

American Machinery Group software enables Craig Newell Welding to nest parts for optimal material usage when waterjetting parts.



THE WAY OF WATER

A Pennsylvania fabricator builds rapport with machinery builder and cutting operations customers

When a machine tool builder establishes a reputation with a customer for not overpromising and under delivering, a long-term relationship is likely to develop. Craig Newell says that his metal fabrication job shop, Craig Newell Welding Inc. in Cambridge Springs, Pennsylvania, has that type of rapport with a builder of waterjet and fiber laser machines in Carrollton, Texas. “American Machinery Group is concentrating on customer service and supplying what they know they can supply.”

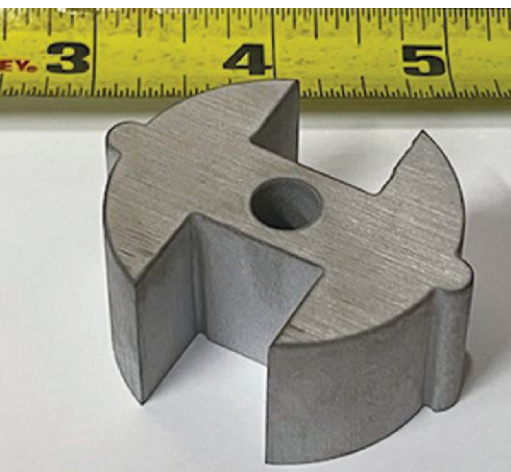
Newell notes that he launched the business in 1981 on a part-time basis and switched to full time in 1986. The company now employs 30 workers in a 20,000-sq.-ft. facility and primarily serves the oil and gas, material handling, telecommunication and transportation industries. It also creates custom fabrications

such as Ganesh the Wooley Mammoth, located at Fireman’s Beach in Conneaut Lake, Pennsylvania, and metal “trees” for display in downtown Erie, Pennsylvania.

When Newell installed abrasive waterjet cutting capabilities in 2000, he says he selected a Calypso model in part because it was American made. Since then, the machine builder changed its name to American Waterjet and then to American Machinery Group LLC in 2019 after it began offering fiber laser machines. When looking to replace its waterjet about two years ago, Newell says his team researched various brands but stayed with American Machinery Group and purchased a Patriot Series 2 waterjet with a 6-ft. by 12-ft. table and a 90,000-psi hydraulic intensifier pump. “It just seemed to be better suited for us, for the job shop metal fabrication industry.”



Kyle Henry, left, laser operator, and Matt Lydic, waterjet operator, with Craig Newell Welding's waterjet machine.



The ultrahigh-pressure pump on the Patriot Series 2 waterjet enables Craig Newell Welding to cut parts with squarer, straighter edges compared with its previous lower-pressure waterjet.

PRESSURE INCREASE

The fabricator's previous waterjet, which Newell traded in, had a 50,000-psi pump. With the higher-pressure pump, he says the newer waterjet machine cuts in the neighborhood of 30 percent faster while producing squarer, straighter edges when cutting workpiece materials up to 6 in. thick. The materials being cut include aluminum, carbon steel, stainless steel, titanium and rubber.

Although the waterjet can cut at 90,000 psi of water pressure, Newell says it is set to waterjet at 82,000 psi to reduce wear on and extend the life of the machine's components. He notes that between cutting faster and consuming less abrasive, his part costs are significantly reduced.

For some applications, such as cutting thin rubber parts, Newell says the work can be performed with straight water. "You can turn the garnet on and off, and you can also adjust the

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Craig Newell, Craig Newell Welding Inc.

flow of garnet to achieve more or less garnet, depending on what you're cutting and what kind of edge finish you're looking for."

That adjustment is done by using the waterjet's abrasive metering system, which is digitally controlled via American Machinery's Mk4 control. The machine builder reports that its 3D-printed abrasive feeder design provides precise abrasive delivery to reduce operating cost when compared to other designs, and inaccuracies that are inherent with "fixed orifice" metering systems are eliminated by providing accurate control over garnet—a waterjet's most expensive consumable.

Abrasive metering is performed using a weight-based calculation, Newell adds. "You run it for a period of one minute, weigh the garnet and then knowing what you want, such as a pound a minute or whatever, you just adjust it that way."

In addition, the waterjet features an abrasive flow sensor, which American Machinery has dubbed the "Abrasive Defender." The sensor detects cutting head clogs that send hot water back to the abrasive feeder, causing a mess, and installs over the abrasive feed tube running from the abrasive feeder to the cutting head. When triggered, the sensor will automatically pause the water stream before water reaches the abrasive feeder to prevent unnecessary garnet loss when opening the top chamber of the abrasive feeder to remove water.

Craig Newell Welding has not had any issue with cutting head clogs, which Newell attributed to consistently using high-quality abrasive. Newell says his company now uses Barton garnet exclusively. "We've tried other abrasives and we keep going back to Barton. The quality is excellent."

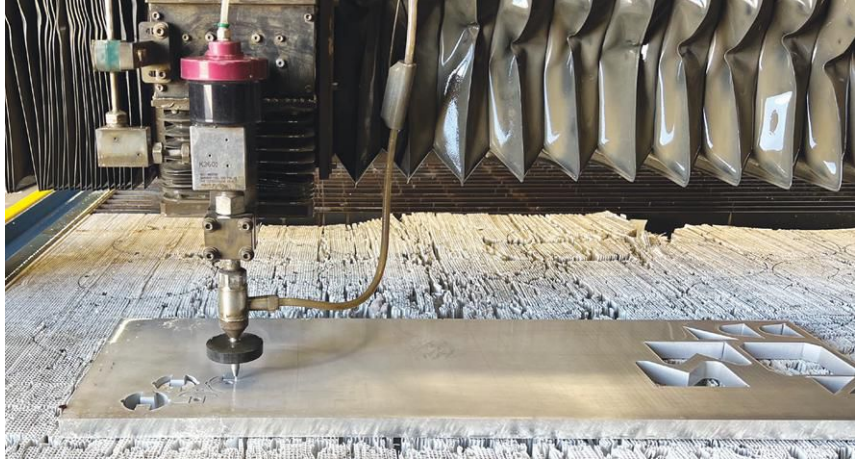
Prior to sending its used garnet to a landfill for disposal, Newell says the garnet is extracted in house, bagged, dried and tested. "It's basically dirt."

MULTIPLE METHODS

Waterjetting is not the only method for shaping workpieces at Craig Newell Welding. For

WATERJET

example, the shop has two fiber laser cutting machines from American Machinery. “Depending on the material type and thickness, if laser is going to be less expensive and the way to go, we will run it on a laser. If it makes sense to do it on the waterjet, we do that,” Newell says.



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Craig Newell Welding achieves tolerances as tight as ± 0.005 in. on its American Machinery waterjet.

When waterjetting makes sense, completed parts can be produced, he adds. However, some parts require threaded holes, which a waterjet cannot create. Newell explains that the holes are waterjetted to a tolerance of ± 0.005 in. and then tapped on a milling machine.

One industry that benefits from specifying waterjet-cut parts is aerospace. Aviation customers frequently choose waterjetting instead of shearing, for instance, because shearing compresses the edge of a workpiece, which is not acceptable for mission-critical components. “You have to cut it big and then machine so much off all the way around to get away from the grain compression. Waterjet cutting eliminates that.”

The fabricator was well-versed in waterjetting when it purchased a new machine, but there was some training relative to the new pump, which is more easily serviced than the one for the original waterjet.

Once the new waterjet was up and running at the shop, Newell notes that an operator runs that machine along with a CNC plasma cutter throughout the single-shift workweek.

Newell says his company remains busy and, hopefully, will add a second waterjet at some point. If or when he does, it will be from American Machinery. “One of the things that I’ve always liked about American Machinery is the culture of how they run their business. [Chief Engineer] Denis Lufkin has a youthful workforce that’s very enthusiastic about their products and the company. I get a great deal of comfort out of that on a moving-forward basis.” **FFJ**

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