High Modulus Pebax TPE Resin for Medical Catheters

Foster Corporation, a PolyMedex Discovery Group company and leader in biomedical materials for minimally invasive devices, introduces NanoMed EX compounds with 45% greater stiffness, without reduction in elongation as compared to Pebax 7233 MED, a thermoplastic elastomer (TPE) made of flexible polyether and rigid polyamide. NanoMed EX compounds are designed to bridge the gap between the Pebax TPE resin and nylon 11 in flexural modulus, a key property linked to improved pushability and torque for cardiovascular and neurovascular catheters.

NanoMed EX compounds leverage Foster's experience over the past decade in formulating and processing nanoparticles into polymers for advanced medical applications. Particles with the dimensions less than a nanometer are dispersed throughout a Pebax polymer based matrix using the company's proprietary polymer processing technology. The result is a polymer formulation with appearance and processability similar to that of unmodified Pebax resin. Using nanoparticles with length-to-thickness ratios that provide reinforcement properties, Foster was able to engineer NanoMed EX compounds to a 45% greater flexural modulus yet the same tensile elongation as Pebax 7233 MED.

"Pebax 7233 MED is an excellent material for cardiovascular and neurovascular catheter applications," said Brian LaBrec, Director of Engineering for Foster Corporation. "It offers a range of grades with increasing stiffnesses and excellent elongation properties. However, some designs require catheters to have greater pushability and torque than is available from Pebax 7233 MED, and not as stiff as nylon 11. Flexural modulus, a measure of material stiffness, is 75,000 psi (5,171 bar) for Pebax 7233 MED and nearly twice this for nylon 11. NanoMed EX compounds can be tailored to provide flexural modulus between these materials

without sacrificing elongation.”

NanoMed EX formulations are also designed for catheter extrusion processing, where small diameters, thin walls, tight tolerances and smooth surfaces are required. Foster can tailor these proprietary formulations to achieve unique stiffness and elongation properties for a specific device.

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