

# Reinventing Your Future

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## Introducing Sodick's Hybrid Wire EDM

Story and photos by P.J. Naughton

*Sodick's Hybrid Wire EDM combines the speed of a waterjet and cutting accuracy of a wire EDM*

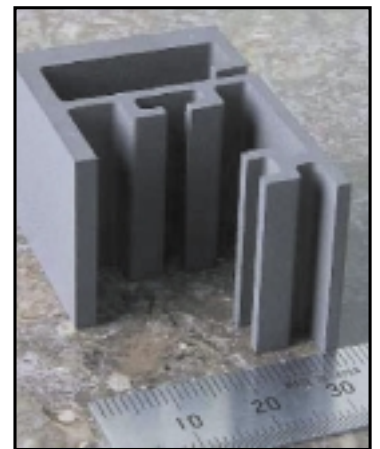
Sodick's new Hybrid Wire EDM combines the fast cutting speed of a waterjet machine with the cutting accuracy of a wire EDM resulting in maximum machining productivity. The machine was first featured at IMTS 2006 where it drew much attention and is now available in the U.S. market.

Wire EDM has long been considered among the most precise machining methods, but not the fastest. Efforts to increase wire EDM machining speeds with coated wire have not been successful due to the cost of the wire itself and its high hourly consumable cost. With this in mind, Sodick set out to develop a way to dramatically improve wire cutting speed, researching unconventional machining methods.

Like its linear motor drive technology, Sodick had to think out of the box in order to come up with a solution to further maximize the wire EDM's machining productivity. A combination between waterjet and EDM technologies seemed like the best solution. The waterjet machine had some similarities to a wire EDM. The waterjet uses a jet of water as its cutter and programming was similar to a wire EDM. Merging the waterjet's fast cutting speed with the precision cutting accuracy of a wire EDM was the perfect solution to increase the EDM's productivity. To achieve this, a joint development was made with

Sodick, the world's largest EDM manufacturer, and Flow International Corporation. Flow's headquarters are in Seattle, WA with an overseas office located just a few miles from the Sodick headquarters in Yokohama, Japan. The close proximity of Sodick's & Flow International's Yokohama offices helped in the development of the Hybrid Wire EDM.

Sodick designs and engineers most of its own technology that goes into their EDM machines. This proved beneficial during the Hybrid's development. Sodick incorporated their own Intelligent Qvic control technology that controlled both the waterjet and the EDM process. A 3D CAD file can be imported into the

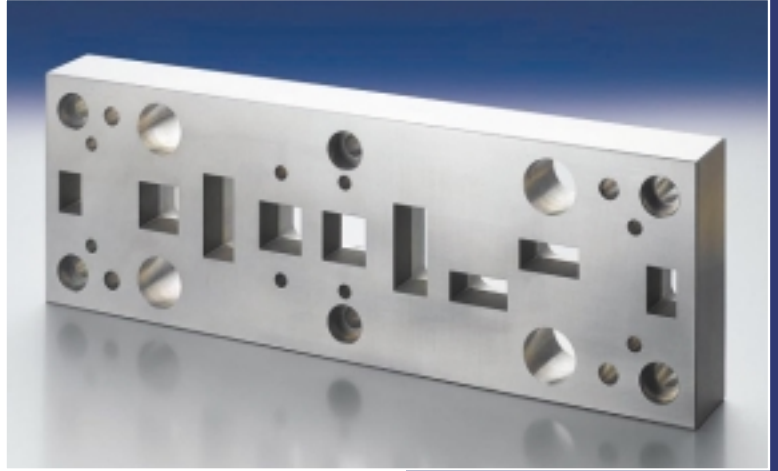


*This 1" thick graphite Hybrid EDM machining sample took 2 minutes to rough out on the waterjet and 25 minutes to skim on the EDM. It would have taken 90 minutes to rough out on the wire EDM or 45X longer.*

The masters in linear EDM technology

## Hybrid Wire EDM Introduction

Hybrid's control automatically converted to NC code for both the waterjet and the EDM process. The operator then selects the workpiece material, thickness, and wire diameter from a pull down menu and the cutting data is automatically entered into the program. This automatic sequence of events makes programming simple and easy to use. Sodick's own linear motor drives are also used on the X,Y,U,V axis drives. Linear motor drives combine fast axis speed and eliminate backlash, developing the perfect match for the Hybrid EDM axis drive system.



The Hybrid Wire EDM can be operated in three different modes. As a waterjet only machine, it can cut non-conductive materials. It can also be used as a wire EDM only or the combination of the two technologies resulting in maximum productivity. Using a die plate as an example, the waterjet can machine start holes into a die plate and rough the part out at 130<sup>00</sup>/hr. Because of the deep depth of the Hybrid's submerged worktank, the slugs will fall harmlessly to the bottom of the worktank. Within 3 minutes, the Hybrid can transform itself into a wire EDM to perform the finishing process. The wire EDM process will improve the dimensional accuracy and surface integrity of the workpiece. The Hybrid reduces floor space since it requires less floor space than an individual wire EDM and waterjet machine. Since the same set up can be used for both processes, there is no need to re-fixture the workpiece.

*Using only one set up, this die plate was roughed out on the waterjet at 130<sup>00</sup>/hr. and finished with the EDM process resulting in a 32RMS surface finish. Since the slugs fall harmlessly to the bottom of the Hybrid's deep submerged worktank, the machine operates completely unattended which further enhances the machine's productivity.*

The Hybrid Wire EDM has an axis travel of 22" x 14" x 10" and a maximum workpiece size of 30" x 15" x 10". Its maximum workpiece weight is 2,200 lbs. The waterjet process can cut up to an 8° angle while the wire EDM process can cut a 30° angle. Standard items include high speed annealing AWT, jumbo wire spooler and wire chopper. The Hybrid Wire EDM is now available in the U.S. market.



*Waterjet machining process*

**For more information and see a Hybrid video demonstration visit [www.hybridedm.com](http://www.hybridedm.com) or call 1.888.639-2325**