Advanced Medical Polymers
FOR THE LIFE OF YOUR PROGRAM

Hostaform® MT® POM
Celanex® MT® PBT
Fortron® MT® PPS
Vectra® MT® LCP
Riteflex® TPC-ET
GUR® UHMW-PE

High quality polymers with long-term supply commitment
Offering advanced polymer solutions in such diverse areas as diagnostics, orthopedic implants, medical supplies and drug packaging and delivery, we provide a wide range of solutions for your medical product development program. We back up our high-performance products with comprehensive support in design assistance, analytical testing, finite element modeling and mold flow analysis. Our MT® polymers have available Drug and Device Master Files, USP Class VI and ISO 10993 biocompatibility to help support your regulatory approvals.
As a trusted global leader in medical technology polymers, we offer total solutions with global reach, local resources, design and application development support, and over 40 years of technical expertise in the medical industry. Celanese enables you to outpace the exacting demands of today’s medical products with advanced engineered materials.

- A portfolio of advanced engineered polymer solutions
- Manufacturing and long-term supply guarantee
- Extensive research and development capabilities
- Processing guidance and support
- Regulatory support

**Strong History of Material Innovations for Medical Products**

Celanese high-performance MT® polymers are robust, easy to process and assure long-term performance, retaining precise dimensions in even the most intricate components. Our polymer benefits include high mechanical properties and resistance to chemicals, with many grades designed to withstand sterilization by usual methods. Couple that with the ability to reduce total manufacturing costs by consolidating multiple parts into a single unit, and you’ve got a solid material advantage in all things medical.

**Responsibility, Commitment and Understanding**

We are a trusted and reliable development partner to the medical industry with a long-term supply commitment to provide advanced high-quality and biocompatible polymer technologies with superior dimensional stability, mechanical properties, chemical resistance and ease of processing, backed by unmatched technical expertise.

- High product purity
- Consistent formulation
- Long-term supply assurance
- Change management
- Production according to GMP principles
- Drug and Device Master File listing
- Food contact compliance (FDA and EU)
- Biocompatibility
- Free from additives derived from animal sources
## Typical Medical Applications

### Hostaform® MT™ and Hostaform® acetal copolymer (POM)
- Thermally stable
- High chemical resistance
- Excellent impact resistance
- Suitable for repeat steam sterilization cycles
- Sliding properties
- High hardness and rigidity
- Spring properties

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Typical Medical Applications</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 2U01</td>
<td>Stiff flowing for extrusion and thick walled parts</td>
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<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 8U01</td>
<td>Standard flow, unfilled</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 12U01</td>
<td>Easy flow, unfilled</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 12U03</td>
<td>Easy flow, unfilled, increased stiffness</td>
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<td>Drug delivery systems</td>
<td>MT 24U01</td>
<td>Very easy flow, unfilled</td>
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<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 8R02</td>
<td>Standard flow, slip modified</td>
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<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 12R01</td>
<td>Easy flow, slip modified</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 8F01</td>
<td>Standard flow, PTFE modified</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 8F02</td>
<td>Standard flow, PTFE modified</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 24F01</td>
<td>Very easy flow, PTFE modified</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>Laser marking</td>
<td>Black with white marking</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 8U05</td>
<td>Standard flow, fluoresces under UV light</td>
</tr>
</tbody>
</table>

### Celanex® MT™ and Celanex® thermoplastic polyester (PBT)
- Ideal sliding and wear behavior
- High dimensional stability
- Good chemical resistance to polar and non-polar solvents
- Gamma-resistance up to 50kGy

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Typical Medical Applications</th>
<th>Grade</th>
<th>Description</th>
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<td>Drug delivery systems</td>
<td>2402 MT</td>
<td>Easy flow unfilled</td>
</tr>
<tr>
<td></td>
<td>Drug delivery systems</td>
<td>2404 MT</td>
<td>Easy flow, PTFE modified</td>
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<tr>
<td></td>
<td>Drug delivery systems</td>
<td>240S MT</td>
<td>Easy flow, slip modified</td>
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<td>Drug delivery systems</td>
<td>Laser marking</td>
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<tr>
<td></td>
<td>Drug delivery systems</td>
<td>MT 8U05</td>
<td>Standard flow, fluoresces under UV light</td>
</tr>
</tbody>
</table>

### GUR® ultra-high molecular weight polyethylene (UHMW-PE)
- Extremely high impact strength
- Low coefficient of friction
- Extremely high abrasion resistance
- High strength
- Gamma stable for crosslinking and sterilization

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Typical Medical Applications</th>
<th>Grade</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Acetabular liners for THA</td>
<td>1020</td>
<td>Implant grade</td>
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<td>Acetabular liners for THA</td>
<td>1050</td>
<td>Implant grade</td>
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<td>Acetabular liners for THA</td>
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<td>VHMW PE</td>
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<td>Acetabular liners for THA</td>
<td>1020-E</td>
<td>Implant grade + vitamin E</td>
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<td></td>
<td>Acetabular liners for THA</td>
<td>1050-E</td>
<td>Implant grade + vitamin E</td>
</tr>
</tbody>
</table>

### Fortron® MT™ polyphenylene sulfide (PPS)
- High dimensional stability
- Excellent chemical resistance
- Heat resistance up to 240°C
- Gamma, ETO and Steam Sterilizable
- Suitable for repeat steam sterilization cycles

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Typical Medical Applications</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surgical instrumentation</td>
<td>MT 9140L4</td>
<td>Standard flow, 40% glass fiber filled</td>
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<td></td>
<td>Sterilization trays</td>
<td>MT 9140L6</td>
<td>Easy flow, 40% glass fiber filled</td>
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<td></td>
<td>Metal replacement</td>
<td>MT 920SC4</td>
<td>Unfilled medium viscosity</td>
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<td></td>
<td>Nonwovens used for filtration</td>
<td>MT 9320C0</td>
<td>Unfilled high viscosity</td>
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<td></td>
<td>Nonwovens used for filtration</td>
<td>MT 9203HS</td>
<td>Low viscosity, heat stabilized</td>
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</tbody>
</table>

### Vectra® MT™ liquid crystal polymer (LCP)
- Extremely high rigidity in thin walled designs
- High impact strength
- Very high heat resistance
- Suitable for repeat steam sterilization cycles
- High dimensional stability
- Replication of very fine parts with extremely high precision

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Typical Medical Applications</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Surgical instrumentation</td>
<td>MT 1300</td>
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<tr>
<td></td>
<td>Surgical instrumentation</td>
<td>MT 1310</td>
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<td>Sterilization trays</td>
<td>MT 1345</td>
<td>Mineral filled</td>
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<td>Metal replacement</td>
<td>MT 2310</td>
<td>Very high stiffness</td>
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<td>Pharmaceutical packaging</td>
<td>MT 4310</td>
<td>Easy flow + glass fiber</td>
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<td></td>
<td>Complete air and moisture barriers</td>
<td>MT 4350</td>
<td>Easy flow with mineral filler</td>
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<td></td>
<td>Integrated 3D circuits</td>
<td>MT 1335</td>
<td>Glass fiber + PTFE</td>
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</table>

### Riteflex® thermoplastic polyester elastomer (TPC-ET)
- Flexibility with high impact strength
- High toughness and rebound resistance
- Wide range of durometers
- Chemical resistance
- Advanced wound care
- Extruded catheter tubing
- Surgical gowns, drapes and bedding
- Surgical instrumentation

<table>
<thead>
<tr>
<th>Material Description</th>
<th>Typical Medical Applications</th>
<th>Grade</th>
<th>Description</th>
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<td>Advanced wound care</td>
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<td>High performance TPE-E</td>
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<td>Advanced wound care</td>
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<td>Film grades</td>
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<tr>
<td></td>
<td>Advanced wound care</td>
<td>Compounded</td>
<td>Specialty grades(custom materials)</td>
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We Invite You to Contact Us to Discuss Your Material Requirements.
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Celanese Engineered Materials for Medical Applications

**Key Features**
- Chemical resistance
- Wide range of durometers
  - High toughness and rebound resistance
  - Flexibility with high impact strength
- High precision
- High impact strength
- Sterilization cycles (Gamma, EtO, and Steam Sterilizable)
- Heat resistance up to 240°C
- High dimensional stability
- Fortron® MT® polyphenylene sulfide (PPS) and sterilization
- High strength
- Extremely high abrasion resistance
- Wear behavior
- Spring properties
- Steam sterilization cycles
- Excellent impact resistance
- High chemical resistance
- Thermally stable
- Hostaform® MT® and Hostaform® acetal copolymer (POM)
- Material Description
- Surgical instrumentation
- Surgical gowns, drapes, and bedding
- Advanced wound care
- Integrated 3D circuits
- Complete air and moisture barriers
- Surgical instrumentation
- Nonwovens used for filtration
- Sterilization trays
- Endoprosthetics
- Bearing components for shoulder
- Tibial inserts for TKA
- Sliding mechanisms
- Tribological systems
- Metal gear replacement
- Drug delivery systems
- Orthopedic trial sizers
- Machining
- Special Applications

**Material Description**
- MT 9140L4 Standard flow, 40% glass fiber filled
- 2401 MT Standard flow unfilled
- 8xx series
  - MT 4350
  - MT 4310
  - MT 2310
  - MT 1310
- 1050-E
- 1020-E
- 8110
- Laser marking
- MT 24F01
- MT 8F02
- MT 8F01
- MT 12R01
- MT 8R02
- MT 24U01
- MT 12U03
- White with black marking
- Typical Medical Applications Grade Description
- Easy flow with mineral filler
- Glass fiber filled
- Standard flow, slip modified
- Glass fiber filled
- Easy flow, slip modified
- VHMW PE
- Mineral filled
- Implant grade + vitamin E
- Standard flow, fluoresces under UV light

**Table of Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>MT 9205C4</th>
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<td>Special Applications</td>
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</tbody>
</table>
Celanese collaborates with OEMs, design engineers, medical design houses and other medical professionals to help solve difficult design and development challenges. We can function as an extension of your own development team to help bring your ideas to market with speed and confidence. Celanese brings decades of industry experience and extensive application development and testing resources to provide you with groundbreaking advanced polymer technologies with unmatched support.
**Full Regulatory Support**

Celanese understands the increasing regulatory demands found throughout the global medical market and can help provide solutions that comply with all necessary requirements. Our regulatory support is designed to provide you with what is needed to comply with the required regulatory demands and thereby shorten your time to market. Our available MT® polymers include:

- US FDA Drug and Device Master Files
- USP Class VI Certifications
- ISO 10993 Biocompatibility
- Food Contact Compliance US/EU
- RoHS
- Free of additives derived from animal sources
- Latex free
- Phthalate free (REACH compliant)

**Stable, Secure Supply Commitment**

The medical industry demands long-term security of supply and Celanese delivers. We are committed to long-term supply and security of supply with advanced change notification and change management processes.

**Benefits include:**

- Stringent process controls with quality-centric focus
- Anti-counterfeiting technologies available
- “No change” formulations available

**Advanced Medical Polymers for the Life of Your Program**

Please contact our segment industry experts. We can help make material recommendations to overcome obstacles with polymer solutions for all industry segments:

- Implants
- Drug delivery
  - Injection
  - Inhalers
    - Dry powder
    - Metered dose
- Instruments and devices
- Catheters and tubing
- Caps, closures and packaging

**Global Availability with Local Support**

Contact us now – and we’ll help with your medical innovations and products

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**Europe**

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Engineered Materials

- Celanex® thermoplastic polyester (PBT)
- Hostaform® and Celcon® acetal copolymer (POM)
- Celstran® Compel® and Factor® long fiber reinforced thermoplastic (LFRT)
- Celstran® continuous fiber reinforced thermoplastic (CFR-TP)
- Fortron® polyphenylene sulfide (PPS)
- GUR® ultra-high molecular weight polyethylene (UHMW-PE)
- Impet® thermoplastic polyester (PET)
- Riteflex® thermoplastic polyester elastomer (TPC-ET)
- Thermx® polycyclohexylene-dimethylene terephthalate (PCT)
- Vandar® thermoplastic polyester alloy (PBT)
- Vectra® and Zenite® liquid crystal polymer (LCP)

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