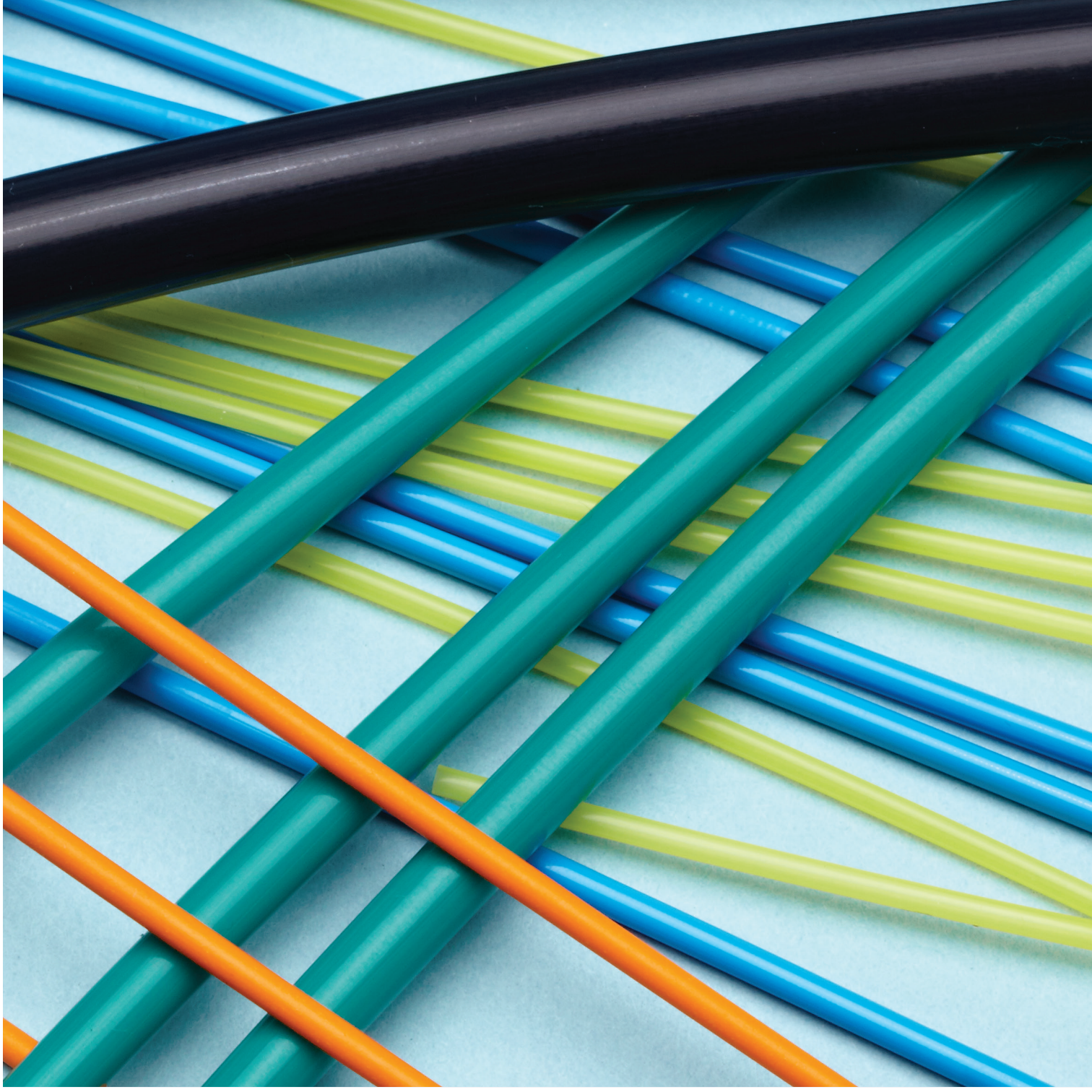


TFX OEM® FLUOROPOLYMER EXTRUSIONS

Teleflex® MEDICAL OEM

WORK WITH THE EXTRUSION EXPERTS® AT TELEFLEX MEDICAL OEM

TELEFLEX MEDICAL OEM DELIVERS SOLUTIONS, INNOVATIONS, AND SERVICES

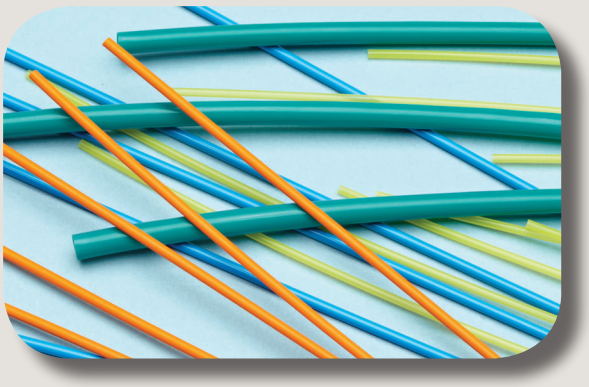
Teleflex Medical OEM is a single source provider of the extrusion development and production services you need to get your project off the drawing board and into the market. We will work closely with you and your R&D team to deliver custom-engineered fluoropolymer extrusions that meet your exact specifications.

We offer you a customer-focused combination of integrated capabilities, deep expertise, decades of experience, advanced extrusion facilities, and dedication to service. That is why Teleflex Medical OEM can take on challenges few other suppliers can. And why we should be your "go to" partner for your custom extrusion projects.

EVERYTHING FOR YOUR SUCCESS

Our global team of highly-qualified engineers, material and polymer experts, PhD scientists, and highly-skilled technicians makes Teleflex Medical OEM stand above the rest. You can count on us to enhance your design, develop prototypes, provide regulatory support, and scale up for manufacturing. It is all made possible by our extensive, in-house capabilities, which include:

- Product concept development
- Engineering
- Design for manufacturability
- Regulatory affairs
- Material selection
- Prototyping, testing, and validation
- Production process development
- Custom tooling
- Manufacturing
- Finishing operations
- Assembly and packaging



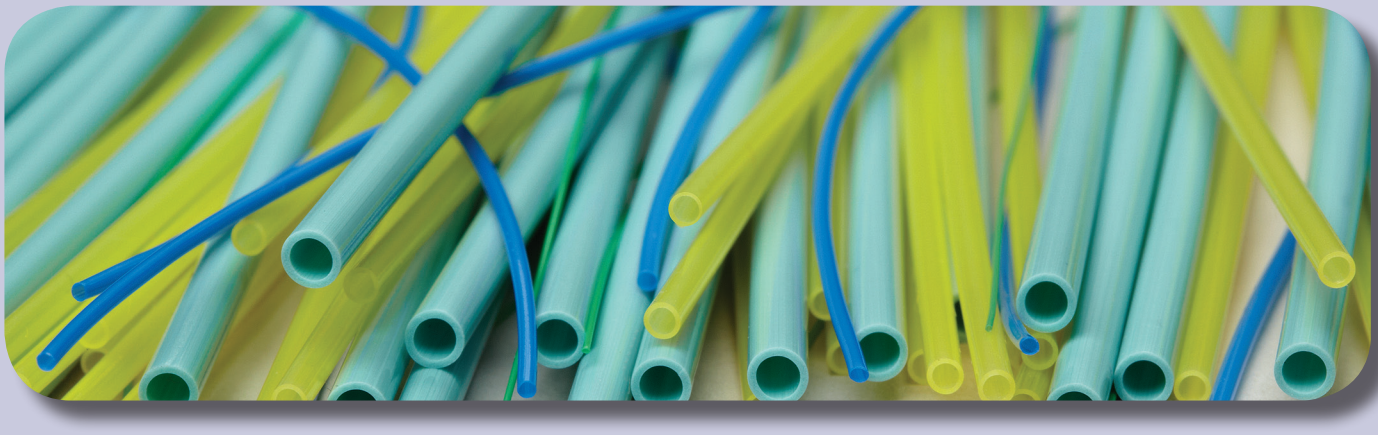
DEEP EXPERTISE IN ALL ASPECTS OF FLUOROPOLYMER EXTRUSIONS

- Single- and multi-lumen tubing
- Profiles
- Ultra-thin walls
- Heat-shrink and spiral heat-shrink tubing
- Co-extrusion (multi-layer)
- Braid- and coil-reinforced shafts and sheaths
- Thin-wall, lubricious-lined reinforced shafts
- Multi-durometer
- Microbore
- Radiopaque fillers
- Marker bands and encapsulated tips
- Color match and custom color

COMPREHENSIVE FINISHING OPERATIONS

- Tube bonding
- Coatings (hydrophilic)
- Coil completion
- Etching
- Flaring
- Hole drilling
- Insert molding
- Labeling
- Shaping
- Skiving
- Tapering
- Tipping
- Tip joining
- Cut lengths or spools
- Finished, packaged, and sterilized devices – including printing.

Teleflex® MEDICAL OEM



CUSTOM-ENGINEERED PTFE AND FEP EXTRUSIONS

PTFE (Polytetrafluoroethylene)

- **SIZE RANGES**
  - OD: 0.006" to 1.50" (0.15mm to 38.10mm)
  - ID: 0.005" to 1.00" (0.127mm to 25.4mm)
  - Wall thickness as small as 0.0005" (0.0127mm)
  - Tolerances as low as +/- 0.0001"
- **CHARACTERISTICS**
  - Excellent lubricity; lowest co-efficient of friction of any polymer
  - Vertically extruded to provide precise and tight tolerances
  - Broad working temperature range
  - Good dielectric strength; insulative
  - Biocompatible, USP Class VI resin
  - 0% water absorption
  - Chemically inert
  - Sterlization: ETO and autoclave

FEP (FLUORINATED ETHYLENE PROPYLENE)

- **SIZE RANGES**
  - OD: 0.018" to 0.400" (0.46mm to 10.2mm)
  - ID: 0.012" (0.30mm)
  - Wall thickness as small as 0.0035" (0.09mm)
  - Tolerances as low as +/- 0.001"
- **CHARACTERISTICS**
  - Good lubricity
  - More flexible than PTFE
  - More optically pure than PTFE
  - Lower porosity than PTFE
  - Excellent dielectric strength
  - Biocompatible, USP Class VI resin
  - Chemically resistant
  - Sterilization: Gamma, ETO, E-Beam, and autoclave

CONFIGURATIONS

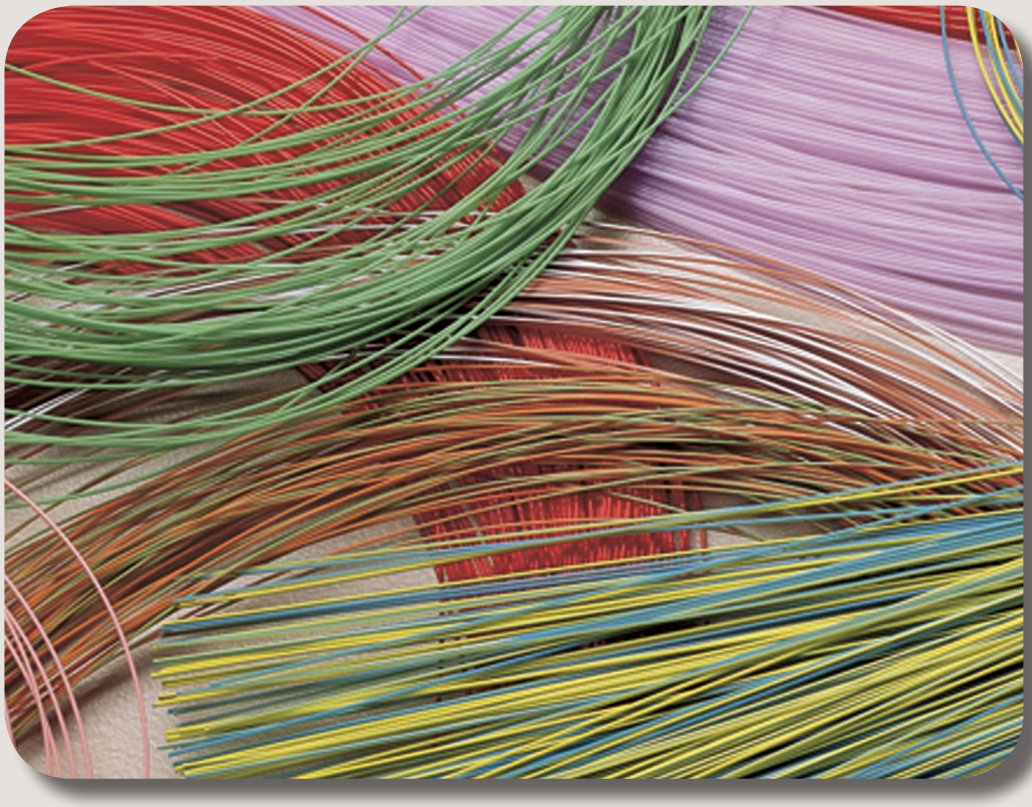
- Custom profiles and shapes
- Ultra-lite wall tubing
- Single- and multi-lumen tubing
- Etch liner (Sodium Naphthalene)
- Custom colors and fillers
- Beading (solid rod)
- Heat-shrink tubing (standard and spiral)

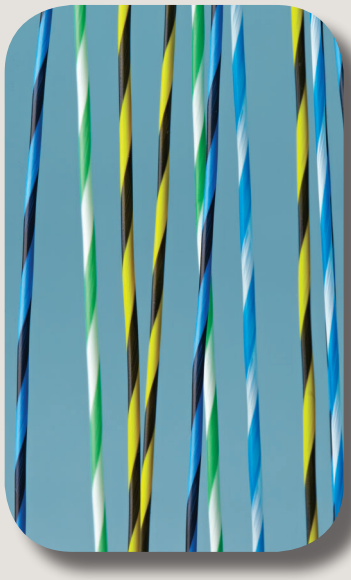
FILLERS

- Available upon request

SURFACE ETCHING

- Sodium Naphthalene





Teleflex Medical OEM is a leading provider of PTFE spiral heat-shrink tubing

PTFE AND FEP HEAT-SHRINK TUBING

CHARACTERISTICS

- Teleflex Medical OEM produces some of the thinnest walled, microbore, heat-shrink tubing available in the industry
- Surface etching is available
- Heat-shrink tubing is available in custom sizes, lengths, and colors

APPLICATIONS

- Guidewire jacketing
- Coating for surgical instruments
- Dielectric insulation
- Protective packaging for components
- Waterproofing
- Abrasion/corrosion protection

- **PTFE (POLYTETRAFLUOROETHYLENE)***
  - Operating temp: 500°F (260°C)
  - Shrink ratios up to 4:1
  - Recovery IDs down to 0.003" (0.076mm)
  - Recovery temperature: 662°F +/-8°F (350°C +/-4°C) for 10 minutes unrestricted per MIL-I-23053/12A**
  - Dielectric strength: 800 V/mil

- **FEP: FLUORINATED ETHYLENE PROPYLENE***
  - Operating temp: 400°F (204°C)
  - Shrink ratios up to 1.6:1
  - Recovery IDs down to 0.024" (0.61mm)
  - Maximum linear shrinkage: 15%
  - Recovery temperature: 375°F +/-4°F (191°C +/-2°C) for 10 minutes unrestricted per MIL-I-23053/11B**
  - Dielectric strength: 2000 V/mil

Please note:
*Consider expanded and recovered ID requirements when selecting and specifying heat-shrink tubing.

**The actual temperature and time depend on tubing size and the application.

FEP I.V. CATHETER TUBING

MATERIAL
- FEP: Fluorinated Ethylene Propylene
  - Compared to PTFE products, FEP extrusions are more flexible and optically clear

SIZE RANGE
- 30 to 10 GA
- Extruded to the tightest of tolerances

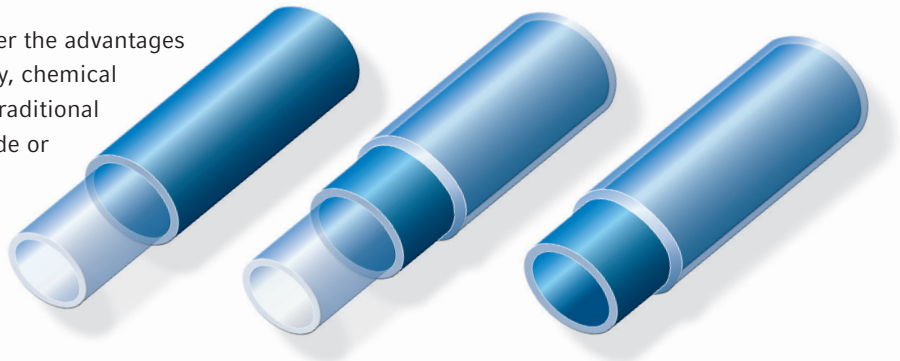
FILLERS
- Clear, striped, and fully radiopaque tubing
  - Barium Sulphate
  - Bismuth Trioxide
- Multiple stripe configurations
- Custom colorations

CONFIGURATIONS
- Cut lengths or spools

ETCHLESS EFEP CO-EXTRUSION

MATERIAL
- EFEP: a terpolymer of ethyelene, tetrafluoroethylene, and hexafluoropropylene
  - EFEP can be co-extruded with polyamide- or PEBA-type materials using a one-step process that eliminates the need for etching
  - EFEP co-extrusion can offer the advantages of fluoropolymers (lubricity, chemical resistance); plus those of traditional materials such as polyamide or PEBA (i.e., flexibility, ease of bonding, over molding)

PRODUCT INFORMATION
- Etch-free EFEP co-extrusion creates tubing with high clarity
- Tubing stiffness can be tailored to specific applications
- EFEP can produce low durometer tubing that is dimensionally stable



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TFX OEM® FLUOROPOLYMER EXTRUSIONS

Work with the experts™ at Teleflex Medical OEM. We are a leader in providing medical product development and production services to medical device manufacturers across the world. We set ourselves apart with extensive, vertically-integrated capabilities, deep expertise, and decades of experience. Our services include

- Product concept development
- Engineering
- Design for manufacturability
- Regulatory affairs
- Material selection
- Prototyping, testing, and validation
- Production process development
- Custom tooling
- Manufacturing
- Finishing operations
- Assembly and packaging

You can count on Teleflex Medical OEM to deliver industry-leading innovations and next-generation solutions for extrusions, diagnostic and interventional catheters, balloons and balloon catheters, specialty sutures and fibers, and bioabsorbable sutures, yarns, and resins. For more information, see www.teleflexmedicaloem.com.

Teleflex Incorporated is a global provider of medical technologies designed to improve the health and quality of people's lives. We apply purpose driven innovation – a relentless pursuit of identifying unmet clinical needs – to benefit patients and healthcare providers. Our portfolio is diverse, with solutions in the fields of vascular and interventional access, surgical, anesthesia, cardiac care, urology, emergency medicine and respiratory care. Teleflex employees worldwide are united in the understanding that what we do every day makes a difference. For more information, see www.teleflex.com

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