

# 6970EFM Freezer/Mill®

Grinding and  
Pulverizing



Tissue  
Homogenization  
Cell Lysis



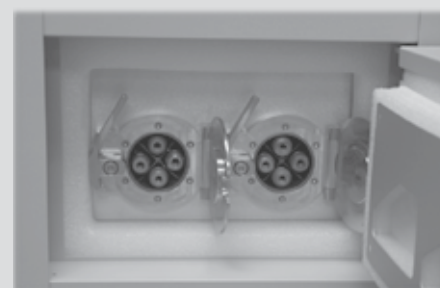
EXTERNAL LOADING



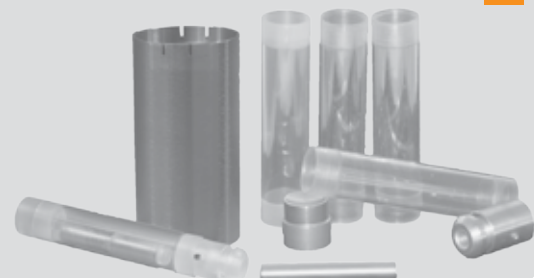
ENCLOSED SYSTEM WITH LIQUID NITROGEN AUTOFILL



HIGH THROUGHPUT



MULTIPLE VIAL SIZES



SPEX SamplePrep®

#### FIELDS OF APPLICATION

- :: Biotechnology
- :: Plant Research and Crop Science
- :: Pesticide Residues
- :: Medicine and Pharmaceuticals
- :: Marine Biology
- :: Forensics
- :: Polymers
- :: RoHS WEEE
- :: Food Science
- :: Materials Science
- :: Nanotechnology and Mechanical Alloying
- :: Glass and Ceramics
- :: Geology and Mining
- :: Environmental Science
- :: Cement, Slag and Fly Ash
- :: Catalysts
- :: National Defense and Homeland Security
- :: Veterinary Drugs



#### 6970D

includes two grinding chambers, increasing grinding capacity to eight 6751 grinding vials. Chambers can be programmed for independent operation and different protocols, providing flexibility and speed.



#### 6970M

includes one grinding chamber and one pre-cool/storage chamber.

# 6970EFM

## Freezer/Mill®

### THE LATEST ADVANCES IN CRYOGENIC GRINDING

- :: For samples that are impossible to grind at ambient temperature
- :: Backed by SPEX SamplePrep's 40 years of experience in cryogenic grinding
- :: Ideal for grinding bone, teeth, hair, tough plant and animal tissue, textiles, plastics, pharmaceuticals and more
- :: DNA/RNA extraction without shearing
- :: No loss of volatile compounds

#### Accuracy

- :: Samples are maintained at Liquid Nitrogen (LN) temperatures

- :: Vials can be cleaned or discarded to eliminate possibility of contamination

#### Safety and Convenience

- :: Totally enclosed LN auto-fill system with no LN exposure

- :: CE compliant

#### Durability

- :: Unique maintenance free design, only one moving part

#### Versatility

- :: Entire system is controlled by a touch screen interface capable of storing up to 10 grinding programs for rapid process replication and consistency
- :: Grinds samples from 0.1-100 grams per grinding chamber (depending on sample characteristics)

For more information please call 855-GET-SPEX or visit [www.spexsampleprep.com/freezermill](http://www.spexsampleprep.com/freezermill)

## ACCESSORIES

### STANDARD GRINDING VIALS

- Sample integrity is maintained in tightly sealed vials
- Polycarbonate center cylinders with steel end plugs and impactors
- Polycarbonate center cylinders are reusable or can be used as disposables
- Three sizes: small samples up to 4mL, mid-size samples for up to 25mL, and large samples for up to 50mL
- Up to four small vials per grinding chamber using multi-vial adapter



### SPECIAL GRINDING VIALS

- Alternative materials available for most vial types
- Poly-Vial sets for grinding soft tissues without metal contamination
- Cr-Free Vial set for RoHS/WEEE testing of electronic components
- Micro-Vial set holds three micro-vials for samples from 0.1-0.5mL
- Steel Center Cylinders for when contact with plastic is not advised



### VIAL EXTRACTORS AND VIAL RACKS

- Vial extractors are used to remove end plugs from center cylinder
- Free vial extractor and rack accessory package supplied with each 6970 Freezer/Mill



### AUTO-EXTRACTOR™

- The 6814 Auto-Extractor is an electrically powered version of the manual vial extractors
- Reduces operator effort and increases throughput by speeding up end plug removal
- Works with large and small vials



### SPEX SAMPLEPREP OFFERS THE COMPLETE SOLUTION FOR AUTOMATED CRYOGENIC GRINDING

- Cryogenic Transfer Hoses to connect Dewar to the auto-fill outlet in the Freezer/Mill
- Cryogenic gloves-designed to protect the hands and arms from ultra-cold materials



## BEFORE & AFTER SAMPLES



## APPLICATION NOTES

### Examples

- SP005 – RNA Extraction from Cartilage Tissue using Cryogenic Grinding
- SP006 - Preparation of Rice Husks for Content Analysis
- SP007 - Grinding Polymers for Qualitative and Quantitative Analyses
- SP015 - Molecular Effects of Pollution in Cetacean Samples (RNA Extraction from Whale Skin and Blubber)

Please visit  
[www.spexsampleprep.com/appnotes](http://www.spexsampleprep.com/appnotes)  
for more FREEZER/MILL application notes.

6970EFM

Freezer/Mill®

## ABSTRACTS

### Biotechnology & Forensics

#### RNA Extraction from Knee Cartilage Tissue

A study to determine the connection between arthritic diseases and certain genes was conducted. Knee cartilage tissue was taken from patients and snap frozen in liquid nitrogen for storage. Samples were ground in the large Freezer/Mill using small vials and a multi-vial adapter. Grinding was completed in three cycles of two minutes each. The total processing time of 12 minutes included precool, grinding, and cooling between grinding cycles. RNA was subsequently purified using a phenol-chloroform extraction method with yields of RNA between 2 & 20 µg.

### Polymers & Materials Research

#### Grinding Polymers for Qualitative and Quantitative Analysis

Compact synthetics (pellets, webbing fabric, textiles) and polymer yarns, fleece material and filaments were successfully ground in the small Freezer/Mill. Cryogenic grinding was required for accurate qualitative and quantitative analysis of additives such as antioxidants using HPLC and INOC-Test. The Freezer/Mill efficiently reduced these samples to particle sizes of less than 500 µm in less than 15 minutes without thermal degradation.

### Crop Research

#### Preparation of Rice Husks for Content Analysis

A study to analyze the quantity of vitamins and important minerals in rice husks was performed. 8g of sample was ground in the large Freezer/Mill. Rice husks are extremely tough and in 3 grinding cycles of 3 minutes each, very good homogenization of the rice husks was achieved. The analytical fineness of the homogenized sample enabled efficient extraction of the desired components for analysis.

**SPEX SamplePrep®**

Your Science is Our Passion.®

#### Customer Service

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2010

## THE ULTIMATE PLANT & ANIMAL TISSUE PULVERIZER & CELL LYSER

*The 2010 Geno/Grinder*

- Specifically designed for vigorous up-and-down shaking of deep-well titer plates and sample vials from 0.6 to 50mL
- Used to prepare tissue for extractions of nucleic acid, protein, and other constituents such as pesticides
- Sample material includes seeds, stems, roots, leaves and soft animal tissue
- Samples are pulverized with a large choice of grinding media, with or without buffer
- Unique vertical motion with variable rate settings for mixing and pulverizing samples

For more information on the Geno/Grinder, please visit:  
[www.spexsampleprep.com/genogrinder](http://www.spexsampleprep.com/genogrinder)



Your Science is Our Passion.™



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## DEMO PROGRAM: TRY IT BEFORE YOU BUY IT

SPEX SamplePrep gives you the opportunity to try out our sample preparation equipment in your laboratory for one week.

**Best of all, our Demo Program is COMPLIMENTARY!!!**

Once you try our quality products you'll ask yourself how you ever lived without them.

For more information please call 1-855-GET-SPEX or visit [www.spexsampleprep.com/freezermill](http://www.spexsampleprep.com/freezermill)