

WORKHORSE PUMPS

KEEP IPSEN FURNACES HUMMING 20 YEARS AFTER INITIAL INSTALLATION

The reputation of manufacturers rides on the performance of their products. So to ensure the best quality for customers, they demand that the parts that go into their products must be reliable and work flawlessly.

That has certainly been the challenge for Ipsen International GmbH of northwestern Germany, the market leader in the manufacture of high-temperature furnaces. Today, Ipsen has installed more than 20,000 of these systems around the world. But in 1993, when Ipsen began building these systems, they were challenged with finding suitable pumps for these high-temperature furnaces.

THE CHALLENGE

Back in 1993, Allweiler® was one of the first and few providers of pumps capable of handling hot liquids. A primary requirement for those furnaces was the ability to handle liquid that reached 320 °C. Although the oil in these furnaces rarely reaches that temperature now, Allweiler pumps are designed to handle high temperatures.

These high temperature requirements are a function of the way chamber furnaces operate. The furnaces heat pieces of metal to approximately 1050 °C in two stages. The metal is then quenched in an oil bath to increase surface hardness, causing the temperature of the quenching oil to rise from approximately 80 °C to approximately 200 °C before it is cooled back down in a heat exchanger. Depending on the size of the system, either one or two 40–160 NBT series centrifugal pumps are used for moving the oil. These pumps are a core component of these furnaces. Pump capacity depends on the size of the oil bath, which is always a compromise between the need for a large volume of oil for the workpiece's rapid cooling and the capabilities of the heat exchanger to cool the oil. According to Ipsen engineer Lutger Heeser, "For us, it was critical to match the pump precisely to the available cooling capacity."



Engineer Lutger Heeser, Manager Product Development Engineering: "We hardly even notice that the pumps are there. And that is the greatest compliment that we can give."

THE SOLUTION

Ipsen turned to Allweiler®'s NBT series, block-type volute centrifugal pumps that can help address those challenges. These pumps are specially designed to move liquid at a temperature of up to 350 °C and pressure up to 16 bar. The maximum capacity is 270 m³/h; the two-stage version achieves a delivery head of 145 m. Ipsen preferred the smallest size with a capacity of 40 m³/h.

The NBT series may be used for pumping petroleum-based thermal oils too. The mechanical seals on these pumps are located behind a heat barrier that helps to protect them from high temperatures. As a result, the simple standardized antimony-carbon/SiC seals used in the pumps have shown



Two centrifugal pumps of the Allweiler® NBT series, circulating quenching oil.

longer service life. Two-stage pumps with the same outside dimensions are also available and ideal for situations that require a small flow rate but a high delivery head. The availability of several different versions gives Ipsen the ability to select just the right variation for each specific installation. Depending on how the pipes are laid and the available space, these variations may include pumps with a:

- Separately coupled motor and volute casing and foot attachment on a base plate
- Directly coupled block version used by Ipsen in vertical or horizontal installations
- Directly coupled in-line version in vertical or horizontal installations

All pumps are intended to be driven by normal standard motors of the IEC efficiency class.

The Ipsen team worked closely with engineers at Allweiler® for a design solution for their furnaces with comparative price/performance ratios. Because of Allweiler®'s design details for the NBT series, the pumps could exceed the requirements of DIN 4754. If the mechanical seal is not working properly, additional safety elements help to ensure that only small amounts of liquid escape. Any pumped liquid that does escape can be collected and diverted without causing damage. The special design of the insert unit drops the temperature to also help extend the life of the bearing and shaft seal.

RESULTS

Allweiler-brand high temperature pumps from Colfax Fluid Handling have been running in those Ipsen furnaces without incident since their installation 20 years ago. That's a testament to the quality of both Ipsen furnaces and Allweiler® pumps! There have been no wear-induced repairs or customer complaints. According to Mr. Heeser: "We hardly even notice that the pumps are there. And that is the greatest compliment that we can give."

Although the selection of suitable pumps was very small in 1993, today many other manufacturers offer comparable pump sets and over the past 20 years, Ipsen has had plenty of opportunities to consider these alternatives. But they chose Colfax Fluid Handling's Allweiler pumps. Their positive experiences played a key role in those decisions, but Ipsen also looked at the way individual pump parts work together and the range of available sizes. "We can tell by examining details like the cabling and the screw fittings whether a pump unit is truly of high quality," according to Mr. Heeser. "These pumps are a core part of our furnaces and must exhibit the same high quality as the furnaces themselves."

The Allweiler® NBT series has been an important part of the company's success, and Ipsen will continue to rely on Allweiler® pumps for new furnaces. After all, they have a reputation for long-lasting furnaces to protect.



ATLAS multi-purpose chamber furnace

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