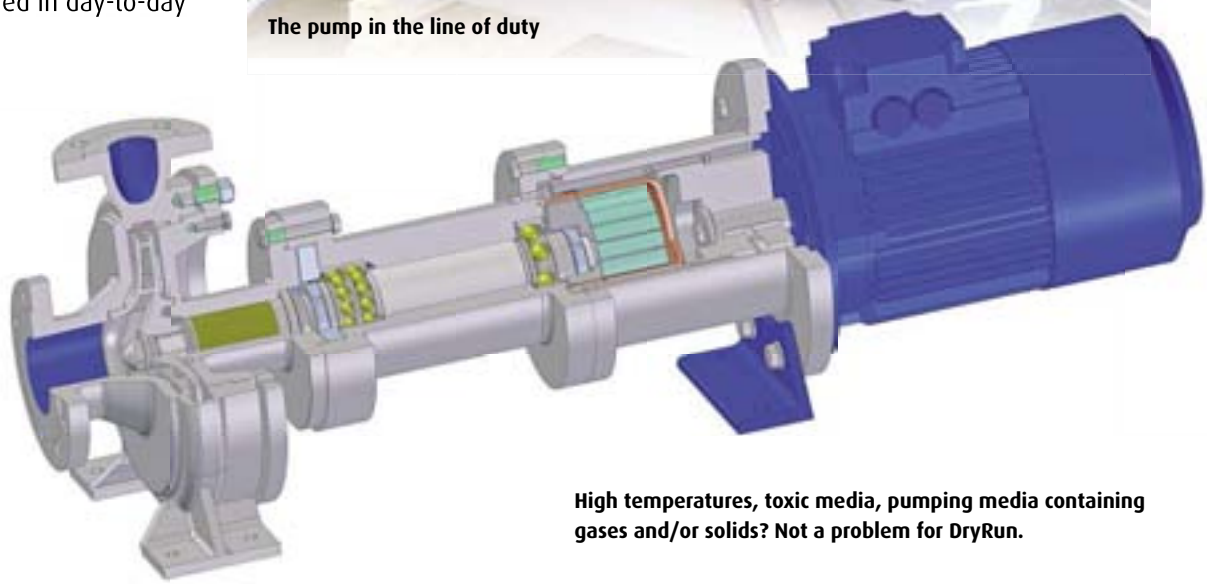
Looking for a troubleshooter?

Special dry-running centrifugal pumps save time, money, and problems

"The hermetically sealed centrifugal pump outperforms magnetic-drive pumps with respect to mode of operation and reliable contents of solids and gases in the pumping medium"—the verdict of PROCESS on a new magnetic-drive pump. That was over two and a half years ago, so its now time to find out how the dry-running horizontal pump has fared in day-to-day service.

The pump in the line of duty

Pictures: Bungartz



High temperatures, toxic media, pumping media containing gases and/or solids? Not a problem for DryRun.

ANNETTE VAN DORP

The onsite situation is "hot" in the truest sense of the word: in one of its many applications, the acid that the $MPCH_{DryRun}$ is handling has a temperature of 240 °C. The liquid, which contains gas and some nitric acid, has a low system pressure of 30 mbar. This means that standard pumps with a closed impeller often suffered from stoppages. Dry running, which is essentially the key feature of these special horizontal pumps from specialist pump manufacturer Bungartz ("it keeps running even when dry"), leads to considerable damage to the sliding bearings in conventional pumps.

To avoid such failures as well as the mounting costs due to material damage and lost time, the management team took the decision last autumn to replace the existing magnetic-drive pump with a $MPCH_{DryRun}$ fitted with an open impeller. Whereas the originally installed pump failed at least once per quarter, the DryRun has been operating without problems since it was commissioned in October 2009.

"Even the high product temperature of 240 °C in this application is not unusual for our pump," explains Frank Bungartz, the third-generation managing director of the Düsseldorf-based pump specialists, "the DryRun can handle pumping media temperatures of up to 400 °C without problems." This is made possible by the barrier integrated between the product and bearing chambers. It minimises heat transfer to the bearing supports. Thus in the aforementioned application, the bearing temperature is only 51 °C at the pump end and 25 °C at the motor end (further example, see diagram). The highly effective thermal shielding means that the DryRun can operate even with extremely hot media, such as liquid melts.

Low energy consumption

But it is not only the thermal stability that makes the special centrifugal pump a virtually all-purpose troubleshooter. Since neither

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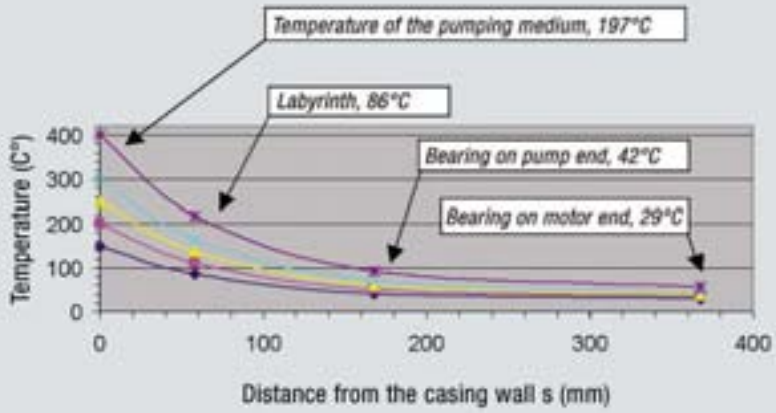
PROCESS PLUS

Online • Find more about the $MPCH_{DryRun}$ at www.bungartz-dryrun.de

Events • Visit Bungartz at the „Pumps and Valves" fair (October, 13–15 2010, Antwerp), Stand 2236

the bearing nor the magnetic drive are in direct contact with the pumping media and various impeller geometries are available, the pump can be operated almost independently of fluid. It is suitable for chemical pumping liquids, regardless of whether they are toxic, corrosive or contain solids or gases. The pump also features a low energy consumption thanks to the use of rolling bearings and ceramic separating can.

For example, savings of up to € 7000 can be achieved over an operating time of 8000 hours (10 ct/kWh, size 50/250, n = 2900 1/min). More recent calculations estimate an average cost saving of one Euro per operating hour.



Temperature curve of casing wall and bearing support (ambient temperature: 15–20 °C)

Safe and reliable

DryRun has demonstrated its particularly high operational safety and reliability in another application example in which the pumping medium, an acrylic acid residue with a temperature of 110 °C, has a tendency to polymerise and thus solidify when it cools. The original pump, a standard pump with a double mechanical seal, reacted to the polymerising material with damaged mechanical seals several times a year. Each of these downtimes resulted in costs of € 1000 to 2500 because the old pump had to be dismantled each time so that it could be repaired and carefully checked.

Fed up with the costs and loss of time, the management team decided to change the pump at the start of last year. The standard pump was replaced by a DryRun. Just like the first application case above, this proceeded without complications because the Bungartz model has standard fitting dimensions according to DIN EN 22858.

Operation without malfunctions

The new pump was installed in January 2009 and has been operating without malfunctions since then. And that's not all: during its 18 months of service, the front part of the pump was dismantled twice at the request of the operator of the acrylic acid plant, who places great value on continuous checks. They were pleased to find that there were no product deposits in the labyrinth system, and the impeller and pump casing were also clean and did not exhibit any signs of wear. The frictionless seal rings had not caused any running-in marks on the labyrinth—"the insides of the pump were in the same condition as when it was delivered," emphasises Frank Bungartz, "the advantages for users are obvious: in addition to saving energy, the operational reliability, the maintenance interval of three years and a very long service life pay off in the long run." So it is not surprising that the operator immediately ordered five more DryRun pumps...