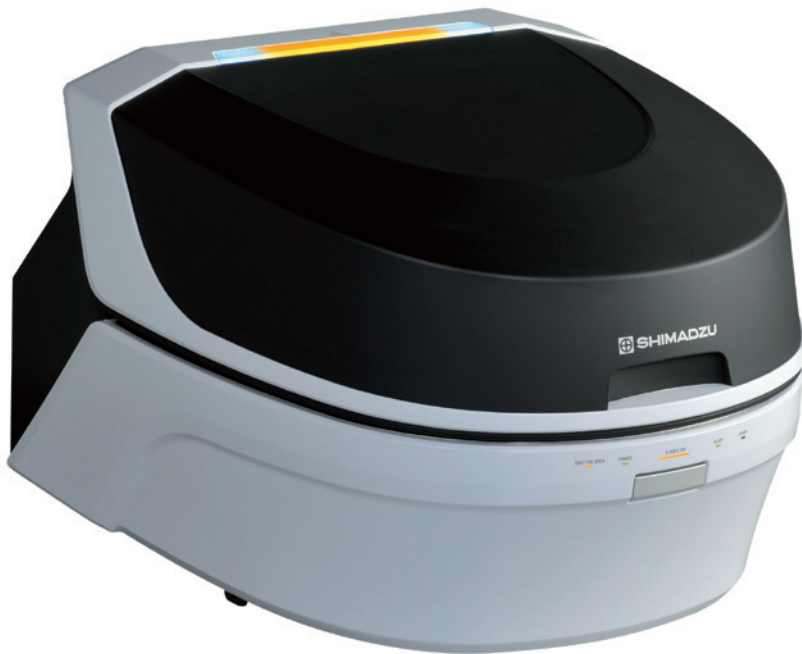


Energy-Dispersive X-Ray Fluorescence Spectrometer

# EDX-7000/8000 Series

## Supplies and Maintenance Parts



# Contents

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## Major Components



These parts must be replaced by a service engineer. Please contact your local Shimadzu office for more information.

PN	Part Name	Replacement Guideline*
212-24378-91	X-ray Tube, XTF-5011A	3 years
212-25358-41	Power Supply, 50 kV Inverter	5 years
212-25470-41	Detector (SDD), EDX-7000	5 years
212-25470-42	Detector (SDD), EDX-8000	5 years



\*Estimate based on usage of 8 hours a day, 5 days a week.

## User Maintenance

### Main Body

Category	Product Name	Remarks	P/N	External Appearance
Sample Chamber	O-ring, AS568A-280 1A	For sample chamber	036-15502-80	
Power Supply	Fuse, 218 3.15P (250 V, 3.15 A)	For main body <b>*2 REQ'D</b>	072-02004-21	

### Vacuum Unit

Category	Product Name	Remarks	P/N	External Appearance
Vacuum Pump	Ultragrade® 19 Pump Oil	1 L supply	220-97808-00	
Power Supply	Fuse, 216 010.P (250 V, 10 A)	For switching box <b>*2 REQ'D</b>	072-02004-73	

## Miscellaneous

Product Name	Remarks	P/N
X-ray Key	2 included <b>*Special order</b>	064-90057-02

## Accessories

### Standards

Product Name	P/N
Instrument Calibration Standard (EDX-7000)	212-24507-96
Instrument Calibration Standard + Check Sample (EDX-8000)	212-24507-91
RoHS Check Sample	212-24705-92
RoHS and Halogen Check Sample	212-24705-91
RoHS, Halogen, and Sb Check Sample	212-24705-93





### RoHS Screening Kits

\*Includes software, manuals, and check samples

Product Name	P/N
RoHS Screening Analysis Kit	212-25475-41
RoHS and Halogen Screening Analysis Kit	212-25476-41
RoHS, Halogen, and Sb Screening Analysis Kit	212-25477-41

### Sample Cells and Film

\*For help choosing accessories, see the Selection Guide

Product Name	Remarks	PN	External Appearance
Double Open-Ended X-Cell	100/pk	219-85000-55	
Closed X-Cell	100/pk	219-85000-52	
Micro X-Cell	100/pk	219-85000-54	
Universal Closed X-Cell	100/pk	219-85000-53	





<b>Mylar® Window Film</b>	500 pre-cut circles	202-86501-56
<b>Polypropylene Window Film</b>	500 pre-cut circles	219-82019-05
<b>Ultralene® Window Film</b>	500 pre-cut circles	220-95349-21
<b>Kapton® Window Film</b>	500 pre-cut circles	220-95352-02




## Filter Paper

Product Name	Remarks	PN
<b>Filter Paper</b>	Allows vacuum option for liquids <b>(50/pk)</b>	210-16043-50
<b>Ion Exchange Paper - Cation</b>	1 piece	210-16167-01
<b>Ion Exchange Paper - Anion</b>	1 piece	210-16167-03
<b>Ion Exchange Paper - Chelate</b>	1 piece	210-16167-02
<b>Drying Rack</b>	Holds 20 samples	205-07221-00

## Sample Presses and Accessories

\*For help choosing accessories, see the [Selection Guide](#)



Product Name	PN	Remarks	External Appearance
<b>Manual Press</b>	220-95372-02	Full-size 25-ton (22.7 metric ton) Carver® hydraulic laboratory pellet press that accepts 13 mm, 31 mm, 35 mm, and 40 mm pellet die sets. Manually controlled.	
<b>X-Press</b>	220-95372-01	35-ton (31.8 metric ton) hydraulic laboratory pellet press that accepts 13 mm, 31 mm, 35 mm, and 40 mm pellet die sets. Automatic and fully programmable.	
<b>Evacuatable Pellet Die Set (31 mm)</b>	220-95372-40	Used to form 31 mm standard sample disks for XRF. Set includes evacuatable die body, base, plunger, two 31 mm polished steel pellets, O-ring vacuum seals, and knock-out ring for sample disk extraction.	
<b>Evacuatable Pellet Die Set (40 mm)</b>	220-95372-41	Used to form 40 mm sample disks. Set includes evacuatable die body, base, plunger, two 40 mm polished steel pellets, O-ring vacuum seals and knock-out ring for sample disk extraction.	

<b>Pre-flared Spec-Caps® (31 mm)</b>	220-95372-30	Pre-flared, shallow, thin-walled aluminum cap for reinforcing XRF pellets. 31 mm wide x 8 mm deep. Produces pellets 31 mm x 5 mm <b>(100/pk)</b>	
<b>Spec-Caps® (38 mm)</b>	220-95372-31	Shallow, thin-walled aluminum cap for reinforcing XRF pellets. 38 mm wide x 9 mm deep. Produces pellets 40 mm x 5 mm <b>(100/pk)</b>	
<b>Edge-flaring Tool (40 mm)</b>	220-95372-32	Tool for flaring the edge of Spec-Caps® to create a tighter fit in the pellet die	

<b>Cellulose Binder</b>	150 g bottle	220-95372-50
<b>UltraBind®</b>	150 g bottle	220-95372-51
<b>Paraffin Binder</b>	150 g bottle	220-95372-52

## Sample Mills and Accessories

\*For help choosing accessories, see the Selection Guide

Product Name	PN	Remarks	External Appearance
<b>Mixer/Mill</b>	220-95372-10	High-energy ball mill that accommodates sample sizes ranging from 0.2 - 10 grams	
<b>Freezer/Mill</b>	220-95372-03	Cryogenic mill that accommodates sample sizes ranging from 0.1 - 5 gram	

<b>Tungsten Carbide Grinding Set</b>	Includes body, caps, balls, and gaskets	220-95372-20
<b>Alumina Ceramic Grinding Set</b>	Includes body, caps, balls, and gaskets	220-95372-21
<b>Methacrylate Grinding Set</b>	Includes body, caps, balls, and gaskets	220-95372-22
<b>Hardened Steel Grinding Set</b>	Includes body, caps, balls, and gaskets	220-95372-23

# Sample Prep Selection Guide

There are several factors to take into account when selecting the correct prep accessories for your samples. These can include, but are not limited to:

- Sample volume
- Sample form
- Sample matrix
- Sample reactivity / stability
- Sample density
- Sample viscosity
- Sample volatility
- Sample pH
- X-ray transmission
- Sensitivity requirements
- Analysis atmosphere
- Elements of interest

## Sample Cells



**219-85000-55**

**3571**

**Double Open-Ended X-Cell**

Disposable open-ended X-ray cell with collar. Includes two polyethylene snap-rings, collar, and open body.

- Ideal for unusual or hard-to-handle samples such as slurries, sludge, pastes, and viscous materials like glue tar and RTV sealant
- Squared snap-ring design insures proper positioning in sample holders
- Collar holds ring in place while film is being applied
- Can be run with open back or sealed window back
- Made of contaminate-free polyethylene

**Overall Height:** .866 in  
**Window Plane OD:** 1.244 in  
**Material:** Polyethylene

**Aperture:** 24.5 mm  
**Capacity:** 10 mL  
**Overall OD:** 1.244 in



**219-85000-54**

**3577**

**Micro X-Cell**

Disposable micro X-ray cell with collar for running of small, air-sensitive or hazardous samples in XRF spectrometers. Includes two polyethylene snap-rings, collar, and open body.

- 6.3 mm window is centered in standard 31 mm sample holder.
- Only requires 0.5 mL of sample.
- Can be run with open back or sealed window back
- For hazardous or sensitive samples, top can be fitted with a standard 7 x 13 mm serum bottle closure for injection, purging, or sample isolation.
- Made of contaminate-free polyethylene.

**Overall Height:** .866 in  
**Window Plane OD:** 1.244 in  
**Material:** Polyethylene

**Aperture:** 6.3 mm  
**Capacity:** 0.5 mL  
**Overall OD:** 1.244 in



**219-85000-52**

**3529**

**Closed X-Cell**

Disposable closed X-ray cell. Includes a polyethylene snap-ring and cup with snap-post vent and reservoir.

- Reservoir cup catches any liquids that expand through the vent, guarding against spillage in inverted-optic spectrometers
- Roughened surface within the reservoir cup facilitates labeling
- Made of contaminate-free polyethylene.

**Overall Height:** .866 in  
**Window Plane OD:** 1.201 in  
**Material:** Polyethylene

**Aperture:** 24.5 mm  
**Capacity:** 8 mL  
**Overall OD:** 1.260 in



**219-85000-53**

**3561**

**Universal Closed X-Cell**

Disposable closed X-ray cell with collar. Includes a polyethylene snap-ring and cup with snap-post vent and reservoir.

- Patented snap-open seal for venting volatile samples ensures a smooth flat window for improved precision.
- Reservoir cup catches any liquids that expand through the vent, guarding against spillage
- Roughened surface within the reservoir cup facilitates labeling.
- Made of contaminate-free polyethylene.

**Overall Height:** .866 in  
**Window Plane OD:** 1.244 in  
**Material:** Polyethylene

**Aperture:** 24.5 mm  
**Capacity:** 8 mL  
**Overall OD:** 1.244 in

# Sample Prep Selection Guide

All films are pre-cut circles designed to fit standard sample cells

<b>Sample Film</b>	
<p><b>202-86501-56</b></p> <p><b>Mylar® Window Film</b></p> <ul style="list-style-type: none"> <li>Unusually strong for its thickness</li> <li>Resistant to organic chemicals but vulnerable to strong acids and strong bases</li> <li>Heat resistant up to 100°C</li> <li>May contain trace levels (ppm) of Ca, P, Fe, Cu, Zn, or Sb</li> </ul> <p><b>Thickness:</b>     0.25 mil (6.35 µm)</p>	<p><b>220-95349-01</b></p> <p><b>Ultralene® Window Film</b></p> <ul style="list-style-type: none"> <li>Considered to offer the best balance between X-ray transmission, chemical resistivity, strength, and purity</li> <li>Reasonably resistant to acids, bases, and many organic chemicals, but can be attacked by aromatic and halogenated hydrocarbons</li> <li>Heat resistant up to 100°C.</li> </ul> <p><b>Thickness:</b>     0.16 mil (4.06 µm)</p>
<p><b>219-82019-05</b></p> <p><b>Polypropylene Window Film</b></p> <ul style="list-style-type: none"> <li>Reasonably resistant to acids, bases, and many organic chemicals, but can be attacked by aromatic and halogenated hydrocarbons</li> <li>Heat resistant up to 100°C</li> <li>May contain trace levels (ppm) of Ca, Zr, P, Fe, Zn, Cu, Ti, and Al</li> </ul> <p><b>Thickness:</b>     0.2 mil (5.08 µm)</p>	<p><b>220-95352-02</b></p> <p><b>Kapton® Window Film</b></p> <ul style="list-style-type: none"> <li>Often considered the closest thing to a “bombproof” XRF window film</li> <li>Incredibly strong and heat resistant to over 300°C</li> <li>Chemically impervious to almost anything except strong alkali solutions</li> <li>Phosphate-based surface coating improves its handling characteristics</li> </ul> <p><b>Thickness:</b>     0.3 mil (7.62 µm)</p>



# Sample Prep Selection Guide

## Sample Presses



**220-95372-02**

**3622**

**Carver® Manual Press**

- Manual, hydraulic laboratory press with buffer plate.
- Can be operated anywhere in the world, even under the most primitive conditions
- Economical alternative to motorized presses for labs with a small sample load
- Hardened steel buffer plate is engraved with concentric circles and enables easy centering of the die
- Upper platen is equipped with a safety shield for operator protection.

<b>Force:</b>	0-25 tons	<b>Daylight:</b>	Adj. 0-9 in
<b>Platen Movement:</b>	6.5 in	<b>Dimensions:</b>	42 x 19 x 24 in
<b>Platen Size:</b>	9 x 9 in	<b>Net Weight:</b>	350 lbs



**220-95372-01**

**3636**

**X-Press®**

- Automated, programmable laboratory press
- Presses samples in minutes
- Safety interlock and automatic pump shut-off safety valve
- Can be operated manually as a simple motorized press whose functions are under direct user control
- Programmable LCD touch screen interface. Allows the user to enter final pressure desired, time to hold at the final pressure, and interval to return back to zero pressure

<b>Force:</b>	10-35 tons	<b>Daylight:</b>	Adj. 2-6 in
<b>Platen Movement:</b>	1 in	<b>Dimensions:</b>	20 x 39 x 22.5 in
<b>Platen Size:</b>	ø 3.25 in	<b>Net Weight:</b>	145 lbs
<b>Screw Adj.:</b>	3.5 in	<b>Dwell Time:</b>	0-10 min
		<b>Release Time:</b>	0-10 min

## Die Sets



**220-95372-40**

**3623**

**31 mm Evacuatable Pellet Die Set**

- Vacuum hose attachment enables a vacuum pump to be hooked up to the die before and during pressing to withdrawal air and moisture from the sample.
- Load limit: 50 tons
- Use with Pre-flared 31 mm Spec-Caps® (220-95372-30) to reinforce pressed pellets and protect the die bore
- Includes:
  - Evacuatable die body
  - Base
  - Plunger
  - Two 31 mm polished steel pellets
  - O-ring vacuum seals
  - Knock-out ring for disk extraction



**220-95372-41**

**3614**

**40 mm Evacuatable Pellet Die Set**

- Vacuum hose attachment enables a vacuum pump to be hooked up to the die before and during pressing to withdrawal air and moisture from the sample.
- Load limit: 50 tons
- Use with 38 mm Spec-Caps® (220-95372-31) to reinforce pressed pellets and protect the die bore
- Includes:
  - Evacuatable die body
  - Base
  - Plunger
  - Two 40 mm polished steel pellets
  - O-ring vacuum seals
  - Knock-out ring for disk extraction

# Sample Prep Selection Guide

## Sample Pellet Caps



**220-95372-30**

**3619A**  
**31 mm Pre-Flared Spec-Caps®**

Pre-flared, shallow, thin-walled aluminum cap for reinforcing XRF pellets. Forms the bottom and sides of the finished pellet. Pre-flared for a snug fit in the 3623 31 mm Evacuatable Pellet Die, and has an unpainted surface.

- Ensures a snug fit against the walls of the pellet die
- Prevents sample loss and pellet jamming
- Reinforces sample disks to resist chipping and breaking
- Makes sample disks easier to remove from the pellet die
- Minimizes contamination during sample handling
- Protects the bore of the pellet die from abrasive samples

**Diameter:** 31 mm  
**Depth:** 8 mm  
**Pellet Size:** 31 mm x 5 mm



**220-95372-31**

**3617**  
**38 mm Spec-Caps®**

Pre-flared, shallow, thin-walled aluminum cap for reinforcing XRF pellets.

- Makes sample disks easier to remove from the pellet die.
- Minimizes contamination during sample handling.
- Protects the bore of the pellet die from abrasive samples.
- Painted outer surface prevents seizure in the die and facilitates labeling.

**Diameter:** 38 mm  
**Depth:** 9 mm  
**Pellet Size:** 40 mm x 5 mm



**220-95372-32**

**3618**  
**Edge-Flaring Tool (30 mm and 40 mm)**

Tool for flaring the edge of Spec-Caps® to create a tighter fit in the pellet die. To use, simply press the tapered end of the Edge-Flaring Tool into the Spec-Cap®.

- Edge-flaring prevents sample loss and pellet jamming.
- Increases the Spec-Cap® rim diameter to 31 mm or 40 mm.
- Compatible with 38 mm Spec-Caps® and 30 mm Spec-Caps®

# Sample Prep Selection Guide

Sample Binders	
<p><b>220-95372-50</b></p> <p><b>3642</b> <b>Cellulose Binder</b></p> <p>≤ 20 μm powder, 150g bottle. Ideal for samples which crumble or ablate after pressing. Can be blended with sample at 10% by weight to form XRF sample disk, or used undiluted as sample matrix with Sleeve-and-Plunger Set.</p> <ul style="list-style-type: none"> <li>•Ideal for samples which crumble or ablate after pressing</li> <li>•Blends quickly and completely with samples at 10-25% by weight to form XRF sample disks</li> <li>•Can be used undiluted as a sample matrix with the sleeve-and-plunger technique</li> <li>•Will not stick to the pellet die nor contaminate the sample</li> <li>•Does not cake in the bottle during storage</li> <li>•Bonds 200-250 sample disks or provides matrix for 25-35 supported sample disks</li> </ul> <p><b>Particle Size:</b>    ≤ 20 μm</p>	<p><b>220-95372-51</b></p> <p><b>3644</b> <b>UltraBind®</b></p> <p>Specially formulated UltraBind® powder with a particle size of less than 20 μm. Combines the moisture resistance of Paraffin Binder along with the ease of removing a prepared disk from the die set associated with the Cellulose Binder. UltraBind® may include low levels of NaCl.</p> <ul style="list-style-type: none"> <li>•Ideal for samples which crumble or ablate after pressing</li> <li>•Blends quickly and completely with samples at 10-25% by weight to form XRF sample disks</li> <li>•Can be used undiluted as a sample matrix with the sleeve-and-plunger technique</li> <li>•Self lubricating and will not stick to the pellet die</li> <li>•Moisture resistant and resists cracking and swelling in storage</li> <li>•Bonds 200-250 sample disks or provides matrix for 25-35 supported sample disks</li> </ul> <p><b>Particle Size:</b>    &lt; 20 μm</p>
<p><b>220-95372-52</b></p> <p><b>3646</b> <b>Paraffin Binder</b></p> <p>Paraffin powder with a particle size of less than 30 μm.</p> <ul style="list-style-type: none"> <li>•Ideal for samples which crumble or ablate after pressing</li> <li>•Blends quickly and completely with samples at 10-20% by weight to form XRF sample disks</li> <li>•Forms air-stable sample disks as the waxy binder seals the surface against moisture</li> <li>•Moisture resistant and does not contaminate samples</li> <li>•Bonds 200-250 sample disks</li> </ul> <p><b>Particle Size:</b>    ≤ 30 μm</p>	

# Sample Prep Selection Guide

## Sample Ball Mills



**220-95372-10**

**8000M  
Mixer/Mill®**

High-energy ball mill that accommodates sample sizes ranging from 0.2 - 10 grams. Ideal for grinding dry, brittle samples.

**Applications include:** Mechanical alloying, slurry grinding, blending powders and mixing emulsions

**Typical samples include:** Rocks, Minerals, Sand, Cement, Slag, Ceramics, Catalyst Supports, Glass, Pharmaceuticals, Plant and Animal Tissues, Cannabis, Seeds, Paints and Ink

**Power:** 115 V / 60 Hz or 230 V / 50 Hz  
**Dimensions:** 19 in x 14 in x 18 in  
**Motor:** 1/3 hp; 1725 RPM @ 60 Hz or 1425 RPM @ 50 Hz  
**Movement:** 2-1/3 in back-and-forth; 1 in side-to-side  
**Speed:** 1060 cycles/min (115 V) or 875 cycles/min (230 V)  
**Timer:** 100 min range (expandable to 1,000 or 10,000 min)



**220-95372-03**

**6770  
Freezer/Mill®**

Small cryogenic mill that accommodates sample sizes ranging from 0.1 - 5 grams. It is specifically designed for cryogenic grinding and pulverizing of tough and/or temperature sensitive samples immersed in liquid nitrogen.

**Applications include:** DNA/RNA extraction, THC extraction, protein extraction, forensic testing, materials testing, pharmaceutical analysis, drug testing, RoHS/WEEE and volatiles extraction

**Typical samples include:** Animal tissue, plastic and polymers, yeast, pharmaceuticals, food products, electronic components, textiles, hair, teeth, bones, plant tissue such as cannabis, seeds, leaves and roots

- Grinding chamber holds one microvial set and one small grinding vial
- Equipped with liquid nitrogen sensor, insulated case and lid safety interlock switch for operator protection
- Liquid nitrogen required for operation
- Magnetically driven sample impactor is the only moving part so there are no mechanical linkages or bearings to fail
- Pre-cooling chamber holds up to three additional grinding vials for high-throughput sample processing
- Programmable parameters include grinding time, impactor rate, pre-cooling and cooling times
- Touch screen stores up to 10 user-defined grinding programs for easy quick recall
- Closed grinding vials eliminate sample cross-contamination, retain volatiles, control hazardous or critical samples, and simplify clean-up

**Power:** 115 V / 60 Hz or 230 V / 50 Hz  
**Dimensions:** 19 in x 10.5 in x 12.75 in

# Sample Prep Selection Guide

## Sample Grinding Sets



**220-95372-20**

**8004**

**Tungsten Carbide Grinding Vial Set**

55 mL tungsten carbide grinding vial set. Vial is 2 ¼ in diameter x 2 ½ in long. Set includes tungsten carbide-lined body, two screw-on tungsten carbide-lined caps, two 7/16 in tungsten carbide balls, and eight corprene gaskets.

- Ideal for grinding hard, brittle samples to an analytical fineness
- Also useful for blending powders and mixing emulsions
- High resistance to abrasion
- Long-wearing and very high efficiency
- Substantially harder and heavier than steel so it grinds faster and with less contamination
- Suitable for slurry grinding

**Sample Capacity – Grinding:** 3 - 10 g  
**Sample Capacity – Mixing:** 25 mL  
**Typical Sample Size:** 10 g  
**Hardness:** Mohs 8-1/2+; Knoop 1400-1800  
**Major Elements:** W, C, Co  
**Minor Elements:** Ta, Ti, Nb



**220-95372-21**

**8003**

**Alumina Ceramic Grinding Vial Set**

45 mL alumina ceramic grinding vial set. Vial is 2 ¼ in diameter x 2 ¾ in long. Set includes high purity 99.5% alumina ceramic grinding vial body, two slip-on alumina ceramic caps, one ½ in alumina ceramic ball, and eight corprene gaskets.

- Ideal for grinding hard, brittle samples to an analytical fineness
- Also useful for blending powders and mixing emulsions
- Long-wearing, very abrasion-resistant, and moderate efficiency
- Alumina components are 99.5% pure aluminum oxide
- Suitable for slurry grinding

**Sample Capacity – Grinding:** 2 - 8 g  
**Sample Capacity – Mixing:** 20 mL  
**Hardness:** Mohs 9; Knoop 2100  
**Major Elements:** Al  
**Minor Elements:** Si, Ca, Mg



**220-95372-22**

**8006**

**Methacrylate Grinding Vial Set**

55 mL methacrylate grinding vial set. Vial is 2 ½ in diameter x 2 5/8 in long. Heavy gauge methacrylate body with methacrylate-lined aluminum screw-on cap. Set includes one corprene gasket, two 1/2 in methacrylate balls, and four 3/8 in methacrylate balls.

- Ideal for pulverizing soft, brittle materials and for mixing liquids and powders
- Rugged construction allows grinding of soft materials without metallic contamination
- Suitable for slurry grinding

**Sample Capacity – Grinding:** 3 - 10 g  
**Sample Capacity – Mixing:** 20 mL  
**Hardness:** Mohs 1-1/2  
**Major Elements:** C



**220-95372-23**

**8001**

**Hardened Steel Grinding Vial Set**

65 mL hardened steel grinding vial set. Vial is 2 ¼ in x 3 in long. Set includes a screw-on cap with O-ring, two ½ in and four ¼ in steel balls. Grinding vial body and cap liner are made of hardened tool steel. Grinding balls are made of type 52-100 steel.

- Ideal for grinding hard, brittle samples to an analytical fineness
- Also useful for blending powders and mixing emulsions.
- Moderate resistance to abrasion
- High durability and efficiency
- Suitable for slurry grinding

**Sample Capacity – Grinding:** 3 - 10 g  
**Sample Capacity – Mixing:** 25 mL  
**Hardness:** Mohs 5-1/2; Rockwell C 60-65  
**Major Elements:** Fe  
**Minor Elements:** Cr, Si, Mn, C



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