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Mini Product Resource Guide

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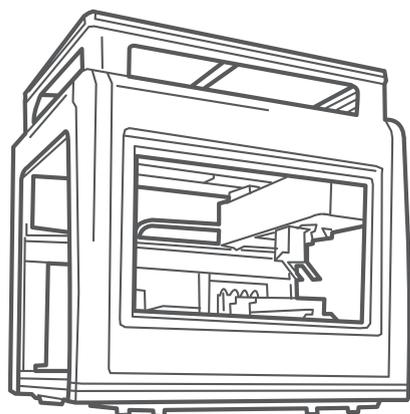
PPQC

PRODUCT

RESOURCE GUIDE

SAMPLE PREPARATION

AUTOMATED SAMPLE PREPARATION



Automated sample preparation is now available for a wide variety of sample types. Switching to automation allows scientists to perform other, more complex tasks, increasing the efficiency of your lab. Automation also eliminates human error, leading to more reliable and reproducible sample preparation.

5 Questions to Ask When Buying an Automated Liquid Handling System

1. Where would automation be most effective in improving the efficiency of your sample preparation?
2. Can the instrument be used to prepare multiple types of samples?
3. Do you have enough bench space to accommodate the instrument?
4. Can the programs be customized to meet your sample prep needs?
5. How expensive are replacement parts for the instrument?



Safety Tip

Automated sample preparation can help protect your lab workers against repetitive strain injuries caused by frequent pipetting. However, there are other safety features to consider when purchasing one of these instruments. Look for options such as guards to prevent workers from putting their hands near the machine when it is running. You should also look for models with sensors that will automatically stop the instrument in case a foreign object enters the work area.



Maintenance Tip

Automated sample preparation systems have many moving parts. Maintenance of your instrument is vital to preventing major breakdowns, costly repairs, and unnecessary down time. When purchasing your instrument, decide on a maintenance plan right from the beginning. Available options include working with the manufacturer directly, with a third-party maintenance service, or with your in-house service team. Take the time to figure out which option will work best for you.



Manufacturers

Agilent	www.agilent.com
Analytik Jena	www.analytik-jena.de
Aurora Biomed	www.aurorabiomed.com
Apricot Designs	www.apricotdesigns.com
Beckman Coulter	www.beckman.com
Biotage USA	www.biotage.com
BioTek Instruments	www.biotek.com
Elemental Scientific	www.icpms.com
Eppendorf	www.eppendorf.com
Gerhardt	www.gerhardt.de
Gilson	www.gilson.com
HighRes Biosolutions	www.highresbio.com
Horizon Technology	www.horizontechstore.com
HTA	www.hta-it.com
Hudson Robotics	www.hudsonrobotics.com
Labcyte	www.labcyte.com
LEAP Technologies	www.leapte.com
METTLER TOLEDO	www.mt.com
OpenTrons	www.opentrons.com
PerkinElmer	www.perkinelmer.com
Qiagen	www.qiagen.com
Qeustron Technologies	www.qtechcorp.com
Shimadzu Scientific	www.ssi.shimadzu.com
Sirius Automation	www.siriusautomation.com
SOTAX Corp.	www.sotax.com
SPEX Sample Prep	www.spexsampleprep.com
Tecan	www.tecan.com
Thermo Fisher Scientific	www.thermoscientific.com
Waters Corp.	www.waters.com
Zinsser North America	www.zinsserna.com

CENTRIFUGATION



Centrifuges are a staple for sample preparation in any lab. They are integral to any workflow that requires particle separation. Centrifuges can differ in their size, capacity, rotor speed, and intended application. With many different types available, it is important for you to identify the solution that best fits your lab's needs.



Maintenance Tip

Regular cleaning of your centrifuge can help prolong the life of your rotor. Review your centrifuge's manual for the best practices when cleaning your instrument. While cleaning your instrument, you should also take time to inspect your rotor for wear and tear. You should replace your rotor at the first sign of damage or rust as these rotors are prone to failure and may put your laboratory workers at risk.

5 Questions to Ask When Purchasing a Centrifuge

1. What type of centrifuge do you need? (ultracentrifuge, microcentrifuge, clinical)
2. Are the centrifuge rotors interchangeable? Can they be replaced if damaged?
3. How quickly does the centrifuge speed up and slow down?
4. How much space will the instrument occupy in your lab?
5. What service options are available for the instrument?



Safety Tip

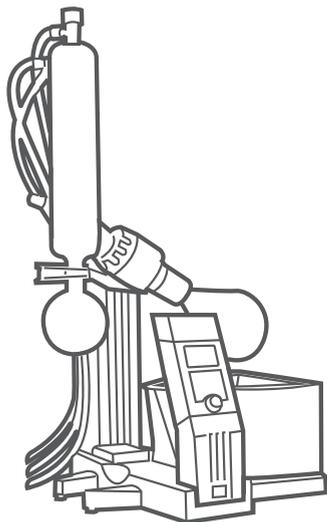
Always make sure your samples are balanced before operating your centrifuge. Imbalanced samples can result in tube breakage, exposing you to aerosolized samples when you open the instrument's lid. More serious injuries can result from rotors that break due to sample imbalance. As an extra precaution, look for instruments that have auto-imbalance detection and will stop the centrifuge if an imbalance is detected.



Manufacturers

Beckman Coulter	www.beckmancoulter.com
Benchmark Scientific	www.benchmarkscientific.com
Centurion Scientific	www.centurionscientificglobal.com
Druker Diagnostics	www.druckerdiagnostics.com
Eppendorf	www.eppendorf.com
Hanil	www.ihanil.com
HERMLE	www.hermle-labortechnik.de
Hettich	www.hettweb.com
HighRes BioSolutions	www.highresbio.com
himac	www.himac-science.com
IKA	www.ika.com
Labnet International	www.labnetinternational.com
LW Scientific	www.lwscientific.com
MP Biomedicals	www.mpbio.com
Neuvention Technologies	www.neuvention.com
NuAire	www.nuaire.com
OHAUS Corporation	www.ohaus.com
Sartorius	www.sartorius.com
Stanhope-Seta	www.stanhope-seta.co.uk
Stuart	www.stuart-equipment.com
Thermo Fisher Scientific	qtechcorp.com
TOMY	www.tomy.amuzainc.com
VWR	www.vwr.com

EVAPORATION & CONDENSATION



Evaporators and condensers are invaluable tools in settings such as organic and food and beverage labs where specific compounds need to be extracted from a solution. These instruments use heating and cooling to separate components based on differences in boiling point.



Safety Tip

Evaporators and condensers operate at very high temperatures. When operating these instruments, take care and wear the proper protective equipment to prevent burns or scalding. Coated glassware should also be used with these instruments to prevent glass breakage and exposure to potentially dangerous solvents.

5 Questions to Ask When Purchasing an Evaporator or Condenser

1. What types of samples will you be preparing? Is your sample heat-sensitive?
2. Can more than one sample be processed at a time?
3. What are the heating and cooling capabilities of the instrument?
4. Can the instrument be pre-programmed with the evaporation protocol?
5. Does it have sensors that will detect temperature and make adjustments if needed?



Maintenance Tip

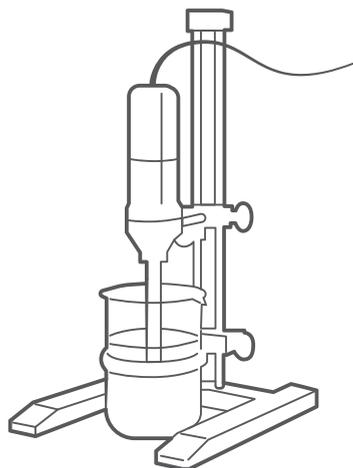
When you are finished with your evaporation or condensation, empty the collection flask and clean it thoroughly. Leaving solvents in the collection flask for prolonged periods may lead to degradation or corrosion of the instrument over time. When cleaning your flasks, inspect them thoroughly for any signs of chipping or cracking. Always replace any damaged flasks to prevent them from breaking while in use.



Manufacturers

Buchi	www.buchi.com
Ecodyst	www.ecodyst.com
EYELA	www.eyelusa.com
Genevac	www.genevac.com
Glas-Col	www.glascol.com
Heidolph Instruments	www.heidolph-instruments.com
IKA	www.ika.com
JEOL USA	www.jeolusa.com
Kinematica	www.kinematica.ch
KNF Neuberger	www.knfusa.com
Labconco	www.labconco.com
Organomation	www.organomation.com
Pope Scientific	www.popeinc.com
Porvair Sciences	www.porvair-sciences.com
Thermo Fisher Scientific	www.thermoscientific.com
Vacuubrand	www.vacuubrand.com
Yamato Scientific America	www.yamato-usa.com

HOMOGENIZATION & CELL DISRUPTION



Homogenizers are used to blend chemical and biological samples such as plants, tissue, food, and soil. They can also be used to disrupt cell membranes and make a homogenous cell suspension. Recent applications have included preparing biological samples for next-generation sequencing. Homogenization allows scientists to better analyze a representative part of a heterogeneous sample.

5 Questions to Ask When Purchasing a Homogenizer or Cell Disruptor

1. How does the homogenizer break down samples? e.g. beads, mechanical force, sonication

2. How many samples can be homogenized at a time?

3. What volume of sample can the homogenizer accommodate?

4. How flexible is the instrument? Can it be used for more than one application?

5. Does the homogenizer come with pre-programmed protocols for easy use?



Safety Tip

Blending solutions using homogenizers can produce aerosols that may be hazardous to users. Only operate the system in a well-ventilated area or consider placing it in a biosafety cabinet or fume hood. Closed homogenizer systems are also available that prevent aerosols from escaping during operation, protecting the users and allowing these instruments to be placed anywhere in the lab.



Maintenance Tip

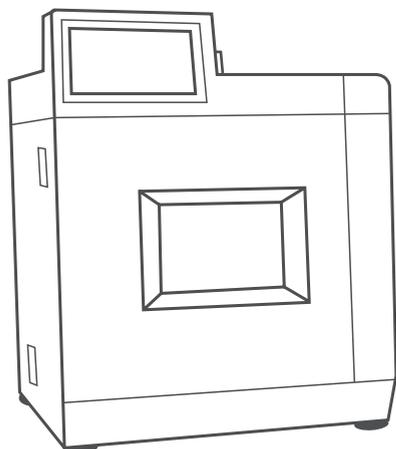
To keep your homogenizer in good working order, specific parts such as upper and lower bearings should be replaced on a semi-regular basis to prevent the need for more extensive repairs. Some manufacturers offer full maintenance kits that have everything you need to maintain your homogenizer between regularly-scheduled maintenance appointments.



Manufacturers

Analytik Jena US LLC	www.analytik-jena.com
Benchmark Scientific	www.benchmarkscientific.com
Bertin Instruments	www.bertin-instruments.com
BioSpec Products	www.biospec.com
Constant Systems Ltd.	www.constantsystems.com
GEA Niro Soavi	www.gea.com
Glas-Col	www.glascol.com
Glen Mills	www.glenmills.com
Hielscher Ultrasonics	www.hielscher.com
Eberbach	www.eberbachlabtools.com
IKA	www.ika.com
Industrial Sonomechanics	www.sonomechanics.com
Kinematica	www.kinematica.ch
Microfluidics	www.microfluidicscorp.com
MP Biomedicals	www.mpbio.com
OHAUS Corporation	www.ohaus.com
Omni International	www.omni-inc.com
PRO Scientific	www.proscientific.com
ProGroup Instrument	www.serialdilution.com
QIAGEN	www.qiagen.com
Qsonica	www.sonicator.com
Sartorius	www.sartorius.com
Sonics & Materials	www.sonics.com
SPEX Sample Prep	www.spexsampleprep.com
VELP Scientific	www.velp.com

MICROWAVE DIGESTION



Microwave digestion is an efficient method used to break down samples for elemental analysis. Because of the high temperature and pressure created by microwaves within the instrument, it takes minutes to complete. From soil and sediment to plastics and biological materials, microwave digesters can save you valuable time during sample preparation.

5 Questions to Ask When Purchasing a Microwave Digester

1. How many samples and what volume of samples can the instrument accommodate?
2. What is the maximum microwave power output of the digester? How long will it take to digest your samples?
3. What type of samples will you be digesting?
4. Which heating method does the instrument use? e.g. closed chamber, single reaction chamber, open vessel
5. Does the instrument have safeguards to protect users against high pressure and temperature?



Safety Tip

While the high temperature and pressure in microwave digesters make them more effective at breaking down samples, it also makes them dangerous for users. Look for an instrument with probes that monitor temperature and pressure during the reaction and with software that will allow for automatic adjustment of these parameters accordingly.



Manufacturers

Analytik Jena US LLC	www.analytik-jena.com
Anton Paar	www.anton-paar.com
Aurora Biomed	www.aurorabiomed.com
Buck Scientific	www.bucksci.com
CEM	www.cem.com
HORIBA	www.horiba.com
Milestone Scientific	www.milestonesci.com
PerkinElmer	www.perkinelmer.com
PreeKem	www.preekem.com
Qestron Technologies	qtechcorp.com
SCP Science	www.scpscience.com



Maintenance Tip

When choosing a location for your microwave digester in your lab, be sure to keep it out of the fume hood and away from any corrosive chemicals. While the instrument is designed to be airtight against the vessel contents, the electronics still need to breathe and will be affected by heavy acids in the air.

MILLING & GRINDING



Mills and grinders use mechanical force to break down samples into small particles for further analysis. This method allows the user to obtain a representation of a larger, non-homogenous sample. Many types of mills and grinders are available that have different capacities and limitations, such as the size of the particle they can produce and how much of a sample they can accommodate.



Safety Tip

Extra care must be taken when working with mills and grinders. Because these instruments are creating small particles, safety glasses or goggles should always be worn during use to prevent eye injury. Operation of these instruments may also produce fine, airborne particles that could be hazardous if inhaled. Using a ventilation system may be necessary to help cut down on these particles.

5 Questions to Ask When Purchasing a Mill or Grinder

1. What size do you need the particles to be after milling/grinding?
2. What capacity does the mill/grinder need to have for your application?
3. How easy are the parts to replace? What are the warranty options for the instrument?
4. How easy is it to clean the instrument and prevent cross-contamination?
5. What safety features are available to prevent user injury?



Maintenance Tip

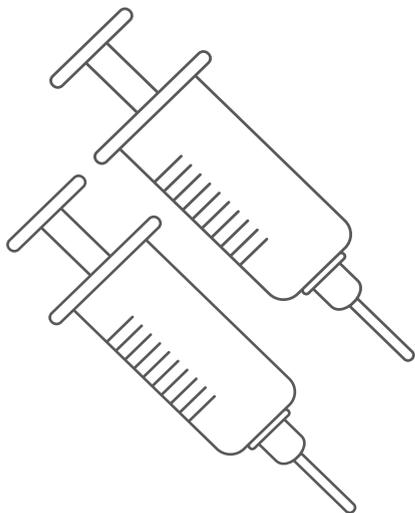
To prevent cross-contamination and prolong the life of your instrument, clean it between each use. Always make sure the instrument is off before cleaning! During this cleaning, look for wearing of any parts that may need to be repaired or replaced. In addition, look for any parts that may be rubbing against each other and require lubrication.



Manufacturers

Anton Paar	www.anton-paar.com
BioSpec Products	www.biospec.com
Buehler	www.buehler.com
Bühler	www.buhlergroup.com
C.W. Brabender Instruments	www.cwbrabender.com
Eberbach	www.eberbachlabtools.com
Extec	www.extec.com
Fritsch Milling and Sizing	www.fritsch-milling.com
Glen Mills	www.glenmills.com
Hosokawa	www.hmicronpowder.com
IKA	www.ika.com
Kinematica	www.kinematica.ch
Lab Synergy	www.labsynergy.com
McCrone	www.mccrone.com
MP Biomedicals	www.mpbio.com
OHAUS Corporation	www.ohaus.com
Retsch	www.retsch.com
SCP Science	www.scpscience.com
SPEX SamplePrep	www.spexsampleprep.com
Sturtevant	www.sturtevantinc.com
The Fitzpatrick Company	www.fitzmill.com
The Jet Pulverizer Co	www.jetpul.com
Union Process	www.unionprocess.com

SAMPLE PREPARATION CONSUMABLES



Sample preparation methods for specific applications, such as chromatography, require single-use consumables like filters and syringes. These methods include filtration, solid phase extraction, solid supported liquid extraction, solid phase microextraction, and dispersive solid phase extraction (QuEChERS).



Maintenance Tip

Consumable products are designed to be used only once, so don't try to wash and re-use supplies. Before use, inspect all packaging to ensure there has been no damage and the supply is still sterile. If the consumable is for use with a specific piece of equipment, make sure that it is compatible before use.

5 Questions to Ask When Purchasing Sample Preparation Consumables

1. Do your supplies need to meet particular specifications or quality assurance thresholds?
2. Do the consumables need to be compatible with your sample preparation instruments?
3. How frequently will you be using consumables for your sample preparation method? How many should you buy at a time?
4. What types of consumables are currently used by your lab?
5. Where will the consumables be stored? Is there space in your lab for large quantities of supplies?



Safety Tip

After use, consumable products should be disposed of safely in the appropriate receptacles. Always use gloves when handling and disposing of consumables that have been exposed to solvents or samples.



Manufacturers

Agilent	www.agilent.com
Biotage USA	www.biotage.com
BUCHI Corp.	www.buchi.com
Cole-Parmer	www.coleparmer.com
CPI International	www.cpiinternational.com
Eppendorf	www.eppendorf.com
PerkinElmer	www.perkinelmer.com
Restek	www.restek.com
Shimadzu Scientific	www.ssi.shimadzu.com
Tecan	www.tecan.com
Thermo Fisher Scientific	www.thermoscientific.com

Filters/Syringes

AMD Manufacturing Inc.	www.amdmanufacturing.com
GE Healthcare	www.gelifesciences.com
Labconco	www.labconco.com
MilliporeSigma	www.emdmillipore.com
Sartorius	www.sartorius.com
VWR	www.vwr.com

Sample Prep Kits

Beckman Coulter	www.beckmancoulter.com
Bio-Rad	www.bio-rad.com
MP Biomedicals	www.mpbio.com
New England BioLabs	www.neb.com
Norgen Biotek	www.norgenbiotek.com
Oxford Nanopore Technologies	www.nanoporetech.com
Qiagen	www.qiagen.com
Roche	www.roche.com
Waters Corp.	www.waters.com