



ADVANCED ADHESIVES

REPORT Your corrugating adhesives newsletter from Harper/Love Adhesives Corporation

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How to cure and prevent clogged pipes in your adhesive distribution system

By John Kohl



Starch adhesive: like a high cholesterol diet for your pipes

All box plants that have corrugators use starch adhesive to bond the liners and medium together. The liquid starch is an adhesive that not only bonds the paper together, it also bonds itself—and any chemicals in it—to the inside of the distribution

system's pipes. The continuous flow of adhesive through the system builds layer upon layer of pipe-plugging material that reduces flow to the pans and creates backpressure that overworks the pumps. The reduced flow can cause bonding problems when the pans are deprived of starch and the glue roll does not apply the proper amount to produce a good bond. This starch buildup is common in all plants and can be a major maintenance issue if not addressed properly.



Liquid starch adhesive not only bonds the paper together, it also bonds itself—and any chemicals in it—to the inside of the distribution system's pipes.

Long pipe runs in a heated environment compound the problem

The starch adhesive used in corrugating is pumped through a piping system from storage tanks, which are usually located in a separate starch room, to the adhesive pans on the corrugator. The most common pipe used is 2" ID that runs in two loops from the storage tanks the length of the corrugator and back to the tanks. One loop is dedicated for the single-face pans and one loop for the double-back glue machine. The pipes are located above the corrugator, near the ceiling, with a pipe drop at each single facer and glue machine. The length of the loop and location of the pipe in a heated environment add to the buildup problem.

There are as many ways to clean and maintain proper flow in the starch lines as there are box plants. Each plant thinks they are using the best method available to clean lines, or

they use the, "This is the way we've always done it" method. In reality, there are a lot of variables to consider when setting up a cleaning program. The adhesive formula, additives, water hardness, pipe location, and the use of wastewater, all add to the buildup problem. There is also the environmental issue of what to do with the waste generated when you clean the lines. All these things combined make it very difficult for a plant to clean the starch lines and keep the best possible adhesive flow.

Water alone won't clean your pipes



Some plants are flushing their starch lines frequently with water only, or water with a little bleach. This may be a "feel good" solution, but does little to remove or prevent buildup. The use of wet strength resin at too high an addition rate will cause a buildup that water alone

will not clean out. Resin used at the proper addition rate will not cause pipe deposits and exacerbate the buildup problem.

There are two acceptable methods for cleaning starch lines to maintain flow. Both methods should be performed on a quarterly basis to guarantee a consistent starch flow to the pans. The standard method that has been used for years is the use of TSP (trisodium phosphate) to clean with, followed by bleach to sterilize the system to kill any bacteria in the system. The complete cleaning instructions are covered in the TAPPI TIS 0304-06. This method still works well but discharge of the phosphate-laden wastewater into the plant's sewer may not be allowed by the local municipality. There are also safety issues with heating bleach and its use for this purpose has been banned recently in most plants.

The other method that has been developed a few years ago is the use of a strong cleaning chemical that cleans and

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Adhesive system cleaning, continued

sanitizes simultaneously. The best product is Clean Tank Plus from Walla Walla Environmental. There are other products with similar names but they do not perform as well and some are dangerous to use. Clean Tank Plus is added to warm water and pumped through the lines for a few hours. The effervescent effect of the product scours the starch buildup and kills any bacteria present. It is a quick, efficient way to keep a plant's starch supply system clear and maximize flow to the pans.

How to prevent buildup of calcium carbonate

The use of hard water or wastewater in the adhesive can cause a calcium carbonate buildup on the glue rolls and inside the supply pipes. Any plant that uses treated or untreated wastewater to make adhesive, needs to use a calcium inhibitor. These chemicals sequester or tie up the calcium so that it can't form large crystals that adhere to glue rolls and pipes. The product Calciban, is available through Harper/Love and should be added to each batch. Volume usage for Calciban is 3-6 ounces, depending on the hardness and calcium levels, and is a small cost compared to glue roll cleaning. The plant should have the water tested periodically for hardness content, and use the data to adjust their calcium inhibitor dosage.

Remember the key to consistently optimized adhesive flow is to use the proper amount of wet strength resin and calcium inhibitor along with a quarterly cleaning program.

Calci-Kleen™ hard water and scale cleaner removes calcium buildup

Calci-Kleen is a cleaning agent formulated to get rid of calcium buildup without hard scrubbing or harsh acid washes or soda blasting.

Clean glue and metering rolls are vital to the successful operation of your corrugator. When the use of treated or untreated wastewater fills the glue roll cells with calcium carbonate, the rolls can no longer transfer adhesive to the flute tips properly. The calcium carbonate will also build up on metering rolls that will affect glue film thickness and consistency. These two problems can cause a plant costly waste, downtime, and maintenance/replacement costs. Regular use of Calci-Kleen will prevent these costly problems. Some plants have found Calci-Kleen useful for cleaning calcium buildup in adhesive distribution system pipes, as well.



Calci-Kleen is packaged in 450-pound drums and 2,500-pound totes.

Most equipment will be thoroughly cleaned in just a few minutes. Just add Calci-Kleen directly into an empty starch pan and allow the rolls to idle for 20 minutes. Then simply return the Calci-Kleen to the original drum or rinse down the drain. Wash off the rolls with running water. Calci-Kleen is biodegradable. It is also USDA and FDA approved for use in food, beverage, bottling, and pharmaceutical processing plants. This makes it fully approved for use in a box plant that produces food packaging.

**50 YEARS
AND COUNTING!**

Two Harper/Love pros mark 50 years in the corrugating industry

Jim Carbone's career reaches back to an early start in a paper mill in 1954, where he learned the ins and outs of paper making.

For the past 13 years, he has been a key player on the Harper/Love technical team. He works exclusively in Latin America, spending almost all his time on issues involving machine audits, starch formulation, and related productivity challenges.

Jim has long been active in industry affairs, including the activities of TAPPI, IACORR, and ACCSA.. In 2002, he was honored by TAPPI with the Bettendorf Prize, the Corrugated Container Division's technical award.



Technical Representative **Joe Logan** began his corrugating career in 1955 operating a Langston XA and later a Langston XD for Owens Illinois in New Jersey. Over the years Joe has seen and worked with every new invention that has entered the industry. After a series of promotions and moves, he worked as a corrugator supervisor, plant supervisor and quality manager for Westvaco in Cleveland. Before joining Harper/Love in

2001, he worked with Weyerhaeuser in the Bedford Heights, Ohio, plant.

Joe's still at it, offering Harper/Love customers in the Great Lakes Region the benefit of his hard-earned diagnostic and troubleshooting skills.



Peter Snyder is third Harper/Love Go-To Guy to receive TAPPI Bettendorf award



Peter Snyder has been recognized by TAPPI for his long service to that organization since 1987. He is the third Harper/Love associate to be awarded the Bettendorf Prize, the Corrugated Container Division's technical award. Bill Nikkel received the award in 2000, and Jim Carbone in 2002.

With TAPPI, Peter has found a rewarding and welcoming outlet for his deep technical knowledge and his unique ability to share that knowledge with others. Since 1988, he has helped teach the Short Course for Corrugating, sharing the stage with other industry leaders such as Bob Schmidt, Ed Riley, Robb Trippsmith, and Rick Croker. Peter has also led workshops on subjects such as bonding and waste water reuse and has served on several committees. (Peter has also done numerous workshops and presentations for ACCCSA and FTA.)

Peter started in the corrugating industry in 1980 as a research and development Chemist for National Starch and Chemical. He joined Harper/Love in 1985 as manager of research and development, contributing to new product development, personnel training, technical leadership and technical service for customers. He worked with the Ringwood company as national sales manager for high-shear automatic mixing and storage systems. Since 1998, he has been national accounts manager for Harper/Love.

Peter comments on the changes he's seen in the industry

since 1980. "As an industry, we've made a lot of progress. We are, overall, more professional and scientific, from the nuts and bolts of housekeeping and safety to the technical advances we've made." Peter cited as technical advances the automation of the dry end for continuous running, and the evolution from manual starch kitchens to high-speed, automated mixing using liquid-enhanced adhesives.

As for the future of the industry, Peter says, "We can't anticipate every challenge we will encounter, but we are better prepared than ever to respond to new ideas and developments." In the adhesives arena, Peter sees dealing with coating alternatives to wax in the near future. In the industry, he sees continued consolidation and growth of well-managed, professional companies with high standards.

"TAPPI will do what it always has," says Peter. "We will look for ways to develop practical answers for specific corrugating challenges. We'll work together to discover what's true and what isn't. We'll teach each other the best ways to do things."

And what will Peter's role be in TAPPI's future? "I've found a place to make a contribution that is a good fit for my experience and my abilities," said Peter. "I'm grateful for the opportunity TAPPI has given me, and I'm grateful for their recognition of my work. I hope I can continue to do what I've been doing for a long time."

*Cure and prevent
clogged pipes
Prevent calcium buildup
Peter Snyder honored*

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*Leaders in the science of
making good adhesives better™*

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REPORT

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Use Calciban™ to keep your glue rolls clean and efficient.

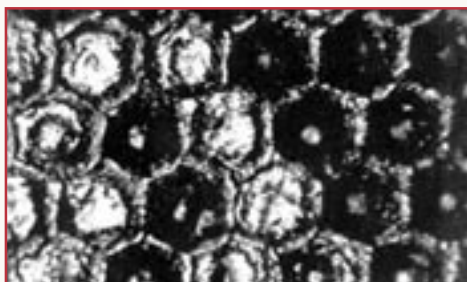
Calciban prevents calcium buildup that can cause adhesive transfer problems.

Inorganic compounds in your adhesive water can cause calcium buildup on your glue rolls. These deposits, which appear as a milky-white haze on the roll surface, clog cells and reduce the amount of adhesive the cells can carry. This creates a risk of bonding problems and increased waste.

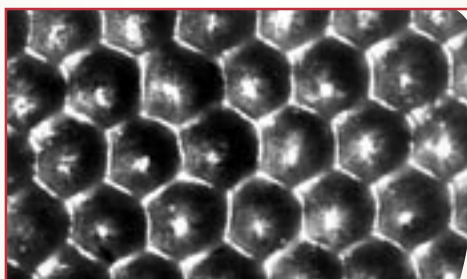
It also means lost productivity when you need to shut down for time-consuming cleaning operations.

Just 3 to 6 ounces of Calciban in a 700-gallon batch of adhesive can prevent this buildup and the problems it creates. It can be post-added to the batch, or to starch in a storage tank.

At just \$3.95 per pound, Calciban is low-cost insurance against the problems of calcium buildup.



The problem: Inorganic compounds in adhesive mix water can clog cells in your glue transfer rolls.



The solution: Used regularly, Calciban keeps glue-roll cells clean and efficient, for proper adhesive transfer.

Other uses for Calciban:

- Add to cooling water in closed-loop systems
- Add to flexo wash water
- Add to boiler feed water

To order, contact your local Harper/Love representative or call us toll free at 800-438-3066.