

IV Infusion Pump

Case Study



Product Description

A medical infusion pump used to administer medications to patients via IV which utilizes a flexible printed circuit to interconnect two pressure monitoring strain gauges to control fluid pressure.

Challenge

The customer was using an existing patented connector, designed by Miraco in the early 1990's, which was ultrasonically welded onto the flexible printed circuit (FPC). The connector used Miraco's DCC technology, allowing for direct contact between the flexible printed circuit and a surface mounted header and also reducing the number of components in the assembly. At the time, Miraco was providing only the assembly of the connector to the FPC.

Due to increased demand for the product, Miraco was posed with the challenge to significantly increase the production run rate and decrease the cost per unit.

Solution

Miraco's management team saw this as an opportunity to introduce new technology which would eliminate the need for ultrasonic welding and provide for more flexible manufacturing.

Miraco's design team redesigned the connector so that it could be assembled by hand or by automated equipment while still using Miraco's DCC technology. The new "sled/shell" connector was assembled by placing the FPC onto a sled with a pre-loaded spring which is then inserted into a shell where it automatically locks into place once fully inserted. This assembly method eliminated the need for costly equipment and assembly tooling, since all operations could be performed by hand.

The manual assembly method was specifically tailored for production in low cost labor centers, providing the flexibility needed to handle the fast production ramp up. Therefore, reallocation of personnel would be the only change required to meet production needs and no costly assembly equipment or tooling would be needed.

Miraco was also able to reverse engineer the flexible printed circuit and source it to provide a complete assembly and not just the value added connector portion of the assembly.

Due to the production timeline, Miraco chose to dual source the components for the assembly to provide assurance that the customer would not encounter delivery issues.

Introduction of a new connector required that the product be recertified by the FDA. To aid in this process, Miraco performed stringent vibration, shock and temperature cycling per IPC specifications and generated the necessary reports to provide to the FDA to streamline the recertification process.

Results

As a result of the connector redesign and component sourcing, Miraco was able to reduce the cost of the entire assembly more than 50% while simultaneously increasing production from approximately 4,500 units per month to approximately 4,500 units per week.

Miraco successfully managed the component supply chain as well as assembly at domestic and international facilities.

