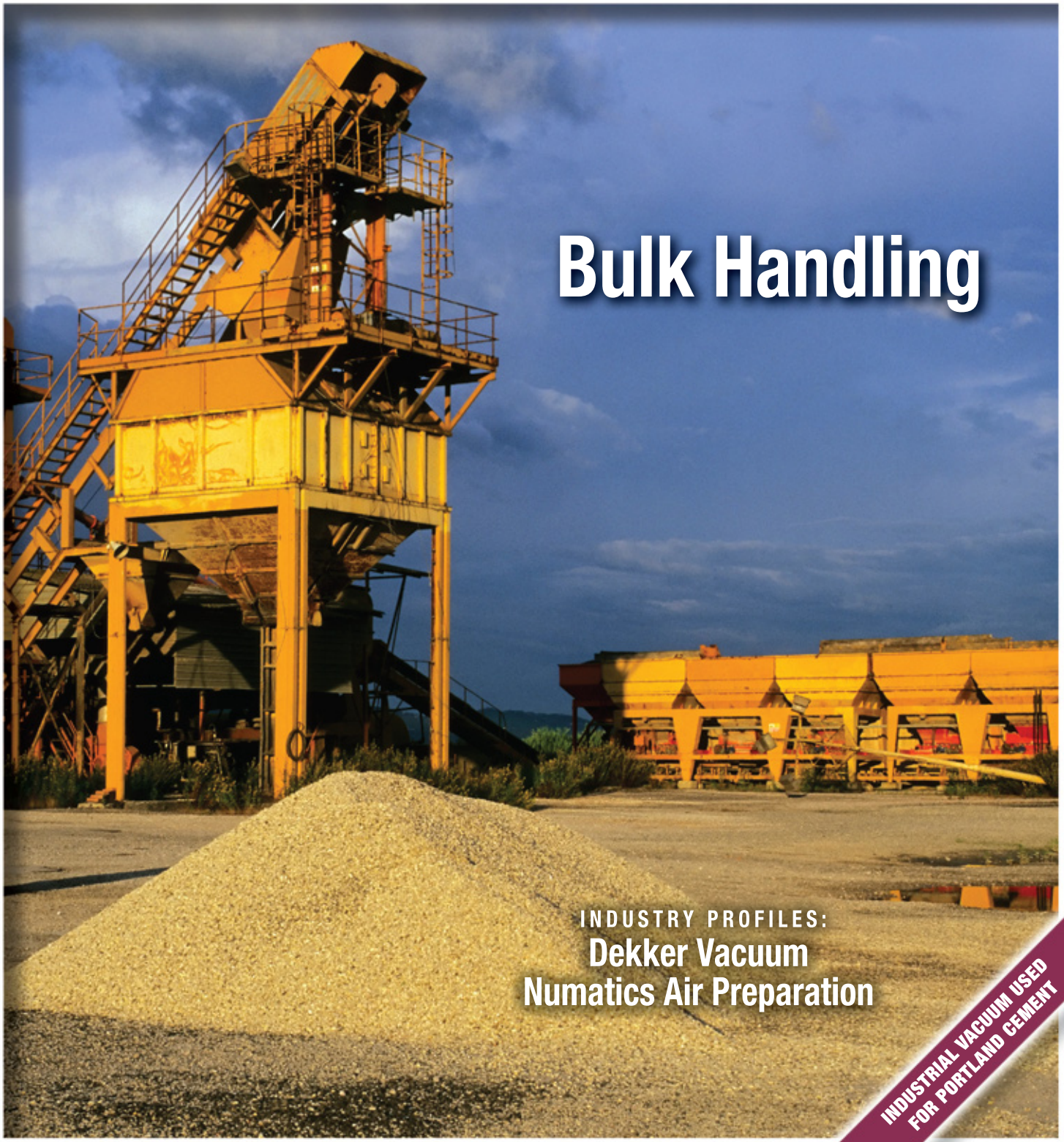
Auditing Dense-Phase Transport

Material Conveying with Pneumatics

February 2008

COMPRESSED AIR BEST PRACTICES



Bulk Handling

INDUSTRY PROFILES:

Dekker Vacuum

Numatics Air Preparation

INDUSTRIAL VACUUM USED FOR PORTLAND CEMENT

DEKKER VACUUM

Compressed Air Best Practices interviewed Rick Dekker (President & CEO) of Dekker Vacuum Technologies.

DEKKER VACUUM TECHNOLOGIES, INC.

Rick Dekker, President & CEO of Dekker Vacuum Technologies

Good morning! Please share the history of Dekker Vacuum Technologies.

Good morning. The roots of our company start with my father, Jan Dekker, who was heavily involved with oil-sealed liquid ring vacuum systems used in the gold mines of South Africa. This was in the mid 1970s when gold prices were going up. Vacuum systems (in the mines) were optimized by improving vacuum levels using oil instead of water and by adding vacuum boosters. He then came to the United States in 1979 to open up a vacuum division for Sullair. I joined him in 1993 as an application engineer with a different company until we founded Dekker Vacuum in 1998.

Why did you start Dekker Vacuum?

When we started Dekker Vacuum, we saw an opportunity because the vacuum industry was very old-fashioned in how it serviced its customers, both before and after the sale. Customers complained about mediocre customer service levels, parts availability, after-sales technical support and repair.

Dekker was therefore founded with a strong focus on providing excellent customer service before and after the sale. This philosophy has hit home with customers and has driven our strong sales growth over the years. The firm reached profitability after only twelve months of operation and the Company has now reached $12 million in annual sales. In 2007, Dekker was listed on the Inc. 5000 list of fastest growing companies in America. We are headquartered in Michigan City, Indiana in a 45,000 square foot manufacturing facility.

Please describe the management philosophy at Dekker Vacuum.

My father (Jan Dekker) is one of the worlds' leading authorities on vacuum applications. I also began my career as a vacuum applications engineer. When my father sold his shares to me in 2004, I was faced with a decision of whether to focus on management/leadership or to become the "vacuum guru" like my father. I realized I couldn't do both. We decided that I should focus on the strategic direction of the company and to assemble an "A-Team" in management, while ensuring that the organization receives the tools and support required to be successful.

Meanwhile, our vacuum expertise in application engineering has flourished through the leadership of our Vice President Jerry Geenen, the applications engineering group and the continued involvement of my father as a consultant and advisor. Jerry is an integral part of the organization and we wouldn't' be where we are today without him.

Full plant audits of vacuum systems are a growing trend.

My strategy has been to find the best people we could afford. We now have an "A-Team" in place, which allows me to focus on strategic direction and providing management with the appropriate tools and resources to be successful. I have learned that leadership is about helping people do their jobs better by providing them with the appropriate support, guidance and freedom in order to do so.

What are some of the strategic directions of Dekker?

We started a formal strategic planning process three years ago and we now update it every year. We promote three core values within our company, which have helped us create a distinct company culture. We have made a lot of progress with this and we continually check our decisions based upon them. When addressing customer issues and problems, these core values are our guide. To provide the highest levels of service to customers, for example, we ask ourselves, "Is this decision in line with our core values?"

The three core values are:

1. Integrity
2. Excellence
3. Innovation

Please describe innovation as a core value.

A company always has to be innovative to survive in today's business environment. We focus on providing innovative vacuum solutions to customers. When reviewing a customer's application, we focus on the best solution for their application rather than focusing on trying to sell a given product to that customer.

If we don't have the right product, we will let them know. We have focused on educating the sales engineers and the customers on application and product knowledge. Education is the key to providing innovative customized solutions for our customers.

Vacuum flash evaporator for Biofuel applications.

Multi-stage vacuum pump systems use a combination of system components to meet customer requirements cost-efficiently.

DEKKER VACUUM

VmaxVFD Variable Frequency Drive oil-sealed liquid-ring vacuum system used in the medical and woodworking industries.

Most of the systems that we design and manufacture require a level of innovation. Dekker is an engineering company, heavily invested in application and design engineering. Each customized application essentially involves designing a new product. Customer satisfaction is extremely high when we are able to tailor a solution for them, rather than offer them a standard product. Innovation also takes place within our organization to create the most efficient processes to handle our day-to-day business.

We are also investing in a pipeline of exciting new products. They involve new control schemes and dry (oil-free) vacuum technologies.

What markets do you serve?

We are in many markets but to name some of the big ones — plastics, woodworking, medical, general industrial, power generation, chemical, petroleum and pharmaceutical.

AquaSeal PowerGen condenser-exhauster two-stage liquid ring vacuum system used for Power Industry to reduce main turbine back pressure.

Where are the energy efficiency opportunities with vacuum?

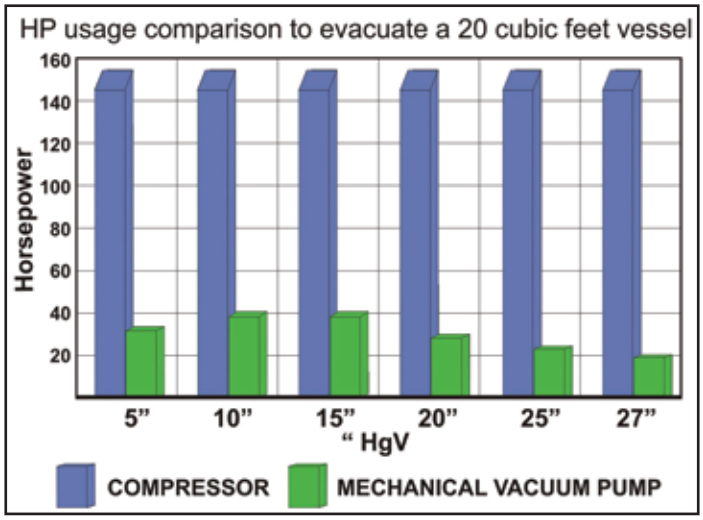
At Dekker, we are very committed to energy efficiency. One of our primary areas on focus has been in promoting the use of variable frequency drives (VFD's). We have sold close to a hundred systems with VFD's. The woodworking industry, with CNC routers, is a good example. As you start routing a board, you are creating leakage as the router cuts through the plywood board on the router table. The more you cut, the more leakage you create and the part can slip, which increases scrap rates. As you create more leakage a VFD system will ramp up the speed of the vacuum pump to keep the part from slipping, reducing scrap. Energy consumption is also reduced due to the elimination of across the line starting and speed turn down when idle.

Another application is in the power plant industry. Upgraded vacuum systems can improve the efficiency of the turbine by reducing back-pressure. This is accomplished by removing the air leakage in the condensers. Customers may realize energy savings between $250,000

and $1 million per year. Savings are naturally dependent on a number of factors, including condenser cooling water temperature and the age or type of vacuum equipment currently in service.

The use of VFD's requires a certain level of electrical integration, especially when multiple VFD's are used such as in Hospital applications. At Dekker, we have a dedicated electrical engineering department, which has developed proprietary control algorithms. Such a focus on electrical engineering is somewhat unique in our industry. This department is also developing some exciting, innovative products that will be launched in the coming year.

Full plant audits of vacuum systems are also a growing trend. Piping networks have pressure drops and leaks like in compressed air distribution systems. Many machines using vacuum are not receiving it at the optimal pressure. Centralized vs. de-centralization issues — there are a lot of opportunities out there.



Industry can save thousands of dollars by shutting down an air compressor and switching to mechanical vacuum pumps.

We also suggest that all packaging companies using venturis (air ejectors) should examine the benefits of switching to mechanical vacuum pumps. While the benefit of a venture is no moving parts, the energy inefficiency overshadows that benefit. Venturis require a lot of compressed air to create vacuum. Using a mechanical vacuum pump will require ¼ to ⅛ the energy used in creating vacuum with a venturi and compressed air. From an energy efficiency perspective, this is very easily justified.

What is the scope of product offering?

Our product range is from 2 acfm to 28,000 acfm. Vacuum levels range from 10 inches of mercury to 1 Tor. We offer liquid ring and rotary vane vacuum pumps and systems. The rotary vane pumps are both dry and lubricated. The dry pumps are truly dry pumps, with no oil in the vacuum pump. We have found a lot of issues in the market as suppliers try to deliver "oil-free" dry vacuum pumps. Most "dry" pumps out there still end up with some oil in the pumping chamber as oil migrates from the gearbox through the seals into the pumping chamber.

To help us serve our customers better, we stock over 1,000 pumps and 85% of bare pump orders ship within 24 hours. We have a full metal fabrication workshop for base plates, tank fabrication and Section 9 pipe welding. We design, fabricate and assemble the complete systems and perform the electrical work and controls programming. Every system is full tested prior to shipment to ensure a satisfied customer.

Power Plant customers may realize energy savings between $250,000 and $1 million per year with upgraded vacuum systems.

Thank you for your insights.

For more information please contact Rick Dekker, Dekker Vacuum Technologies, tel: 888-925-5444, email: rdekker@dekkervacuum.com, www.dekkervacuum.com