



# TECHNICAL DATA SHEET

485 KENMORE BLVD.  
AKRON, OH 44301-1013  
WEB SITE: [www.ruscoec.com](http://www.ruscoec.com)

W.J. RUSCOE COMPANY  
P.O. BOX 3858  
AKRON, OH 44314-0858  
E-MAIL: [sales@ruscoec.com](mailto:sales@ruscoec.com)

PHONE: 330-253-8148  
FAX: 330-253-2933  
TOLL FREE: 800-293-8148

## RB-1706 FRICTION BONDING ADHESIVE

RB-1706 is a nitrile rubber and phenolic resin adhesive designed for bonding friction material to metal. This adhesive offers high bond strength across a wide range of temperatures. Cured RB-1706 has excellent resistance to oil, grease, transmission fluid, and brake cleaning fluid. RB-1706 contains a slower drying solvent blend specifically formulated for roll coating application.

### TYPICAL PROPERTIES:

(NOT FOR SPECIFICATION PURPOSES)

	RB-1706
<u>Solids</u> (Non-Volatiles)	28-32%
Viscosity <sup>1</sup> (Brookfield RVF)	2500-3500 cps (#2 @ 4 rpm)
Density (Weight per Gallon)	7.52 #/gal
Shelf Life <sup>2</sup>	12 months

1. Viscosity at time of manufacture. RB-1706 will increase slightly in viscosity over time. See "Storage" for details.
2. When stored at temperatures less than 60°F (16°C) in original unopened container. See "Storage" for details.

### Shear Strength

"Button & Bar" Shear Strength Test (SAE J840 Rev C)

(Grit blasted steel bonded to grit blasted steel. Cured 1 hour @ 425°F and 200 psi)

Tested at 75°F: 3000 psi minimum

Tested at 400°F: 700 psi minimum

### APPLICATION INSTRUCTIONS:

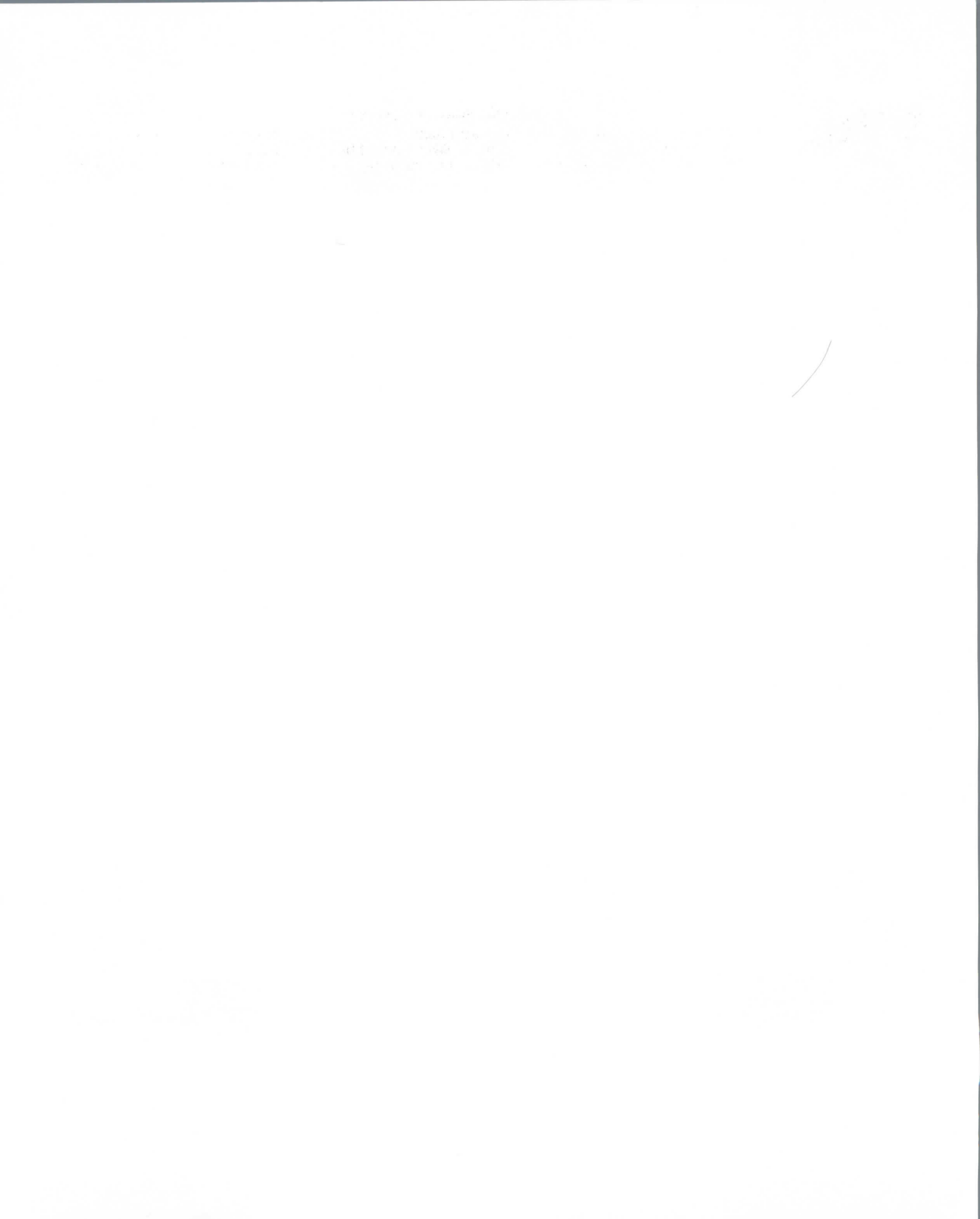
#### Surface Preparation:

All metal surfaces must be free of 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 adhesive bond. RB-1706 adhesive 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.

#### Adhesive Application:

RB-1706 should be thoroughly mixed before application. Mix the product before application using a high shear mixing blade, pail tumbler, or drum roller for 30 minutes to 1 hour. RB-1706 can be reduced to a desired viscosity/solids by using methyl ethyl ketone, acetone, n-butyl acetate, methyl acetate, or t-butyl acetate in any proportion. Toluene, xylene, and alcohols can be used in small amounts but will destabilize the product if too much is added.

RB-1706 adhesive is typically applied to the friction material surface. Experimentation is necessary to determine the optimum adhesive thickness and coating pattern for each part design.



For friction paper applications the adhesive is usually roll coated or curtain coated onto the paper. For clutch or transmission parts, a dry film thickness of 0.5-1.5 mils is a recommended starting range. The optimum film thickness allows for full wetting of adhesive onto the metal surface during cure, but does not squeeze out of the bond line or penetrate too deeply into the friction paper. If RB-1706 adhesive consistently penetrates too deeply into the friction material regardless of coating thickness, try Ruscoe DH7-007 which flows very little during cure and is designed to minimize penetration into low density friction paper.

#### **Drying:**

RB-1706 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-250°F (38-121°C). Do not exceed 250°F (121°C) 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:**

The phenolic resins in RB-1706 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.

RB-1706 adhesive will cure in the temperature range of 300-450°F (148-232°C). 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. Experimentation is required to determine the optimum cure cycle for each part design. A good starting point is to cure for 30 minutes at 400°F (204°C) at 200 psi.

#### **Cleaning:**

RB-1706 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 (316°C) for many hours, or soaking in a highly caustic solution. Consult MSDS for instructions on spill clean up and disposal.

#### **Storage:**

Recommended storage temperature is 40°-60°F (4°-16°C). Storage at temperatures above 60°F will cause significant increase in viscosity and eventually loss of adhesive performance. Parts that have been pre-coated and dried can be bonded within 6 months if stored in a clean, dry area at temperature below 85°F (30°C).

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.

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