Flexibility is key: Screw pumps in oil-supply systems

Flender AG, a subsidiary of Siemens AG, has been using screw pumps from Allweiler AG for more than 25 years. Flender's plant in Voerde, Germany (in the industrialized Ruhr region) manufactures gear units for extruder systems and vertical mills. The pumps supply the gear units with oil that is needed both for lubrication and for cooling. Large vertical mills require as much as 2000 l/min in order to achieve the required cooling capacity of 400 to 500 kW. In extruder gear units, pump capacity is usually 1200 l/min and cooling capacity is approximately 600 kW. Because gear pumps are unable to achieve the high capacities required, they are generally unsuitable for use with these systems. The trend towards ever-larger systems with elevated capacity requirements is another reason for the popularity of screw pumps. Flender is also examining the feasibility of using screw pumps with ball mills in the cement industry, since they are better suited to this application as well. In this case, vertically immersed screw pumps of the "RUV" series are under consideration.

Individual solutions

In decades of use, Allweiler's "SN", "SNS", and "SNF" series have proven to be ideal for use with extruder systems. According to Jens Jürgensen, the director or product management for oil supply systems, Allweiler's flexibility is a major advantage. "Every customer has different requirements for extruder systems, so we depend on suppliers who are highly flexible and can fulfill even special wishes quickly." For example, some operators must meet a variety of materials guidelines or they may have specific preferences for the motor coupling and piping connections. In fact, one major benefit of the "SNS" series is its vertical, space-saving installation.

In addition, Allweiler pumps effectively resolve the problem of air dissolved in the oil through design details and special dimensioning that guides air bubbles contained in the oil into the rear-mounted screw chamber. There the air bubbles are re-incorporated into the solution. This design avoids generation of noise and prevents premature wear to the pump. Even the flow rate and oil volume are selected for each system so that most of the unavoidable quantities of air can escape. The pumps are driven by three-phase motors running at a speed of 1200 1/min. (60 Hz) and 1500 1/min. (50 Hz).

Wide viscosity range

Chamfering of the spindles is carefully matched to the oil quality being used. Oil of the "VG320" quality has an ideal viscosity and has proven to work effectively. When the machine starts, oil temperature is 15 °C with viscosity of about 2400 mm²/s; in continuous operation, oil temperature hits 60 °C with viscosity of approximately 100 mm²/s. Temperature can reach as high as 70 °C in extruder gear units. Allweiler screw pumps cover these temperature and viscosity ranges without limitations.

Siemens sometimes delivers heated gear units in order to ensure that temperature does not fall below the minimum level of 15 °C.

Long service life

Pump operators value two additional characteristics of Allweiler pumps: their low noise and extremely long service lives. According to Mr. Jürgensen: “Our need for spare parts is very limited. We replace seals once in awhile, but that’s about it.” Pumps that stay in service for 30 to 50 years are nothing unusual. In the worst-case scenario, it is a simple matter to replace the insert unit with all three spindles. Although the pumps are extremely reliable, they are usually set up as redundant double units, since extruders must run without interruption. Any downtime would allow the plastic to harden, making it very time-consuming and costly to bring the entire system back into operation.

Incidentally, noisy pumps tend to have shorter service lives because cavitation is the main reason pumps operate loudly. Noise is more than just an annoyance. Cavitation caused by air bubbles in the liquid drastically increases material stress, which significantly shortens the service life of the pump.

Good support

For designers at Siemens, good documentation and the support provided by on-site field engineers are two more reasons to work with Allweiler. Selecting the right pump is a quick and easy task as long as they know the size of the system and its requirements for lubrication and coolant. Yearly contracts with tabular proposals that list all pump sizes and screw pitches make it easy for Siemens engineers to quickly calculate their own quotations. Dimensional and motor data are likewise readily accessible for all pump sizes.

The customer uses IMO pumps in gear units for vertical mills. Since IMO and Allweiler are both business units of Colfax Corporation, the customer can order both brands directly from Allweiler. With these systems, the oil supply is often located far away from the gear unit. Furthermore, the proportion of air in the oil is approximately 10 percent. For these reasons, the tuning valve on the IMO pumps has proven to be very beneficial.

“You can always find cheaper pumps. But for us, dependable quality and flexible reactions to our requirements are more important,” according to J. Jürgensen. Siemens in Voerde installs approximately 150 Allweiler and IMO pumps into its gear units every year.

Requirements

Individually configured, high-capacity pumps for supplying the gear units of extruders and vertical mills with lubricating and cooling liquid.

Solution

Usage of Allweiler and IMO screw pumps.

Result

Allweiler pumps of the SNS and TRF series have been in service for more than 25 years.

Three-screw pump of the TRF series in an oil-supply system (“OWGM” construction type) for a vertical mill drive. The pump moves synthetic or mineral oil VG320 at a pressure of 10 bar.

Jens Jürgensen, director of product management for oil supply systems: “You can always find cheaper pumps. But for us, dependable quality and flexible reactions to our requirements are more important.”

Three-screw pump of the TRF series in an oil-supply system (“OWGM” construction type) for a vertical mill drive. The pump moves synthetic or mineral oil VG320 at a pressure of 10 bar.

Redundant twin three-screw pumps of the SNS series in an oil-supply system (“OWGX” construction type) for an extruder drive. The pumps move synthetic or mineral oil VG320 at a pressure of 8 bar.

Redundant twin three-screw pumps of the SNS series in an oil-supply system (“OWGX” construction type) for an extruder drive. The pumps move synthetic or mineral oil VG320 at a pressure of 8 bar.

Redundant twin three-screw pumps of the SNS series in an oil-supply system (“OWGX” construction type) for an extruder drive. The pumps move synthetic or mineral oil VG320 at a pressure of 8 bar.

ABOUT COLFAX CORPORATION – Colfax Corporation is a global leader in critical fluid-handling products and technologies. Through its global operating subsidiaries, Colfax manufactures positive displacement industrial pumps and valves used in oil & gas, power generation, commercial marine, defense and general industrial markets. Colfax's operating subsidiaries supply products under the well-known brands Allweiler, Baric, Fairmount Automation, Houttuin, Imo, LSC, Portland Valve, Tushaco, Warren and Zenith. Colfax is traded on the NYSE under the ticker "CFX." Additional information about Colfax is available at www.colfaxcorp.com.

ABOUT ALLWEILER – Allweiler AG is the oldest German pump manufacturer and the European market and technology leader for macerators and centrifugal, propeller, screw, progressing cavity, gear, rotary lobe and peristaltic pumps. Headquartered in Radolfzell and with locations in Bottrop and Gottmadingen, Allweiler owns a foundry, produces its own stators, and manufactures ready-to-use fuel and lube oil skids and rinsing-water facilities for commercial marine, oil & gas, chemical processing, specialty chemical, and waste and wastewater applications.

CAUTIONARY NOTE CONCERNING FORWARD LOOKING STATEMENTS:

This press release may contain forward-looking statements, including forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Such forward-looking statements include, but are not limited to, statements concerning Colfax's plans, objectives, expectations and intentions and other statements that are not historical or current facts. Forward-looking statements are based on Colfax's current expectations and involve risks and uncertainties that could cause actual results to differ materially from those expressed or implied in such forward-looking statements. Factors that could cause Colfax's results to differ materially from current expectations include, but are not limited to factors detailed in Colfax's reports filed with the U.S. Securities and Exchange Commission as well as its Annual Report on Form 10-K under the caption "Risk Factors". In addition, these statements are based on a number of assumptions that are subject to change. This press release speaks only as of this date. Colfax disclaims any duty to update the information herein.

The term "Colfax" in reference to the activities described in this press release may mean one or more of Colfax's global operating subsidiaries and/or their internal business divisions and does not necessarily indicate activities engaged in by Colfax Corporation.