Hybrid Cutting System Provides Maximum Versatility for Medical Devices

Challenge

Manufacturers of medical devices – components and assemblies – often are tasked with making numerous specific products in only small (e.g., <100) quantities. This means they need to cut a wide range of tubes and flat stocks with quite different thickness and dimensions, often from different metals and even from both metals and non-metals, as well as delivering a range of surface roughness tolerances. But the limited quantity of each product category often cannot justify multiple laser machines.

Solution

The StarCut Tube has been designed in a "hybrid" version to meet this need – by incorporating two types of lasers in the same compact machine: a fiber laser, the Coherent StarFiber, with adjustable pulse width from 10-50 microseconds, and a state-of-the-art ultrashort pulse (USP) laser – the Coherent Monaco – with a pulse width <350 femtoseconds. The high average power of the fiber laser is ideal for cutting thicker materials and tubes, where speed is the most important factor. The short pulse width and high peak power/average power ratio of the Monaco makes this laser ideal for cutting very thin or delicate components, where surface finish is very important and thermal effects (HAZ) must be completely avoided. In fact, the excellent surface quality that can be achieved with the femtosecond output of Monaco often means that post processing such as electropolishing is not required. Importantly, the user can program the machine to switch between the different lasers in the same job (i.e., in a single cnc-file) where the fiber laser is used for fast cutting and the femtosecond laser is used for the finer details. The output of both lasers is in the near infrared which is a good match for machining most metals (e.g., stainless steel, magnesium, platinum, nitinol) and many non-metals.

The StarCut Tube "hybrid" version includes all the established features and benefits found in other StarCut Tube machines, including up to 4 axes of cutting motion and optional automatic feeding. The machine can handle both tubular (up to 30 mm diam.) and flat substrates.

Benefit

The result is a high-performance cutting system that is far more versatile than typical machines, maximizing its utility, and hence value, to both medical device manufacturers and their sub-contractors. Capable of cutting struts smaller than a human hair, the StarCut Tube "hybrid" version is ideal for dry or wet cutting stents for neural, cardiac and renal procedures, TAVR scaffolds, pull-wire assemblies, flexible delivery tubes, implants and much more.

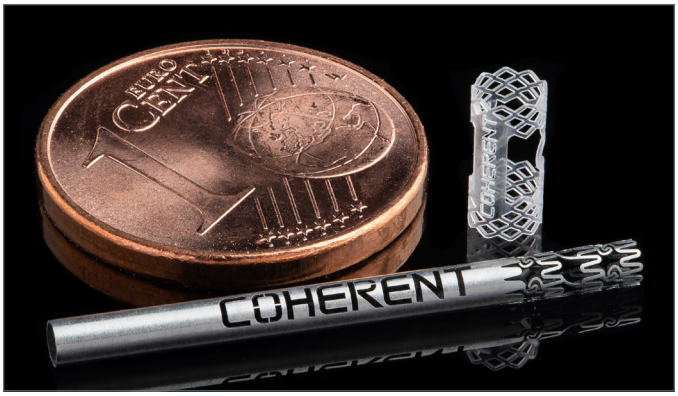

Figure 1: The versatile StarCut Tube (Hybrid) can be used with both metals and non-metals.

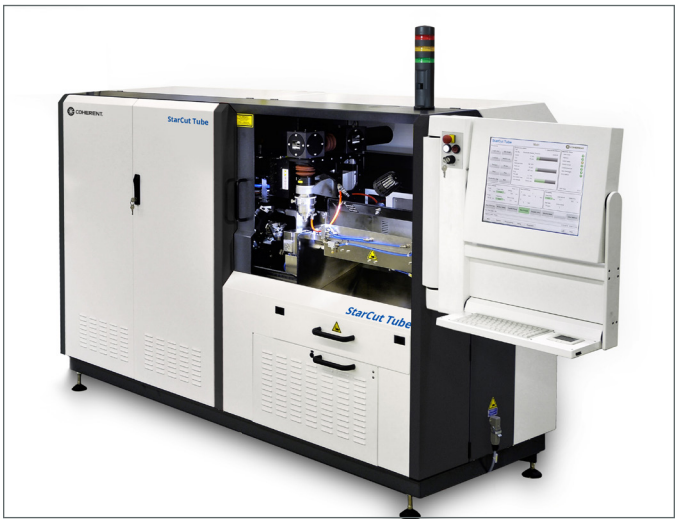

Figure 2. The StarCut Tube (Hybrid) integrates two laser types in a single compact machine.

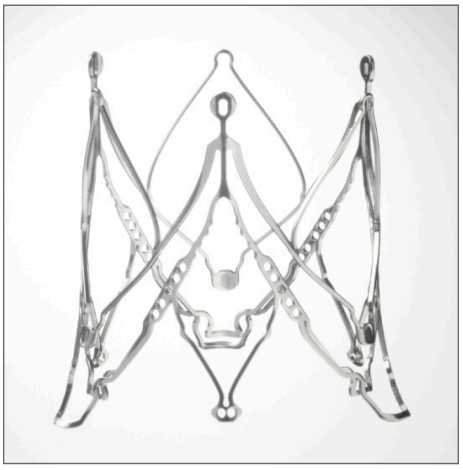

Figure 3. The StarCut Tube (Hybrid) can cut TAVR valve scaffolds and other complex geometries.

Application Field

Cutting medical devices from tubular and flat stock.

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