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Contract Manufacturer Profits from Versatile, Laser-Based Tube Cutting System

Case Study

Contract Manufacturer Profits from Versatile, Laser-Based Tube Cutting System

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StarCut Tube delivers high precision, ease-of-use and reliability, making it a cost-effective production tool for Micrometric Ltd.

Contract manufacturers exist in a highly competitive environment, and often seek to differentiate themselves by offering some unique capability or area of expertise. Micrometric Ltd. (Lincoln, UK) has accomplished this, in part, by employing a Coherent StarCut Tube system, which enables them to cut, drill and mark metal tubing with extremely high precision.

The StarCut Tube is a 3 or 4 axes, CNC, laser-based, fully-automated system, primarily intended for production of high-precision tubular and flat components, including medical instruments and aerospace parts. It can be configured with either a fiber laser or ultrashort pulse (USP) laser depending upon the requirements for cutting speed and heat affected zone.

Cutting Away from the Crowd

Micrometric Managing Director Neil Main, explains, "From the very beginning, we've set out to specialize in difficult tasks. This means processing less-common materials, such as molybdenum, tungsten, platinum, high-strength nickel alloys and spring steel, plus the manufacture of 3D shaped parts. This differentiates us from many other laser job shops that often use only flat-bed cutters to process sheet steel, and gives us a competitive edge over these less versatile shops. But, it also requires that we invest in an array of both laser and traditional (non-laser) machining to support this broad range of capabilities."

StarCut Tube Makes the Cut

Main explains why they chose to purchase the StarCut Tube in 2019. "We acquired the StarCut Tube for a specific job. Obviously, we first satisfied ourselves that it could deliver the required performance for that particular project. But, we also felt that it would have to be useful past that initial job in order to maximize ROI. And, reliability, including a long, low-maintenance lifetime were also necessities for cost-effective operation within our working environment." To make that evaluation, Main describes the criteria that were considered.

Figure 1. The side access of the StarCut Tube enables Micrometric to easily process long tubes. Image courtesy of Micrometric.

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Performance. The initial project had an unusual combination of specifications that included cutting and drilling of a fairly large (21 mm) diameter steel tube. But, the wall thickness was also quite large at 1 mm, making it a challenge for lower powered laser tools. Added to this, the tolerances were relatively tight. The StarCut Tube offered the unique combination of power and precision necessary to achieve this.

Versatility. More commonly, Micrometric processes smaller diameter tubes with thinner wall thicknesses for applications including sensors and industrial endoscopes. For these, they wanted a machine where the high laser power would translate into faster cutting speeds and hence higher throughput. They also wanted the capability for both wet and dry cutting. Main explains, "On thinner parts, flowing water through the tube delivers two benefits. It cools the thin walls and thereby minimizes HAZ, and, more importantly, it prevents 'back face damage,' i.e., on the opposite side of the tube, where the laser is still quite tightly focused because of the small diameter." Main notes that StarCut Tube delivered on all these factors.

Reliability. "This is a tricky one," notes Main. "Of course, everyone claims reliability and longevity. But in addition to data supplied by Coherent, we did our homework and consulted other members of the laser trade organization AILU. We confirmed that this machine is very well designed and built, and that it has a strong user reputation in our industry for being particularly reliable."

User Interface. Main further cites the user-friendly Human Machine Interface (HMI) that simplifies job setup. The HMI also provides Micrometric with security user access level, diagnostic and data logging for validated processes such as aerospace and medical products.

Figure 2. Micrometric uses the StarCut Tube to make a wide variety of cuts on both large and thinner tubes. The smallest one shown here is only 0.6 mm diameter and has a laser cut hole through one side of the tube. Image courtesy of Micrometric.

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Cut to the Bottom Line

“Unfortunately, our customer changed their design, and didn’t place another order for the components for which we purchased the StarCut Tube,” reports Main. “But that’s where the machine´s versatility paid off. Its ability to cut thinner tubes than our other machines, and to cut both tubes and flat stock with increased precision, has extended our portfolio of capabilities and the range of contracts we can pursue and win. As a result, we now make heavy use of the StarCut Tube on several new components. Our team finds it easy to use and it’s also proved very reliable with no downtime and no service needed at all. We would happily recommend this machine to any job shop without any reservation.”

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