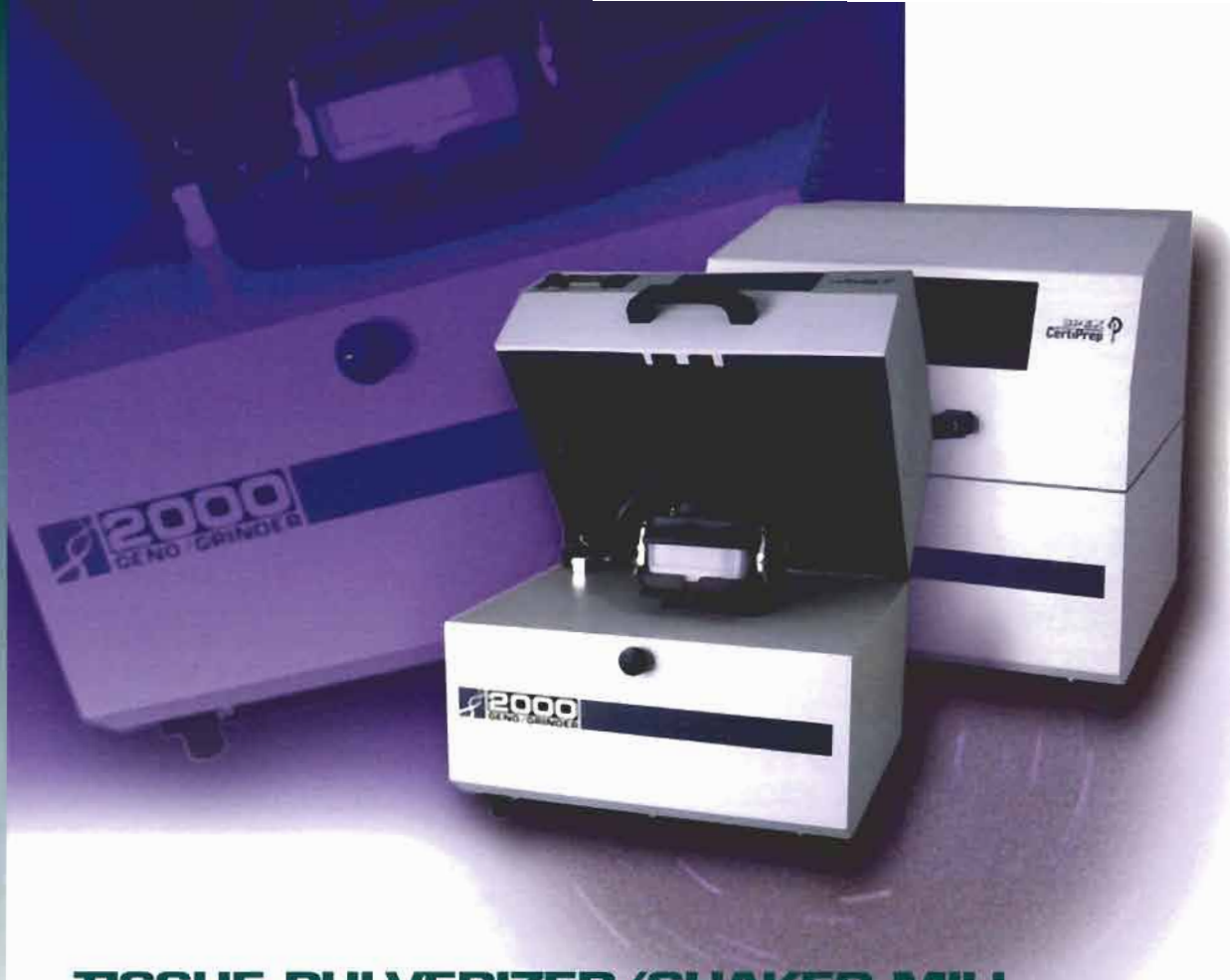
2000 GENO/GRINDER®



TISSUE PULVERIZER/SHAKER MILL

The SPEX CertiPrep Model 2000 Geno/Grinder is a new laboratory mill specifically designed for vigorous up-and-down shaking of deep-well titer plates. It is typically used to prepare plant tissue for extractions of nucleic acid, protein, and other constituents.

Sample material that can be prepared includes seeds, stems, roots, leaves, and certain animal tissue. Because the unique vertical shaking motion of the Geno/Grinder is so strong, many seeds and other forms of plant tissue can also be pulverized dry in titer plates with the help of one or two grinding balls per well.

SPECIFICATIONS:

Dimensions:	20.5 in. (52 cm) wide x 16.9 in. (43 cm) deep x 22 in. (56 cm) high
Weight:	110 lbs. net (50 kg), 168 lbs. gross (76 kg)
Motor:	1/2 HP
Power Cord:	3-prong grounded plug for 115 V/60 Hz version, 2-prong European plug for 230 V/50 Hz version
Clamp Movement:	1.25 in. (3.2 cm) vertical
Clamp Speed:	Adjustable from 500 to 2000 strokes/minute
Safety Features:	Two safety interlocks, lockdown lid, two-stage latching clamps
Timer:	Digital in minutes: seconds, maximum 99:59 (typical running times are under 2 minutes)

SAMPLE CONTAINERS

While the Geno/Grinder clamp is designed to hold two standard deep-well titer plates, it can adapt to anything of the same general dimensions (5 in. long x 3 in. wide x 2 in. high). This includes titer plates with fewer and/or larger wells, racks which hold multiple individual vials, and other possible configurations. The clamp can also accommodate different sample containers with heights up to 2.25 inches.

SPEX CertiPrep INC.

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APPLICATION SUMMARY

GRINDING MEDIA GUIDE:

SAMPLE	GRINDING MEDIA
Soy Beans	#2150 - 4mm Steel Beads (One/Well)
Corn Seeds	#2150 - 4mm Steel Beads (One/Well)
Yeast	#2166 - Silica Beads (400-600 µm)
Fungi	#2166 - Silica Beads (400-600 µm)
Clostridium	#2171 - Silica Resin (100-400 µm)
Peas	#2150 - 4mm Steel Beads (One/Well)
Cotton Seed	#2150 - 4mm Steel Beads (One/Well)
Frozen Corn leaves	#2150 - 4mm Steel Beads (One/Well)
Fresh Sorghum leaves in buffer	#2150 - 4mm Steel Beads (One/Well)
Muscle Tissue	#2150 - 4mm Steel Beads (One/Well)
Cultured Cells	#2180 - Zirconium Beads (200-400 µm)
Bacterial Cells	#2166 - Silica Beads (400-600 µm)

RAPID PREPARATION OF GENOMIC DNA FROM CULTURED CELLS FOR PCR™ ANALYSIS

PCR has revolutionized the scientist's ability to detect and quantify nucleic acid sequences for research and diagnostic purposes. However, the process is slowed in that PCR methods usually require a purification step prior to template amplification. This involves harvesting cells and/or solubilizing the nucleic acids, followed by separating the nucleic acids from lysis reagents using chromatography resins. Though these purification methods have evolved to be rapid, they still require time and materials that can be costly in a high-throughput environment.

Geno/Grinder technology is used for a rapid and low-cost method to prepare cultured cells for PCR analysis of genomic DNA. This approach circumvents the need for purification methods using chromatography resins or columns by simply homogenizing the cells and performing the PCR analysis on the lysate. This approach has been developed for micro-well plates and is therefore amenable to high-throughput operations.

NUCLEIC ACID EXTRACTION FROM PLANT MATERIAL

The isolation of nucleic acids from intact seeds requires mechanically disrupting the seed followed by the extraction and subsequent purification of the nucleic acid. The mechanical disruption is often performed manually with a mortar and pestle, an approach that is not practical for high throughput screening of seeds as manual grinding is slow and reuse of mortar and pestles may lead to cross-contamination. Nucleic acids can be isolated from seeds in a micro well plate format using the Geno/Grinder to mechanically disrupt the seeds. Conventional isolation methodologies can then be used to purify the nucleic acids from the seed homogenates. Soy beans that are soaked overnight in water are effectively and uniformly homogenized in less than 3 minutes. The resulting pulp can then be used as a source of DNA for genetic analysis.

HIGH THROUGHPUT DISRUPTION OF YEAST IN A 96-WELL FORMAT

The wealth of information generated from years of biochemical, genetic, and molecular analyses has made yeasts both model biological systems and tools for biopharmaceutical scientists. Consequently, yeast are a popular host for gene expression studies and for the production of recombinant proteins. Though many yeast species are in use, including *Pichia, Hansenula, and Debaryomyces,* the most popular yeast continues to be *Saccharomyces.*

Yeast mRNA and intracellular proteins are often difficult to extract intact from cells by traditional enzymatic methods. Lysing enzymes are often crude preparations containing RNases and proteases that will not only attack the cell wall, but also the molecules of interest. Furthermore, protoplasts generated from enzymatic digestion usually require lysis with detergents that will also denature many proteins to inactivity. Therefore, mechanical cracking/fracturing of the yeast cell is often required to liberate the molecules. For experiments where large numbers of yeast clones must be examined in a high throughput-screening environment, the Geno/Grinder can be used to disrupt yeast in a micro well plate format.

LYSING OF BACTERIAL CELLS *(Halomonas elongate and Bacillus)*

The Geno/Grinder can lyse bacterial cells via a ballistic method. Two techniques have been developed, using either the gram-negative salt tolerant Bacterium known as *Halomonas elongate* or gram-positive *Bacillus.* The organism is grown, harvested and washed to remove spent medium. A cell pellet is suspended in a brine solution and shaken in the Geno/Grinder with grinding media, for 6 - 9 minutes to produce a measurable amount of nucleic acid.

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