



# ADVANCED ADHESIVES REPORT

Your corrugating adhesives newsletter  
from Harper/Love Adhesives Corporation

SEPTEMBER 2000

## The economics of liquid-enhanced adhesives

*Using liquid adhesives is an investment in cost savings.  
They more than pay for themselves through improved R. O. I.*

By Lou Cuccia

Corrugating plants are more streamlined than ever. Modern equipment and attentive management have them running faster, with greater efficiency and lower cost than ever before.

The marketplace, however, will not tolerate complacency. The search for improvements never ends. Liquid adhesives provide an opportunity to improve your return on investment without simply resorting to attractive but counterproductive cost-cutting measures.

### Technical benefits

Liquid adhesives have a dramatic effect on quality, cost and productivity. Once the technology was developed to suspend performance-enhancing ingredients with specially blended dissolved starches in liquid form, the next generation of performance adhesives was born.

Chemically enhanced liquid starch adhesives are tailor-made to penetrate tight paper fibers, dry faster, and create stronger bonds. Liquids have the characteristics of modifying the rheology of the starch, resulting in better film forming. The better the film-forming characteristic, the better the pick up and transfer of the

starch adhesive. The end result is more consistent application, reduced consumption, and drier, firmer, flatter sheets coming off the corrugator.

### Handling benefits

Liquid enhanced adhesives fit the new automatic starch mixing systems with the benefit of reduced labor cost. Liquids can be supplied in totes or bulk, reducing space and inventory. They can be automatically metered or pumped to the starch system eliminating the need for

cutting and handling of bags. They eliminate the cost and risks of handling pallets and bags. They do away with the environmental concerns of airborne particles. There are no more bags to dispose of.

### Dollars and sense

The big news is that liquid adhesives make sense economically. Getting a handle on that contribution requires an analysis of true applied costs. Let's take a look at four ways using liquid adhesives can improve your

### Our model plant parameters:

- Model plant is running three shifts, 5 days per week.
- Average machine speed 25,000 lf/hr
- Average paper width 90 inches
- Average square feet/hour 187,000
- Average yearly MSF 1,125,000
- Average basis weight 146 pounds per MSF
- Average monthly waste 7.5%
- Machine fixed cost per hour \$500.00
- Machine fixed cost per MSF \$2.67
- Modified carrier formula cost per MSF \$3.05
- Liquid enhanced formula cost per MSF \$3.08

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## Liquid adhesives, continued

R.O.I.

### 1. Greater machine speeds

Liquid adhesives let you run faster. If you can experience a 2% increase in corrugator speed, say from 25,000 lineal feet per hour to 25,500 LFPH, your output with 90" paper would step up from 187,000 square feet per hour to 191,250 square feet per hour. This increased production reduces your machine cost per thousand square feet (MSF), and therefore your total production cost per MSF.

### 2. Lower consumption

The superior film-forming properties of a liquid enhanced adhesive allow greater control over adhesive usage. Exploiting this feature will allow for adhesive consumption reductions. A reduction of just two-tenths of a dry pound per MSF can result in significant annual savings.

### 3. Less waste

Liquid adhesives produce superior bonds (especially with heavyweight and HRC liners). Better bonds reduce waste and returns. A waste reduction of just one quarter of one percent can

yield dramatic savings.

### 4. Converting efficiency

Flat, dry, high-quality sheets improve throughput and kicks per minute. If a converting machine is running 36,000 square feet per hour, and increases production by only 0.5%, an increase in contribution would result.

Machine A is converting 36,000 SFPH:

$$\begin{aligned} 0.5\% \text{ increase SFPH} &= 180 \\ \times \text{ hours run per week} &= 100 \\ \times \text{ weeks per year} &= 52 \\ \text{Add'l S.F. per year} &= 936,000 \end{aligned}$$

If the material contribution margin (net sales less raw materials) is \$13.35 per MSF, the yearly return would be \$12,500 (936

MSF per year x \$13.35 per MSF.)  
**It all adds up.**

Taken together, these liquid-adhesive improvements can make a big difference in the profitability of your corrugating operation. Careful analysis reveals that what matters is not the *investment* (the price of the adhesive), but the *return on the investment*.

There are many calculations involved in getting to the bottom line. Space here does not allow a full development, but a copy of our calculations, tables and results is available from your Harper/Love representative.

More to the point, he can also help you work through the same calculations using your plant's

#### The results

1. Increase speed 2%. machine cost reduction	\$34,425
2. Reduce consumption 0.2 dry pounds per MSF	6,082
3. Reduce waste 0.25% (paper cost only)	62,825
4. Improve converting efficiency 0.5%	12,500
<b>Total savings</b>	<b>\$115,832</b>
<b>Annual additional investment to use liquid enhanced adhesives</b>	<b>(\$33,750)</b>
<b>Return on investment (243%)</b>	<b>\$82,082</b>

**Now showing at a VCR near you.**

**Have you seen "The secret life of starch?"**

**T**his 25-minute Harper/Love extravaganza reveals the shocking truth about the natural behavior of starch and demonstrates in explicit, close-up action the stimulating effects of temperature, caustic, and borax.

See a detailed discussion of the finer points of starch quality control, including measurements of viscosity, solids, and alkaline sensitivity. Rated Xtra helpful. A private showing can be arranged in the privacy of your own office. Or see it at [TAPPI, booth #1834](#).



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## Three new at Harper/Love

*Our newest associates will serve primarily Latin- and Central-American customers.*

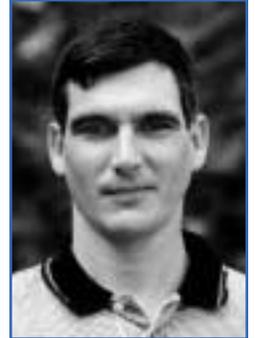
**Mary Clark** is new in Customer Service for Latin and Central America. Born in Peru, Mary now lives in the Charlotte area. She will handle the many tasks associated with fulfilling customer orders, requests, and inquires.



**Osni Soares** has been named Harper/Love's official agent for Latin and Central America. Osni will be responsible for both technical sales and service in his region. Mr. Soares has over 26 years experience in the corrugated industry with several large plants in Brazil and Costa Rica. He will continue to reside in San Jose, Costa Rica.

**Rex Woodville-Price** has joined us as Senior Technical Specialist.

Rex has considerable industry-related experience, having worked for Chiquita's Packaging Division in Panama and Costa Rica. He was also associated with Goettsch International and Interfic, Inc., as a project engineer and project manager.



Rex will support our efforts both in the domestic market as well as in Latin and Central America.

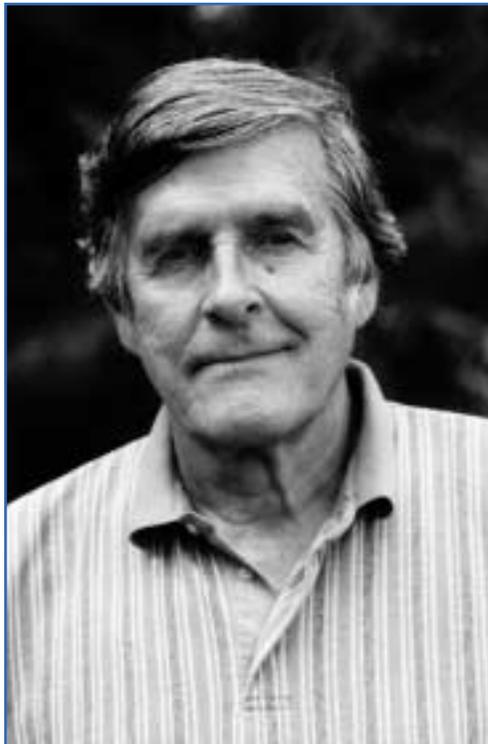
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## Bill Nikkel to be honored at TAPPI

**C**orrugating consultant Willem A. (Bill) Nikkel will receive the Harry J. Bettendorf Prize at the October TAPPI meeting. This is TAPPI's Corrugated Container Division Technical Award.

Consulting exclusively with Harper/Love since 1993, Bill has been a TAPPI member since 1961, was named a TAPPI Fellow in 1981, and served on the organization's board of directors from 1984 to 1987. He has a long career in the industry dating from 1956, working in engineering and scientific research.

His career is marked by a long list of technical accomplishments and publications. Harper/Love is honored to be associated with Bill.



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## The center of corrugating service is in booth #1834

**P**lease make plans to visit our space at TAPPI October 23 through 27 in Atlanta World Congress Center. This year we will feature our newest liquid performance enhancer, HRC-2000, and the industry's largest and most experienced service organization, plus some very interesting hands-on demonstrations that will show you things you've probably never seen before.

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**REPORT**  
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BREAKTHROUGH PERFORMANCE WITH HIGH RING CRUSH LINERS

# HRC-2000

**AT LAST! HIGHER SPEEDS *and* BETTER BONDING FOR HARD-TO-BOND SUBSTRATES.**

HRC-2000 is designed specifically to address the challenges of accomplishing good bonds on high ring crush liners at production and profitable corrugator speeds. HRC lowers starch moisture absorption. They also transfer heat faster, causing the starch gel point to occur too early for proper wetting out.

HRC-2000 solves these problems with a unique blend of proprietary performance enhancers that improve penetration and water holdout. The result is increased pin values and higher corrugator speeds. It is a safe, odorless liquid product that is simply past-added to the starch formula.

For detailed technical information and application recommendations, contact your Harper/Love representative or call us direct at 800-438-3066.



**HARPER/LOVE**  
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## HRC-2000™

### *New performance enhancer for high ring crush liners*

HRC-2000 is the latest addition to Harper/Love's growing line of liquid performance products. The new offering is a unique blend of proprietary performance enhancers that include both penetrating and corrugating performance agents to increase corrugator speeds on difficult-to-bond substrates.

HRC-2000 is specifically intended to address the challenges of achieving good bonds on high ring crush liners at acceptable corrugator speeds. Compared to standard liners, HRC materials resist moisture absorption. Starch tends to remain on the surface. They also transfer heat faster, causing the starch gel point to occur too early for proper wetting out. The result is a shallow brittle bond.

HRC-2000 solves these problems with a safe, odorless, easy-to-use liquid product that improves penetration and water holdout. The result is increased pin values and higher corrugator speeds with a single, simple application.

