

Honeywell

DRIVING LAB PERFORMANCE AND PRODUCTIVITY

Making the right packaging choices can reduce costs
and accelerate research



Abstract

Managers of analytical laboratories are increasingly faced with a conflicting set of demands. Increasing performance constraints and escalating financial pressures must be balanced against the ever present need to maintain or improve laboratory efficiency and output, frequently without access to additional resources.

To further compound these issues, the growing emphasis on laboratory collaboration means test results need to be consistent and repeatable on a global scale. To meet all these demands, lab managers must increase staff productivity, eliminate redundancy, enhance testing reliability and minimize waste – all without having a detrimental impact on overall performance.

Automation has long been regarded as an important means for analytical laboratories to achieve greater efficiency, accuracy, standardization, quality, and safety. The development of new generations of automated equipment has made automation a more and more viable option for labs of all sizes—and in many cases, a necessary option to remain competitive in today's marketplace.

Experience has shown the selection of high-performance solvent and reagent packaging can support lab automation strategies and help reduce solvent storage, handling and disposal costs – while significantly accelerating research activities.

As a major global supplier of high-quality, consistent chemical and analytical reagents, Honeywell Research Chemicals has developed unique performance packaging solutions enabling labs to optimize their operational effectiveness while maintaining and enhancing overall data quality and reproducibility.

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Need for Increased Automation



Figure 1: The customary first step in optimizing laboratory processes has been to improve levels of automation and process integration

Most successful laboratories have two common traits; they are effective and efficient. They accomplish their tasks faster than other labs and they get it right the first time. This balance of quality and quantity is the result of hard work, dedication, and leadership.

Labor costs represent the largest portion of analytical laboratory budgets – as much as 60 percent in industrialized countries. To cost-effectively handle the ever-increasing workload, lab managers must significantly improve workforce productivity.

The customary first step in optimizing laboratory processes – and thus improving sample throughput and reducing testing costs – has been to improve levels of automation and process integration. Equipment vendors are meeting this requirement by implementing increased amounts of hardware interoperability.

The streamlining of common lab procedures, such as sample preparation involving dilution, filtration and the addition of reagents, can cut costs and improve productivity. Laboratory automation and robotics also have the potential to eradicate human error, especially in repetitive tasks, while freeing up lab staff for more demanding tasks such as data analysis.

Laboratory automation has been shown to reduce human errors by 50 percent, while increasing productivity by as much as 75 percent. At the same time, it can help reduce reagent waste by up to 25 percent. Automation standardizes laboratory practices and helps maintain the continuity of laboratory-wide quality improvement programs by hardwiring quality into the underlying fabric of the facility.¹

Role of Performance Packaging

The customary first step has been to improve levels of automation and process integration. In response, equipment vendors are implementing increased amounts of hardware interoperability. The streamlining of common laboratory procedures, such as sample preparation including dilution, filtration and the addition of reagents, can cut costs and improve productivity. Laboratory automation and robotics also have the potential to eradicate human error, especially in repetitive tasks, while also freeing up lab staff for more demanding tasks such as data analysis.

While the latest advancements in laboratory automation and integration are very valuable, they aren't the entirety of the enhanced productivity story. There is also an important role for the manufacturers and suppliers of reagents and chemicals in helping labs optimize their operational performance while maintaining and enhancing overall data quality and reproducibility.

Key to this effort is the development of flexible, robust and environmentally friendly packaging solutions that can improve how chemicals and analytical reagents are provided to laboratories, or delivered directly to the instrumentation.

The majority of labs currently use chemical packaging options that range from single-use glass or plastic bottles, to stainless steel returnable containers. Although familiar and functional, glass and plastic bottles can be detrimental to overall lab performance due to the frequent handling required, not to mention increased storage, disposal and transport costs. Returnable and reusable stainless steel containers, on the other hand, are much easier to handle, and typically come complete with accessories that allow easy dispensing and connection to commonly used analytical instruments. These containers are specifically engineered to allow safe and efficient storage, transport and dispensing of solvents and reagents while maintaining product quality.

Honeywell's Robust Solution

Solvents and Reagents

A growing number of testing laboratories in pharmaceuticals, biotechnology and other industries are willing to invest in premium-grade chemical products to ensure they receive accurate results from critical analytical procedures.

Laboratories can realize gains in accuracy, efficiency and productivity by selecting a manufacturer who offers multiple chemical grades to suit diverse applications, and whose manufacturing processes are focused on controlling potential variables to ensure users get reliable results.

Solvents such as acetonitrile and methanol are available in various grades suitable for preparative High Performance Liquid Chromatography (HPLC), gradient HPLC, or demanding HPLC Mass Spectrometry (HPLC-MS) applications. Other solvent options, including ethyl acetate and cyclohexane, are offered for residue analysis of pesticides, dioxins, furans and Polychlorobiphenyls (PCBs) using gas chromatography.

Beyond critical requirements for purity, solvents must be delivered in a way that meets the needs of busy analytical labs while maintaining employee safety, reducing packaging and disposal costs, maximizing storage space, and complying with government regulations.

Honeywell company's returnable containers are filled with quality solvents that have excellent lot-to-lot consistency and come with a detailed Certificate of Analysis.² The following chemicals are available in returnable containers:



Figure 2: Honeywell's BioSyn™ solvents and reagents

- Burdick & Jackson™ and Chromasolv™ high-purity solvents
- BioSyn™ solvents and reagents for DNA and RNA synthesis

Containers

Honeywell Research Chemicals has developed a robust steel returnable container solution that ensures analytical laboratories have the right materials delivered in the right quantities, at the right time, and with seamless integration with lab systems. Using strong steel returnable containers means you can safely receive solvents in larger volumes. Using larger volumes of one solvent batch can lessen the testing required to evaluate new solvent batches and provide confidence in the quality and consistency of the solvent, as well as the reproducibility of the analysis.

The Honeywell returnable container program also saves scientists time in handling solvent bottles, and connecting and exchanging bottles with analytical instruments. Containers can be fitted with dispensing accessories enabling easy, secure and contamination-free direct connections to instruments, or multiple dispensing points. After the solvent container is empty, it will be collected and cleaned by Honeywell.



Figure 3: Honeywell's returnable stainless steel containers are specifically engineered to store, transport and dispense solvents.

Honeywell's innovative returnable containers, the Stainless Steel Pressure Dispense System (SSPDS) containers, are made of high-quality stainless steel and are specifically engineered to store, transport and dispense solvents. Each SSPDS container maintains solvent purity and meets UN, US DOT and OSHA standards for flammable and combustible liquids. They come in sizes of 56 L, 200L and 1250 L. In addition, Intermediate Bulk containers (IBC) can be offered.

Benefits to Analytical Labs

Analytical laboratories can realize significant benefits from Honeywell's innovative performance packaging solutions. This includes a reduction in solvent storage, handling and disposal cost by as much as 98 percent.* Users can also accelerate research, often saving a week of lab time per year.

Delivered in reusable stainless steel containers, Honeywell solvents take up 50 percent less space than glass bottles, reducing storage costs by half. And with easy-to-grip handles and shatterproof construction, the containers are easy to transport.

Furthermore, Honeywell's approach is better for the environment. With virtually no packaging waste, no hazardous disposal costs, and no rinsing done on site, labs will be greener and more environmentally friendly. The stainless steel containers also help to minimize fire risk and staff exposure to hazardous solvents caused by spillage. After the containers are empty, they are collected, cleaned and filled again.



Figure 4: With Honeywell's performance packaging solutions, analytical labs can reduce solvent storage, handling and disposal costs, and accelerate their research activities.

Conclusion

Choosing high-purity solvents in returnable containers and working with chemical suppliers that fully understand a laboratory's needs can increase efficiency while enhancing confidence. It is therefore important to work with companies like Honeywell that offer a wide range of bespoke solutions and are prepared to work in partnership with customers.

References

1. Jones M. (2016, November). Lab Automation and Productivity. Retrieved from <http://laboratory-manager.advanceweb.com/lab-automation-and-productivity/>
2. Honeywell Research Chemicals 2018, High purity solvents whitepaper.

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* Based on usage of 250 cases (4 x 2.5L) of solvent per year, compared to one 200L returnable drum.

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