

# Lab Manager<sup>®</sup>

Run Your Lab Like a Business



August 2013

Volume 8 • Number 7

## *2013/2014* **PRODUCT RESOURCE**

# GUIDE

**YOUR GO-TO SOURCE FOR TECHNOLOGY TRENDS,  
BEST PURCHASING PRACTICES, LATEST PRODUCT  
OFFERINGS, AND MANUFACTURER LISTINGS**

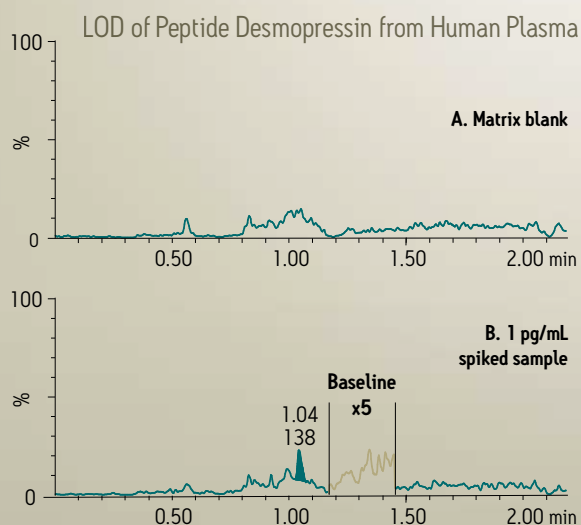
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## GET STARTED ON YOUR LAB EQUIPMENT PURCHASING JOURNEY

It's tough to start a journey without a map. You might have a general idea of where you're going but there's a greater chance of making mistakes, getting lost, and wasting time without a map or GPS showing you exactly where you can find each street and major landmark.

Buying or servicing lab equipment without at least some information to get you started can be just as difficult as trying to get somewhere without a map.

Our goal in compiling this year's *Lab Manager* Product Resource Guide (PRG) is the same as always — bringing our readers the critical information they need to make the best lab equipment purchasing decisions, all in one convenient publication. Each year, we get better and better at meeting that goal as we continue to add key pieces to our editorial while simplifying the presentation.

Last year, for example, saw us swap reprints of our Product Focus articles in each product category for lists of questions you should ask when buying those products as well as key survey data. We also added a list of distributors and laboratory apps to the back of the book to further assist our readers.

This year, our fourth putting out this guide, we have added lists of the main signs you should look for to know when it's time to service or replace your equipment. Of course, the Internet is also an important resource and we will provide extra content in the labmanager.com version of the guide to help you with more specific product categories.

We hope you find this year's PRG a great starting off point in purchasing, maintaining and replacing your lab equipment.

All the best,

*Rachel Muenz*

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Assistant Editor

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## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR AUTOMATED LIQUID HANDLING SYSTEM

- 1** System instrumentation, software, and/or methods are not user-friendly and take too much time to learn and use.
- 2** The system is not flexible for your future needs or takes up too much space in the laboratory.
- 3** The system is experiencing constant glitches and is no longer producing consistent or reliable results.
- 4** You are experiencing mechanical problems—pipette tips are out of calibration, the deck is not “framed” properly, belts are worn out, or the pipette stages are out of alignment.
- 5** Your throughput is increasing or you are moving into applications that your current system can’t handle.

## TOP 7 QUESTIONS YOU SHOULD ASK WHEN BUYING AN AUTOMATED LIQUID HANDLING SYSTEM

- 1** What kind(s) of dispensing technology is used? Peristaltic pump dispensing offers low prime volumes and back-flushing; while microprocessor-controlled syringes are characterized by fast output and high precision. Hybrid detection systems combine both technologies in one compact unit, and can even add washing functions for the utmost in volume range, flexibility and precision.
- 2** Is the liquid handler automatable? Manual plate handling slows productivity as throughput increases. Automating the process with a compatible microplate stacker increases throughput with walk-away operation.
- 3** Can the liquid handler accommodate magnetic or plastic bead-based assays? If using bead-based assays, the liquid handler should be equipped with appropriate magnets or vacuum filtration for critical wash steps.
- 4** What is the volume range, and how many different sample vessel types may be used?
- 5** Ask about the software—is it integrated and user-friendly? Does it allow for pre-programmed and custom protocols?
- 6** What is the flow rate spectrum? A wide flow rate spectrum allows use with sensitive cell-based assays to viscous liquids.
- 7** What assay validation data is available for the liquid handler? Assay validation data specific for the liquid handler provides proof that the instrument performs as indicated

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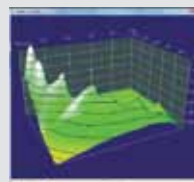
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### TECHNOLOGY

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air displacement pipetting (offers less risk of sample dilution or contamination resulting from syringe based pipetting), Anti-Droplet Control (ADC) to facilitate effective pipetting of highly volatile solvents, liquid level detection (pLLD/cLLD), TADM (Total aspirate and Dispense Monitoring technology) and MAD (Monitored Air Displacement technology) for monitoring the pipetting process in real time.



### NIMBUS INSTINCT SOFTWARE

Hamilton recognizes the critical role that instrument control software plays in overall system usability and end-user satisfaction. Microlab Instinct software provides an intuitive graphical user interface for simplified instrument control and streamlined method programming, allowing you to achieve results faster and with less training than before. Designed around the practical needs of users in today's busy labs, INSTINCT supports a wide range of your daily lab work. For users at all levels of experience, from begin-

ner to advanced, INSTINCT software enables programming of the most basic pipetting tasks as well as more complex protocols.



### APPLICATIONS

Because of its compact size and high-density deck, NIMBUS is the ideal platform for dedicating to a discrete task or application. NIMBUS makes quick work of basic routines such as reagents additions, serial dilutions, plate replication and reformatting, yet can also be easily adapted to perform more demanding tasks such as nucleic acid extraction, PCR set up, clean up, next generation sequencing sample preparation, cell culture, protein purification, MALDI spotting, ADMET studies, ELISA processing, sample pooling etc. For more information about NIMBUS, please visit link [www.hamiltonrobotics.com/nimbus/](http://www.hamiltonrobotics.com/nimbus/)

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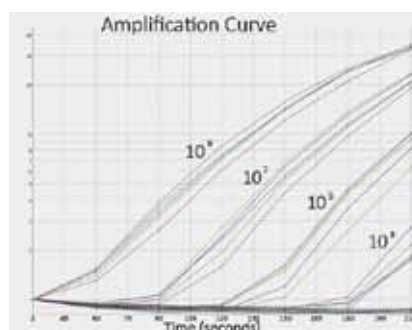
## CHEMISTRY

DNABle is a novel isothermal DNA amplification technique developed by EnviroLogix that utilizes two primers and a fluorescent molecular beacon to rapidly amplify and detect specific DNA sequences. Unlike PCR, DNABle uses two enzymes—a nicking enzyme and DNA polymerase—that work together at one temperature in the presence of a proprietary chemistry to amplify DNA specifically and exponentially. More importantly, real-time amplification curves can be generated and employed to quantify nucleic acid samples.

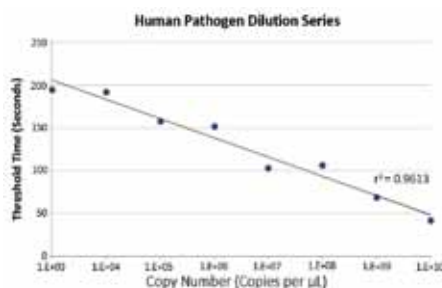
## AMPLIFYING A HUMAN PATHOGEN

A dilution series spanning seven orders of magnitude was generated by diluting synthetic DNA that encodes the sequence of a common human pathogen. The

dilution series used to build the standard curve was generated in just 10 minutes at 56°C. It utilized pathogen DNA in the DNABle assay with the Nexar system and a DNABle assay specific to that pathogen. The amplification curves are shown below in figure 1.



▲ Figure 1. Amplification Curves



▲ Figure 2. Regression Plot

The regression line produced by the dilution series is shown in figure 2.

This figure clearly shows that the Nexar system is ideally suited to quantifying DNA, because the relationship between threshold time and quantity of DNA produced is virtually linear ( $r^2 = 0.96$ ).

## MORE INFORMATION

To learn more about the Nexar Optimized for Real Time Nucleic Acid Processing and how it can lower your costs and significantly increase your sample throughput, go to [www.douglasscientific.com](http://www.douglasscientific.com).

\*DNABle is a registered trademark of EnviroLogix, Inc.



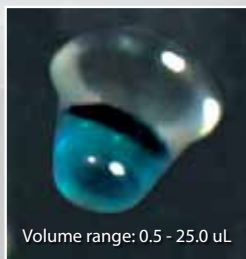
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## REPRODUCIBLE ISOLATION OF HIGH QUALITY RNA

INTEGRA has released a new video demonstrating a solid phase extraction (SPE) microplate method for reproducible, high throughput isolation of high-quality DNA-free total RNA.

Large scale gene expression screening projects require reliable high-throughput methods to isolate high quality RNA from a large number of samples. To meet this need, a growing number of commercial 96-well format RNA isolation kits are now available. Typically such kits are compatible with commonly used 96-well plate vacuum manifolds enabling the extraction (isolation) procedure to be accelerated.

The video shows how researchers use a VIAFLO 384 handheld electronic pipette in conjunction with vacuum manifold, 96-well solid phase extraction (SPE) microplate and RNA isolation kit to reproducibly extract high quality total RNA from cultured cells and bacteria.

The VIAFLO 384 is a handheld 384-channel electronic pipette that offers all the benefits of increased sample throughput as well as lower sample and reagent use without the expense of having to invest in a robotic liquid handling system. Designed to be used just like a standard handheld pipette the VIAFLO 384 requires no special skills or training to operate it. The VIAFLO 384 features INTEGRA's popular Touch Wheel™ pipette user interface enabling simple and fast programming of a wide range of pipetting modes including repeat dispense, serial dilute and mixing routines.

To watch the RNA isolation video please visit [www.youtube.com/watch?v=qZUDG\\_74MgU](http://www.youtube.com/watch?v=qZUDG_74MgU). For further

information on the VIAFLO 384 please contact INTEGRA in Europe / Asia on telephone +41-81-286-9530 / email [info@integra-biosciences.com](mailto:info@integra-biosciences.com) or in North / South America on telephone +1-603-578-5800 / email [US@integra-biosciences.com](mailto:US@integra-biosciences.com)

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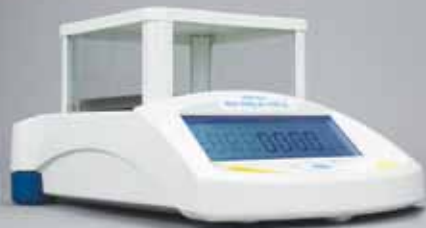
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## BALANCES

# TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR ANALYTICAL BALANCE

- 1** The balance is unable to hold calibration, needing re-calibration after very few weighing tasks.
- 2** The displayed results drift up or down, jump for no apparent reason, or are consistently unstable.
- 3** The lab's weighing needs have changed and the facility could benefit from more advanced features such as up-to-date data communication interfaces, statistical calculations, storage of readings, and product identification codes.
- 4** The stability and repeatability are no longer accurate.
- 5** Integration to a computer may be necessary and there may be definitive signs of corrosion.
- 6** The balance requires constant maintenance.

# TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A LAB BALANCE

- 1** What is the heaviest sample you will weigh (including container weight) and what is the lightest sample?
- 2** What is the required +/- tolerance of your lightest sample?
- 3** How many decimal places in grams do you require for the displayed weight?
- 4** What type of samples will you be weighing and do you need to take into consideration the size of the weighing surface or the securing of a tare container?
- 5** Is on-site service available from a factory-trained service technician?
- 6** Do you need to interface the balance to another device such as a computer, printer, bar code reader, etc.?

## RECENTLY RELEASED BALANCES

### EXCELLENCE PLUS XP MICRO BALANCES

- Especially qualified for micro-dosing directly into large tare containers
- Features SmartGrid micro, SmartSens and SmartScreen—three innovations combined in one balance—ensuring comprehensive weighing security
- Provide optimal user protection, excellent measurement performance, full data security and seamless traceability
- Include built-in warning systems that visually and audibly alert the user



METTLER TOLEDO  
[www.mt.com](http://www.mt.com)

### AUW ANALYTICAL BALANCES

- Engineered with the UniBloc technology
- Provides fast response and superb stability in a 0.1mg analytical balance
- Various application functions, two modes of fully automatic calibration and back lit display support many requirements
- Choice of fully-automatic calibrations available: PSC and Clock –CAL
- Calibration report can be automatically printed with the optional electronic printer



Shimadzu  
[www.ssi.shimadzu.com](http://www.ssi.shimadzu.com)

### PW ANALYTICAL BALANCES

- Designed to meet the needs of laboratories, schools, industry and commercial users offering a wide range of applications
- Includes 16+ weighing units (including one custom unit)
- Features selectable digital filtering for animal / dynamic weighing
- Also includes adjustable filters and simple user-friendly operation as well as full range tare and zero tracking



Adam Equipment  
[www.adamequipment.com](http://www.adamequipment.com)

### EXPLORER® LAB BALANCE

- Features four user programmable touchless sensors
- Offers hands-free operation of tare, zero, print, calibration and other functions to minimize cross-contamination or unwanted residue on the balance
- Improves weighing speed and efficiency in the laboratory
- Sensors eliminate the extra effort or time to press the balance's keys
- Balance also includes enhanced SmarText™ 2.0 easy-to-use graphical software



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**BALANCE MANUFACTURERS**

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Adam Equipment	<a href="http://www.adamequipment.com">www.adamequipment.com</a>
Alliance Scale	<a href="http://www.alliancescale.com">www.alliancescale.com</a>
Denver Instrument Company	<a href="http://www.denverinstrument.com">www.denverinstrument.com</a>
Gram Precision	<a href="http://www.gramprecision.com">www.gramprecision.com</a>
Intelligent Weighing Technology	<a href="http://www.intelligentwt.com">www.intelligentwt.com</a>
Mettler Toledo	<a href="http://www.mt.com">www.mt.com</a>
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Scientech	<a href="http://www.scientech-inc.com">www.scientech-inc.com</a>
Shimadzu	<a href="http://www.ssi.shimadzu.com">www.ssi.shimadzu.com</a>
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balances, trust A&D  
for ***all*** your weighing  
needs.



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[www.andweighing.com](http://www.andweighing.com)



# The new Quintix® Redefining Standard.



What makes the new Quintix® so different from other standard laboratory balances? Practical features that are anything but standard and that make workflows for the user much more efficient and reliable:

- Intuitive applications guidance for easy navigation
- Maximum accuracy at all times thanks to isoCAL
- Make your record-keeping faster and easier with Quintix® USB "plug & work" connectivity to a printer or computer

[www.sartorius.com/quintix](http://www.sartorius.com/quintix)







Components our readers are using with their lab balances include:

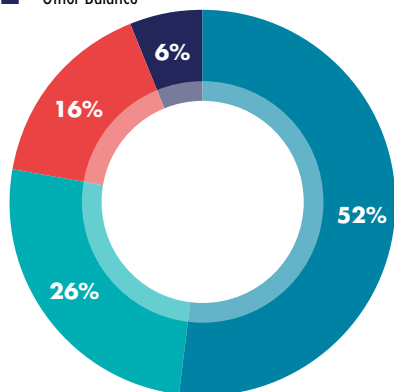
Calibration Weights	33%
Balance Enclosure	23%
Vibration Isolation Table	12%
Weighting Table	12%
Moisture Analyzer	8%
Balance Printer	4%
Barcode Scanner	3%
Other	2%
Keyboard	2%
Evaporation Traps	1%

The weighing applications respondents are using their lab balances for:

Pipette Calibration	25%
Differential Weighting	22%
Dynamic Weighing	21%
Mass Comparison	19%
Filter Weighting	11%
Other	3%

Types of balances respondents are using or planning to purchase for their facilities include:

- Analytical Balance
- Precision Balance
- Micro Balance
- Other Balance

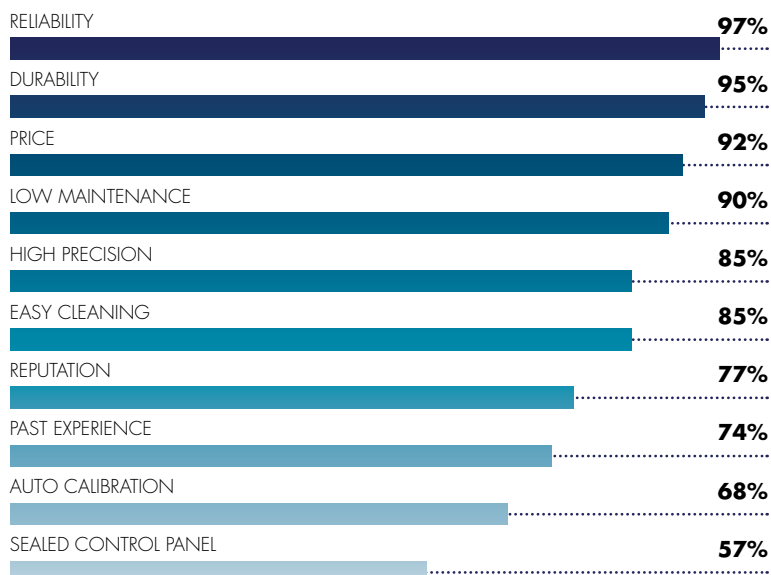


## ARE YOU IN THE MARKET FOR A... LAB BALANCE?

With older mechanical balances fading from the picture, balances are becoming sophisticated in terms of user interface, ergonomics, data acquisition, and built-in diagnostics. Most balances interface with the user through a front panel, although some features are available through a computer connection. Newer models are designed to make sample introduction and removal a comfortable experience and to reduce the likelihood of repetitive-stress injuries. For example, quality control or environmental laboratories may run several hundred samples per week; the busiest establishments may encounter such workflows in one day. Copying numbers to three or four decimal places is not only tedious—it may lead to skewed results through miscopying weight values or entering them into the wrong location on a spreadsheet. Analysts may not notice anything is wrong until after completing several days' worth of measurements. The last thing a busy lab wants is rework: having to reweigh samples or, in a worst-case scenario, having to prepare a tray of samples and rerun an experiment. Most top-line balances include some sort of connectivity option to help make things easier for users.

### TOP 10 FEATURES/FACTORS

respondents look for when purchasing a lab balance



COMPLETED SURVEYS: 338



For more information on lab balances, including useful articles and a list of manufacturers, visit [www.labmanager.com/balances](http://www.labmanager.com/balances)

# NEW SERIES 3Y

## NEW DESIGN

- In 2Y series cable was hidden under the main housing now is folded behind the indicator
- New bottom design of AS/3Y and PS/3Y.

## OPERATING SYSTEM – WINDOWS CE

New operating system enables better communication with external devices and improves efficiency of the balance alongside with graphic transfer to standard office printers.

## NEW WORKING MODES

- Differential weighing – enables single and multi sub sequential weighing of the same sample
- Pipette calibration – after defining pipette id dedicated data base pipette can be checked in accordance to ISO Standard
- Automatic calibration – enables statistical control from the batch in accordance to Pharmaceutical guidelines USP

## UPGRADED WORKING MODES

- Formulation – enables formula making from hand or data base of formulas with automatic protection against overdosing and recalculations function
- Mass comparison – enables using balances as mass comparator

## GRAPHS

Graph visualization of measurements or Gaussian distribution, zooming function and BMP file printed on PLC printers or exported into a file via USB

## EXCHANGEDATA

Data exchange between balances software enabling programming databases from PC level

## MULTIUSER

Four level of accessibility to the balance menu and to each database separately

Profile personalization covers language, display and printout content functionality of buttons and proximity sensors, tailored to each working mode independently

## ECONDITIONING

Monitoring of ambient conditions by internal and external sensors – THB

Air buoyancy correction calculated from internal sensors or THB2 on line

## EXMEMORY

of 3Y - series solution – the size of each database is adjusted dynamically

## NEW MODELS IN 3Y FAMILY

- New model – moisture analyzer MAY with all functionality and advantages of 3Y Series
- New model – XA 3Y offering high accuracy mechanism with manual opening door system



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Fax: +48 48 385 00 10  
[www.radwag.com](http://www.radwag.com)

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR CLASS II BIOSAFETY CABINET

- 1** The stainless steel interior is showing signs of rust or pitting.
- 2** Any time an alarm sounds and does not self-correct.
- 3** Is the BSC still supported by the manufacturer, are parts still available?
- 4** The BSC no longer passes its annual certification.
- 5** The BSC no longer meets current performance criteria (i.e. NSF/ANSI 49, EN 12469)

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A BIOLOGICAL SAFETY CABINET (BSC OR MSC)

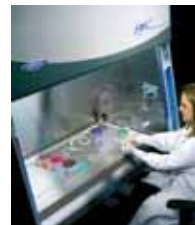
- 1** Do the samples/specimens/cultures need to be protected from environmental particulates? Answering this question determines what type of BSC you require.
- 2** Are chemicals involved in your application? Hazardous (toxic or volatile) vapors are not filtered by the HEPA/ULPA filters found in BSCs. Different BSC designs are available.
- 3** What are your size limits? Know what the maximum space allotment is so that you don't end up with equipment that is too big for your lab, or so small that you can't work.
- 4** Does your procedure require modifications to the equipment that are uncommon? BSCs should be built to an appropriate standard and listed by a testing agency. Some modifications can lead to the equipment being unsafe; reputable manufacturers will not provide such alterations.
- 5** Cost is always a concern. Avoid looking at the sticker price of a BSC; inquire instead about the lifetime cost of each BSC. This includes energy savings, service life, and a proven product track record.

### RECENTLY RELEASED BIOLOGICAL SAFETY CABINETS

#### CLASS II | PURIFIER® LOGIC®+

- Keeps the researcher safe from the biohazard agents being used
- Comfort is provided with an angled sash for a closer, more comfortable view and an electrical outlet cover that can be opened with one finger and gently and slowly self closes
- Offers a large interior work area and 27" of viewing height

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- Animal Handling Equipment
- Ultra-low Freezers
- And more



International Federation of  
Biosafety Associations

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## BIOLOGICAL SAFETY CABINETS

### CELLGARD HD ES NU-481

- Incorporates NuAire's existing technology and new DC ECM technology to give users the best value
- Requires less energy to operate, has a longer filter life and the lowest possible noise and vibration
- TouchLink™ Electronic Control System monitors and controls all cabinet functions
- Supplies an ergonomically correct environment and safety effective work zone



NuAire  
[www.nuaire.com](http://www.nuaire.com)

### BIOCHEMGARD E3

- Operates at only 664 CFM, minimizing noise and cutting power requirements
- Reduces the overall annual cost of operation by 49%
- Motor blower reserve is at least 420%, extending the filter life for less downtime
- Allows for faster, simpler maintenance
- Engineered specifically for laboratories that need containment and removal of vapors, mists and particulates



The Baker Company  
[www.bakerco.com](http://www.bakerco.com)

### 1300 SERIES

- Available with choices of stainless steel or SmartCoat interiors
- Supply and exhaust blowers adapt in real time to provide the correct airflow parameters and maintain a safe working environment
- Digital Airflow Verification (DAVe) system also increases safety
- Brushless DC motors reduce energy consumption, heat output, and noise



Thermo Fisher Scientific  
[www.thermoscientific.com](http://www.thermoscientific.com)

## BSC MANUFACTURERS

Air Science USA	<a href="http://www.air-science.com">www.air-science.com</a>
AirClean Systems	<a href="http://www.aircleansystems.com">www.aircleansystems.com</a>
Captair	<a href="http://www.captair.com">www.captair.com</a>
Erlab	<a href="http://www.erlab.com">www.erlab.com</a>
ESCO	<a href="http://www.escoglobal.com">www.escoglobal.com</a>
Flow Sciences	<a href="http://www.flowsciences.com">www.flowsciences.com</a>
Germfree	<a href="http://www.germfree.com">www.germfree.com</a>
HEMCO	<a href="http://www.hemcocorp.com">www.hemcocorp.com</a>
Kewaunee Scientific	<a href="http://www.kewaunee.com">www.kewaunee.com</a>
LABCONCO	<a href="http://www.labconco.com">www.labconco.com</a>
Mystaire Misonix	<a href="http://www.misonix.com">www.misonix.com</a>
NuAire	<a href="http://www.nuaire.com">www.nuaire.com</a>
Sentry Air Systems	<a href="http://www.sentryair.com">www.sentryair.com</a>
Terra Universal	<a href="http://www.terrauniversal.com">www.terrauniversal.com</a>
The Baker Company	<a href="http://www.bakerco.com">www.bakerco.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>

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## MORE UNDER THE HOOD. OVER 100,000 LOCATED WORLDWIDE

**NuAire, Inc. offers two Biological Safety Cabinet designs, the LabGard® ES and the CellGard™ ES (Energy Saver) Class II, Type A2 models, available in four widths (3ft., 4ft., 5ft. & 6ft.). The LabGard® has a straight front 0° (vertical), the CellGard™ model features a 10° sloped front window, with a vertical sliding window encased in a frame that opens 30° to aid in cleaning behind the sash.**

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The CellGard™ is compatible with NuAire's DECON 101 System which streamlines the decontamination process providing the service technician with a safe and easy method to protect your laboratory from harmful gases.

NuAire's BSC's are engineered with an ultra high efficiency DC ECM motor to decrease energy consumption and your laboratory's total cost of ownership saving 40% over a 15 year period compared to previous models. With the use of the DC ECM motor, internal exhaust damper, motor speed controller, and an optimally determined forward curve fan, we're able to increase the life of your filter, handling up to a 250% pressure drop when in operation. The NU-425 and NU-475 features NuAire's ESSENTIALS control package consisting of easy to use toggle switches that control cabinet functions. The NU-437 and NU-477 features the FlowGard™ control package, utilizing a digital pressure transducer which monitors the cabinet's plenum, warning laboratory personnel of improper airflow through audible and visual alarms. The NU-440 and NU-480 features the TOUCHLINK System offers step-by-step on-screen instructions to aid laboratory personnel and certifiers in maintaining the cabinet by providing detailed diagnostic information. The TOUCHLINK system has the capability to start and stop cabinet operations on a customizable schedule and integrates with current Laboratory security systems.

LabGard® ES NU-437, NU-440, and CellGard® ES NU-477, NU-480 all feature the nitecare™ night setback program, which is incorporated in the FlowGard™ Control System. nitecare™ will cut energy costs while maintaining work zone sterility when the cabinet is not in use. nitecare™ is initiated by closing the window, once the sash has been closed, the automated nitecare™ system turns off lights and decreases the fan/motor speed. The optional "UV Light Timer" allows the Germicidal Ultra Violet (UV) light to be activated for a period of time helping maintain work zone sterility. nitecare™ provides the performance, reliability, and cost saving technologies for your laboratory.

Constructed of heavyweight 16 gauge, type 304 stainless steel, the superior construction provides long term durability with better safety features than other Biosafety cabinets. The ergonomic features enhance user comfort and safety when engaged with scientific research. NuAire® Biological Safety Cabinets provide maximum knee clearance, staggered sidewall service valves, and frameless polished edge window allowing for greater visibility and better sight lines to the work zone area, all aiding in lessening the chance of sitting in an awkward posture resulting in neck and shoulder strain. The cool white lighting in our cabinets decreases glare, helping to eliminate eye fatigue. The centrally located Electronic Control System is custom built to order allowing you the ability to create the perfect cabinet for your specific research application needs.



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[www.nuaire.com](http://www.nuaire.com)

## TOP 7 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR CENTRIFUGE

- 1** See, hear, smell—You see rust and corrosion or damage, it makes noises that cannot be explained/fixed by service, or it has strange smells that cannot be explained.
- 2** You make a lot of adjustments to run your application— i.e. there is a more efficient, modern, innovative rotor/tube/adaptor to perform your application.
- 3** There are no longer rotors to buy (rotors are obsolete).
- 4** Your instrument is no longer supported by the supplier's service department, or you've received a letter from the supplier that parts are no longer available.
- 5** Service and/or parts replacement purchases are increasing—i.e. more breakdowns as time goes on.
- 6** No one can remember when it was purchased.
- 7** It is older than you are.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A CENTRIFUGE

- 1** What is the maximum g-force the centrifuge can generate?
- 2** How does the company's centrifuge differ from other ones that have the same speed and capacity?
- 3** What kind of warranty comes with the centrifuge, what does it cover?
- 4** If the company discontinues the product, for how many years do they provide accessories and parts for the centrifuge?
- 5** Ask about cost of the purchase—not just the price of the product being installed but the total cost of ownership, which includes price, service expectations, warranty, etc.

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**Fiberlite® Carbon Fiber Rotors**

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and performance

## RECENTLY RELEASED CENTRIFUGES

### SORVALL LYNX SUPERSPEED CENTRIFUGE

- Features a 100,000 x g top speed performance
- Supports high-throughput sample processing from 50 mL conical tubes and microplates to 1 L bottles, up to a six-liter capacity
- Includes easy run set-up with the touchscreen interface featuring a bright, highly visible and durable display and on-board video tutorials and access controls, for advanced training and programming options



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### AVANTI J-26S HIGH PERFORMANCE CENTRIFUGE

- Newly redesigned
- Combines important environmental benefits with increased BioSafety features
- Coupling the J-26S with new 1-liter polypropylene bottles furthers sample security and extends the range of biopharmaceutical and research applications
- Provides high speed, low heat output, imbalance tolerance and low noise, and a range of ever-expanding separations capabilities



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- Much quieter than its predecessors
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- Includes a condensation drain to eliminate water accumulation and to prevent corrosion
- FastTemp program takes just eight minutes to cool the sample down to 4°C



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### HETTICH CELL CULTURE VALUE PACKAGE

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- Centrifuge features a wide variety of swing-out and fixed angle rotors
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- Exchangeable rotors also offered
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## CENTRIFUGE MANUFACTURERS

Beckman Coulter

[www.beckman.com](http://www.beckman.com)

Eppendorf

[www.eppendorfn.com](http://www.eppendorfn.com)

Hanil

<http://eng.ihanil.com>

Helmer

[www.helmerinc.com](http://www.helmerinc.com)

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CENTRIFUGES

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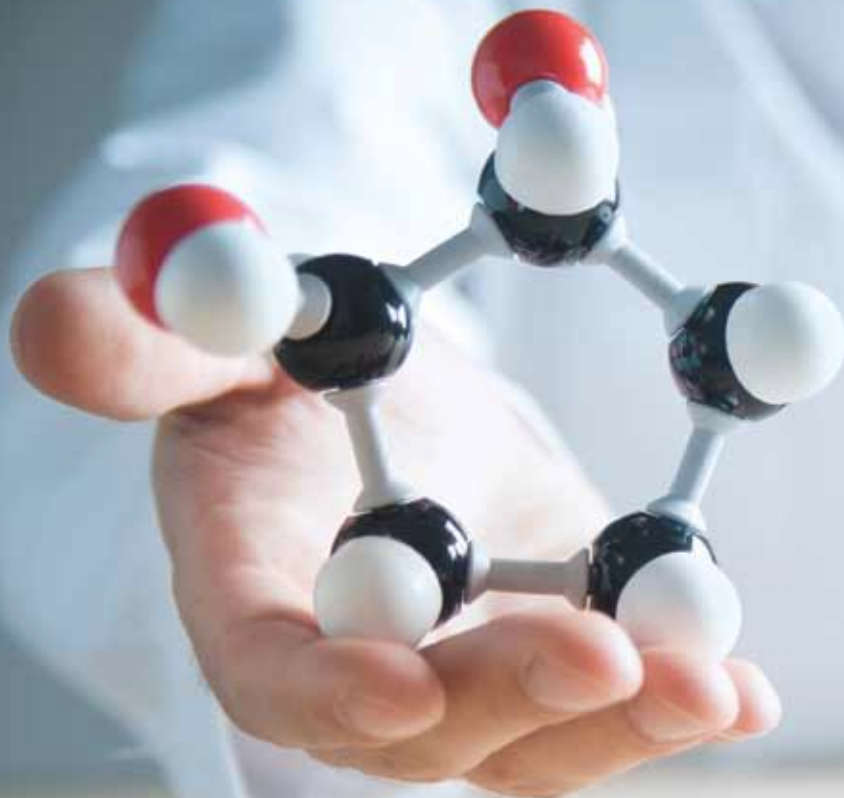
## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING QPCR REAGENTS

- 1 What key performance attributes does the company's reverse transcription and qPCR reagents offer that the competition does not offer? Do these attributes make your choice the most fit for your application?
- 2 Are you able to submit data files and questions to your reagent provider to help ensure your lab's success? Does your reagent provider offer on-site and electronic qPCR application support, and technical phone support before and after product purchase?
- 3 qPCR reagents have been on the market for many years. What improvements in enzyme engineering and buffering chemistry has the company taken to provide the latest in qPCR reagents performance?
- 4 Does your reagent provider offer technical support to enable successful transitioning to the newest qPCR reagent offerings whenever they become available?
- 5 What processes are in place to ensure minimal lot to lot variation of the reagents when generating data for a long-term study?

## TOP 7 QUESTIONS YOU SHOULD ASK WHEN BUYING RNAi REAGENTS

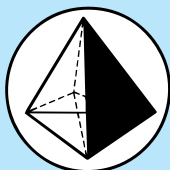
- 1 Does the RNAi product provide transient silencing only or does it allow stable gene knockdown? Choice of RNAi products will be determined by whether you need to knockdown expression for several days or create a stable cell line.
- 2 Is the RNAi product suitable for your cells? How difficult it is to transfect your cells will determine the delivery method you require, such as tailored transfection reagent or lentiviral vector.
- 3 Ask if a ready-to-use product is already available; has the silencing of your gene(s) of interest already been validated and published?
- 4 Do the RNAi products guarantee a level of knockdown? What happens if you do not get the amount of gene silencing needed?
- 5 Are positive and negative controls provided with the RNAi products?
- 6 Does the RNAi product silence all known splice variants of my gene of interest and does it target the ORF or non-coding region of my gene?
- 7 How can I minimize the interferon response of RNAi transfection? shRNA instead of siRNA may be an option in some cases.

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- PBDEs (all 209 congeners) & metabolites
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- Other Brominated Flame Retardants
- Halo-dibenzo-p-dioxins and furans
- PAHs, nitro-PAHs, methyl-PAHs

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- All solutions are manufactured under the scope of our ISO/IEC 17025 and ISO Guide 34 quality systems using the highest purity raw materials available
- Verified for accuracy through rigorous quality control

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### SsoADVANCED UNIVERSAL SUPERMIXES

- Deliver excellent real-time PCR (qPCR) performance under any reaction conditions on any qPCR instrument
- Include the SsoAdvanced™ universal SYBR® Green supermix and the SsoAdvanced universal probes supermix
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- Complement Bio-Rad's iTaq™ universal supermixes



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# USE OF FLUORINATED PBDE'S AS AIDES IN THE IDENTIFICATION OF NATIVE PBDE CONGENERS

By Jack Hubball Ph.D.

## IMPORTANCE OF PBDES

Polybrominated diphenyl ethers are a group of brominated flame retardants used primarily as additives in various plastics and polymers. Due to their widespread use as well as their tendency to leach from the polymer matrices, PBDEs have become a major class of environmental pollutants. The ability to bio-accumulate and the structural similarities to PCBs have led to concern over the possible health effects of PBDE exposure.

## CHALLENGES FOR ANALYSIS

As with PCBs, the separation and identification of PBDE congeners and related metabolites present a significant analytical challenge due to the co-elution of compounds and nearly identical mass spectra. The traditional approach of using C13 labeled compounds has been successfully utilized for both internal standard quantification, and as an internal standard for calculating relative retention indices. However, this approach is expensive and cannot be used with electron capture detector methods.

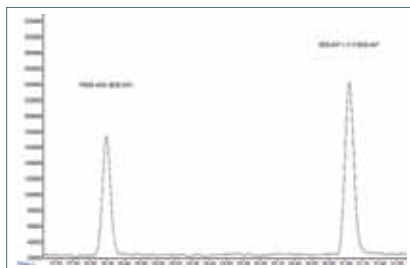
A less expensive and more versatile approach to the problem is the synthesis and use of mono and di-fluorinated analogs of the native BDEs.

## ADVANTAGES OF FBDES

These compounds offer several advantages over the C13 labeled counterparts:

- They are more cost-effective
- They can be used with electron capture detection
- They add 18/36 mass units resulting in fewer problems with co-elution
- They have been shown to provide improved precision in PBDE analyses

These attributes are pertinent whether the FBDEs are used for quantitative analysis, or as markers to calculate relative retention indices. Figure 1 illustrates the usefulness of using the fluorinated analog to avoid the co-elution between the native BDE and the C13 labeled internal standard.



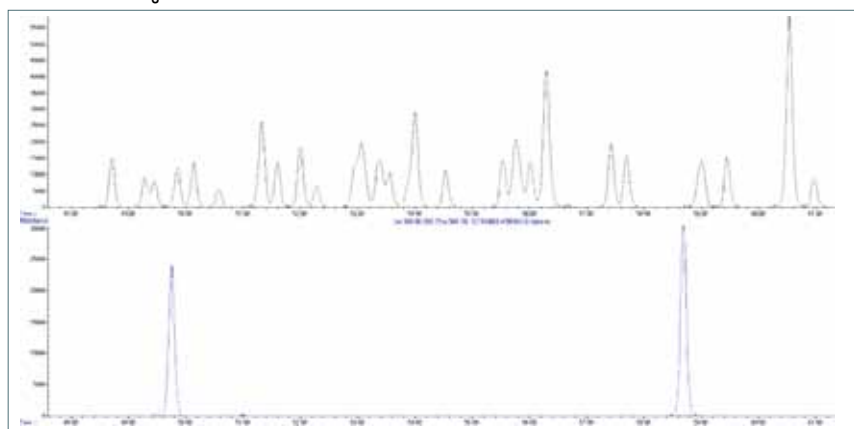
Elution times which are independent of the native analogs enable the analyst to calculate relative retention data which provide more accurate identifications within congener mixes.

Figure 2 shows a separation of all 42 TetrabromoBDE's on a MS-5 GC column. There are only 25 chromatographic peaks present which indicates a number of co-elutions. However, all 42 homologs can be identified through the use of relative retention data calculated for two different selectivity GC columns. The mass spectral differences between the fluorinated and native BDEs makes them excellent choices as brackets for the native compounds.

## CONCLUSION

The number and variety of FBDEs also make them a logical and cost effective choice when analyzing real-world samples for BDEs. Compounds having from one to nine bromine substitutions are available to help with any analytical challenge.

◀ Figure 1. Chromatogram showing the Fluorinated BDE 047 and the co-eluting Native and C13 BDE 047



▲ Figure 2. Total Ion Chromatogram of all 42 Tetra BDE homologs and the FBDE compounds used to calculate relative retention values.



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Instrument noise, particularly from cooling devices, can take its toll on laboratory workers. Noise interferes with conversations but can also induce stress, leading to irritability, anxiety, and poor performance. Lab workers are particularly susceptible, as decibels in busy labs can add up quickly from refrigerators, freezers, aspirators, fume hoods, and chillers. Noise is therefore an important factor when choosing a chiller.

## TOP 3 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR CHILLER OR BATH

- 1 Product is no longer cooling or pumping.
- 2 Troubleshooting has not resolved the problem.
- 3 Irresolvable error messages on the display.

## TOP 7 QUESTIONS YOU SHOULD ASK WHEN BUYING A CHILLER OR BATH

- 1 Does the product have any exclusive features? What sets it apart from other vendor's chillers or baths?
- 2 Is the vendor ISO 9001 certified?
- 3 What refrigerants are used in the product? (this is applicable to chillers and refrigerated baths/circulators)
- 4 Are the products energy efficient, environmentally friendly, and in compliance with RoHS guidelines? (no heavy metals used in printed circuit boards, etc.)
- 5 Can old/broken units be returned for disposal in an environmentally friendly manner? (refrigerants reclaimed, metals and other materials recycled, etc.)
- 6 Does the company accept trade-ins and if so, what happens to the old unit? (should be disposed of properly)
- 7 What warranties and application and tech support do the company offer?

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### CHILLER & BATH MANUFACTURERS

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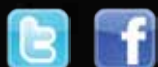
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## TOP 3 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR CLEAN ROOM FURNITURE

- 1** The furnishings (due to size or configurability) are not suited to new applications you are getting into or do not meet the clean room's classification by Federal Standard 209E for airborne particulate cleanliness.
- 2** The furnishings are damaged or worn out by exposure to liquids and solids processed inside the room or are a main source of contamination in the clean room.
- 3** New applications mean you need a different material of construction for your clean room furniture or casework, either coated steel, stainless steel, or polypropylene—or a higher grade of one of these materials. For example, the lowest grade of polypropylene will minimize fire damage while the highest grade, FM-4910, will self-extinguish if it catches fire.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING CLEAN ROOM PRODUCTS

- 1** What applications are you using your clean room for? This will determine the classification of cleanroom you will need and the setup and type of shelves, cabinets, hinges and doors you'll require. If you expect applications to change in the near future, getting modular casework is probably a good idea.
- 2** How easy to clean is the furniture and other equipment? Clean room products must be easy to clean since the purpose of a clean room is to protect the environment from hazardous or sensitive materials.
- 3** What materials will you be working with in the clean room? This will help you determine what finish/materials you will need in your clean room furniture, etc. Polypropylene casework is a good choice if your lab works with corrosive acids or chemicals that experience high humidity. However, it is expensive while casework made from welded steel with an epoxy powder coat finish is more economical and also has high resistance to acids and moisture.
- 4** How large is the space you will be working in? This will also help you decide the size, shape, and configuration of clean room products you will need.
- 5** How much do the products cost? Ask about warranties and how long the products last, based on their use with the materials you work with.

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CLEAN ROOM  
PRODUCTS

# EVAPORATORS & EVAPORATION SYSTEMS

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR NITROGEN EVAPORATOR

- 1** It uses a water bath vs. a dry heat block. Water baths can cause contamination by condensing evaporate from the water bath on the lid and dripping into your sample.
- 2** Evaporation rates are getting longer. This could be a sign of cracked or damaged nitrogen hoses or gaskets. It could also indicate a heater problem.
- 3** A sample temperature probe is not available. Temperature probes read actual sample temperature during evaporation. Without it, samples could overheat, causing degradation and damage to the sample.
- 4** Too much nitrogen is being used. There could be a leak in the nitrogen line or in the system, wasting valuable nitrogen.
- 5** The evaporator is no longer reliable. Inconsistent evaporation rates from run to run could indicate service issues that could be costly to fix.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR VACUUM CONCENTRATOR

- 1** Refrigeration of samples during evaporation is not available. Heat sensitive samples, such as protein and RNA can be ruined if they are overheated. A vacuum evaporator with controlled cooling is required.
- 2** The concentrator takes up a lot of space. Newer concentrators are as small as a 9" cube and others include the concentrator, cold trap and pump in one box. A floor model option houses the vacuum pump and doesn't take any bench space.
- 3** Your application has changed. The vacuum concentrator was intended for aqueous samples, but now solvents or acids are used. Corrosion of key components, including the chamber, lid and rotor hub, could affect the concentrator's ability to evaporate or even operate.
- 4** The unit no longer pulls a good vacuum. Gaskets, hoses and all rubber components break down over time, causing a decrease in depth of vacuum resulting in longer evaporation times.
- 5** The evaporator is no longer reliable. Inconsistent evaporation rates from run to run could indicate service issues that could be costly to fix.



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Labconco's RapidVap® Vertex Dry Evaporator uses a dry heat block to quickly evaporate samples under nitrogen stream.

Combinatorial chemistry can be traced back to the 1960's, but didn't gain popularity until 1990 when pharmaceutical companies started compounding large amounts of potential new drugs into libraries. Now, combinatorial chemistry has moved into other disciplines such as materials science, biotechnology and even semiconductors.

Because combinatorial chemistry requires multiple samples to be run in parallel, the RapidVap Vertex Evaporator, accommodating up to 50 samples, is the perfect choice for this type of research and development. During operation, each product is synthesized in separate reaction vessels. The advantage of parallel synthesis is that the composition of each compound is known, but generally, the split and mix procedure can generate many more compounds in the same amount of time. The samples are evaporated in the Vertex simultaneously which speeds throughput and keeps all samples under the same conditions. The nitrogen supply is controlled in rows of 10 so nitrogen can be conserved in smaller sample runs.

The RapidVap Vertex Evaporator uses a dry heat block to quickly evaporate samples under a gentle stream of nitrogen. Unlike water baths, a dry block does not evaporate during the run which can result in condensation from the bath—condensation



which could drip into the samples causing contamination. A dry block requires less maintenance and requires no distilled water or additives.

The RapidVap Vertex accommodates tube sizes ranging from microcentrifuges up to 28mm in diameter. A convenient LCD touch screen allows easy programming of time and temperature and

up to ten different programs may be stored in its microprocessor for protocol consistency. A microprocessor-controlled heater supplies heat to the block and is programmable from 30° C to 100° C in 1 degree increments.

Nitrogen blow down reduces the partial pressure directly over the liquid to speed evaporation and help remove the solvent as it evaporates. Heat helps speed the process. The samples are angled thus increasing the surface area for faster evaporation and optimized recovery. The temperature sensor probe may be positioned on the block or in a sample to monitor temperature.

There are seven interchangeable aluminum blocks to choose from and are sold separately—five hold samples as small as two milliliters; two additional blocks hold 28 mm tubes with samples sizes of 40 and 60 milliliters.

Jenny Sprung, Product Manager, Labconco Corporation 816-822-37236, 88114 Prospect Avenue, Kansas City, MO 64132 Toll free: 800-732-0031, [www.labconco.com](http://www.labconco.com)

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## EVAPORATORS & EVAPORATION SYSTEMS

### TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING AN EVAPORATOR OR EVAPORATION SYSTEM

- 1** What are your sample sizes? Microtiter plates and micro centrifuge tubes work best in a centrifugal vacuum concentrator. For large samples up to 450mls, a vortex evaporator is recommended.
- 2** What are your samples? Acids require an acid-resistant system. Solvents damage plastic and rubber components, an appropriate system to prevent damage is recommended. A -50C cold trap is ideal for aqueous-based samples, a -85C cold trap traps most solvents and a -105C cold trap is recommended for alcohols.
- 3** Are your samples heat sensitive? Even at ambient set point, vacuum concentrators add heat through friction. A concentrator that has refrigeration built into it will give you the temperature control recommended to maintain the viability of heat liable samples.
- 4** Do you have limited space? A floor model with casters or small all-in-one benchtop model can be moved out of the way when not in use.
- 5** Do you prefer vacuum evaporation or nitrogen blow-down? Some samples require evaporation under nitrogen, which is gentler, for volatile solvents.

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## TOP 3 REASONS YOUR LAB FILTER SHOULD BE REPLACED

- 1 Some filters have an indicator showing when the product needs replacing.
- 2 The filter is nearing the end of its service life.
- 3 Tests show that the filter is not removing hazardous substances from the air.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING LAB FILTRATION PRODUCTS

- 1 What sort of facility do you work in and what sort of applications do you use filtration for? This will help you determine whether disposable filters are right for you or not. Disposables make sense for any process where cleaning and reuse must be validated but tend to be more expensive than multiple-use filters.
- 2 What are the costs of using disposable filters versus the cost of the time and materials needed to clean a multi-use filter? This will help you determine the most cost-effective choice for your lab.
- 3 How can the company's filters eliminate steps in your lab's workflow?
- 4 How pure do you need your samples to be? Again, this helps clarify if disposable or multi-use filters are best for you and also helps narrow down which specific types of filters you'll need.
- 5 What sort of service or support does the company offer?



## FIVE FAST FACTS ON LAB FILTRATION

As researchers filter small volumes of sample, they can afford to lose less and less.

When customers do fewer than ten samples a day, they can use syringe filters.

The accuracy of HPLC depends on sample preparation, including filtration.

Challenges in small volumes get even more complicated with ultra-HPLC (UHPLC) but some of these problems can be solved by using a combined filter and autosampler vial.

What a researcher needs when filtering small-volume samples really depends on just what is being done. It depends on the kind of sample and its source; it depends on the question at hand and how it will be analyzed.

## RECENTLY RELEASED LAB FILTRATION PRODUCTS

### EXHAUST FILTER

- Keeps your workspace safe and your solvent reservoirs clean
- Includes a change indicator which shows the elapsed service life clearly and is easy to observe; lets users know when they should change the filter
- Easy to activate with the push of a button
- Available in two sizes with three and six month service lives



SCAT  
[www.scat-europe.com](http://www.scat-europe.com)

### NALGENE RAPID-FLOW FILTER FOR CELL CULTURE MEDIA

- Enables faster filtration of cell-culture media
- All Thermo Scientific Nalgene filter units and bottle-top filters now incorporate the Nalgene Rapid-Flow™ membrane support system
- Filter design maintains membrane stability, providing better performance and increased flow rates for faster throughput of media
- Provides a last line of defense against contamination



Thermo Fisher Scientific  
[www.thermoscientific.com](http://www.thermoscientific.com)

### CHEMTRAP™ DUCTLESS FILTRATION SYSTEM

- Eliminates noxious vapors generated by chemicals stored in the fireproof cabinet
- Allows laboratories equipped with fireproof cabinets to also benefit from a protection against chemical inhalation risks without having to connect to an expensive energy consuming ductwork
- Provides a simple and fast connection utilizing a universal pipe fitting sheath to a fireproof cabinet



Erlab  
[www.erlab.com](http://www.erlab.com)

### SIMPLEFILTER COMBINED FILTRATION & DRYING EQUIPMENT

- Provides a simplified alternative to more complex and costly technologies
- Designed for many pharmaceutical and chemical applications
- Consists of a heated insulated vessel with a filtration media attached to a heated base and a side discharge hatch for efficient drying and uncomplicated removal of the product through a purged GloveBag
- Available in two standard sizes 0.125m<sup>2</sup> (50L) and 0.3m<sup>2</sup> (130L)



PSL  
[www.powdersystems.com](http://www.powdersystems.com)

## LAB FILTRATION SYSTEM MANUFACTURERS

Bio-Rad	<a href="http://www.bio-rad.com">www.bio-rad.com</a>
EMD Millipore	<a href="http://www.emdmillipore.com">www.emdmillipore.com</a>
Erlab	<a href="http://www.erlab.com">www.erlab.com</a>
Pall Life Sciences	<a href="http://www.pall.com">www.pall.com</a>
Porvair Sciences	<a href="http://www.porvair-sciences.com">www.porvair-sciences.com</a>
PSL	<a href="http://www.powdersystems.com">www.powdersystems.com</a>
Sartorius Stedim	<a href="http://www.sartorius.com">www.sartorius.com</a>
SCAT	<a href="http://www.scat-europe.com">www.scat-europe.com</a>
Sigma-Aldrich	<a href="http://www.sigma-aldrich.com">www.sigma-aldrich.com</a>
Spectrum Labs	<a href="http://www.spectrumlabs.com">www.spectrumlabs.com</a>
Sterlitech	<a href="http://www.sterlitech.com">www.sterlitech.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>

Flow cytometry is a powerful technology that allows researchers and clinicians to perform complex cellular analysis quickly and efficiently by analyzing several parameters simultaneously.

## TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR FLOW CYTOMETER

- 1** The instrument is outdated and is either too complex for staff to learn to use or too simple to perform the complicated tasks you require.
- 2** You are getting considerable variability in your results.
- 3** The flow cytometer does not support the assay types you need it to.
- 4** The system takes up too much space in the lab and/or is costing too much time and money in maintenance.
- 5** The instrument's speed is too slow to keep up with your lab's workload.
- 6** The flow cytometer does not have the laser capability or data features you require for your experiments.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A FLOW CYTOMETER

- 1** What type of information can you obtain in terms of cell-based assays at the level of individual cells?
- 2** How does the company's technology improve your level of confidence in flow data?
- 3** How does the learning curve of the instrument's software compare to competitive offerings?
- 4** Will you be able to perform assays on this instrument without extensive experience?
- 5** Can the company provide some key differentiators regarding their system(s)?

You may also wish to ask where you will be in three to five years: How many samples and what kind of assays will you be running? What parameters will you be looking at? Do you expect to increase the number or complexity of your applications and is it possible to upgrade the machine you're considering? If the instrument doesn't meet your future needs, you may better serve your lab in purchasing a higher-end instrument.

## RECENTLY RELEASED FLOW CYTOMETERS

### FACSJAZZ™ FLOW CYTOMETER CELL SORTER

- Simplifies cellular isolation and analysis for researchers requiring high sample integrity
- Occupies 20" x 20" (51 cm x 51 cm) of benchtop space
- Features high sensitivity to identify and isolate target cells for up to eight parameters
- Capable of identifying, characterizing and isolating single or multiple cells and depositing them in 96 and 384 well plates



BD Biosciences  
[www.bd.com](http://www.bd.com)

### GUAVA® EASYCYTE™ SERIES

- Offers up to eight-parameter detection in a single-sampler format
- Four models are available: two single-laser units capable of detecting five to six parameters and two dual-laser systems that can detect six to eight parameters
- Features a small footprint and easy maintenance
- Reduces number of cells needed for analysis and the amount of waste generated



EMD Millipore  
[www.millipore.com](http://www.millipore.com)

### COPAS PLUS

- For high-throughput analysis and sorting of human induced pluripotent stem cell (hiPS) clusters using large particle flow cytometry
- Allows the analysis and sorting of intact hiPS cell clusters from a complex mixture of varying sizes based on size, optical density and fluorescent parameters
- Does not influence the morphology or viability compared to manually sorted cell clusters



Union Biometrica  
[www.unionbio.com](http://www.unionbio.com)

### VERSACOMP ANTIBODY CAPTURE BEAD KIT

- Designed to set compensation for multicolor flow cytometry experiments by allowing researchers to utilize the same reagents used in their experiments
- Uses positive and negative beads for each conjugate, which allows generation of a compensation matrix to correct for the spectral overlap of that conjugate into other channels
- Can be used with any cytometer, including configurations with more than three lasers



Beckman Coulter  
[www.beckmancoulter.com](http://www.beckmancoulter.com)

## FLOW CYTOMETER MANUFACTURERS

BD Biosciences	<a href="http://www.bdbiosciences.com">www.bdbiosciences.com</a>
Beckman Coulter	<a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a>
EMD Millipore	<a href="http://www.emdmillipore.com">www.emdmillipore.com</a>
Life Technologies	<a href="http://www.lifetech.com">www.lifetech.com</a>
Partec	<a href="http://www.partec.com">www.partec.com</a>
Union Biometrica	<a href="http://www.unionbio.com">www.unionbio.com</a>

## TOP 4 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR FREEZE DRYER

- 1** Your application has changed. The freeze dryer was intended for aqueous samples, now solvents or acids are used. A temperature differential is required for proper freeze drying; an upgrade to a cascade model is recommended.
- 2** The freeze dryer was inherited from another lab. A used freeze dryer can cause problems. Rubber parts dry out and crack, decontamination may not have been done properly. A used pump can have corrosion that can't be seen until it's too late.
- 3** Sharing a community freeze dryer. Personal freeze dryers used by a single researcher are more popular than ever. No more guessing if an oil change was done, or if a harmful sample is being processed.
- 4** The unit no longer pulls a good vacuum. Gaskets, hoses and all rubber components break down over time causing poor vacuum and refrigeration leaks.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A FREEZE DRYER

- 1** What solvents are you using? A temperature differential between the sample's eutectic temperature and collector temperature of 15 – 20 degrees is required. If solvents such as acetonitrile are used, a cascade freeze dryer is required.
- 2** How much sample in liters will you run? When choosing a freeze dryer, vendors recommend loading 1/2 of the listed capacity. For example, a 6L freeze dryer will hold 3L during the run.
- 3** Do you want to freeze dry in flasks, tubes, or bulk? Many drying accessories are available. On a manifold or drying chamber, flasks can be placed on each port. Test tubes and serum vials can be placed inside of the flasks for multiple samples per container. If samples are bulk, a tray dryer would be a good choice.
- 4** Do you need to stopper under vacuum? Accessories can allow you to stopper under vacuum or nitrogen without using compressed gas.
- 5** Is this a shared freeze dryer? A hybrid pump is recommended to prevent damage to the pump.



The use of freeze dryers extends from applications in academic labs to zoos. Moreover, this technology contributes to basic research and manufacturing. For example, scientists at a zoo might use a freeze dryer to increase the concentration of a tranquilizer so that it works for larger animals such as bears or even elephants.

## RECENTLY RELEASED FREEZE DRYERS

### -105° FREEZONE® FREEZE DRY SYSTEM

- Includes ice holding capacity for light to moderate loads and have dual refrigeration systems for samples with very low eutectic points
- Provides a compact benchtop design and include a 12-port drying chamber
- -105°C 4.5 liter systems remove over 4 liters of water in 24 hours



Labconco  
[www.labconco.com](http://www.labconco.com)

### REVO® AND MAGNUM® SERIES

- Feature an all new Clean In Place (CIP) option
- Gives users the option to perform a basic rinse to remove residue material or a full, multi-stage cleaning cycle using detergent, rinses and even hot air drying phases
- CIP systems are capable of 95 to 98% coverage of all internal surfaces



Millrock  
[www.millrocktech.com](http://www.millrocktech.com)

### FDU-1200

- Features trap cooling temperature of up to -45°C
- Ice holding capacity is 1L/time
- Safety features include: automatic operation for vacuum pump, monitoring for vacuum degree and trap temperature, stop watch, selecting the setting for power recovery
- Includes sheet key type, digital display



EYELA USA  
[www.eyelausa.com](http://www.eyelausa.com)

### ADVANTAGE PLUS

- Can freeze dry bulk product or be configured for applications in stoppered vials
- Side-mounted manifold valves provide the additional flexibility to freeze dry product in flasks
- Three refrigeration choices (-53°C, -70°C, or -85°C) are available for the large 6-litre capacity condenser
- Comes with a two-year refrigeration warranty and includes CE marking



Genevac  
[www.genevac.com](http://www.genevac.com)

## FREEZE DRYER MANUFACTURERS

EYELA	<a href="http://www.eyelausa.com">www.eyelausa.com</a>
Genevac	<a href="http://www.genevac.com">www.genevac.com</a>
Hanil	<a href="http://eng.ihanil.com">http://eng.ihanil.com</a> (NA: <a href="http://www.tritech.com">www.tritech.com</a> )
Labconco	<a href="http://www.labconco.com">www.labconco.com</a>
Millrock	<a href="http://www.millrocktech.com">www.millrocktech.com</a>
SP Scientific	<a href="http://www.spscientific.com">www.spscientific.com</a>
Z-Sc1	<a href="http://www.z-sc1.com">www.z-sc1.com</a>

Protecting **you.**  
Protecting  
**your products.**

## CaptairFlex

Ductless Fume Hoods

### Eliminate toxic fumes

while purifying ambient air!

Our stackable molecular filter technology lets you work safely with liquids and powders without changing filters.

- Meet strict AFNOR NFX 15-211 safety standards, protecting users with confidence
- Lower energy cost
- Choose from 6 sizes with optional accessories
- Lifetime warranty



Visit [www.captair.com](http://www.captair.com)  
to download the new catalog.

## FUME HOODS

### TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR FUME HOOD

- 1 The fume hood fails to pass a filtration efficiency test but the filters are in good condition. In other words, the product is no longer keeping employees safe.
- 2 Degradation of materials. This includes a physical discoloration of the materials, such as etching of steel, fogging on the glass barrier or window, or loud noises coming from the internal fan of the ductless or, in some cases, ducted unit.
- 3 You require better containment of a larger number and variety of chemicals, and a higher safety level.
- 4 Your current fume hood has broken down, and repair costs are too high.
- 5 There is a decline in mechanical functionality (sash movement, etc.).
- 6 You have an older, less efficient model that is becoming too expensive to operate.

### TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A FUME HOOD

- 1 Can your lab go ductless? Ductless hoods are a viable solution for most routine laboratory applications. If a total exhaust hood is not an absolute requirement for the process being performed, a ductless solution often makes more sense.
- 2 What is the hood constructed from, how is it constructed, and how does this affect equipment life cycle? Based on your application, will any of the chemicals being used attack, degrade or physically alter the construction material of the hood? Will the hood stand up to harsh corrosives?
- 3 What type of safety controls are included in the base cost of the unit?
- 4 Has the manufacturer/distributor gone through a thorough application review process? Does the suggested filtration make sense?
- 5 How hard is installation? Will there be a future/potential need to move the hood after it has been installed the first time? Should the hood be portable?
- 6 What are the capital, installation and operational costs? From the lab manager's perspective, capital costs are but a fraction of the overall budget. Installation/labor costs and operational costs must be factored in as well.



# Fume containment that evolves with your needs.

Protecting the operator and environment from toxic fumes, gases, vapors and particulate.

As research and laboratories evolve, AirClean® Systems continues to innovate with more sophisticated and efficient ductless fume containment solutions. From our AC600 chemical workstations to Patriot™ ductless fume hoods and ultimately the Independence™ fume hood, AirClean® Systems provides scalable, energy-efficient fume containment for a diverse range of applications.

Your innovation drives us to innovate. To find out more about AirClean® Systems' latest advancements in filtration, gas detection and energy conservation, visit <http://www.aircleansystems.com/evolve>.

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## RECENTLY RELEASED FUME HOODS

### CAPTAIN® FLOW

- Designed to protect samples handled in the enclosure using very low energy consumption
- Ultra-clean air entering the cabinet is quality ISO 5 (EN ISO 14644) which corresponds to U.S. class 100
- By adding a carbon filter upstream, the fan module protects the enclosure volume of gaseous pollutants present in ambient air

Erlab  
www.erlab.com



### OPTIMA™

- Push button height adjustable work surface improves ergonomics and accommodates persons with disabilities
- Self-lowering sash enhances operator safety and energy savings
- Features low profile flush airfoil with spill containment trough
- Includes durable chain and sprocket sash system



Mott  
www.mott.ca

## Conserving energy can give you something to smile about



### The Protector® XStream® Laboratory Hood consumes a fraction of the energy used by other hoods

Regardless of desired face velocity, high-performance Protector® XStream® Hoods consume the lowest CFM — and we can prove it. They also provide:

- Unobstructed sight line of 37-1/2"
- Significant savings to your bottom line
- Unmatched containment for an extremely safe environment

Visit [www.labconco.com/Provelt](http://www.labconco.com/Provelt) or call **800.821.5525** to learn how our full-line of high-performance fume hoods will save you money. Now that's worth smiling about.



### PARAMOUNT® DUCTLESS ENCLOSURES

- Do not require ducting, which makes them suitable for modular labs where applications or personnel change
- Six different stackable carbon filter types are available to allow safe handling of a variety of vapors and compounds
- A 99.99% efficient HEPA filter may also be used
- Feature quiet, energy-efficient ECM motor technology



Labconco  
www.labconco.com

### AIRMAX™ TOTAL EXHAUST FUME HOODS

- Hoods' Wet Fume Scrubber System protects personnel from dangerous chemical exposure while also protecting ductwork and the environment by scrubbing acids and other water soluble gases from fume hood exhaust
- Constructed of thermoplastics (primarily polypropylene) with all contact surfaces utilizing seamless, thermally-welded joints, eliminating the potential for corrosion
- Available in 36", 48", 60", 72" and 96" widths



AirClean Systems  
www.aircleansystems.com



Kansas City, MO | 800.821.5525  
www.labconco.com





# AURA® FUME HOODS

*Superior Protection from Fumes, Vapors and Particulate*

Mystaire® Misonix® ductless fume hoods are self-contained, filtered enclosures that remove hazardous fumes, vapors and particles from virtually any laboratory application.

## Standard Features:

- EverSafe II™ advanced microprocessor controller
- Electronic monitoring; low airflow and filter saturation alarms
- Filtrak™ filter locking system
- Powder coated aluminum head and chassis
- Removable fiberglass spill tray
- Available in 30", 42" and 54" widths
- 110V or 220V

## ESD Model Features:

- Stainless steel spill tray
- ESD rated clear panels



*Aura 30 ESD Model*



*Aura 42 model*

*Aura meets applicable OSHA and ANSI standards*

*ASHRAE110-1995 tested*

**AURA® — Built to LAST!**





## ARE YOU IN THE MARKET FOR A... FUME HOOD?

### Fume hood type(s) currently being used in readers' labs:

Conventional ducted fume hood	<b>76%</b>
Laminar flow hood	<b>36%</b>
Benchtop ductless fume hood	<b>19%</b>
Canopy ducted fume hood	<b>18%</b>
Variable air volume ducted fume hood	<b>12%</b>
Down flow workstation	<b>7%</b>
Portable ductless fume hood	<b>6%</b>

### The frequency of fume hood inspections in respondents' labs:

Monthly	<b>11%</b>
Quarterly	<b>15%</b>
Every six months	<b>15%</b>
Annually	<b>49%</b>
Every two years or more	<b>4%</b>
Not applicable	<b>2%</b>
Don't know	<b>6%</b>

### Survey respondents are also using the following fume hood-related components:

All lab fume hoods have been tested within the past year	<b>90%</b>
Workers using biohazards, toxins and regulated carcinogens have received the proper training	<b>87%</b>
Test labels are properly affixed to all fume hoods tested	<b>87%</b>
Storage in fume hoods is kept to a minimum and doesn't impede proper airflow	<b>87%</b>
Fume hoods containing regulated carcinogens, biohazards and radioactive materials are properly labeled	<b>83%</b>
Samples/specimens/cultures are protected from environment Particulars	<b>77%</b>

### Percentage of respondents who agree with the following fume hood safety statements:

Airflow monitor	<b>54%</b>
Base storage cabinet	<b>48%</b>
Work surface	<b>38%</b>
Blowers	<b>28%</b>
Digital monitor	<b>19%</b>
Fume extractor arms	<b>10%</b>
Transport support cart	<b>8%</b>
Other	<b>2%</b>

## TOP 10 FEATURES/FACTORS

respondents look for when purchasing a fume hood

DURABILITY OF PRODUCT	<b>97%</b>
PERFORMANCE OF PRODUCT	<b>94%</b>
EASE OF USE; ERGONOMIC OPERATION	<b>93%</b>
SAFETY AND HEALTH FEATURES	<b>92%</b>
LOW OPERATING COSTS	<b>91%</b>
LOW MAINTENANCE / EASY TO CLEAN	<b>91%</b>
VALUE FOR PRICE PAID	<b>89%</b>
TOTAL COST OF OWNERSHIP	<b>86%</b>
SERVICE AND SUPPORT	<b>86%</b>
WARRANTIES	<b>84%</b>



**For more information on fume hoods, including useful articles and a list of manufacturers, visit [www.labmanager.com/fume-hoods](http://www.labmanager.com/fume-hoods)**

## FUME HOODS

### FUME HOOD MANUFACTURERS

Air Impurities Removal Systems

[www.airsystems-inc.com](http://www.airsystems-inc.com)

Air Master Systems

[www.airmastersystems.com](http://www.airmastersystems.com)

Air Science

[www.air-science.com](http://www.air-science.com)

AirClean Systems

[www.aircleansystems.com](http://www.aircleansystems.com)

Bedcolab

[www.bedcolab.com](http://www.bedcolab.com)

CIF Lab Solutions

[www.cifsolutions.com](http://www.cifsolutions.com)

CLEATECH

[www.cleatech.com](http://www.cleatech.com)

Design Filtration

[www.designfiltration.com](http://www.designfiltration.com)

Erlab

[www.greenfumehood.com](http://www.greenfumehood.com)

ESCO

[www.escoglobal.com](http://www.escoglobal.com)

Flow Sciences

[www.flowsciences.com](http://www.flowsciences.com)

Genie Scientific

[www.geniescientific.com](http://www.geniescientific.com)

Germfree Laboratories

[www.germfree.co](http://www.germfree.co)

Hanson Lab Furniture

[www.hansonlab.com](http://www.hansonlab.com)

HEMCO

[www.hemcocorp.com](http://www.hemcocorp.com)

ISEC

[www.isecinc.com](http://www.isecinc.com)

Kewaunee Scientific

[www.kewaunee.com](http://www.kewaunee.com)

LM Air Technology

[www.lmairtech.com](http://www.lmairtech.com)

Mystaire

[www.mystaire.com](http://www.mystaire.com)

Labconco

[www.labconco.com](http://www.labconco.com)

Mott Manufacturing

[www.mott.ca](http://www.mott.ca)

mottLAB

[www.mottlab.com](http://www.mottlab.com)

NuAire

[www.nuaire.com](http://www.nuaire.com)

RDM Industrial

[www.labspacesolutions.com](http://www.labspacesolutions.com)

Salare

[www.salareinc.co](http://www.salareinc.co)

Sentry Air Systems

[www.sentryair.com](http://www.sentryair.com)

Terra Universal

[www.terrauniversal.com](http://www.terrauniversal.com)

TFI/Inline Design

[www.tfiinlinedesign.net](http://www.tfiinlinedesign.net)

The Baker Company

[www.bakerco.com](http://www.bakerco.com)

Thermo Fisher Scientific

[www.thermoscientific.com](http://www.thermoscientific.com)

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## UniFlow™ SE Aire-Stream Laboratory Fume Hoods



**5**  
Year Warranty

A New Standard for Laboratory Fume Hood Design and Construction. Available in 4', 5', 6' & 8' widths, and 32" & 38" depths. Reduce Energy Costs up to 50% and provide Maximum User Protection. U.L. 1805 Classified for Laboratory Fume Hoods.

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Our Extract-All™ brand of portable air cleaning systems offer a high level of filtration in a compact design.

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- Oil Mist Collectors
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Solutions for over 25 years!

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Removal Systems, Inc. brand

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## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR GAS GENERATOR

- 1** The alarms for leak detection are either not going off when there is a leak or are constantly going off even when there are no leaks.
- 2** You are moving into new applications and your current gas generator does not produce the gas or gases you need or isn't sized right for the systems you need to generate gas for.
- 3** The air filter in the zero-air gas generator is clogged.
- 4** The noise from the gas generator's integrated compressor is too loud.
- 5** Your current gas generator doesn't have all the features you need, such as the ability to capture performance data ,etc.

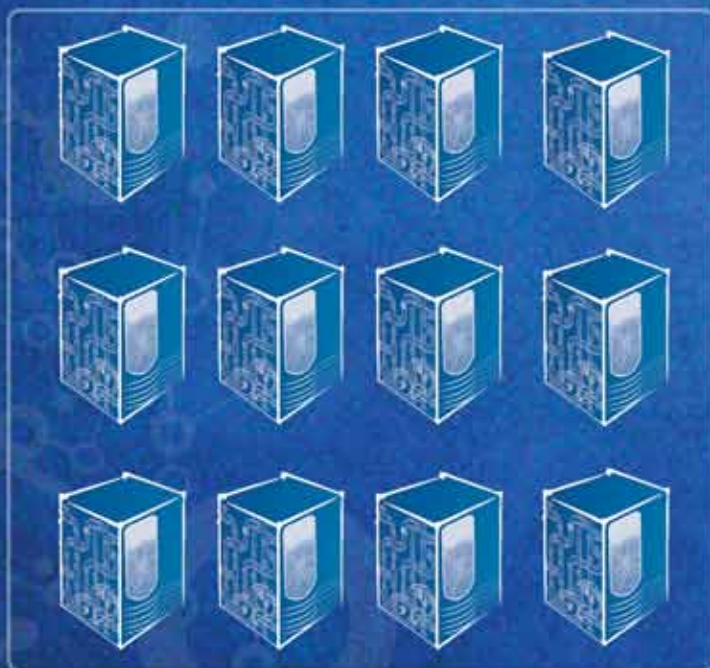
**MAINTENANCE TIPS:** For certain hydrogen gas generators, vendors recommend charging the device with deionized water and replacing an ion exchange "scrubber" every six months. For zero-air gas generators, the air filter should be replaced once a year.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A GAS GENERATOR

- 1** What application do you need a supply of gas for? Depending on the experiment or application you may need one or more hydrogen, nitrogen or a zero-air gas generators.
- 2** How many systems will your gas generator supply? There are a number of sizes of gas generator that will service one or many systems for a number of applications.
- 3** If you need to supply gas to more than one system, are you planning on having a central source of gas? The number of labs you need to supply will determine whether you opt for a larger, central generator or numerous, smaller generators.
- 4** Is space an issue in your lab? It may be that you need a smaller, stand-alone generator that can be stored or stacked away to save space.
- 5** What are the safety parameters that you must adhere to when using gases? A generator significantly reduces the hazardous risk that comes with on-site gas supplies, but it's good to discuss your gas options with your safety representative.
- 6** What service proposition comes with the gas generator? There are a number of options when managing a generator, whether that's getting an education in self-maintenance, knowing a service representative will be able to maintain the unit regularly or having the ability to send a unit back to the manufacturer.



# HYDROGEN LAB SERVER



**MULTIPLE** - smaller units **OR** **1 - HOGEN® S Series**  
HYDROGEN GENERATION SYSTEM

REPLACE YOUR MULTIPLE UNIT CLUSTER WITH A  
**SINGLE HYDROGEN GAS LAB SERVER!**

**IT'S A LOT SIMPLER THAN YOU THINK!**



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customerservice@protononsite.com

## NEW HYDROGEN GENERATOR SUPPORTS UP TO 20 INSTRUMENTS WITH FUEL AND CARRIER GAS.

**The new Parker Balston H2PEMPD Hydrogen Generator will replace dangerous, expensive cylinders of hydrogen fuel gases and helium carrier gases in the laboratory, allowing users to supply, control, and automate all hydrogen gas supplies. The Generator will produce 1,300 cc/minute of 99.99999+% pure hydrogen. A single generator can support up to as many as 20 instruments with fuel and carrier gas. With delivery pressures of up to 175 PSI this product is ideal for Fast, Ultra-Fast and Flash GC applications.**



Parker Balston H2PEMPD Hydrogen Generators are an excellent source of ultra-pure, dry hydrogen for a wide range of laboratory uses. The generator can be used with Gas Chromatographs (GC), as a fuel gas for Flame Ionization Detectors (FID), as a reaction gas for Hall Detectors, and as a carrier gas to ensure absolute repeatability of retention times. In high sensitivity trace hydrocarbon analyzers and air pollution monitors, the hydrogen produced ensures the lowest possible background noise. Other applications include using hydrogen for hydrogenation reactions and for FIDs used in the analysis of engine gas emissions in the automobile industry. With an output capacity of up to 1,300 cc/minute, one generator can supply 99.99999+% pure carrier gas at up to 175 psig to multiple GCs, and fuel gas to up to 45 FIDs. The Parker Balston H2PEM series hydrogen generators use a Proton Exchange membrane (PEM) to produce hydrogen on demand. Each generator incorporates a maintenance free palladium purifier module to remove oxygen down to <0.01 ppm and moisture down to <1.0 ppm. Only 100 mL

of hydrogen gas is stored in the system at any time. Based on cylinder gas savings alone, a Parker Balston hydrogen generator pays for itself in less than one year.

This new range of hydrogen generators incorporate breakthrough proton exchange membrane design, software, microprocessor controls and automatic water feed for unattended operation that laboratories can depend upon. Up to 32 hydrogen generators can be connected together using Parker's cascading, load balancing software to supply gas to a large gas delivery system. Built in remote monitoring capability enables users to view system performance from a PC; multiple systems can be monitored at one time. Data logging of gas generator performance is incorporated into the H2PEMPD series for use in regulated environments where system validation may be required. Parker is offering a three year warranty on the Proton Exchange Membrane for this new to world product.



[www.parker.com](http://www.parker.com)





# Together, we can reduce your carbon footprint by decreasing energy usage.

One factor that users of compressed gas should consider when selecting a supply method, is the effect that production and delivery of gas has on the environment. Extraction, fractional distillation, delivery and handling of compressed gas cylinders or dewars requires a great deal of energy and has a direct impact on the environment. The energy employed by these processes generates a significant amount of CO<sub>2</sub>, which is believed to have an unfavorable effect on climate change.

Users of compressed gases may wish to consider an alternative source, such as an in-house gas generator which will produce far less CO<sub>2</sub> and is a much less expensive source of gas over time. Please join us in this discussion and learn more by scanning the above code with your smartphone, or go to [solutions.parker.com/noco2](https://solutions.parker.com/noco2).

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## RECENTLY RELEASED GAS GENERATORS/SPECIALTY GASES

### NIGEN NITROGEN GAS GENERATORS

- New line of generators is designed to meet a variety of laboratory budgets, sizes and demands
- Simple design helps reduce time spent on maintenance, while delivering a reliable and constant stream of nitrogen gas
- Four of the new generators create nitrogen using membrane technology, producing 34, 60 or 120 liters/minute without an internal compressor, and 36 liters/minute with a compressor



Proton OnSite  
[www.protononsite.com](http://www.protononsite.com)

### H2-PEMPD SERIES HYDROGEN GENERATORS

- Produces up to 1,300 cc/minute of 99.9999+ % pure hydrogen
- Eliminates the need for dangerous and expensive cylinders of hydrogen fuel gases and helium carrier gases
- Includes output pressure to 175 psig; a maintenance-free self-regenerative palladium membrane; an advanced PEM electrochemical cell protection system with microprocessor controls and a unique water hydration circulation system, along with a variety of other special features



Parker Balston  
[www.parker.com](http://www.parker.com)

### FLEXSTREAM™ AUTOMATED GAS STANDARDS GENERATOR

- Along with TraceSource™ permeation tubes, dynamically blends trace concentration calibration standards of acetaldehyde in carbon dioxide
- User may achieve concentrations from over 400 ppb down to 25 ppb using a single permeation tube
- Lower concentrations, or variable concentration in constant flow, are available using optional secondary dilution



KIN-TEK  
[www.kin-tek.com](http://www.kin-tek.com)

### MODEL 150 DYNACALIBRATOR® CALIBRATION GAS GENERATOR

- Designed to generate precise ppm or ppb concentrations of chemical compounds in a gas stream
- Digital temperature controller maintains the chamber temperature at a set point with an accuracy of  $\pm 0.01^\circ\text{C}$ , traceable to NIST standards
- Features a wide range of temperature settings ( $5^\circ\text{C}$  above ambient to  $110^\circ\text{C}$ )



VICI Metronics  
[www.vicimetronics.com](http://www.vicimetronics.com)

## GAS GENERATOR MANUFACTURERS

Air Liquide	<a href="http://www.airliquide.com">www.airliquide.com</a>
Airgas	<a href="http://www.airgas.com">www.airgas.com</a>
CONCOA/Controls Corporation of America	<a href="http://www.concoa.com">www.concoa.com</a>
Envionics	<a href="http://www.envionics.com">www.envionics.com</a>
Gasco	<a href="http://www.gascogas.com">www.gascogas.com</a>
Ionicon Analytik	<a href="http://www.ionicon.com">www.ionicon.com</a>
Kin-Tek	<a href="http://www.kin-tek.com">www.kin-tek.com</a>
Linde	<a href="http://www.linde-gas.com">www.linde-gas.com</a>
Parker Balston	<a href="http://www.labgasgenerators.com">www.labgasgenerators.com</a>
Peak Scientific	<a href="http://www.peakscientific.com">www.peakscientific.com</a>
Praxair	<a href="http://www.praxair.com">www.praxair.com</a>
Proton Onsite	<a href="http://www.protononsite.com">www.protononsite.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
VICI Metronics	<a href="http://www.vici.com">www.vici.com</a>



Taking some time to investigate the lab's operations to uncover inefficiencies is a key part of successful lab design. It's important to note any complaints regarding lab ergonomics: benches that are too high or crowded, not enough space for computer-related work, workflows scattered around the lab instead of being concentrated. Workflow-based questioning could lead to simple but effective implementations, such as adding space for a glassware drying rack, adjusting placement of utilities, and adding benches or desks that accommodate sitting instead of standing employees. Flexible lab furniture such as adjustable casework to accommodate both disabled access and changing workflows is critical to good lab design.

## TOP 5 SIGNS YOU SHOULD REPAIR OR REPLACE YOUR LAB FURNITURE

- 1 No longer meets the requirements of your processes.
- 2 The furniture is damaged, no longer highly functioning, or unsafe.
- 3 It was in style when disco ruled.
- 4 It's not ergonomic.
- 5 It's not efficient with your equipment and/or your IT system.

## TOP 7 QUESTIONS TO ASK WHEN BUYING LAB FURNITURE

- 1 How often will your lab be reconfigured?
- 2 Do your work surfaces need to be height-adjustable?
- 3 What weight capacity does your system need to support?
- 4 What are your storage requirements?
- 5 What processes are you doing in the lab?
- 6 How will the mechanical services be connected to the system?
- 7 Will form or function be the priority in design?

## LAB FURNITURE MANUFACTURERS

BEVCO	<a href="http://www.bevco.com">www.bevco.com</a>
BioFit	<a href="http://www.biofit.com">www.biofit.com</a>
Hamilton Scientific	<a href="http://www.hamiltonscientific.com">www.hamiltonscientific.com</a>
Hatfield Laboratory Furniture	<a href="http://www.hatfieldlaboratoryfurniture.com">www.hatfieldlaboratoryfurniture.com</a>
HEMCO	<a href="http://www.hemcocorp.com">www.hemcocorp.com</a>
IAC Industries	<a href="http://www.furnitureforlabs.com">www.furnitureforlabs.com</a>
Kewaunee Scientific	<a href="http://www.kewaunee.com">www.kewaunee.com</a>
Lista International	<a href="http://www.listaintl.com">www.listaintl.com</a>
Mott	<a href="http://www.mott.ca">www.mott.ca</a>
Pro-Line	<a href="http://www.1proline.com">www.1proline.com</a>
RDM Industrial	<a href="http://www.rdm-ind.com">www.rdm-ind.com</a>
Salesmaker Carts	<a href="http://www.salesmakercarts.com">www.salesmakercarts.com</a>
Sovella USA	<a href="http://www.sovella.us">www.sovella.us</a>
Terra Universal	<a href="http://www.terrauniversal.com">www.terrauniversal.com</a>
Unilab	<a href="http://www.unilabfurniture.com">www.unilabfurniture.com</a>

# FURNITURE

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## RECENTLY RELEASED LAB FURNITURE

### ALTUS TABLE SYSTEM

- Tables can be conveniently integrated into existing work spaces or located as freestanding self-supporting moveable workstations
- Customizable features provide easy adaptation to changing laboratory environments
- Adaptability provides savings throughout table system's long service life as the needs of the lab change
- Can be configured with many accessories



Mott  
[www.mott.ca](http://www.mott.ca)

### PREMIUM SERIES LABORATORY CABINETS

- Offer a modular design that allows users to configure their laboratories to meet their requirements
- Traditional casework, islands or hanging cabinets also available
- Featuring sound-deadening doors and drawers, stainless steel pulls and hinges; drawers offer 90 percent extension slides with 150 pounds capacity
- Adjustable uprights allow shelving, cabinets and other accessories to adjust on 3/4" centers



Hatfield Laboratory Furniture  
[www.hatfieldlaboratoryfurniture.com](http://www.hatfieldlaboratoryfurniture.com)

## FURNITURE

### RECENTLY RELEASED LAB FURNITURE

#### CORNERSTONE-WS™ LAB BENCH

- Replaces the previous "Basic" lab bench product line
- Features an increased maximum load capacity of 1500 lbs. (previously 660 lbs. with the Basic bench), and an improved leg design that allows for greater strength and stability
- Height adjustment range has also been increased in one inch increments from 24.75" to 37.75"



Sovella USA  
[www.sovella.us](http://www.sovella.us)

#### STORAGE WALL® STORAGE SYSTEM

- Now includes a new tambour door with a double wall foam-filled aluminum slat design that increases door strength
- New aluminum slat design decreases door weight and makes it easy for operators to open and close the door
- Modular drawer, shelf, and roll-out tray storage system provides optimum security, productivity and flexibility



Lista International  
[www.listaintl.com](http://www.listaintl.com)

## NEW! Vented Polyurethane Laboratory Seating Options - 7000V from BEVCO -

Newly designed polyurethane seating from BEVCO features vented seats and backs for outstanding comfort. Fast, easy clean-up, extreme durability and a wide range of adjustments make the 7000V Series the perfect choice for use in today's productive laboratory environments.



- ♦ Extreme durability. Seats and backs resist stains and damage from punctures, grease, water and mild chemicals
- ♦ 10 distinctive models. Choice of base designs, casters, floor glides and footings
- ♦ Comprehensive range of adjustment options.
- ♦ Exceeds ANSI/BIFMA safety and durability standards.
- ♦ Exclusive 12 year warranty

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## TOP 5 SIGNS THAT YOU SHOULD REPLACE YOUR GC OR GC-MS SYSTEM

- 1** The regular servicing and the cost of service are increasing. The GC and MS systems are designed to last 10+ years; however, there will come a point when normal wear-and-tear will make it very difficult to maintain acceptable performance. You will be able to track this by the increasing number of service calls and the cost of that service. Add those costs to lost productivity, and the solution is replacement.
- 2** The GC or GC-MS system is not able to keep up with increasing regulatory requirements. It is rare when regulatory requirements become easier to meet. There are a lot of method parameters that can be adjusted on a GC and GC-MS to meet the increasing requirements. However, the accuracy and precision of the old equipment will not be able to meet new requirements no matter how you adjust the method. A new GC or GC-MS can be used to meet the current requirements and will allow the laboratory to meet future requirements.
- 3** There is a drift in the method performance of the system. This drift can be in the form of method calibration or retention time. Calibration drift is generally due to the fact that the detector is no longer able to maintain a consistent current, plasma, or connection depending on the detector technology. More frequent re-calibration may be able to compensate, but this means lost time and productivity. Drift in retention times is generally due to the carrier gas control. If there is electronic control, the EPC may have a leak or is just no longer able to sufficiently control the pressure. This will be seen as randomly changing retention times. If there is a leak deep in the system you will be losing carrier gas, most commonly helium, potentially costing the lab large amounts of money.
- 4** The laboratory is not able keep up with the projects and sample load. Every laboratory is asked to do more, respond faster and operate with less staff. New GC and GC-MS systems incorporate advances that allow reduced sample preparation, faster analysis and less operator attention. In some cases, the new GC or GC-MS can take the place of two or more systems, which also frees bench space for other functions. In this case the older equipment can be relegated to other less critical analyses, used as parts for other equipment, or retired.
- 5** Software upgrades, service contracts, and replacement parts are no longer available. As a GC or GC-MS system reaches 10 years of operation, repair parts are more expensive and difficult to locate. In turn, the cost of service increases, and service contracts may not be available at all. The latest software may not be compatible with older communication boards or not compatible with older PC hardware and operating systems. A new PC may not be an option either without costly upgrades of software. These hardware and software incompatibilities can lead to communications errors, failed sequences and lost samples—and lost laboratory efficiency.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A GC SYSTEM

- 1 What factors come into play when determining the GC system specifications you require in terms of cycle time, enhanced operator benefits, increased productivity and flexibility for specific applications?
- 2 What differentiates the vendor's GC system from others offered, in terms of performance?
- 3 How do you validate the specification claims presented by the vendor?
- 4 Has the data processing software been designed for enhanced analytics, with workflow in mind and does it support critical compliance requirements?
- 5 What are important price points to keep in mind when selecting a GC system?
- 6 Laboratories need fast and effective services, including an effective distribution of instruments, spare parts, education, and service personnel. How does the company serve these needs worldwide?

## RECENTLY RELEASED GC & GC-MS SYSTEMS

### MASTER GC

- Decreases sample run times in a wide range of GC applications
- Modular design allows the user to easily change or upgrade to any GC configuration
- Includes a complete range of injectors
- Features a user-friendly touchscreen interface and DPC—patented digital flow control
- Also includes a one-year warranty, GC start-up kit, and more



GenTech  
[www.gentechscientific.com](http://www.gentechscientific.com)

### 7890B GC

- Offers improved performance specifications with advances in numerous detector modules
- Features lower operating costs and eco-friendly operation with power/gas management and sleep/wake modes
- Early Maintenance Feedback enhancements help minimize downtime
- GC calculators, integrated within Agilent data systems, optimize methods and even auto-transfer new values to the method editor



Agilent  
[www.agilent.com](http://www.agilent.com)

### AXION® IQT GC-MS-MS

- Provides greater quantitative capabilities to that of a triple quadrupole, while quickly identifying compounds like a quadrupole time-of-flight (Q-TOF) at a rate of up to 500 compounds per second
- Gives laboratories easier to use technology, faster results, and more specific, selective data needed to make more accurate decisions faster
- Easy to use for non-experts



PerkinElmer  
[www.perkinelmer.com](http://www.perkinelmer.com)

### TSQ 8000 TRIPLE QUADRUPOLE GC-MS SYSTEM

- Now includes negative and positive ion chemical ionization (CI) capabilities
- Makes it easy for users to address further the chemical diversity they face in their most challenging analyses
- New direct insertion and direct exposure probe options further enhance the user's ability to analyze samples



Thermo Fisher Scientific  
[www.thermoscientific.com](http://www.thermoscientific.com)

## GC & GC-MS SYSTEM MANUFACTURERS

Agilent	<a href="http://www.agilent.com">www.agilent.com</a>
Bruker	<a href="http://www.bruker.com">www.bruker.com</a>
Buck Scientific	<a href="http://www.bucksci.com">www.bucksci.com</a>
CDS Analytical	<a href="http://www.cdsanalytical.com">www.cdsanalytical.com</a>
GenTech Master	<a href="http://www.gentechscientific.com">www.gentechscientific.com</a>
GOW-MAC	<a href="http://www.gow-mac.com">www.gow-mac.com</a>
JEOL	<a href="http://www.jeolusa.com">www.jeolusa.com</a>
LECO	<a href="http://www.leco.com">www.leco.com</a>

OI Analytical	<a href="http://www.oico.com">www.oico.com</a>
PerkinElmer	<a href="http://www.perkinelmer.com">www.perkinelmer.com</a>
Quadrex	<a href="http://www.quadrexcorp.com">www.quadrexcorp.com</a>
Shimadzu	<a href="http://www.shimadzu.com">www.shimadzu.com</a>
Teledyne Tekmar	<a href="http://www.teledynetekmar.com">www.teledynetekmar.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
Torion	<a href="http://www.torion.com">www.torion.com</a>
Waters	<a href="http://www.waters.com">www.waters.com</a>

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR GEL IMAGER / GEL DOCUMENTATION SYSTEM

- 1** Accurate quantitation is a struggle due to lack of sensitivity or inability of your software to report pixel saturation.
- 2** It is difficult and time-consuming to find the perfect zoom, focus, and exposure, and to save these settings for repeatability.
- 3** Your current system is complicated to operate, imaging of simple gels takes more than a few seconds, or the unit requires hands-on training of new lab personnel.
- 4** Your system's hardware and software is no longer compatible with the latest operating systems.
- 5** The imaging system no longer meets the needs of your applications.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR GEL RUNNING SYSTEM

- 1** Your tank does not match your gel running throughput, reducing your current laboratory efficiency.
- 2** The inner buffer chamber of your current tank leaks buffer during runs.
- 3** You are getting inconsistent results between gel runs.
- 4** Handcasting accessories originally included with your system are missing or broken.
- 5** Your current running system does not match your gel size requirements or allow you to run both precast and handcast gels when needed.

## TOP 9 QUESTIONS YOU SHOULD ASK WHEN BUYING ELECTROPHORESIS EQUIPMENT AND GELS

### *ELECTROPHORESIS EQUIPMENT*

- 1** How many gels, per experiment, can you run at once in a single electrophoresis cell?
- 2** Can you run handcast and precast gels with the same electrophoresis equipment?
- 3** Can you blot in the same tank as you run the gels?

## GELS

- 4 How fast can you run a set of gels with optimal performance?
- 5 How fast can you visualize your proteins in the gel?
- 6 Do you need any special buffers or sample buffer to run your gel?
- 7 Does a precast gel give you the same separation as a handcast gel?

## TRANSFER OF PROTEINS FROM THE GEL TO A MEMBRANE FOR WESTERN BLOTTING

- 8 How fast can you transfer proteins from your gel to a membrane?
- 9 How efficiently can you transfer your high MW proteins from your gel to a membrane?

## RECENTLY RELEASED GEL ELECTROPHORESIS PRODUCTS

### GS-900™ CALIBRATED DENSITOMETER

- Part of the new Biologics Analysis Workflow™ for faster, easier, and more reproducible purity assessment of protein-based therapeutics in cGMP-regulated environments
- Autocalibration prior to each run ensures consistency and accuracy
- Wide dynamic range improves purity estimates by allowing for impurity detection at low optical density (OD)



Bio-Rad  
www.bio-rad.com

### SUBHT SUBMARINE GEL ELECTROPHORESIS UNIT

- Runs an entire 96-well plate of samples (plus up to 24 control or marker lanes) in 30 minutes
- Multi-channel pipette compatible
- Well spacing and labeled gel running tray ensure positive ID of loaded samples
- A large selection of different combs and accessories allows you to optimize this unit for your particular application



Hoefer, Inc.  
www.Hoeferinc.com

### ECO-LINE ELECTROPHORESIS

- Modular tank system for polyacrylamide gel electrophoresis and blotting
- Includes glass plates with fixed glass spacers
- Features integrated cooling option
- Casting system for one or two gels
- Comes with two-year warranty



Biometra  
www.biometra.com

### CL-150 SERIES UV VIEWING CABINET FOR GEL ANALYSIS

- Enables lab technicians to view, analyze and photograph fluorescent samples with both epi-illumination and trans-illumination light sources
- 25-watt white light bulb in the cabinet provides visible illumination for easy sample preparation
- Accommodates large electrophoresis gels and up to four 8 x 8" (20 x 20cm) TLC plates



Spectroline  
www.spectroline.com

## GEL ELECTROPHORESIS PRODUCT MANUFACTURERS

AMRESKO	www.amresco-inc.com
Beckman Coulter	www.beckmancoulter.com
Biometra	www.biometra.com
Bio-Rad	www.bio-rad.com

Hoefer, Inc.	www.hoeferinc.com
Life Technologies	www.lifetechnologies.com
Spectroline	www.spectroline.com
Syngene	www.syngene.com

A glove box consists of a sealed box with the inside accessible only by gloves. Though their uses are expanding, they are essentially utilized for two basic purposes: Protect what you work on from the environment, such as an analytic balance on a production floor, or protect you from what you work on, such as a virus. Despite the fact that most glove boxes provide a relatively simple process, different applications require different boxes.

## TOP 4 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR GLOVE BOX

- 1 The glove box no longer safely contains the hazardous materials the lab is working with.
- 2 You are starting to get into new applications that aren't supported by your current unit. For example, a microbiologist might want an anaerobic glove box for anaerobic bacterial cultures.
- 3 Staff are experiencing ergonomic issues with the current box, such as gloves not fitting correctly or the gloves being poorly placed for users to reach comfortably.
- 4 The unit is either too small for the work being done in the lab or is taking up too much space in the lab for the work being done.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A GLOVE BOX

- 1 What applications are you using the glove box for? This will determine exactly what you will need in a glove box, such as an oxygen-free atmosphere, etc.
- 2 Are the incubation and processing separated in order to prevent contamination? This is important if you will be using the glove box for cell culture.
- 3 How much will the glove box cost to acquire and maintain? Are warranties offered? Custom glove boxes are the most expensive, so if a standard model can fit your needs that is probably the better way to go. Making small customizations to an off-the-shelf model is also another less costly option than a fully-custom unit.
- 4 What are your future needs? This will help determine if the smallest unit is really the best option or if a larger option which can accommodate future expansion would make more sense.
- 5 What sort of safety features does the glove box have? These are especially important if you are working with very hazardous materials.



## RECENTLY RELEASED GLOVE BOXES

### PROTECTOR®

- Designed for use in controlled atmospheres (dry boxes) or for use with hazardous materials
- Series includes Controlled Atmosphere, Multi-Hazard, Combination, and Double glove boxes
- Controlled Atmosphere glove boxes provide a leak-tight environment for work with contamination-sensitive materials
- Multi-Hazard glove boxes provide HEPA filtration and a physical barrier to protect the user from exposure to potentially dangerous materials



LABCONCO  
[www.labconco.com](http://www.labconco.com)

### MB-GB-2202 ACRYLIC GLOVEBOX WORKSTATION

- Offers a cost-effective solution for inert atmosphere applications
- Thick, clear, and durable acrylic shell allows optimum visibility and remains impermeable to ambient air
- Standard Neoprene gloves provide excellent resistance to abrasion and chemicals
- Can be configured to meet your project specifications and/or can simply be chosen from a variety of standard pre-defined configurations



mBraun  
[www.mbraun.com](http://www.mbraun.com)

### PURAIR FLEX FILM ISOLATOR

- Provides more working volume than comparable glove bags
- Double O-ring design allows users to quickly and easily change gloves
- Easy to set up and provides increased stability
- Safety options include HEPA filter availability, bag-in / bag-out port, and optional nitrogen purge inlet connections



Air Science USA  
[www.airscience.com](http://www.airscience.com)

### BACTROX HYPOXIA CHAMBER

- Offers precise oxygen and carbon dioxide control from 1-20%
- Preserves optimal application conditions not only during incubation but also in the chamber work station
- Advanced atmospheric controller allows for the use of a highly accurate and long-lasting zirconium dioxide oxygen sensor
- Also has a standalone 300 plate incubator



SHEL LAB  
[www.shellab.com](http://www.shellab.com)

## GLOVE BOX MANUFACTURERS

Air Science USA	<a href="http://www.airscience.com">www.airscience.com</a>
Banthrax	<a href="http://www.banthrax.com">www.banthrax.com</a>
Coy Labs	<a href="http://www.coylab.com">www.coylab.com</a>
Erlab	<a href="http://www.erlab.com">www.erlab.com</a>
Germfree	<a href="http://www.germfree.com">www.germfree.com</a>
HEMCO	<a href="http://www.hemcocorp.com">www.hemcocorp.com</a>
Innovative Technology	<a href="http://www.gloveboxes.com">www.gloveboxes.com</a>
Labconco	<a href="http://www.labconco.com">www.labconco.com</a>
mBraun	<a href="http://www.mbraunusa.com">www.mbraunusa.com</a>
NuAire	<a href="http://www.nuaire.com">www.nuaire.com</a>
Plas-Labs	<a href="http://www.Plas-Labs.com">www.Plas-Labs.com</a>
SHEL LAB	<a href="http://www.shellab.com">www.shellab.com</a>

Turning a sample into a suspension—the essence of homogenizing—occurs in a wide range of laboratory applications. In life science and clinical research, scientists often homogenize tissue samples for various analytical studies.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR HOMOGENIZER GENERATOR PROBES

The most important component of homogenizing is your generator probe—the item that actually goes into your sample.

- 1 Your sample is getting hot and the generator probe or motor unit is hot to the touch.
- 2 There is black residue in your sample.
- 3 You aren't getting the same homogenizing results you used to.
- 4 Some of the inner components, such as PTFE bearings, look worn or overly discolored.
- 5 Your generator probe is seizing up.

If you have never taken apart your generator probe for a good cleaning, then chances are that some maintenance is required.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A HOMOGENIZER

- 1 How does this homogenizer differ from the competition? What makes it superior in quality and cost effective for the scientist?
- 2 What accessories are necessary to run the unit? Are there pre-assembled bead kits to use that will simplify the homogenization process?
- 3 Does the company offer demo units for the scientist to test out?
- 4 Does the company offer application and technical phone support before/after the product purchase?
- 5 Ask about replacements in case the product parts break down with use.
- 6 Finally, ask about cost of the purchase, installation charges and warranty extension costs.

## RECENTLY RELEASED HOMOGENIZERS

### PRO UNIVERSAL HOMOGENIZERS

- Hand-held homogenizers, post-mounted homogenizers and programmable homogenizers with the ability to homogenize various volumes (.03ML to 20L) at speeds of up to 30,000 RPM offered
- New preselected economic packages help users choose the homogenizer that best suits their needs
- Packages include options for a variety of volumes and sample types



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[www.proscientific.com](http://www.proscientific.com)

### BULLET BLENDER STORM

- Breaks down 24 tissue samples simultaneously within minutes
- Comes standard with built-in Air Cooling™ Technology to keep samples cool during powerful homogenization
- Simple user interface and two settings—time and speed—allow scientists to multitask homogenizing soft cell types
- Prevents sample to sample cross contamination
- Comes with 2-year warranty; manufactured in the USA



MIDSCI  
[www.midsci.com](http://www.midsci.com)

## HOMOGENIZER MANUFACTURERS

Branson Ultrasonics	<a href="http://www.bransonultrasonics.com">www.bransonultrasonics.com</a>
Glas-Col	<a href="http://www.glas-col.com">www.glas-col.com</a>
Hielscher Ultrasonics	<a href="http://www.hielscher.com">www.hielscher.com</a>
IKA	<a href="http://www.ika.com">www.ika.com</a>
KINEMATICA	<a href="http://www.kinematica.com">www.kinematica.com</a>
Microfluidics	<a href="http://www.microfluidicscorp.com">www.microfluidicscorp.com</a>
MIDSCI	<a href="http://www.midsci.com">www.midsci.com</a>
MP Biomedical	<a href="http://www.mpbio.com">www.mpbio.com</a>
Omni	<a href="http://www.omni-inc.com">www.omni-inc.com</a>
Precellys	<a href="http://www.precellys.com">www.precellys.com</a>
PRO Scientific	<a href="http://www.proscientific.com">www.proscientific.com</a>
QIAGEN	<a href="http://www.qiagen.com">www.qiagen.com</a>
Qsonica	<a href="http://www.sonicator.com">www.sonicator.com</a>
Sartorius BBI Systems	<a href="http://www.sartorius.com">www.sartorius.com</a>
Sonics & Materials	<a href="http://www.sonics.com">www.sonics.com</a>

### T 25 DIGITAL ULTRA-TURRAX®

- For volumes of 1 to 2,000 ml (H<sub>2</sub>O)
- Three types of shaft bearings available
- Standard version offers digital display
- Rotor-Stator configurations have delivered 30 years of proven comparability test results
- Can be used for a variety of applications including homogenizing waste water samples and dispersion tasks under vacuum / pressure

IKA  
[www.ika.com](http://www.ika.com)



### BEAD RUPTOR

- Combine maximum power with a broad array of processing accessories
- Quickly grinds, lyses, and homogenizes biological samples with high processing power
- Provides an efficient, consistent, high-yield and quality homogenization usually in less than 40 seconds
- Can simultaneously homogenize multiple samples in either 2mL, 7mL, 35mL or 96-stripwell tubes



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## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR HPLC COLUMNS

- 1** The backpressure increases above the column or system limit. A common practical limit is a 10-20% increase.
- 2** A quantitative chromatographic system suitability parameter fails: resolution, tailing factor, S/N, RRT, efficiency.
- 3** A qualitative chromatographic parameter changes significantly from the expected: Peak shape, background response, irregular baseline disturbances, column leaking.
- 4** Visible external hardware wear and tear: inlet/outlet threading wear, corrosion, reagent precipitates (buffer salts or derivatizing agents).
- 5** Known exposure to components that could afflict future selectivity under new conditions: ion-pairing agents, sample contaminants (such as inorganic ions or phospholipids), phthalates, immiscible solvents.

## TOP 7 QUESTIONS YOU SHOULD ASK WHEN BUYING HPLC COLUMNS

- 1** Based on your analyte(s), matrix, separation goals, and instrumentation, what column does the vendor recommend?
- 2** What benefits does this column offer over your current column? Performance? Lifetime? Reproducibility? Etc.
- 3** How should you clean/prepare your sample prior to injection on the column?
- 4** How do you care for the column? Conditioning, cleaning, storage, etc.
- 5** What type of chromatographic media (fully porous, monolithic, core-shell) is going to provide the most benefit for your separation?
- 6** Do you need a unique selectivity (HILIC, polar-end capped, etc.) to separate any very polar and/or non-polar components in your mixture?
- 7** What column dimension is going to be most suitable for your loading requirement?

## RECENTLY RELEASED HPLC COLUMNS

## CORTECS UPLC COLUMNS

- Allow laboratories to produce greater amounts of information faster with every chromatographic separation
- Available in C18, C18+ or HILIC chemistries and offered in 30 unique column configurations available for shipping worldwide
- Column particles feature a solid, impermeable silica core encased in a porous silica outer layer where the interactions between the stationary phase and the analytes occur



Waters  
www.waters.com

## MABPAC PROTEIN A HPLC COLUMNS

- For high-performance monoclonal antibody titer analysis
- Specially designed for higher sensitivity and accurate concentration analysis over a wide linear range to minimize the need to re-analyze samples
- Novel non-porous polymeric resin with hydrophilic surface offers fast mass transfer to enhance throughput and minimize carryover
- Accommodate high flow rates to further increase throughput



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www.thermoscientific

## HPLC COLUMN MANUFACTURERS

Advanced Chromatography Technologies

www.ace-hplc.com

Agela Technologies

www.agela.com

Agilent

www.agilent.com

Applied Biosystems

www.appliedbiosystems.com

Beckman Coulter

www.beckmancoulter.com

Bio-Rad

www.bio-rad.com

Biotage

www.biotage.com

ChiralTech

www.chiraltch.com

Dynamax

www.dynamaxcorp.com

Eksigent

www.eksigent.com

ES Industries

www.esind.com

Grace Discovery Sciences

www.discoverysciences.com

Hamilton

www.hamiltoncompany.com

Imtakt

www.imtaktusa.com

J & K Scientific

www.jkscientific.com

MAC-MOD

www.mac-mod.com

## KINETEX® PREPARATIVE HPLC AND SFC CORE-SHELL MEDIA

- Kinetex 5-micron particles in four phases—C18, XB-C18, Phenyl-Hexyl and PFP—are now offered in 21.2 mm ID Axia packing
- Axia preparative format delivers longer column lifetime, higher efficiencies, improved performance and high reproducibility, compared to conventionally packed columns for lab-scale prep chromatography
- Axia packing eliminates the drawbacks of traditional slurry packing, delivering uniform bed density and dramatic performance advances



Phenomenex  
www.phenomenex.com

## TSKGEL® SW MAB SIZE EXCLUSION HPLC COLUMNS

- Meet the growing demand for the higher resolution separation of mAb monomer and dimer/fragment, as well as higher resolution of mAb aggregates
- Offer reduced lot-to-lot variation, long column life, reduction of unspecified adsorption, and superior recovery of aggregates
- Include the TSKgel SuperSW mAb HR and TSKgel UltraSW Aggregate



Tosoh Bioscience  
www.tosohbioscience.com

MicroSolve

www.microsovetech.com

Peeke Scientific

www.peekescientific.com

PerkinElmer

www.perkinelmer.com

Phenomenex

www.phenomenex.com

Proxeon

www.proxeon.com

Restek

www.restek.com

Shiseido

www.shiseido.co

Shodex

www.shodex.com

SiliCycle Inc.

www.silicycle.com

Supelco

www.sial.com

Thermo Fisher Scientific

www.thermofisher.com

Valco

www.vici.com

Waters

www.waters.com

Whatman

www.whatman.com

Zirchrom

www.zirchrom.com

Tosoh Bioscience

www.tosohbioscience.com



## TOP 8 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR HPLC SYSTEM

- 1 New applications require more modern, speedy, and sensitive methods.
- 2 When any piece of hardware repeatedly suffers from the same malfunction.
- 3 If one is unable to obtain spare parts, then its replacement should be considered.
- 4 When any piece of hardware is beyond economical repair.
- 5 If the software is too inflexible to meet current requirements, then an alternative software package should be considered.
- 6 If an item of hardware of the HPLC system is not sufficiently flexible to cope with current or future requirements, then an alternative item of hardware should be considered.
- 7 If it is not possible to obtain customer support for that item.
- 8 An organization is standardizing the HPLC systems they use.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING AN HPLC SYSTEM

- 1 How flexible is the system? Ask about whether the system can be optimized to meet your laboratory requirements.
- 2 What tubes, vessels, vials can it accommodate? Can components (such as additional detectors, valves, etc.) be upgraded in the future?
- 3 Is the software easy to use and operate? Can a demo version be put in place to get a feel for how the software functions for your laboratory's workflow?
- 4 How is the system (not just components) qualified during installation as to meeting manufacturer performance expectations?
- 5 Who provides the support and service for the product? Is it the manufacturer or a third party service group? If it is a third party service group, are they factory-trained?
- 6 Finally, ask about cost of the purchase; not just the price of the product being installed but the total cost of ownership, which includes price, service expectations, warranty, etc.

## RECENTLY RELEASED HPLC SYSTEMS

### ALLIANCE

- Includes new design improvements such as updated electronics and user interface
- Updated system maintains key Alliance performance specifications and control algorithms to ensure that catalysts can seamlessly replicate their existing methods
- Changes will not affect established, validated HPLC methods
- Suited to help scientists enhance their HPLC methodologies through the use of Waters eXtended Performance [XP] 2.5  $\mu$ m columns



Waters  
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### MERIT HPLC RANGE

- Easy-to-use, low cost system reduces the time needed for software familiarization
- Offers performance of the highest specification
- The fully PC controlled isocratic and binary systems with the new Merit software provide automatic integration of chromatograph peaks without operator intervention
- Suited for screening, quality assurance, method development, teaching and use by novices



Cecil Instruments  
[www.cecilinstruments.com](http://www.cecilinstruments.com)

### 1290 INFINITY BINARY LC SYSTEM

- Emulates other HPLC and UPLC systems, connects to all Agilent and many non-Agilent software
- Provides high performance and flexibility
- Features HPLC-like service costs—UHPLC productivity
- Boasts an infinite power range that combines ultra high pressure up to 1200 bar and high flow rates up to 5 mL/min
- Quaternary version also available



Agilent  
[www.agilent.com](http://www.agilent.com)

### DIONEX ULTIMATE 3000 SYSTEM

- Provides increased application flexibility with binary and quaternary solvent delivery for HPLC and UHPLC
- Options from 9,000 psi standard to 15,000 psi RSLC available
- Gives users excellent analytical reproducibility with ultrafast sampling speeds and extremely low carryover
- Also provides maximum separation efficiency and retention time precision with column temperature control



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## HPLC SYSTEM MANUFACTURERS

Agilent	<a href="http://www.agilent.com">www.agilent.com</a>
Beckman Coulter	<a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a>
Bio-Rad	<a href="http://www.bio-rad.com">www.bio-rad.com</a>
Buck Scientific	<a href="http://www.bucksci.com">www.bucksci.com</a>
Cecil Instruments	<a href="http://www.cecilinstruments.com">www.cecilinstruments.com</a>
Eksigent	<a href="http://www.eksigent.com">www.eksigent.com</a>
Gilson	<a href="http://www.gilson.com">www.gilson.com</a>
Hitachi High Technologies	<a href="http://www.hitachi-hta.com">www.hitachi-hta.com</a>
Jasco	<a href="http://www.jascoinc.com">www.jascoinc.com</a>
Knauer	<a href="http://www.knauer.net">www.knauer.net</a>
PerkinElmer	<a href="http://www.perkinelmer.com">www.perkinelmer.com</a>
Shimadzu	<a href="http://www.shimadzu.com">www.shimadzu.com</a>
SSI LabAlliance	<a href="http://www.laballiance.com">www.laballiance.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
Waters	<a href="http://www.waters.com">www.waters.com</a>

## TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR CO<sub>2</sub> INCUBATOR

- 1** CO<sub>2</sub> Incubators should have a regular maintenance schedule to avoid unscheduled down-time and potential loss of product. Components of the incubator such as the CO<sub>2</sub> sensor and temperature controller need to be calibrated on a regular schedule. HEPA filters, and anodes should be replaced regularly. Decontamination of the incubator needs to occur on a frequent basis.
- 2** If your CO<sub>2</sub> incubator is older than 5 years, chances are there have been improvements to CO<sub>2</sub> incubator technology such as IR sensor monitoring of the CO<sub>2</sub> levels. This technology change improves the accuracy of CO<sub>2</sub> level monitoring and improves reliability of the incubator.
- 3** If your CO<sub>2</sub> incubator is more than 7 years old, chances are it has parts on it that are obsolete and impossible to get, which could result in excessive down-time. It is better to replace the unit early and reduce the risk.
- 4** When the warranty period is expired. Repairs on units that are out of the warranty can be costly. It may be more economical to buy a new unit.
- 5** Newer models of CO<sub>2</sub> incubators offer features such as high heat decontamination which can greatly reduce contamination inside the unit.
- 6** CO<sub>2</sub> calibration issues—frequency, off set amount, stability for CO<sub>2</sub>, temp, etc. Humidity pan condition, gaskets, evidence of condensation, etc.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A CO<sub>2</sub> INCUBATOR

- 1** What measures have been taken in the design to avoid contamination and what features are included to remove (sterilize versus decon) contamination?
- 2** How does the CO<sub>2</sub> sensor contribute to optimal cell growth?
- 3** How does the humidity contribute to optimal cell growth?
- 4** Ask for the uniformity and accuracy data versus asking for a water jacket or air jacket.
- 5** Do you need O<sub>2</sub> control to simulate the environment for your experiment accurately?
- 6** Calculate the total cost of ownership on the product over one year including product price, install, regular cleaning labor, material like HEPA filter, etc.

## RECENTLY RELEASED INCUBATORS

### HERATHERM MICROBIOLOGICAL INCUBATORS

- Include two new sizes for high sample volume or larger samples: 400- and 750-liter capacity
- Provide excellent temperature performance for reproducible results
- General Protocol incubators are designed for routine applications in pharmaceutical, medical, food and research laboratories
- Advanced Protocol Security incubators come with mechanical convection technology for excellent temperature performance – keeping sample environment stable



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[www.thermoscientific.com](http://www.thermoscientific.com)

### MODEL 2428H LARGE CAPACITY CO<sub>2</sub> INCUBATOR

- 27 cubic foot incubator features active humidity control up to 95%
- Features excellent CO<sub>2</sub> and temperature uniformity
- Includes a user controllable humidity system that is more accurate and responsive to door openings than a traditional water pan humidity system
- Heated glass door minimizes condensation, another potential source for contamination



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## INCUBATOR MANUFACTURER LIST

BINDER	<a href="http://www.binder-oven.us">www.binder-oven.us</a>
Boekel Scientific	<a href="http://www.boekelsci.com">www.boekelsci.com</a>
CARON Products	<a href="http://www.caronproducts.com">www.caronproducts.com</a>
Eppendorf	<a href="http://www.eppendorfn.com">www.eppendorfn.com</a>
Esco	<a href="http://www.escoglobal.com">www.escoglobal.com</a>
Hach	<a href="http://www.hach.com">www.hach.com</a>
Jeio Tech	<a href="http://www.jeiotech.com">www.jeiotech.com</a>
Labnet International	<a href="http://www.labnetlink.com">www.labnetlink.com</a>

NuAire	<a href="http://www.nuaire.com">www.nuaire.com</a>
Panasonic Healthcare	<a href="http://www.panasonic.com/biomedical">www.panasonic.com/biomedical</a>
SHEL LAB	<a href="http://www.shellab.com">www.shellab.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
Torrey Pines Scientific	<a href="http://www.torreypinesscientific.com">www.torreypinesscientific.com</a>
UVP	<a href="http://www.uvp.com">www.uvp.com</a>
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## TOP 7 REASONS YOU SHOULD REPLACE YOUR EXISTING LAB INFORMATICS SOFTWARE

- 1 Vender discontinues or ends the life of software and support for product.
- 2 It is cost prohibitive to upgrade to new version.
- 3 You spend more time manually entering data than analyzing the data (let your scientist do more science!).
- 4 Your LIMS/ELN or CDS does not interface with all of your instruments or multiple data sources/system interfaces.
- 5 You cannot access your data from multiple web browsers/devices.
- 6 You cannot create your own web submission or data entry form.
- 7 You cannot configure your own LIMS's, ELN's, or CDS's look and layout.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING AN INFORMATICS SYSTEM

- 1 How local are resources and how available are resources for deployment, training and extensions? What is the timeline for availability and cost?
- 2 How easy is it to extend the application? Does it require IT or super users? How long does training take to make modifications and how extensive is the API for modifications?
- 3 What are the key elements you need to have from the data system?
- 4 What differentiates the vendor's software from others offered, in terms of chromatography data handling, customization and powerful analysis?
- 5 Why does your organization need a LIMS? You and your staff should come up with a cost-benefit list to help you decide if a LIMS is worth investing in.
- 6 What are your current user requirements and how do you expect those to change five to ten years down the road? Make a list. If you expect your needs to change, a flexible LIMS is likely a good choice. Requirements can include labeling, sample registration, etc.





## LIMS Nightmare #534

"How long does it take? I've had 15 people working 5 days a week for two years and my LIMS **still** isn't fully deployed."



**Does this sound like you?**

Download "How to Avoid the top 5 LIMS Nightmares" so you can rest easy.

[accelrys.com/limswp](https://accelrys.com/limswp)



## RECENTLY RELEASED INFORMATICS SOFTWARE

### KINEMATIK ELECTRONIC LAB NOTEBOOK

- Allows new experiments to be created from pre-defined templates, ensuring consistency in how notebooks are structured and organized
- Enables any type of file or data to be imported into the notebook, or information can be entered directly into the notebook through a rich text editor
- A powerful search engine makes finding existing information a simple process



KineMatik  
www.kinematik.com

### DIONEX CHROMELEON 7.2 CDS

- Bridges the gap between gas, liquid, or ion chromatography and mass spectrometry
- Suite of automation tools, including Cobra detection algorithm, SmartPeaks integration assistant, and linking panes are designed to reduce review time and data processing
- New consolidated report function easily generates summaries of very large data sets to facilitate interpretation of results



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### LABVANTAGE PHARMA LIMS

- Allows laboratories to get up and running fast with a fully operational and validated LIMS at a fraction of the cost and time of a traditional LIMS project
- Includes a copy of the LABVANTAGE 6 software that has been preconfigured for pharmaceutical use; a comprehensive, GAMP-based validation document suite; and much more

LABVANTAGE  
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### E-WORKBOOK 9.3

- Provides users with excellent flexibility across their organization providing a single point of secure interaction with their data
- Extends the web capabilities with customized personal and project dashboards
- Also provides fast and easy access to data and applications, including editing and content creation as well as the ability to complete tasks and workflows



IDBS  
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## INFORMATICS MANUFACTURERS

Accelrys	www.accelrys.com
Advanced Chemistry Development	www.acdlabs.com
Agilent	www.agilent.com
Accelrys	www.accelrys.com
Aurora Systems	www.visualab.com
Bio-Rad	www.bio-rad.com
ChemSW	www.chemsw.com
ChemWare	www.chemware.com
Ethosoft	www.ethosoft.com
Hach	www.hach.com
Hitachi High Technologies	www.hitachi-hta.com
IDBS	www.idbs.com
Information Management Services	www.bsi-ii.com
Jasco	www.jascoinc.com
KineMatik	www.kinematik.com

LabAnswer	www.labanswer.com
LabLogic Systems	www.lablogic.com
Labtronics	www.labtronics.com
LabVantage	www.labvantage.com
LabWare	www.labware.com
Micronic	www.micronic.com
Modul-Bio	www.modul-bio.com
PerkinElmer	www.perkinelmer.com
Ruro	www.ruro.com
Sapio Sciences	www.sapiosciences.com
Shimadzu	www.ssi.shimadzu.com
SRI Instruments	www.srigc.com
STARLIMS	www.starlims.com
Thermo Fisher Scientific	www.thermoscientific.com
Waters	www.waters.com

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**Compliance:**

FDA 21 CFR Parts 11, 21, 58, 210, 211, 820  
cGLP/cGMP (Good Laboratory Practice and Good  
Manufacturing Practice)  
Section 508 Accessibility Guidelines  
HIPAA Accountability Act of 1996  
HIPAA Patient Safety and Quality Improvement Act  
of 2005 (Patient Safety Act)

**Compatibility:**

PC/MAC  
Tablet  
Smartphone  
Web-based



## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR LAB WASHER

- 1 The washer is not suited to the types/sizes of glassware you need to wash and cannot be easily or economically upgraded or modified to accommodate the glassware.
- 2 Your current washer isn't high-capacity enough to handle the high volumes of glassware you need to wash.
- 3 You have an older machine that is loud or isn't very efficient and is becoming too costly to use and maintain, in terms of both money and the environment. The machine may also be taking up too much space in the lab—a stackable unit may be better suited to the space.
- 4 You are getting into new applications and your current instrument doesn't have all the features you need, such as secure controls and cycle documentation and fail-safe cycles and program monitoring for pharmaceuticals applications.
- 5 Any mechanical problems, such as the heating elements not heating the water to the desired temperature or taking too long to do so, strange noises, cleanliness of the water, or issues with the circulation pumps are usually signs that you need to do some maintenance or even replace your washer if these problems won't go away.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A LAB WASHER

- 1 How is the product manufactured? Ask about the quality of the materials used and the product life expectation based on manufacturing testing. Also find out about the product's warranty.
- 2 What differentiates the lab washer from others offered in terms of performance?
- 3 Does the company offer application support and technical phone support before and after product installation?
- 4 How sustainable is the product? Ask the company to provide details on energy and water consumption as well as the recycle ability of the product.
- 5 If the product is discontinued, for how many years does the company provide accessories and parts for the washer?
- 6 Finally, ask about the cost of the purchase—not just the price of the product being installed but the total cost of ownership, which includes price, service expectations, warranty, etc.



## RECENTLY RELEASED LAB WASHERS

### RELIANCE 100 SERIES

- Includes three different models
- Reliance 100: designed to hold general glassware such as beakers, utensils, test tubes, petri dishes and other wide-mouth items
- Reliance 100LS: designed to clean and dry narrow neck glassware such as volumetric and Erlenmeyer flasks and pipettes
- Reliance 100XLS: designed for cleaning and drying of narrow neck glassware in contamination sensitive or critical applications



STERIS

[www.steris.com](http://www.steris.com)

### FLASKSCRUBBER® 33 AND STEAMSCRUBBER® 33

- Come in a new height of 33" to accommodate lower countertops in the laboratory
- SteamScrubbers have top and bottom racks that accommodate a wide variety of glassware shapes and sizes—primarily beakers
- FlaskScrubbers have lower spindle racks that hold up to 36 pieces of narrow-necked glassware
- All racks are interchangeable among washers



LABCONCO

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## LAB WASHER MANUFACTURERS

Geringe

[www.getingeusa.com](http://www.getingeusa.com)

Hotpack

[www.hotpack.com](http://www.hotpack.com)

Labconco

[www.labconco.com](http://www.labconco.com)

LANCER

[www.lancer.com](http://www.lancer.com)

Miele

[www.labwashers.com](http://www.labwashers.com)

Scientek

[www.scientek.net](http://www.scientek.net)

STERIS

[www.steris.com](http://www.steris.com)

Thermo Fisher Scientific

[www.thermoscientific.com](http://www.thermoscientific.com)

### 1400 LXP

- Features 316 L stainless steel chamber, injection washing and drying on 1 to 3 levels
- Includes microprocessor with 40 user defined programs and jet racks interchangeable between all levels
- Ergonomic loading height and top-loading chemical storage compartment
- Achieves life cycle cost savings through water conservation, lower chemical and power usage



LANCER

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### PG 8535 AND PG 8536

- Reduce the daily workload and guarantee clean glassware for analytical experiments
- "Perfect" features provide safeguards to ensure the consistent reproducible reprocessing of laboratory glassware
- PG 8535: handles 37 narrow necked flasks, 96 pipettes, 1600 test tubes
- PG 8536: handles 66 narrow necked flasks, 116 pipettes, 1600 test tubes



Miele

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## Five Year Limited Warranty\* . . .

And if that's not enough, here's a few more reasons to include Miele in your lab:

- Minimal water usage ( 2.6 gallons per fill undercounter machines)
- Application assistance for lifetime of product
- Longevity: Factory rated for 15,000 operating hours (10 years ++)
- German-engineered for exceptional performance



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**Miele**  
PROFESSIONAL

\*This limited warranty includes Miele's standard one year manufacturer's warranty and an extended limited warranty for the remaining four years.



VISIT [www.labmanager.com/handler-questions](http://www.labmanager.com/handler-questions) TO GET A LIST OF QUESTIONS YOU SHOULD ASK WHEN BUYING A MICROPLATE HANDLER.

## TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR MICROPLATE READER OR HANDLER

- 1** Misalignment of the microplate transport system with the measurement optics is one of the most common problems to occur in microplate readers over time. The easiest way to diagnose this problem is to fill each well of a 96- or a 384- well plate with the same concentration of fluorescein (or another colorimetric dye). Measure the entire plate. If there is a trend of increasing or decreasing values across the plate, and if the same trend is seen after the plate is turned 180 degrees, then the instrument may be misaligned and the manufacturer should be contacted for service.
- 2** When users need a new feature, a new detection mode, or a new technology that is not found in their current instrument, it's usually time to replace their current instrument.
- 3** The instrument's software is out of date and an update is not available for the user's current system.
- 4** Your current handler is so old that it does not include features such as scheduling, thermosensors, or error detection and correction and your lab has the workload to require such functions.
- 5** You do not have the correct size or complexity of microplate handler for your applications and throughput. For example, single-plate capacity plate handlers create bottlenecks when one assay component is completed but the next one is not yet ready to accept the plate.
- 6** Wear and tear on the reader or handler, such as degraded filters or worn out motors and belts, can also mean it's time to replace or service the instrument.

**TIPS:** One way to keep a microplate reader going is to have an annual QCPM (quality control preventive maintenance) check.

## TOP 8 QUESTIONS YOU SHOULD ASK WHEN BUYING A MICROPLATE READER

- 1** How many read modes are offered? Multiple read modes offer greater flexibility and value than single read modes for those working with, or considering the addition of, various assay platforms.
- 2** What kind of detection technology is used? Monochromator-based detection offers flexibility, convenience and spectral scanning; while filter-based detection is characterized by precise sensitivity and may often switch rapidly between distinct wavelengths for kinetic assays. Hybrid detection systems combine both technologies in one compact unit for the utmost in flexibility and sensitivity.
- 3** Is it upgradeable? If so, can the upgrade be installed on-site, or must it be shipped back to the factory? On-site installations reduce overall downtime, and often the technician is available to answer questions or conduct training.

Nucleic Acid Quantification

Protein Quantification

Micro-Volume Analysis

Endotoxin Analysis

Spectral Scanning

Enzyme Kinetics

PAMPA

ELISA

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Cell Toxicity

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- 4** Is the reader automatable? Manual plate handling slows productivity as throughput increases. Automating the process with a compatible microplate stacker increases throughput with walk-away operation.
- 5** Ask about the software—is it integrated and user-friendly? Does it allow for pre-programmed and custom protocols? What kind of analysis is offered? How is data exported?
- 6** Is on-site training available? Is there a fee? On-site training provides an opportunity for all staff to learn about the reader, reducing the amount of subsequent training needed.
- 7** What options are available? Options such as gas control, barcode scanning, shaking, and injecting increase assay flexibility for those that need these features, and as options, do not add additional unnecessary expense for those that do not need them.
- 8** What assay validation data is available for the reader? Assay validation data specific for the reader provides proof that the reader performs as indicated.

## RECENTLY RELEASED MICROPLATE HANDLERS & READERS

### CLARIOSTAR®

- Includes new advanced LVF monochromators, highly sensitive filters, and an ultra-fast spectrometer
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## MICROPLATE HANDLER & READER MANUFACTURERS

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Bio-Rad	www.bio-rad.com	Phenix Research Products	www.phenixresearch.com
Biotage	www.biotage.com	Tecan	www.tecan-us.com
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BMG LABTECH	www.bmglabtech.com	Tomtec	www.tomtec.com

# DETERMINING ANTIOXIDANT POTENTIAL USING AN OXYGEN RADICAL ABSORBANCE CAPACITY (ORAC) ASSAY

Authors: Pete Brescia and Paul Held

**ABSTRACT:** The oxygen radical absorbance capacity (ORAC) assay is an analytical method to determine the antioxidant potential of nutraceutical, pharmaceutical and food ingredients. The ORAC assay relies on the fluorescent probe to monitor antioxidant activity, which can be read in 96-well microplates using a fluorescence-capable reader.

**INTRODUCTION:** Oxidative damage to living organisms is associated with several disease states and aging<sup>1</sup>. Sources of reactive oxygen species (ROS) are both endogenous and exogenous, and can lead to toxic compound formation within organisms. A proper balance must be maintained between oxidants and antioxidants to ensure that the ubiquitous ROS species are not deleterious to the organism. Disrupting these mechanisms can result in an imbalance and ensuing damage to critical components required to maintain cells. Thus, there is interest in accurately determining the antioxidant capabilities of foods, cosmetics, dietary supplements and pharmaceutical agents.

While several methods exist to measure total antioxidant capacity, ORAC is a low cost method suitable for microplate-based high-throughput automation<sup>2,3</sup>. The assay relies on free radical damage to a fluorescent probe resulting in a loss of fluorescent intensity<sup>4</sup>. Inhibition of oxidative damage to the fluorescent probe is correlated with a compound's antioxidant capacity acting as a free radical scavenger. Kinetic reactions containing antioxidants and blanks are run in parallel with integration of the resultant curve to calculate the area under the curve (AUC). Antioxidant protection is then quantified by the difference between the AUC of the blank reaction and reactions containing antioxidant.

**EXPERIMENTAL CONDITIONS:** The ORAC assay was performed as described by Huang et al.<sup>2</sup> with modifications described by Held<sup>5</sup>. Reactions were initiated by adding 25  $\mu$ L of AAPH solution using the Synergy™ H4 Hybrid Multi-mode Microplate Reader injectors (BioTek Instruments, Inc., Winooski, VT) in a 200  $\mu$ L final reaction volume. The fluorescence was monitored kinetically with data taken every minute for two hours.

**RESULTS:** Several compounds with known antioxidant properties were assayed by the ORAC method (Figure 1). To determine each compound's antioxidant capacity, the net AUC for each sample was calculated and Trolox® equivalents calculated using the ratio of the compound's slope of the linear regression analysis to the Trolox® standard's slope<sup>6</sup>.

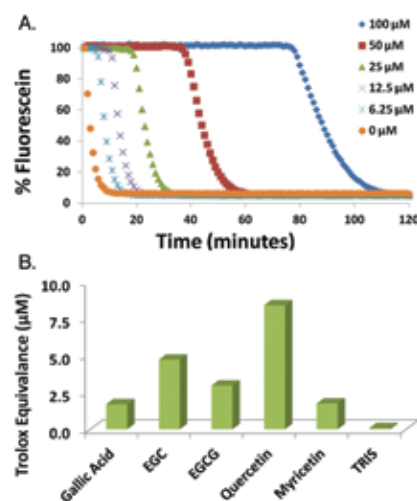
**CONCLUSIONS:** High throughput antioxidant determination requires a low-cost assay with high precision and accuracy that is amenable to microplates. Here we show that the ORAC assay provided antioxidant determination of several known antioxidants and subsequent conversion to the commonly accepted Trolox® equivalents for quantitative analysis. The assay used common reagents, a standard 96-well microplate and a fluorescence-capable microplate reader. The ORAC assay provided excellent precision across all microplate wells tested and performed the assay in approximately 60 minutes. Results correlated well with those presented in the literature<sup>2</sup>.

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with Synergy™ HT Multi-Mode Microplate Reader – ORAC Antioxidant Tests. BioTek Instruments, Inc. <http://www.biotek.com/resources/articles/performing-orac-assays.html> (accessed Jul 16, 2012).

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**Figure 1. Trolox® kinetic curves and resultant Trolox® equivalents.** (A) ORAC assay kinetic curves of Trolox® antioxidant concentrations ranging from 0-100  $\mu$ M. (B) Calculated Trolox® equivalents were then used for sample antioxidant comparative analysis.

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## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING AN OPTICAL MICROSCOPE

- 1** What type of specimens will you be looking at? This will help you determine whether or not an upright or inverted frame type is best for you.
- 2** What applications are you using your microscope for? Answering this question is important when deciding whether a polarizing or non-polarizing microscope is required. That information will also be useful in deciding on a basic or advanced model.
- 3** Are accuracy and ease of use critical for your applications? If they are, you will want to check out the motorized options of the microscope brand you decide to select.
- 4** Of course, asking about cost is also important. If your budget is limited, going with the basic model is usually the cheapest option.
- 5** What service and support options are available?
- 6** How long will staff be working at the microscope? If lab workers will be using the instrument for extended periods, selecting the most ergonomic microscope you can is important.

## TOP 7 QUESTIONS YOU SHOULD ASK WHEN BUYING AN SEM MICROSCOPE

- 1** What type of samples will you be looking at? This needs to be asked of the technical experts who can guide the user to the appropriate type of SEM, X-ray spectrometer and accessories.
- 2** What are the sizes of the features you want to image, or expressed differently, what is the maximum magnification you want to view the samples at; and at what accelerating voltages do you want to use? This will be the deciding factor between: a) table top SEM b) W SEM, or c) Field Emission SEM.
- 3** Who will be using the instrument the most? Experts or non-experts?
- 4** What is the budget? #1, 2 above may be moot if the budget is not sufficient. What is the expected total cost of ownership?
- 5** How many of the SEM you are considering (or similar models) are in use, in the field? Get a *complete*, not hand-picked, users list.
- 6** Will you receive application support/instrument training? How many service engineers are in your area and what is their average response time to be "on site" for repairs?
- 7** What is the experience of the applications/training support staff, and can they be contacted directly for help?

## RECENTLY RELEASED MICROSCOPES

### SMZ25 AND SMZ18 STEREOMICROSCOPES

- The automated zoom model SMZ25 utilizes the Nikon Perfect Zoom System, which enables the world's largest zoom ratio of 25:1, superior resolution, and exceptional fluorescence transmission capability
- The SMZ18 is more economic and uses a manual-intelligent zoom
- Both instruments are the first stereomicroscopes to use a fly-eye lens on an epi-fluorescence attachment



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Edmund Optics	www.edmundoptics.com
FEI	www.fei.com
Hamamatsu	www.sales.hamamatsu.com
Hirox-USA	www.hirox-usa.com
Hitachi High Technologies	www.hitachi-hita.com
JEOL	www.jeol.com
Keyence	www.keyence.com
Kramer	www.kramerscientific.com
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- Delivers fast operation and faster processor speeds
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## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR MICROWAVE DIGESTER

- 1** Corrosion is visible inside the cavity—this compromises the integrity of the cavity, may cause arching, and can cause microwave leakage.
- 2** Strange noises—Trust your ears, if you hear something that is not normal then it's probably not and should be investigated.
- 3** Poor results—If you get poor results from a proven method.
- 4** Temperature not following program—If your unit cannot follow a program as it has in the past, this could be a sign of low power output and should be checked by a service professional.
- 5** Not heating—If your unit is not able to heat even a few hundred mL of water, then it should be serviced by a trained professional.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A MICROWAVE SAMPLE PREPARATION SYSTEM

- 1** What is the system's maximum microwave power output? Microwave energy heats substances quickly to high temperatures. The higher the temperature, the faster and more completely substances are digested. Extractions also need sufficient power, as some solvents can act as a heat sink and are difficult to heat.
- 2** Can the system monitor and control every vessel? Temperature and pressure monitoring and control are extremely important. Inadequate safeguards can result in damaged vessels and equipment, and a lack of temperature and pressure control can pose a safety hazard to lab personnel.
- 3** How many samples can be processed per run? Though the number of samples processed is dependent upon your laboratory's needs, planning for growth is always a good idea.
- 4** Does the company offer free applications support? Do they offer dedicated, direct service support and local factory-trained field service technicians? Dependable applications and service support are essential since you never know what may go wrong.
- 5** How user-friendly is the system? As with many instruments, if a system is very complicated to operate, it generally becomes either a glorified shelf to store things on or a headache to those having to operate it. The easier a microwave system is to use, the better off you will be. Also make sure the vessels are easy to handle and set up.

## RECENTLY RELEASED MICROWAVE SAMPLE PREP PRODUCTS

### ULTRAWAVE MICROWAVE DIGESTION SYSTEM

- Features Milestone's unique SRC technology in a fully automated benchtop package
- Brings greater efficiency to microwave digestion, using disposable glass vials instead of traditional digestion vessels
- Reduces digestion acid volume, lowering digestion blanks
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### DISCOVER SP-D 80 ACID DIGESTION SYSTEM

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- Especially suited to laboratories that need immediate turnaround
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- Capable of temperatures up to 260°C and can accommodate a variety of different samples



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### MONOWAVE 300 MICROWAVE REACTOR

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## MICROWAVE SAMPLE PREP PRODUCT MANUFACTURERS

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Buck Scientific	<a href="http://www.bucksci.com">www.bucksci.com</a>
CEM	<a href="http://www.cem.com">www.cem.com</a>
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To grind something solid, many of us might think of a mortar and pestle as the original grinding machine. In fact, that technology goes back at least to 1550 BCE, when one was described in Egyptian writing. Many other hand-powered mills and grinders followed, leading to powered devices in today's many forms.

## TOP 5 SIGNS YOU SHOULD SERVICE OR REPLACE YOUR MILL OR GRINDER

- 1** The mill or grinder is no longer producing accurate and reproducible results.
- 2** The instrument does not have the features/accessories you need, to support new or future applications, or the instrument is unable to grind material to the fineness you need.
- 3** It is becoming too difficult and costly to find replacement parts for the instrument.
- 4** Liquids and powders have built up on the machine to a disgusting degree. Regular cleaning with a mild cleaner or damp cloth should help users avoid this problem. Users should always remember to turn the machine off when cleaning.
- 5** Mechanical components are worn or dried out and may need either replacing or lubricating.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A MILL OR GRINDER

- 1** Will the mill/grinder be used for wet or dry milling?
- 2** For dry milling, ask how finely the material needs to be ground and what are the properties of the material? Rotor beater, disc, and mortar mills for example, are best for mid-range grinding (final fineness of ~0.01-0.1 mm).
- 3** For wet milling, ask what capacity of grinder you will need. Bead mills are usually best for small capacity applications while rotor-stator homogenizers should be considered for larger scale applications. For very large scale applications, industrial-scale mills are probably the best fit.
- 4** How important is preventing cross-contamination? Bead mills are likely a good choice if you don't want any risk of contamination.
- 5** Based on the materials you will be milling, how long does the miller or grinder typically last? How much do replacement parts cost and how easy are they to get? What level of support/warranties does the company offer?



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- Single-use milling vessels save on cleaning, time and energy; they also prevent cross-contamination
- 40 ml capacity milling vessels and hood are made from transparent material, allowing the milling process to be observed at any time



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## TOP 7 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR MASS SPECTROMETER

- 1** The user could improve their overall ROI by replacing their current technology.
- 2** The system needs too much maintenance to run at peak performance.
- 3** The instrument doesn't meet the user's expanding research requirements in terms of detection limits, linearity, speed of analysis, robustness, reporting and regulatory requirements.
- 4** Known standards and blanks are not correct when tested.
- 5** Service and training costs are becoming too high.
- 6** Replacement parts are too difficult to find.
- 7** Growing business necessitates a new or additional MS system to meet demand.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A MASS SPECTROMETER

- 1** What factors come into play when determining the MS specifications you require in terms of throughput, sensitivity, robustness, software control, ease of use, and ease of maintenance?
- 2** What differentiates the vendor's MS from others offered, in terms of performance and how easy it would be to upgrade?
- 3** How do you validate the specification claims presented by the vendor?
- 4** Has the data processing software been designed for enhanced analytics, with lab workflow in mind and does it support critical compliance requirements?
- 5** What are important price points to keep in mind when selecting an MS?
- 6** Laboratories need fast and effective services, including an effective distribution of spare parts, instruments, service personnel and education/training. How does the company serve these needs globally?

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- Features an acquisition rate up to 30,000 spectra/s
- Provides fast detection capability over the full mass range
- Acquires 30,000 mass spectra over the entire mass range, compared to the fastest quadrupole MS which only provides about 10 mass spectra at 10,000 amu/s in the same mass range (1 – 1,000 amu)
- Also features linearity of 5 orders of magnitude



GenTech  
[www.gentechscientific.com](http://www.gentechscientific.com)

## MASS SPECTROMETER MANUFACTURERS

AB Sciex	<a href="http://www.absciex.com">www.absciex.com</a>
Agilent	<a href="http://www.agilent.com">www.agilent.com</a>
Applied Biosystems	<a href="http://www.appliedbiosystems.com">www.appliedbiosystems.com</a>
Bruker	<a href="http://www.bruker.com">www.bruker.com</a>
GenTech Master	<a href="http://www.gentechscientific.com">www.gentechscientific.com</a>
Hitachi High Technologies	<a href="http://www.hitachi-hta.com">www.hitachi-hta.com</a>
JEOL	<a href="http://www.jeol.com">www.jeol.com</a>
LECO	<a href="http://www.leco.com">www.leco.com</a>
PerkinElmer	<a href="http://www.perkinelmer.com">www.perkinelmer.com</a>
Shimadzu	<a href="http://www.shimadzu.com">www.shimadzu.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
Waters	<a href="http://www.waters.com">www.waters.com</a>

## TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR LAB OVEN

- 1** Ovens should have a regular maintenance schedule to avoid unscheduled downtime and potential loss of product. Components such as gaskets, elements, blowers, etc. should be replaced or verified before they become a problem. Temperature calibration should be checked on a routine basis.
- 2** When your process outgrows your oven's capabilities. Ovens have very different performance characteristics such as temperature uniformity, temperature range, capacity, heat-up time, and recovery time. If your oven's performance does not match your process requirements, then it's time to upgrade.
- 3** If your oven is more than 7 years old, chances are it has parts that are obsolete and impossible to purchase, which could result in excessive downtime. It is better to replace the unit early and reduce the risk.
- 4** When the warranty period has expired. Repairs on units that are out of the warranty can be costly. When a unit is in need of repair and is out of warranty, it may be more economical to buy a new unit.
- 5** Your process may produce hazardous exhaust. Baking certain materials in an oven can produce flammable vapor and/or obnoxious odors. Upgrading your oven to a vented system can do more than make a better smelling workplace, it can also bring you into compliance with government safety regulations.
- 6** Any time you have issues such as slow to reach temperature, temperature variation, noises, reduced airflow, or problems with door alignment and gaskets, you should service or replace your lab oven.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A LAB OVEN

- 1** What temperature range do you require? (Does the product have reserve temperature capacity?)
- 2** What accuracy and uniformity does the product have? (Will my sample be damaged or will my experiment only function in one "sweet spot"?)
- 3** Are interior chamber space / weight of my sample and floor space in the lab a match to application and lab?
- 4** Do I need any computer interfaces, alarms or safety devices on my oven?
- 5** Are accessories like data loggers, viewing windows and modifications like access ports available from the manufacturer to suit my specific needs?

## RECENTLY RELEASED OVENS

### 1425, 1445 AND 1465 VACUUM OVEN LINE

- New RS485 communication capability allows users to easily program the ramp and soak profile directly from a personal computer
- Now includes an easy-to-read digital vacuum gauge that provides better vacuum readings
- Other new features include TUV certification that covers all CE, UL and CSA requirements and a gasket guide to make gasket selection easier



SHEL LAB  
[www.shellab.com](http://www.shellab.com)

### HERATHERM

- Provides gentle heating and drying with minimal air turbulence
- Microprocessor controls deliver detailed information on current temperature and set points
- Allows users to set the temperature from 50 to 330 C and store the setting in memory while the oven is off
- Features a visual over temperature alarm and built-in safety backup



Thermo Fisher Scientific  
[www.thermoscientific.com](http://www.thermoscientific.com)

### ED, FD AND FED SERIES

- Wide temperature range of 5°C above ambient temperature to 300°C allows short heating up times and provides large capacity reserve
- Excellent thermal insulation reduces operating costs
- Provides uniform drying conditions through features such as homogeneous temperature control
- Minimal maintenance and operating costs; short delivery times



BINDER  
[www.binder-world.com](http://www.binder-world.com)

### TR 60 – 1050 SERIES

- Features forced air circulation and a maximum working temperature of 300°C
- Stainless steel interior chamber is easy to clean and resistant to rust
- Suitable for various applications, including drying, sterilizing and warm storing
- Features consistent temperature uniformity



Nabertherm  
[www.nabertherm.com](http://www.nabertherm.com)

## OVEN MANUFACTURERS

Binder	<a href="http://www.binder-world.com">www.binder-world.com</a>
Boekel Scientific	<a href="http://www.boekelsci.com">www.boekelsci.com</a>
Carbolite	<a href="http://www.carbolite.us">www.carbolite.us</a>
Cascade TEK	<a href="http://www.cascadetek.com">www.cascadetek.com</a>
ESCO	<a href="http://escoglobal.com">escoglobal.com</a>
Jeio Tech	<a href="http://www.jeiotech.com">www.jeiotech.com</a>
Labnet International	<a href="http://www.labnetlink.com">www.labnetlink.com</a>
LABREPCO	<a href="http://www.labrepco.com">www.labrepco.com</a>
Lucifer Furnaces	<a href="http://www.luciferfurnaces.com">www.luciferfurnaces.com</a>
MTI	<a href="http://www.mtixtl.com">www.mtixtl.com</a>
Nabertherm	<a href="http://www.nabertherm.com">www.nabertherm.com</a>
SHEL LAB	<a href="http://www.shellab.com">www.shellab.com</a>
So-Low	<a href="http://www.so-low.com">www.so-low.com</a>
SP Industries	<a href="http://www.spindustries.com">www.spindustries.com</a>
Stovall Life Science	<a href="http://www.slscience.com">www.slscience.com</a>
Ted Pella	<a href="http://www.tedpella.com">www.tedpella.com</a>
Terra Universal	<a href="http://www.terrauniversal.com">www.terrauniversal.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
Yamato Scientific America	<a href="http://www.yamato-usa.com">www.yamato-usa.com</a>
Z-Sc1	<a href="http://www.z-sc1.com">www.z-sc1.com</a>



## TOP 11 QUESTIONS YOU SHOULD ASK WHEN BUYING A PARTICLE SIZE ANALYZER

- 1** What is the size range you need to measure? Unfortunately, no one technique can measure all possible particle sizes, so the range needed will narrow the potential systems which can be used. If your application has a very wide range of sizes, try to narrow that range down to the fraction of that range that is most important. For example, are the smallest particles most important or the largest? Refine the system choice based on a system that best handles the most important part of the overall size range.
- 2** What exactly do you want to measure and why? Particle analyzers use many different techniques to arrive at measurements. In order to figure out what technique will work best for your application, you need to define what you are trying to measure and why. This will help narrow down the appropriate technology type for the application.
- 3** Are you trying to characterize different particle types in a single sample? The large majority of particle “analyzers” only perform “particle sizing” based on a signal proportional to the particle’s volume. This, combined with an assumption that “all particles are spherical”, produces a single number, Equivalent Spherical Diameter (ESD) as a measure of each particle’s “size.” Imaging techniques, on the other hand, can measure many different particle shape attributes which can be used to automatically differentiate different particle types in a heterogeneous mixture.
- 4** In what “state” should the measurements be made? In many cases, measurement of the particles in the “native state” may not be possible; for instance, a slurry of particles at high percent solids is very difficult to measure with most techniques. When dilution is necessary, care must be taken to use a diluent that is inert to the particles under study and does not alter them once diluted. Just because the raw material is a dry powder, does not necessarily mean that measuring them in a dry state is always the best method, as there can be benefits to suspending the dry particles in an inert liquid for analysis.
- 5** Is measuring the count or concentration (two different measurements!) of the particles along with size/shape important? If knowing an absolute particle count, or a particle concentration is important, then some techniques will be eliminated immediately. Any “ensemble” methods, or other methods that recirculate the particles can only be used for very relative comparisons, not true concentrations. If concentration is important, make sure that the manufacturer has a well-established procedure for verifying concentration measurements (through the use of standards, for instance).
- 6** How easy is it to generate reliable data? Think about your users and ask what, if any, specific expertise is required for system set-up and routine use. Then, ask to make a measurement to assess this during the selection process.
- 7** Can the instrument comfortably handle all your samples? Check the particle size range and the availability of efficient dispersion units for suspension, emulsion, and dry powder analysis.

- 8** Are there any features that will boost productivity? Ask about measurement times; check how easy it is to switch between sample types and assess maintenance requirements.
- 9** How does the SHE performance of the system compare with others? A good dry dispersion unit will minimize the need for wet measurement, for example, cutting dispersant use. If you need containment, then assess its quality.
- 10** How easy is it to tailor analysis to your precise needs? Check out the software interface, and the process required to develop methods and present your data how you want it.
- 11** And finally what type of support is available, now and into the future, if things go wrong, or with a new application? Ask about provisions for on-line education and training.

## RECENTLY RELEASED PARTICLE SIZE ANALYZERS

### FLOWCAM®

- Combines the speed of data acquisition typical of particle analyzers and the detailed individual particle information typical of microscopy
- Automatically captures digital images of particles from  $2\ \mu\text{m}$  –  $2\ \text{mm}$
- Stores and indexes each image according to 32 discrete measurements (e.g. length, width, transparency, and circularity)
- Software identifies subtle differences between particles, allowing automated identification and classification



Fluid Imaging  
[www.fluidimaging.com](http://www.fluidimaging.com)

### NANOPLUS

- Features an extended analysis range, intuitive software, and multiple sample cells to fit the user's application
- Can measure particle size in the range of  $0.6\ \text{nm}$  to  $10\ \mu\text{m}$  with sample suspension concentrations from  $0.00001\%$  to  $40\%$  and zeta potential of sample suspensions in the  $-200\ \text{mV}$  to  $+200\ \text{mV}$  range with concentrations from  $0.001\%$  to  $40\%$



Micromeritics  
[www.micromeritics.com](http://www.micromeritics.com)

### DELSAMAX PARTICLE ANALYZERS

- DelsaMax PRO provides precise measurement of the size, structure and charge of particles  $0.4$  to  $10,000\ \text{nm}$  in diameter in as little as one second
- Instruments in the family utilize two independent detection systems that operate in parallel—a configuration that significantly streamlines workflows in biological, chemical, material and polymer science applications



Beckman Coulter  
[www.beckmancoulter.com](http://www.beckmancoulter.com)

### NANO DS

- Combines Dynamic Light Scattering and Static Light Scattering measurement in one single optical system, making it more effective at analyzing nanoparticles
- Allows the user to select different measurement angles
- Provides excellent accuracy and repeatability across the entire  $0.3\ \text{nm}$  to  $10\ \mu\text{m}$  size range
- Compact, portable, and easy to use



Cilas Particle Size  
[www.particle-size.com](http://www.particle-size.com)

## PARTICLE SIZE ANALYZER MANUFACTURERS

Agilent	<a href="http://www.agilent.com">www.agilent.com</a>	Hach	<a href="http://www.hach.com">www.hach.com</a>
AimSizer Scientific	<a href="http://www.aimsizer.com">www.aimsizer.com</a>	Horiba Instruments	<a href="http://www.horibalab.com">www.horibalab.com</a>
Ankersmid B.V.	<a href="http://www.ankersmid.com">www.ankersmid.com</a>	JM Canty	<a href="http://www.jmcanty.com">www.jmcanty.com</a>
Beckman Coulter	<a href="http://www.coultercounter.com">www.coultercounter.com</a>	Malvern Instruments	<a href="http://www.malvern.com">www.malvern.com</a>
Brightwell	<a href="http://www.brightwelltech.com">www.brightwelltech.com</a>	Micromeritics	<a href="http://www.micromeritics.com">www.micromeritics.com</a>
Brookhaven Instruments	<a href="http://www.bic.com">www.bic.com</a>	Microtrac	<a href="http://www.microtrac.com">www.microtrac.com</a>
CILAS Particle Size	<a href="http://www.particle-size.com">www.particle-size.com</a>	NanoSight	<a href="http://www.nanosight.com">www.nanosight.com</a>
Clemex Technologies Inc.	<a href="http://www.clemex.com">www.clemex.com</a>	New Star Environmental	<a href="http://www.newstarenvironmental.com">www.newstarenvironmental.com</a>
Dispersion Technology	<a href="http://www.dispersion.com">www.dispersion.com</a>	Particle Sizing Systems	<a href="http://www.pssnicomp.com">www.pssnicomp.com</a>
Fluid Imaging	<a href="http://www.fluidimaging.com">www.fluidimaging.com</a>	Shimadzu	<a href="http://www.ssi.shimadzu.com">www.ssi.shimadzu.com</a>
Formulation	<a href="http://www.formulation.com">www.formulation.com</a>	Sympatec	<a href="http://www.sympatec.com">www.sympatec.com</a>
Fritsch	<a href="http://www.fritsch.de">www.fritsch.de</a>	TSI	<a href="http://www.tsi.com">www.tsi.com</a>

An old analog pH meter seemed accurate enough, as long as the task didn't require much accuracy. Today's meters must be more accurate and provide more reproducible results. In some cases, pH meters do even more. Some customers want multifunction meters—a device might measure various parameters, including pH, conductivity, ion concentration, and oxidation reduction potential.

## TOP 5 SIGNS THAT YOU SHOULD REPLACE YOUR pH METER

- 1 The circuitry or connections have been damaged.
- 2 It does not meet current GLP guidelines for measurement or data storage and recording.
- 3 You are performing multiple measurements on different instruments instead of using one instrument for simultaneous measurements.
- 4 The meter doesn't meet your current needs for accuracy and efficiency.
- 5 Need a meter with more security features or peripheral options.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN PURCHASING A pH METER

- 1 What type of connector does the meter use?
  - a. Is it a BNC or DIN?
  - b. Is it proprietary or can other manufacturer's probes be used with it?
- 2 What is the replacement cost for a pH electrode?
- 3 What accessories are included with the meter?
  - a. What is the complete cost of all accessories needed to operate the meter?
- 4 What type of after sales support is offered?
  - a. If something goes wrong with the meter, can it be fixed locally?
  - b. What is the general turn-around time for repair?
- 5 What makes the company different from other companies that manufacture similar products?
- 6 What additional types of features are offered? (GLP data, PC connectivity (USB vs RS 232), calibration timeout, number of calibration points, ISE concentration readout, incremental methods for ISE and mv readout of concentration during calibration process.)

## RECENTLY RELEASED pH METERS

### 826 MOBILE PH METER

- Waterproof, rugged pH meter suitable for use in any harsh environment
- Easy-to-use instrument features level IP67 protection, which seals it against dust and submersion in water up to 1 meter
- Also features wireless printing, 1 - 3 calibration points, and memory capable of holding 200 results
- Rugged impact resistant carrying case protects the meter and components in the field



Metrohm  
[www.metrohmusa.com](http://www.metrohmusa.com)

### SEVENEXCELLENCE

- Includes different modules for pH, conductivity, and ion specific electrodes
- One-click methods ensure users are always running the same analysis increasing reliability and reproducibility
- Meter provides a full package of GLP support with PIN protection, GLP printout format and all GLP relevant information stored and USP/EP compliance for conductivity
- Features user-friendly touchscreen



Mettler Toledo  
[www.mt.com](http://www.mt.com)

### pHIT SCANNER

- Requires no calibration
- Product design eliminates glass electrodes and enhances usability compared to traditional pH meters
- Can be stored dry and the glass-free design also eliminates the threat of broken pH electrodes
- Solid-state sensor reduces signal drift for more accurate and reliable measurement
- Measurement data can be transmitted via USB or Bluetooth



Senova Systems  
<http://senovasystems.com>

### pHASE pH ELECTRODES

- Provide accurate and stable pH measurement changes in dynamic process environments under wide ranging variable temperature conditions
- Specially designed for variable temperature operation process testing
- Available in two designs to best suit user needs: the cost-saving, user-friendly sealed design and the Rapid-Renew refillable design, ideal for dirty samples



Sensorex  
[www.sensorex.com](http://www.sensorex.com)

## pH METER MANUFACTURERS

Beckman Coulter	<a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a>
Corning	<a href="http://www.corning.com">www.corning.com</a>
Denver	<a href="http://www.denverinstrumentusa.com">www.denverinstrumentusa.com</a>
Hach	<a href="http://www.hach.com">www.hach.com</a>
Hamilton	<a href="http://www.hamiltoncompany.com">www.hamiltoncompany.com</a>
Hanna Instruments	<a href="http://www.hannainst.com/usa">www.hannainst.com/usa</a>
Horiba	<a href="http://www.horiba.com">www.horiba.com</a>
ITT Analytics	<a href="http://www.itt.com">www.itt.com</a>
LaMotte	<a href="http://www.lamotte.com">www.lamotte.com</a>
Metrohm	<a href="http://www.metrohmusa.com">www.metrohmusa.com</a>
Mettler Toledo	<a href="http://www.mt.com">www.mt.com</a>
Nova Analytics	<a href="http://www.novaanalytic.com">www.novaanalytic.com</a>
Oakton	<a href="http://www.4oakton.com">www.4oakton.com</a>
Omega	<a href="http://www.omega.ca">www.omega.ca</a>
Pulse Instrument	<a href="http://www.pulseinstrument.com">www.pulseinstrument.com</a>
Sartorius	<a href="http://www.sartorius.com">www.sartorius.com</a>
Sensorex	<a href="http://www.sensorex.com">www.sensorex.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>

## TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR PIPETTES

- 1 The pipettes no longer fit the user's needs.
- 2 The pipettes are no longer accurate, or the volume is drifting.
- 3 Lab technicians are experiencing repetitive motion injuries from heavy or non-ergonomic pipettes.
- 4 Tip cones are visibly worn and tips aren't sealing well.
- 5 The piston surface is worn or corroded.
- 6 The batteries of an electronic pipette are no longer holding a charge.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A PIPETTE

- 1 What differentiates the pipette from others offered in terms of performance and ergonomics?
- 2 Is the product compatible with other manufacturers' consumables (tips)?
- 3 What types of services are offered for this product? Calibration? Repair?
- 4 Does the company offer application support and technical phone support before and after product purchase?
- 5 What is the product life expectation? What is the product's warranty period? If the company discontinues the product, for how many years do they provide accessories and parts for the instrument?



## RECENTLY RELEASED PIPETTES

### VIAFLO 384 HANDHELD ELECTRONIC PIPETTE

- Can be used in conjunction with vacuum manifold, 96-well solid phase extraction (SPE) microplate and RNA isolation kit to reproducibly extract high quality total RNA from cultured cells and bacteria
- Offers all the benefits of increased sample throughput as well as lower sample and reagent use without the expense of having to invest in a robotic liquid handling system



INTEGRA  
www.integra-biosciences.com

### F1-CLIPTIP PIPETTING SYSTEM

- Features low tip attachment, ejection and plunger forces for safe and comfortable use, reducing the risk of repetitive strain injuries
- Lightweight design reduces fatigue during extended periods of pipetting
- Includes 150 percent increase in air boost to ensure efficient delivery of micro-volumes and prevent capillary action for low volume pipetting
- Interlocking design securely locks tips in place



Thermo Fisher Scientific  
www.thermoscientific.com

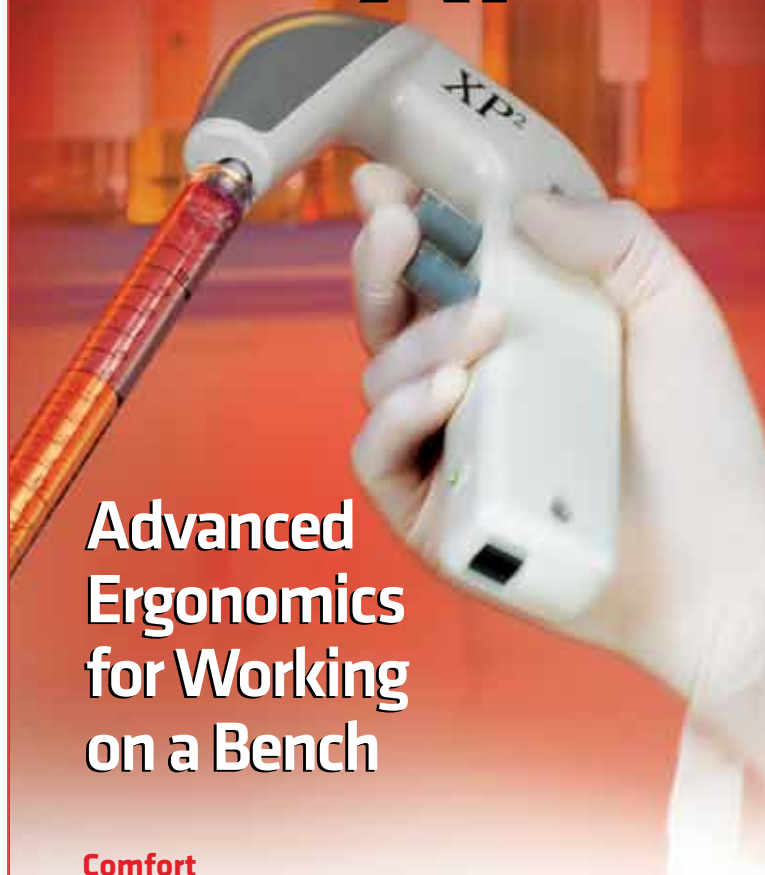
### MICROLAB 300 SERIES PIPETTOR

- Allows users to dispense between 0.5 to 1000  $\mu$ L without needing to exchange pipettes
- Requires just one probe and two tip sizes
- Enables laboratories to achieve excellent quality assurance through reproducible and traceable methods
- Software allows technicians to easily create, save, and execute pipetting applications from start to finish



Hamilton  
www.hamiltoncompany.com

# Pipet-Aid® XP2



## Advanced Ergonomics for Working on a Bench

### Comfort

The most comfortable pipettor you ever laid a hand on

### Convenience

Uninterrupted extended operation

### Control

Quiet precision pump responds instantly to the touch of the button

Drummond Pipet-Aids have set the standard for making pipetting in the laboratory safer, easier, and more convenient. The Pipet-Aid® XP2 delivers more. More comfort...more convenience...better control.



For a copy of our new 2013 catalog or more information on the Pipet-Aid XP2 visit [drummondsci.com](http://drummondsci.com).

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the Original Pipet-Aid®



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SCIENTIFIC COMPANY

MADE  IN USA

500 Parkway, Box 700  
Broomall, PA 19008

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Advanced speed control ends meniscus "jumping," and soft blow-out has never been easier!

- **Protect your cells:** Selectable maximum speed for ultra-sensitive operations
- **Precise control:** Touch-sensitive, continuously variable speed control
- **Ergonomic:** Sculpted grip eliminates uncomfortable pressure points



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**BRANDTECH®**  
SCIENTIFIC, INC.

**Toll Free (888) 522-2726**  
[www.brandtech.com](http://www.brandtech.com)

## PIPETTES

### SARPETTE® M AND E

- Available in single, 8, and 12 channel configurations
- M pipettes feature continuously adjustable volumes from either the dispenser button or thumbwheel and offer excellent accuracy and precision
- E model electronic pipettes are controlled by a high-precision motor and microprocessor to ensure smooth and accurate pipetting
- Pipette tips offered in a wide range of packaging and purity options

Sarstedt  
[www.sarstedt.com](http://www.sarstedt.com)



### PIPETTE MANUFACTURERS

BrandTech	<a href="http://www.brandtech.com">www.brandtech.com</a>
CAPP	<a href="http://www.capp.dk">www.capp.dk</a>
Cole-Parmer	<a href="http://www.coleparmer.com">www.coleparmer.com</a>
Drummond Scientific	<a href="http://www.drummondsci.com">www.drummondsci.com</a>
Eppendorf	<a href="http://www.eppendorf.com">www.eppendorf.com</a>
Gelcompany	<a href="http://www.gelcompany.com">www.gelcompany.com</a>
Gilson	<a href="http://www.gilson.com">www.gilson.com</a>
Globe Scientific	<a href="http://www.globescientific.com">www.globescientific.com</a>
Hamilton	<a href="http://www.hamiltoncompany.com">www.hamiltoncompany.com</a>
Hirschmann	<a href="http://www.hirschmann-inc.com">www.hirschmann-inc.com</a>
INTEGRA Biosciences	<a href="http://www.integra-biosciences.com">www.integra-biosciences.com</a>
Jencons Scientific	<a href="http://www.jenconsusa.com">www.jenconsusa.com</a>
Labnet International	<a href="http://www.labnetlink.com">www.labnetlink.com</a>
Nichiryo America	<a href="http://www.nichiryo.com">www.nichiryo.com</a>
Oxford Instruments	<a href="http://www.oxford-instruments.com">www.oxford-instruments.com</a>
Rainin Instrument Company	<a href="http://www.rainin.com">www.rainin.com</a>
Sarstedt	<a href="http://www.sarstedt.com">www.sarstedt.com</a>
Sartorius	<a href="http://www.sartorius.com">www.sartorius.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
USA Scientific	<a href="http://www.usascientific.com">www.usascientific.com</a>
VistaLab Technologies	<a href="http://www.vistalab.com">www.vistalab.com</a>
Wheaton Science Products	<a href="http://www.wheatonsci.com">www.wheatonsci.com</a>

# VACUUBRAND® BVC FLUID ASPIRATION SYSTEMS – CONVENIENCE AND SAFETY FOR CELL CULTURE ASPIRATION

Cell Culture and other laboratories that isolate and work with cells require the tools to safely and effectively remove wash and culture media away without harming their cells, and maintaining a safe laboratory environment. The new BVC fluid aspirators are third-generation systems that provide fine control, while providing the highest level of safety.

## UNSURPASSED CONTROL

The BVC systems provide touch sensitive control of liquid flow through the hand controller. Additionally, the Control and Professional models, with integrated vacuum pump, feature a touch screen vacuum level adjustment that operates even with gloves, so that gentle aspiration can be provided with sensitive cells, or loose cell pellets, while allowing powerful flow for larger volume applications. The unpowered BVC Basic model has a mechanical vacuum switch that controls demand to the vacuum source, allowing more efficient use of vacuum resources, and quieting the pump – all without the use of footswitches.

## CULTURE PROTECTION

Maintaining cleanliness in the culture lab is paramount to successful cell growth. As such, all BVC units are designed with smooth surfaces for easy cleaning. The hand controller keeps all aspirated media contained within the replaceable tubing, making cleaning and decontamination easy, with no valves to leak. Two users can be accommodated with the addition of a second hand controller at the bottle, ensuring that each fluid path is completely independent.

## USER PROTECTION

All BVC systems use high-flow 0.2µm filters between the collection vessel and the pump to contain aerosols generated by the aspiration process. This helps protect the pump as well as the laboratory environment. Filters can be autoclaved up to twenty times for long life. Users who are working with potential pathogens will also be happy to know that “G” glass bottle versions of BVC systems are resistant to the use of chlorine bleach in the collection vessel during use for immediate disinfection of waste.

**For more information about the VACUUBRAND® BVC family of fluid aspiration systems, visit [www.brandtech.com](http://www.brandtech.com)**



**BRANDTECH**  
SCIENTIFIC, INC.

BrandTech Scientific  
11 Bokum Road, Essex, CT 06426, USA  
888-522-2726 or 860-767-2562  
Website: [www.brandtech.com](http://www.brandtech.com)

## NEW EPPENDORF REFERENCE 2



The one button operating principle that was a major success in our original Reference line has been re-vamped with additional premium characteristics to provide users with extraordinary precision and accuracy, a long service life, and an even more ergonomic design. The spring loaded nose cone that was not previously available in Eppendorf's one button pipettes provide increased user to user reproducibility for more uniform results among members of the lab. The Reference 2 also now boasts new multi-channel options to allow for higher throughput, a secondary liquid class adjustment for the utmost in accuracy in precision when working with liquids that differ significantly from water, and a volume lock to prevent accidental changes for increased security in the most stringent lab environments. The Reference 2 will now feature an RFID chip that contains all relevant pipette data which makes keeping track of service information easier than ever before!

### EPPENDORF TRACKIT™ NEW

RFID chip contains all relevant data regarding the pipette (serial no., Certificate of Conformity, article no. etc.)

Ability to add your own data (e.g. calibration time and results, location)

Simple identification and documentation

### MULTI-CHANNEL VERSION NEW

Channel indicator guarantees a pipette tip alignment during the work process

Spring-loaded tip cone for reproducible tip fit and reduced effort (with the ability to be easily switched on/off)

More flexibility and simple maintenance with the ability to remove single cones

The one button operating principal of the Reference 2 has multiple benefits for the user. By not having to move the thumb from side to

side to eject tips users can move more quickly through their pipetting tasks with less thumb and hand strain than ever before. The one button system additionally enables protection for the pipette by limiting the exposure of the internal mechanisms to aerosols, biomolecules and corrosive vapors during use. Having the ability to eject a tip immediately following dispensing will significantly reduce both contamination of and wear and tear on the pipette.

### ONE-BUTTON OPERATION

Ergonomic handling with reduced operating effort.

Haptic feedback before tip ejection

Simple and quick tip ejection with active aerosol reduction

Reduce repetitive strain injuries by not having to move your thumb side to side

# eppendorf

Eppendorf  
102 Motor Parkway  
Hauppauge NY 11788  
800-645-3050  
[www.eppendorfna.com](http://www.eppendorfna.com)





[eppendorfcomplete.com](http://eppendorfcomplete.com)

# Complete Pipetting

## From pipettes to calibration to automation

The Eppendorf complete liquid handling solution offers your lab a single solution for the superior quality tips, calibration services and liquid handling products, from manual pipettes all the way to automation.

- > Eppendorf liquid handling products meet the highest needs for precision, ergonomics and robustness
- > Eppendorf offers a variety of tips in the purity grade your lab needs
- > Eppendorf also offers calibration services for all Eppendorf and non-Eppendorf brand pipettes



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Like to speed up your sample transfers?



Cell Seeding



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Gel Loading

## VOYAGER Space Adjustable Multichannel Pipettes

Increase productivity by adjusting your pipette tip spacing to allow the transfer of samples between differing labware formats.

For further information please visit  
[www.integra-biosciences.com](http://www.integra-biosciences.com)

**INTEGRA**

## PIPETTES



## ARE YOU IN THE MARKET FOR A... PIPETTE?

The most common errors our readers experience with their pipettes, based on our latest survey, include:

Human errors	27%
Viscosity reduces accuracy	16%
Liquids stick to tip	15%
Immersed tips carry over liquid	13%
Surface tension reduces accuracy	10%
Pipettes take up more liquid	7%
Liquids evaporate	4%
Other	4%
Liquid temperature	3%

The types of pipettes our readers are using or planning to purchase for their labs:

	Using	Plan to purchase
Manual: single-channel	28%	4%
Manual: multi-channel	16%	2%
Manual: fixed volume	11%	2%
Electronic: single-channel	8%	3%
Electronic: multi-channel	7%	2%
Electronic: fixed volume	1%	1%
Repeater	12%	2%
Other	1%	0%

The amount of time individuals in our readers' labs spend per day working with their pipettes:

Less than 1 hour	29%
1 - 2 hours	29%
2 - 3 hours	17%
Over 3 hours	26%



For more information on pipettes, including useful articles and a list of manufacturers, visit [www.labmanager.com/pipettes](http://www.labmanager.com/pipettes)

# Revolutionize your pipetting.

New **BIOHIT** Picus electronic pipette.

The smallest, the lightest, the most precise.



Lab Innovator

The Biohit Picus defines a new level of ergonomics, accuracy and reliability:

- Helps you prevent repetitive strain injury due to light weight design and electronic tip ejection.
- Achieve better and more reliable results with a new generation technology and the error control system.
- Save time with an extremely fast one-handed volume adjustment, a unique built-in microplate tracker and easy programmability.

[www.sartorius.com/picus](http://www.sartorius.com/picus)



turning science **into solutions**

Since standard laboratory equipment contains its own individually-designed power supplies that plug into standard electrical outlets, many labs rarely use external power supplies—mostly for specialty applications, instrument testing, and design. OEM power supplies operate steadily and predictably at one output inside equipment, instruments, and computers. By contrast, low- and medium-voltage programmable supplies are designed for applications—particularly in testing, measurement, and instrument design—where users might require 12V one day and 5V the next.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR POWER SUPPLY

- 1** Lacks present-day basic features for ease of use and efficiency, such as an internal timer, pause and resume, and programmable interface.
- 2** Cannot output constant high current that is required for most western blotting applications and running multiple gels at once.
- 3** Unable to produce constant high voltages required for demanding applications in the lab such as isoelectric focusing and sequencing.
- 4** Is not energy efficient, such as old linear power supplies that use more energy due to the need for heat sinks to dissipate unused thermal energy.
- 5** Does not align with modern safety standards designated by an EN 61010 or CE mark.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN SPECIFYING POWER MANAGEMENT SOLUTIONS

- 1** What options are available and how will they affect the lab?
- 2** Will you need to do a complete overhaul each time you add a piece of equipment or are solutions flexible enough to allow for additional equipment?
- 3** How difficult is it to move or relocate plugs and receptacles if you need to adjust your layout?
- 4** Does the company's product offer any level of sustainability?
- 5** What kind of product life can you expect from the company's system? Is it durable enough to handle years of use or will it continually show wear? Can you count on the company's team to provide service throughout the product's life?
- 6** What kind of cost should you expect from the company's system? Materials? Installation? On-going maintenance? Service? Warranty? Total cost of ownership?

The more  
you investigate,  
the better  
STARLINE Plug-In  
Raceway looks.

Sure, it may look like other raceway products. But STARLINE® Plug-In Raceway has the unique ability to add or relocate plug-in modules anywhere on the raceway quickly and easily, eliminating panel boards and the associated costs of reconfiguring circuits, receptacles and wiring. To learn how we can meet the power distribution needs of universities, labs and research environments, visit **StarlinePower.com**.

**STARLINE**®  
PLUG-IN RACEWAY



## RECENTLY RELEASED POWER SUPPLIES

### STARLINE PLUG-IN RACEWAY

- Provides on-demand power in a scalable format to combine reliability with versatility
- Includes the ability to add or relocate plug-in modules anywhere on the raceway
- Features a smooth aluminum finish and compact design that requires minimal space and allows for quick installation
- Accepts standard plugs and datacom channels to help keep ownership costs low



Universal Electric  
[www.uecorp.com](http://www.uecorp.com)

### PS600 600 VOLT POWER SUPPLY

- Designed for electrophoresis and blotting techniques including large format and high throughput applications
- Small footprint, large handle, and simple operation make the PS600 easy to set up and use in the lab
- Features a large, easy to read LED
- Offers constant voltage or constant current mode with automatic crossover



Hoefer  
[www.hoeferinc.com](http://www.hoeferinc.com)

### HVPS SERIES SWITCHING MODE POWER SUPPLY

- Provides precise 1 to 100 kV adjustable output at power levels up to 200 kW
- Featuring < 0.1% ripple and regulation with < < 10 joules stored energy, depending upon configuration, this compact unit eliminates the need for connecting multiple smaller units
- Packaged in a 19" W rack that uses tap water for cooling



Diversified  
[www.divtecs.com](http://www.divtecs.com)

### BT-GP SERIES BENCHTOP POWER SUPPLY

- Now offered at 1kV, 2kV, 4kV, and 6kV of output power at 30W
- New, lower voltage range on the BT-GP Series fills in the gap in the product lines by offering bench-top devices at 30W in lower voltages
- Suited for OEM biasing applications such as air purification, process fluid cleansing, hi pot testing, and for laboratory research



UltraVolt  
[www.ultravolt.com](http://www.ultravolt.com)

## POWER SUPPLY MANUFACTURERS

AS Research	<a href="http://www.asresearch.com">www.asresearch.com</a>
B&K Precision	<a href="http://www.bkprecision.com">www.bkprecision.com</a>
Bio-Rad	<a href="http://www.bio-rad.com">www.bio-rad.com</a>
Diversified Technologies	<a href="http://www.divtecs.com">www.divtecs.com</a>
EMCO High Voltage	<a href="http://www.emcohighvoltage.com">www.emcohighvoltage.com</a>
Hoefer	<a href="http://www.hoeferinc.com">www.hoeferinc.com</a>
Spellman High Voltage	<a href="http://www.spellmanhv.com">www.spellmanhv.com</a>
TDK-Lambda	<a href="http://www.tdk-lambda.com">www.tdk-lambda.com</a>
Tripp Lite	<a href="http://www.tripplite.com">www.tripplite.com</a>
UltraVolt	<a href="http://www.ultravolt.com">www.ultravolt.com</a>
Universal Electric	<a href="http://www.uecorp.com">www.uecorp.com</a>



# THE FUTURE OF RACE WAY...

## STARLINE PLUG-IN RACEWAY,

has revolutionized the power distribution industry! Universal Electric Corporation created STARLINE Plug-In Raceway to meet the ever-changing power distribution and datacom needs of research, pharmaceutical, university, hospital and data labs.

It offers a flexibility that no other product has – the ability to add or relocate electrical outlet modules anywhere on the raceway quickly and easily – without shutting down power!

STARLINE Plug-In Raceway not only offers flexibility and low cost of ownership, additional benefits are:

Reliability

Aesthetically Appealing

Re-locatable and Scalable

Reduced Installation Costs

To learn more about Universal Electric Corporation and its products, please visit [www.uecorp.com](http://www.uecorp.com) or call us at 800-245-6378.



**STARLINE®**  
TRACK BUSWAY

**UNIVERSAL**  
ELECTRIC CORPORATION

168 Georgetown Rd.  
Canonsburg, PA 15317  
Phone 800-245-6378  
[www.uecorp.com](http://www.uecorp.com)

Refractometers come in all sizes, shapes, capabilities, and prices. Some readers may recognize refractometry as a “high school” analysis method or a specialized technique for measuring specific analytes like sugar in water. Increasingly, lab and process engineers employ refractometry to provide quick measures of key quality attributes that under normal circumstances would require much lengthier assays on significantly more expensive equipment.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR REFRACTOMETER

- 1** Refractive index measurements for your current instrument are no longer accurate or aren't accurate enough for your applications.
- 2** You are starting to deal with harsh substances and your current instrument is not designed to stand up to spills of corrosive substances, etc.
- 3** The type of refractometer you currently have—either benchtop, hand-held, or in-line—is not suited to your facility or applications.
- 4** You are experiencing instrument-related errors in your flat-prism refractometer. However these could be due to improper cleaning, inappropriate application of analyte to the prism surface, and poor temperature control. If these errors are cropping up often, you may want to invest in a refractometer with “smart” features and/or Peltier cooling.
- 5** Your refractometer does not connect or does not connect well to other instruments in your lab, such as pH meters or polarimeters.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A REFRACTOMETER

- 1** What is the range of readings (highest to lowest) the instrument can make? This will help you make sure it will suit your purpose.
- 2** How easy can the refractometer be read and understood? This is especially important if non-experts will be the main users.
- 3** What is the calibration temperature of the refractometer?
- 4** How easy it is to calibrate? Must you purchase a calibration liquid, or can you calibrate with distilled water? Does it calibrate with a set screw or a dial or knob?
- 5** How easy it is to clean the instrument?

## RECENTLY RELEASED REFRACTOMETERS

### BELLINGHAM + STANLEY PRO-JUICE

- Can achieve the same high accuracy results for orange juice as it can for other fruit based juices
- Provides a measurement accuracy of 0.01 °Brix for sucrose solutions and a reproducibility of 0.02 °Brix between orange juice samples, regardless of temperature deviation or operator skill level
- Allows for cost savings and higher profits from increased concentrate yield



Xylem  
www.xylemanalytics.com

### HI 96801

- Suited to the analysis of fruits, energy drinks, puddings, soy milk juices, jam, marmalade, honey, soups, jelly, tofu and condiments
- Dual-level LCD displays measurement and temperature readings simultaneously
- Includes Automatic Temperature Compensation for accurate measurements
- Provides easy measurement; place a few drops of the sample in the well and press the READ key



Hanna Instruments  
www.hannainst.com

### DR-A1-PLUS

- Features a brighter field of view than its predecessor, the DR-A1, making it easier to measure inhomogeneous and/or dark samples
- Refractive index (nD) 1.3000 to 1.7100
- Brix 0.0 to 95.0%
- Measurement temperature range: 5 to 50°C (at unit of 0.1°C)
- Provides measurement accuracy of (nD)  $\pm 0.0002$  (refractive index) and Brix  $\pm 0.1\%$



ATAGO USA  
www.atago.net

### ABBEMAT SERIES

- Sophisticated measuring principle guarantees maximum accuracy
- Low sample volume, highest efficiency
- Simple to adjust
- User-friendly, quick and easy
- Performance, Performance Plus, Heavy Duty, and WR-MW models available



Anton Paar  
www.anton-paar.com

## REFRACTOMETER MANUFACTURERS

Anton Paar

www.anton-paar.com

ATAGO U.S.A

www.atago.net

Hanna Instruments

www.hannainst.com/usa

Index Instruments

www.indexinstruments.com

METTLER TOLEDO

www.mt.com

Reichert

www.reichert.com

Rudolph Research Analytical

www.rudolphresearch.com

Xylem

www.xylemanalytics.com

# REFRIGERATORS, FREEZERS, & ULTRA-LOW FREEZERS

## TOP 5 SIGNS THAT YOUR LAB REFRIGERATOR, FREEZER OR ULTRA-LOW FREEZER NEEDS TO BE SERVICED OR REPLACED

- 1 When a freezer or refrigerator has a pattern of being slow to recover after an extended door opening.
- 2 When your lab fridge or freezer is frequently accessed and the door doesn't securely close easily.
- 3 When the ambient temperature in the room where lab refrigerators and freezers are kept is consistently high, causing the equipment to work harder.
- 4 When a fridge or freezer for no reason raises and drops temperature regardless of door openings.
- 5 When signs of heavy defrost affect the ability of the door having a good seal when closed.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A LAB REFRIGERATOR/FREEZER

- 1 How is the product manufactured? Ask about the quality of the materials used and the product life expectation based on manufacturing testing.
- 2 What is the warranty? What does it include and for how long? Will anything void the warranty?
- 3 How green is the product? Ask the company to provide details on energy efficiency and have them relate it to your return on investment (e.g. in four years you will save enough money in energy costs to pay for your freezer/fridge?).
- 4 How much sample capacity are you getting for your space?
- 5 What are the optimal voltage/wiring conditions for running the fridge/freezer? If the building is older, will low voltage or voltage fluctuations affect the performance of the freezer/fridge?

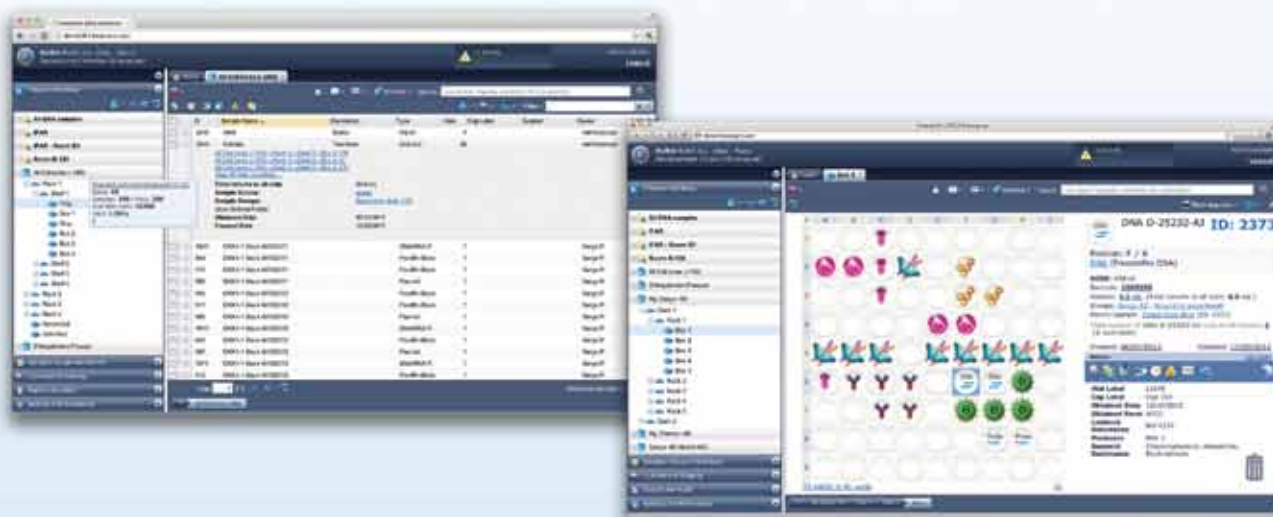
FOR THE TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A LOW TEMPERATURE FREEZER, VISIT [www.labmanager.com/ultra-low-questions](http://www.labmanager.com/ultra-low-questions)

# RuRo

Laboratory Information Bliss™



Sample Management System



FreezerPro was designed purely for sample management. This focus allows it to eliminate wasteful inefficiencies and help streamline laboratory production without the resource requirements associated with adopting a LIMS.

FreezerPro enhances user's ability to work, collaborate and learn through traceability, automation, configurable reporting, communication tools and hardware support. For thousands of users worldwide, FreezerPro is Laboratory Information Bliss™.

#### Contact us at:

888-881-RURO (7876)  
301-639-5546

[sales@ruro.com](mailto:sales@ruro.com)

**RuRo** Laboratory Information Bliss™

Visit [www.RURO.com](http://www.RURO.com) for more information

#### Compliance:

FDA 21 CFR Parts 11, 21, 58, 210, 211, 820  
cGLP/cGMP (Good Laboratory Practice and Good  
Manufacturing Practice)  
Section 508 Accessibility Guidelines  
HIPAA Accountability Act of 1996  
HIPAA Patient Safety and Quality Improvement Act  
of 2005 (Patient Safety Act)

#### Compatibility:

PC/MAC  
Tablet  
Smartphone  
Web-based





## ADA COMPATIBLE UNDERCOUNTER REFRIGERATION

Helmer has released new undercounter refrigerators and freezers that offer secure storage and consistent temperatures to provide safe storage of products while fitting under counters that meet the requirements for ADA (Americans with Disabilities Act) compliant counters.



ADA requires that all new construction and remodeling projects meet ADA requirements for counter heights. ADA Undercounter Refrigerators and Freezers offer the same high-quality storage solution found in all Helmer Scientific products. They feature superior chamber temperature uniformity and quick recovery with a heavy-duty, air-cooled refrigeration system that promotes exceptional airflow throughout the entire chamber without restricting storage space. The bacteria-resistant powder coated exterior and interior provides security against contaminants and is easy to clean. In addition, products are stored safely with a key lock or with optional integrated access control.

ADA undercounter models have been designed for convenience and performance. The field-reversible door is also self-closing. Front ventilation eliminates the need for top or side clearance so that the unit will easily fit beneath your counter and next to other cabinetry or products. The front drop-down panel offers access to components for easy serviceability.

ADA refrigerators and freezers are available in i.Series®, Horizon Series™, and Scientific Series™ models. i.Series models include the i.C3® User Interface which features an icon driven full-color touchscreen. The i.C3 includes multiple information logs, on-screen corrective

action, and downloading capabilities putting valuable information at your fingertips and providing documentation for record keeping.

Custom storage options are available for all models and include drawers, roll out baskets, and fixed shelves. LED lighting, swivel casters, glass doors, integrated access control, and stainless steel are also available to create a custom storage solution for your facility.

For more information on ADA or standard undercounter refrigerators and freezers contact: [www.helmerinc.com](http://www.helmerinc.com).



Helmer Scientific  
14400 Bergen Boulevard  
Noblesville, IN 46060  
800-743-5637 or 317-773-9073  
[www.helmerinc.com](http://www.helmerinc.com)



True Blue.

When performance matters

## Why Take a Chance With Your Storage?

When it comes to performance, Helmer refrigerators perform like no other, giving you a competitive edge when it comes to storing samples, reagents, blood products, and more.

- First to offer a 7 year compressor warranty
- Forced-air refrigeration system provides superior temperature uniformity throughout cabinet
- Reduced humidity environment preserves container integrity
- Advanced alarms and monitoring ensure product quality

**NEW** ADA Undercounter Refrigerators and Freezers



Contact us

800.743.5637 [www.helmerinc.com](http://www.helmerinc.com)



**Helmer**  
SCIENTIFIC

# INNOVATION IN ULTRA LOW FREEZER TECHNOLOGY

## – Optimizing the safety and security of high value samples.

Many universities, pharma/biotech companies and biorepositories use -80°C ultra-low temperature freezers (ULT) to store their priceless collections of biological samples. The safety of these samples depends heavily on the proper functioning of ULT freezers. At present, most ULTs use a conventional cascade compressor system, which can result in rapid warm up of the chamber, if one of the compressors fails. However, the increased level of laboratory protocol regulations has driven the conventional ULT technology to a higher standard in a more mature industry. Additional cost effectiveness, energy sustainability and increased efficiency demands have led to the development of newer technologies that can deliver performance-based new cooling solutions.

TwinGuard Technology, a new solution, offers a way to safely store biological samples by implementing a fail-safe mechanism. Through the use of two independent refrigeration systems, the ULT freezer is able to keep running at the necessary temperature (-65°C) in the event that one compressor fails.

In order to understand the value of samples stored in these ULTs, a study was conducted at Stanford University, which revealed that more than \$2 Billion worth of samples were stored within their freezers. Stanford houses nearly 2,000 freezers in more than 350 laboratories across its campus, resulting in an average of approximately 6 freezers per laboratory (1).

Since these freezers store such high-valued samples, any chance of malfunction or freezer failure needs to be reduced. Standard practices for optimum preservation include routine preventative maintenance of freezers, round-the-clock automated monitoring of temperatures, on-call staff to address emergency calls, sufficient available empty pre-cooled back up units, priority availability of refrigeration mechanics, and emergency backup power in the event of power loss (6). However, many times the freezer fails due to unforeseen technical reasons. The table shows a few recent incidents that have resulted in significant loss of valuable samples. Hence, a freezer with highly reliable, dependable and consistent technology should be the preferred choice of all laboratories.

using two completely independent one-compressor, auto-cascade cooling systems. This innovative design utilizes two independent systems allowing the unit to continue to run continuously at -65°C in the unlikely event of one compressor failure. The Panasonic Twin Guard® Series satisfies the industry demand for safe, long-term storage for the most high-valued materials.

### REFERENCES:

- (1) Jensen, 2009: Room Temperature Biological Sample Storage: Stanford University Pilot <http://medfacilities.stanford.edu/sustainability/downloads/RoomTempStoragePilotResults.pdf>
- (2) [http://news.hjnews.com/news/article\\_5ffbc72c-bdab-11e1-8341-001a4bcf887a.html](http://news.hjnews.com/news/article_5ffbc72c-bdab-11e1-8341-001a4bcf887a.html)
- (3) [http://www.cbsnews.com/8301-504763\\_162-57450310-10391704/freezer-malfunction-thaws-150-brains-at-harvard-research-hospital/](http://www.cbsnews.com/8301-504763_162-57450310-10391704/freezer-malfunction-thaws-150-brains-at-harvard-research-hospital/)
- (4) <http://www.lsuagcenter.com/NR/rdonlyres/E5E661B8-5268-42C1-AA34-9ECBCE-13A9EA/59509/Entomologynewsfall08.pdf>
- (5) <http://www.governingcouncil.utoronto.ca/AssetFactory.aspx?did=5348>
- (6) Groover et al, (2007) The Use of Compressor Cycle Patterns: The Ability to Predict Freezer Failure; CELL PRESERVATION TECHNOLOGY (5) 225-228

Estimated Value of Stanford Sample collection

VALUE PER SAMPLE	% OF COLLECTION	COLLECTION VALUE
\$2,500 -10,000	1%	\$1.21 Billion
\$500 -2,500	9%	\$0.56 Billion
\$100 -500	40%	\$0.79 Billion
\$0 -100	50%	\$0.26 Billion
Total	100%	\$2.82 Billion

RECENT FREEZER FAILURES

WHEN?	WHERE?	WHAT?	WHY?	REFERENCE
June 2012	Main State University	The work of eight people was compromised by the loss of 9 years' worth of research	The freezer was moved to a different room in the same lab where it was plugged in but left unattended all year long	(1)
May 2012	Wilson Memorial Hospital	23 human brains in autopsy research were destroyed leading to a loss of a decade worth of scientific research	The freezer shut down without triggering any of the two alarms	(2)
June 2010	Louisiana State University	The Entomology Department lost a precious collection including a diverse assemblage of reptilian tissues	Power failure to ultra-low freezers	(3)
June 2008	University of Toronto	More than 100,000 worth of samples were damaged	Water pipe failure caused the ultra-low temperature in the basement of Medical Sciences Building	(4)

### THE TWINGUARD SOLUTION

The Panasonic Twin Guard Series MDF-U700VXC -86°C ultra-low temperature (ULT) freezer employs advanced dual compressor technology to maintain ultra-low temperatures by



Find out more about Panasonic's TwinGuard Freezers at [www.twinguardseries.com](http://www.twinguardseries.com)

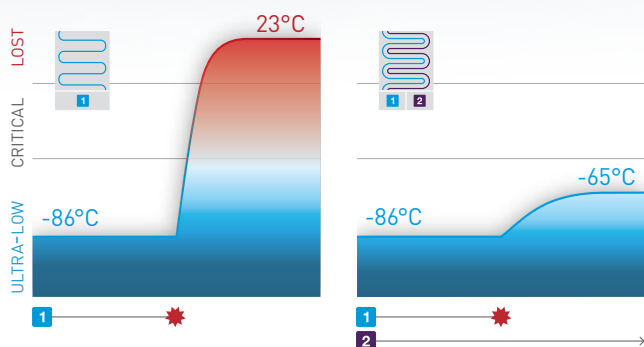
**Panasonic**

[www.panasonic.com/biomedical](http://www.panasonic.com/biomedical)

Set a New Standard in *Preservation*

**Panasonic**

# Why rely on one? Security now comes with two.



## TWIN GUARD® SERIES

Give your samples the ultimate protection of patented Twin Guard® technology –two independent systems can individually sustain ultra-low temperatures in the event of a failure, so you can rest easy knowing your valuable work is in good hands.

Visit [www.TwinGuardSeries.com](http://www.TwinGuardSeries.com) to download the Infographic.

**Twin Guard®**  
FREEZERS



**Dual Independent**  
Refrigeration  
Systems



## RECENTLY RELEASED REFRIGERATORS, FREEZERS, & ULTRA-LOW FREEZERS

### SMART-VUE WIRELESS MONITORING SYSTEM

- Safeguards the integrity of important laboratory storage by continuously monitoring critical parameters of laboratory equipment such as temperature, CO<sub>2</sub> concentration and relative humidity
- Securely logs data that can always be accessed via the Internet
- Provides immediate notification of electrical or mechanical failure by audible/visual siren, fax, telephone, email or text messaging
- Easy to install, use, and maintain



Thermo Fisher Scientific  
[www.thermoscientific.com](http://www.thermoscientific.com)

### SELECT™ SERIES

- Now available in three upright sizes
- Features an operating temperature range of -50°C to -86°C
- Includes high/low audible & visual temperature alarms, remote alarm contacts, patent pending voltage buck/boost
- Contains 1HP low noise high-efficiency compressors



Nor-Lake Scientific  
[www.norlakescientific.com](http://www.norlakescientific.com)

### SHUTTLE™ PORTABLE ULTRA-LOW FREEZERS

- Features a -86°C to -20°C temperature range
- Offers secure mobile transport of high-value vaccines or biological specimens
- Requires no compressors, dry ice, or LN<sub>2</sub>, and is quiet and energy-efficient
- Weighs 42 lbs and is efficient for both benchtop and field uses
- Operates independently for up to two hours when connected to an optional uninterruptible power supply



Stirling Ultracold  
<http://stirlingultracold.com>

### comPOUND® AND ARKTIC™ AUTOMATED STORAGE MODULES

- Capable of storing up to three times the number of samples of a standard -80°C freezer within almost the same physical space
- Have no moving parts within the cold zone, instead relying on TTP Labtech's proprietary pneumatic transport technology
- Samples are stored individually under nitrogen or dry air in hermetically sealed chambers eliminating contamination worries and improving sample stability



TTP Labtech  
[www.ttplabtech.com](http://www.ttplabtech.com)

## REFRIGERATOR, FREEZER, AND ULTRA-LOW FREEZER MANUFACTURERS

Angelantoni	<a href="http://www.angelantoni.it">www.angelantoni.it</a>
Baker BioScience Solutions	<a href="http://www.bakerbio.com">www.bakerbio.com</a>
Caron Products	<a href="http://www.caronproducts.com">www.caronproducts.com</a>
Darwin Chambers	<a href="http://www.darwinchambers.com">www.darwinchambers.com</a>
Eppendorf	<a href="http://www.eppendorfna.com">www.eppendorfna.com</a>
Freezer Concepts	<a href="http://www.freezer-concepts.com">www.freezer-concepts.com</a>
Helmer Scientific	<a href="http://www.helmerinc.com">www.helmerinc.com</a>
Marvel Scientific	<a href="http://www.marvelscientific.com">www.marvelscientific.com</a>
MIDSCI	<a href="http://www.midsci.com">www.midsci.com</a>
Nor-lake	<a href="http://www.norlake.com">www.norlake.com</a>
NuAire	<a href="http://www.nuaire.com">www.nuaire.com</a>
Panasonic Healthcare	<a href="http://www.panasonic.com/biomedical">www.panasonic.com/biomedical</a>
Ruro	<a href="http://www.ruro.com">www.ruro.com</a>
SHEL LAB	<a href="http://www.shellab.com">www.shellab.com</a>
So-Low	<a href="http://www.so-low.com">www.so-low.com</a>
SP Scientific	<a href="http://www.spscientific.com">www.spscientific.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
TTP Labtech	<a href="http://www.ttplabtech.com">www.ttplabtech.com</a>
Z-Sc1	<a href="http://www.z-sc1.com">www.z-sc1.com</a>



# NOR-LAKE<sup>®</sup> SCIENTIFIC

## -86°C SELECT<sup>™</sup> ULTRA-LOW UPRIGHT FREEZERS

*Designed to Meet the Demanding Requirements for Scientific and Laboratory Research.*



**Select<sup>™</sup> Control System**

- Upright models available in 27.5ft , 23.3ft and 18.9ft internal storage capacity
- Operating temperature range -50°C to -86°C
- Next generation 1HP low noise high efficiency compressors
- Exclusive cascade refrigeration and cabinet design
- Programmable logic microprocessor controller with LCD digital display
- High/low audible and visual temperature alarms, remote alarm contacts
- Door ajar alarm, on board diagnostics, surge protector, password protection, real time clock and battery backup of controller display
- Available options-CO2 and LN2 Backup systems, chart recorder, inventory storage systems
- UL/CUL listed



Nor-Lake Scientific

727 Second Street

Hudson, WI 54016

800-477-5253

715-386-2323

715-386-4290 FAX

[www.norlakescientific.com](http://www.norlakescientific.com)



Committed to our environment



Nor-Lake, Inc.  
Registered to ISO 9001:2008  
File No. 10001816





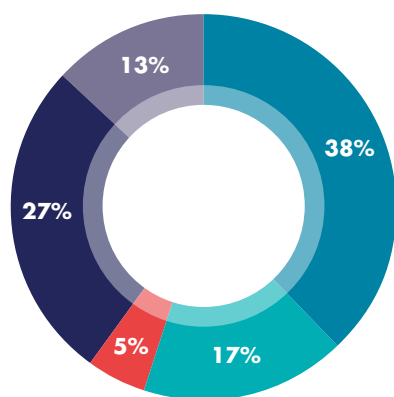
## ARE YOU IN THE MARKET FOR A... REFRIGERATOR OR FREEZER?

Types of refrigerators or freezers survey respondents are currently using:

Upright general purpose lab freezers	63%
Upright ultra-low temperature freezers	36%
Low temperature upright lab freezers	33%
Under-counter general purpose lab freezers	25%
Low temperature chest lab freezers	16%
Flammable materials storage	15%
Blood bank and plasma	14%
Chest ultra-low temperature freezers	14%
Explosion-proof	12%
Other	10%

Temperature ranges required by respondents currently using or planning to purchase fridges or freezers:

- 0° to -20°C
- -20° to -30°C
- -30° to -45°C
- -45° to -85°C
- Other



Freezers and refrigerators are an integral part of any laboratory that requires temperature controlled storage. Maintaining samples at an optimal temperature while in storage is vital for many lab professionals and this makes choosing the right freezer or refrigerator a crucial task. While the average kitchen freezer operates at about -20°C, laboratory variants have a much wider range of options depending on the storage conditions needed.

Type(s) of service used by respondents for repair/service of their refrigerators/freezers:

In-house service department	41%
Third-party time/material	30%
Third-party contract	21%
Instrument manufacturer time/material	12%
Instrument manufacturer service contract	12%
Multi-vendor service provider	8%
Don't know	6%
Our department	3%
Other	2%

### TOP 10 FEATURES/BENEFITS

our readers look for when purchasing refrigerators or freezers

PRICE	100%
RELIABILITY OF PRODUCT	100%
DURABILITY OF PRODUCT	99%
WARRANTIES	97%
ENERGY EFFICIENCY	96%
QUIET OPERATION	96%
SENSITIVITY AND ACCURACY OF TEMPERATURE CONTROLS	95%
REPUTATION OF VENDOR	94%
SERVICE AND SUPPORT	90%
AUDIBLE AND VISUAL HI/LO ALARM FOR EACH CONTROLLER	86%



For more information on Refrigerators & Freezers, including useful articles and a list of manufacturers, visit [www.labmanager.com/fridges&freezers](http://www.labmanager.com/fridges&freezers)

# NOR-LAKE® SCIENTIFIC -86°C SELECT™ ULTRA-LOW UPRIGHT FREEZERS

**Designed to meet the demanding requirements for scientific and laboratory research. Advanced engineered design incorporates the latest in cabinet, refrigeration, temperature control and monitoring features. Provides energy efficient, convenient, safe and reliable performance for optimal storage temperature environments necessary for a wide range of life science, pharmacy, biological, medical, clinical, and industrial applications.**

## CONSTRUCTION

CFC free polyurethane cabinet and door foam insulation.

High-impact, smooth scratch and corrosion resistant painted exterior and smooth white painted interior, provides attractive appearance and easy to clean surfaces.

Interior and exterior of the freezer cabinet are white painted galvanized steel.

Combination cabinet mounted multi-bulb and door perimeter gaskets provide multiple points of door sealing. Ensures reliable frost resistant performance and enhances energy efficient cold performance for long term sample security and storage.

Interior doors (5) independent hinged steel inner doors are constructed of insulating material with magnetic catch and easy pull handles. Reduces cold loss during door openings and sample retrieval.

Five internal storage compartments with four heavy duty reinforced stainless steel shelves. Shelves are adjustable in 1 inch increments. Compatible with optional stainless steel storage racks, fiberboard boxes and dividers for multiple storage needs.

Multi-feed patent pending cold wall evaporator design provides superior refrigerant flow and maximizes cooling power by ensuring that the evaporator is always 100% in contact with the freezer wall, maximizing cold transfer into the freezer and heat removal from the chamber.

## SELECT™ CONTROL SYSTEM

Advanced PLC (programmable logic) microprocessor controller (door mounted eye

level display and interface) includes real time clock, event logging alarm history, advanced alarms, alarm-test, and memory functions.

Password protection (2 levels, setpoints and parameters) security for power, temperature and alarm settings.

Key pad, multifunction, menu driven, LCD display for trouble free access on monitoring of all control features.

Temperature adjustable in 0.1°C increments.

Temperature display to 0.1°C increments.

Control probe located in rear wall bottom left corner for optimal and accurate temperature measurement and control.

Evaporator design enhances refrigerant flow increasing the overall efficiency, temperature uniformity and recovery performance.

Air cooled condenser, high capacity with large surface area. Washable condenser filter maintains optimal efficiency and performance.



## SELECT™ REFRIGERATION SYSTEM

Nor-Lake Scientific's Select™ Refrigeration system is powered by an advanced low noise high performance cascade refrigeration system using two next generation 1 HP hermetically-sealed compressors.

Exclusive engineered super capacity (Itri-tube) capillary tube system delivers refrigerant on demand matching with advanced heat exchanger design providing optimal heat removal and superior low temperature performance.



727 Second Street  
Hudson, WI 54016  
800-477-5253  
[www.norlakescientific.com](http://www.norlakescientific.com)

It's official: Sample and standards preparation are significant bottlenecks in high-throughput laboratories, particularly those partly or fully automated. Improved instrument sensitivity—and the need for speed and accuracy—have made sample prep a top priority.

Yet discussing sample prep as a monolithic operation is impossible because prep steps, analyses, and matrices are highly variable among industries. Measuring protein levels in energy drinks is not the same as for granola; food safety analyzes for pesticide residues and microbial contamination; still other tests quantify trace nutrients. Matrix removal is a great idea, but even the "matrix" differs for all the tests mentioned.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING HPLC SAMPLE PREP PRODUCTS (SPE)

- 1 What is your sample matrix?
- 2 What volume of sample do you need to extract?
- 3 What are your target analyte(s)?
- 4 What are your sample clean-up goals (high recovery vs. clean-up vs. speed)?
- 5 What sample preparation format is best for your work?
- 6 What is your mode of analysis (LC-UV, LC-MS-MS, GC-FID, GC-MS etc.)?

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A SYSTEM FOR CHROMATOGRAPHY ANALYSIS SAMPLE PREP

- 1 Can this system perform exhaustive extractions in about 10 minutes?
- 2 Can this extraction system operate unattended overnight?
- 3 Does the system change solvents and perform rinses automatically between samples?
- 4 Does the extraction system comply with U.S. EPA methods?
- 5 How does solvent consumption compare to other systems?
- 6 Can the extraction system handle solid and semisolid and samples, or are multiple systems needed?

# OASIS $\mu$ ELUTION PLATES FOR REPRODUCIBLE, EFFICIENT SAMPLE PREPARATION

Confidently perform solid-phase extraction (SPE) cleanup of very small volumes with high analyte recovery and clean extracts in low elution volumes that can be directly injected into your LC/MS/MS system.

## SUPERIOR RESULTS

The Oasis®  $\mu$ Elution plate is a patented design that when combined with the highly efficient Oasis sorbents (HLB, MCX, MAX, WCX, and WAX), enables elution volumes as low as 25  $\mu$ L and provides fast cleanup with improved performance over protein precipitation. In addition,  $\mu$ Elution plates concentrate samples up to 1.5x eliminating time-consuming evaporation and reconstitution steps, compressing sample preparation cycle time and increasing throughput capabilities.

## BENEFITS

Ideal for sample volumes ranging from 10  $\mu$ L to 375  $\mu$ L

No evaporation and reconstitution necessary

Up to a 1.5x increase in concentration

Compatible with most liquid-handling robotic systems

## SORBENTS

Oasis  $\mu$ Elution plates are available in a variety of reversed-phase (HLB) and mixed mode ion-exchange (MCX, MAX, WCX, and WAX) sorbents to provide a range of method development options for acids, bases, and neutrals.

## REDUCED MATRIX EFFECTS

The presence of matrix interferences in a sample limits the maximum sensitivity that can be achieved. All of Oasis SPE products, including the  $\mu$ Elution plate, help you achieve the cleanest extracts by significantly reducing matrix interference.

## LOADING CAPACITY

SPE device capacity is defined as the total mass of analytes and endogenous sample components retained by the sorbent bed under loading conditions. Breakthrough will

occur when the capacity of the sorbent bed is exceeded. Oasis sorbents are designed to provide exceptionally high loading capacity, yet each well in a Waters Oasis  $\mu$ Elution plate contains only 2 mg of Oasis sorbent.

**For more information, visit:**  
[www.waters.com/oasis](http://www.waters.com/oasis)

**OASIS®**  
SAMPLE EXTRACTION PRODUCTS



**Waters**

THE SCIENCE OF WHAT'S POSSIBLE.™

34 Maple Street  
Milford, MA 01757 USA  
Toll free: 800-252-4752  
Tel: 508-478-2000  
[www.waters.com](http://www.waters.com)



## RECENTLY RELEASED CHROMATOGRAPHY SAMPLE PREP PRODUCTS

### METROHM COMBUSTION ION CHROMATOGRAPHY SYSTEM

- Automates the determination of halogens and sulfur of various matrices across different industries
- Complies with environmental requirements, including DIN, EN, IEC, RoHS, WEEE and more
- Flame sensor technology measures the light intensity from the pyrolysis oven, controls the feed rate of the sample boat and prevents soot formation
- Combustion by one universal method



Metrohm  
[www.metrohmusa.com](http://www.metrohmusa.com)

### MICROLUTE™ SPE SAMPLE PREPARATION SYSTEM

- Provides a faster, trouble-free alternative to cartridges for high throughput sample clean-up
- Handles samples as small as 150ul
- Includes filter plate, collection plate, waste tray and manifold
- Offers all the advantages of automated and high throughput SPE sample preparation in a convenient microplate format
- Capable of rapidly processing 96 samples in one go repeatedly and precisely



Porvair Sciences  
[www.porvair-sciences.com](http://www.porvair-sciences.com)

### STRATA® AND STRATA-X TABLESS TUBE HOLDER ACCESSORIES

- Hold SPE tubes in 96-well spacing to integrate with automated systems
- All Strata and Strata-X products are now available in the tabless 1 mL tube format, enabling the user to arrange multiple sorbents within the holders
- Allows users to remove and replace a single SPE tube should they make an error



Phenomenex  
[www.phenomenex.com](http://www.phenomenex.com)

### EVOLUTE® EXPRESS 96-WELL PLATES

- Simplify polymer-based SPE by employing a streamlined 3-step protocol; Load-Wash-Elute
- Reduce processing and method development times without loss of analyte recovery or method robustness
- Design provides a uniform flow in the processing of aqueous samples and eliminates the need to re-run samples due to well-clogging



Biotage  
[www.biotage.com](http://www.biotage.com)

## CHROMATOGRAPHY SAMPLE PREP PRODUCT MANUFACTURERS

Agilent	<a href="http://www.agilent.com">www.agilent.com</a>
BDH Chemicals	<a href="http://us.vwr.com">us.vwr.com</a>
Biotage	<a href="http://www.biotage.com">www.biotage.com</a>
Fluid Management Systems	<a href="http://www.fms-inc.com">www.fms-inc.com</a>
Gilson	<a href="http://www.gilson.com">www.gilson.com</a>
Horizon Technology	<a href="http://www.horizontech.com">www.horizontech.com</a>
Metrohm	<a href="http://www.metrohmusa.com">www.metrohmusa.com</a>
Perfinity Biosciences	<a href="http://www.perfinity.com">www.perfinity.com</a>
Phenomenex	<a href="http://www.phenomenex.com">www.phenomenex.com</a>
Porvair Sciences	<a href="http://www.porvair-sciences.com">www.porvair-sciences.com</a>
Shimadzu	<a href="http://www.shimadzu.com">www.shimadzu.com</a>
Sigma-Aldrich	<a href="http://www.sigmaaldrich.com">www.sigmaaldrich.com</a>
Thermo Fisher Scientific	<a href="http://www.thermofisher.com">www.thermofisher.com</a>
UCT	<a href="http://www.unitedchem.com">www.unitedchem.com</a>
Waters	<a href="http://www.waters.com">www.waters.com</a>

Assays from academics to industry require shakers. In the life sciences, for example, one expert says the new uses of shakers basically mimic what you see in the industry, which is an increase in the use of genomics. He adds shakers are used in almost every application in some fashion. For example, shakers are widely used in cell culture work.

Choosing a shaker comes down to such features as heating/cooling capability, capacity, shaking speed, orbital vs. reciprocating motion, ease of use, programmability, heating capability, and footprint. With research budgets tight and lab space even tighter, groups or departments are increasingly sharing shakers.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR SHAKER

- 1** Crowded lab space may mean needing to purchase a shaker that performs more than one function, such as a variety of different motions—orbital, reciprocal, nutating, etc.
- 2** The type or types of shakers you currently have don't meet your requirements. There are a variety of shakers to choose from, wet, dry, heated, unheated, fast, slow, large, small, and more.
- 3** Your shaker does not have the level of control you need or cannot be customized for your particular applications.
- 4** Mechanical components on the shaker are damaged, dirty, or worn out.
- 5** The warranty is up on your current instrument or instruments and buying new is cheaper than the service costs.

FOR THE TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR BIOLOGICAL SHAKER, VISIT [www.labmanager.com/bioshaker-signs](http://www.labmanager.com/bioshaker-signs)

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN PURCHASING A SHAKER

- 1** What is the capacity of the unit (both for total weight and volume)?
- 2** What accessories are available?
- 3** What is the RPM range and what increments can it be controlled in?
- 4** What are the temperature and humidity operating conditions for the unit?
- 5** What programming functions, if any, does the unit have?

FOR THE TOP 7 QUESTIONS YOU SHOULD ASK WHEN PURCHASING A BIOLOGICAL SHAKER OR STIRRER, VISIT [www.labmanager.com/bioshaker-questions](http://www.labmanager.com/bioshaker-questions)

## RECENTLY RELEASED SHAKERS

### KS 3000 SERIES INCUBATOR SHAKERS

- Series includes the I control and ic control versions
- Allow for safe, unattended operation in a temperature-controlled environment
- Large LED display shows the speed, temperature and time settings
- A circulation fan ensures that the temperature is evenly distributed and that no condensate forms on the surface
- A wide range of attachments is available



IKA  
www.ika.com

### SS-10

- Provides fast, accurate separations of materials 2mm and finer
- Touchscreen programmable controller allows selection of vibration level, time, and pauses
- Allows storage of 99 testing profiles in non-volatile memory
- For 8in and 200mm sieves



Gilson Company  
www.globalgilson.com

### AS 450 BASIC

- Sieves large quantities up to 15 kg
- Accepts sieve diameters up to 450 mm and covers a measuring range from 25  $\mu$ m to 125 mm
- Allows time and amplitude to be digitally set
- Offers efficient electromagnetic drive with 3D movement



Retsch  
www.retsch-us.com

### LAB PLUS SERIES

- Series includes the VSN-5 Nutating Mixer, the VSM-3 Vortex Mixer, the VSR-50 Variable Speed Rocker, the VSOS-4P Orbital Shaker and HPS-7 Hot Plate Stirrers
- Features a variety of available accessories for an array of applications
- Can be integrated into current lab procedures with ease
- Simplifies everyday lab processes such as mixing, blending and resuspending



PRO Scientific  
www.proscientific.com

## SHAKER MANUFACTURERS

Bel-Art Products	www.belart.com
Boekel Scientific	www.boekelsci.com
Eberbach	www.eberbachlabtools.com
Endecotts USA	www.endecotts.com
Eppendorf	www.eppendorfna.com
Gilson	www.globalgilson.com
Heidolph USA	www.heidolphUSA.com
IKA Works	www.ika.net
Jeio Tech	www.jeiotech.com
Kinematica	www.kinematica-inc.com
Labnet International	www.labnetlink.com

Labnics Equipment	www.labnics.com
LabStrong	www.labstrong.com
Pro Scientific	www.proscientific.com
Retsch	www.retsch-us.com
Sartorius Stedim	www.sartorius-stedim.com
Scientific Industries	www.scientificindustries.com
Stovall Life Science	www.slsience.com
Thermo Fisher Scientific	www.thermo.com
Troemner	www.troemner.com
UDY Corporation	www.udylene.com
Yamato Scientific America	www.yamato-usa.com

## TOP 4 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR SPECTROPHOTOMETER

- 1** UV-Vis: If monitoring against known standards suggests the spectrometer is not performing according to its design parameters, the instrument needs to be recalibrated.
- 2** For AA: You need a higher-end instrument with capabilities such as more extensive automation, software, data handling, and the ability to switch back and forth from flame to graphite furnace operation.
- 3** The adoption of lean processes call for streamlined material analysis.
- 4** There are not enough lab resources to effectively and efficiently analyze large volumes of samples.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A SPECTROPHOTOMETER

- 1** What applications will you be using the instrument for? This will help you determine the detection range you require. Don't forget to consider future applications that may require a broader range.
- 2** Ask if it's possible to have a sample run on the instrument you're considering for purchase and how long will it take.
- 3** What sort of environment will you be working in? If you are out in the field, in a humid area for example, the instrument should be tough enough to handle the conditions.
- 4** What is my budget and what kind of ROI can I get on a new system purchase?
- 5** How are customers supported during implementation and post-sale?

FOR MORE SPECIFIC LISTS VISIT:

[www.labmanager.com/aa-questions](http://www.labmanager.com/aa-questions) FOR AA,  
[www.labmanager.com/FTIR-questions](http://www.labmanager.com/FTIR-questions) FOR FTIR,  
[www.labmanager.com/raman-questions](http://www.labmanager.com/raman-questions) FOR RAMAN, AND  
[www.labmanager.com/uv-vis-questions](http://www.labmanager.com/uv-vis-questions) FOR UV-VIS

SPECTROPHOTOMETERS  
INCLUDES AA, FTIR, RAMAN, AND UV-VIS

## RECENTLY RELEASED SPECTROPHOTOMETERS

### EMBED MINIATURE SPECTROMETER

- Provides excellent thermal stability and measurement reliability, yet is packaged with only essential electronics to reduce footprint and simplify integration
- Onboard electronics provide fundamental spectral pre-processing and multi-channel capability, as well as native SPI communication support
- Standard configuration includes a robust 2048-element CCD-array detector and selectable optical bench components



Ocean Optics  
[www.oceanoptics.com](http://www.oceanoptics.com)

### XANTUS-2™ RAMAN ANALYZER

- Equipped with options of 785 and 1064nm or 532 and 1064nm lasers stabilized for Raman spectroscopy
- Provides a unique combination of high sensitivity and minimized fluorescence
- Lightweight, portable and battery-operated and supports an integrated academic lab-lecture approach to education
- Utilizes integrated software combining open architecture with customizable, user-defined settings



Rigaku Raman  
[www.rigakuraman.com](http://www.rigakuraman.com)

### ACCUSYS 211

- Shipped ready for use
- Features a hands free ignition for added safety
- All operating conditions are pre-loaded in the internal computer
- The three lamp turret has individual controls for alignment and standby mode to keep lamps warm



Buck Scientific  
[www.bucksci.com](http://www.bucksci.com)

### i-RAMAN® PLUS

- Puts research grade Raman spectroscopy into a platform that is accessible to more users
- Delivers an improved signal to noise ratio for up to 30 minutes of integration time, making it possible to measure weak Raman signals
- Features a combination of wide spectral coverage and high resolution with configurations measuring out to 4000cm<sup>-1</sup>



B&W Tek  
<http://bwtek.com>

## Buck Scientific Ion Chromatography systems deliver the ease of use and reliability that you have come to expect from Buck.



Dual overlapping piston pump  
Microprocessor control for low pulsing  
Chemically inert flow-path  
Precisely thermostatted cell  
Low dispersion heat exchanger  
Dual column oven  
Leak detection  
PowerStream data processing  
PowerStream system control  
In line vacuum degassing  
Regenerative chemical suppression  
IC using UV detector  
Suppressor cartridge in oven  
Modular Flexibility

The system is easy to use by control panel operation, or by using the sophisticated Cecil PowerStream software for data acquisition, processing and reporting. Full system control is also provided by the workstation equipped with PowerStream. The modularity of the system enables its configuration to be changed with ease, for instance to use a UV/Visible detector



### PowerStream Features

- Digital and analogue outputs
- Process signals from multiple detectors
- Comprehensive integration parameters
- Calibration curves with unlimited number of standards
- Linear, Quadratic and Cubic calibration curves
- Chromatogram overlays
- Bracketing of samples
- Digital control of a range of peripherals



Call us today for a  
free consultation!

**BUCK** 800-562-566 ~ 203-853-9444  
**Scientific** [www.bucksci.com](http://www.bucksci.com) ~ [Sales@bucksci.com](mailto:Sales@bucksci.com)



## SPECTROPHOTOMETER MANUFACTURERS

ABB	<a href="http://www.abb.com">www.abb.com</a>
Agilent	<a href="http://www.agilent.com">www.agilent.com</a>
Analytik Jena	<a href="http://www.analytik-jena.com">www.analytik-jena.com</a>
Aurora Biomed	<a href="http://www.aurorabiomed.com">www.aurorabiomed.com</a>
B&W Tek	<a href="http://www.bwtek.com">www.bwtek.com</a>
Beckman Coulter	<a href="http://www.beckman.com">www.beckman.com</a>
Biochrom	<a href="http://www.biochrom.uk">www.biochrom.uk</a>
Biotek	<a href="http://www.biotek.com">www.biotek.com</a>
Bruker	<a href="http://www.bruker.com">www.bruker.com</a>
Buck Scientific	<a href="http://www.bucksci.com">www.bucksci.com</a>
Cecil Instruments	<a href="http://www.cecilinstruments.com">www.cecilinstruments.com</a>
CRAIC	<a href="http://www.microspectra.com">www.microspectra.com</a>
DeltaNu	<a href="http://www.deltanu.com">www.deltanu.com</a>
Enwave Optronics	<a href="http://www.enwaveopt.com">www.enwaveopt.com</a>
Eppendorf	<a href="http://www.eppendorfn.com">www.eppendorfn.com</a>
GBC Scientific	<a href="http://www.gbcscientific.com">www.gbcscientific.com</a>
GE Healthcare	<a href="http://www.gelifesciences.com">www.gelifesciences.com</a>
Hach	<a href="http://www.hach.com">www.hach.com</a>
Hamamatsu Photonics	<a href="http://www.hamamatsu.com">www.hamamatsu.com</a>
Hitachi High Technologies	<a href="http://www.hitachi-hita.com">www.hitachi-hita.com</a>
HORIBA Scientific	<a href="http://www.horiba.com/scientific">www.horiba.com/scientific</a>
JASCO	<a href="http://www.jascoinc.com">www.jascoinc.com</a>
Malvern Instruments	<a href="http://www.malvern.com">www.malvern.com</a>
Ocean Optics	<a href="http://www.oceanoptics.com">www.oceanoptics.com</a>
PerkinElmer	<a href="http://www.perkinelmer.com">www.perkinelmer.com</a>
Renishaw	<a href="http://www.renishaw.com">www.renishaw.com</a>
Rigaku Raman	<a href="http://www.rigakuraman.com">www.rigakuraman.com</a>
Scinco	<a href="http://www.scinco.com">www.scinco.com</a>
Shimadzu	<a href="http://www.ssi.shimadzu.com">www.ssi.shimadzu.com</a>
Tec5USA	<a href="http://www.tec5usa.com">www.tec5usa.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>

## TOP 6 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR STIRRER

- 1** Your current stirrer doesn't suit the mixtures/applications you are dealing with in the lab and/or isn't designed for the size and shape of the vessel you are using. For example, rare-earth magnets work better for viscous mixtures and there are stirrers designed specifically for microplates.
- 2** Your stirrer is no longer reliable or accurate or doesn't allow you to work with varying viscosities and volumes safely.
- 3** The magnetic stir bar in your current stirrer is not suited to your application or is experiencing some wear, such as flaking. Teflon stir bars, for example, aren't as durable as bars with a hard plastic casing, which are designed to be used with granular slurries.
- 4** Your paddle and/or blades aren't suited to your task and/or have been damaged.
- 5** The stirrer uses a brushed motor and the brushes are worn out.
- 6** You need the bells and whistles of the latest and greatest stirrers such as a wireless controller to control and monitor the stirrer.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING AN OVERHEAD STIRRER

- 1** When purchasing an overhead stirrer, know the application information and the result that needs to be accomplished as this will help to determine the best stirrer fit for the application. The following would be helpful when talking to a sales rep:
- 2** What are the features and specs of the overhead stirrers available?
- 3** What type of motor is used in the stirrer? A brushless DC motor is very efficient and maintenance-free. A brushed motor contains brushes which wear and over time need replacing.
- 4** Does the manufacturing company offer application and technical support over the phone?
- 5** Have you purchased everything you need to start mixing? Sometimes stirrers are sold as kits and sometimes the stirrer motor, stand, clamp and mixing impeller accessories are sold separately.
- 6** Finally, ask about warranty and delivery to determine how quickly the new purchase will be received.

## RECENTLY RELEASED STIRRERS

### EUROSTAR OVERHEAD STIRRERS

- Feature a detachable impeller, digital display interface and the option of monitoring the flow properties and other parameters using labworldsoft® software
- Can process quantities ranging from milliliters up to 200 liters
- Include a removable digital display interface, also called Wireless Controller (Wico), which can operate the unit via Bluetooth wireless technology



IKA  
www.ika.com

### SWEEP BLADE FOR OVERHEAD STIRRERS

- Provides high viscosity, low speed mixing
- Sweeps product from vessel wall
- Improves process results
- Fits on U044 Anchor paddle in 4 liter beaker and is for use with BDC1850 or BDC3030 model stirrers
- Features a viscosity range of 0-38,000 Centipoise and a temperature maximum of 100 ° Celsius (212 ° Fahrenheit)



Caframo  
www.caframo.com

### DRYSYN MULTI HEATING BLOCK SYSTEM

- Allows scientists to perform safe, productive heating and stirring experiments with the widest possible range of laboratory glassware
- Converts any standard hotplate stirrer into a reaction block accommodating 3 flasks of 10ml - 100ml, or up to 12 reactions in tubes or vials
- Offer excellent heating performance to over 300°C



Asynt  
www.asynt.com

### ST15, HS15, ST19, HS19 HOT PLATES AND STIRRERS

- Large 12" (30.48cm) square ceramic heater tops have a temperature range to 400°C
- 5-position stirring units can stir 5-800ml beakers and the 9-position units can stir 9-500ml beakers of aqueous solutions
- Stirring units feature stirring range from 100 to 1500 rpm
- Units available with voltages and agency certifications for use all over the world



Torrey Pines Scientific  
www.torreypinesscientific.com

## STIRRER MANUFACTURERS

Asynt	www.asynt.com
Bel-Art Products	www.belart.com
Bibby Scientific	www.bibby-scientific.com
Caframo	www.caframo.com
Eberbach	www.eberbachlabtools.com
Eppendorf	www.eppendorfn.com
Grant Instruments	www.grantsci.com
Heidolph USA	www.heidolphUSA.com
IKA Works	www.ika.net
Jeio Tech	www.jeiotech.com
Kinematica	www.kinematica-inc.com

Labnet International	www.labnetlink.com
Labnics Equipment	www.labnics.com
Pro Scientific	www.proscientific.com
Sartorius Stedim	www.sartorius-stedim.com
Scientific Industries	www.scientificindustries.com
Silverson Machines	www.silverson.com
TECA	www.thermoelectric.com
Thermo Fisher Scientific	www.thermoscientific.com
Torrey Pines Scientific	www.torreypinesscientific.com
Troemner	www.troemner.com
Yamato Scientific America	www.yamato-usa.com

Thermal analysis is the broad category of at least 20 techniques that measure some fundamental property of matter as a result of adding heat. For example, dilatometry measures volume changes upon heating, thermomechanical analysis quantifies the change in dimension of a sample as a function of temperature, and thermo-optical analysis detects changes in optical properties on heating or cooling.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR THERMAL ANALYZER

- 1** Your current instrument doesn't perform the type or types of thermal analysis you need for the materials you work with—either differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), another technique, or a combo of these techniques. DSC is most often used with materials that undergo phase changes while TGA is often used to quantify the residual solvent or moisture content of a sample (for example, in foods and pharmaceuticals). A related technique, evolved gas analysis, analyzes gas decomposition products.
- 2** The software is too complicated and awkward to use for the non-experts in your lab and/or the analyzer takes up too much space.
- 3** Sample prep for the instrument is taking too long or is too cumbersome.
- 4** Your current instrument doesn't provide all the features you need, such as macros and wizards and the ability to schedule after-hours calibration.
- 5** The analyzer doesn't provide the sensitivity, temperature range or heating and cooling rates you need.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A THERMAL ANALYZER

- 1** If you are going to be analyzing x,y,z properties, ask if the company has any customers conducting the same type of work and if you can talk to them.
- 2** Ask if you can submit a sample for a demo using specified conditions and, if so, how long this will take and whether a report will be provided.
- 3** What type of post-sale application and technical support does the company offer, and how much will it cost you?
- 4** What features distinguish the company's instrument from their competitors'?
- 5** What can the company tell you about the quality of the product, i.e., how it was manufactured and tested? This will help you determine the typical lifespan.
- 6** What can the vendor tell you about the total cost of ownership, including expected consumables, software upgrades, service, and warranty costs?

## RECENTLY RELEASED THERMAL ANALYZERS

### TL-9000

- Combines the power of thermal analysis, with the specificity of separation and the sensitivity of detection available in spectroscopic and chromatographic methods
- Offers an accessory that enables hyphenation
- Provides scientists the ability to identify and study low levels of materials in highly complex matrices



PerkinElmer  
[www.perkinelmer.com](http://www.perkinelmer.com)

### DTG-60/ DTG-60A

- Improves ease of operation, sensitivity and analytical accuracy of conventional standalone systems
- Basic functions required by simultaneous thermogravimetry/differential thermal analysis (TG/DTA) measurements are improved
- Features programmable atmosphere control
- Provides advanced acquisition, analysis and report functions which ensure comfortable simultaneous measurements
- DTG-60A is a new automatic DTG which defines new standards in autosampler technology



Shimadzu  
[www.ssi.shimadzu.com](http://www.ssi.shimadzu.com)

### FLASH DSC 1

- Opens up new frontiers in the field of materials characterization
- Ultra-high heating and cooling rates add a new dimension to the study of thermally induced physical transitions and chemical processes
- Enables users to investigate effects that were previously impossible to measure
- Features Fast response sensor and wide temperature range



Mettler Toledo  
[www.mt.com](http://www.mt.com)

### DISCOVERY SERIES TGA

- Combines innovative technologies for temperature control and mass measurement with an advanced user interface
- Introduces Diffusion-Bonded Sensor technology which improves sensitivity of the temperature measurement while maintaining a very short time constant for excellent signal resolution
- New TRIOS software makes it easy for users to manage the sample queue



TA Instruments  
[www.tainstruments.com](http://www.tainstruments.com)

## THERMAL ANALYZER MANUFACTURERS

Anasys Instruments

[www.anasysinstruments.com](http://www.anasysinstruments.com)

Anton Paar

[www.anton-paar.com](http://www.anton-paar.com)

GE Healthcare

[www3.gehealthcare.com](http://www3.gehealthcare.com)

Mettler Toledo

[www.mt.com](http://www.mt.com)

Netzsch

[www.netzsch-thermal-analysis.com](http://www.netzsch-thermal-analysis.com)

PerkinElmer

[www.perkinelmer.com](http://www.perkinelmer.com)

Rigaku

[www.rigaku.com](http://www.rigaku.com)

Scinco

[www.scinco.com](http://www.scinco.com)

Setaram Instrumentation

[www.setaram.com](http://www.setaram.com)

Shimadzu

[www.ssi.shimadzu.com](http://www.ssi.shimadzu.com)

TA Instruments

[www.tainstruments.com](http://www.tainstruments.com)



## TOP 5 SIGNS THAT YOUR THERMAL CYCLER NEEDS TO BE SERVICED OR REPLACED

- 1 Any unusual noise when running a protocol or when idle.
- 2 Any visible damage to the block or display.
- 3 Irresolvable error messages on the display.
- 4 The product does not pass the manufacturer's thermal validation process or on-system hardware diagnostic checks.
- 5 The equipment no longer meets the throughput or application needs of the researcher.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR REAL-TIME PCR INSTRUMENT

- 1 Any unusual noise when running a protocol or when idle.
- 2 Irresolvable error messages on the display.
- 3 The product does not pass the manufacturer's thermal validation process or on-system hardware diagnostic checks.
- 4 The product fails to meet the passing criteria of a manufacturers' wet chemistry validation test.
- 5 The equipment no longer meets the throughput or application needs of the researcher.

## TOP 7 QUESTIONS YOU SHOULD ASK WHEN BUYING A THERMAL CYCLER

- 1 What features does the company's thermal cyclor offer to save programming time?
- 2 How important is it to have a highly intuitive interface which saves time training new users?

- 3 Does the thermal cycler provide a thermal gradient for quick PCR optimization?
- 4 Does the instrument offer the flexibility to accommodate researchers' changing needs (increase throughput and/or upgrade to real time PCR)? Find out what options are available.
- 5 Does the thermal cycler support protocol backup and transfer using a USB flash drive?
- 6 Is the thermal cycler designed to provide quiet operation?
- 7 What differentiates the company's thermal cycler from others offered in terms of reliability and performance?

## RECENTLY RELEASED THERMAL CYCLERS

### T100

- Enables easy programming using a large color touch screen and intuitive interface
- Robust design ensures effective and consistent performance run to run
- Allows fast PCR optimization using a unique thermal gradient
- Protocols can be organized using personalized folders or a USB flash drive
- Features a small space-saving footprint



Bio-Rad  
[www.bio-rad.com](http://www.bio-rad.com)

### HYB-ICE THERMAL PROFILING SYSTEM

- An affordable and flexible alternative to a standard thermal cycler for performing everyday temperature profiles
- Consists of a programmable heating/cooling base and removable block that heat and cool samples from 4 to 99°C
- Accommodates a variety of quick-change blocks to fit nearly any tube or plate
- Performs PCR in either standard or large volume tubes



SciGene  
[www.scigene.com](http://www.scigene.com)

### MASTERCYCLER® NEXUS

- Allows users to combine up to three units for ultimate throughput
- Connects to the user's computer network
- Controls all the relevant parameters of user's PCR through intuitive software
- Features low energy consumption and stand-by function
- Includes Screen Saver option that serves as a booking schedule and universal block for excellent flexibility



Eppendorf  
[www.eppendorfna.com](http://www.eppendorfna.com)

### PRIME SERIES

- Performs user-friendly programming functions with prompted protocol templates displayed on a large color touch screen interface
- Six models, with numerous options, are available to accommodate a wide range of PCR processing requirements
- Basic models offer cost effective upgrade flexibility to meet changing cycling needs
- Sample blocks are also fully interchangeable



Techne  
[www.techneusa.com](http://www.techneusa.com)

## THERMAL CYCLER MANUFACTURERS

Agilent	<a href="http://www.agilent.com">www.agilent.com</a>
Analytik Jena	<a href="http://www.analytik-jena.de/en">www.analytik-jena.de/en</a>
Applied Biosystems	<a href="http://www.invitrogen.com">www.invitrogen.com</a>
Biometra	<a href="http://www.biometra.com">www.biometra.com</a>
Bio-Rad	<a href="http://www.bio-rad.com">www.bio-rad.com</a>
Eppendorf	<a href="http://www.eppendorfna.com">www.eppendorfna.com</a>
Esco	<a href="http://us.escoglobal.com">http://us.escoglobal.com</a>
G-Storm	<a href="http://www.gstormdirect.com">www.gstormdirect.com</a>

Labnet International	<a href="http://northamerica.labnetinternational.com">http://northamerica.labnetinternational.com</a>
Life Technologies	<a href="http://www.lifetechnologies.com">www.lifetechnologies.com</a>
Peqlab	<a href="http://peqlab.us">http://peqlab.us</a>
PerkinElmer	<a href="http://www.perkinelmer.com">www.perkinelmer.com</a>
Techne	<a href="http://www.techneusa.com">www.techneusa.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>

While titration is a basic analytical method, titrators are specialized instruments that perform titrations with minimal operator intervention. They can thus minimize errors, improve throughput, and facilitate documentation. There are two major titrator types: potentiometric acid-based designs and Karl Fischer titrators.

## TOP 4 SIGNS THAT YOU SHOULD REPLACE YOUR TITRATOR

- 1 You're doing manual titrations. Automatic titrators are more simple, accurate, and affordable than ever before.
- 2 Burette issues, i.e. noisy, not dispensing titrant, leaking, piston does not move.
- 3 The parts for your current unit are obsolete.
- 4 Your operators can't produce the same results repeatedly or each of your operators produce repeatable results but they are different between operators.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN PURCHASING A TITRATOR

- 1 How precise is the titrant delivery system?
  - a. Is the titrant delivery system certified for accuracy?
- 2 Can additional titrants be used without having to purge burettes?
- 3 What information is included in the titrator's display and reports?
- 4 Is the titrator limited to proprietary electrodes?
  - a. What is the replacement cost for electrodes?
- 5 Is the software field upgradeable?
- 6 What is the service and repair policy?
  - a. Is on-site support offered?
  - b. If something goes wrong with the meter, can it be fixed locally?
  - c. What is the general turn-around time for repair?

## RECENTLY RELEASED TITRATORS

### 915/916 TI-TOUCH TITRATOR

- Single, space-saving unit contains a burette, stirrer, dosing system and operation module for maximum system integration
- Includes personalized touchscreen for up to 14 methods or instrument functions
- Safety Stop prevents overflowing of titration cell
- Features contact-free reagent exchange
- Provides unattended determination of up to 100 samples for straightforward automation



Mettrohm  
www.metrohmusa.com

### TITRATION EXCELLENCE

- Guarantees users are optimally prepared for future changes
- Modern platform provides users with ideal interfaces
- Devices such as printers, memory sticks or barcode readers can be connected via the USB port and are automatically recognized
- Built-in Ethernet connection allows users to integrate their titrators directly into a LabX® network



Mettler Toledo  
www.mt.com

### AQUACOUNTER® AQ-300

- Easy-to-use coulometric titrator that has six built-in calculation modes to accommodate solid, liquid and gas samples
- Features a choice of ion exchange or fritless cell option and it offers fast and accurate results
- Boasts one-touch calculations—including a statistics package
- Four files with preset conditions can be stored in memory and allows instant recall of data for up to 20 samples



HIRANUMA  
www.hiranuma.com (US: JM Science www.jmscience.com)

### HI 84500 AND HI 84502

- Designed to measure Sulfur Dioxide (SO<sub>2</sub>) and Total Acidity, parameters essential in the art of wine making
- Replace HI 84100 and HI 84102 and feature improved accuracy with a high precision piston dosing system and compact, space saving footprint
- Feature automatic stirrer speed control, a graphic mode with exportable data and a Good Laboratory Practices feature



Hanna Instruments  
www.hannainst.com

## TITRATOR MANUFACTURERS

Crescent Chemical

www.crescentchemical.com

Denver Instrument

www.denverinstrumentusa.com

GR Scientific

www.grscientific.com

Hanna Instruments

www.hannainst.com

HIRANUMA

www.hiranuma.com

Hirschmann

www.hirschmann-inc.com

Man-Tech

www.titrationplus.com

Metrohm

www.metrohmusa.com

Mettler Toledo

www.us.mt.com

Photovolt

www.photovolt.com

Radiometer Analytical

www.radiometer-analytical.com

Sigma Aldrich

www.sigmaaldrich.com



Ph 800.495.1678 or 716.774.8706  
www.jmscience.com • sales@jmscience.com



**AQUACOUNTER® Series 300 Titrators**  
Potentiometric • Volumetric • Coulometric  
for affordable titration with  
state-of-the-art performance features

A mainstay of environmental and quality control chemistry, TOC analyzers measure the carbon content of dissolved and particulate organic materials in water. The carbon measured may arise from any combination of living or dead organisms and chemical contamination. TOC often serves as a surrogate for more difficult measurements, for example, contamination from petrochemicals, solvents, pharmaceuticals, chlorinated industrial chemicals and pesticides. It can also act as a screen for additional analysis.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR TOC INSTRUMENT

- 1 Declining analytical performance.
- 2 Must be frequently re-calibrated.
- 3 Instrument is repeatedly down for troubleshooting or extended maintenance.
- 4 Parts, service, software updates, and consumables are becoming more difficult or expensive to obtain (due to obsolescence).
- 5 Instrument capability no longer meets regulatory, production, or quality requirements.

## TOP 5 QUESTIONS YOU SHOULD ASK WHEN BUYING A TOC ANALYZER

- 1 Is the TOC technology suitable for your specific application or water conditions? Many TOC technologies may be suitable only for waters with a narrow range of organic or inorganic contaminants.
- 2 Are different models available to meet your current and future sampling needs (i.e. online, portable, laboratory)? Do these models use similar technology to simplify method transfer or data comparability from lab to online?
- 3 Does the company offer the documentation and support necessary to help meet applicable industry or government regulations?
- 4 What is the company's level of experience supporting sales of TOC analyzers in your specific industry? Do they understand the unique challenges specific to your application?
- 5 What type of service, applications, and technical support are available during and after the purchasing process?



## RECENTLY RELEASED TOC ANALYZERS

### SIEVERS 900 LABORATORY + GE AUTOSAMPLER

- Features automated calibration and validation procedures, 12-month calibration stability, and low maintenance requirements
- Autoreagent adjustment feature eliminates the time-consuming optimization process
- Offers a 0.03 ppb to 50 ppm operating range and has a compact, 19.2-cm wide footprint
- Can be used with the high-capacity GE Autosampler which features convenient user-defined random sampling capability



GE Analytical Instruments  
[www.GEInstruments.com](http://www.GEInstruments.com)

### BIOTECTOR B3500C

- Designed and engineered to meet the requirements of clean water applications
- Offers process insights, process incident alerts, environmental monitoring, energy optimization, product and water loss prevention, and boiler and plant protection
- Only requires reagent replacement every 6 months
- Able to monitor two streams at the same time, eliminating the potential double-cost of needing two separate analyzers



Hach  
[www.hach.com](http://www.hach.com)

### MULTI N/C® 2100/2100 S

- Equipped with an excellent injection technique for particle containing samples
- Includes VITA®, the FR NDIR detector and catalytic high temperature combustion up to 950°C
- Provides sample feed by valve- and septum-free direct injection
- Upgradeable for simultaneous determination of TNb (ChD or CLD)
- Features auto-protection



Analytik Jena  
[www.analytik-jena.com](http://www.analytik-jena.com)

### TOC-L

- Includes a wide sample range from 4 µg/L to 30,000 mg/L
- Consists of four models, including PC-controlled and standalone versions
- Uses Shimadzu's 680°C combustion catalytic oxidation method to efficiently analyze all organic compounds
- Features automatic sample acidification and sparging, as well as an automatic dilution function that reduces sample salinity, acidity and alkalinity



Shimadzu  
[www.ssi.shimadzu.com](http://www.ssi.shimadzu.com)

## TOC ANALYZER MANUFACTURERS

Analytik Jena	<a href="http://www.analytik-jena.com">www.analytik-jena.com</a>
EST Analytical	<a href="http://www.estanalytical.com">www.estanalytical.com</a>
GE Analytical Instruments	<a href="http://www.geinstruments.com">www.geinstruments.com</a>
Hach	<a href="http://www.hach.com">www.hach.com</a>
Mettler Toledo	<a href="http://www.mt.com">www.mt.com</a>
OI Analytical	<a href="http://www.oico.com">www.oico.com</a>
Parker Balston	<a href="http://www.balstonfilters.com">www.balstonfilters.com</a>
Shimadzu	<a href="http://www.ssi.shimadzu.com">www.ssi.shimadzu.com</a>
Skalar Analytical	<a href="http://www.skalar.com">www.skalar.com</a>
Teledyne	<a href="http://www.teledyne.com">www.teledyne.com</a>
Thermo Fisher Scientific	<a href="http://www.thermoscientific.com">www.thermoscientific.com</a>
TOC Systems	<a href="http://www.tocsystemsinc.com">www.tocsystemsinc.com</a>
UIC	<a href="http://www.uicinc.com">www.uicinc.com</a>

Vacuum pumps are an essential piece of equipment and are used in a wide variety of processes in most laboratories. Over the past 25 years, vendors have made significant innovative improvements to vacuum pumps, with important developments in high vacuum technology, corrosion resistance, vacuum control, and improvements in the efficiency and ecological impact of vacuum pumps.

## TOP 5 SIGNS YOU SHOULD SERVICE OR REPLACE YOUR DIAPHRAGM VACUUM PUMP

- 1** Loud—Increased operating noise level can indicate problems with wearing parts.
- 2** Hot—Elevated operating temperatures can lead to premature failures and unexpected downtime.
- 3** Low vacuum—Low or no vacuum performance, slower processing times.
- 4** Does not start—Blown fuses may indicate an incompatible electrical source or damaged components.
- 5** Contamination/fouling—Contaminants can collect within the pump and impede performance.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A LAB VACUUM PUMP

- 1** What will you be using the vacuum for? Filtration needs modest vacuum. Evaporation requires deeper vacuum. Molecular distillation requires even more. Match the pump to the use.
- 2** Can you use a dry (oil-free) vacuum pump? Oil-free vacuum pumps can support most lab applications. For the service advantages, choose a dry pump where possible.
- 3** What is the pumping capacity at the intended vacuum level? Actual pumping speed declines from the nominal speed as depth of vacuum increases. The rate of decline differs among pumps.
- 4** Do you work with corrosive media? Standard duty pumps have lower purchase costs, but corrosion-resistant pumps will have lower lifetime costs if working with corrosives.
- 5** Should you invest in vacuum control? Electronics can improve reproducibility, protect samples and shorten process times when specific vacuum conditions need to be maintained.
- 6** What is the lifetime cost of operation? Include purchase cost, service intervals, servicing cost, pump protection (e.g., filters, cold traps), and staff time for operation.

# SAFETY & CONVENIENCE IN CELL & TISSUE CULTURE ASPIRATION

**VACUUBRAND's BVC integrated aspiration station is a safe, convenient system with a small footprint and the power to support two users.**

## TRADITIONAL PRACTICE

Traditional "best practice" for aspirating biological liquids relies on two flasks – the second one for overflow protection – and a biofilter between the aspiration flasks and the vacuum source to contain biological aerosols. In addition, at least the first flask should be supported with a ring stand and clamp – to minimize the risk of a glass flask being pulled over as the aspiration tubing flexes with use.

In practice, these practical guidelines are frequently overlooked in the lab. The second flask is often omitted, and the receiving even placed on the floor where it is vulnerable to spillage. Similarly, the sterile filter between the application and the vacuum source may be neglected, leading to a risk of cross-contamination from aerosols escaping through central vacuum system piping. Such improvised aspiration set-ups pose hazards to the lab staff and a risk that biological materials may escape.

## A MODERN ALTERNATIVE

The BVC Professional G manages these hazards with an integrated design that includes:

A small footprint;

A sterilizable, hydrophobic 0.2 micron filter that contains biological aerosols;

Easily adjustable suction power – fast for quick aspirations; gentle to avoid inadvertent aspiration of cells;

An autoclavable vacuum collection bottle that reduces aerosol production and foaming and may be removed for closed transport;

A base that supports the collection flasks against tip-over ;

An aspiration handset for touch-control of aspirations, designed to ensure that aspirated materials make no contact with the handle;

A non-contact liquid-level sensor and shut-off function to prevent overflows;

A quiet, corrosion-resistant, oil-free vacuum pump powerful enough to support two users at once;

Full bleach compatibility – an industry first – for applications in which safety protocols require bleach in the receiving flask.

Other BVC Aspiration Station models are available for use with central vacuum systems or your own diaphragm vacuum pump. Systems with polypropylene collection bottles are available for use in protocols that do not require bleach in the collection vessel during aspiration procedures.



VACUUBRAND, INC.  
11 Bokum Road  
Essex, CT 06426  
888-882-6730  
[www.vacuubrand.com](http://www.vacuubrand.com)

## RECENTLY RELEASED VACUUM PUMPS

### MODEL SC950 VACUUM PUMP SYSTEM

- Features a high 50 l/min pumping capacity and a deep 1.5 Torr end vacuum
- Enables a shorter processing time with a wide range of solvents
- User-friendly wireless remote control enables the system to be operated within a fume hood with the sash closed for added safety benefits and energy savings



KNF Neuberger  
www.knf.com

### WELCHNET TITAN OIL-FREE VACUUM SYSTEM

- A microprocessor controlled system of high capacity PTFE diaphragm vacuum pumps for multi-user laboratory installations
- Pumps work individually or in tandem as the laboratory vacuum demand requires, holding vacuum level even if an individual pump needs maintenance
- Chemical-resistant, energy efficient system includes intelligent vacuum control and green technology and is low maintenance



Welch-Illvac  
www.welchvacuum.com

### MZ2C NT +AK+M+D

- Integrated with the essential accessories for basic rotary evaporation and other common laboratory tasks
- Features the MZ2C NT chemistry-design oil-free pump with a 5 Torr ultimate vacuum, and 38 liter per minute free air capacity
- Flow control knob helps match pumping speed to vapor flow to quietly help prevent bumping and foaming



VACUUBRAND  
www.vacuubrand.com

### HIPACE™ 300 PLUS TURBOPUMPS

- Available with pumping speeds up to 260 liters per second (300 Plus) or 685 liters per second (700 Plus) for N<sub>2</sub>
- Feature reduced and improved vibration spectrum and reduced magnetic stray field
- Suited for analytical applications such as electron microscopy and high-end mass spectrometry
- Improved rotor design gives both high pumping speeds and very good compression for light gases



Pfeiffer Vacuum  
www.pfeiffer-vacuum.com

## VACUUM PUMP MANUFACTURERS

Agilent Vacuum	www.chem.agilent.com
BrandTech	www.brandtech.com
Buchi	www.buchi.com
Cole Parmer	www.coleparmer.com
Edwards	www.edwardsvacuum.com
KNF	www.knf.com
Labconco	www.labconco.com
Myers Vacuum	www.myers-vacuum.com
New Star Environmental	www.newstarenvironmental.com
Oerlikon	www.oerlikon.com
Pfeiffer Vacuum	www.pfeiffer-vacuum.com
Precision Scientific	www.precision-scientific.com
Shimadzu	www.ssi.shimadzu.com
VACUUBRAND	www.vacuubrand.com
Vacuum Research	www.vacuumresearch.com
Welch-Illvac	www.welchvacuum.com



Many industries measure viscosity, though the biggest user is the quality control department using single-point measurement. Research scientists also use viscometers to see how a material reacts to being sheared. The task at hand determines the kind of viscometer to use—different viscometers measure different magnitudes of viscosity and different changes in it. According to one expert, the most important factor to consider when buying a viscometer is robustness, even if users have to give up some sensitivity.

## TOP 5 SIGNS THAT YOUR VISCOMETER NEEDS TO BE SERVICED OR REPLACED

- 1 The instrument does not pass the leak test.
- 2 The measuring values of a known sample are incorrect.
- 3 Visible signs of leaking at one or more of the seals.
- 4 A strange (screeching) noise occurs when the motor starts up to the measuring speed.
- 5 If the relative deviation of the viscosity and/or the density is out of tolerance.

## TOP 6 QUESTIONS YOU SHOULD ASK WHEN BUYING A VISCOMETER

- 1 What kind of temperature control and spindle rotational speed control does the instrument offer? Temperature is critical, since viscosity generally rises as a fluid cools. Spindle rotation may also affect viscosity.
- 2 What range of accessories (ex. sample holders) does the company offer for the instrument?
- 3 How easy to use is the viscometer? Since most users nowadays aren't experts, an easy-to-use instrument is probably the best fit for most labs.
- 4 What are the sizes of the samples you'll be working with? This may be an issue when analyzing very expensive materials such as drugs or proteins and cost of ownership is also important for high-volume applications.
- 5 What is the instrument's measurement range? If you're analyzing petroleum, from crude oil to gasoline, do you want to change out the capillary for each measurement, or use something that works all the way through?
- 6 What kind of service and support does the company provide?



## RECENTLY RELEASED VISCOMETERS

### VISCOTEK VISCOMETER DETECTOR

- Enhances GPC/SEC analysis for polymer development
- Viscotek viscometers can be supplied as part of an integrated triple detector Viscotek GPC/SEC system or as an addition to any existing separation system
- GPC/SEC is a central analytical technique for the analysis of proteins, polymers and macromolecules



Malvern  
www.malvern.com

### LOVIS 2000 M/ME ROLLING-BALL VISCOMETER

- Measures the rolling time of a ball through transparent and opaque liquids according to Hoeppler's falling ball principle
- Measurement requires only 400  $\mu$ L sample volume
- Compact and economical, and saves space in the lab
- Results are given as relative, kinematic or dynamic viscosity
- Provides first results after only 30 seconds



Anton-Paar  
www.anton-paar.com

### REACTAVISC RV3 LAB-SCALE VISCOMETER

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# SIMPLIFIED VISCOSITY ANALYSIS OF PASTE-LIKE MATERIALS

Measuring the viscosity of creamy, pasty or heterogeneous material presents a challenge for rotational viscometers when using traditional smooth geometries such as coaxial cylinder, cone-plate, or simple disk spindles. Creams and pastes may be non-flowing, forming voids around the spindle, resulting in false low viscosity values. Heterogeneous materials may consist of a moderate viscosity liquid filled with deformable solid particles which migrate away from the spindle during rotation, resulting in a measurement of the liquid viscosity rather than that of the mixture as a whole. To overcome these problems, the Helipath Stand with T-bar spindles is commonly used to test highly viscous heterogeneous materials, gels, pastes, creams, putty and other non-flowing substances where traditional smooth geometries fail.

A typical Helipath test may gather over four hundred data points from start to finish. Viewing the data graphically and analyzing to come up with a final result requires the use of applications software. With the new generation rheometers, it's possible to configure multi step tests and perform comprehensive data analysis directly from the touch screen interface of the instrument without the use of a PC (Figure 1).

## HOW IT WORKS

The Helipath Stand is an accessory to rotational viscometers and rheometers that incorporates a wire spindle (T-bar) and verticle drive unit. This system produces a helical path for the spindle during the measurement (Figure 1 Insert). Helipath data traces progress from the initial viscosity – just as the spindle begins to drill down through the material - to a “plateau” region where the spindle is in the bulk of the sample. The system then reverses direction, and the measured torque - and calculated viscosity – continues to be recorded as the spindle rises up to the initial starting point. The “plateau” for both the downstroke and upstroke data is based on the depth of the material in the container and the fixed speed of the Helipath drive. In the past, recording, viewing and analyzing this data was done manually or required the use of application software and a PC. In most cases, a single viscosity number was desired for a simple QC/QA measurement.

Today, Helipath testing with the new generation of rheometers has been simplified with the ability to configure multi step tests and perform comprehensive data analysis directly from the full color graphical touch screen display of the instrument without the use of a PC. The interface allows for control of all instrument parameters as well as data analysis and management. All data points will be displayed graphically in real time on the touch screen display during the test. Measurement data includes the complete set of measurement

results and calculated values along with the test protocol. There are several options available for viewing test data including averaging which can be used to provide a single viscosity number for a QC/QA measure.



▲ Figure 1.

## RESULTS:

All measurement data can be saved to the instrument's internal memory or to a USB flash drive. Results can be viewed graphically (Figure 1) and analyzed directly on the instrument's display. The post test averaging option allows both the down and up plateau data to be averaged separately or together to give a single QC/QA number for viscosity. Two data sets can be shown on the graph simultaneously

or compared side by side in table format.

Security 21CFR, available in new generation rheometers, include controlled user access and complete data integrity for each test.

## CONCLUSIONS:

Measuring, analyzing and reporting viscosity data for creamy, heterogeneous or pasty materials can be simplified with the use of a Helipath Stand, T-bar spindles and the new generation of rheometers. Using the touch screen interface to create a customized multi step test, taking advantage of short data collection intervals and specific end condition times for the downstroke and upstroke steps, ensures an efficient and productive method requiring no operator involvement during the actual test. The results are displayed graphically or in table format and can be analyzed to provide QC/QA with a single measure for viscosity without the use of a PC.

**For the complete Experimental Conditions visit:**

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# WATER PURIFICATION SYSTEMS

Lab workers tend to treat water systems like utility or house water—open the spout and pour it out. That is partly true, as water systems have become ultra-reliable. What scientists often fail to note is how thoroughly lab operations depend on water quality. There may be some leeway in certain operations, such as cleaning glassware that will wind up in an autoclave, but even there, delicate techniques such as atomic absorption and polymerase chain reaction are extremely sensitive to impurities.

## TOP 5 SIGNS THAT YOU SHOULD SERVICE OR REPLACE YOUR LAB WATER SYSTEM

- 1 Issues with water-based lab work—not trusting results.
- 2 Continuously breaks down and is unreliable.
- 3 Annual spend: high running costs/repair services.
- 4 Increased demand for pure water.
- 5 Desire for an innovative system with up-to-date features and benefits.

## TOP 4 QUESTIONS YOU SHOULD ASK WHEN BUYING A LAB WATER PURIFICATION SYSTEM

- 1 What do you need the water for? What is your application? What type of water is needed? What is the source of your current water? How much water is required per batch/day? Are there special requirements for delivery?
- 2 What is your budget? The budget will determine the technology. What is the cost of ownership over five years?
- 3 Where do you need the system in the lab(s)? Consider, top of counter, under counter or wall mounting the unit. What is the overall footprint/real estate of the system(s) and components?
- 4 What kind of warranty and service is provided? Is the system manufactured to quality standards and which ones? Is this a pharmaceutical application, does it need to be validated?



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Enables users to take NanoDrop 2000/2000C sample data on the go, allowing an easy and portable way to interact with data anywhere, any time.



## Thermo Fisher Scientific - Nicolet iS50

The Nicolet iS50 FTIR spectrometer is the ultimate materials analysis workstation with a built-in ATR, automatic beamsplitter exchange, FT-Raman and time-saving Mercury TGA-IR and GC-IR software.



## Waters - Part Selector

A suite of easy-to-use product finders for Waters consumables in a convenient selector format. This version features an Interactive Selectivity Chart to help streamline your column selection process. In just a few easy steps, this app identifies the best product for you, along with alternative options.

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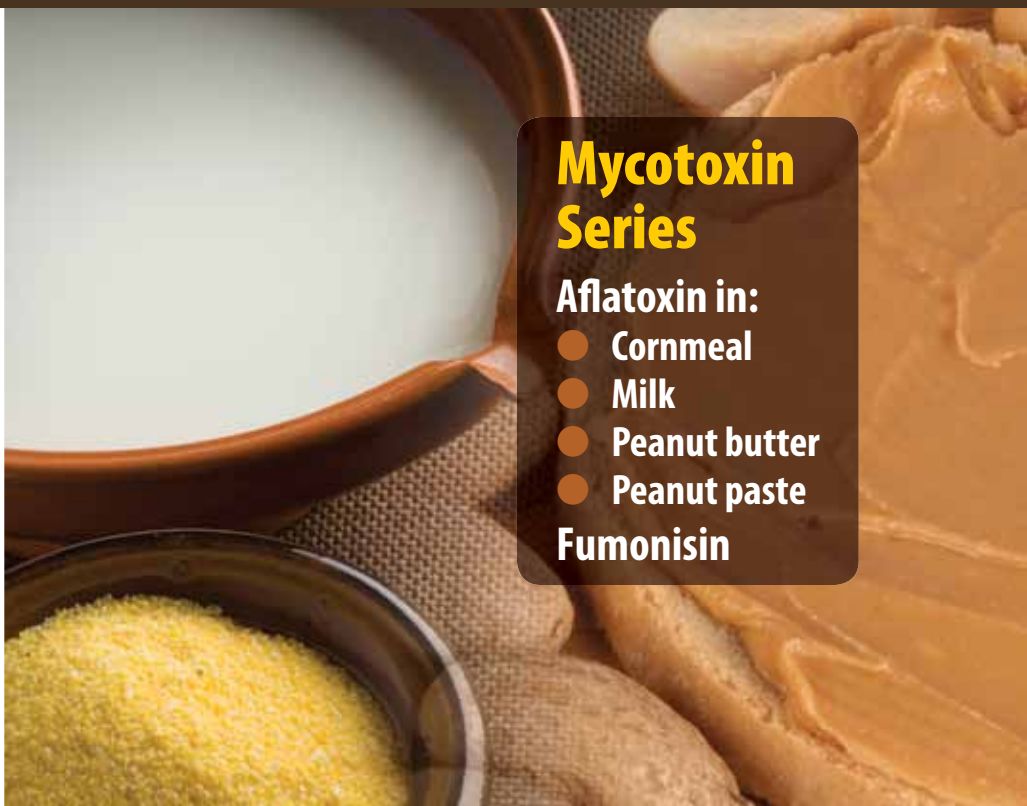
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## FIGHTING FOR LAB SAFETY WITH S.C.A.T. EUROPE

After 15 years of constant improvement, S.C.A.T. SafetyCaps belong to the global safety standard in pharmaceutical and chemical laboratories. They enable operators to get solvent vapors under control and create perfect solvent conditions for their HPLC systems. The automated caps think ahead and fight health and environmental hazards directly at their origin - the solvent receptacle. Good laboratory practice often requires more useful and cost-efficient solutions than fume cupboards or extraction hoods. This is why S.C.A.T. caps are installed within seconds and provide 100% protection. In addition, solvent costs will be cut down remarkably by protecting the solvent reservoir with a Safety-Cap. Even waste fluid containers can now be rebuilt into safe disposal devices, instead of being a hazard source.

Running a trouble-free HPLC lab requires avoiding accident risks, as well as keeping the system free of contamination. The SafetyCap system fulfils both functions with one simple and solid cap. The self-acting air valve blocks vapors and gases while pressurization and HPLC operation can take place as usual. However, the operator will realize significant quality advancement. Where contamination once used to cause retention time shifting and distortion of the chromatogram, there is now stability and reproducibility. The caps offer multiple sized tubing and capillary connec-

tors which make them suitable for all types of liquid chromatography systems - regardless of their brand or manufacturer.



Securing your waste containers is just as easy. Putting the SafetyWasteCap on top turns a common canister into a disposal device with advanced safety features. The integrated exhaust filter collects hazardous vapors and prevents overpressure inside the container. The device even stays safely locked while discharging waste fluids via tubing directly from the HPLC system.

Wherever sample or solvent residues have to be discharged manually, the S.C.A.T. caps offer an integrated safety funnel which closes automatically after filling. This keeps the disposal device safely closed and prevents accident risks.

The modular system offers many additional features which can be added to the standard solvent caps. One of them is the integrated level sensor, helping the operator to keep an eye on filling levels and avoid unnoticed overflow. For those who do not operate HPLC systems and want to get their waste disposal under control anyway, S.C.A.T. also offers a wide range of safety funnels and disposal devices. There is also a series made of electroconductive plastic material against sparking and static charge.

Taking responsibility for health and environment protection is one of the lab manager's obligatory duties. On the other hand, it is easy to comply with these requirements quickly and cost-efficient, because the S.C.A.T. system has been developed especially for this purpose.



**Safety Solutions**

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Join us for the 2013 I<sup>2</sup>SL Annual Conference in Minneapolis, Minnesota, September 24 through 26. Formerly the Labs21 Annual Conference, the 2013 I<sup>2</sup>SL Annual Conference will offer the same quality technical sessions, exhibitors, and networking opportunities attendees have come to expect, and will include even more valuable opportunities for laboratory and high-tech facility professionals.

Attendees can look forward to dozens of technical sessions on engaging topics like laboratory retrofits, building information modeling, and laboratory equipment energy efficiency opportunities, as well as working group meetings, symposia, workshops, and an offsite evening tour and reception at the University of Minnesota.

- **Enhance your experience with pre-conference training sessions.** I<sup>2</sup>SL has pre-conference training sessions that range from a basic overview of sustainable laboratory concepts to an in-depth exploration of the latest technologies. Sign up for a workshop that best fits your educational needs.

[www.i2sl.org/conference/2013/preconf.html](http://www.i2sl.org/conference/2013/preconf.html)

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[www.i2sl.org/conference/2013/eveningevents.html](http://www.i2sl.org/conference/2013/eveningevents.html)

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[www.i2sl.org/conference/2013/techfair.html](http://www.i2sl.org/conference/2013/techfair.html)

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The 2013 I<sup>2</sup>SL Annual Conference remains the country's premier educational and networking opportunity for those who design, build, own, and operate sustainable laboratories and other high-tech buildings.

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