

- Remembering John Curie!!
  - Awards
  - Feed water deaerators
  - Preventive maintenance
- In this issue:

800-438-3066 • [www.harperlove.com](http://www.harperlove.com)  
 e-mail: [salestech@harperlove.com](mailto:salestech@harperlove.com)

11101 Westlake Drive  
 P.O. Box 410408  
 Charlotte, NC 28241-0408

Harper/Love Adhesives Corporation

Leaders in the science  
 of making  
 good adhesives better™



## Ask your Harper/Love representative about our complete line of problem-solving products



### Calciban™

Calcium build-up inhibitor, now in convenient dispenser package



### Harlocide™

Adhesive preservative to prevent bacteria growth



### XM-5™

Penetrant



### Calci-Kleen™

Calcium carbonate cleaner for glue rolls



### Harlocide II™

Adhesive preservative to prevent bacteria growth



### XW-200™

Bond enhancer for wax replacement paper



### Defoamer

Reduces foam in adhesive



### Harlocide Green™

Adhesive preservative to prevent bacteria growth

  
**HARPER/LOVE**  
 ADHESIVES CORPORATION

**800-438-3066**



# ADVANCED ADHESIVES REPORT

Your corrugating newsletter from Harper/Love Adhesives Corporation

## If it ain't broke, don't fix it?

by John Kohl

In a world of ever-increasing operating costs, some can be affected at the plant level and some cannot. Something plant managers *can* do something about is the high cost of machine failure and downtime. A logical and disciplined preventive maintenance program can take care of problems before they arise and keep machines in production without catastrophic failures.

Most of us have no problem with the concept. After all, the prudent among us routinely change the oil in our cars at regular intervals to avoid the cost of a total breakdown of the engine. It just makes good sense. But knowing something is right isn't the same as doing it. It's all too easy to put off maintenance as long as things seem to be working okay.

Let's look at some ways other smart people have figured out to organize and manage a PM program for good results at reasonable cost.

The first PM programs for manufacturing facilities were instituted in the early 60s for Japanese manufacturing plants under the core concept of TPM: total plant maintenance. This was done to improve both productivity and quality. It makes sense that if all the plant equipment operates at its optimum, the products produced will have fewer quality issues.

Today there are many titles and acronyms associated with the concept of planned maintenance. There is preventive maintenance (PM), predictive maintenance, reliability-centered maintenance (RCM), maintenance scheduling and planning, and root-cause analysis. And now there are computerized maintenance management software products (CMMS) that tie it all together to help managers plan PM, reduce labor costs, and control spare parts inventory and ordering.

### Repairs are not maintenance

When a maintenance man goes out on the plant floor to fix a machine he is not performing maintenance, he is doing a repair. This is otherwise known as reactive maintenance. There is a huge difference between fixing a machine that has gone down during a production run and performing routine maintenance to prevent costly downtime and disruption to manufacturing. The definition of the word

*Wrong! Solving problems before they ruin your day will save you a world of woe and a pile of cash.*

maintenance is "the work of keeping something in proper condition; upkeep," not fixing or repairing something when broken.

Recent studies show that reactive maintenance is the predominant method employed in the United States. The study identified the maintenance programs in use as:

- 55% reactive
- 31% preventive
- 12% predictive
- 2% other



### Advantages and disadvantages

Each approach has its pros and cons. Here's a quick look at the systems and their key points:

#### *Reactive maintenance (fix when broken)*

##### Advantages

- Lower initial investment
- Smaller staff

##### Disadvantages

- Increased cost due to unplanned downtime, and overtime labor
- Possible secondary equipment damaged during equipment failure

*(Next page, please)*

*(preventive maintenance, continued)*

- Inefficient use of maintenance staff
- Increased cost for expediting parts

***Preventive maintenance (scheduled maintenance at fixed intervals)***

**Advantages**

- Cost effective
- Increased component life cycle
- Energy savings
- Reduced equipment failures
- 12% to 18% cost savings compared to reactive maintenance

**Disadvantages**

- Catastrophic failures can still occur
- Labor intensive
- Includes performing unneeded maintenance on some equipment

***Predictive maintenance (scheduled maintenance at fixed intervals based on history)***

**Advantages**

- Increased equipment life
- Decreased downtime
- Decreased parts and labor costs
- Increased product quality
- Energy savings
- 8% to 12% cost savings compared to preventive maintenance programs

**Disadvantages**

- Increased cost for testing and diagnostic equipment
- Increased staff training costs
- Savings potential hard to justify

***Reliability-centered maintenance (process used to determine maintenance requirements of any physical asset)***

**Advantages**

- Can be the most efficient maintenance program
- Lowers cost by eliminating unnecessary maintenance on equipment
- Reduces sudden failures
- Increases component reliability
- Incorporates root cause analysis

**Disadvantages**

- Significant start-up cost in training and equipment
- Savings potential hard to justify

Box plants can benefit from these types of programs to improve control over the cost of labor and employ maintenance personnel and resources efficiently. These programs can also be used to reduce spare parts inventory and limit machine downtime. There is no need to lose precious machine production time if your maintenance department can plan downtime and do routine maintenance to limit the frequency of major machine failures and production loss. The higher the value of the plant asset (and the cost of lost production) the greater the return on investment of the PM program.

Most machine manufactures have a specified PM schedule for their equipment that is supplied at the time of purchase. This is a good starting point for that particular machine. All others need to be studied and recorded to determine the best time for PM and part replacement.

***A true PM program not only sets the frequency for routine maintenance and lubrication, it also looks at the life cycle of machines and their integral parts and determines the best time to service or replace critical parts. This is closer to the predictive maintenance approach.***

A box plant should set up a system that is economical and comprehensive for the all the manufacturing equipment, the physical plant equipment, and structure. Some plants even use outside vendors to perform periodic vibration analysis and ultrasonic testing of machines. All this should be done with the best economic sense. Maintenance personnel should perform root-cause analysis on all equipment failures to determine the best point in a part's life cycle to service it or replace it.

It is possible to have a successful preventive maintenance program that reduces costs to a plant and improves both quality and efficiency. In order to maximize the return on the investment, preventive maintenance must be carefully planned and executed out by well-trained personnel.

As mentioned before, there are numerous software programs available to help the maintenance department get started. Most of these programs will help a plant pinpoint the best time to service or replace parts and equipment.



***John Curielli 1938 - 2007***

*Our friend and colleague John Curielli passed away June 15. John served Harper/Love as vice president, sales, from 1991 to 2000. After his retirement, he continued to work with us part time serving customers in the Twin Cities, Minnesota, area. John began his career in corrugating in 1963; he was well known and appreciated in the industry.*

# Why your deaerator does what it does. And how.

*Getting the air out of your feed water is critical to the health of your steam system and the efficiency of your hot plates*

by Rex Woodville-Price

Steam systems don't like air. It corrodes their innards and keeps things we want hot from getting as hot as we want.

When water is exposed to the atmosphere it absorbs certain gases, which dissolve in it. A naturally occurring example of a gas dissolved in water is the oxygen that fish breathe. Most city water also has chlorine added to it. These dissolved gases are considered to be noncondensable.

Oxygen will oxidize, or rust, the internal metal parts of a boiler and steam system. This is particularly relevant to steam generation equipment because the oxidation process occurs faster at higher temperatures.

If we add treated water to a boiler without running it through a deaerator first, the dissolved gases are released inside the boiler as the water is heated. Oxygen is released into the boiler and begins to corrode the ferrous metals inside the boiler and the steam system.

Noncondensable gases also serve as insulation in that they don't allow transfer of heat. When trapped in a hot plate, these lighter-than-steam gases rise to the top of the chamber and hinder

heat transfer to the plate surface and to the board. They also take up space that should be occupied by steam, further reducing the heating capacity of the vessel.

So feed water must be deaerated to avoid these problems. A deaerator removes dissolved gases by heating the water, and through mechanical action (scrubbing) as steam comes into contact with the feed water. There are two general types of deaerators: spray type and tray type, although there are some systems that combine successfully both types for greater efficiency.

Deaerators work with a certain pressure above atmospheric, and consequently with a corresponding temperature, typically around 5 psi and 227°F (0.345 Bar and 108°C).

A deaerator tank also serves to preheat feed water before it is added to the boiler, which reduces the thermal shock on the equipment and the amount of heat the boiler must add to the feed water to bring it to operating temperature.

A deaerator in proper working order is a necessary part of a box plant's steam system and an important tool for preventing problems.



*Deaerator photograph courtesy Stickle Steam Specialties Co., Inc. Stickle manufactures both tray and spray type deaerators.*

## Jim Carbone receives Kal Linke award

At our annual sales meeting in June, **Jim Carbone** received the Kal Linke Award. Named for Kal Linke, of Love Starches, the award is presented by Love Starches to a Harper/Love employee who contributes significantly to the overall success of Harper/Love. Kal Linke was a long-term technical director for Love Starches and was instrumental in the startup of the Harper/Love joint venture in 1978.

At the same event, **Greg May** and **Barry Mitchell** were recognized as co-salesman of the year. This award is presented to Harper/Love representatives who produce the largest increase in volume over the previous year.



*Left to right: Jim Carbone, Bill Gerard, Greg May, Barry Mitchell, and Lou Cuccia*