Robert Farrell, president, Farrell MarCom Services

BUILT TO TILT

Fiber laser bevel cutting takes a big step forward

Representing some of the world's most reputable CNC machine tool builders, United Precision Services provides equipment to North American manufacturers focused on producing medium to large parts using machining and fabrication processes. A recently announced partnership between the company and MicroStep, a CNC cutting machinery manufacturer, injects new technology into the market in the form of bevel cutting mild steel and stainless steel on a traditional gantry-style machine using a rotator head using fiber laser technology.

I caught up with United Precision's national sales manager, John Previsch, to learn a bit more about this bevel cutting technology and what benefits this partnership brings to the North American metal fabrication market.

Farrell: MicroStep may not be a familiar brand to many readers. What can you tell us about them?

Previsch: Over its 30-year history, MicroStep has become a leading provider of CNC cutting machinery, using fiber laser, plasma, oxyfuel and waterjet technologies on cutting table sizes ranging from a standard 5 ft. by 10 ft. to as large as 26 ft. by 164 ft. The MicroStep brand is noted for quality and reliability and is very popular throughout Europe. Today, the company is gaining recognition globally especially for its advanced bevel cutting capabilities.

Tell us about MicroStep's beveling solution.

Since the introduction of bevel cutting using plasma technology in 2000, MicroStep has made continuous efforts to establish automated CNC bevel cutting as a common and highly efficient production technology for preparation of weld edges on different types of materials.

Today, bevel cutting is available not only with plasma, but with oxyfuel, waterjet and fiber laser. However, many fabricators rely on manual grinding operations or some type of specialized milling operation to bevel parts prior to welding. Understanding →

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>
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the widespread need, MicroStep brought bevel cutting capability to their standard 2-D machine offerings, making the technology readily available to all metal fabrication facilities.

John Previsch, national sales manager at United Precision Services, sat down with Shop Floor Lasers *to discuss the importance of his company's new partnership with MicroStep.*

What are some of the unique benefits of MicroStep's fiber laser bevel cutting?

First off, it's not a specialized machine. It's an accessory added to a standard fiber laser cutting machine, meaning traditional 2-D cutting can now be combined with 3-D bevel cutting on the same part using one program on the same machine. MicroStep's Rotator cutting head can bevel up to 45 degrees, and the capacitive height sensor is calibrated automatically for the full range of tilt angles.

Control of the cutting is provided by a capacitive sensor inside the head that automatically measures the distance between the cutting tool and material. To ensure measurement accuracy, it's important to keep the cutting nozzle undamaged and clean. Therefore, nozzle checks and cleaning are also automated.

In addition, not only can bevels be cut on the perimeter of the part, but also on interior features, such as holes and slots. The cut edge quality of the bevel cut is like a 2-D cut edge. Even more exciting is that complex bevel cuts, such as A, V, Y, X or K grooves, can be accomplished in both mild steel and stainless steel.

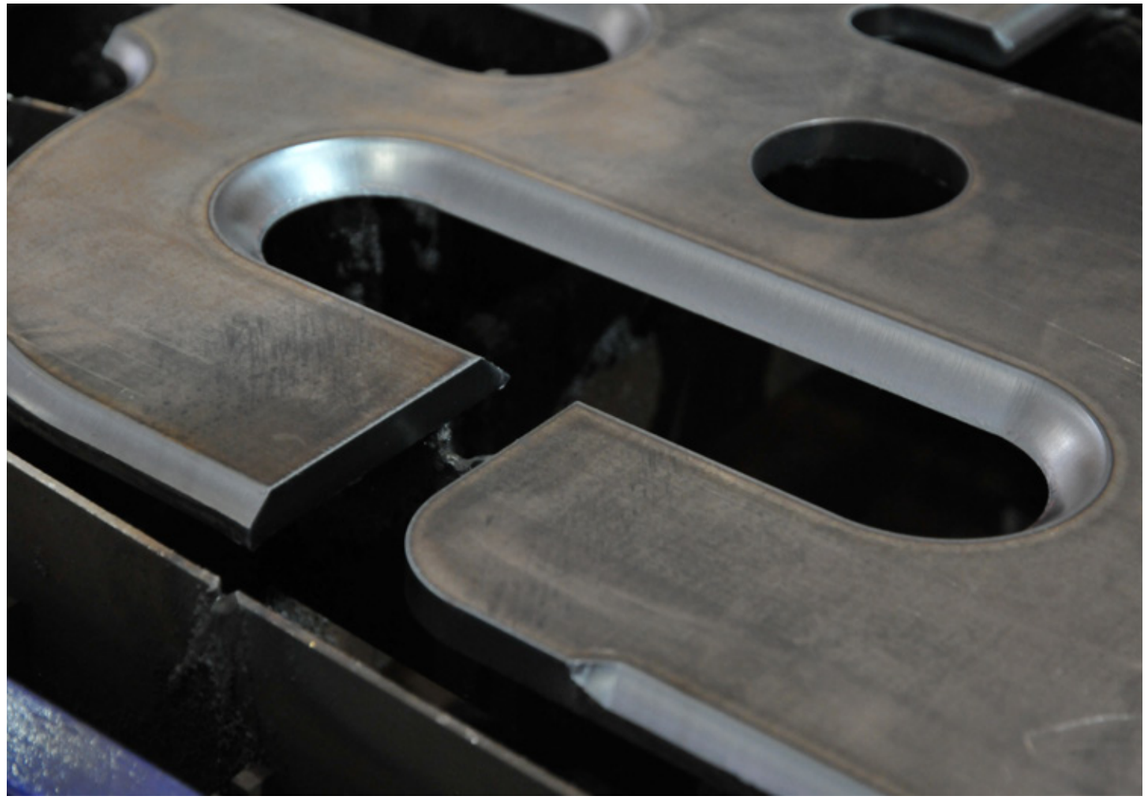
It should be noted that a MicroStep Rotator cutting head is available for all technologies: fiber laser, plasma, waterjet and oxyfuel. The degree of bevel varies for each technology. Fiber laser and waterjet are 45 degrees, plasma is 50 degrees and oxyfuel is 65 degrees.

What about bevel cutting thicker materials?

MicroStep's Additional Beveling Process (ABP) makes bevel cutting thicker materials possible. It's an innovative beveling technology unique to MicroStep that enables adding bevels to parts that have already been 2-D cut using plasma, oxyfuel, waterjet or fiber laser. The machine first needs to be equipped with an integrated scanner. Then, in combination with the scanner and MicroStep's Asper software, the machine operator defines the required bevels in the user-friendly interface.

Thanks to MicroStep's constant advancements, bevel cutting is available not only with plasma, but with oxyfuel, waterjet and fiber laser technologies.

From there, the machine scans the part to determine the actual true shape so that the most accurate bevel cutting result is achieved. The technology allows parts to be processed from completely different machines. For example, thick parts cut with oxyfuel can be subsequently beveled by plasma, or parts pre-cut with plasma can be cut with fiber laser. →

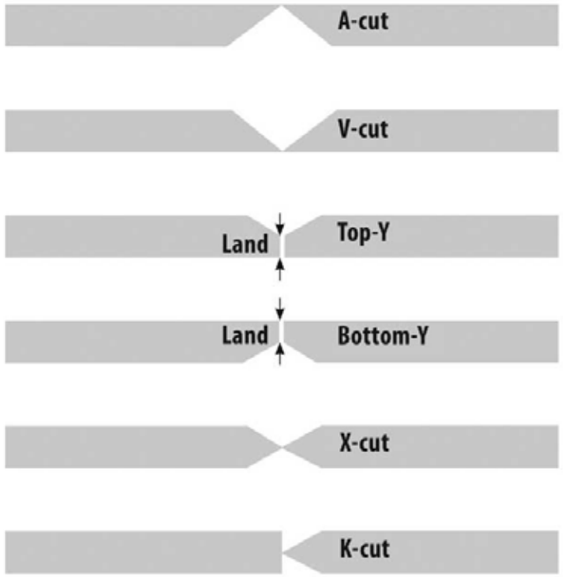


The MicroStep Rotator cutting head's degree of bevel varies for each technology it's paired with. For fiber laser and waterjet, 45-degree bevels are possible. For plasma, it's 50 degrees. For oxyfuel, it's 65 degrees.

Keep in mind, however, that each process technology – oxyfuel, plasma, waterjet and fiber laser – has a limited cutting capacity. For fiber, it's typically up to 1-in.-thick material while plasma is up to 2 in. and oxyfuel is over 2 in. As an example, if the material is 4 in. thick, the first straight cut would be with oxyfuel and then a bevel can be added using plasma.

How accurate and consistent is the bevel angle especially on long parts?

Maintaining quality cuts is not only a function of the overall machine and sophisticated Asper programming software, but more importantly MicroStep's Auto-Calibration of Tool Geometry (ACTG) technology ensures that the Rotator cutting head tip always stays in the exact position required. ACTG consists of a calibration station, extension probe and advanced control software and eliminates the necessity of mechanical adjustments of the bevel head while significantly reducing setup time of the machine from hours to minutes.



Can the fiber laser cutting machines be easily configurated to customer-specific applications?

Yes, MicroStep developed its fiber laser product line as a modular design that allows for a variety of cutting table sizes and range of accessories such as drilling, tapping, marking, pipe and profile cutting, and automated material handling solutions ranging from simple load and unload to storage towers and part sorting. Standard versions are equipped with an automatic shuttle table allowing parts to be cut and loaded or unloaded simultaneously. I should also mention that these machines can be equipped with dual heads for parallel bevel cutting for increased productivity.

With the Rotator cutting head, fabricators can execute complex bevel cuts, such as A, V, Y, X or K grooves, in mild steel and stainless steel.

What are some of the more common configurations?

The most popular is the MSF-Pro that ranges in table size from 5 ft. by 10 ft. to 10 ft. by 50 ft. and up to 15 kW of power. For those that need to process very large parts, the MSF-Max is available in up to 20-ft.-by-164-ft. →

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> *John Previsch, national sales manager, United Precision Services*

table sizes and is available with a fixed or moveable enclosure.

Going head-to-head, what advantages do MicroStep fiber laser machines offer over competitive solutions when beveling?

Generally speaking, MicroStep fiber laser cutting machines are highly configurable and able to process complex bevel cuts in mild steel and stainless steel up to 45 degrees with superior cut edge quality and fewer cutting limitations than competitive offerings. The exclusive technologies of ABP, the additional beveling process; ACTG, the automatic calibration of tool geometry; and the ability to incorporate dual cutting heads are exciting technologies that will greatly benefit the end users and allow them to be more productive and competitive in their own markets.

How can readers learn more?

Our working showroom at United Precision's headquarters in Cincinnati. In addition to MicroStep, we have import and distribution rights for equipment from Hexram, MTE, Bost, Huron, Matec, ROMI Heavy Duty Lathes and MAUSA. You can learn more about MicroStep's line of fabrication machinery and related services offered through United Precision Services by visiting our website or headquarters showroom. ●

MicroStep →

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