

# Case Study: Pebax® Catheter Jacket

Shift from braid-reinforced, multilayer shaft to spiral-cut hypotube with Pebax Heat Shrink Tubing jacket allows for thinner walls and higher performance

## CUSTOMER SITUATION

A global health technology company (Tier I OEM) was designing a next-generation advanced diagnostic catheter. The first-generation device had used a braid-reinforced, multilayer shaft with a polymer reflow process. The customer's engineering team felt it had maximized the mechanical properties of this design and was looking for a novel, higher-performance design.

Featuring a metal core, the new design allowed for higher strength, higher torque, and thinner walls than the previous generation. This tiny (2 Fr) catheter required a thin, flexible, protective polymer cover that would bond to and move with the underlying metal structures, including a laser-cut hypotube and a welded cable tube. It also had to accommodate a hydrophilic coating.

Using a traditional reflow process would have been problematic. The metal core and thin walls would have made the reflow process very difficult, leading to high costs for materials and labor as well as compromised yields. The customer was also concerned about supply chain issues with fluoropolymer liners and FEP heat shrink tubing.

## COBALT POLYMERS SOLUTION

The customer had experience with Cobalt Polymers' Pebax Heat Shrink Tubing and thought it would be ideal for this project. No other single material offers such thin walls (.001"/.025 mm) in a flexible polymer in a heat shrink format for easy application.



The customer's team worked with Cobalt Polymers to find the optimal wall thickness with a custom durometer that met their needs. They started by testing 2:1 shrink ratio, 72 D durometer tubing, eventually settling on 70 D durometer tubing when they discovered that a slightly lower durometer dramatically increased flexibility.

### **Why was a Pebax Heat Shrink Tubing jacket ideal for this application?**

- Bonds to underlying metal core
- Has flexibility to move with underlying metal structures
- Eliminates reflow process, saving time and cost and preserving yield
- Compatible with hydrophilic coating

The 6-foot/1.8 m length allowed for a single, continuous outer jacket with uniform thickness and flexibility. This design put the structural change in the underlying metal rather than in the outer polymer layer, resulting in:

- Thinner walls
- Higher performance
- Ease of manufacturing

In addition, the heat shrink process was easy to duplicate and had no production constraints. Cobalt Polymers was able to ramp up quickly and scale to production levels. We continue to work with this customer on several other projects.

Thin, flexible Pebax Heat Shrink Tubing could be an ideal solution for design engineers looking for a thinner-wall alternative to braid-reinforced catheters with a polymer reflow process.

### **Ready to try our Heat Shrink Tubing?**

- Request samples at <https://www.cobaltpolymers.com/order>
- Order small quantities at <https://chamfr.com/>
- Request a quote at <https://www.cobaltpolymers.com/order/request-quote>

*Some technical details have been changed to protect customer confidentiality.*

### **About Cobalt Polymers**

Cobalt Polymers manufactures flexible, durable, thin-wall heat shrink tubing in Pebax and Polyolefin. These Class VI materials are well suited for medical device applications that require thin walls and low-temperature shrink. Located in Sonoma County, California, USA, Cobalt Polymers is ISO 13485:2016 certified and has been producing medical-grade tubing for many of the world's most innovative medical device manufacturers since 2001.

Have a question or want to discuss custom tubing to fit your engineering requirements? Contact our Technical Team at [sales@cobaltpolymers.com](mailto:sales@cobaltpolymers.com) or (800) 337-0901.