

# THE BENEFITS

## OF ALLWEILER® MAGNETICALLY-COUPLED CHEMICAL PUMPS IN PROCESS ENGINEERING

### CHALLENGE:

Low-maintenance pumps with minimal leakage of chemically and physically aggressive materials.

### SOLUTION:

Allweiler® chemical standard pumps with magnetic couplings.

### RESULTS:

Leak-free pumping with a service life that is two to three times longer.

Kao Chemicals GmbH, based in Emmerich, Germany, has been producing tertiary amines as precursors for body care products, detergents, cleaning agents, and concrete additives since 1995. Customers include major corporations like L'Oréal, Evonik, Henkel, and Unilever.

When Kao expanded its plant in 1995, it utilized Allweiler® pumps almost exclusively. Allweiler GmbH, Germany's oldest pump manufacturer, is based in Radolfzell and has a plant in Bottrop. Since 1998, Allweiler® has been a brand of Colfax Fluid Handling, a business segment of the Colfax Corporation (NYSE: CFX).

### MAGNETIC COUPLINGS ARE LEAK-FREE AND LOW-MAINTENANCE

The Kao plant utilizes both chemical standard pumps with mechanical seals as well as magnetically coupled pumps. The magnetically coupled pumps are characterized by their



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Series CNH-B 40-160/11 G-W20, capacity 20 m<sup>3</sup>/h, Liquid Farmin DM20, process: tank storage discharging.



Alltherm series type CHT 65-250, capacity 75 m<sup>3</sup>/h, liquid thermal oil, process: heating system 250 °C.



Series NT150-400/02, capacity 350 m<sup>3</sup>/h, 5 bar, liquid cooling water, process: cooling water system.

ability to pump chemically or physically aggressive liquids for long periods of time without leaks. In the experience of Andreas Bernert, who was responsible for pump maintenance at the Kao Chemicals plant in Emmerich, "maintenance-free" continuous operation of more than one year is common. This is true even with liquids that contain catalyst additives, for example, which frequently cause mechanical seals to leak.

#### TECHNOLOGICAL BENEFITS OF ALLWEILER® PUMPS

In Kao's experience, Allweiler® magnetic pumps have a number of technical characteristics that distinguish them from other manufacturers. First among these are the robust silicon carbide plain bearings (axial radial bearing) and the thick-walled magnetic can. Together, these characteristics result in much greater reliability in 24-hour continuous operation, which is extremely important for the operating company. Unplanned interruptions cost a great deal of money, and not just from a loss of production. Because many liquids must be kept at elevated temperatures, restarting the pumps is also time-consuming. The entire production line is heated continuously, while nitrogen is used for flushing and cleaning.

In addition to the large magnetic drive, two other technical details set Allweiler® pumps apart from the others: A swirl breaker and special return flushing guidance that minimizes pump wear with physically abrasive liquids like quartz sand. Although Kao does not add quartz sand to its process, its precursor products contain catalyst powder that can be similarly abrasive. The special design traits not only prevent leaks at the seal, but also minimize wear to the casing and impeller. On pumps with mechanical seals, the extra-thick and rigid shaft is particularly important, since minimal flexing of the shaft greatly reduces stress on the bearing.



Series CNH-B 50-200G-W20, capacity 60 m<sup>3</sup>/h, liquid glycol/water, process: cooling system.



Series CMAL 32-200/1, capacity 15 m<sup>3</sup>/h, 1.2 bar, liquid caustic soda (50%), process: truck discharging.  
Series AK440-227-12, capacity 30 m<sup>3</sup>/h, 1 bar, 30 °C, liquid aqueous polycarboxylate, process: truck discharging.  
Series CMAL 32-200/1, capacity 15 m<sup>3</sup>/h, 0.9 bar, 40 °C, liquid phosphoric acid (75%), process: truck discharging.  
Series AK450-334-08, capacity 40 m<sup>3</sup>/h, 2.5 bar, 80 °C, liquid polyethylene glycol, process: truck discharging.

#### ALLWEILER® PUMPS IN NUMEROUS PROCESSES

In total, approximately 60 Allweiler® pumps of the CNH series are in operation at the Emmerich plant, the majority of which have magnetic couplings. Capacities range from 20 m<sup>3</sup>/h to 40 m<sup>3</sup>/h, liquid temperatures reach up to 80 °C. In addition to the centrifugal pumps, Allweiler® side-channel pumps are also used to move about 20 m<sup>3</sup> of fatty alcohol per hour. Magnetically coupled pumps of the SEMA-S series have strong self-priming capabilities: The suction length is up to 50 m. The delivery head is approximately 20 m and the liquid temperature is between 60 °C and 80 °C. Allweiler® thermal oil pumps of the NTHW and Alltherm series are used for heating purposes. Approximately 25 Allweiler® progressive cavity pumps, some of which are mobile, move detergent precursors into tank trucks.

#### FAST AND COMPETENT SERVICE

In addition to the design characteristics of the pumps, Kao values close collaboration with the manufacturer. This makes it possible to match materials, particularly those of the

mechanical seal, to the liquid being pumped, thereby optimizing resistance to the acids and lyes that are pumped at the plant. When necessary, technicians are available quickly.

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Series CNH-B50-200, capacity 60 m<sup>3</sup>/h, liquid glycol/water, process: cooling system.

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