



LoPro[®] Radiopaque Compounds

Today's catheters are used to diagnose and treat smaller and more distal areas of the vascular pathway, requiring smaller device components than ever before. Many of these devices must be visible under fluoroscopy to ensure proper placement during the procedure, yet plastics used for the construction of these devices are inherently transparent to x-ray; fillers must be blended into the polymers to provide the required radiopacity. Foster LoPro[®] Radiopaque Compounds include a wide range of the most advanced radiopaque fillers and polymers to create high quality compounds required for small, 'low profile' device designs.

Applications for LoPro[®] Compounds

LoPro[®] compounds are selected for a wide variety of applications, from the most traditional to the most advanced devices in a range of therapies:

Interventional Cardiology— Percutaneous Transluminal Coronary Angioplasty (PTCA) devices now reach smaller vascular pathways in and around the heart to deploy balloons that deliver life saving stents. LoPro[®] compounds provide necessary visibility for physicians navigating these small, thin wall catheter shafts to the therapeutic region.

Interventional Radiology— LoPro compounds are used in small diameter, multi-lumen catheters of today allowing for a wide range of therapeutic applications in radiology that may not be possible otherwise. LoPro[®] formulations, particularly in urethanes that soften at body temperature, are ideal for peripherally inserted lines and drainage catheters. Increased pushability to reach more distal vascular regions for angiographic imaging or therapeutic ablation will benefit from a wide selection of LoPro[®] formulations based on polyamide-based polymers with radiopacifiers.

Neurology— Neurological catheters demand excellent mechanical properties to reach the distant therapeutic site from the point of vascular insertion, and sufficient radiopacity for visibility of the small diameter, thin wall catheters. LoPro[®] compounds provide excellent visibility for diagnostic and therapeutic catheters. LoPro[®] compounds have been designed for applications such as embolization catheters used to block abnormal blood vessels, most commonly to prevent aneurysms.

Implants— The use of polymers structural devices from spinal cages to dental implants is rapidly expanding. LoPro compounds allow implanted polymers such as PEEK or polyethylene to remain visible to the physician long after surgery. Foster's dedicated clean room compounding operations are designed to manufacture LoPro[®] radiopaque formulations for implant devices under cGMP conditions.

Radiopaque Fillers

Barium Sulfate (BaSO₄) was the first radiopaque filler widely used in medical formulations. It is a relatively inexpensive white powder that has excellent process stability. High loadings are required for comparable radiopacity to other fillers. Typical loading levels for this filler are between 10-40%.

Bismuth Subcarbonate ($\text{Bi}_2\text{O}_2\text{CO}_3$) offers greater radiopacity than barium sulfate and can be added at a lower quantity to achieve comparable results. It is a white powder with high tinting strength. Its use is limited by processing temperatures (yellows at 400° F) and the chemistry of the polymer matrix. Typical loading levels for Bismuth Subcarbonate are 10-40% , and this filler is not recommended in Polykeyone, Fluorinated Ethylene Propylene, or Aromatic Polyurethane.

Bismuth Oxychloride (BiOCl) provides excellent radiopacity and is compatible with a wide range of polymers. It is more temperature stable than bismuth subcarbonate. White 'platelet-like' particles provide a smooth, pearlescent finish on components. This filler has typical loading levels of 10-40%, and is not compatible with Polykeyone, Fluorinated Ethylene Propylene, or Polyurethane.

Tungsten (W) is a highly dense metal powder that is compatible with virtually all polymers at very high loadings by weight percentage. It is dark gray in color and produces a matte finish in high concentrations. Though, polymer compounds with tungsten can be very abrasive on processing equipment, it is the filler of choice in very thin walled devices where high radiopacity is critical. Typical loading levels for this filler are 40-85%, and is not recommended in Fluorinated Ethylene Propylene.



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