FOSTER

Custom Compounds for Medical Devices

Enabling Polymer Technologies to Improve the Quality of Life™

Solutions for Minimally Invasive Devices

The building blocks of advanced medical devices are polymers tailored to achieve specific performance properties. For over two decades, we have been a leading supplier of these custom compounds for minimally invasive devices, blending standard polymers with performance additives or other polymers to achieve properties specific to each device. Our services include formulation, prototype quantities, and production.

CUSTOM COMPOUNDS

POLYMERS

Custom compounds for minimally invasive devices require precision feeding, melting and dispersion of polymers and additives to achieve a homogenous blend suitable for applications such as vascular catheters. All compounding is performed on twin screw extruders with processing capabilities suitable for a wide range of base polymers.

Category	Class	Examples
Specialty	Polyolefins	LDPE, HDPE, LLDPE, PP
	Styrenics	PS, SAN, ABS, HIPS
	Vinyls	PVC, EVA
Engineering	Polyamides	Nylon 6, 6/6, 6/10, 6/12, 11, 12, Amorphous
	Polyesters	PET, PBT, PETG
	Acetals	Copolymer, Homopolymer
	Thermoplastic Elastomers	PU, PEBA, COPE
	Polycarbonate	
Performance	High Temperature	PEEK, PES, PPS, PSU, LCP
	Fluoropolymers	FEP, PVDF, ETFE

ENHANCEMENTS

Custom compounding may include blending of two commercially available polymers to achieve hybrid properties not available from any single resin. Examples include the blending of HDPE and LDPE to achieve intermediate durometers, or nylon and urethane to achieve a balance of lubricity and elasticity. Additionally, polymers may be blended with specialized additives for enhanced properties to achieve specific functional requirements.

Radiopaque Additives

A common requirement for minimally invasive surgical (MIS) devices is visibility during x-rays or fluoroscopy. Polymers are inherently transparent to this imaging and require specific additives to achieve visibility. Radiopaque

fillers commonly blended with polymers for radiopacity include:

Barium sulfate – off white powder that compounds easily into most thermoplastics and is easily colored.

Bismuth subcarbonate – pale white powder provides excellent x-ray absorption with some color matching limitations.

Bismuth trioxide – yellow powder provides excellent x-ray absorption, limited to low/moderate processing temperature polymers and color matching options.

Bismuth oxychloride – white powder with good temperature stability for processing, yet susceptible to UV degradation.

Tungsten – dark grey powder with superior x-ray absorption with color matching limitations.

Colors

Color plays a vital role in the identification and differentiation of today's sophisticated minimally invasive devices. Our color matching covers every one of the thousands of color specifications in the PMS guide, the global standard, as well as unlimited shades in between. Guided by a computer aided color matching system, we work with a range of biocompatible organic and inorganic pigments. Our capabilities include pigmenting both standard polymers and custom compounds with additives diverse in inherent color.

Specialty Additives

A wide variety of specialty additives enhance specific properties of polymers. These include:

Nanoparticles – Selectively enhance strength and stiffness properties while maintaining toughness and surface finish ideal for thin-walled catheters.

Lubricants – Reduces friction properties of polymers; ideal for catheter working channels and component surfaces.

Heat Stabilizers – Minimize degradation during compounding or later fabrication processes that involve high temperatures.

UV Stabilizers – Minimize degradation due to UV light exposure, which may occur in later fabrication processes that involve UV cured adhesives, or in clinical use.

Antioxidants – Preserve the chemical and mechanical properties of polymers, extending shelf life.

Processing Aids – Improve dispersion of additives and improve overall quality of compounded polymers.

Others – antimicrobial, cross-linking, conductive, anti-blocks, minerals, magnetic and more.

COMPREHENSIVE SERVICES

CONTRACT DEVELOPMENT

At the core of our services is a commitment to developing new material solutions for emerging device challenges. Our engineers engage with customers early in the design process providing formulation expertise and fast track sampling of custom materials in quantities as small as 10 lbs (4.54 kg) for evaluation. A staged development process ensures goals and timelines are met throughout the development cycle, and the process is sufficiently robust to meet quality and manufacturing requirements in production. Throughout development and production, materials are tested to ensure adherence to device requirements and specification. Our testing capabilities include viscosity, melt flow, FTIR, capillary rheometer, specific gravity, bulk density, tensile, elongation, flexural modulus, ash testing, durometers and more. A Haake R&D twin screw extruder allows for small trials and color match sampling.

CONTRACT MANUFACTURING

At the center of the manufacturing operations in our Putnam, CT and Las Vegas, NV facilities are co-rotating twin screw extruders ranging in size from 27-53 mm. A range of pre and post extrusion equipment maximizes quality, consistency and throughput. Dehumidifying hopper dryers, along with dehumidifying and non-dehumidifying tray oven dryers ensure materials are properly prepared prior to melt blending. Sophisticated material blending and feeding technologies include high intensity pre-mixers, deagllomerating V-blenders, Loss-in-Weight pellet and powder feeders, and liquid feeders. Post extrusion technologies such as strand and underwater pelletizing, sifters, classifiers and cross tumblers ensure finished materials are consistent throughout the lot and from lot to lot.

Foster Corporation

a PolyMedex Discovery Group® company

45 Ridge Road
Putnam, CT 06260
PH: 860-928-4102
FX: 860-928-4226
info@fostercomp.com
www.fostercomp.com