

Smaller, Smarter and Sustainable: Trends that Will Define the Future of Medical Device Design

There's never been a bigger moment for innovation in the healthcare industry than right now. Leading medical device manufacturers are in a race to develop new devices that are smarter, minimally invasive and capable of delivering better patient outcomes. But without a trusted polymers partner to offer the materials knowledge and testing capabilities necessary to give your device the performance characteristics it needs – your innovation may not be realized.



Trend 1: MINIMALLY INVASIVE DEVICES

Patient comfort is one of the highest considerations when developing a medical device. Manufacturers are constantly striving to make their devices less invasive. The first thing that comes to mind when we think of "minimally invasive" is size. Because these types of devices are introduced into the patient's body through incisions that need to be kept small, device designers know it is critical for them to have the thinnest possible walls to allow the largest possible delivery channel without compromising on outer diameter (gauge).

Thin walls require materials with the appropriate physical properties that provide a combination of strength, kink resistance, friction reduction and extrusion processability. Thermoplastic polyurethanes (TPUs) are a widely used material due to the strength they impart in minimally invasive devices, allowing manufacturers to bring designs for optimal patient outcomes to life.

Trend 2: DEVICES WITH SMART TECHNOLOGY

An emerging trend in medical device design is utilizing new technology to make devices smarter. For example, by incorporating additional sensors into a catheter, you are also able to measure flow, pressure and other factors during an examination that help physicians to optimize the treatment for a better patient outcome.

Another example of smarter devices are wearables such as continuous glucose monitors (CGMs). Just as important as the sensors that are pushed through the skin to measure glucose levels in the body are the membranes that coat them. CGM sensor coatings are a unique part of the function of the device itself and are coated for multiple reasons including:

- Immobilization of glucose-related enzymes, which fuel the generation of electrochemical signals to the sensor.
- Exclusion of other dissolved substances that can interfere with sensor readings and reduce device sensitivity.
- Creation of a biocompatible interface within the body, including prevention of sensor fouling.

Materials suppliers can evaluate how best to incorporate and apply polymers as a coating. Suppliers can also modify existing polymers to develop these necessary membranes and provide critical protection to the device and to the patient.



Trend 3: DEVICES MADE WITH SUSTAINABILITY IN MIND

As the healthcare industry evolves, manufacturers are facing pressure from key stakeholders to produce devices that use environmentally sustainable materials, implement processes that reduce their carbon footprint, and produce more high-quality devices that are capable of lasting longer periods of time and meet evolving regulatory requirements. Partnering with a materials supplier who utilizes bio-sourced raw materials and optimized processing techniques is key to developing more sustainable devices.

HOW LUBRIZOL LIFE SCIENCE SUPPORTS INNOVATION IN MEDICAL DEVICE DESIGN

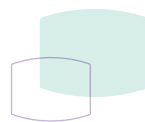
Device manufacturers looking to stay ahead of the curve and develop the next generation of medical devices will need to innovate in terms of size, smart technology and sustainability. Selecting the right materials and the right partner will enable them to do so.

At Lubrizol, we are experts in the relationship between the structure, processing, and performance of medical-grade TPUs. Our team designs new TPUs to achieve specific mechanical properties that will allow medical device designers to create smarter and smaller devices, thereby making them less invasive, safer, and ultimately, more effective.

We also strive to create a more sustainable environment and reduce our carbon footprint by recycling materials and exploring reclaiming our Isoplast® ETPU during dental aligner manufacturing and reusing it in industrial applications. We are also considering utilization of sustainably bio-sourced raw materials. Furthermore, we help our customers develop more sustainable and more reliable medical devices, particularly in implant applications by producing high quality materials for long-term applications.

DELIVERING VALUE BEYOND THE DEVICE

To develop an innovative device, manufacturers must think holistically. It's important to consider a variety of factors including material selection, compatibility with other materials and equipment used during procedures, manufacturability, and how the device will be assembled, packaged, and sterilized. At Lubrizol, we consider all phases - from concept to commercialization to ensure the device can deliver the required clinical performance and desired patient outcome - **it's how we deliver value beyond the device.**



To learn more about how Lubrizol can bring your innovation to life, visit us at go.lubrizol.com/BYDBrief or [contact our team of experts.](#)



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