

TECHNICAL DATA SHEET

RELIOBOND 1651

DESCRIPTION

Ruscoe's Reliobond 1651 is a black in color nitrile and phenolic resin adhesive designed for bonding friction material to metal. It offers high bond strength across a wide range of temperatures.

SUGGESTED USES

Used heavily in brake, paper, clutch and transmission part applications.



METHOD OF APPLICATION

Bonding surfaces must be free of moisture, oils, dirt and other contaminants. Adhesive is typically applied to the friction material surface. In drum brake applications, the adhesive is usually extruded in a "ribbon" or "bead" pattern on the back of the lining. The channels between the beads or ribbons allow water vapor, which is formed during the curing process, to escape the bond line. Beads or ribbons of 8-15 mils (0.2-0.4mm) dry adhesive thickness is a good starting point for drum brakes. Experimentation is necessary to determine the optimum adhesive thickness and coating pattern for each part design.

STORAGE AND SHELF LIFE

Reliobond 1651 adhesives are flammable and should be stored in tightly sealed containers away from direct sunlight, heat, sparks or other potential sources of ignition. Shelf life is 12 months when stored 40-60°F (4-16°C) in unopened containers. Storage at temperatures above 60°F will cause eventual loss of adhesive performance. Parts that have been coated and dried can be bonded within 12 months if stored in a clean, dry area at temperature below 100°F (30°C).

HEALTH AND SAFETY

Health and safety data sheets available upon request at The Ruscoe Company.

DRYING

Reliobond 1651 must be fully dried before curing. Residual solvent in the adhesive can cause a weak, "spongy", "blown" bond. It is difficult to recommend exact drying parameters. 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-230°F. Do not exceed 230°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.

CURING

The phenolic resins in Reliobond 1651 generate water vapor during cure. This water vapor must be forced out of the adhesive using pressure during the cure cycle. Most bonding problems with this type of adhesive 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.

Reliobond 1651 adhesive will cure in the temperature range of 300°F-450°F. Keep in mind that this is the temperature that the adhesive must reach, not the oven setting. The adhesive will take longer to cure at lower temperatures but will allow more time for water vapor to escape and for adhesive to flow and wet the metal surface. Curing at too high of a temperature can cause the adhesive to gel quickly which will trap water vapor in the adhesive and cause a weak bond. A good starting point is to cure for 30 minutes at 400°F at 200 psi.

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RELIOBOND 1651 (cont'd)



TYPICAL PROPERTIES	
Color	Black
Solids, by Weight %	>40%
Solvent Formulation	Methyl Ethyl Ketone Isopropyl Alcohol
Viscosity, Brookfield, Spindle #	#5
Viscosity, Brookfield, Test RPM	4 rpm
Viscosity, Brookfield, Test Result, CPS	43,000 – 60,000
Pounds Per Gallon @77°F (25°C)	8.1
Shelf Life	12 Months



PERFORMANCE PROPERTIES	
Shear Strength (ambient)	>3,500 psi
Shear Strength (@400°F)	> 500 psi
Drying Temp	100°F - 230°F

CLEANING

Reliobond 1651 can be cleaned prior to cure using methyl ethyl ketone, acetone, n-butyl acetate, methyl acetate or t-butyl acetate solvents. If the adhesive is fully cured the only practical methods of removal are abrasion, burning, heating above 600°F for many hours or soaking in a highly caustic solution.

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 express 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 many are not changed except by an agreement signed by officers of seller or manufacturer.