

# 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.*



Higher Yields. Consistent Quality. Super Fast.

**MP**  
www.mpbio.com

## 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 sample holders 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 Sample Holder  
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

FastPrep-24™ 5G instrument

### Cat. No.

116005500

# Sample Holders

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

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

### Ambient Temperature Sample Holders for FastPrep-24 and FastPrep-24 5G Instruments



**QuickPrep™ Sample Holder**  
24 x 2 mL tubes (included with FastPrep-24™ instrument)  
Cat. No. 116002512



**QuickPrep™ 3 Sample Holder**  
24 x 2 mL tubes (included with FastPrep-24™ 5G instrument)  
Cat. No. 116005512



**BigPrep™ Sample Holder**  
2 x 50 mL tubes  
Cat. No. 116002525



**TeenPrep™ Sample Holder**  
12 x 15 mL tubes  
Cat. No. 116002526



**HiPrep™ Sample Holder**  
48 x 2 mL tubes  
Cat. No. 116002527



**TallPrep™ Sample Holder**  
24 x 4.5 mL tubes  
Cat. No. 116002540

### Cryogenic Temperature Sample Holders 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™ Sample Holder**  
24 x 2 mL tubes  
Cat. No. 116002528



**CoolTeenPrep™ Sample Holder**  
6 x 15 mL tubes  
Cat. No. 116002530



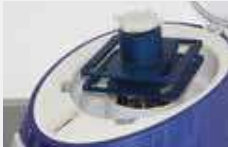
**CoolBigPrep™ Sample Holder**  
2 x 50 mL tubes  
Cat. No. 116002531



# Sample Holders

## Metal Sample Holders for FastPrep-24 and FastPrep-24 5G Instruments

All-Metal sample holders 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 sample holders are also safe to use with most laboratory detergents and sterilization solutions, ensuring easy care and maintenance.



**Metal BigPrep™ Sample Holder**  
2 x 50 mL tubes

Cat. No. 116002547



**Metal QuickPrep™ Sample Holder**  
24 x 2 mL tubes

Cat. No. 116002545



**Metal TeenPrep™ Sample Holder**  
12 x 15 mL tubes

Cat. No. 116002546

## FastPrep-96™ Sample Holders

FastPrep-96™ offers the widest variety of sample holders (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™ Sample Holder**  
8 x 50 mL tubes

Cat. No. 116010550



**TeenFlex™ Sample Holder**  
24 x 15 mL tubes

Cat. No. 116010560



**TallFlex™ Sample Holder**  
48 x 4.5 mL tubes

Cat. No. 116010580



**QuickFlex™ Sample Holder**  
96 x 2 mL tubes

Cat. No. 116010570



**LargeFlex™ Sample Holder**  
2 x 250 mL tube

Cat. No. 116010590



**Well Plate Adapter**  
2 x 96 deep well plates  
(included with FastPrep-96™ instrument)  
Cat. No. 119696168

## ConeFlex™ Legacy Sample Holder

ConeFlex™ Legacy Sample Holder allows any existing FastPrep-24™ Sample Holders to be used on the FastPrep-96™ instrument.



**ConeFlex™ Sample Holder Adapter**

Cat. No. 116010595

# 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 impactation, 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 Ytria-stabilized zirconium oxide beads
● H	2 mm glass beads and 2 mm yellow zirconium oxide beads	● Z	2 mm diameter Ytria-stabilized zirconium oxide beads



# Lysing Matrix

## 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.

Performance: medium shear, medium to high impaction  
Sample Characteristics: hard, brittle cell wall, large cell size.

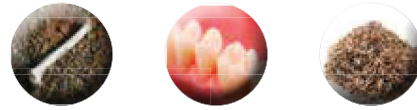


Matrix J

Matrix F

Matrix G

Performance: high shear, high impaction,  
Sample Characteristics: dense, elastic cell wall, medium to large cell size.



Matrix A

Matrix M

Matrix Z

Matrix SS

**Less Aggressive**  
Lower Density  
Less Hardness

Matrix C

Matrix H

Matrix D

Matrix B

Matrix E

**Less Aggressive**  
Spherical Shape  
Smaller Size



Performance: low shear, medium impaction  
Sample Characteristics: soft cell wall, small cell size.

**More Aggressive**  
Higher Density  
More Hardness

Matrix I

Matrix K

Matrix S

Matrix Y



Performance: low shear, high impaction,  
Sample Characteristics: hard, brittle cell wall, small to large cell size.

# Ready-to-Use Lysing Matrix

Sample Type		Lysing Matrix															
		A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y	Z
Soft Tissues	Animal & Human Tissues																
	Lung, Breast, Kidney, Heart, Intestine, Muscle, Spleen, Liver, Brain	•			•									•	•		•
Unique Samples	Skin	•			•												
	Nail													•			
	Tail, Ear	•												•			
	Vascular tissue	•			•												•
	Hair													•			
	Bone	•										•	•	•	•		
	Tumor	•												•			
	Mammalian cell	•			•												•
	Infected tissue (isolation of viruses or virus)													•			
	<b>Microorganisms</b>		A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y
Bacteria (gram + and -)		•	•				•				•						
Yeast, Mold		•		•			•	•				•					•
Bacterial & Fungal spore		•	•				•	•		•	•	•			•		
Algae		•		•				•									•
Virus		•	•														
<b>Environmental Samples</b>		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						•		•	•	•							
<b>Plant Tissues</b>		A	B	C	D	E	F	G	H	I	J	K	M	S	SS	Y	Z
Leaf		•			•		•	•									•
Seed		•					•	•	•	•			•	•	•		
Root		•					•	•						•			
Needle		•					•	•					•	•			
Wood		•					•	•	•	•							
Stem, Flower		•			•		•	•									•
<b>Insects &amp; Worms</b>		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 2mL	116910050
	100 x 2mL	116910100
	500 x 2mL	116910500
Lysing Matrix A	25 x 4.5mL	116970025
	50 x 4.5mL	116970050
	100 x 4.5mL	116970100
Lysing Matrix A	5 x 15mL	116930005
	25 x 15mL	116930025
	50 x 15mL	116930050
Lysing Matrix A	10 x 50mL	116950010
	50 x 50mL	116950050
	100 x 50mL	116950100
	500 x 50mL	116950500
Lysing Matrix A	96-well Rack	116980001
	10 x 96-well Rack	116980010
Lysing Matrix B	50 x 2mL	116911050
	100 x 2mL	116911100
	500 x 2mL	116911500
Lysing Matrix B	25 x 4.5mL	116971025
	50 x 4.5mL	116971050
	100 x 4.5mL	116971100
Lysing Matrix B	5 x 15mL	116931005
	25 x 15mL	116931025
	50 x 15mL	116931050
Lysing Matrix B	10 x 50mL	116951010
	50 x 50mL	116951050
	100 x 50mL	116951100
	500 x 50mL	116951500
Lysing Matrix B	96-well Rack	116981001
	10 x 96-well Rack	116981010
Lysing Matrix C	50 x 2mL	116912050
	100 x 2mL	116912100
	500 x 2mL	116912500
Lysing Matrix C	25 x 4.5mL	116972025
	50 x 4.5mL	116972050
	100 x 4.5mL	116972100
Lysing Matrix C	5 x 15mL	116932005
	25 x 15mL	116932025
	50 x 15mL	116932050

Description	Pack Size	Cat. No.
Lysing Matrix C	10 x 50mL	116952010
	50 x 50mL	116952050
Lysing Matrix C	96-well Rack	116982001
	10 x 96-well Rack	116982010
Lysing Matrix D	50 x 2mL	116913050
	100 x 2mL	116913100
	500 x 2mL	116913500
Lysing Matrix D	25 x 4.5mL	116973025
	50 x 4.5mL	116973050
	100 x 4.5mL	116973100
Lysing Matrix D	5 x 15mL	116933005
	25 x 15mL	116933025
	50 x 15mL	116933050
Lysing Matrix D	10 x 50mL	116953010
	50 x 50mL	116953050
	100 x 50mL	116953100
Lysing Matrix D	500 x 50mL	116953500
	96-well Rack	116983001
Lysing Matrix D	10 x 96-well Rack	116983010
	50 x 2mL	116914050
Lysing Matrix E	100 x 2mL	116914100
	500 x 2mL	116914500
Lysing Matrix E	25 x 4.5mL	116974025
	50 x 4.5mL	116974050
	100 x 4.5mL	116974100
Lysing Matrix E	5 x 15mL	116934005
	25 x 15mL	116934025
	50 x 15mL	116934050
Lysing Matrix E	10 x 50mL	116954010
	50 x 50mL	116954050
Lysing Matrix E	100 x 50mL	116954100
	96-well Rack	116984001
Lysing Matrix E	10 x 96-well Rack	116984010
	50 x 2mL	116915050
Lysing Matrix F	100 x 2mL	116915100
	500 x 2mL	116915500
	50 x 2mL	116916050
Lysing Matrix G	100 x 2mL	116916100

## Lysing Matrix Tubes

Description	Pack Size	Cat. No.
Lysing Matrix H	50 x 2mL	116917050
	100 x 2mL	116917100
Lysing Matrix I	50 x 2mL	116918050
	100 x 2mL	116918100
Lysing Matrix J	50 x 2mL	116919050
	100 x 2mL	116919100
Lysing Matrix K	50 x 2mL	116920050
	100 x 2mL	116920100
Lysing Matrix M	50 x 2mL	116923050
	100 x 2mL	116923100
	500 x 2mL	116923500
Lysing Matrix M	25 x 15mL	116939025
	50 x 15mL	116939050
Lysing Matrix M	10 x 50mL	116959010
	50 x 50mL	116959050
Lysing Matrix S	50 x 2mL	116925050
	100 x 2mL	116925100
	500 x 2mL	116925500
Lysing Matrix S	5 x 15mL	116938005
	25 x 15mL	116938025
	50 x 15mL	116938050
Lysing Matrix SS	10 x 50mL	116941010
	50 x 50mL	116941050
	100 x 50mL	116941100
Lysing Matrix Y	50 x 2mL	116960050
	100 x 2mL	116960100
	500 x 2mL	116960500
Lysing Matrix Y	25 x 4.5mL	116977025
	50 x 4.5mL	116977050
	100 x 4.5mL	116977100
Lysing Matrix Y	5 x 15mL	116975005
	25 x 15mL	116975025
	50 x 15mL	116975050
Lysing Matrix Y	10 x 50mL	116976010
	50 x 50mL	116976050

Description	Pack Size	Cat. No.
Lysing Matrix Y	96-well Rack	116960001
	10 x 96-well Rack	116960010
Lysing Matrix Z	50 x 2mL	116961050
	100 x 2mL	116961100
	500 x 2mL	116961500
Lysing Matrix Z	25 x 4.5mL	116985025
	50 x 4.5mL	116985050
	100 x 4.5mL	116985100
Lysing Matrix Z	5 x 15mL	116978005
	25 x 15mL	116978025
	50 x 15mL	116978050
Lysing Matrix Z	10 x 50mL	116979010
	50 x 50mL	116979050
Lysing Matrix Z	96-well Rack	116961001
	10 x 96-well Rack	116961010

### Biopulverizer System I

Cat. No. 116750200

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!**

[www.mpbio.com](http://www.mpbio.com)

## 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, 1/4" diameter; or a Stainless Steel Cylinder, 1/4" diameter x 1/2" 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<sub>2</sub>) 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.
	2 Each	116991002
Metal Lysing tube, 2 mL, w/ Grinding Ball	3 Each	116991003
	6 Each	116991006
	2 Each	116992002
Metal Lysing tube, 2 mL, w/ Grinding Cylinder	3 Each	116992003
	6 Each	116992006
Replacement O-rings for Metal Lysing Tube, 2 mL	50 Each	116990100