

Mandrels

PTFE, Glass-Filled PTFE, PEEK, PEEK Glide™, PFA, FEP, and XpanCore™

Overview-

Designed to support and define the catheter's internal diameter (ID) during construction, mandrels are foundational components that can significantly affect the final device's performance. As such, selecting the correct mandrel material is crucial for maximizing the potential of your device design.

Traditionally, many catheter manufacturers have opted for PTFE-coated stainless steel wire as the mandrel of choice for most catheter builds. While stainless steel provides good mechanical strength, the thin PTFE coating applied over the wire can be prone to flaking during mandrel removal, potentially compromising the build. Extruded PTFE monofilament, on the other hand, avoids this issue and still provides sufficient compressive strength for a wide range of catheter designs while also being easy to remove due to the inherent lubricity of PTFE.

For more complex builds or designs requiring a higher PIC count braiding, glass particles can be compounded with the PTFE resin prior to extrusion to enhance the mechanical properties of the extruded PTFE monofilament while still maintaining high lubricity for easy removal.

For other devices, Zeus can extrude mandrels in several resins, including FEP, PFA, PEEK, and PEEK Glide™. For hyptotube assemblies, Zeus XpanCore™ mandrels are also an option. Designed to expand when heat is applied, XpanCore™ mandrels are advanced processing aids that help alleviate issues with liner sizing, placement, and adhesion.



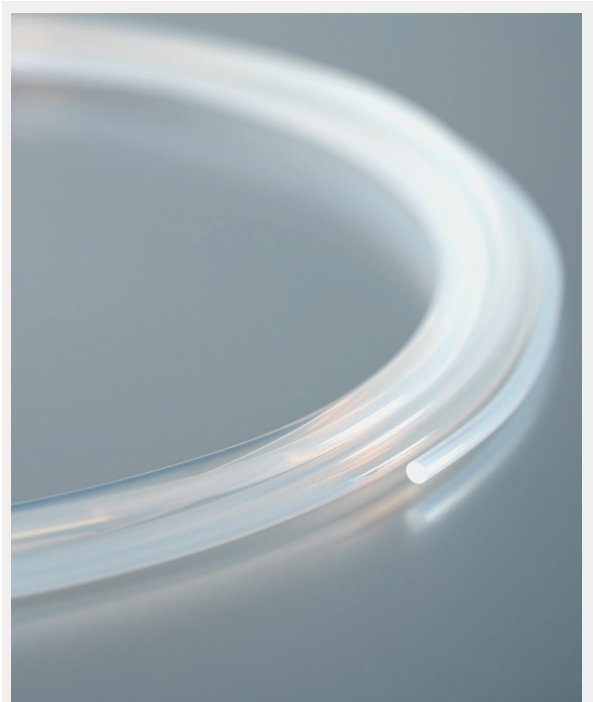
COEFFICIENT OF FRICTION



TENSILE STRENGTH



CONTINUOUS SERVICE TEMP



Zeus glass-filled PTFE monofilament provides device manufacturers a tight tolerance, high compressive strength foundation upon which the next generation of advanced vascular catheters can be built.

APPLICATIONS

- Catheter construction

CAPABILITIES AND SIZING

- Diameters from 0.004" – 0.248" (0.102 mm – 6.299 mm)
- Tolerances as low as $\pm 0.0005"$ (± 0.0127 mm)
- Smooth surface finish

KEY PROPERTIES

- Resin-dependent temperatures up to 500 °F (260 °C)
- Chemical resistance
- Lubricity and stiffness vary depending on resin



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All Zeus mandrels are produced based on customer specifications, and the table below is a general capability guide. Users should evaluate the material to determine suitability for their own particular application. Supplied in natural color unless otherwise specified. Custom Pantone® colors or Zeus standard colors available upon request. Lot-to-lot testing is also available upon request..

MANDRELS - TYPICAL SIZE RANGES				
TYPE	OD RANGE	OD TOLERANCE	LUBRICITY	STIFFNESS
FEP	0.010" - 0.120" (0.254 mm - 3.048 mm)	± 0.001" - 0.003" (± 0.025 mm - 0.076 mm)	★★★★☆	★★★☆☆
PEEK	0.010" - 0.070" (0.254 mm - 1.778 mm)	± 0.001" - 0.002" (± 0.025 mm - 0.051 mm)	★★★★☆	★★★★★
PEEK Glide™	0.010" - 0.070" (0.254 mm - 1.778 mm)	± 0.001" - 0.002" (± 0.025 mm - 0.051 mm)	★★★★☆	★★★★★
PFA	0.010" - 0.120" (0.254 mm - 3.048 mm)	± 0.001" - 0.003" (± 0.025 mm - 0.076 mm)	★★★★☆	★★★☆☆
PTFE	0.004" - 0.170" (0.102 mm - 4.318 mm)	± 0.0005" - 0.003" (± 0.0127 mm - 0.076 mm)	★★★★★	★★★☆☆
Glass-Filled PTFE	0.006" - 0.099" (0.152 mm - 2.515 mm)	± 0.0005" - 0.003" (± 0.0127 mm - 0.076 mm)	★★★★★	★★★★★
XpanCore™	0.010" - 0.267"* (0.254 mm - 6.782 mm*)	N/A	★★★★☆	★★★☆☆

* XpanCore™ mandrels are designed to expand when heat is applied. OD range listed is as-supplied, before expansion. Typical OD growth after heat is applied is 10% - 30%, design dependent.

