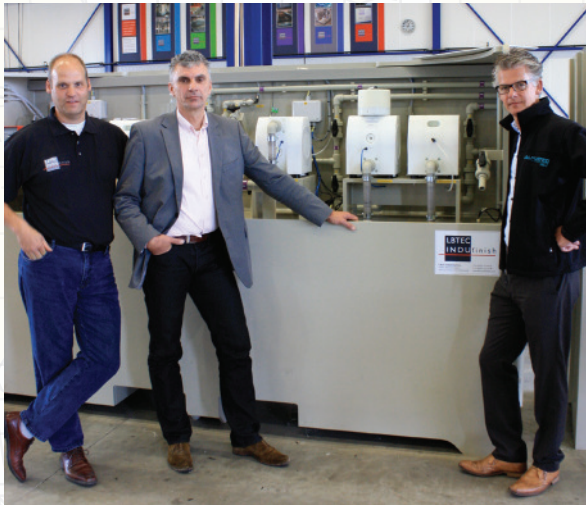


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MEN OF STEEL

An electric-driven, vertical centrifugal pump used in steel production at LBTEC INDUfinish was “rotted away by the chemistry we were pumping” in only six months, the company said, before replacing it with a solid-body plastic air-operated double-diaphragm (AODD) pump. Plastic AODD pumps work on a principle of positive displacement, having a diaphragm in each of their two pumping chambers. These diaphragms are connected by a shaft so that when the compression stroke takes place in one chamber, the suction stroke takes place simultaneously in the other. The result is efficient operation when handling corrosive liquids. LBTEC INDUfinish says it’s never seen any leakage from the pump or its connections. **Read more on page 3.**

ASIA GIANT AWAKENS TO STEEPER WATER ISSUES

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reduce consumption and is also launching a resources cleanup program. Learn more on **page 7.**

SA PETROCHEMICAL 2014 OUTLOOK SOMEWHAT OPTIMISTIC



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Men of steel

Air-operated double-diaphragm pump solution applied in the pre-treatment of raw steel

By Bernd Reitemeyer



LBTEC INDUfinish Sales Manager Erik van der Staaij, left, and Director Wim Brandsema, center, with one of the company's flux-fluid systems.

of LBTEC INDUfinish, Emmen, The Netherlands. Founded in 1991, LBTEC INDUfinish supplies systems used in surface-treating steel.

"We currently sell our equipment mainly throughout Europe and we are starting to pick up business in Northern Africa and the Middle East," said Brandsema. "LBTEC INDUfinish specializes in hot-dip galvanizing, particularly the pre-treatment stage of the hot-dip galvanizing process."

Hot to trot

The pre-treatment that leads to the actual hot-dip galvanizing of steel is precise and exacting:

- A piece of raw steel is pre-treated with a degreaser to remove any oil and grease from its surface.

Steel possesses the strength and structural integrity to support a 100-story skyscraper or a mile-long extension bridge. Yet the process used to manufacture steel is an extremely delicate one.

One person very familiar with steel-making intricacies is Wim Brandsema, director and an owner

- The steel is "pickled" in a hydrochloric acid bath.
- The steel is dipped in flux fluid to ensure the zinc will react correctly with the steel.
- The steel is placed in a melted zinc bath at 450 degrees C (about 840 degrees F); if the previous three steps were not followed properly, the zinc will not adhere to the raw steel.
- The piece of steel is hot-dip galvanized.

LBTEC INDUfinish's system houses the flux fluid used in the pre-treatment. The system includes four compartments: the first contains the flux fluid; the second mixes the flux fluid with certain chemicals to obtain the correct pH level; the third receives the flux fluid after it passes through a



Flux-fluid systems are used to pre-treat raw steel before it is introduced to the hot-dip galvanizing process.

filter press to ensure that any iron in the flux fluid is collected, allowing only clean flux fluid to come out; and the fourth gathers the used flux fluid before transfer to the flux-cleaning unit and back to the first flux-fluid

tank. The system's heartbeat is the four individual pumps keeping the flux fluid flowing amongst the four compartments.

"We began producing these units in 2006 and the most important issue is that you have to make sure it is not going to be corroded when operated," said Brandsema. "Flux fluid is very aggressive so we have to have a pump that will last at least 10 years. We knew that to manufacture our products we would need plastic pumps that would have to deal with very corrosive fluids like hydrochloric acid. Steel, carbon steel and stainless steel aren't compatible with these very aggressive fluids, so you need plastics like PE, PP, PVCs and PVDF."



The solid-body, plastic construction of AODD pumps make them well-suited for handling aggressive and corrosive fluids used during the hot-dip galvanizing process for steel, including flux fluid and hydrochloric acid.

Challenges early on

"An electric-driven, vertical centrifugal pump for the second stage lasted only six months," said Erik van der Staaij, sales manager for LBTEC INDUfinish. "At that point, the engine was rotted away by the chemistry we were pumping."

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As it happened, the other three pumps contained in the system were solid-body plastic air-operated double-diaphragm (AODD) pumps from Almatec, Kamp-Lintfort, Germany. In 2008, Almatec became a founding member of the Dover Corp.'s Pump Solution Group, Oakbrook Terrace, Ill.

"We looked at the other three pumps," said van der Staaij. "We didn't see any corrosion, so we mounted another Almatec pump for mixing the chemical solution and it worked fine. We have never seen any leakage from the pump or connections, not on the thread or the pump body itself; everything sits tight."

Plastic AODD pumps are positive-displacement pumps that have a diaphragm in each of their two pumping chambers. These diaphragms are connected by a shaft so that when the compression stroke takes place in one chamber, the suction stroke takes place simultaneously in the other. This results in efficient operation when handling any type of corrosive liquid.

The pump features solid-body design. Typically, construction is of polyethylene (PE), which offers abrasion-resistance said to be seven times higher than pumps made with polypropylene (PP) — while still having similar chemical-resistance characteristics — and are 1.6 times more durable than stainless-steel pumps.

A pump performs

Solid PE also delivers better sealing, higher static weight, smoother operation and better torque retention than other popular materials of construction. For specific applications, E-Series pumps can also be constructed of PE, PE conductive, polytetrafluoroethylene Teflon (PTFE) and PTFE conductive. All of the pump's cylinder valves are constructed with PTFE; diaphragms are made of ethylene propylene diene monomer (EPDM), PTFE/EPDM and nitrile butadiene rubber (NBR); and ball



Wim Brandsema, left photo, and Sales Manager Erik van der Staaij, right photo, oversee operations at LBTEC INDUfinish.

valves are made of EPDM, PTFE, NBR and stainless steel.

Since 2006, LBTEC INDUfinish has produced more than 50 flux-fluid systems used in steel-making applications around the world.

“The first pump from 2006 we overhauled in 2012 and we changed the membranes, we changed the valves, we changed everything, but there was no need to change them,” says Brandsema. “It was still running perfectly with the valves and membranes of 2006, even handling an aggressive fluid. At the heart of our units you will find Almatec E-Series plastic pumps. We rely on them, and we would choose nothing else.”

Bernd Reitemeyer is regional manager – Western Europe for Almatec® and Pump Solutions Group (PSG®). He can be reached at Bernd.Reitemeyer@psgdover.com. Based in Kamp-Lintfort, Germany, Almatec is one of the world's leading manufacturers of air-operated double-diaphragm (AODD) pumps and is an operating company within Dover Corporation's Pump Solutions Group (PSG®). Find more information on Almatec at www.almatec.de and PSG at www.psgdover.com.

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