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Reliability, Energy, and
Maintenance Solutions

High-Tech Fabrication of Hard-to-Get Parts Breathes New Life into Older Pumps

While consolidating plants, chemical maker repurposes pumps instead of scrapping them

Around the world, at any given moment, millions of pumps are making processes run and industries hum. Like any other complex machine, it's inevitable that pumps and their parts break, wear out, or are discontinued by their manufacturers. For many companies, it is cost-efficient to keep some older, unique pumps running, but it's often a challenge to get parts.

When a major petro-chemical company consolidated plants, moving machinery from one southern United States location to another, it needed a way to re-fit existing pumps to serve a new process, and to generate spare parts that would keep its older pumps running without downtime worries.

CUSTOMER PROBLEM: **Upgrades and Parts for Older Pumps**

For this large chemical maker, the challenge of closing one plant and moving the equipment three states away to be part of a polyurethane-type manufacturing process wasn't simple. The pumps needed to handle a high-temperature, high-viscosity application—one that requires the impellers to be "cottonball-clean," or the process easily can be shut down. The company's engineers didn't want to scrap the older pumps and lose the investment, but couldn't move to the new location without a thorough retrofit and replacement parts.

ITT SOLUTION: **Digital, Electronic Processes Revitalize Older Pumps**

ITT ProCast in Zachary, La., specializes in manufacturing OEM parts to upgrade pumps for a variety of applications, including chemical processing. ProCast does it all in-house—everything from engineering to pattern-making, to casting the part to machining.

ProCast engineering specialists can scan an old pump part with a state-of-the-art laser coordinate measuring machine (CMM), make a three-dimensional model, generate drawings and, if required, go right to a mold. Workers in the pattern shops convert digital models to a programming language that runs a high-speed, five-axis router that cuts materials to make molds and patterns. Patterns can be made of foam, wood, aluminum or specified materials.

Engineered for life



CASE STUDY

REMANUFACTURE AND REPAIR

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In ProCast's versatile foundry, workers can cast a wide range of materials, including all stainless metals, bronze, carbon steel, and even zirconium from partner foundries—a light-weight alloy that gives pump parts the ability to expand and shrink for specialized applications.

With more than 20,000 patterns and nearly 30,000 drawings on hand, ProCast is ready to produce parts to fit more than 200 original equipment manufacturers. On completion, each pattern is quality controlled against the model itself. The cast piece comes back to the engineering department, where it can be re-scanned and precision-compared with the original. In fact, ProCast can even rebuild a worn pump part by scanning it and using software extrapolation to create the size and fit that it needs to be.

"We're a very advanced operation that specializes in pumps of all vintages and types," said Jack Chapman, general manager of the ITT ProCast. "Our specialty is that we manufacture in low volume, producing one to six precision pieces per year of thousands of hard-to-find parts."

The chemical company presented one of the more unusual challenges for the ProCast's experts, Chapman explained. Two engineers from the company drove to ITT with a truck full of old pumps and parts that the original manufacturer had stopped making, and for which it would not sell the patterns. "They literally parked the load outside our door and asked if there was anything we could do to help," Chapman recalled.

ProCast did just that. ITT reverse-engineered and modified the Tri-Clover pump models per the company's specifications, producing 12 copies of three different pumps to use as spare parts and saving the company the cost of new pumps for the plant. The pumps were assembled, installed and are running at peak performance today.

Another customer needed a replacement part—a 2,800-lb. impeller—that the original manufacturer could not provide for six months. ITT ProCast reverse-engineered the part and produced it within 30 days.

About 65 percent of the parts that ProCast produces are cast parts. The remaining are turned parts such as shafts, sleeves, nuts and bolts. Each month, ProCast ships over 500 line items to customers throughout the world including China and Europe. Approximately thirty percent of their business is new parts that require reverse-engineering, and the remainder is for repeat orders for make-to-fit OEM parts.

Each pump part produced at ProCast carries a guarantee to perform at or above OEM standards for one year under normal use. ProCast's goal is to provide the customer with efficient solutions and quality parts.

THE BOTTOM LINE:

Making new parts for older pumps can easily beat the cost of replacement pumps. In the projects for a major chemical company, ITT ProCast has:

- Refurbished 15 pumps
- Remade 75 parts
- Cost the customer only \$500,000, helping the company to avoid potential costs of over \$1 million to purchase brand new pumps and parts, and redesign the whole pump installation from pipe fittings to base plates

