related to inadequate or uneven pressure. At least 100 psi must be continuously and uniformly applied during the curing process to ensure a good bond.

Recommended cure temperature range is 300-450°F. Keep in mind that this is the temperature that the coating must reach, not the oven setting. Phenolic resins will cure slower at lower temperatures, but will allow more time for water vapor to escape and for the coating to flow and wet the metal surface. Curing at too high of a temperature can cause the resin to gel quickly which will trap water vapor and cause a weak bond. Experimentation is required to determine the optimum cure cycle for each part design. A good starting point is to cure for 10-30 minutes at 400°F and 200 psi.

#### CLEANING:

Uncured resin can be cleaned using methyl ethyl ketone, acetone, tetrahydrofuran, toluene, xylene, or ethanol. Tetrahydrofuran or a blend of toluene and ethanol are most effective. If the resin is fully cured the only practical methods of removal are abrasion, burning, heating above 600°F to decompose the coating, or soaking in a highly caustic solution. Consult SDS for instructions on spill clean-up and disposal.

#### STORAGE:

Reliobond 1500 series adhesives are flammable and should be stored below 100°F (37.7°C) in tightly sealed containers away from direct sunlight, heat, sparks, or other potential sources of ignition. Shelf life is 12 months from date of manufacture when stored appropriately. See Safety Data Sheet for more information on storage and disposal.

All statements, technical information and recommendations contained herein are based on tests believed to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties expressed or implied.

Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of, or the inability to use the product. Before using, user shall determine the suitability of the product for their intended use and user assumes all risk and liability whatsoever in connection therewith.

The foregoing may not be changed except by an agreement signed by officers of seller or manufacturer.

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