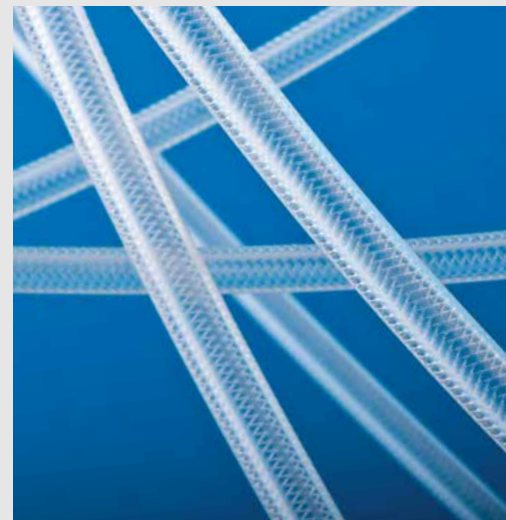


QUADRA™ FAMILY OF MEDICAL POLYURETHANES



POLYMER SOLUTIONS FOR THE HEALTHCARE MARKET

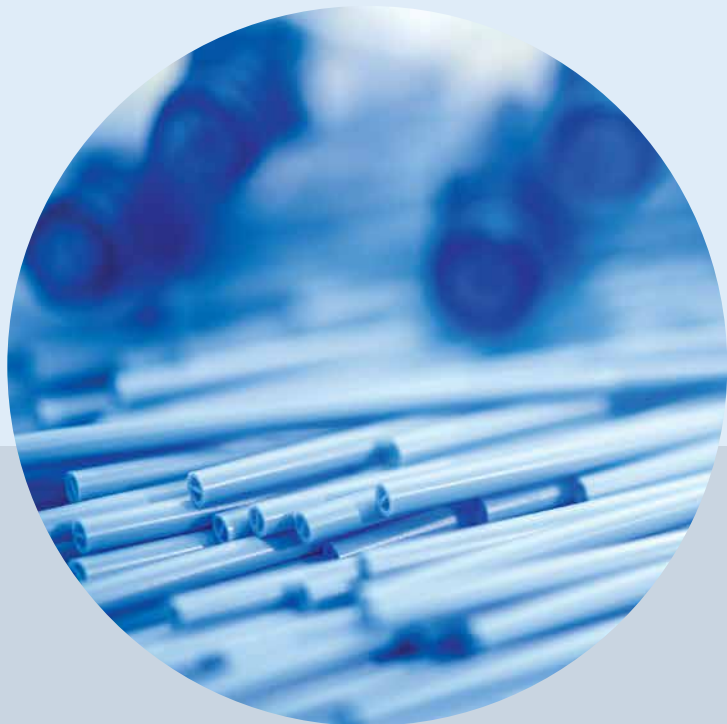


BIOMERICS



Biomerics is an innovative, polymer solution provider to the medical device and biotech industries. We specialize in biomaterials, compounding, extrusions, injection molding, coating, and medical device assembly for many of the world's leading medical device corporations. We partner with our customers to increase their profitability through material technology, operational excellence, and premier, market based customer service.

Headquartered in Salt Lake City, Utah, Biomerics has been a trusted OEM contract manufacturer for over 20 years. Our proprietary biomaterials are specified by global device manufacturers for their superior performance and quality.



Applications

Biomerics' family of medical, thermoplastic urethanes are used in a variety of medical device applications. They are specifically engineered to meet the demanding quality and biocompatibility requirements of the medical device market and are ISO-10993 and USP Class VI compliant. Common applications include:

Vascular Access

- Peripheral Catheters (PIV, Midline, Art)
- Central Catheters (PICC, CVC)
- Procedural Devices (Dilators, Introducers)
- Ports
- Hemodialysis Catheters
- Neurovascular Catheters
- IV Sets

Interventional Radiology

- Fluid Management
- Imaging and Diagnostic Catheters
- Drainage Catheters
- Thrombectomy Catheters
- Atherectomy Catheters
- Occlusion Catheters
- Balloon Catheters
- Delivery Catheters
- Steerable Catheters

Interventional Cardiology

- Pacemaker Leads
- Pacemaker Heads
- Ventricle Assist Devices
- Delivery Systems
- Implantable Materials
- Transapical and Transeptal Access
- EP Catheters

Gastroenterology Devices

- Feeding Catheters
- Urology Catheters
- MIS Tools
- Delivery and Access Catheters







Others

- Wound Care
- Oral Care
- Orthopedics
- Medical Supplies
- Coatings

Quality Commitment

Biomerics strives to manufacture products that meet or exceed our customers' expectations. As a team, we continually improve our processes and products, providing superior service to our customers. Biomerics materials are manufactured in a ISO-13485 and FDA registered facility under a robust quality management system.



	<p>Quadrathane™ </p>	<p>Quadrathane™ is a family of polycarbonate-based, thermoplastic polyurethanes offering superior biocompatibility, chemical resistance, and oxidative stability for use in long term body contact applications. Quadrathane is available in both aliphatic (ALC) and aromatic (ARC) chemistries and is biocompatible, hemocompatible, and biostable. It is USP Class IV and ISO-10993 compliant and is used across a wide range of medical applications.</p>
	<p>Quadraflex™ </p>	<p>Quadraflex™ is a family of polyether-based, medical grade thermoplastic urethanes and is available in both aliphatic and aromatic chemistries. These medical grade polymers exhibit excellent mechanical properties, elasticity, biocompatibility, and softening at body temperature. Quadraflex is the most common medical grade urethane family and can be used across a range of medical markets including venous access, urology, cardiology, hemodialysis, respiratory, and minimally invasive surgical devices. It is USP Class IV and ISO-10993 compliant.</p>
	<p>Quadrasil™ </p>	<p>Quadrasil™ is a family of co-polymer, thermoplastic, silicone polyurethanes that exhibit the properties of both urethane and silicone. Included in this family of materials are the Elast-Eon™ and ECSil™ line of long-term implantable biomedical polymers. These materials are ideal for use in implantable medical devices such as cardiac pacing leads, neuromodulation leads, orthopedics, stent coating, and interventional cardiac devices.</p>
	<p>Quadraplast™ </p>	<p>Quadraplast™ is a family of aromatic, rigid, thermoplastic polyurethanes that are designed for injection molded, biostable applications such as connectors, fittings, luers, and hubs. Quadraplast offers a unique combination of toughness, dimensional stability, biocompatibility, and chemical resistance. Quadraplast is typically used to replace nylon and polycarbonate based engineered plastics where coloring or stress cracking may be an issue.</p>
	<p>Quadraban™ </p>	<p>Quadraban is a group of material technologies designed to incorporate antimicrobial technologies into medical devices via polymerization, imbibing, compounding, and coating.</p>
	<p>Quadraphilic™ </p>	<p>Quadraphilic is a group of aliphatic, hydrophilic, thermoplastic polyurethanes designed to absorb water or provide lubricity. These materials are available in both elastomers pellets and coating solutions for use in spray or dip coating processes. These materials can be engineered to absorb water from 5% to 400% of the dry urethane weight and offer unique elution or lubricity performance.</p>

QUADRA™ Product Selection Guide



Quadrathane™

Quadraflex™

Quadrasil™

Product Family	ALC	ARC	ALE	ARE	ARS
Chemistry	Aliphatic Polycarbonate TPU	Aromatic Polycarbonate TPU	Aliphatic Polyether TPU	Aromatic Polyether TPU	Aromatic Polycarbonate Silicone TPU
Typical Medical Application	Indwelling Catheters, Ports, Dialysis Catheters, Drainage Catheters	Long-term Implants, Orthopedics, Indwelling Catheters, Ports, Dialysis Catheters, Chemical Resistance Applications	Vascular Access Devices, Fluid Management Applications, IV Sets, Wound Care, Balloons, Interventional Radiology Catheters, CVC, PICCS	Fluid Management Applications, Introducers, Lower End Vascular Access, Molded Components	Long-term Implants, Orthopedics, Indwelling Catheters, Ports, Dialysis Catheters, Chemical Resistance Applications
Durometer Range	70A - 72D	70A - 80D	65A - 72D	80A - 72D	75A - 80A
Radiopacifiers	Barium Sulfate, Bismuth Salts, Tungsten	Barium Sulfate, Bismuth Salts, Tungsten	Barium Sulfate, Bismuth Salts, Tungsten	Barium Sulfate, Bismuth Salts, Tungsten	Barium Sulfate, Bismuth Salts, Tungsten
Yellowing (UV exposure)	No	Yes	No	Yes	Yes
Body Softening	Good	Limited	Excellent	Limited	Limited
Custom Colors	Yes	Yes	Yes	Yes	Yes
Solution Grades Available	Yes	Yes	Yes	Yes	Yes
Hydrogel Grades Available	No	No	No	No	No
Extrusion and Molding Grades	Both	Both	Both	Both	Both
Biostability	Good	Excellent	Good	Good	Excellent
Biocompatibility	Excellent	Excellent	Excellent	Good	Excellent
Hemocompatibility	Excellent	Excellent	Excellent	Excellent	Excellent
Chemical Resistance	Better	Excellent	Good	Good	Excellent
Strength	Good	Excellent	Good	Excellent	Good
Flexibility	Good	Good	Good	Good	Good
Resiliency	Good	Good	Good	Good	Good

Visit biomerics.com for Technical Data Sheets, Sterilization, Biocompatibility, and Chemical Compatibility

Quadrplast™ **Quadraphilic™**

Elast-Eon	ECSiL	Rigid AR	ALE
Siloxane Segmented TPU	Carbonate Silicon	Aromatic Rigid TPU	Aliphatic Ether Based
Long-term Implants, Heart Wall Graft, Pacemaker Leads, Ventricular Assist Device Neuromodulation Leads Implantable Balloons	Long-Term Implant: Blood Glucose Monitoring, Finger Joint, General Orthopedic, Stent Coating	Luers, Connectors, Junctions, Fluid Management Components	Custom Extrusion, Solution Grades, Hydrophilic Coatings, Lubricious Coatings
84A - 78D	75A - 80A	82D	Custom grades, 70A - 60D
Barium Sulfate, Bismuth Salts, Tungsten	Barium Sulfate, Bismuth Salts, Tungsten	No	Barium Sulfate, Bismuth Salts, Tungsten
Yes	Yes	Yes	No
Limited	Limited	No	Excellent
Yes	Yes	Yes	Limited by Grade
Yes	Yes	No	Yes
No	No	No	Yes
Both	Both	Molding Only	Extrusion Only
Excellent	Excellent	Good	Good
Excellent	Excellent	Good	Good
Excellent	Excellent	Good	Good
Excellent	Excellent	Better	Varies by Grade
Excellent	Excellent	Good	Dry - Good Wet - Fair
Excellent	Excellent	None	Varies by Grade
Excellent	Excellent	Good	Varies by Grade

Biomerics Provides Customized Polymerization

Biomerics specializes in the development of custom grades to solve unique application requirements. Our specialized understanding of polymerization, colorants, radiopacifiers, lubricants, antimicrobials, and stabilizers enables us to tailor these products for a given application. Our chemists have partnered with our customers to introduce solutions for demanding applications such as implantable catheters, coatings, balloons, and blood contact applications.

Our product portfolio is engineered to provide the following unique performance benefits for medical applications:

- Antimicrobial Grades**
- Body Softening Materials**
- Chemical Resistance Grades**
- Clarity**
- Color**
- Excellent Mechanical Properties**
- High Purity Grades**
- Improved Anti-restenosis Grades**
- Lubricity**
- Oxidative Stability**
- Processability**
- Radiopacity**
- Solubility**
- Superior Biocompatibility**

Who We Are

Biomerics, LLC is headquartered in Salt Lake City, Utah, and is a leading and innovative medical, polymer solution provider to the medical device market. Biomerics specializes in biomedical materials, compounding, injection molding, extrusion, and medical device fabrication. Biomerics partners with our customers to increase their profitability through material technology, operational excellence, and market based customer service.

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