

The Magazine For Pump Users Worldwide

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# PUMPS & SYSTEMS<sup>®</sup>

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## PACKAGED PUMPING SYSTEMS

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# Solving a Reliability and Metering Problem

Mark Simakaski, P.E., Ellipsis, LLC and Ken Majors, Fyrewerks

**How one hose pump solved problems for a fabricator of fire door core panels.**

**F**yrewerks is a fabricator of fire door core panels used in the building industry. By sandwiching the core between a veneer or routed wood exterior, the company provides a thin core panel to door manufacturers that meets the requirements for fire protection without losing architectural details of style. Since the panels are thin and easy to incorporate into door manufacturing, Fyrewerks blends form and function.

Each panel is designed and constructed with a specific fire rating, from 20 to 90 minutes of protection, which means a properly designed door will stay cool even though a 2,000-deg fire is raging on the other side. Properly designing the door is accomplished through the careful application of an intumescent layer on the core panel. When exposed to heat or flames, intumescent material expands in volume, providing a protective and insulating layer from the fire.

Reliable and repeatable application of the intumescent material is critical in producing quality door panels. Fyrewerks explored several pumping systems to meter the abrasive material from a bulk tank to the operator's station. First, we used a light duty tubing pump based on the design of a readily available commercial system. The peristaltic action of the tube provided a consistent flow, and the pump was easy to operate. However, the system was not reliable because the tubing pump would wear out in a week.

Next, we upgraded to an industrial air piston pump with the assumption that a larger, more robust pump would last longer. The exact opposite happened. Instead of a week of operation, this pump lasted a matter of days due to abrasive wear of the elastomeric seals and gaskets. They simply could not handle the repeated piston action in the presence of an abrasive material.

We reinstalled the tubing pump while we searched for something better and discovered a hose pump. A hose pump uses a flexible hose just like a tubing pump to create the



peristaltic action to move along the fluid, but the similarities end there. Specifically, the hose pump:

- Uses a fabric reinforced hose that can operate at higher pressures than a tubing pump

## Hose life is directly proportional to the number of compressions, so less is better.

- Uses a lubricated roller to compress the hose and provide the pumping action
- Has a high strength aluminum pump housing that contains the hose
- Can easily pump an abrasive material because there are no moving parts in the fluid stream
- Is available with a variety of hose materials for chemical compatibility
- Produces a repeatable, metered flow
- Provides a longer service life than a tubing pump

The pump we chose was an Eccentric Pumps SLP/128, in which the hose traces a full 360-deg in the pump housing and uses a single roller to compress the hose once per revolution. A single squeeze of the hose results in longer life compared to pumps with multiple shoes and multiple compressions of the hose per revolution. Hose life is directly proportional to the number of compressions, so less is better.

Instead of weekly shutdowns for maintenance, we now have a pump that has not needed a single hose change to date. In addition, the hose pump is:

- **Repeatable:** Fireworks produces a core that is certified and rated for fire protection, and the application of the various coatings must be documented and repeatable. The pump is accurate with calibration and meets the requirements of our quality system.
- **Flexible:** Since the pump is positive displacement, flow is directly proportional to its output speed. This allows us to use the same pump with an electronic speed controller for various products without the need for hose changes or mechanical changes to the pump.
- **Quiet:** The pump is very quiet, even when compared to typical noise found on the shop floor. This provides a better working environment for our operators.
- **Reliable:** Pump failures have been greatly reduced, leaving more time for production. The manufacturer estimates that our pumps should not require any service for several years based on our typical cycle of operation.
- **Easy to Use:** The pump is simple to operate and easy to understand.

The elimination of a maintenance problem has allowed us to focus our energies on expanding the business, and the application of the right pump has allowed us to meet customer demands.

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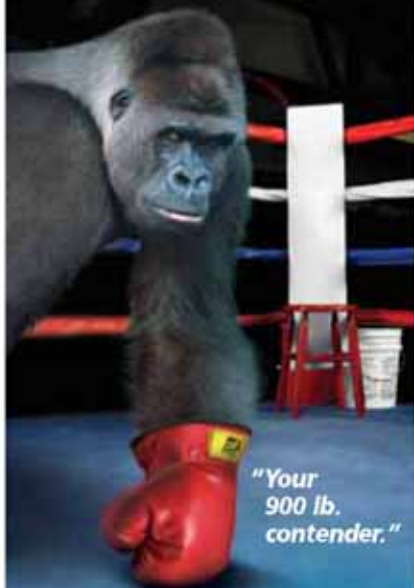
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