

Inside Out UV Curing

April 2016

Application Overview

Medical device assemblies are often comprised of various biomedical sensors, PTFE tubing, wires and multiple cure points. Often times the sensors selected are multilayer thin film devices which are opaque or totally optically impenetrable. As the majority of these types of medical devices are designed to be inserted into major arteries or other small pathways into the human body, the devices are understandably quite small. In this case, adhering a UV blocking sensor to a guide tube becomes extremely challenging.

The Challenge

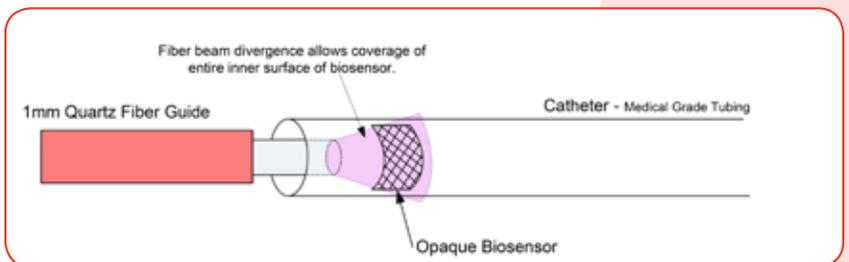
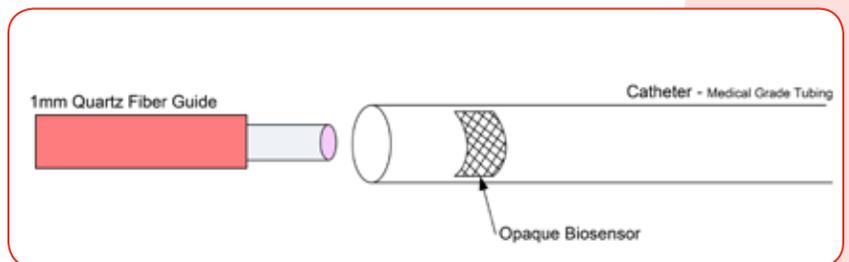
The bonding of a UV blocking biomedical sensor to a guide tube comprised of PTFE or similar tubing. The bond point is on the underside of the sensor, between the sensor and the PTFE tubing. This results in little to no penetration of UV energy to the UV curable medical grade adhesive.

The Solution

A custom 1mm diameter quartz light guide was fabricated to allow insertion into the PTFE guide tube. With an NA of 0.39, the resulting beam divergence is 23° which allows the UV energy exiting the fiber to penetrate through the side walls of the tubing. The optical transmission of the PTFE tubing was greater than 50% resulting in an excellent cure of the adhesive and more than sufficient bond strength. Sizes other than 1mm are also available and customization can easily be accomplished to address each unique application.

The Benefit

Environmentally-friendly and cost-effective UV curable adhesives can be used with this novel inside-out curing technique. This type of light guide is quite inexpensive with extremely short lead times.



For more information on this custom application, please contact:
roy.kayser@excelitas.com