Improve Reliability and Reduce Cost

Application: Improving reliability by replacing wire harnesses in medical diagnostic instruments.

Most heater designs have a need for multiple conductors, typically two for the heater element and two for integrated temperature sensors. All Flex was given the task of redesigning a heater that was being used in a medical diagnostic instrument. The goal was to reduce the amount of interconnects, reduce cost, and increase reliability.

By switching from a conventional wire harness to a flex lead All Flex's Design Engineers increased the reliability of the connection and reduced the amount of space and weight of the heater. While All Flex's polyimide-based heaters already increase space savings, the elimination of wire interconnects can also make a significant impact. By using a flex lead the cost of parts and production is also decreased substantially.

Specific improvements included:

- Reduced weight by 75%
- Reduced total cost by 70% by eliminating connector(s)
- Increased reliability by 70%
- Decreased area needed by 75%

In the example below the wired version of this heater has 22 connections, creating 22 possible locations for failure. Whereas the flex lead version has only 10 connections, a reduction of almost 55%.

	Wire Lead	Flex Lead
Heater	2 Wires	0
Sensor One Connection	2 Wires + 2 SMT Solder Joints	2 SMT Solder Joints
Sensor Two Connection	2 Wires + 2 SMT Solder Joints	2 SMT Solder Joints
Wires to Terminal Crimping	6	0
Crimp Terminal to Mating Connector	6	0
Heater to ZIF Connector	0	6
Total Electrical Transitions	22 Total	10 Total

Disclaimer: Data presented for informational purposes only. Actual values and/or usage is for reference. Contact All Flex for details.