FastDNA™ SPIN Kit for Soil

Rapid isolation of PCR-ready genomic DNA from soil and other environmental samples

Cat. No. **116560200/116560300**

Size: **50 preps/100 preps**

Storage: **Ambient Temperature – 15-30 °C**

Revision Date: **2021-05**

Choose the Best Homogenization and Extraction for Your Application

INSTRUMENTS

FastPrep-24™ 5G

FastPrep-96™

Super FastPrep-2™

ADAPTERS

Metal

High Throughput

Cryogenic

Large Sample Volume

LYSING MATRIX TUBES

2 mL

4.5 mL

15 mL

50 mL

EXTRACTION KITS

DNA

RNA

Protein

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1. INTRODUCTION TO FASTDNA™ SPIN KIT FOR SOIL AND FASTPREP® INSTRUMENTS

The FastDNA™ SPIN Kit for Soil quickly and efficiently isolates PCR-ready genomic DNA directly from soil samples in less than 30 minutes. Designed for use with the FastPrep® instruments from MP Biomedicals, plant and animal tissues, bacteria, algae, fungal spores and other members of a soil population are easily lysed within 40 seconds. These benchtop devices use a unique, optimized motion to homogenize samples by multidirectional, simultaneous impaction with lysing matrix particles. FastPrep instruments provide a quick, efficient and highly reproducible homogenization that surpasses traditional extraction methods using enzymatic digestion, sonication, blending, douncing and vortexing.

Samples are placed into 2.0 mL tubes containing Lysing Matrix E, a mixture of ceramic and silica particles designed to efficiently lyse all soil organisms, including historically difficult sources, such as eubacterial spores and endospores, gram positive bacteria, yeast, algae, nematodes and fungi. Homogenization in a FastPrep instrument with Lysing Matrix E takes place in the presence of MT Buffer and Sodium Phosphate Buffer, reagents carefully developed to protect and solubilize nucleic acids and proteins upon cell lysis. These reagents work synergistically to allow extraction of genomic DNA with minimal RNA contamination.

Following lysis, samples are centrifuged to pellet soil, cell debris and lysing matrix. DNA is purified from the supernatant with the Binding Matrix FastDNA procedure using SPIN filters. Eluted DNA is ready for PCR, restriction digest, electrophoresis and any other desired application.

2. KIT COMPONENTS AND USER SUPPLIED MATERIALS

2.1 FastDNA SPIN Kit for Soil Components

	50 preps (116560200)		100 preps (116560300)	
Product	**Size**	**Cat. No.**	**Size**	**Cat. No.**
Lysing Matrix E	50 x 2 mL tubes	116914050	100 x 2 mL tubes	116914100
Sodium Phosphate Buffer	60 mL	116560205	120 mL	116560105
MT Buffer	8 mL	116511202	15 mL	116560602
PPS Solution	15 mL	116560203	30 mL	116560403
Binding Matrix	2 x 30 mL	116540408	4 x 30 mL	116540408
SPIN Modules	50 each	116560210	100 each	112080802
Catch Tubes	50 each	116560211	100 each	112080801
Concentrated SEWS-M	12 mL	116540405	12 mL	116540405
DES	20 mL	116540406	20 mL	116540406
BBS Gel Loading Dye	200 µL	116540407	200 µL	116540407
User Manual	1 each	-	1 each	-
Detailed Protocol	1 each	-	1 each	-
Certificate of Analysis	1 each	-	1 each	-

2.2 User Supplied Materials

- FastPrep instrument *(see Section 8)*
- Microcentrifuge to spin 2.0 mL tubes
- Microcentrifuge tubes (2.0 mL and 1.5 mL)
- Clean 15 mL tubes for DNA binding
- Rotator or low-speed vortex

3. IMPORTANT INSTRUCTIONS BEFORE USE

Sample Lysis with the FastPrep Instrument

The fill volume of the lysing matrix tube after addition of Sodium Phosphate and MT Buffers to the sample should allow sufficient air space in the sample tube for efficient FastPrep instrument processing. MP Bio recommends using up to 500 mg of most soil types. Very wet soils or detritus-rich soils may require less sample by mass. Ensure that there is 250–500 µL of empty space in the tube. Sample loss or tube failure may result from overfilling the matrix tube. The matrix tube caps must be secure, but not over-tightened, to prevent sample leakage. If the sample is too large for processing in a single tube, divide the sample and process using multiple tubes.

MP Bio's Lysing Matrix particles and tubes have been rigorously tested and validated in the FastPrep instrument. The use of other products with the FastPrep instrument is not recommended and may result in sample loss or instrument failure. A single 40 second run at a speed setting of 6.0 in the FastPrep instrument is sufficient to lyse almost all samples. If the user experimentally determines that additional processing time is required, the sample should be incubated on ice in the Lysing Matrix E tube for at least 2 minutes between successive FastPrep instrument homogenizations to prevent overheating the sample and tube.

4. SAFETY PRECAUTIONS

Binding Matrix contains components that, when in contact with human tissue, may cause irritation. Wear personal protective equipment to prevent contact with the skin or mucous membranes (gloves, lab coat, and eye protection).

NOTE ▸ *Consult the Material Safety Data Sheet available online at www.mpbio.com.*

5. FASTDNA SPIN KIT FOR SOIL TYPICAL WORKFLOW

1 PREPARE the sample

ADD up to **500 mg** of soil sample, **978 µL** Sodium Phosphate Buffer and **122 µL** MT Buffer to Lysing Matrix E tube

2 HOMOGENIZE with the FastPrep *(or similar instrument)*

LOAD tube in FastPrep instrument.

PROCESS: 40 s at a speed setting of **6.0 m/s.**

CENTRIFUGE at **14,000 x g** for **5-10 mins** to pellet debris

3 PRECIPITATE proteins

TRANSFER supernatant to a clean 2 mL microcentrifuge tube.

ADD 250 µL PPS and mix 10 times.

CENTRIFUGE at **14,000 x g** for **5 mins** to pellet precipitate.

4 ADJUST binding conditions

TRANSFER supernatant to 15 mL tube.

ADD 1 mL Binding Matrix Solution. Invert **2 mins** and place tube on a rack for **3 mins**.

DISCARD 500 µL of supernatant.

5 BIND the DNA

TRANSFER max 600 µL of DNA Solution to a SPIN Filter Tube.

CENTRIFUGE at **14,000 x g** for **1 min**. Empty catch tube.

Repeat step 5 if the volume of the mixture is higher than 600 µL.

6 WASH the SPIN Filter

ADD 500 µL prepared SEWS-M Solution.

CENTRIFUGE at **14,000 x g** for **1 min**.

Empty catch tube.

7 DRY the SPIN Filter

CENTRIFUGE again at **14,000 x g** for **2 mins**.

AIR DRY SPIN Filter for **5 mins** at room temperature.

8 ELUTE the DNA

ADD 50–100 µL DES Elution Solution.

CENTRIFUGE at **14,000 x g** for **1 min**.

DNA in the catch tube is ready-to-use.

6. TROUBLESHOOTING GUIDE

Observation	Cause	Solution
Wet Soil Sample		Centrifuge sample for 30 seconds at 10,000 x g. Decant most of the liquid, place in the lysing matrix tube and continue with protocol.
Low DNA Yield in Eluate	Insufficient Lysis	Add processing cycles with 2 minutes incubation on ice between cycles to avoid excessive heat buildup.
	Insufficient Binding Matrix	Thoroughly mix Binding Matrix before dispensing for each sample.
	Ethanol Not Added to concentrated SEWS-M	Make sure to add 100 mL of 100% Ethanol to concentrated SEWS-M before use.
	DNA Not Eluted Efficiently	After resuspending binding matrix with DES solution, incubate for 5 minutes at 55 °C before centrifuging the final eluate.
DNA Does Not Amplify	Excess DNA	Dilute DNA accordingly.
	Non-Specific Bands	Further purification of DNA may be necessary, for example, using one of MP Bio's GENECLEAN® Kits.
	Verify PCR Optimization	Changing reaction conditions or primer selection may be necessary.
DNA Fragmented	Use Care with Liquid Transfer	Gently and thoroughly mix the Binding Matrix bound DNA with SEWS-M solution or DES. Use wide-bore pipet tips.
	Optimize Lysis Conditions	Lower the speed and/or duration settings of the FastPrep.
Low A_{260}/A_{280} Ratios for Purified DNA	Ethanol Not Added to concentrated SEWS-M	Make sure to add 100 mL of 100% Ethanol to concentrated SEWS-M before use.
	Proteins Not Removed Efficiently	Efficiently mix PPS solution and lysate (step 6 in detailed protocol) by inverting tube at least 10 times or mix by pipetting. Incubate on ice for 5 minutes to further precipitate proteins.
	Contaminants Not Removed Efficiently	Gently and thoroughly mix the Binding Matrix bound DNA with SEWS-M solution or DES. Use wide-bore pipet tips.
Elevated A_{230} Absorbance	Proteins Not Removed Efficiently	Efficiently mix PPS solution and lysate (step 6) by inverting tube at least 10 times or mix by pipetting. Incubate on ice for 5 minutes to further precipitate proteins.
	Contaminants Not Removed Efficiently	Repeat PPS treatment (step 6). Gently and thoroughly mix the Binding Matrix bound DNA with SEWS-M solution or DES. Use wide-bore pipet tips.
	Residual Ethanol in the Final Eluate	Centrifuge for an additional 2 minutes (step 14) to remove excess SEWS-M solution from the column. Incubate sample at 60 °C during step 15 to aid in removing residual ethanol.

7. REFERENCES

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8. RELATED PRODUCTS

Product Name	Cat. No.
Instruments	
FastPrep-24™ Classic	116004500
FastPrep-24™ 5G	116005500
FastPrep-96™	116010500
Super FastPrep-2™	116012500
MPure-12™	117002200
Kits	
GENECLEAN® SPIN KIT	111101200
GENECLEAN® Kit	111001200
GENECLEAN® II Kit	111001400
GENECLEAN® III Kit	111001600
FastRNA™ Pro Soil-Direct Kit	116070050
FastRNA™ Pro Soil-Indirect Kit	116075050
FastDNA™ SPIN Kit for Soil, 50 mL tubes	116560600
FastDNA™-96 Soil Microbe DNA Kit	119696200
FastPROTEIN™ Blue Matrix	116550400
FastPROTEIN™ Red Matrix	116550600
Lysing Matrix Tubes	
Lysing Matrix A, 2 mL	116910050
Lysing Matrix B, 2 mL	116911050
Lysing Matrix C, 2 mL	116912050
Lysing Matrix D, 2 mL	116913050
Lysing Matrix E, 2 mL	116914050

9. PRODUCT USE LIMITATION AND WARRANTY

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