

The Magazine For Pump Users Worldwide

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# PUMPS & SYSTEMS

## STATE OF THE PUMP INDUSTRY 2005

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**Oyster research project relies on its VFDs**

**Adjusting to new pigment pumps . . . and more**

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seepex's bare-shaft NS 5-12 progressive cavity (PC) pump with a molded-to-size stator outfitted with an adjustable retensioning device

## Costly maintenance headaches cured!

By Jane Alexander

# New Pigment Pump Adjusts for Wear and Lasts 4X Longer

**A** pigments and dispersions manufacturer in Michigan faced a dilemma that threatened to hamper production efficiency with frequent downtime and costly repair parts.

CDR Pigments and Dispersions, a division of Flint Ink Corporation, manufactures colorants for ink, plastic and paint applications. The company supplies pigments to more than 50 ink manufacturers, who then customize ink to end-user specifications. CDR's color technology also serves non-ink markets in dispersions for latex products and in coatings for paper,

as well as pigments used in textiles and paints.

CDR has earned and maintained an enviable reputation for:

- meeting and exceeding rigid standards in both its raw materials and finished product;
- developing a full range of environmentally-friendly soy oil-based flushes; and

■ managing all liquid and solid waste on site so none remains for city landfill.

Spending excessive time and money on problematic process pumps was definitely not something this company wanted to be known for.

The CDR pigment manufacturing process involves mixing raw materials with raw pigment, then sending the mixture to a mill.



## Stator Retensioning

The patented seepex stator retensioning device, consisting of an adjustable stainless steel sleeve with an internal rubber lining and a series of adjusting bolts, reduces the circumference of the worn stator as needed. In this way, the desired compression force between stator and rotor can be maintained, significantly increasing stator life. The stator retensioning device typically increases stator life by at least 3X, saving on replacement parts and labor costs associated with disassembling a pump to replace a worn stator.

The mill device rapidly and thoroughly links the ingredients by means of size-reduction media (in this case, carbon steel shot) to make a homogeneous product. Once the desired degree of dispersion has been achieved, magnetic screens ideally remove the shot, and the pigment slurry is pumped to tanks for further processing.

But, in the process that makes it effective for grinding, some of that shot breaks apart, resulting in small, microscopically jagged pieces that can pass through the screens and end up being pumped along with the pigment. While the continued presence of the shot pieces is not a problem for the pigment, it does, however, introduce a challenge for CDR's progressive cavity (PC) pumps' elastomeric stators that convey the highly abrasive solution from mill to tanks for further processing. There, magnetic separation removes the remaining media shards from the finished product.

## Solving Its Problems

CDR's senior maintenance personnel had chosen PC pumps for their highly abrasive application only after careful consideration of many other types of pumps. In operation, a progressive cavity pump's single helix rotor rotates within an elastomeric double helix stator to form sealed cavities that progress from the suction side to the dis-

charge end of the pump. The continuous seal between the rotor and the stator helices moves the fluid steadily, without valves or pulsations, at a fixed flow rate proportional to the rotational speed of the pump and independent of pressure fluctuations that can result from varying densities of conveyed product.

With their ability to run consistently at lower speeds and at a constant, fluctuation-free flow rate so crucial in pigment processing, the CDR pumps were functioning well overall—but the abrasive shot-laden solution was creating maintenance headaches. Specifically, extreme abrasion was prematurely eroding the stator elastomer on these units. This required that the stators be replaced frequently, resulting in expensive downtime and repairs. In fact, CDR management had to budget for \$10,000 in annual expenditure for replacement parts for these PC pumps.

CDR shared its frustration over this situation with a distributor who suggested that the company evaluate seepex's patented stator retensioning device. seepex, in turn, recommended its bare-shaft NS 5-12 PC pump with a molded-to-size stator outfitted with an adjustable retensioning device for the problematic application. This pump is equipped with a stainless steel, Duktil-coated rotor for abrasion resistance.

## Payback

Dean Foy, an engineer with Professional Pump, Inc., the company that serves the CDR account, reports that the new pump has exceeded expectations for reliable operation, 24/7, for over two years. "To date, there's been no need to replace the stator. It's lasted 400% longer than the non-adjustable stators on the other PC pumps, which are now inactive. We expect to see that percentage rise even higher before we need a replacement stator," says Foy.

The cost savings captured as a result of the new pump's reliability were so dramatic that CDR management authorized the purchase of two additional seepex pumps to handle expanding operations. The new pumps have been delivered and are in operation. **P&S**

*The first seepex progressive cavity pump was manufactured in 1972. Today, seepex, Inc./See-berger GmbH is the largest privately held progressive cavity pump manufacturer. seepex pumps are found in numerous industries and markets, including municipal water and wastewater, petroleum, chemicals, paper and fine paper and food and beverages, among others. Special coatings and elastomers have made the company's products especially suitable for handling abrasive and corrosive slurries. For more information, contact seepex, Inc., based in Enon, OH, at (937) 864-7150, or log on to [www.seepex.com](http://www.seepex.com)*



## STATE OF THE PUMP INDUSTRY

### Michael Dillon, President seepex, Inc.

**Brands/Product Lines:** seepex, Tricam, seerator

#### End Users' Changing Needs

Customers will expect higher levels of service and a more complete approach to solving their problems. Delivery requirements are likely to shorten and more technical application and pricing information will be required from Internet-accessible sources.

#### Changing Technologies

Instrumentation and drive control packages are likely to become standard offerings from most pump vendors. New high-performance motor and drive packages provide too many control and energy cost savings to be ignored.

Electrical equipment manufacturers are already starting to forwardly integrate into process technologies. Acquisitions made by Siemens and General Electric are two examples of this trend. Pump companies must integrate as well, or face becoming a commodity purchase item for larger companies that will integrate their offerings into complete solutions for end users.

#### Our Biggest Growth Markets

In the U.S. and Canada, Water and Wastewater seem to hold the most promise, as the need for infrastructure is expanding at a rate greater than the general economy. Asia, and particularly China, seem to have the highest growth rate for the process industries. But, the bubble that has surfaced in China is expected to burst due to that government's continued intervention in currency values and banking. Long term, South America is of more interest than Asia, as the influence of Western culture and the U.S., in general, is creating a more stable and import-friendly environment.

#### Life Cycle Cost Issues

Customers have been able to ignore life-cycle evaluations because they can. The fluid nature of the U.S. job market, historically low energy costs and the importance of short-term financial results have all helped elevate the importance of initial purchase prices. Profit manipulation has built pressure in our system that will need to be relieved. Energy prices will rise, as fuel costs rise and as pollution abatement can no longer be minimized. As more process industries leave North America, government incentives will have to be initiated to reduce unemployment and provide strategic resources. Not all industries will survive, but some will absolutely need to be retained.

#### Helping North America's End Users Stay Competitive

The answer contains two key elements: reduction of labor through automation and the availability of adequately trained technicians.

The automation need can be addressed by pump manufacturers supplying more complete solutions. Labor is a very difficult situation because the educational system has ignored the need for non-professional technical training. Labor laws also discourage institutionalized apprenticeship programs, because company-trained personnel can easily bid themselves into the labor market. This will probably not change until the unemployment rate permanently rises above double-digit percentages.

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#### Optimistic or Pessimistic?

We're optimistic. The drop in the value of the U.S. Dollar will allow U.S. exports to become more competitive in the world market and also will serve as a barrier to imports. Unfortunately, it also will increase the investment of foreign companies in the U.S. European companies, which have had to deal with high labor and benefits costs for much longer than U.S. companies, are more likely to invest in technology and training, as they have already seen the advantages of long-term thinking with regard to their bottom line, competitiveness, growth prospects and financial security.

## Specialized Coatings for Process Pumps

While this article focuses primarily on the benefits of a stator retensioning device for a pigment manufacturer's highly abrasive slurry application, it's important to note that the new pump is equipped with a stainless steel, *Duktil-coated rotor*. Usually, when customers speak of coatings, the first thought from pump manufacturers is *paint*. The term, *coatings*, though, is much more generalized and constitutes a number of materials with various application techniques.

Most pump manufacturers struggle with the economics of coatings for corrosion protection. It used to be that the basic systems employed automotive type finishes with solvent based primers and paints. Exotic coatings consisted of special colors or enhanced coatings that had epoxy hardeners and required special mixing and application techniques. Environmental and safety restrictions have pushed manufacturers towards water-based coatings that are more difficult to apply and have less resistance to erosion and permeability.

The term "coatings" can apply to a much broader range of protection techniques, however. Electrostatic coatings are becoming more popular because they can penetrate recessed areas better than other application techniques and improve the environment for the application technicians. Some of these products require heat fusing, which can be problematic for electrical, plastic or elastomer components used on finished pumps.

seepex has taken to the use of electrostatically applied powder coatings on fabricated steel components to improve corrosion resistance. These coatings are baked in an oven to fuse the particles and are also quite tough, so they can be

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subjected to the rigors of manual assembly without the need for "touch-up" before shipment. This is an excellent choice for pumps constructed with wetted castings or other components made of corrosion-resistant metals like stainless steel.

Polyamide (Nylon) 11 is a very interesting type of powder coating commonly used in the food industry. It is now being commonly used in high-end dishwashers to coat the welded carbon steel wire racks. Approved for repeated contact with food by the FDA, this compound has excellent chemical and abrasion resistance and is quite flexible. seepex uses it to coat non-wetted cast iron parts on stainless steel food grade pumps because it supplies superior corrosion and abrasion resistance to standard paint. Most food plants use very aggressive cleaning chemicals and commonly damage conventional coatings due to the frequent teardowns needed for either cleaning or inspection.

Pump parts subjected to strong oxidizing chemicals can be coated, internally and externally, with Halar®. This material from Ausimont has the same chemical resistance as TFE and is very tough, resisting abrasion and impacts. On the other hand, it's not particularly resistant to abrasion and is generally limited to non-wearing parts.

Prior to using Halar, it was common to use rubber sheeting to protect cast iron parts from corrosion. Using the same specialized adhesives that are employed to bond rubber to the metal tubes in progressive cavity pump stators, the rubber is applied to cast iron. Various synthetic and natural elastomers can be used. Selecting the correct elastomer compound for adequate chemical compatibility is critical. Conversely, these linings, which are common in centrifugal pumps used in the mining industry, are both abrasion and impact resistant.

Selection of the correct combination of materials is critical to any successful pump installation. Reputable manufacturers offer sample discs of coatings, elastomers, metals and plastic, at no charge, so that customers can satisfy themselves that they are making the correct material selection.