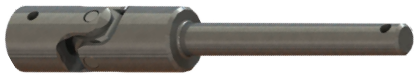


Medical Device Industry Case Study

MINIATURE U JOINT ENABLES AN INNOVATIVE SURGICAL TOOL



Belden developed a customized miniature universal joint for a company specializing in surgical instrumentation for a tool used in minimally invasive surgeries.

The manual surgical manipulator system required a highly precise universal joint to transmit power from the handle to the connecting shaft, which serves as a natural extension for the surgeon that emulates the movement of the hand. The system was meant to fill the need between conventional surgical instruments and surgical robotics: while conventional instrumentation does not meet the requirements of advanced endoscopic surgeries, robotic systems are too complex and costly for daily routine use. This manual manipulator represents a

new class of surgical devices that provide full freedom and optimal ergonomics during surgeries without the complexity of electromechanical robotic devices.

The Belden universal joint designed for this application had an outside diameter of 8 mm to accommodate the space limitations of a surgical tool. The customer requested a special hub configuration to ensure a secure connection to the shaft and precise operation throughout the surgical procedure. Through innovative manufacturing processes, Belden made modifications to its standard universal joint concept and delivered prototypes for testing. Originally done as two separate pieces, the new product incorporates the universal joint and a component of the internal extension into single piece. Adhering to the sterilization regulations of the medical industry, the universal joint was manufactured in high grade stainless steel.