MP

Sample Preparation

Crushing Lysis Efficiency. Nothing Resists FastPrep®.

FastPrep® systems, lysing matrix and kits provide the most usable DNA, RNA and proteins from tough, dirty or tiny samples.

Fast and easy, everytime.

Find it at **fishersci.com**

fisher scientific
part of **Thermo Fisher Scientific**

Sample Preparation

MP Bio, the leader in sample preparation, provides a complete range of high quality products for all steps of your research experiments. From lysis and extraction through purification of DNA, RNA and proteins, we offer the best solutions to achieve excellent and reliable results for your applications. FastPrep systems deliver high yields of DNA, RNA and protein from even the most resistant sample types in 40 seconds or less.

FastPrep homogenizers pulverize samples through simultaneous beating of specialized lysing matrix beads. Interchangeable adapters allow unique flexibility in terms of sample size (2 mL to 250 mL as well as 96 deep well plates) and temperature (ambient or cryogenic conditions). FastPrep systems can quickly and efficiently process routine and resistant samples, including plant, root, soil, waste water, skin, tissue, seeds, and feces. FastPrep instruments, combined with the widest selection of industry leading lysing matrix materials and complete isolation kits, offer a complete solution for processing even the most difficult samples.

Drawing on years of manufacturing and laboratory experience, MP Bio provides a premium and complete workflow solution for molecular biology research studies. The product range includes sample homogenization and lysis tools, DNA and RNA extraction and purification kits, PCR enzymes and mastermixes, as well as transformation kits, gel electrophoresis and hybridization products.

The FastPrep family is a comprehensive laboratory solution that optimizes the lysis, grinding, or homogenization process from virtually any sample type. Mechanical lysis disrupts cells and tissues for the isolation of DNA, RNA, proteins, metabolites, and other small molecules, and eliminates the need for chemicals, enzymes, and detergents, which can inhibit some downstream processes. FastPrep instruments, Lysing Matrix tubes, and kits work together to deliver rapid, consistent, and efficient lysis and homogenization, resulting in high yields of purified nucleic acid or protein. A benchtop instrument utilizing bead-beating technology, the FastPrep provides complete and quantitative lysis of difficult and routine samples and is suitable in all applications that require grinding, lysing, or homogenization.

Examples of sample types include, but are not limited to:

- **Plant –** Stems, roots, leaves, buds, flowers, fruits, and seeds
- **Animal –** Animal and human samples, including bone, tumors, and skin
- **Soil –** Eubacterial spores and endospores; gram positive bacteria; yeast; algae; nematodes; fungi; clay, sandy, silty, peaty, chalky, and loamy soil samples
- **Bacteria –** Gram-positive, gram-negative, eubacterial spores, and endospores
- **Feces –** Complex fecal matrices
- **Yeast –** Cells and spores

MP Bio offers genomic DNA and total RNA extraction and purification kits and reagents that are optimized to provide maximum yield, purity and integrity from any sample.

MP Bio Extraction and Purification Kits offer the following benefits:

- Rapid and reproducible sample lysis and purification
- Closed lysing matrix tubes to prevent cross-contamination
- Increased yields of high-quality DNA and RNA
- Integrity and size of DNA and RNA are retained
- Ready-to-use nucleic acids for downstream applications

FastPrep-24™ 5G

Most Advanced Lysis, Homogenization and Grinding System Applicable for Genomics, Proteomics, or Other Chemical Studies and Analysis.

MOST VERSATILE
Often Imitated,
Never Replicated

QuickPrep-3 adapter
included with instrument

The FastPrep-24 5G instrument is a versatile sample disruption device that provides the ultimate in speed and performance for the lysis of biological or inorganic samples.

A completely self-contained system, the FastPrep-24 5G instrument eliminates the risk of cross-contamination and time-consuming clean-up associated with manual lysis methods.

Samples and buffers are simply added to a Lysing Matrix tube containing specialized Lysing Matrix particles. Select your sample type from the Recommended Programs menu, push start, and in 40 seconds or less, your samples are completely lysed. The FastPrep-24 5G also allows for up to 12 custom assays to be manually programmed and saved.

Specifications	
Interface	Touch Screen Interface
Programmable Assays	Up to 12 Manual Assays Saved to Memory
Pre-Defined Assays	73 Pre-Defined and Optimized Assay Programs
Time Range	1 to 120 seconds in 1 second Increments
Speed Range	4 to 10 m/sec in 0.5 m/sec Increments
Cycles	1 to 9 Cycles
Pause Time	1 to 300 Second Pause Between Cycles in 1 Second Increments (Default: 300 Seconds)
Data Export	Via USB
Acceleration	< 2 Seconds to Maximum Speed
Deceleration	< 2 Seconds to Stop
Dimensions	Height: 490 mm; Base: 472 mm x 385 mm (Elliptic Shape)
Weight	23.6 kg (52 lb)
Power Requirement	120 VAC/60 Hz, 500W; 230 VAC/50 Hz, 500 W
Maximum Sound Level	< 70 dB

The heartbeat of the 5G is a microprocessor control interfaced to a touch screen display. The large, 7-inch HD monitor allows assay parameters to be set with the touch of a button. Hi-def graphics and intuitive software make programming the 5G fast and simple, while high-tech exterior graphics add to the sleek and sophisticated design of the instrument.

Product Name	Cat. No.
FastPrep-24™ 5G instrument	11-600-5500

FastPrep Adapters

Adapters for FastPrep Systems are Flexible, Interchangeable, and Available for Ambient or Cryogenic Sample Types

MP Bio offers the widest selection of adapters to best meet your needs in sample preparation. Our adapters allow for sample sizes ranging from 2 to 250 mL tube size and are built for durability in ambient and cryogenic conditions.

Ambient Temperature Adapters for FastPrep-24 and FastPrep-24 5G Instruments

QuickPrep™ Adapter
24 x 2 mL tubes
(included with FastPrep-24™ instrument)
Cat. No. ICN6002512

QuickPrep™ 3 Adapter
24 x 2 mL tubes
(included with FastPrep-24™ 5G instrument)
Cat. No. MP116005512

BigPrep™ Adapter
2 x 50 mL tubes

Cat. No. MP116002525

TeenPrep™ Adapter
12 x 15 mL tubes

Cat. No. ICN6002526

HiPrep™ Adapter
48 x 2 mL tubes

Cat. No. ICN6002527

TallPrep™ Adapter
24 x 4.5 mL tubes

Cat. No. MP116002540

Cryogenic Temperature Adapters for FastPrep-24 and FastPrep-24 5G Instruments

During mechanical lysis, the temperature within the tube can increase and can cause damage to the molecules in your sample.

- **Protects thermosensitive molecules** from heat degradation due to an innovative design encompassing a cooling chamber.
- **Prevents the increase of sample temperature** during the homogenization process by maintaining sample temperature at 4°C.
- **Ensures a highly effective grinding process of any sample,** even the most elastic, by making them brittle.

CoolPrep™ Adapter
24 x 2 mL tubes

Cat. No. ICN6002528

CoolTeenPrep™ Adapter
6 x 15 mL tubes

Cat. No. ICN6002530

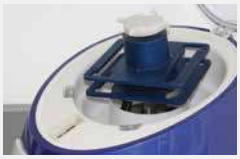
CoolBigPrep™ Adapter
2 x 50 mL tubes

Cat. No. MP116002531

FastPrep Adapters

Metal Adapters for FastPrep-24 and FastPrep-24 5G Instruments

All-Metal adapters are ideally suited for work with highly infectious, pathogenic, or other biologically hazardous samples. They withstand temperatures up to 450°C, allowing for sterilization by pyrolysis or autoclaving. Pathogens, including bacteria, viruses, fungi, parasites, viroids, and prions, can be effectively eliminated. All-Metal adapters are also safe to use with most laboratory detergents and sterilization solutions, ensuring easy care and maintenance.

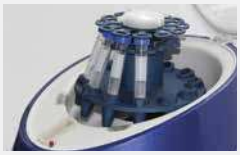


Metal BigPrep™ Adapter
2 x 50 mL tubes

Cat. No. 116002547

Metal QuickPrep™ Adapter
24 x 2 mL tubes

Cat. No. MP116002545



Metal TeenPrep™ Adapter
12 x 15 mL tubes

Cat. No. 116002546

FastPrep-96™ Adapters

FastPrep-96™ offers the widest variety of adapters (2 x 96 deep well plates, 96 x 2 mL, 48 x 4.5 mL, 24 x 15 mL, 8 x 50 mL and 2 x 250 mL flasks) and a simple, accurate, closed loop control of lysing power and speed. All this and more make the FastPrep-96™ the perfect solution for all of your high volume sample preparation needs.

BigFlex™ Adapter
8 x 50 mL tubes

Cat. No. MP116010550

TeenFlex™ Adapter
20 x 15 mL tubes

Cat. No. MP116010560

TallFlex™ Adapter
48 x 4.5 mL tubes

Cat. No. MP116010580

QuickFlex™ Adapter
96 x 2 mL tubes

Cat. No. MP116010570

LargeFlex™ Adapter
2 x 250 mL tube

Cat. No. MP116010590

Well Plate Adapter
2 x 96 deep well plates
(included with FastPrep-96™ instrument)
Cat. No. NC1490728

ConeFlex™ Legacy Adapter

The ConeFlex™ Legacy Adapter allows any existing FastPrep-24™ adapters to be used on the FastPrep-96™ instrument.

ConeFlex™ Adapter
Adapter

Cat. No. MP116010595

Lysing Matrix

FastPrep® Lysing Matrix makes difficult-to-lyse samples easy. No matter how tough or resistant your samples are, our bead beating tubes will effectively disrupt cell walls, providing the highest yields of nucleic acids and proteins in a matter of seconds. Lysing Matrix tubes from MP Bio are highly reproducible with no cross-contamination. All Lysing Matrix tubes are standard sizes and fit just about any homogenizer on the market. We offer a wide variety of lysing beads and matrices to fit all sample types and applications.

- Optimal cell disruption for any sample
- Size and composition optimized according to sample type
- No cross contamination with closed Lysing Matrix tubes
- Available in 2 mL, 4.5 mL, 15 mL, 50 mL tubes or 96 well plates
- Fit any high-speed bead-beating homogenizers
- Validated worldwide with 3,000+ Lysing Matrix specific publications

FastPrep® Lysing Matrix tubes range from low to high impaction, breaking down any sample type whether the cell walls are hard or soft. Sample types include, but are not limited to, human, animal, and plant tissues; microorganisms like bacteria, yeast and fungi; soil; feces; plus insects and worms.

Impact-resistant Lysing Matrix tubes with beads are available in 2 mL, 4.5 mL, 15 mL, 50 mL and 96-well format sizes and contain a wide variety of materials to meet your lysing, grinding, and homogenization needs. All matrix particles are produced to the highest quality standards to ensure optimum performance. The lysing matrix particles are then dispensed into the Lysing Matrix tubes under a rigorous set of proprietary conditions, allowing complete confidence for immediate use.

For optimal performance and results, we recommend using the Lysing Matrix tubes in conjunction with our FastPrep instruments to ensure easy grinding, lysing, and homogenization of any sample type in seconds.

Lysing Matrix	Matrix Composition	Lysing Matrix	Matrix Composition
A	Garnet matrix and 1/4 inch banded sstellites	I	2 mm yellow zirconium oxide beads and 4 mm black ceramic sphere
B	0.1 mm silica spheres	J	2 mm yellow zirconium oxide beads and 1.6 mm aluminum oxide particles
C	1 mm silica spheres	K	0.8 mm zirconium silicate beads
D	1.4 mm ceramic spheres	M	1/4 inch ceramic beads
E	1.4 mm ceramic spheres, 0.1 mm silica spheres, and 4 mm glass beads	S	1/8 inch stainless steel beads
F	1.6 mm aluminum oxide particles and 1.6 mm silicon carbide particles	SS	6.35 mm stainless steel grinding balls
G	1.6 mm silicon carbide particles and 2 mm glass beads	Y	0.5 mm diameter Yttria-stabilized zirconium oxide beads
H	2 mm glass beads and 2 mm yellow zirconium oxide beads	Z	2 mm diameter Yttria-stabilized zirconium oxide beads

Size

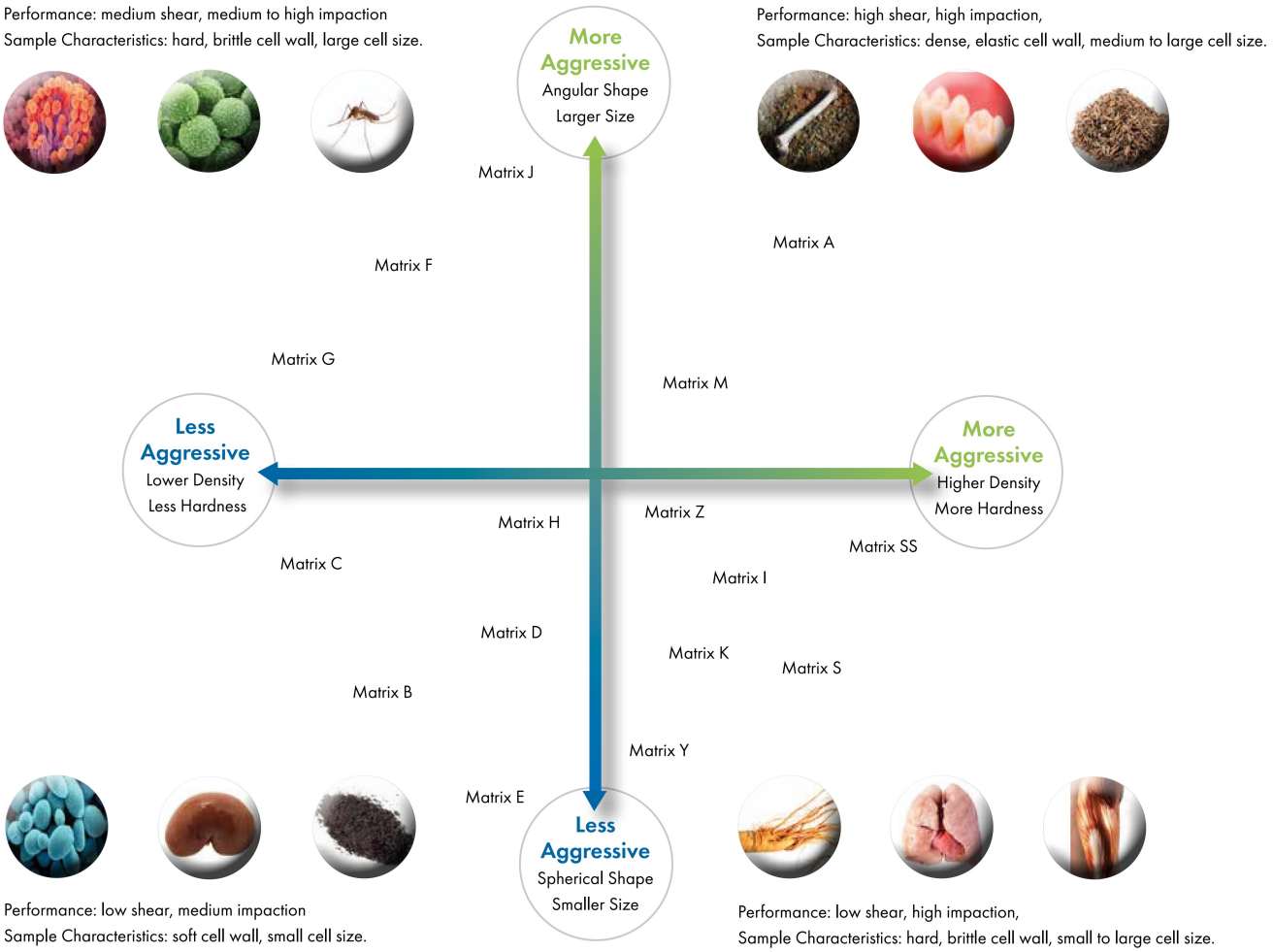
The smaller the particles used in the grinding media, the smaller the average particle size and the smaller the lowest-limiting particle size produced during pulverization. Matrix particle size should be selected based upon the size of the particles you wish to obtain in your lysate.

Shape

The shape of the grinding media is a major determining factor in how cells are disrupted. Dull media, such as spherical beads, utilize cascade impaction (hammering) as the main force for cell lysis. Sharp and angular shaped media will primarily generate mechanical shear forces (chopping and cutting) which can quickly open difficult cell walls, grind fibrous or elastic animal tissue, or crack spores or oocytes. Shear forces are preferable when isolating stable molecules such as DNA, stable proteins, structural polysaccharides and small molecules or metabolites. RNA and certain easily denatured proteins can be quickly degraded by shear forces, so care needs to be taken when using angular media. For isolation of these molecules, smooth impactor grinding media can be much more forgiving.

Hardness, Density, and Composition

The composition determines two very important qualities: hardness and density, both of which are inherent physical properties derived from the molecular composition of the matrix particle. The hardness must be greater than that of the sample being pulverized, with higher hardness values being more effective at disrupting hard and brittle cell membranes. Hardness and density values help optimize lysis efficiency while preserving the integrity of the analytes of interest.



Ready-to-Use Lysing Matrix

	Sample Type	Lysing Matrix														
	Animal & Human Tissues	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**M**	**S**	**SS**	**Y**	**Z**
Soft Tissues	Lung, Breast, Kidney, Heart, Intestine, Muscle, Spleen, Liver, Brain	•			•									•	•		•
	Skin	•			•												
	Nail													•			
Unique Samples	Tail, Ear	•												•			
	Vascular tissue	•			•												•
	Hair													•			
	Bone	•										•	•	•	•		
	Tumor	•												•			
	Mammalian cell	•			•												•
	Infected tissue (isolation of viruses or virus)												•				
	Microorganisms	A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y	Z
	Bacteria (gram + and -)	•	•				•				•						
	Yeast, Mold	•		•			•	•				•				•	
	Bacterial & Fungal spore	•	•				•	•		•	•	•			•		
	Algae	•		•				•								•	
	Virus	•	•														
	Environmental Samples	A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y	Z
	Soil, Marine sediment, Rhizosphere, Manure, Compost, Sludge, Feces, Wastewater					•		•	•	•							
	Plant Tissues	A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y	Z
	Leaf	•			•		•	•									•
	Seed	•					•	•	•	•			•	•	•		
	Root	•					•	•						•			
	Needle	•					•	•					•	•			
	Wood	•					•	•	•	•							
	Stem, Flower	•			•		•	•									•
	Insects & Worms	A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y	Z
	Tick, Fly	•			•				•	•							•
	Nematode	•		•	•												•
	Bee, Mosquito	•			•												•

Lysing Matrix Tubes

Description	Pack Size	Cat. No.
Lysing Matrix A	50 x 2 mL	MP116910050
	100 x 2 mL	MP116910100
	500 x 2 mL	MP116910500
Lysing Matrix A	25 x 4.5 mL	MP116970025
	50 x 4.5 mL	MP116970050
	100 x 4.5 mL	MP116970100
Lysing Matrix A	5 x 15 mL	MP116930005
	25 x 15 mL	MP116930025
	50 x 15 mL	MP116930050
Lysing Matrix A	10 x 50 mL	MP116950010
	50 x 50 mL	MP116950050
Lysing Matrix A	96-well Rack	MP116980001
	10 x 96-well Rack	MP116980010
Lysing Matrix B	50 x 2 mL	MP116911050
	100 x 2 mL	MP116911100
	500 x 2 mL	MP116911500
Lysing Matrix B	25 x 4.5 mL	MP116971025
	50 x 4.5 mL	MP116971050
	100 x 4.5 mL	MP116971100
Lysing Matrix B	5 x 15 mL	MP116931005
	25 x 15 mL	MP116931025
	50 x 15 mL	MP116931050
Lysing Matrix B	10 x 50 mL	MP116951010
	50 x 50 mL	MP116951050
	100 x 50 mL	MP116951100
Lysing Matrix B	96-well Rack	MP116981001
	10 x 96-well Rack	MP116981010
Lysing Matrix C	50 x 2 mL	MP116912050
	100 x 2 mL	MP116912100
	500 x 2 mL	MP116912500
Lysing Matrix C	25 x 4.5 mL	MP116972025
	50 x 4.5 mL	MP116972050
	100 x 4.5 mL	MP116972100
Lysing Matrix C	5 x 15 mL	MP116932005
	25 x 15 mL	MP116932025
	50 x 15 mL	MP116932050

Description	Pack Size	Cat. No.
Lysing Matrix C	10 x 50 mL	MP116952010
	50 x 50 mL	MP116952050
Lysing Matrix C	96-well Rack	MP116982001
	10 x 96-well Rack	MP116982010
Lysing Matrix D	50 x 2 mL	MP116913050
	100 x 2 mL	MP116913100
	500 x 2 mL	MP116913500
Lysing Matrix D	25 x 4.5 mL	MP116973025
	50 x 4.5 mL	MP116973050
	100 x 4.5 mL	MP116973100
Lysing Matrix D	5 x 15 mL	MP116933005
	25 x 15 mL	MP116933025
	50 x 15 mL	MP116933050
Lysing Matrix D	10 x 50 mL	MP116953010
	50 x 50 mL	MP116953050
	100 x 50 mL	MP116953100
	500 x 50 mL	MP116953500
Lysing Matrix D	96-well Rack	MP116983001
	10 x 96-well Rack	MP116983010
Lysing Matrix E	50 x 2 mL	MP116914050
	100 x 2 mL	MP116914100
	500 x 2 mL	MP116914500
Lysing Matrix E	25 x 4.5 mL	MP116974025
	50 x 4.5 mL	MP116974050
	100 x 4.5 mL	MP116974100
Lysing Matrix E	5 x 15 mL	MP116934005
	25 x 15 mL	MP116934025
	50 x 15 mL	MP116934050
Lysing Matrix E	10 x 50 mL	MP116954010
	50 x 50 mL	116954050
Lysing Matrix E	96-well Rack	MP116984001
	10 x 96-well Rack	MP116984010
Lysing Matrix F	50 x 2 mL	MP116915050
	100 x 2 mL	MP116915100
	500 x 2 mL	MP116915500
Lysing Matrix G	50 x 2 mL	MP116916050
	100 x 2 mL	MP116916100

Lysing Matrix Tubes

Description	Pack Size	Cat. No.
Lysing Matrix H	50 x 2 mL	MP116917050
	100 x 2 mL	MP116917100
Lysing Matrix I	50 x 2 mL	MP116918050
	100 x 2 mL	MP116918100
Lysing Matrix J	50 x 2 mL	MP116919050
	100 x 2 mL	MP116919100
Lysing Matrix K	50 x 2 mL	MP116920050
	100 x 2 mL	MP116920100
Lysing Matrix M	50 x 2 mL	MP116923050
	100 x 2 mL	MP116923100
	500 x 2 mL	MP116923500
Lysing Matrix M	25 x 15 mL	MP116939025
	50 x 15 mL	MP116939050
Lysing Matrix M	10 x 50 mL	MP116959010
	50 x 50 mL	MP116959050
Lysing Matrix S	50 x 2 mL	MP116925050
	100 x 2 mL	MP116925100
	500 x 2 mL	MP116925500
Lysing Matrix S	5 x 15 mL	MP116938005
	25 x 15 mL	MP116938025
	50 x 15 mL	MP116938050
Lysing Matrix SS	10 x 50 mL	116941010
	50 x 50 mL	MP116941050
	100 x 50 mL	MP116941100
Lysing Matrix Y	50 x 2 mL	MP116960050
	100 x 2 mL	MP116960100
	500 x 2 mL	MP116960500
Lysing Matrix Y	25 x 4.5 mL	MP116977025
	50 x 4.5 mL	MP116977050
	100 x 4.5 mL	MP116977100
Lysing Matrix Y	5 x 15 mL	MP116975005
	25 x 15 mL	MP116975025
	50 x 15 mL	MP116975050
Lysing Matrix Y	10 x 50 mL	MP116976010
	50 x 50 mL	MP116976050

Description	Pack Size	Cat. No.
Lysing Matrix Y	96-well Rack	MP116960001
	10 x 96-well Rack	MP116960010
Lysing Matrix Z	50 x 2 mL	MP116961050
	100 x 2 mL	MP116961100
	500 x 2 mL	MP116961500
Lysing Matrix Z	25 x 4.5 mL	MP116985025
	50 x 4.5 mL	MP116985050
	100 x 4.5 mL	MP116985100
Lysing Matrix Z	5 x 15 mL	MP116978005
	25 x 15 mL	MP116978025
	50 x 15 mL	MP116978050
Lysing Matrix Z	10 x 50 mL	MP116979010
	50 x 50 mL	MP116979050
Lysing Matrix Z	96-well Rack	MP116961001
	10 x 96-well Rack	MP116961010

Biopulverizer System I

Cat. No. MP116750200

The perfect starter pack for new FastPrep™ instrument owners.
Suitable for all sample types.
System I contains Lysing Matrix A, B, C, D, E.

Biopulverizer System II

Cat. No. 116850200

The perfect pack for processing difficult samples,such as skeletal muscle, pancreas, lung, heart, bone, seeds and spores.
System II contains Lysing Matrix F, G, H, I, J.

ORDER NOW!
fishersci.com/mpbiomedicals

Metal Lysing Matrix Tubes

Stainless Steel Lysing Matrix tubes are ideal for grinding, lysing, and homogenizing your most resistant samples! Constructed from 308 SS, these tubes and grinding matrix are tough enough to stand up to the most demanding mechanical punishment that can cause traditional thermoplastic tubes to crack. Our tubes are machined from premium grade billet and deliver superior strength over less expensive production methods such as deep-drawn aluminum tubes. An oblique angle conical bottom provides a better impact surface than the rounded bottoms of deep-drawn tubes.

The stainless steel threaded cap provides a leak-proof closure without the energy-robbing alternatives like plastic flange screw caps or rubber stoppers. A Teflon O-ring prevents leakage, and can be cleaned with detergent and/or autoclaving, or replaced entirely between samples. Machined knurls on the cap provide a firm grip for easy opening and closing.

Two different impactors are available, a single Stainless Steel Ball, ¼" diameter; or a Stainless Steel Cylinder, ¼" diameter x ½" length.

Applications

- Dry grinding very tough or hard samples where heat generation can damage plastic tubes
- Cryogenic dry grinding where severe cold temps (dry ice or LN_2) can damage plastic tubes
- Milling or grinding non-biological samples where plastic contamination is of concern
- Sample processing with solvents or chemicals that are incompatible with plastics

Research Areas and Sample Types

- **Environmental and Agriculture**
  Tough seeds such as dried corn, soybeans, wheat, tomato, and chile; wood, bark, roots; animal claws and hooves
- **Forensics**
  Bone, teeth, hair, fingernails, and non-biological substrates
- **Cancer and Disease**
  Tough tissues, bone, cartilage, and skin
- **Industrial**
  Non-biological, rocks and minerals, plastics and composites, printed circuit boards, wood and building materials

Description	Pack Size	Cat. No.
Metal Lysing tube, 2 mL, w/ Grinding Ball	2 Each	MP116991002
	3 Each	MP116991003
	6 Each	MP116991006
Metal Lysing tube, 2 mL, w/ Grinding Cylinder	2 Each	MP116992002
	3 Each	MP116992003
	6 Each	MP116992006

Protoplast Isolation from Yeast and Plant Cells

Biodegrading yeast cell walls is necessary for protoplasts preparation and transformation. Selecting the optimal lysing enzyme is always challenging as it needs to have maximum efficiency without hindering the regeneration of the protoplasts after transformation. Zymolyase is a combination enzyme product with a proprietary mixture of four unique lytic enzymes to easily break down various yeast cell wall components, enabling maximal yield of viable protoplasts.

With almost 3 decades of expertise in the industry and over 2,000 citations, Zymolyase from MP Bio is a time proven and quality driven product that offers:

- Highest efficiency to form almost 100% protoplasts
- Shortest time for yeast cell wall biodegradation
- Lot to lot consistency and high reproducibility
- Widely cited and highly recognized in almost 2,400 publications

Description	Size	Cat. No.
Zymolyase 100 T	250 mg	ICN320932
	500 mg	MP08320931
Zymolyase 20 T	1 g	MP08320921

Enzymes for Plant Cell Lysis and Protoplast Formation

Plant protoplasts are plant cells which have had their cell wall removed, usually by digestion with enzymes like pectinases and cellulases. Protoplasts can be isolated from various plant tissues, such as leaves, flowers, stems, roots, and anthers. Due to the various sample sources and structure differences, it is challenging to effectively prepare plant protoplasts with high efficiency and satisfying quality for subsequent applications such as DNA transformation, plant breeding, and other uses. MP Bio has long provided high quality pectinases to support plant protoplasts. These products offer:

- High efficiency to remove cell walls
- High yield of viable protoplasts
- Robust enzymatic activities
- Optimized enzymatic components

Description	Size	Cat. No.
Pectolyase Y-23	1 g	ICN320951
Pectolyase Y-23	10 g	ICN320952

During maceration, the breakdown of pectins leads to a loss of cohesion and cell separation. Both endo-polygalacturonase or endo-pectate lyases have been reported to macerate specific tissues. Pectolyase Y-23 is a specific preparation from *Aspergillus japonicas*, containing both endo-polygalacturonases and endo-pectin lyases in high activity in addition to a maceration stimulating factor. It has found wide use and acceptance in the scientific literature. MP Bio supplies purified pectolyase Y-23 with activity greater than 1000 U/g.