

## Down to a system

### END USER

Breaux Machine Works Inc.

### CHALLENGE

Reducing the number of tool changes required when cutting difficult-to-machine parts in a horizontal boring mill.

### SOLUTION

Combination cutting tools.

Large, irregularly shaped parts that cannot be easily machined in a lathe are often machined on a horizontal boring mill. Such operations typically require frequent tool changes to produce the parts' precise geometries.

This was a challenge faced by Breaux Machine Works Inc., Tomball, Texas, which provides large-capacity machining services to oil and gas companies, and has special expertise in machining valves and their components. It also provides machining and repair services to companies in the steel and aircraft industries.

One of Breaux's customers, a major chemical company, informed a salesman at an unnamed tool systems builder that Breaux was performing work that could benefit from an upgrade to a combination cutting tool system. According to Robert Stokes, Breaux Machine's manufacturing operations manager, this salesman then approached the company.

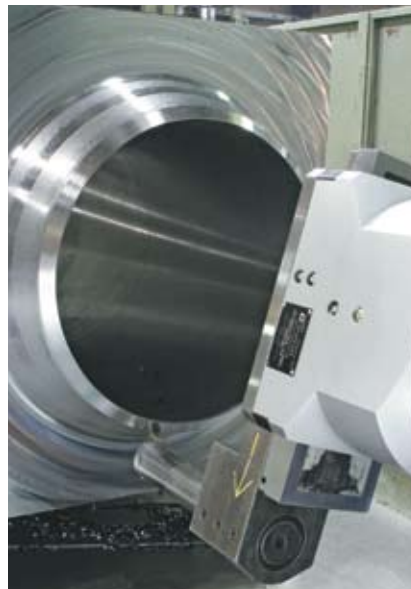
"We do a lot of work that requires this type of tooling, and it was a jump forward in technology," Stokes said. "We're a pretty progressive shop, so we went ahead and [investigated] it."

Breaux Machine went to its customer to learn more about both the product offered by this company and those offered by a competitor, Camden, S.C.-based Cogsdill Tool Products Inc. "[They] had a detailed analysis of the two combination systems, and Cogsdill [had] the edge, because it went a tad deeper into the hole," said Stokes, who added that the Cogsdill

system was also better at dampening vibration.

Cogsdill provided Breaux Machine with its ZX combination boring, facing, contouring, grooving and chamfering systems. These tools increase productivity because multiple operations can often be performed with a single tool. In one application, an end user reduced machining time by 59.5 minutes, according to Breaux.

The tools are for operations on part surfaces that are irregularly shaped or otherwise difficult to machine, such as internal and external tapers or deep cavities.



**A ZX-420 16" facing and contouring head equipped with an attached tool slide extension and a 2½" boring bar with an interchangeable head.**

ZX tools utilize a horizontal boring mill's independent and parallel W-axis and Z-axis to perform lathelike operations. The inner spindle controls cutting of the diameters, while the tool converts axial spindle motion into radial cutter travel. This has the effect of adding another axis to the mill by simultaneously controlling the two axes (i.e., inner spindle and table).

The ZX system is comprised of three types of tools: facing and contouring heads, modular boring tools and modular boring tools with supported cutting action for machining extended-reach bores, such as valve seat pockets.

For the facing and contouring heads, top tooling is mounted on a single tool slide to perform facing or ID and OD work.

Breaux Machine has used ZX tools from Cogsdill on its horizontal boring mills for the past 4 years. "ZX tools have enabled us to do jobs that we could not do before, or that would have required multiple operations on different machines, or a special form-cut tool or inserted ring-groove cutter," said Paul Bourgeois, horizontal boring mill machinist and lead operator for Breaux Machine. "We've mounted and remounted the tool, and [we're] consistently within tenths. If not, [we] know something is not right with the setup."

Breaux Machine uses a Cogsdill ZX valve seat pocket tool to machine a 3¼" dia. bore on a dual-oil valve body. The tool, which features a 28" work length, is used for finish-machining four internal seat pockets (two per side) in stainless steel.

The company also applies a ZX-200 8" facing and contouring head with a boring bar mounted in a tool slide adapter to perform back-boring operations on a face and taper on the outer sleeve of a hydraulic pump for an oil rig.

Another Breaux Machine ZX application requires use of a ZX-420 16" facing and contouring head equipped with an attached tool slide extension and a 2½" boring bar with an interchangeable head. The tool is used to turn OD tapers in A-105 steel for weld preparation. The component is a 24", 14,000-lb. "Y" block.

According to Richard Breaux, machine production manager, by using ZX tools, the company can machine ring grooves with one tool instead of performing multiple operations, cutting machining time from 1 hour to 30 seconds.

Bill Spring, CNC programming manager at Breaux Machine, said that ZX tooling is crucial to the company's machining operations: "It's not only more accurate, but there are some operations that we just can't do without [ZX] seat pocket tooling."