

Cole-Parmer®

HG-600/HG-400 Geno/Grinder®

Tissue and Cell Lyser for Biological Applications

Accessory Manual



For Product Information



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TRAYS



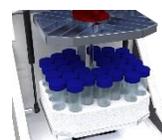
2012T Nesting Tray Set Geno/Grinder®

Nesting trays used to stack titer plates vertically in the adjustable clamp (#2011). Set comes with two nesting mid-plates and one bottom plate.



1690T Nesting Tray for MiniG®

Nesting trays used to stack titer plates vertically in the MiniG® adjustable clamp (#1690).



2014 High-Capacity Clamp

Thick, rugged foam block holds 30 standard 50 mL centrifuge tubes (#2253-PC-48). Includes clamp insert for #2011/2012 Geno/Grinder Clamp (only) and locking knob with lid.

GRINDING BALLS AND DISPENSERS

Stainless steel and Zirconia balls are useful for grinding large or tough samples. The choice of ball size should be determined based on the sample material and the size of the grinding vial or titer plate. After use, the grinding balls can be discarded or cleaned for re-use.



2150 Grinding Balls, nominal diameter 5/32 in. (4 mm)

Made of 440C stainless steel. Used with Grinding Ball Dispenser (#2100); 96-well titer plates (#2200, #2210, #2205-50). Sold in package of 5,000.



2151 Grinding Balls, nominal diameter 4/32 in. (3 mm)

Made of 440C stainless steel. Used with 96-well titer plate (#2200, #2210); polypropylene microfuge tube (#2300-500E) or reinforced polypropylene tube (#2310). Sold in package of 1000.



2154 Grinding Balls, nominal diameter 1/4 in. (6.35 mm)

Made of 440C stainless steel. Used with reinforced polypropylene tube (#2310).



2155 Grinding Balls, nominal diameter 3/8 in. (9.5 mm)

Made of 440C stainless steel. Used with 24-well titer plate (#2230); vial (#2241-PC) or frosted vial. Sold in package of 100.



2156 Grinding Balls, nominal diameter 7/16 in. (11 mm)

Made of 440C stainless steel. Used to grind large or tough sample(s) with 24-well titer plate (#2230) or pre-cleaned vial set (#2250). Sold in package of 100.



2157 Grinding Balls, nominal diameter 1/2 in. (12.7 mm)

Made of 440C stainless steel. Used to grind large or tough sample(s) with a thick-walled polycarbonate jar (#2254) or cryogenic grinding vial (#2255). Sold in package of 50.

	<p>2158 Grinding Balls, nominal diameter 25/32 in. (20 mm)</p> <p>Made of 440C stainless steel. Used with polycarbonate vial only (#2253-PC-48). Sold in package of 50.</p>
	<p>2186 Zirconia Grinding Balls, nominal diameter 15/64 in. (6 mm)</p> <p>Made of zirconia. Used with reinforced polypropylene tube (#2310). Sold in package of 1,000.</p>
	<p>5005B Grinding Balls, nominal diameter 5/16 in. (7.9 mm)</p> <p>Made of 440C stainless steel. Used with a thick-walled polycarbonate jar (#2254).</p>
	<p>5006B Grinding Balls, nominal diameter 5/16 in. (7.9 mm)</p> <p>Made of tungsten carbide. Used with a thick-walled polycarbonate jar (#2254).</p>
	<p>6133B Grinding Balls, nominal diameter 9/16 in. (14 mm)</p> <p>Made of chrome steel. Used with reinforced vial only (#6133PC-T).</p>
	<p>2100 Grinding Ball Dispenser</p> <p>Simultaneously dispenses one 5/32 in. (4 mm) steel grinding ball (#2150) into each well of a standard 96-well titer plate (#2200, #2210, #2205-50).</p>
	<p>2110M-12 Magnetic Tips</p> <p>Converts micropipette dispensers into pin magnets for removing steel grinding balls from deep-well titer plates. Sold in package of 12 or 96 (#2110M-96).</p>

GRINDING BEADS

Molecular Biology Grade Grinding Beads are treated to inactivate contaminating enzymes and have been tested accordingly. Low Binding Grinding Beads are coated to reduce non-specific binding of nucleic acids and proteins and are used for lysing dilute samples of cells. Acid Washed Grinding Beads are treated to remove fine particles and contaminants. Contact us for detailed instructions.

	<p>Silica Grinding Beads</p> <p>Acid washed silica grinding beads. Available in sizes 800-1000 μm (#2160) and 400-660 μm (#2165). 200 g bottle.</p>
	<p>Low Binding Silica Beads</p> <p>Acid washed and chemically treated to keep samples from binding to titer plate wells. Available in sizes 800 μm (#2162), 400 μm (#2167), 100 μm (#2168).</p>
	<p>2166 Silica Grinding Beads Molecular Biology Grade, 400-600 μm</p> <p>Acid washed RNase/DNase-free treated silica beads. 200 g bottle.</p>

	<p>2180 Zirconia Grinding Beads, Molecular Biology Grade, 200-400 µm</p> <p>Acid washed RNase/DNase-free treated zirconia beads. 250 g bottle.</p>
	<p>Low Binding Zirconia Beads</p> <p>Acid washed and chemically treated to keep samples from binding to titer plate wells. Available in sizes 100 µm (#2181) and 200 µm (#2182). 250 g bottle.</p>
	<p>2302-30 (3 mm) Zirconium Beads</p> <p>Acid washed zirconium beads, 300 g bottle.</p>

GRINDING CYLINDERS

Our chemically inert ceramic cylinders are specifically designed for the QuEChERS method which is used to extract pesticide residues or other organic contaminants from fruits, vegetables, meat or seafood. The angle-cut ends help the cylinders to shear the sample matrix and break up salt agglomerates during processing, reducing extraction time and resulting in a thorough extraction of analytes into the solvent. Typically, 2 cylinders are used per sample vial.

	<p>Ceramic Grinding Cylinder</p> <p>Ceramic grinding cylinder with angle-cut ends. Sold in bags of 100. Available in large 3/8 in. x 7/8 in. (#2183) for use with standard 50 mL centrifuge tubes, medium 5/16 in. x 5/8 in. (#2184) for use with standard 15 mL centrifuge tubes and small 5/32 in x 5/16 in. (#2185) for use with standard 5 or 15 mL centrifuge tubes.</p>
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TITER PLATES AND CAP-MATS

While most titer plates can be used in the Geno/Grinder, we carry sturdy titer plates that have been tested extensively with various samples and resist perforation by steel grinding balls even at high clamp speeds. They can be used for many applications including sample libraries, mother-to-daughter automated plate pipetting, large sample dilutions and cell suspensions. Suitable for RNA extraction when used with 2600 Cryo-Station. Titer plates are made of polypropylene, with alphanumeric marks for well identification. Cap-Mats seal titer plate wells, preventing spills and well-to-well contamination. Rugged, silicone rubber Cap-Mats may be sterilized and re-used.

	<p>2200-100 96-Well Titer Plate, Square Wells</p> <p>Square 2.4 mL wells with a working capacity of 2.0 mL. Used with the Grinding Ball Dispenser (#2100). Sold as a case of 100 or single (#2200). This titer plate is recommended for dry grinding.</p>
	<p>2201-10 Cap-Mat</p> <p>Sealing mats only for the 96-well titer plate (#2200). Sold in package of 10 or single (#2201).</p>

	<p>2205-10 96-Square Well Reinforced Titer Plate, Round Bottom Wells</p> <p>Square 1.4 mL wells with a working capacity of 1.0 mL. Used with the Grinding Ball Dispenser (#2100). Sold in package of 10. DNase/RNase free. This titer plate is recommended for dry and wet grinding. (available in case of 50, #2205-50).</p>
	<p>2206-10 Cap-Mat</p> <p>Sealing mat only for the 96-well titer plate (#2205-10). Tough silicone rubber prevents leaks and cross-well contamination. May be sterilized and reused. Sold in package of 10. (available in case of 50, #2206-50).</p>
	<p>2210-100 96-Well Titer Plate, Round Wells</p> <p>Round 1.0 mL wells, rugged polypropylene, alphanumeric marks for well identification. Used with the Cryo-Adapter (#2650) which is inserted from the bottom in gaps between wells to keep plates and samples chilled to preserve RNA or proteins for extraction. Sold in packs of 100 or single (#2210).</p>
	<p>2211-10 Cap-Mat</p> <p>Sealing mats only for the 96-well titer plate (#2210). Tough silicone rubber prevents leaks and cross-well contamination. May be sterilized and reused. Sold in package of 10 or single (#2211).</p>
	<p>2220-100 48-Well Titer Plate</p> <p>Rectangular 5 mL wells with a working capacity of 2 mL per well. Use with steel grinding balls (#2150). Sold in package of 100 or single (#2220).</p>
	<p>2221-10 Cap-Mat</p> <p>Sealing mats only for the 48-well titer plate (#2220). Sold in package of 10 or single (#2221).</p>
	<p>2230-100 24-Well Titer Plate</p> <p>Square 10 mL wells with a working capacity of 4 mL per well. Use with steel grinding balls (#2155, #2156). Sold in package of 100 or single (#2230).</p>
	<p>2231-10 Cap-Mat</p> <p>Sealing mats only for the 24-well titer plate (#2230). Tough silicone rubber prevents leaks and cross-well contamination. May be sterilized and reused. Sold in package of 10 or single (#2231).</p>

VIALS AND VIAL SETS

Vial sets are an alternative to titer plates. Vials can be filled and sealed individually, and the larger vials can hold bigger samples than titer plates. Replacement vials and steel balls can be purchased separately.

	<p>2142-PE (7 mL) Polyethylene Vial</p> <p>Polyethylene vial with screw-on polyethylene cap. The nominal outer diameter measures 5/32 in. x 2 in. long (18 mm x 51 mm). Pre-cleaned. Grinding load per vial 3 g; mixing load 5 mL. Sold in package of 50.</p>
	<p>2240-PC (4 mL) Polycarbonate Tapered Vial Set</p> <p>Set of 24 pre-cleaned tapered vials (#2241-PC) with screw-on polyethylene cap. The nominal outer diameter (center) measures 1/2 in. x 2 in. long (12.7 mm x 50.8 mm). Pre-loaded with one 3/8 in. (9.5 mm) stainless steel grinding ball (#2155). Used with the Cryo-Block (#2662) and the Vial-Holder (#2191). Grinding load per vial 1-2 g; mixing load 2 mL. Sold in package of 10.</p>
	<p>2240-PEF (5 mL) Pre-Cleaned Frosted Polyethylene Vial Set</p> <p>Set of 24 vials with screw-on polyethylene cap. The nominal outer diameter measures 1/2 in. x 2 in. long (12.7 mm x 50.8 mm). Pre-loaded with one 3/8 in. (9.5 mm) stainless steel grinding ball (#2155). Can also be used with the Cryo-Block (#2663) and the Vial-Holder (#2191). Grinding load per vial 1-3 g; mixing load 3 mL. Sold in package of 10.</p>
	<p>2241-PC (4 mL) Polycarbonate Tapered Vial</p> <p>Polycarbonate tapered vial with screw-on polyethylene cap. The nominal outer diameter (center) measures 1/2 in x 2 in. long (12.7 mm x 50.8 mm). Holds one 3/8 in. (9.5 mm) stainless steel grinding ball (#2155). May be used with the Cryo-Block (#2662) and the Vial-Holder (#2191). Grinding load per vial 1-2 g; mixing load 2 mL. Sold in package of 240.</p>
	<p>2241-PEF-200 (5 mL) Frosted Polyethylene Vial</p> <p>Frosted polyethylene vial with screw-on polyethylene cap. The nominal outer diameter measures 1/2 in. x 2 in. long (12.7 mm x 50.8 mm). Holds one 3/8 in. (9.5 mm) stainless steel grinding ball (#2155). May be used with the Cryo-Block (#2663) and the Vial-Holder (#2191). Grinding load per vial 1-3 g; mixing load 3 mL. Sold in package of 200.</p>
	<p>2248 (12 oz.) Jar</p> <p>12 oz. (355 mL) polyethylene terephthalate (PET) jar. Not pre-cleaned. Not recommended for liquids, or wet mixing. Sold in package of 8.</p>
	<p>2250 (15 mL) Pre-Cleaned Short Polycarbonate Vial Set</p> <p>Set of 5 pre-cleaned vials (#2250) with screw-on polyethylene cap. The nominal outer diameter measures 1 1/8 in. x 1 2/3 in. long (29 mm x 42 mm). Pre-loaded with two 7/16 in. (11 mm) stainless steel grinding balls (#2156). May be used with the Cryo-Block (#2660) and the Vial-Holder (#2193). Grinding load per vial 1-5 g; mixing load 10 mL. Sold in package of 10.</p>
	<p>2254 (75 mL) Thick-Walled Jar Set Polycarbonate</p> <p>Polycarbonate body with screw-on polypropylene cap and rubber gasket. Supplied with two 1/2 in (12.7 mm) stainless steel balls (#2157). The nominal outer diameter measures 2 in. x 3 in. long (51 mm x 76.2 mm). Grinding load per vial 1-20 g; mixing load 40 mL. Sold in pairs.</p>

	<p>2251-PC (15 mL) Short Vial Polycarbonate</p> <p>Polycarbonate vial with screw-on cap. The nominal outer diameter measures 1 1/8 in. x 1 2/3 in. long (29 mm x 42 mm). Holds two 7/16 in. (11 mm) stainless steel grinding ball (#2156). May be used with the Cryo-Block (#2660) and the Vial-Holder (#2193). Pre-cleaned with grinding load per vial 1-5 g; mixing load 10 mL. Sold in package of 100.</p>
	<p>2251S Silicone Lined Cap for 2251-PC, 2250 (15 mL) Short Vial Polycarbonate</p> <p>The polypropylene caps are lined with a thick 3/32 in. red silicone disc that prevents cracking. The cap firmly seals vials. Replacement caps (only). Sold in package of 100.</p>
	<p>2252-PC-30 (15 mL) Tall Vial Polycarbonate</p> <p>Polycarbonate round-bottomed centrifuge tube vial with screw-on polyethylene cap. The nominal outer diameter measures 5/8 in. x 4 3/4 in. long (16 mm x 120.65 mm). Holds one 3/8 in. (9.5 mm) stainless steel grinding ball (#2155). Grinding load per vial 1-5 g. Not recommended for liquids or wet mixing. Sold in package of 30.</p>
	<p>2253-PC-48 (50 mL) Polycarbonate Vial</p> <p>Polycarbonate round-bottomed centrifuge tube vial with screw-on polyethylene cap. The nominal outer diameter measures 1 1/8 in. x 4 1/2 in. long (29 mm x 114.3 mm). Holds two 7/16 in. (11 mm) stainless steel grinding balls (#2156). Grinding load per vial 1-10 g. Not recommended for liquids or wet mixing. Sold in package of 48.</p>
	<p>2300-500E</p> <p>2 mL Polypropylene microfuge tube. Grinding load 60-120 mg; mixing load 1.0 mL. Sold in package of 500.</p>
	<p>2310 (2 mL) Reinforced Tube</p> <p>Reinforced polypropylene, Self-standing 2 mL microfuge tube with screw-on polyethylene cap. The nominal outer diameter measures 25/64 in. x 1 27/32 in. long (10 mm x 47 mm). Grinding load per tube 60-120 mg; mixing load 1.0 mL. Sold 200 per pack.</p>
	<p>2256 (16 oz.) Jar</p> <p>16 oz. (480 mL) polyethylene terephthalate (PET) jar. Not pre-cleaned. Not recommended for liquids or wet mixing. Sold in packs of 12.</p>
	<p>2258 (25 oz.) Jar</p> <p>25 oz. (750 mL) polyethylene terephthalate (PET) jar. Not pre-cleaned. Not recommended for liquids or wet mixing. Sold in packs of 4.</p>
	<p>6133PC-T (12 mL) Polycarbonate Vial</p> <p>Reinforced polycarbonate vial with slip-on cap. Holds one (14 mm) stainless steel grinding ball (#6133B). Not pre-cleaned. Grinding load per vial 1 – 3 g. Not recommended for use with liquids. Sold in package of 100.</p>

PRE-LOADED 2 ML DISRUPTION TUBES

Ideal for fast and simple setup—add samples and you're ready to go. Vials are self-standing, making it easier to add samples, and are prefilled with your choice of molecular biology grade silica beads, acid washed silica or zirconia beads, silica beads or steel balls. Approximate grinding load per vial 60-120 mg; mixing load 1.0 mL.

	<p>2301-100MB</p> <p>2 mL microfuge tube with screw-cap, prefilled with 1200 mg of 100 µm molecular biology grade silica beads. Sold in package of 100.</p>
	<p>2302-100AW2</p> <p>2 mL microfuge tube with screw-cap, prefilled with 600 mg of 100 µm acid washed zirconia beads. Available as 200 µm (#2302-200AW). Sold in package of 100.</p>
	<p>2302-1000AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 1.0 mm acid washed zirconia beads. Sold in package of 100.</p>
	<p>2302-1400AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 1.4 mm acid washed zirconia beads. Sold in package of 100.</p>
	<p>2302-1700AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 1.7 mm acid washed zirconia beads. Sold in package of 50.</p>
	<p>2302-3000AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 3 mm acid washed zirconia beads. Sold in package of 50.</p>
	<p>2302-6000AW</p> <p>2 mL microfuge tube with 6 mm Ceria Stabilized Zirconia beads. For grinding tough plant samples. Sold in package of 100.</p>
	<p>2303-MM1</p> <p>2 mL microfuge tube with screw-cap, prefilled with garnet and zirconia satellites. Sold in package of 100.</p>
	<p>2303-MM2</p> <p>2 mL microfuge tube with screw-cap, prefilled with 800 µm and 1.4 mm acid washed zirconia beads. Sold in package of 100.</p>

	<p>2303–MM3</p> <p>2 mL microfuge tube with screw-cap, prefilled with 100 µm silica beads, 1.4 mm zirconia beads and a 4 mm acid washed silica bead. Sold in package of 100.</p>
	<p>2304–100AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 100 µm acid washed silica beads. Sold in package of 100.</p>
	<p>2304–400AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 400 µm acid washed silica beads. Sold in package of 100.</p>
	<p>2304–800AW</p> <p>2 mL microfuge tube with screw-cap, prefilled with 800 µm acid washed silica beads. Sold in package of 100.</p>
	<p>2305-2800SS</p> <p>2 mL microfuge tube with screw-cap, prefilled with 2.8 mm stainless steel grinding balls. Sold in package of 50.</p>

HOLDERS

The Holders are designed to hold vials securely in place on the HG-600 Geno/Grinder® or HG-400 MiniG® during processing. They are lightweight and can also be used on the benchtop and to transport samples within the laboratory.

HG-400 MINIG® VIAL HOLDERS

	<p>1680 (2 mL) Foam Holder for MiniG®</p> <p>Rugged foam block holds 24 standard 2 mL vials (#2310, #2300-500E). Sold as a pair.</p>
	<p>1681 (5 mL) Block</p> <p>Rugged Foam Block Holds 24 standard 5 mL or 4 mL vials (#2241-PEF-200, #2241-PC). Sold in pairs.</p>
	<p>1685 (15 mL) Foam Holder for MiniG®</p> <p>Rugged foam block holds 12 standard 15 mL centrifuge vials (#2252-PC-30).</p>
	<p>1686 (50 mL) Foam Holder for MiniG®</p> <p>Rugged foam block holds six standard 50 mL centrifuge vials (#2253-PC-48).</p>

	<p>1687 Foam Holder Foam holder for 15 mL polycarbonate jars (#2251-PC), holds 6 vials.</p>
	<p>1688 Foam Holder Foam holder for 75 mL polycarbonate jars (#2254), holds 2 jars.</p>
HG-600 GENO/GRINDER 2010® VIAL HOLDERS	
	<p>2140 (7 mL) Vial Holder Holds 24 x 7 mL polyethylene vials (#2142-PE).</p>
	<p>2191 (5 mL) Vial Holder Thick, rugged foam block holds 48 standard 5 mL or 4 mL centrifuge vials. Used with Polycarbonate and Frosted Polyethylene Vial (#2241-PEF-200, #2241-PC).</p>
	<p>2193 (15 mL) Vial Holder Holds 12 x 15 mL polycarbonate vials (#2250, #2251-PC).</p>
	<p>2196-16-PE Holder for 50 mL Centrifuge Tube Thick, rugged foam block holds 16 standard 50 mL centrifuge tubes (#2253-PC-48).</p>
	<p>2197 Holder for 15 mL Centrifuge Tube Thick, rugged foam block holds 24 standard 15 mL centrifuge tubes (#2252-PC-30).</p>
	<p>2198 Foam Holder for 75 mL Polycarbonate Jars Thick, foam block holds six 75 mL thick wall Polycarbonate jars (#2254).</p>
	<p>2198-24 -PE Foam Holder for 12 mL Reinforced Polycarbonate Vial Holds 24 vials (#6133PC-T).</p>
	<p>2257 Foam Holder Thick, rugged polyethylene foam block holds up to sixteen cryogenic grinding vials (#2255).</p>



2259 Holder for PET Jars

Foam holder for two 25 oz. (750 mL) polyethylene terephthalate jars (#2258) or four 12 oz (355 mL) polyethylene terephthalate jars (#2248).



2300 Holder for 2 mL Micro-centrifuge Tubes

Thick, rugged foam block holds 48 microfuge tubes (#2310, #2300-500E).

PRE-LOADED DISRUPTION TUBES REFERENCE TABLE

VPN	2 ML VIAL SET	DETAILS
2301-100MB	100 µm Silica Beads (1200 mg)	Economical bead for disrupting bacteria.
2302-1400AW	1.4 mm Zirconia Beads	Suitable for small tissue samples and biomass.
2303-MM1	Garnet & ZrO ₂ Satellites	General Sample Shredding.
2303-MM2	800 micron & 1.4 mm Zirconia Beads	Mycelium & Soft Leaves.
2303-MM3	100 micron Si, 1.4 mm Zr, & 4 mm Si	Biofilms & Plant Tissues.
2304-100AW	100 µm Silica Beads (600 mg)	Suitable for Bacteria.
2302-100AW2	100 µm Zirconia Beads (600 mg)	Zirconium beads are of higher density; excellent for bacterial disruption.
2304-400AW	400 µm Silica Beads	Size is ideal for yeasts such as Saccharomyces.
2304-800AW	800 µm Silica Beads	Size is suitable for molds and pollen.
2302-1000AW	1.0 mm Zirconia Beads	Beads are suitable to disrupt finer soils.
2302-1700AW	1.7 mm Zirconia Beads	Effective for larger tissue samples and fine plant materials.
2305-2800SS	2.8 mm Stainless Steel Grinding Balls	Most dense of all the grinding media, popular for their moderate cost. Good for tissues.
2302-3000AW	3.0 mm Zirconia Beads	Good for larger tissue samples. Excellent chemical resistance to organics.
2302-6000AW	6 mm Ceria Stabilized Zirconia Beads	Ideal for grinding tough plant samples.
2302-200AW	200 µm Zirconium Beads	Suitable for bacteria and small yeast (e.g. Pichia).

KRYO-TECH® ACCESSORIES

These accessories are used to chill samples to cryogenic temperature and to maintain temperature during grinding in the Geno/Grinder®. Additional products for liquid nitrogen handling, such as protective gloves (#6900) and portable dewars, can be found in the Freezer/Mill® section of Handbook.

	<p>2189C Cryoplate (Geno/Grinder®)</p> <p>The Cryoplate (#2189C) keeps sample lids cold during the grinding process. Used with Cryo-Block or Cryo-Adapter (#2650) for titer plates.</p>
	<p>2255 Cryogenic Grinding Vial Pack</p> <p>Used to grind tough materials (e.g. bone) at cryogenic temperatures. Used with the extractor (#2261). Package includes four sets of cryogenic vials, each with 1 cylinder, 2 end plugs, and 2 stainless steel balls (#2157). For use with the polyethylene foam holder (#2257) or the Cryo-Block (#2260). Grinding load 1-5 g; 10 mL. Sold in a pack of 4.</p>
	<p>2255C4 Polycarbonate Center Cylinder</p> <p>Replacement polycarbonate center cylinders for cryogenic grinding vial set (#2255). Sold in package of 4.</p>
	<p>2255C20 Polycarbonate Center Cylinder</p> <p>Replacement polycarbonate center cylinders for cryogenic grinding vial set (#2255). Sold in package of 20.</p>
	<p>2600 Cryo-Station</p> <p>The Cryo-Station holds temperature sensitive samples that must be kept chilled for cryogenic grinding, RNA, or proteins for extraction. It has an insulated jacket and can be filled manually or automatically with liquid nitrogen. The well of the Cryo-Station reaches liquid nitrogen temperatures quickly. Up to two Cryo-Blocks can be placed in the well to be chilled and kept cold prior to grinding. The well can also hold a chilled cutting board to prepare temperature sensitive samples.</p>
	<p>2650 Cryo-Adapter for Titer Plates</p> <p>Extruded aluminum insert for the 96-well titer plate (#2210). When inserted in titer plate and chilled in 2600 Cryo-Station, the Cryo-Adapter (#2650) keeps samples in titer plate cold during grinding, preserving RNA and proteins. Sold in pairs.</p>
<h2>EXTRACTOR</h2>	
	<p>2261 Extractor</p> <p>Vial opener for the cryogenic grinding vial (#2255). Used to remove the End Plug from the center cylinders of the cryovial.</p>

CRYO-BLOCKS

Aluminum Cryo-Blocks are designed to keep sample tubes or vials cold during processing. They can be pre-cooled in liquid nitrogen, dry ice, or a freezer. Cryo-Blocks should always be used two at a time to balance the load in HG-600 Geno/Grinder® Clamps.

HG-400 MINIG® CRYO-BLOCKS



1660 (2 mL) Cryo-Block

Lightweight cryo-block for 2 mL vials with a hollow base and a lid to help the samples maintain cold temperature during processing. Holds 48 vials.



1665 (5 mL) Cryo-Block

Lightweight cryo-block for 5 mL vials with a hollow base and a lid to help the samples maintain cold temperature during processing. Holds 24 vials.



1666 Cryo-Block for 15 mL Centrifuge Tubes

Aluminum block that holds fifteen 15 mL round-bottom centrifuge tubes.



1667 Cryo-Block for 50 mL Centrifuge Tubes

Aluminum block that holds six 50 mL round-bottom centrifuge tubes.



1668 Cryo-Block for 15 mL Polycarbonate Vials

Aluminum block that holds six short polycarbonate vials (#2251PC).

HG-600 GENO/GRINDER 2010® CRYO-BLOCKS



2260 Cryo-Block for 2255 Vial

Aluminum block holds eight cryogenic grinding vials (#2255). Two Cryo-Blocks, allows 16 samples to run simultaneously. Sold in pairs.



2660 Cryo-Block for 15 mL Polycarbonate Vials

Aluminum block that holds six short polycarbonate vials (#2251PC). Sold in pairs.



2661 Cryo-Block for 15 mL Centrifuge Tubes

Aluminum block that holds fifteen 15 mL round-bottom centrifuge tubes. Sold in pairs.

	<p>2662 Cryo-Block for 4 mL Polycarbonate Tapered Vials</p> <p>Aluminum block that holds twenty-four polycarbonate tapered vials (#2241-PC). Sold in pairs.</p>
	<p>2663 Cryo-Block for 5 mL Polyethylene Vials</p> <p>Aluminum block that holds twenty-four frosted polyethylene vials (#2241-PEF). Sold in pairs.</p>
	<p>2664 Cryo-Block for 50 mL Centrifuge Tubes</p> <p>Aluminum block that holds six standard conical-bottom 50 mL centrifuge tubes for cryogenic milling. Sold in pairs.</p>
	<p>2665 Cryo-Block for Micro-centrifuge or PCR Tubes</p> <p>Aluminum block that holds 96 standard (0.6 mL) micro-centrifuge tubes. Sold in pairs.</p>
	<p>2666 Cryo-Block for 48 Micro-centrifuge or PCR Tubes</p> <p>Aluminum block that holds 48 standard (1.5 - 2.0 mL) micro-centrifuge tubes. Sold in pairs. Recommended for use with 2266 Foam Cryo Holder.</p>
	<p>2266 Foam Cryo Holder (For 2666 Cryo-Block)</p> <p>Holds two 2666 (2.0 mL micro-centrifuge tubes) cryo-blocks. Holder allows cryo-blocks to be held secure, lifted easily in and out of the HG-600 Geno/Grinder clamp assembly. Cryo-blocks and 2 mL tubes sold separately.</p>

VIAL AND TITER PLATE CAPACITY TABLE

	VPN	MiniG® CAPACITY	HOLDER (VPN)	NUMBER OF LAYERS	STACKING TRAY (VPN)	GENO/GRINDER® CAPACITY	HOLDER (VPN)	NUMBER OF LAYERS	STACKING (VPN)
Titer plate	Various	2	n/a	2	1690T	6	n/a	3	2012T
2 mL vial	Various	48	1680	2	1690T	96	2300	2	2189C
4 mL vial 5 mL vial	2240-PC 2240-PEF	48	1681	2	1690T	96	2191	2	2189C
12 oz. (355 mL) jar	2248	2	n/a	1	n/a	4	2259	1	n/a
15 mL vial (short)	2250	10	n/a	2	1690T	24	2193	2	2189C
15 mL vial (tall)	2252-PC-30	12	1685	1	n/a	24	2197	1	n/a
50 mL vial (tall)	2253-PC-48	6	1686	1	n/a	16	2196- 16-PE	1	n/a
75 mL vial	2254	2	1688	1	n/a	6	2198	1	n/a
Cryovials	2255	n/a	n/a	1	n/a	6	2257	1	n/a
25 oz. (750 mL) jar	2258	n/a	n/a	1	n/a	2	2259	1	n/a

VIALS, JARS, AND TUBES REFERENCE TABLE

Vial Set (VPN)	Vial Size	Grinding Balls (VPN)	Foam Holder (VPN)		Cryo-Block (VPN)	
			GG	MiniG	GG	MiniG
2241-PC	4 mL	9.5 mm (2155)	2191	1681	2662	1665
2241-PEF-200	5 mL	9.5 mm (2155)	2191	1681	2663	1665
2251-PC	15 mL (short)	11 mm (2156)	2193	1687	2660	1668
2253-PC-48	50 mL	9.5 mm (2155) 11 mm (2156) 20 mm (2158)	2196-16-PE 2014	1686	2664	1667
2252-PC-30	15 mL	9.5 mm (2155)	2197	1685	2661	1666
2248	12 oz Jar	11mm (2156)	2259	N/A	N/A	N/A
2254	75 mL Jar	12.7 mm (2157) 7.9 mm (5004B) 7.9 mm (5005B)	2198	1688	N/A	N/A
6133PC-T	12 mL	14 mm (6133B)	2198-24-PE	N/A	N/A	N/A
2258	25 oz Jar	11 mm (2156)	2259	N/A	N/A	N/A
2255	Cryogenic Vial	12.7 mm (2157)	2257	N/A	2260	2260
2300-500E, 2310, (Table A)	2 mL	3 mm (2151) 6.35 mm (2154) 6 mm (2186)	2300	1680	2666	1660

OPERATING LOAD RESTRICTIONS

To maintain proper functionality of the HG-600 Geno/Grinder[®], the maximum recommended total sample load in the clamp assembly is 4 lb. (1.8 kg). The total sample load includes sample, vials (or titer plates), grinding media, holders (or cryo-blocks), and nesting trays. For Sample loads exceeding 2.0 lb. (0.9 kg), the maximum recommended operating rate is 1500 rpm. Sample loads less than 2.0 lb. can be run at rates up to the maximum of 1750 rpm. Dynamic loads greater than 2 lb. can create a rate error. When stacking 4 or 6 titer plates, do not add more than five 4 mm steel balls to a single titer plate well.

Operating with loads that exceed the recommended maximum rate and weight limits can result in damage to the Geno/Grinder[®]. Therefore, warranty restrictions or invalidation may apply.

USING THE HG-600 GENO/GRINDER[®] FOR BEAD BEATING

Bead beating is the preferred method to disrupt a variety of microorganisms and plant or animal tissues. In bead milling, grinding media such as steel or ceramic balls or glass beads are vigorously agitated inside a sealed vial or titer plate with the sample. The most commonly used grinding balls are steel ball bearings 4 mm in diameter. Disruption or cell lysis occurs as a result of the crushing action of the grinding media as they collide with the sample. Low shearing of nucleic acids can be achieved by varying the agitation speed of the mill. It is considered the method of choice for disruption of yeast and fungi and tough-to-disrupt cells such as bacteria and microalgae.

This method is one of the few that avoids cross-contamination between samples because both vials and grinding media are disposable. Cole-Parmer[®] offers a comprehensive range of grinding media, vials, jars and titer plates ranging from 0.6 to 750 mL. The size and amount of the grinding media used is important. Speed and effectiveness of disruption can be increased dramatically by increasing the density, form and amount of grinding media in the sample vial or titer plate. Tough tissues may require precooling to embrittle the sample and this also serves to preserve any temperature-sensitive components such as RNA or Proteins. Cole-Parmer[®] offers a full range of cryogenic Kryo-Tech[®] accessories for this purpose. The loading of the beads should always allow adequate movement inside the sample vials but can be up to 80% of the total sample volume, provided there is still adequate agitation.

PROTOCOLS



SPELT SEEDS BEAD BEATING

Insert one seed and one grinding ball in each well of the deep well titer plate.

Grinding Balls = 4 mm

Rate = 1,400 RPM

Time = 1 minute



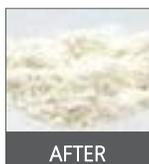
CANNABIS

Place two grinding balls into a 50 mL centrifuge tube.

Grinding Balls = 11 mm

Rate = 1,500 RPM

Time = 1-2 minutes



RICE

Dispense one steel bead into each well of the deep well titer plate.