

**MEDICAL**



**PIPER**  
PLASTICS, INC.

Engineering • Machining • Distribution  
**Plastics and Metals**

**Highest Quality • Minimum Cost • Quick Turn-Around**

# MEDICAL

Piper Plastics combines experience, engineering, material science, and technology to produce high quality plastic and metal parts that meet exact specifications. We are vertically integrated and have collaborative relationships with strategic suppliers to guarantee successful management of any aspect of your project. Piper can help trim your project costs and lead times by streamlining services and reducing production costs.

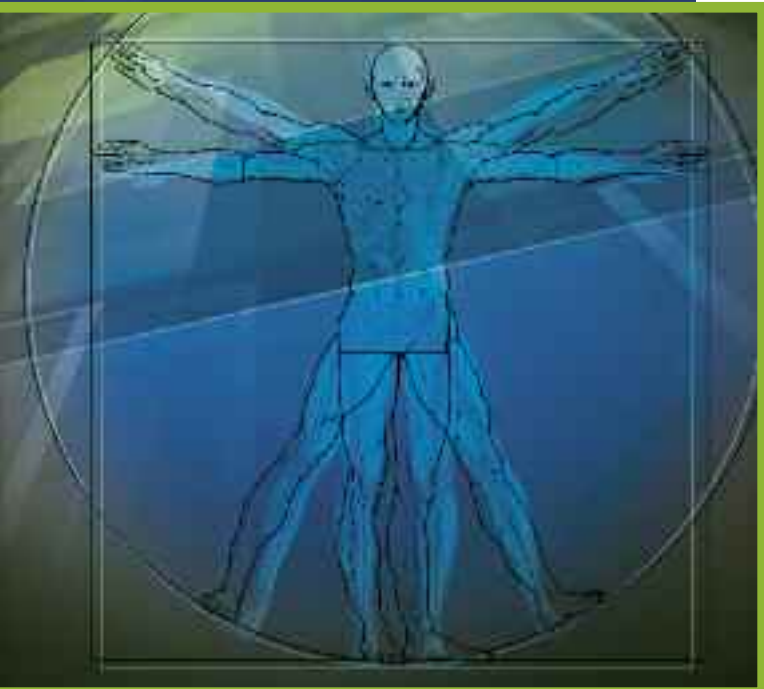
Piper Plastics develops and manufactures medical devices and capital equipment components that are designed to comply with the stringent standards of medical technology. These standards demand materials that have outstanding properties in the following areas:

- Physiological harmlessness due to their biocompatibility in accordance with application conditions
- Excellent resistance to various sterilization methods without loss of mechanical properties
- Superior long term resistance to chemicals and disinfectants
- High strength with precision tolerance capability



Our customers benefit from Piper's state-of-the-art process technologies and comprehensive experience in developing medical component solutions.

- ISO 13485 certified - global quality management standard for medical devices
- Class 6 cleanroom for assembly, cleaning, and packaging
- All materials FDA approved and biocompatible materials are certified to ISO 10993/USP Class VI
- Superior molding, annealing, and machining processes maximize component performance and reduce material costs



## Medical Devices

Through a proprietary process technology Piper Plastics molds and extrudes profiles designed to improve mechanical performance, improve material utilization, and reduce cycle times. Mechanical properties can be tailored to optimize performance of finished components. We have advanced multi-axis CNC machining capabilities to produce intricate geometries and hold tolerances to  $\pm 0.0001''$ .

## Medical and Analytical Equipment

Piper offers engineering design assistance to reduce production cost, provides a seamless conversion from machining to injection molding production, and offers affordable tooling.

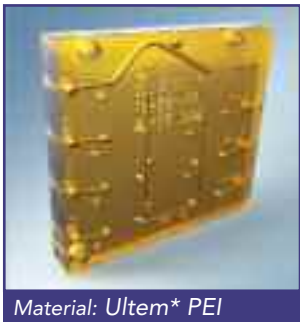
### Fluidic Manifolds and Assemblies

- Manifold Assembly



Material: PEEK

- Fluidic Manifold Assemblies
  - Complex interior channels possible via thermal diffusion bonding



Material: Ultem\* PEI



Material: Acrylic

### Pharmaceutical Application

- Chemically Resistant Indexible Rack Assembly



Material: CPVC/HDPE

### Medical Device Application

- Implantable PEEK Spinal Assembly
  - Piper Plastics' process technology reduces raw material costs
  - Seven axis CNC machining improves cycle times
  - Class 6 cleanroom for assembly, cleaning, and packaging



Material: PEEK

### Carbon Fiber Reinforced PEEK Bone Screw

A leading medical device OEM needed a thermoplastic composite material to replace titanium for a demanding implantable bone screw application. The OEM was unable to find a composite material that achieved the high flexural modulus and tensile strength requirements needed for this application. Testing of industry standard rod also revealed large mechanical property variations. Only Piper Plastics, using our advanced process technology, was able to produce high strength carbon fiber reinforced PEEK rod that met the customer's engineering specifications.



#### Design requirements:

- 3,000,000 psi (21 GPa) flexural modulus
- 30,000 psi (207 MPa) tensile strength
- Mechanical property standard deviation < 3%
- Porosity-free 0.51 in (13 mm) diameter cross section

\*Ultem is a registered trademark of Sabic Innovative Plastics

## Engineering Capabilities and Technical Services

### Material Selection Assistance

- Material selection for optimal performance and cost efficiency
- Customer formulated materials for customer specific application
- Reverse engineering and material identification



### Design Assistance and Evaluation

- Metal to plastic conversion expertise
- Design plastic parts for ease of manufacturing and cost reduction
- Structural failure consultation
- Composite materials design assistance and education
- Product testing recommendation
- 100% critical part inspection and functional testing

### FEA Structural Mold Flow Analysis - Computer-Aided Design

- Part design assistance for optimal mechanical performance
- Structure analysis for non-uniform properties due to fiber orientation
- Design validation and optimization
- Evaluate part stress and effects with various polymers



[www.piperplastics.com](http://www.piperplastics.com)

Engineering & Design • Polymer Development • Precision Machining • Injection Molding • Distribution  
ISO 9001 • ISO 13485 • AS9100

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