

Design Teamwork Enhances Medical Devices

When selecting a supplier of integral items such as metal tubes, it is logical for engineers and manufacturers to consider the basics: timelines, prices, specs, metallurgical factors, and so on. However, as is the case with many other sophisticated sectors, it is advantageous for manufacturers of medical devices to pursue collaborative relationships with suppliers that are specialists in their fields.

“Partnering with qualified and innovative suppliers entails choosing those who can provide the experience, strategic thinking, production capabilities, and services needed to fully execute the project at the best price, while eliminating potential waste and preventing recalls,” says Lance Heft, CEO of International Tube.

A provider of metal tubing to the medical, aerospace, electronics and industrial marketplace, Heft has seen many instances where supplier-manufacturer relationships have produced noteworthy results in terms of safety, improved performance, product life, and cost effectiveness.

Eliminating failure and costs

In one case, Heft’s firm assisted in the redesign of an endoscopic tool that had several tubular components and fittings attached to it, some welded, others crimped. While one of the primary concerns was the avoidance of unnecessary costs, the manufacturer’s key requirement was to eliminate any possibility of failure.

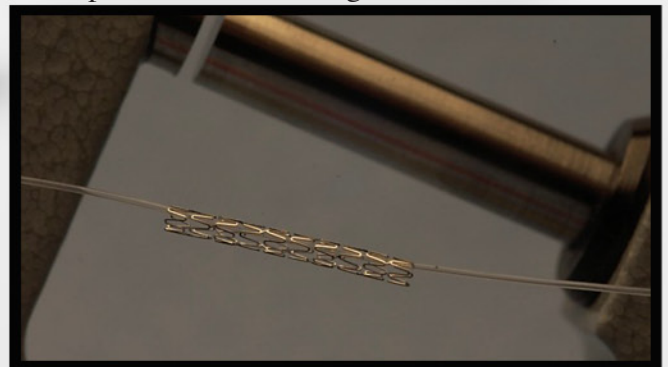
“We had a lot of experience with this type of product, so we recognized that there were actually four possibilities of failure due to the design of the device. This was due mainly to the attachment of multiple pieces that were supplied by different vendors, which also drove up costs,” explains Heft. “After reviewing the material selection, our team sat down with theirs and developed a new design that integrated all of those pieces into a single piece unit. We swaged a portion of the tube down to the size needed, and bulged and flared the end, making it a one-piece component that had no possibility of failure. This method improved safety and greatly reduced costs.

The redesigned, integrated component produced an initial savings of \$400,000 for the manufacturer, with ongoing savings of 30 percent on each piece. Today, International Tube produces 120,000 pieces per year for the endoscope manufacturer, who has not had a tube failure in over four years.

Quality Matters

Quality correlation is imperative between a vendor and a customer. With the FDA becoming more and more invasive in the manufacturing process, it is imperative that not only the quality inspection methods are correlated between the vendor and the customer, but equally important that the customer is fully educated in standard tube mechanical properties and functional performance—specifically for their device. International Tube prides itself in possessing many years of experience in dealing specifically with tube mechanical properties and how the tube must perform in a customer’s device. “We saw early on the importance of obtaining ISO 13485 certification. Due to the delicate and pliable nature of the fiber optics, the device manufacturer got reports that the fibers were occasionally getting snagged in the tubes. Worse yet, this snagging sometimes resulted in metal-to-metal contact, which produced distressing shocks to the surgical patients.

Partnering with innovative suppliers can help medical device manufacturers eliminate waste and recalls while reducing costs and turnaround time.



“Of course this snagging problem was very disconcerting to the manufacturer,” Heft says. “They were very concerned about any possibility of patient discomfort as well as the performance of their fiber optic equipment.”

“The problem was that the tube ID surface was not smooth enough for this virtually nanotechnology-level application,” he explains. “So our engineers analyzed the requirements and designed an ultra-smooth interior tube surface. The new tube design not only solved the snagging and shorting problems, but also saved the manufacturer almost 50 percent on the expenditures for replacement fiber optics.”

Heft adds that International Tube also worked with customer engineers to develop its Ultra Clean tube line to facilitate microsurgery applications that include the removal of debris during surgery. The smoothness ensures that tissue and tool debris created during the procedures will no longer tend to collect in cleanout tubes, thereby reducing the need to clear or change tubes during operations.

Reducing waste

On several occasions, International Tube has collaborated with medical device engineers to reduce waste and associated costs. In one example a medical gage manufacturer had been purchasing metal tubing in bulk, 10-foot lengths, in an effort to save on material costs. Ironically, the scrap rate went through the roof, since the tubing had to be custom cut-to-length for most gage orders.

“Unfortunately, the cost savings effort backfired on the manufacturer,” Heft says. “Not only did they have unnecessary waste, but cutting their own tubing required extra fabrication plus associated time and labor costs. We overcame that problem and provided the savings they wanted by creating a stock and release program where we made their tubing in various lengths and stored them at our factory. We took a 24-month blanket purchase order and allowed them to call material off on an as-needed basis. They had discreet lengths, and had no fabrication requirements, so the material went straight into product.

A combo dental drill

International Tube has been providing metal root canal tubes for many years. Recently a manufacturer of surgical dental devices requested a design for a tube that could be used for drilling and extracting fluid and debris at the same time.

“This was an interesting challenge, which our engineers really enjoy,” Heft says. So they worked with the manufacturer’s designers to develop a unique tool that was essentially a high-strength, suaged tube that could both drill and extract. This design enables an oral surgeon to simultaneously drill via the external surface of the tube and also vacuum debris through the interior of the tube.”

International Tube is a specialty metal tubing company supplying the medical, electronic, aerospace, and industrial markets with high quality products and personalized service in combination with cost-effective solutions.

**For more information, contact International Tube, P.O. Box 26814, Collegeville, PA, 19426.
Phone: 610-495-8060, Fax: 610-495-8062, Email: info@internationaltube.com, or visit the website at www.internationaltube.com**