

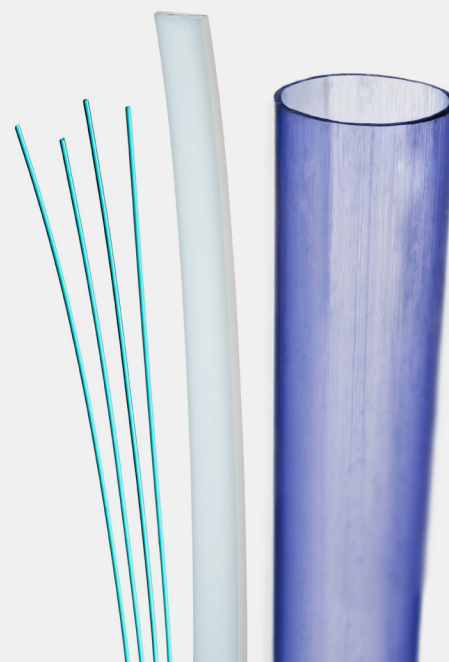
Bioabsorbable Polymers

PLLA, PGA, PCL, PDO, PLGA, PLC, PLDLLA, PDLGA

Overview-

First introduced in the 1970s, the use of bioabsorbable polymers in the medical device industry has grown in popularity over the years, particularly for applications seeking to provide an alternative to metal stents and other components. A key advantage of bioabsorbable polymers is their ability to be absorbed by the body over time, eliminating the need for permanent device implantation, or for surgical removal at a later date. The absorption profile, defined by the mechanical integrity loss profile and the mass loss profile, as well as other properties, such as strength and rigidity, can be customized by varying the compositions of the polymer chains, allowing for highly tailored treatment options.

Zeus works with a number of bioabsorbable homopolymers including poly(L-lactide) (PLLA), poly(glycolide) (PGA), poly(ϵ -caprolactone) (PCL), and polydioxanone (PDO), as well as copolymers such as poly(L-lactide-co-glycolide) (PLGA), poly(L-lactide-co-caprolactone) (PLC), poly(L-lactide-co-DL-lactide) (PLDLLA), and poly(D,L-lactide-co-glycolide) (PDLGA). Our ability to select and blend the above materials coupled with our processing capabilities, allow us to produce high precision tubular geometries, monofilaments, special profiles, and ribbons for use in a number of clinical applications across multiple disciplines including coronary and peripheral vascular intervention, structural heart intervention, drug delivery, brachytherapy, gastroenterology, and otolaryngology (ENT).



Absorv™ products can be extruded from a number of bioabsorbable polymers.

APPLICATIONS

- Bioabsorbable stents
- Coronary vascular scaffolds
- Peripheral vascular scaffolds
- Structural heart occluders
- Brachytherapy strands and spacers
- Cosmetic face lift fibers
- Gastrointestinal devices with fibers
- Ocular drug delivery
- Dental Barrier

AVAILABLE PRODUCTS

- Absorv™ Tubing
- Absorv™ Oriented Tubing
- Absorv™ Monofilament
- Absorv™ Drawn Fiber
- Absorv™ Ribbon

KEY PROPERTIES

- Bioabsorbable
- Tailored absorption profiles (1-36 months)
- Ability to tailor mechanical properties
- Materials used in FDA-approved devices



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The information presented in this publication is believed to be accurate and is not intended to constitute a specification. Property characteristics are dramatically impacted by geometry and processing method, thus properties of extruded parts may vary. In some instances, data may not be available for publication and will be notated as "na" where applicable.

These tables are meant to serve as a general guideline only. For some polymers, varying levels of molecular orientation and crystallinity may result in a significant deviation from these values. Users should evaluate the material to determine suitability for their own particular application.

MECHANICAL	ASTM	PDLGA (50DL/50G)	PLGA (10L/90G)	PGA	PDO	PLDLLA (80L/20DL)
Total Mass Loss (months)		1 - 2	3 - 4	4 - 6	5 - 9	12 - 18
Modulus of Elasticity (GPa)	ASTM D638 / ISO 527	2.0 - 4.0	3.0 - 6.0	6.0 - 7.0	0.4 - 1.0	2.0 - 4.0
Ultimate Tensile Strength (MPa)	ASTM D638 / ISO 527	45	45	95	65	50
THERMAL	ASTM	PDLGA (50DL/50G)	PLGA (10L/90G)	PGA	PDO	PLDLLA (80L/20DL)
Melt Temp (°C)	ASTM D3418	Amorphous	200 - 210	215 - 225	100 - 110	115 - 130
Glass Transition Temp (°C)	ASTM D3418	45	42	40	-10	60

MECHANICAL	ASTM	PLGA (82L/18G)	PLGA (85L/15G)	PLC (95L/5C)	PLLA	PCL
Total Mass Loss (months)		12 - 20	16 - 24	18 - 30	18 - 36	24 - 36
Modulus of Elasticity (GPa)	ASTM D638 / ISO 527	2.0 - 4.0	2.0 - 4.0	2.0 - 4.0	3.0 - 4.0	0.2 - 0.4
Ultimate Tensile Strength (MPa)	ASTM D638 / ISO 527	60	60	60	65	25
THERMAL	ASTM	PLGA (82L/18G)	PLGA (85L/15G)	PLC (95L/5C)	PLLA	PCL
Melt Temp (°C)	ASTM D3418	135 - 145	140 - 150	160 - 180	180 - 190	55 - 65
Glass Transition Temp (°C)	ASTM D3418	50	55	55	60	-60