Demystifying the No.1 hazard in the laboratory workspace

By STEQ America. September 12, 2016

Typically, pharmaceutical scientists spend most of their time in a laboratory dealing with the process of discovering drugs and testing them. Everything from discovery, to development, to manufacturing is a phase that demands an inordinate amount of investment in time and money. Likewise, quality control in a research laboratory is front and center in the list of principal concerns in drug research, production and control, and rightly so - running a research lab is challenging and demanding and also requires substantial amounts of financing. With all of these factors playing a part in uncovering new ways to develop more advanced and targeted drugs for patients, one other essential human element often gets overlooked - that of the health and safety of the laboratory workers themselves.

In June 2016, Campus Safety Magazine looked at the top 5 lab hazards in campus laboratories. No.1 is fire/explosions because of chemicals and liquids not being handled or stored safely. In the most recent research report released by the Bureau of Labor Statistics (April 2015), fires and explosion accounted for 148 workplace deaths in 2013. Despite industry and regulatory efforts to improve fire safety, this number has remained persistent since 2007. In December of 2009, a young research assistant at UCLA working on a chemistry experiment suffered from 43 percent of burns to her body after a fire erupted caused by the improper storage of liquids. Devastatingly, she passed away 18 days later. As a consequence, the American Association for the Advancement of Science dropped the supervising UCLA professor of that laboratory as one of its 2015 fellows because of his failure to provide a safe working environment for his employees. It's worth noting that since that time, UCLA invested in excess of $20 million to improve the quality of safety in its laboratories.

Why do fires occur more frequently in the lab versus any other workplace?

In addition to laboratory workers being under-trained when it comes to essential fire safety practices, the ability of flammable liquids to easily ignite is often overlooked and improperly handled. This is sometimes due to the fact that the fundamental principles of safe handling and storage of these hazardous materials is completely underestimated by users. The focus is often directed towards drug research, development and production, which can at times overshadow key safety decisions in building and operating a safe laboratory.

What can be done?

Environmental health and safety officials for laboratories should be recommending the safe storage of flammable liquids and any other hazardous materials. Quantities of flammable and hazardous materials should be limited in the laboratory. Ideally, volumes greater than one liter should be stored in a safety cabinet.

STEQ America is the exclusive supplier of Düperthal products in North America - European manufactured designs that provide the highest grade of safe storage options for flammables, compressed gas and chemicals. Düperthal has been an industry leader in the areas of fire and environmental protection, and working safety for more than 40 years. Fire-proof safety storage cabinets by Düperthal offer a reliable fire protection of 90 minutes. In the U.S., not all fireproof cabinets are required to be tested, however if a safety storage cabinet manufacturer wishes for their products to be UL/NFPA/OSHA/FM certified, they must undergo a 10-minute fire test, which is a far cry from the safety testing performed on European safety storage cabinets as a standard policy of their Type 90 products. As stainless steel is the component of choice for safety storage cabinets, it's also important that EHS personnel are conscious of the fact that as a material, stainless steel does not inherently have a fire rating. Fire resistance tests are performed in laboratories under specific procedures. With 90-minute fire protection, laboratory workers are given enough time to evacuate the building regardless of their location, and first responders are given time to arrive at the site of the incident and address the situation in the correct and safe manner.

Düperthal's CLASSIC L Type 90 safety cabinet

Another point that is often overlooked is that of the storage of empty containers of flammables or hazardous materials. Those empty containers that are, for example, waiting to be returned to a gas company or just simply sitting in storage, should also be given the same amount of care and attention as those that are completely full. Surprisingly, mishandling of these containers while in storage is one of the biggest issues when looking at handling as a whole, with many laboratory supervisors not recognizing that potential exposure to chemical hazards can still occur in that stationary environment. Düperthal has designed a vast range of safety storage solutions with minimal footprint to fit into any laboratory environment.

Those whose primary purpose is to purchase laboratory equipment should look past the basic fire testing policies applied to safety storage cabinets and make further assessments such as: Is the cabinet constructed of non-porous, anti-corrosive and non-flammable stainless steel? Or, does the cabinet feature exhaust air systems and venting flaps to extract and allow for the monitoring for hazardous vapors? In ordinary laboratory cabinets, work materials are not protected against the external influences of heat. In the case of a fire, some substances may trigger

a reaction, causing harm to a person or property. It's imperative that factors such as these are assessed when making the right decision.

Workers are not only entitled to safety in their workplace, but the law requires it. While this white paper aims to highlight important aspects of safety in laboratories that are often overlooked, by no means is it all-inclusive and it does not take the place of substantial consolation with a safety director who will conduct and perform a comprehensive laboratory assessment and recommendation on other important factors including but limited to - personal protective equipment (PPE), labels to alert workers to hazards, ventilation in the laboratory and reviewing documentation on fire safety on a regular basis. Support of industry and regulatory efforts to improve fire safety in the laboratory is essential in order to begin to even put a dent in the amount of preventable workplace injuries and deaths caused by fire and explosions.

*Contact **STEQ America**, your exclusive DÜPERTHAL representative in North America, for your customized quote or additional technical information today*

p: (267) 245-7010 **I e:** info@steqamerica.com **I w:** www.steqamerica.com

References:
1. U.S. Department of Labor, Bureau of Labor Statistics, in cooperation with state, New York City, District of Columbia, and federal agencies, Census of Fatal Occupational Injuries. April 2015.
2. "Is your campus addressing these top 5 lab hazards?". by Campus Safety magazine staff. June 2016.
3. K. Christensen. "UCLA chemistry professor loses fellowship over fatal lab fire". Los Angeles Times. September 2016.
4. National Fire Protection Association (NFPA). NFPA 30: Flammable and Combustible Liquids Code. 2015.
5. "Standard FM 6050 for Storage Cabinets (flammable and ignitable liquids)". Approvals Guide: FM Approvals.
6. The Occupational Safety and Health Administration (OSHA) rules and regulations for fire protection and prevention. Link to materials: https://www.osha.gov/dte/grant_materials/fy09/sh-18796-09/fireprotection.pdf

About STEQ America

STEQ America is dedicated to helping biotechnology and pharmaceutical companies find the right information and solutions to be leaders in their industry. We do this by providing premium products that feature the latest, most innovative technologies, with the highest standards that cone with reliable longevity.

What we can offer

European engineered and manufactured solutions for dissolution, disintegration, hardness, friability, blister density, granulate and powder flow testing for the pharmaceutical, veterinary, chemical, food and biotechnology industries, with a focus on laboratory needs and research and development. We also offer solutions for the storage of hazardous and flammable materials, cleaning and drying in pharmaceutical manufacturing environments, and bio-medical freezers and refrigerators. Ask us about our mobile, autonomous cleanroom containment options.