The first cut is the deepest: *an EDM story*

BY CHRISTOPHER CUMMINGS

In Canada, it is rare for a tool shop to use a wire-cut EDM (electrical discharge machine) to make cuts as deep as 23-in. Indeed, there were gasps of amazement at a mouldmaking conference last year when Adriano Oppio told delegates about the Hitachi Ultra-Cut EDM—one of the world's largest—that his shop uses.

But for Classic Tool & Die (1986) Inc. of Windsor, Ont., buying the machine, at a cost of several hundred thousand dollars, was no gamble. The company has always tried to lead the way with EDM technology, so its investment in this large, fast machine was a natural decision. Meeting his automotive industry customers' increased demands for better accuracy and faster speed is a challenge, says Oppio, general manager of the family-run firm. These are goals the EDM helps Classic to achieve.

With the Hitachi, Classic can handle, not only large-scale jobs with accuracies to 0.00025/ in., but also all the steps involved in making parts.

"We can do work faster and ensure our quality is high and consistent. You get away from the back-and-forth stuff that outsourcing entails," says Oppio.

Hitachi Ultra-Cut wire cut EDM at Classic Tool & Die.

CUTS THROUGH 23-IN. STEEL BLOCKS

The machine, which has an automatic wire feed system, is 53.5 in. wide and 39.5 in. in length, and has actually been used to cut through steel blocks to its full 23-in. depth. It cuts through any type of steel, as well as brass, copper, aluminum, carbide, and PCD titanium. "Anything that's conductive, we can cut it," says Oppio.

The EDM is designed for totally automatic, unmanned operation, and runs 24 hours a day "most of the time. It will even automatically rethread itself if the wire breaks. It can also handle five or six programs in sequence, moving from one position to another, cutting the wire each time. And, to top if off, it's very fast too," Oppio says. The controller is a H-Mark-100.

Keeping the machine clean is essential to ensuring a high level of accuracy. "You lose up to 30% of accuracy if it's dirty. There are about 200 parts in the upper portion alone and you need an operator who is patient enough to clean each one of them carefully," says Oppio.

DIEMAKING IS MAIN ROLE

The EDM's main role is diemaking. "We use it to cut the cutting sections on a die. We bring a shape or form into the CAD, where the part is designed, and then we translate it and have cutter paths made. Then it is dumped through the DNC file into the wire EDM, which reads the file and does the cutting. By the time a part gets to the EDM cutting stage, dozens of hours have been spent designing and preparing it."

The shop is given great latitude in creating a die. "The customer gives us dimensions for his press and tells how he wants it manufactured. We take it from there and handle the design and manufacturing aspects," providing start-to-finish service, says Oppio.

It's tough keeping up with the standards and tolerances that continue to get higher, he adds. "The competition among automakers filters down to us: vehicles have to be more precise, so their parts have to be more precise. Accuracies have become extremely small. A wire EDM cuts to accuracies of less than 0.00025 in.; a human hair is about 0.003 in."

ONE OF THE FIRST TO ACQUIRE EDM

In the early 1980s, Classic was one of the first shops in southern Ontario to acquire a wire EDM, later bought another one and recently purchased the Hitachi wire EDM. "EDMs have changed greatly over the ➤