

Casting the Right Part for Its Navy Role

Keyport has one of just five machines in the world for the precision patterning of metal parts.

By ELAINE HELM
EHELM@KITSAPSUN.COM

KEYPORT

It looks and sounds like something out of “Star Trek.”

But a new system in place at Keyport Naval Undersea Warfare Center cuts in half the time and money required to create small numbers of complex metal parts used in submarines, weapons systems and other equipment.

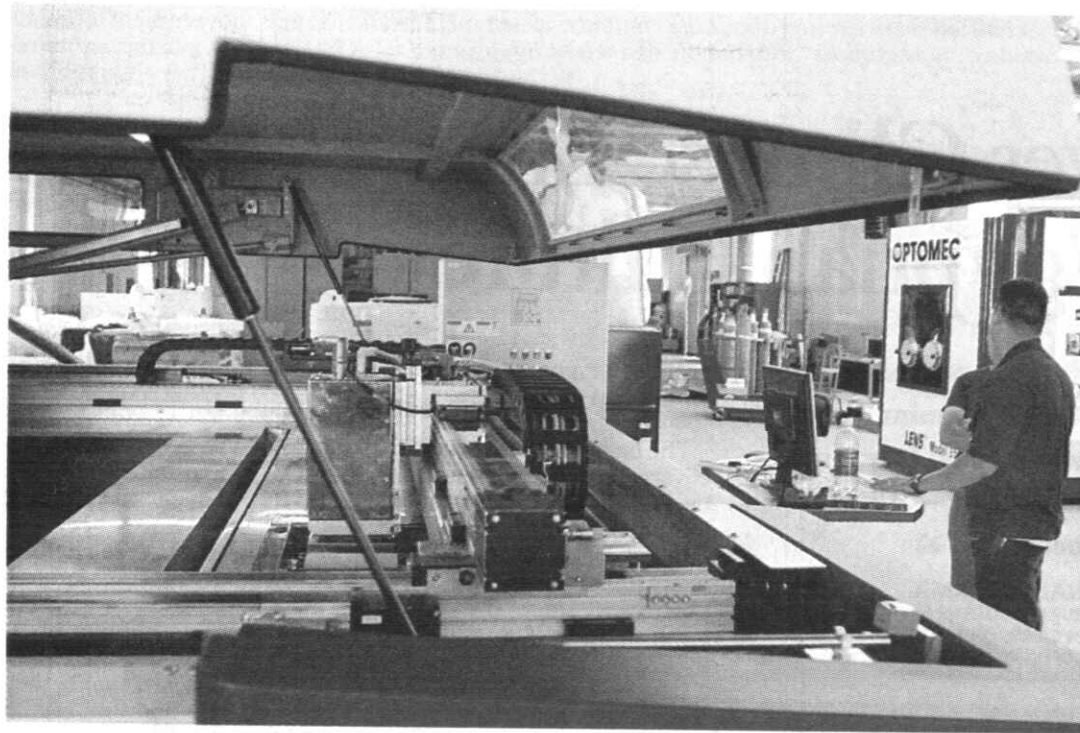
A large, 3-D printer creates patterns for the parts out of layers of sand and glue 0.0011 of an inch thick. The \$1 million machine is one of only five in the world and the first in use by the Defense Department, said Keyport spokeswoman Diane Jennings.

Sen. Patty Murray, D-Wash., and Rep. Norm Dicks, D-Belfair, supported funding in this year’s defense spending budget to establish a multi-year project using the system at Keyport.

Purchasing metal castings has proven difficult for the Pentagon because of long lead times, high costs and the loss of industrial metal casting expertise in the nation over the past 20 years, Jennings said.

Developed by ProMetal, a division of Ex One Co., the technology revolutionizes the casting process, said Patrick Bergan.

“It could take them six months to come up with a



PHOTOS BY KAYLEN KINNEY | KITSAP SUN

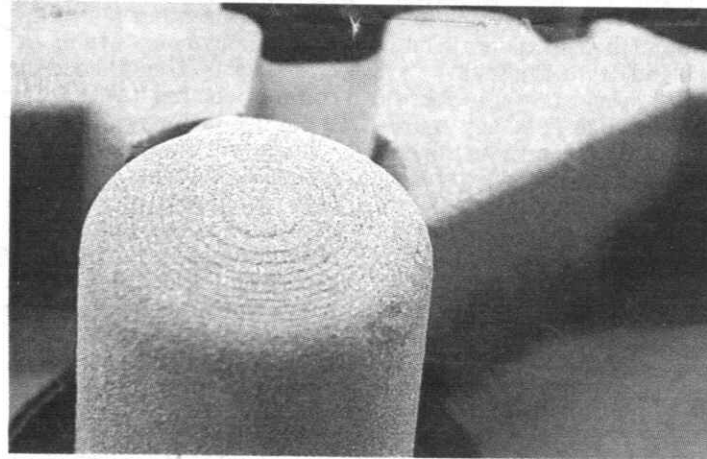
The rapid-casting technology machine at Keyport Naval Undersea Warfare Center creates molds with a layering system similar to a 3-D printer. The machine prints layers of glue, which are covered with sand. As the layers build up, the mold takes shape. The machine cuts down on lead time for creating parts from months to days.

Relief Recognition: Civilian Navy employees who did volunteer work on the hurricane-stricken Gulf Coast were honored Wednesday. | **A8**

pattern that works, where we could do it in three or four days, have it ready in a week,” he said of the traditional process.

Bergan is the engineering supervisor for a special division at Keyport that is using innovative new technology to create parts for the Navy and other branches of the Defense

SEE PARTS | A8



This detail of a mold made by the rapid-casting technology machine shows the thin layers of sand glued into place.

RAPID CASTING: HOW IT WORKS

Rapid casting is a way to create small numbers of complex metal parts that is quicker and less expensive than traditional metal casting. In this casting method, a machine uses layers of sand and glue to create a mold. That eliminates the need to first create a time-intensive, costly pattern. Here’s how it works, step-by-step:

1. Setup

A computer-drafted design is loaded into the control system of the machine (shown in the photograph at left). Operators drop designs for parts into an electronic version of the work space until the space is full or all parts that need to be created are present. Specialized sand and adhesive are loaded into the machine’s holding tanks.

2. Making the Molds

The machine’s printer head deposits glue onto layers of sand 0.0011 of an inch thick until the shape of the mold or molds form. Excess sand holds the molds in place. When the process is finished — in about 48 hours for a full load — all the extra sand is removed and the molds are ready for the foundry.

3. Creating the Parts

The molds (an example is shown in the photograph at left) are sent to a foundry, where molten metal fills the cavity in the shape of the part. After cleaning off extra pieces of metal, the part is now ready for shipment to the customer.

Source: Keyport Naval Undersea Warfare Center

