Polysciences
Chemistry beyond the ordinary

# BIODEGRADABLE POLYMERS

## A Sustainable Future for Research Applications

INFO@POLYSCIENCES.COM

## *WHO WE ARE*

### History
Polysciences has been a manufacturer of specialty chemicals for more than 60 years, beginning with stains and resins for biological electron microscopy, and continuing through our current industry leadership in the synthesis of fine chemicals.

### Commitment
We strive to deliver innovative solutions and provide our customers with the highest quality products and services.

### Capabilities
With our dedicated resources and advanced capabilities, we work to deliver solutions for the evolving needs of our core markets. Polysciences' primary campus in Warrington, PA is home to dedicated facilities designed to support projects from development through successful scale-up, validation, and commercialization. We also offer flexible packaging configurations to accommodate your needs and applications, from milligrams to kilograms.

## *WHAT WE DO*

### Lab Products
A diverse portfolio of life sciences and materials science products, offering an array of products tailored for histology workflow and diagnostic applications, as well as specialized starting materials and reagents in materials science research.

### Medical Device Coatings & Precursors
Monomers and polymers used in the development of a variety of medical device coatings and intraocular lenses.

### Electronic Chemicals
High-performance adhesives, coatings, and encapsulants used in electronic components for highly technical fields and applications, including medical devices, aerospace, alternative energy, optoelectronics and sensors.

### Transfection Reagents
Cationic and lipid-based cellular transfection reagents for the development of vaccines and biotherapeutics including therapeutic proteins and gene therapies.

### Microspheres & Particles
Polymer, silica, fluorescent, and magnetic microparticles used in assay development and for the calibration of laboratory instrumentation and diagnostic platforms.

## *A GREENER FUTURE STARTS HERE*

Embark upon a realm of innovation and sustainability with biodegradable polymers, a groundbreaking class of materials designed to revolutionize industries while minimizing environmental impact. These biodegradable polymers, derived from renewable sources such as plant starches, are synthesized to be eco-sensitive and exhibit the remarkable ability to naturally degrade over time. Beyond their ecological benefits, biodegradable polymers find application in diverse fields, ranging from packaging solutions that reduce single-use plastic waste to biomedical materials that facilitate controlled drug release.

Our goal is to unlock the potential for a more sustainable future, where cutting-edge technology harmonizes with environmental responsibility. We invite you to join this journey into a world where innovation meets eco-consciousness, and the applications of biodegradable polymers pave the way for a greener and more sustainable tomorrow. We offer a comprehensive catalog of high-quality biodegradable polymers for research applications:

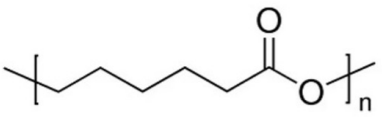
- **Medical Implants & Devices**
- **Dental Materials**
- **Drug Encapsulation & Delivery**
- **Tissue Engineering**
- **Biodegradable Sutures**
- **Hydrogel Engineering**
- **Orthopedic Devices**
- **Prosthetics**
- **Cosmetics**
- **Sanitation Products**
- **Specialty Coatings**
- **Nanosystems**

# BIODEGRADABLE POLYMERS

## *Where Innovation Meets Environmental Sustainability*

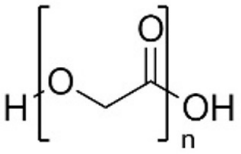
Biodegradable polymers or bioplastics are a revolutionary class of materials designed to address the growing concerns of traditional polymers' impact on our planet. Unlike conventional plastics that persist for centuries, biodegradable polymers are engineered to break down naturally, reducing their environmental footprint.

As we seek more socially responsible and environmentally conscious solutions, biodegradable polymers stand at the forefront of a green revolution in materials science. Below showcases our biodegradable polymer portfolio and its common application.



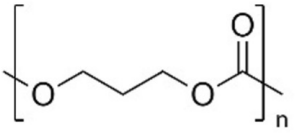

### Polycaprolactone (PCL)

Polycaprolactone is a semi-crystalline, hydrophobic, biodegradable polyester noted for its ease of processing with melting point and glass transition temperature at~60°C. We offer various grades of PLC, as well as powder form.



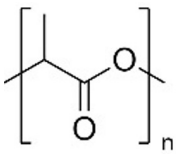

### Polyglycolide (PGA)

Polyglycolide is an aliphatic polyester with moderate to high crystallinity and is frequently used for its mechanical strength properties. The degradation rate of PGA is higher than most other biodegradable polymers.



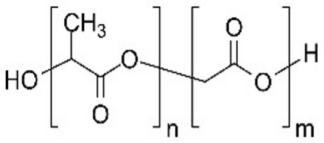

### Poly(trimethylene carbonate) (PTMC)

Poly (trimethylene carbonate) is a highly amorphous, aliphatic polycarbonate with a higher degree of flexibility and greater resistance to hydrolytic degradation.



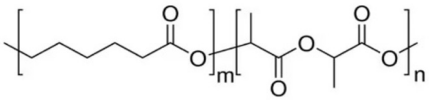

### Poly(L-lactide) and Poly(DL-lactide) (PLA, PLLA, PDLLA)

Poly (Lactic acid) and its stereoisomers are well-researched and utilized polymers known for their strong mechanical properties such as tensile strength, stiffness, and impact resistance. PLA are known for slower degradation rates often on the order of several years which makes them useful for longer term applications.




### Poly(lactide-co-glycolide) (PLGA)

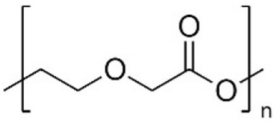
Poly (lactide-co-glycolide) combines the favorable mechanical properties of PGA and PLA with the longer degradation time of PLA. Increasing the ratio of PGA to PLA will increase the rate of biodegradation.




### Poly(Caprolactone-co-L-lactide)

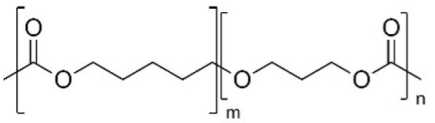
Poly (Caprolactone-co-L-lactide) offers greater mechanical strength properties compared to PCL homopolymer alone. Additionally, the biodegradation rate will increase with an increasing ratio of PLA.

# *Biodegradable Polymers*



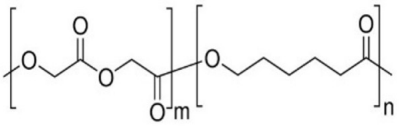
## Polydioxanone (PDO)

Polydioxanone is a polylactone ester with high degrees of crystallinity known for its strong safety profile and high elongation at break and flexural strength properties.



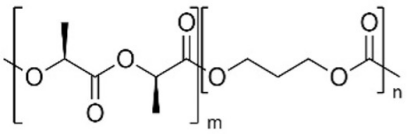
## Poly(trimethylene carbonate-co-caprolactone)

Poly (trimethylene carbonate-co-caprolactone) is a copolymer that blends the elasticity of PTMC with the ease of processing of PCL, offering versatile mechanical properties.



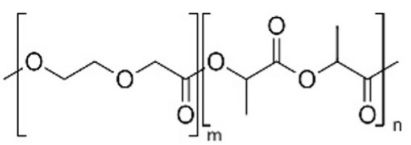
## Poly(Caprolactone-co-glycolide)

Poly (Caprolactone-co-glycolide) combines the flexibility of PCL with the mechanical strength of PGA. Increasing the ratio of PGA will increase the structural stiffness and rate of biodegradation.



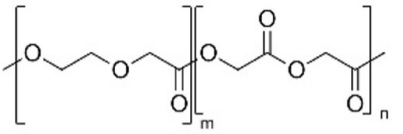
## Poly(trimethylene carbonate-co-L-lactide)

Poly (trimethylene carbonate-co-L-lactide) combines the elasticity of PTMC with the tensile strength and stiffness of PLA, yielding a strong yet flexible polymer with a longer degradation time than PTMC alone.



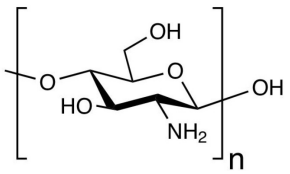
## Poly(Dioxanone-co-lactide)

Poly(Dioxanone-co-lactide) combines the flexural strength and high elongation at the break of PDO with the tensile strength, impact resistance, and stiffness of PLA. The addition of PLA also imparts a longer degradation profile than PDO alone.



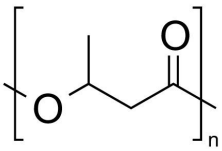
## Poly(Dioxanone-co-glycolide)

Poly(Dioxanone-co-glycolide) blends the flexibility of PDO with the mechanical strength and faster degradation of PGA. A higher ratio of PGA will enable greater stiffness and load-bearing ability.



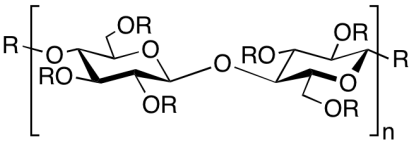
## Chitosan

Chitosan, poly(D-glucosamine), is a highly pure multifunctional cationic polymer prepared by deacetylation of chitin. It is odorless and colorless with a minimum degree of deacetylation of 85%. It has an excellent non-cytotoxicity profile, biodegradability, biocompatibility, non-allergenicity, mucoadhesive property, and ease of modification.



## Polyhydroxybutyrates (PHBs)

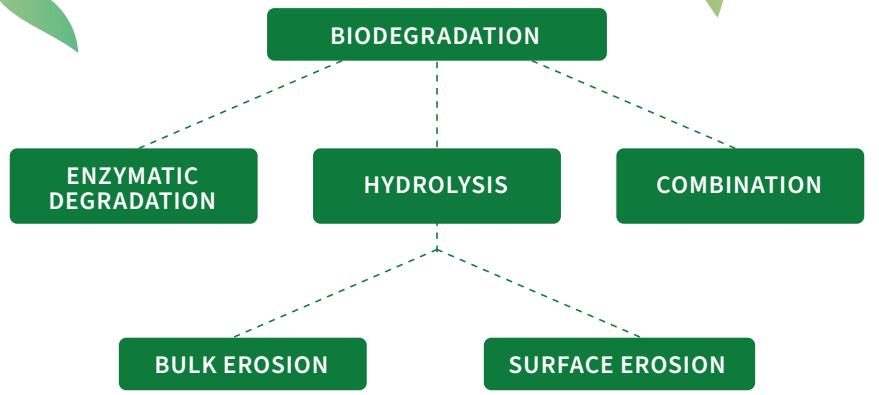
Polyhydroxybutyrates are a type of polyhydroxyalkanoate (PHA) and are of natural origins via microbial fermentation. The biodegradable and non-toxic degradation products of PHBs make them useful for many medical applications, including drug release, bone regeneration, and nerve guidance.



## Cellulose

Cellulose and its functionalized derivatives are found in numerous natural origins such as plant cell walls and are composed of a glucose backbone. It naturally undergoes biodegradation, most commonly via microbial degradation. They are environmentally friendly and used in eco-friendly products like packaging and textiles. They also find frequent use as binders and thickening agents.

# BIODEGRADATION OVERVIEW




## *Enzymatic Degradation*

Enzymatic degradation stands as another common mechanism in the life cycle of biodegradable polymers, contributing to their eco-friendly nature. In this process, specialized enzymes catalyze the breakdown of polymer chains into smaller and digestible fragments. Microorganisms produce enzymes tailored to break down specific types of polymers, allowing for the efficient assimilation of the degraded material into the surrounding ecosystem. This mechanism ensures that biodegradable polymers can be metabolized by nature.

## *Hydrolysis*

Hydrolysis is a fundamental degradation mechanism for biodegradable polymers, involving the chemical breakdown of polymer chains through water-induced reactions. In this process, water infiltrates the polymer matrix, catalyzing the cleavage of polymer chains and leading to the formation of smaller fragments. Particularly crucial for polymers derived from natural sources or engineered to be water-sensitive, hydrolysis renders these materials more susceptible to microbial digestion and eventual assimilation into the environment. This environmentally friendly degradation pathway underscores the significance of hydrolysis in enhancing the sustainability of biodegradable polymers as eco-conscious alternatives to traditional plastics, aligning with the global push for greener materials.

### Bulk Erosion

Bulk erosion typically occurs when water penetrates the polymer structure, enabling hydrolysis and therefore reduction of molecular weight and mechanical properties. Autocatalysis may happen if the degradation products don't diffuse out of the interior structure, further weakening the overall structure.

### Surface Erosion

Surface erosion primarily occurs at the outer surface of the polymer structure, leading to a gradual reduction in material thickness over time. Since the breakdown occurs on surface layers, the resulting degradation products disperse away from the structure, which prevents autocatalytic degradation. The rate of surface erosion is typically proportional to the surface area of the polymer structure.

# PRODUCT OFFERINGS

| ITEM CODE | ITEM DESCRIPTION | INHERENT VISCOSITY (dL/g) | APPROX. MOLECULAR WEIGHT (Da) | APPROX. DEGRADATION TIMEFRAME [1-3] | DEGRADATION MECHANISM | Tm (°C) | Tg (°C) |
|---|---|---|---|---|---|---|---|
| 04687 | Cellulose, cyanoethyl ether | - | 100,000 | - | Enzymatic, Hydrolysis | - | - |
| 05570 | Cellulose, hydroxyethyl ether (MW ~90,000) | - | 90,000 | - | Enzymatic, Hydrolysis | - | - |
| 05569 | Cellulose, hydroxyethyl ether (MW 720,000) | - | 720,000 | - | Enzymatic, Hydrolysis | - | - |
| 05568 | Cellulose, hydroxyethyl ether (MW 1,000,000) | - | 1,000,000 | - | Enzymatic, Hydrolysis | - | - |
| 25727 | Hydroxypropyl Cellulose [3-6 cP] | - | - | - | Enzymatic, Hydrolysis | - | - |
| 25728 | Hydroxypropyl Cellulose [6-10 cP] | - | - | - | Enzymatic, Hydrolysis | - | - |
| 25729 | Hydroxypropyl Cellulose [150-400 cP] | - | - | - | Enzymatic, Hydrolysis | - | - |
| 25730 | Hydroxypropyl Cellulose [1,000-4,000 cP] | - | - | - | Enzymatic, Hydrolysis | - | - |
| 21275 | Cellulose, methyl hydroxyethyl ether | - | - | - | Enzymatic, Hydrolysis | - | - |
| 21161 | Chitosan, Purified Powder MW ~15,000 | - | 15,000 | - | Enzymatic, Hydrolysis | - | - |
| 25010 | PCL(1,000)-b-PEG(1,000), Diblock Polymer | - | 2,000 | - | Enzymatic, Hydrolysis | - | - |
| 25011 | PCL(1,000)-b-PEG(2,000), Diblock Polymer | - | 3,000 | - | Enzymatic, Hydrolysis | - | - |
| 25012 | PCL(1,000)-b-PEG(5,000), Diblock Polymer | - | 6,000 | - | Enzymatic, Hydrolysis | - | - |
| 25022 | PCL(5,000)-b-PEG(1,000), Diblock Polymer | - | 6,000 | - | Enzymatic, Hydrolysis | - | - |
| 25023 | PCL(5,000)-b-PEG(2,000), Diblock Polymer | - | 7,000 | - | Enzymatic, Hydrolysis | - | - |
| 25024 | PCL(5,000)-b-PEG(5,000), Diblock Polymer | - | 10,000 | - | Enzymatic, Hydrolysis | - | - |
| 25019 | PCL(1,000)-b-PEG(1,000)-b-PCL(1,000), Triblock Polymer | - | 3,000 | - | Enzymatic, Hydrolysis | - | - |
| 25020 | PCL(1,000)-b-PEG(2,000)-b-PCL(1,000), Triblock Polymer | - | 4,000 | - | Enzymatic, Hydrolysis | - | - |
| 25021 | PCL(1,000)-b-PEG(6,000)-b-PCL(1,000), Triblock Polymer | - | 8,000 | - | Enzymatic, Hydrolysis | - | - |
| 25013 | PCL(1,000)-b-PEG(10,000)-b-PCL(1,000), Triblock Polymer | - | 12,000 | - | Enzymatic, Hydrolysis | - | - |
| 25014 | PCL(5,000)-b-PEG(1,000)-b-PCL(5,000), Triblock Polymer | - | 11,000 | - | Enzymatic, Hydrolysis | - | - |
| 25015 | PCL(5,000)-b-PEG(2,000)-b-PCL(5,000), Triblock Polymer | - | 12,000 | - | Enzymatic, Hydrolysis | - | - |
| 25016 | PCL(5,000)-b-PEG(5,000)-b-PCL(5,000), Triblock Polymer | - | 15,000 | - | Enzymatic, Hydrolysis | - | - |
| 25025 | PCL(5,000)-b-PEG(10,000)-b-PCL(5,000), Triblock Polymer | - | 20,000 | - | Enzymatic, Hydrolysis | - | - |
| 24375 | PEG(350)-b-PLA(300), Diblock Polymer | - | 650 | - | Enzymatic, Hydrolysis | - | - |
| 24378 | PEG(1000)-b-PLA(750), Diblock Polymer | - | 1,750 | - | Enzymatic, Hydrolysis | - | - |
| 24381 | PEG(1000)-b-PLA(5000), Diblock Polymer | - | 6,000 | - | Enzymatic, Hydrolysis | - | - |
| 24386 | PEG(5000)-b-PLA(1000), Diblock Polymer | - | 6,000 | - | Enzymatic, Hydrolysis | - | - |
| 24389 | PEG(5000)-b-PLA(5000), Diblock Polymer | - | 7,000 | - | Enzymatic, Hydrolysis | - | - |
| 25018 | PEG(5000)-b-PLA(10,000), Diblock Polymer | - | 15,000 | - | Enzymatic, Hydrolysis | - | - |
| 25017 | PEG(10,000)-b-PLA(5,000), Diblock Polymer | - | 15,000 | - | Enzymatic, Hydrolysis | - | - |
| 24500 | PLA(1000)-b-PEG(1000)-b-PLA(1000), Triblock Polymer | - | 3,000 | - | Enzymatic, Hydrolysis | - | - |
| 24501 | PLA(2000)-b-PEG(1000)-b-PLA(2000), Triblock Polymer | - | 5,000 | - | Enzymatic, Hydrolysis | - | - |
| 24502 | PLA(5000)-b-PEG(1000)-b-PLA(5000), Triblock Polymer | - | 11,000 | - | Enzymatic, Hydrolysis | - | - |
| 24503 | PLA(1000)-b-PEG(4000)-b-PLA(1000), Triblock Polymer | - | 11,000 | - | Enzymatic, Hydrolysis | - | - |
| 24509 | PLA(1000)-b-PEG(10,000)-b-PLA(1000), Triblock Polymer | - | 12,000 | - | Enzymatic, Hydrolysis | - | - |
| 25026 | PLA(5,000)-b-PEG(10,000)-b-PLA(5,000), Triblock Polymer | - | 20,000 | - | Enzymatic, Hydrolysis | - | - |
| 25027 | PLA(10,000)-b-PEG(10,000)-b-PLA(10,000), Triblock Polymer | - | 30,000 | - | Enzymatic, Hydrolysis | - | - |
| 26287 | Polycaprolactone, MW 25000 (Technical Grade) | - | 25,000 | 1 - 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 26288 | Polycaprolactone, MW 37000 (Technical Grade) | - | 37,000 | 1 - 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 19561 | Polycaprolactone, MW 43000 (Technical Grade) | - | 43,000 | 1 - 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |

| ITEM CODE | ITEM DESCRIPTION | INHERENT VISCOSITY (dL/g) | APPROX. MOLECULAR WEIGHT (Da) | APPROX. DEGRADATION TIMEFRAME [1-3] | DEGRADATION MECHANISM | Tm (°C) | Tg (°C) |
|---|---|---|---|---|---|---|---|
| 26289 | Polycaprolactone, MW 50000 (Technical Grade) | - | 50,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 26290 | Polycaprolactone, MW 80000 (Technical Grade) | - | 80,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50001 | Polycaprolactone, IV 0.2 dL/g | 0.1 - 0.3 | 10,000 | 6 - 12 months | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50002 | Polycaprolactone, IV 0.4 dL/g | 0.3 - 0.6 | 25,000 | 1 - 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50003 | Polycaprolactone, IV 0.8 dL/g | 0.5 - 1.0 | 75,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50004 | Polycaprolactone, IV 1.2 dL/g | 1.0 - 1.4 | 150,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50005 | Polycaprolactone, IV 1.7 dL/g | 1.3 - 1.7 | 250,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50006 | Polycaprolactone, IV 2.0 dL/g | 1.9 - 2.2 | 300,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50007 | Polycaprolactone, IV 2.2 dL/g | 2.1 - 2.3 | 325,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50008 | Polycaprolactone, IV 2.6 dL/g | 2.4 - 3.0 | 350,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50310 | Polycaprolactone, IV 0.2 dL/g, Powder | 0.16 - 0.24 | 15,000 | 6 - 12 months | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50311 | Polycaprolactone, IV 0.6 dL/g, Powder | 0.5 - 0.7 | 50,000 | 1 - 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50312 | Polycaprolactone, IV 1.0 dL/g, Powder | 0.9 - 1.2 | 120,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50313 | Polycaprolactone, IV 1.5 dL/g, Powder | 1.3 - 1.7 | 220,000 | > 2 years | Enzymatic, Hydrolysis | 56 - 72 | -65 - -30 |
| 50009 | Poly(Caprolactone-co-glycolide), 95:5, IV 1.4 dL/g | 1.0 - 2.0 | - | Months to years | Enzymatic, Hydrolysis | 50 - 58 | -60 - -50 |
| 50010 | Poly(Caprolactone-co-glycolide), 90:10, IV 0.8 dL/g | 0.5 - 1.0 | - | Months to years | Enzymatic, Hydrolysis | 50 - 58 | -60 - -50 |
| 50011 | Poly(Caprolactone-co-glycolide), 90:10, IV 1.6 dL/g | 1.2 - 2.0 | - | Months to years | Enzymatic, Hydrolysis | 50 - 58 | -60 - -50 |
| 50012 | Poly(Caprolactone-co-glycolide), 85:15, IV 1.7 dL/g | 1.0 - 1.8 | - | Months to years | Enzymatic, Hydrolysis | 50 - 58 | -60 - -50 |
| 50013 | Poly(Caprolactone-co-glycolide), 85:15, IV 1.8 dL/g | 1.5 - 2.0 | - | Months to years | Enzymatic, Hydrolysis | 50 - 58 | -60 - -50 |
| 50014 | Poly(Caprolactone-co-L-lactide), 95:5, IV 2.1 dL/g | 1.6 - 2.4 | - | Months to years | Enzymatic, Hydrolysis | 35 - 55 | -60 - -50 |
| 50015 | Poly(Caprolactone-co-L-lactide), 90:10, IV 2.0 dL/g | 1.0 - 2.0 | - | Months to years | Enzymatic, Hydrolysis | 35 - 55 | -60 - -50 |
| 50016 | Poly(Caprolactone-co-L-lactide), 85:15, IV 1.8 dL/g | 1.5 - 2.5 | - | Months to years | Enzymatic, Hydrolysis | 35 - 55 | -60 - -50 |
| 50017 | Poly(Caprolactone-co-L-lactide), 85:15, IV 1.6 dL/g | 1.0 - 2.0 | - | Months to years | Enzymatic, Hydrolysis | 35 - 55 | -60 - -50 |
| 50066 | Polydioxanone, IV 1.7 dL/g | 1.0 - 1.8 | 90,000 | < 6 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50067 | Polydioxanone, IV 1.9 dL/g | 1.5 - 2.2 | 100,000 | < 6 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50068 | Polydioxanone, IV 2.5 dL/g | 2.2 - 3.0 | 130,000 | 6 - 12 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50069 | Polydioxanone, dyed, IV 1.6 dL/g | 1.0 - 1.8 | 85,000 | < 6 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50070 | Polydioxanone, dyed, IV 2.0 dL/g | 1.8 - 2.1 | 105,000 | < 6 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50071 | Polydioxanone, dyed, IV 2.2 dL/g | 2.1 - 2.7 | 120,000 | < 6 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50072 | Polydioxanone, dyed, IV 3.1 dL/g | 2.7 - 3.5 | 160,000 | 6 - 12 months | Enzymatic, Hydrolysis | 110 - 120 | -15 - -5 |
| 50073 | Poly(Dioxanone-co-glycolide), 90:10, IV 1.9 dL/g | 1.5 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | 110 - 120 | 0 - 5 |
| 50074 | Poly(Dioxanone-co-glycolide), 90:10, IV 2.1 dL/g | 2.0 - 2.5 | - | Weeks to months | Enzymatic, Hydrolysis | 110 - 120 | 0 - 5 |
| 50075 | Poly(Dioxanone-co-lactide), 95:5, IV 1.9 dL/g | 1.5 - 2.5 | - | 6 - 12 months | Enzymatic, Hydrolysis | 100 - 115 | -5 - 5 |
| 50076 | Poly(Dioxanone-co-lactide), 92:8, IV 1.3 dL/g | 1.0 - 1.5 | - | 7 - 12 months | Enzymatic, Hydrolysis | 100 - 115 | -5 - 5 |
| 50077 | Poly(Dioxanone-co-lactide), 90:10, IV 2.0 dL/g | 1.5 - 2.5 | - | 8 - 12 months | Enzymatic, Hydrolysis | 100 - 115 | -5 - 5 |
| 50078 | Poly(Dioxanone-co-lactide), 85:15, IV 2.1 dL/g | 1.5 - 2.5 | - | 9 - 12 months | Enzymatic, Hydrolysis | 100 - 115 | -5 - 5 |
| 50079 | Poly(Dioxanone-co-lactide-co-glycolide), 90:5:5, IV 2.2 dL/g | 1.5 - 2.5 | - | Months | Enzymatic, Hydrolysis | 95 - 105 | -10 - 0 |
| 22505 | Poly(D,L-lactic acid), IV 0.2 dL/g | 0.1 - 0.3 | 15,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 26267 | Poly(D,L-lactic acid), IV 0.2 dL/g, acid terminated | 0.15 - 0.25 | 15,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 16585 | Poly(D,L-lactic acid), IV 0.4 dL/g | 0.3 - 0.5 | 20,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50050 | Poly(D,L-lactic acid), IV 0.4 dL/g, acid terminated | 0.2 - 0.8 | 20,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |

| ITEM CODE | ITEM DESCRIPTION | INHERENT VISCOSITY (dL/g) | APPROX. MOLECULAR WEIGHT (Da) | APPROX. DEGRADATION TIMEFRAME [1-3] | DEGRADATION MECHANISM | Tm (°C) | Tg (°C) |
|---|---|---|---|---|---|---|---|
| 50051 | Poly(D,L-lactic acid), IV 0.5 dL/g | 0.3 - 0.6 | 30,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50052 | Poly(D,L-lactic acid), IV 0.6 dL/g | 0.6 - 0.8 | 40,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50 053 | Poly(D,L-lactic acid), IV 0.9 dL/g | 0.8 - 1.1 | 60,000 | Months to years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50054 | Poly(D,L-lactic acid), IV 1.2 dL/g | 1.1 - 1.4 | 80,000 | 1 - 2 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50055 | Poly(D,L-lactic acid), IV 1.6 dL/g | 1.4 - 1.8 | 120,000 | 1 - 2 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50065 | Poly(DL-lactide co-Caprolactone), 80:20, IV 2.0 dL/g | 1.0 - 3.0 | - | 1 - 3 years | Enzymatic, Hydrolysis | Amorphous | 0 - 10 |
| 19076 | Poly(D,L-lactide-co-glycolide), 90:10, IV 0.2 dL/g | 0.15 - 0.30 | 10,000 | Months to years | Enzymatic, Hydrolysis | - | 55 - 60 |
| 23989 | Poly(D,L-lactide-co-glycolide), 85:15, IV 0.85 dL/g | 0.75 - 0.85 | 120,000 | Months to years | Enzymatic, Hydrolysis | - | 50 - 55 |
| 19077 | Poly(D,L-lactide-co-glycolide), 80:20, IV 0.2 dL/g | 0.15 - 0.30 | 10,000 | Months to years | Enzymatic, Hydrolysis | - | 50 - 55 |
| 26268 | Poly(D,L-lactide-co-glycolide), 75:25, IV 0.2 dL/g | 0.15 - 0.25 | 10,000 | Months to years | Enzymatic, Hydrolysis | - | 50 - 55 |
| 25107 | Poly(D,L-lactide-co-glycolide), 75:25, IV 0.65 dL/g | 0.55 - 0.85 | 100,000 | Months to years | Enzymatic, Hydrolysis | - | 50 - 55 |
| 19247 | Poly(D,L-lactide-co-glycolide), 70:30, IV 0.2 dL/g | 0.12 - 0.30 | 10,000 | Months to years | Enzymatic, Hydrolysis | - | 50 - 55 |
| 26269 | Poly(D,L-lactide-co-glycolide), 50:50, IV 0.2 dL/g | 0.16 - 0.24 | 10,000 | Weeks to months | Enzymatic, Hydrolysis | - | 45 - 50 |
| 26270 | Poly(D,L-lactide-co-glycolide), 50:50, IV 0.4 dL/g, acid terminated | 0.32 - 0.48 | 30,000 | Weeks to months | Enzymatic, Hydrolysis | - | 45 - 50 |
| 26297 | Poly(D,L-lactide-co-glycolide), 50:50, IV 0.4 dL/g | 0.32 - 0.48 | 30,000 | Weeks to months | Enzymatic, Hydrolysis | - | 45 - 50 |
| 23986 | Poly(D,L-lactide-co-glycolide), 50:50, IV 0.6 dL/g | 0.50 - 0.75 | 40,000 | Weeks to months | Enzymatic, Hydrolysis | - | 45 - 50 |
| 23987 | Poly(D,L-lactide-co-glycolide), 50:50, IV 1.0 dL/g | 0.8 - 1.2 | 100,000 | Weeks to months | Enzymatic, Hydrolysis | - | 45 - 50 |
| 50033 | Polyglycolide, IV 0.5 dL/g | 0.3 - 0.8 | 30,000 | Weeks | Enzymatic, Hydrolysis | 220 - 230 | 35 - 45 |
| 06525 | Polyglycolide, IV 1.0 dL/g | 1.0 - 1.2 | 80,000 | Weeks | Enzymatic, Hydrolysis | 220 - 230 | 35 - 45 |
| 50034 | Polyglycolide, IV 1.2 dL/g | 0.9 - 1.4 | 100,000 | Weeks | Enzymatic, Hydrolysis | 220 - 230 | 35 - 45 |
| 50035 | Polyglycolide, IV 1.6 dL/g | 1.4 - 1.8 | 150,000 | Weeks | Enzymatic, Hydrolysis | 220 - 230 | 35 - 45 |
| 50036 | Polyglycolide, IV 2.0 dL/g | 1.8 - 2.2 | 175,000 | Weeks to months | Enzymatic, Hydrolysis | 220 - 230 | 35 - 45 |
| 50037 | Polyglycolide, IV 2.5 dL/g | 2.2 - 2.7 | 200,000 | Weeks to months | Enzymatic, Hydrolysis | 220 - 230 | 35 - 45 |
| 50038 | Poly(glycolide-co-lactide), 95:5, IV 1.7 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | 200 - 215 | 35 - 45 |
| 50039 | Poly(glycolide-co-lactide), 90:10, IV 1.7 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | 200 - 215 | 35 - 45 |
| 50040 | Poly(glycolide-co-lactide), 80:20, IV 1.8 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | 200 - 215 | 35 - 45 |
| 50041 | Poly(glycolide-co-caprolactone), 75:25, 1.6 dL/g | 1.4 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -20 - -5 |
| 50042 | Poly(glycolide-co-caprolactone), 60:40, 1.4 dL/g | 1.4 - 1.8 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -20 - -5 |
| 50043 | Poly(glycolide-co-caprolactone), 60:40, 1.3 dL/g | 0.8 - 1.4 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -20 - -5 |
| 50044 | Poly(glycolide-co-caprolactone), 55:45, 1.5 dL/g | 1.0 - 1.8 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -20 - -5 |
| 18580 | Poly(L-lactide), IV 0.15 dL/g | 0.1 - 0.2 | 2,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 06529 | Poly(L-lactide), IV 1.0 dL/g | 0.8 - 1.2 | 80,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50045 | Poly(L-lactide), IV 1.6 dL/g | 1.0 - 2.0 | 120,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 18402 | Poly(L-lactide), IV 1.8 dL/g | 1.5 - 2.0 | 150,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50046 | Poly(L-lactide), IV 2.0 dL/g | 1.8 - 2.3 | 175,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50047 | Poly(L-lactide), IV 2.4 dL/g | 2.2 - 3.0 | 200,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50048 | Poly(L-lactide), IV 3.2 dL/g | 3.0 - 3.6 | 300,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50049 | Poly(L-lactide), IV 3.8 dL/g | 3.6 - 4.2 | 350,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 18582 | Poly(L-lactide), IV 5.0 dL/g | 4.3 - 5.5 | 400,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 21512 | Poly(L-lactide), IV 6.5 dL/g | 5.5 - 7.5 | 700,000 | > 3 years | Enzymatic, Hydrolysis | 170 - 180 | 50 - 60 |
| 50063 | Poly(L-lactide co-Caprolactone), 60:40, IV 1.8 dL/g | 1.0 - 2.0 | - | 1 - 3 years | Enzymatic, Hydrolysis | Amorphous | 0 - 10 |

| ITEM CODE | ITEM DESCRIPTION | INHERENT VISCOSITY (dL/g) | APPROX. MOLECULAR WEIGHT (Da) | APPROX. DEGRADATION TIMEFRAME [1-3] | DEGRADATION MECHANISM | Tm (°C) | Tg (°C) |
|---|---|---|---|---|---|---|---|
| 50064 | Poly(L-lactide co-Caprolactone), 70:30, IV 1.5 dL/g | 1.0 - 2.0 | - | 1 - 3 years | Enzymatic, Hydrolysis | Amorphous | 0 - 10 |
| 50056 | Poly(L-lactide-co-D,L-lactide), 70:30, IV 2.4 dL/g | 2.0 - 2.5 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 50057 | Poly(L-lactide-co-D,L-lactide), 70:30, IV 2.6 dL/g | 2.5 - 2.7 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 50058 | Poly(L-lactide-co-D,L-lactide), 70:30, IV 2.8 dL/g | 2.7 - 3.4 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 50059 | Poly(L-lactide-co-D,L-lactide), 70:30, IV 3.8 dL/g | 3.4 - 4.5 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 50060 | Poly(L-lactide-co-D,L-lactide), 70:30, IV 6.0 dL/g | 4.5 - 6.5 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 50061 | Poly(L-lactide-co-D,L-lactide), 80:20, IV 3.8 dL/g | 3.0 - 4.5 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 50062 | Poly(L-lactide-co-D,L-lactide), 80:20, IV 5.8 dL/g | 4.5 - 6.0 | - | 2 - 3 years | Enzymatic, Hydrolysis | Amorphous | 35 - 45 |
| 16587 | Poly(L-lactide-co-glycolide), 70:30, IV 0.2 dL/g | 0.1 - 0.3 | 10,000 | Months to years | Enzymatic, Hydrolysis | - | 50 - 55 |
| 16930 | Poly[(R)-3-hydroxybutyrate], MW ~500 | - | 500 | - | Enzymatic, Hydrolysis | - | - |
| 16932 | Poly[(R)-3-hydroxybutyrate], MW ~1000 | - | 1,000 | - | Enzymatic, Hydrolysis | - | - |
| 16934 | Poly[(R)-3-hydroxybutyrate], MW ~2000 | - | 2,000 | - | Enzymatic, Hydrolysis | - | - |
| 16936 | Poly[(R)-3-hydroxybutyrate], MW ~3000 | - | 3,000 | - | Enzymatic, Hydrolysis | - | - |
| 16938 | Poly[(R)-3-hydroxybutyrate], MW ~5000 | - | 5,000 | - | Enzymatic, Hydrolysis | - | - |
| 16940 | Poly[(R)-3-hydroxybutyrate], MW ~10,000 | - | 10,000 | - | Enzymatic, Hydrolysis | - | - |
| 16916 | Poly[(R)-3-hydroxybutyrate], MW ~500,000 | - | 500,000 | - | Enzymatic, Hydrolysis | - | - |
| 50018 | Poly(trimethylene carbonate), IV 0.5 dL/g | 0.3 - 0.8 | - | Weeks to months | Enzymatic, Hydrolysis | 38 - 50 | -30 - -15 |
| 50019 | Poly(trimethylene carbonate), IV 1.0 dL/g | 0.8 - 1.2 | - | Weeks to months | Enzymatic, Hydrolysis | 38 - 50 | -30 - -15 |
| 50020 | Poly(trimethylene carbonate), IV 1.3 dL/g | 1.2 - 1.4 | - | Weeks to months | Enzymatic, Hydrolysis | 38 - 50 | -30 - -15 |
| 50021 | Poly(trimethylene carbonate), IV 1.5 dL/g | 1.5 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | 38 - 50 | -30 - -15 |
| 50022 | Poly(trimethylene carbonate-co-caprolactone), 90:10, IV 1.1 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - -20 |
| 50023 | Poly(trimethylene carbonate-co-caprolactone), 80:20, IV 1.5 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - -20 |
| 50024 | Poly(trimethylene carbonate-co-L-lactide), 90:10, IV 0.7 dL/g | 0.5 - 1.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50025 | Poly(trimethylene carbonate-co-L-lactide), 80:20, IV 0.9 dL/g | 0.7 - 1.2 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50026 | Poly(trimethylene carbonate-co-L-lactide), 80:20, IV 1.1 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50027 | Poly(trimethylene carbonate-co-L-lactide), 60:40, IV 1.0 dL/g | 0.8 - 1.2 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50028 | Poly(trimethylene carbonate-co-L-lactide), 60:40, IV 1.2 dL/g | 1.0 - 2.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50029 | Poly(trimethylene carbonate-co-L-lactide), 50:50, IV 0.9 dL/g | 0.5 - 1.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50030 | Poly(trimethylene carbonate-co-L-lactide), 50:50, IV 1.1 dL/g | 1.0 - 1.5 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | -30 - 5 |
| 50031 | Poly(trimethylene carbonate-co-D,L-lactide), 50:50, IV 1.1 dL/g | 0.8 - 1.4 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | 20 - 30 |
| 50032 | Poly(trimethylene carbonate-co-D,L-lactide), 50:50, IV 0.9 dL/g | 0.5 - 1.0 | - | Weeks to months | Enzymatic, Hydrolysis | Amorphous | 20 - 30 |

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## Further Readings


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Polysciences, Inc.
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