

Modern Vacuum Technology Delivers Optimum Pneumatic Conveying Performance

Stockhausen, Inc., the U.S. subsidiary of Stockhausen GmbH & Co.KG in Krefeld, Germany, manufactures chemical superabsorbents (polyacrylates) which are used in a variety of industries, including the production of disposable diapers and hygiene products; auxiliaries for paper manufacturing, water filtering and water purification, mining and sugar extraction; auxiliaries for textile and man-made fiber production; leather production, as well as products for skin care.

When the U.S. superabsorbent manufacturing facility located in Greensboro, North Carolina started to eliminate problems with their oil-lubricated vacuum pumps on their pneumatic conveying systems, Stockhausen GmbH & Co.KG suggested trying a Busch Mink dry running, non-contacting vacuum pump. Stockhausen, Inc. took their advice and as a result, has lowered its operating costs, reduced maintenance and energy costs, and eliminated downtime at the Greensboro plant.

The Production Process

The raw material for the production of superabsorbents is liquid sodium acrylate monomer which is polymerized into a gel. The gel is then dried and pulverized. The end product is a granular substance which looks like sugar crystals. This ultra fine, granular powder is then transported via pneumatic conveying (using vacuum pumps) from the production area for further processing and packaging.

The first vacuum conveying system was installed at the Krefeld plant in 1990 and contained an oil-lubricated vacuum



pump. This type of oil-recirculating design is one of the simplest and most reliable vacuum pumps available on the world market. However, in this particular application, the fine powder particles were getting into the pump, causing the oil to gel. Frequent oil changes became necessary.

Finally in 1996, due to increasing environmental and economical concerns, Stockhausen decided to try out a new vacuum technology. They chose a low maintenance, dry running, non-contacting, rotary, claw-type, single stage vacuum pump. The Busch Mink is a rotary claw-type positive displacement pump designed for either pressure or vacuum. Because they are dry and non-contacting, the pumps are ideal for pneumatic conveying. The few wearing parts in the pump are thermally and physically separated from the pumping chamber for longer pump life. With the installation of the new Busch Mink vacuum pumps, the following advantages were gained:

- Enormous energy savings. The new pump has been so efficient that energy costs have been reduced by a third.
- The powder particles no longer get mixed with oil, since it is a dry running pump. With

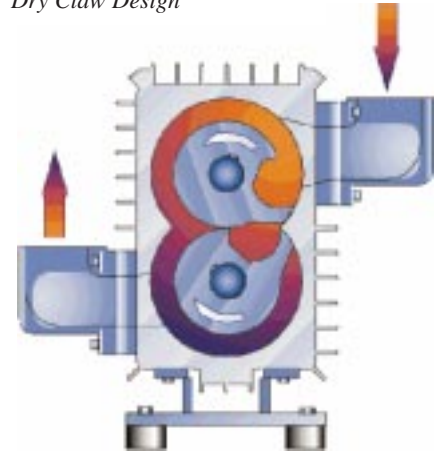
The Mink vacuum pump has lowered operating costs, reduced maintenance, and eliminated downtime.

the oil-lubricated pump, oil had to be changed once a month. The Mink pump has been maintenance free for over one year.

- The waste heat in the pump exhaust line can now be used in the drying process. The exhaust vapors from the oil-lubricated, traditional pump contained oil, so it could not be used in the further processing operation.
- Because the dry running pump is emission free, it was easier for Stockhausen to obtain a building permit, when they expanded their production facilities.
- The production process no longer emits pollutants into the environment, making the new vacuum technology environmentally friendly.

Stockhausen compared the production costs of their traditional oil-lubricated vacuum pump with the Mink dry running vacuum pump and realized a savings of over \$7,000/year per pump. Since 1996, Stockhausen in Krefeld has replaced all of their oil-lubricated rotary vane pumps with the claw-type, oil-less Minks.

Dry Claw Design



The Greensboro Plant

The Stockhausen subsidiary in Greensboro, North Carolina was also experiencing some of the same problems with their oil-lubricated vacuum pumps. The Maintenance department at the Greensboro plant found that the ultra fine powder, called FAVOR® was getting into the oil sump of the pumps during transport via the pneumatic conveying systems. As a result, maintenance of the pumps increased, causing additional labor and parts costs, as well as downtime.

The Krefeld plant recommended the Busch Mink Model 1504, which was installed in February 1998. Since then, the Greensboro plant has purchased five more Mink vacuum pumps. Since installation of the claw-type dry running pumps, a decrease of man hours servicing the pumps and a reduction in parts costs resulted. "The only maintenance we have with the Mink pumps is routine, which consists of lubricating the bearings. Other than that, we have had no problem with the pumps," says Bill Ritchie, Maintenance Superintendent. He is pleased with the results and is confident that a quick return on his investment will be realized. The Greensboro plant will eventually replace all of their oil-lubricated pumps with dry running Mink pumps.

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