



Case Study:

Replacing PVC with Electrically Conductive TPU in Medical Hoses



Background

Toppi Oy, a long-established plastic extrusion company founded in 1953, specializes in manufacturing high-quality hoses, tubes, and profiles for industrial and consumer needs. As a family-owned company, Toppi is committed to delivering safe and reliable solutions to its customers.

In the healthcare sector, medical hoses are critical components that require consistent electrical properties and absolute purity to ensure safe and effective performance in demanding hospital environments. These hoses often come into direct contact with sensitive medical gases, making the choice of material paramount.

Challenge / Need

Toppi Oy faced a challenge with their existing medical hoses, which were traditionally manufactured using electrically conductive PVC. While PVC met the electrical requirements, it fell short on several other key properties essential for medical use. The company needed a replacement that could:

- Maintain consistent antistatic performance, especially in contact with flammable medical gases
- Offer excellent flexibility and a pleasant feel for handling and patient comfort
- Provide stability under varying temperatures without compromising performance
- Ensure safety, quality, and compliance with EN ISO 5359 standards

Solution

Toppi Oy turned to **Premix's PRE-ELEC® TPU compound** to address their requirements. Unlike PVC, PRE-ELEC® TPU provided superior flexibility even under pressure, with a softer and more pleasant feel for users. Its antistatic performance ensured the safe handling of medical gases. The compound's formulation also offered consistent conductivity, stable performance in lower temperatures, and robust wear resistance.

Furthermore, PRE-ELEC® TPU supports both mono- and multi-layer tube structures, enabling customized solutions to meet complex design requirements. For Toppi's application, the TPU-based inner layer replaced the previous PVC, enhancing the overall safety and functionality of the medical hose.

Results

The transition to PRE-ELEC® TPU brought significant benefits:

- **Enhanced flexibility and better bending angle**, ensuring ease of use.
- **Consistent conductivity performance**, critical for patient and equipment safety
- **A softer feel**, improving user experience
- **Maintained flexibility** even in colder conditions
- **EN ISO 5359 compliance** and improved wear resistance
- **Recyclable material**, aligning with environmental goals

Toppi Oy's Purchasing Manager, **Mr. Tomi Toppi**, summed up the collaboration:

"Medical hoses are all about purity and consistent electrical properties. The antistatic material is in direct contact with flammable medical gases, and this underlines the validation of the highest quality material. Premix's PRE-ELEC® material was the right choice, no doubt. We've received excellent feedback from the market and are happy to market this pioneering product further. Premix's top quality and reliable PRE-ELEC® material creates full confidence in the product."

Get in touch with us

Whether you have questions about our wide range of plastic compounds and materials or need assistance, our team is here to help.

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