Biopharma Company Uses Chromium-Coated Pump to Reduce Wear in Abrasive Conditions

CASE STUDY | STOCKHOLM, SWEDEN

OVERVIEW

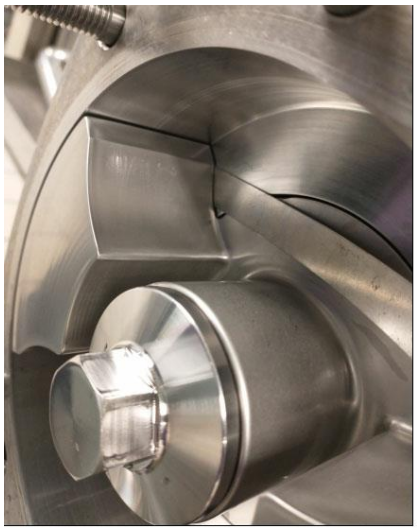
A Swedish biopharma company was experiencing frequent maintenance and a very short duty cycle of filter-press pumps critical to processing blood plasma proteins. An alternative pump solution was needed to address these time/cost inefficiencies due in large part to abrasive filtering agents; while also supporting a wide range of temperatures and other operating parameters (pressure, flow rate, etc.) unique to this delicate lab operation. Viking's hygienic, chromium-coated pump discussed in this case study was successful in delivering 2-4 times lifecycle improvement.

CHALLENGE

The steps involved in filtering proteins from blood plasma require certain filter agents, such as CELITE (SiO2), to improve the filtration process. This causes the liquid suspension to be severely abrasive with respect to pump surface wear. Over the years, the customer employed different options, including air-operated diaphragm pumps as feed pumps, to mitigate maintenance issues. However, these were only temporary fixes since production needs grew and more batches were run; thus, the high cost of pump repair/replacement became a concern once again.

SOLUTION

A local Viking distributor suggested testing a unique coating on all wetted parts of a previously used Revolution CPP0800 pump. The Armoloy TDC (Thin Dense Chrome) is a hard (78 Rc), thin, dense chromium coating with a micronodular surface texture that would potentially protect the pump. This particular coating was chosen for its proven capability over many years of use across industries in abrasive applications that lead to high-wear problems.



Viking's Armoloy-coated pump, Revolution CPP0800.

Biopharma laboratory application tested.

HOW IT WORKS

The chrome-based coating is applied to pump surfaces in a chemical bath via a proprietary, FDA-compliant process. It reacts with the base material of the pump to provide a tight surface with outstanding wear resistance. In operation, the surface is shown to be polished only, not worn down!

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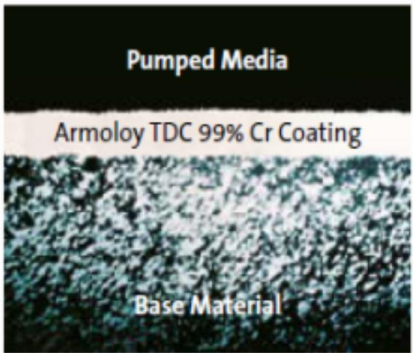
COATED VS. UNCOATED TEST

After evaluation, qualification, and validation of the technical solution on the initial test pump, the customer gave a "green light" to test it using two new pumps in actual production. One pump was coated, while the other was left uncoated. Both pumps were operated according to identical parameters and identical gearmotors/ speeds, run on two equal applications with oversight at the Stockholm biopharma lab. It was decided to rely on the out signal of the pumps' frequency controller as a measure of wear, ranging from 0% (no maintenance needed) to 100% (maintenance needed).

RESULTS

After 195 batches had been test-run, the chrome-coated pump clearly showed less wear and longer duty life.

- The non-coated pump output signal had already reached 100%, indicating maintenance was required.
- The coated pump, on the other hand, was still in good working condition with an 86% out signal, indicating it did not yet require maintenance. (Note: Further batches will help to evaluate the full lifetime that can be reasonably expected.)



ADVANTAGES

The trial successfully demonstrated the following advantages of the Armoloy TDC 99% CR coating:

- Durable, smooth surface
- Heat resistant
- No flaking, looseness, or cracking
- Protection from damaging effects of filter agents, soaps, etc.
- Useful on piston rotor and lobe rotor pumps
- Tested and proven in Swedish and Nordic region applications
- FDA-certified

Viking Pump® is the leader in hygienic pumps used in the beverage, bio-pharmaceutical, chemical, dairy, food, and personal care industries. The chromium coating offers a more durable surface that resists damage in applications with liquid suspensions containing abrasive filtering agents, or other harsh additives, used to produce delicate bioproducts at varying temperature and pressure settings. For more information, contact your Viking Pump distributor and request a flyer with full details and specifications.