

Borates in starch adhesives

Starch is a natural polymeric product and is found in almost every plant. The principal sources of most commercial starches are maize, potato, tapioca, and wheat. Adhesives derived from starch can be significantly improved by borate additives through:

- Increased viscosity
- Quicker tack
- Better fluid properties

Modifying the starch molecule

The chemical makeup of the starch polymer makes it a good adhesive, but for many industrial applications its tack is too slow and its viscosity too low.

If starch is treated with a hot aqueous solution of soda ash or caustic soda plus a borate compound, extensive chemical changes can be brought about. Interchain linkages can be formed through the borate ester anions, resulting in a desirable modification of the starch's physical properties.

It is the change to a more highly branched chain polymer with higher molecular weight that improves the viscosity, tack, and fluid properties of starch adhesives.

Industrial applications

The starch and adhesive industry depends on unique characteristics imparted by the addition of U.S. Borax borates products in adhesives. Products and processes requiring starch adhesives include:

- Corrugated box board
- Paper bags (grocery and multi-wall)
- Paper boxes
- Carton sealing
- Case sealing
- Tube winding (paper and board)
- Laminated paper board
- Gummed tape
- Gummed paper
- Textile sizing

About U.S. Borax

U.S. Borax, part of Rio Tinto, is a global leader in the supply and science of borates—naturally-occurring minerals containing boron and other elements. We are 1,000 people serving 650 customers with more than 1,800 delivery locations globally. We supply around 30% of the world's need for refined borates from our world-class mine in Boron, California, about 100 miles northeast of Los Angeles.

About 20 Mule Team products

U.S. Borax produces the 20 Mule Team® borates family of products from naturally occurring minerals and have an excellent reputation for purity and safety when used as directed. Borates are key ingredients in a number of industrial applications including fiberglass, glass, ceramics, batteries and capacitors, wood preservatives, and flame retardants.

High quality, high reliability, high performance borate products. It's what we're known for.