Revolutionize your HPLC waste collection with this new system

By STEQ America. May 18, 2017

Hazardous wastes used in testing and research laboratories can cause critical illness, sometimes ending in the loss of life, and can be responsible for detrimental environmental threats when improperly collected or stored. According to U.S. Government Code of Regulations (Title 40, CFR 264), “A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste” and “A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak”. According to OSHA regulations, these containers must also *remain* closed while an HPLC unit is being operated. But despite the safe storage and collection of solvents being a top priority in government regulations, it’s unfortunately still common to see laboratories using open, unlabeled, non-electrically grounded containers or equipment for the collection and storage of their hazardous waste, and engaging in a dangerous manual system of transfer for these chemical substances.

There are multiple articles and federal codes that highlight the above regulations, but an additional factor for consideration which is not always at the forefront of these documents, is the cost and valuable time lost associated with years of destroyed research and developments due to fire or fatal explosions. The frightening plausibility of all these factors has made it obligatory for laboratory equipment manufacturers to transform their existing products on the market in order to keep up with the current climate.

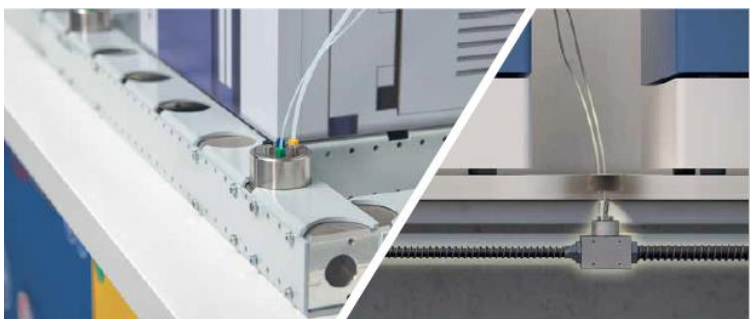
New HPLC Service Station Innovations

The HPLC Service Station by Düperthal is a newly improved solution to collect and store HPLC or flammable waste. It is a complete unit that incorporates Düperthal's undercounter UTS safety cabinet which can be customized to store either 2.64 gallons or 5.28 gallons of waste. Its outer carcass is made of powder-coated sheet metal, followed by 3 layers of gypsum, décor panels, and another inner layer of conductive powder-coated sheet metal. The inner carcass also features interior cooling packs, which deflect the rising temperature of a fire more so than metal cabinet alternatives. This helps to protect not only laboratory workers, but also the invaluable contents within the laboratory itself, long enough for emergency responders to get to a site and extinguish a fire.

Containers within the UTS S Ergo S safety storage cabinet

New improvements to the HPLC Service Station include a PTFE media hose, replacing a previously plastic one that was at risk of breaking when flexed. The PTFE hose is also electrically conductive so that there is no risk of static shock that could ignite a flammable liquid.

The system's corrugated tubing has been replaced with one that features a smooth, level interior wall to eliminate the risks of flammable liquid assembling in ridges when opening and closing the door of the cabinet.

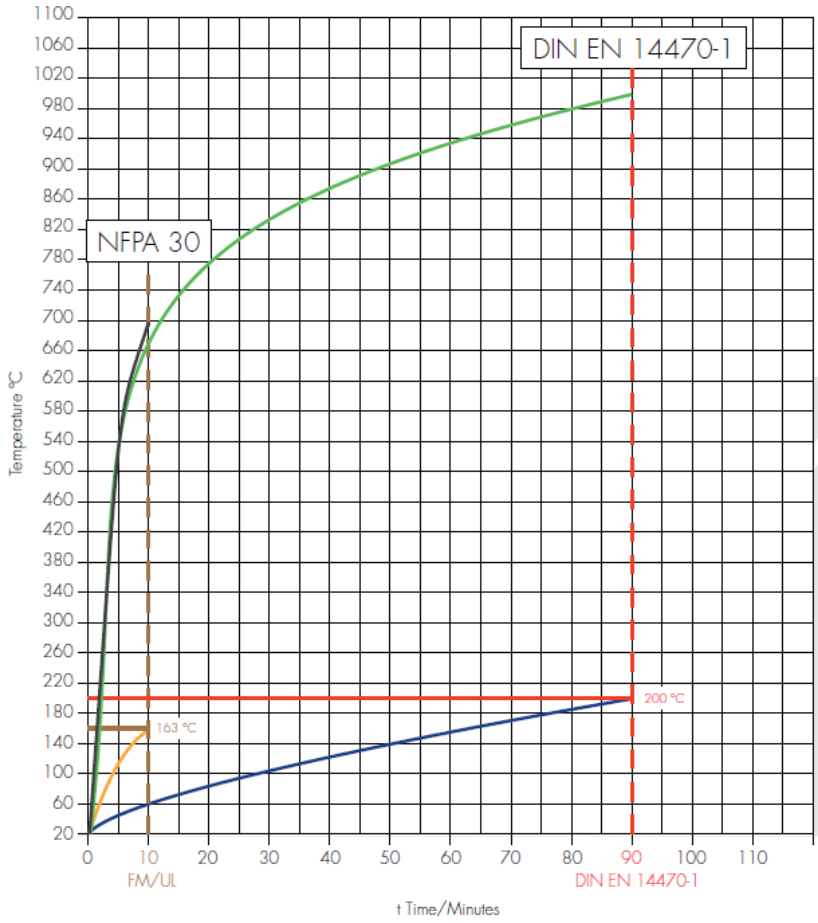


PTFE media hose and smooth interior tubing

Fire Safety

The HPLC Service Station comes with certified safety at the highest level, including guaranteed compliance with the ISO 9000 series of standards and OSHA (29 CFR 1910). As with all Düperthal Type 90 cabinets, the range available with the UTS Ergo line was subjected to a 90-minute fire resistance test, versus the U.S. standard of a 10-minute test (where tested, as not all fireproof cabinets are even tested in the U.S.). Additionally, U.S. cabinets are only measured against one isolated point of temperature. Compare that to European standards, where 11 measuring points are used to test the degree of fire within multiple parts of the cabinet (DIN EN 14470-1 and DIN EN 14727), for a more accurate portrayal of the rate of temperature rise. This is significant when considering your Emergency Response Plan related to first responder safety. In the event of a fire emergency, first responders will analyze the situation to determine the hazardous materials present from a safe location. This may include surveying a placard describing the hazardous material stored in the laboratory along with the containers involved, followed by implementing actions according to the emergency response plan. In their responsibility to predict the likely behavior of the hazardous material, and estimate the potential harm of exposure to the people at risk, they may deem that evacuation is the best step after considering the storage cabinet is only fire resistant for 10 minutes, and given that the duration of the fire is already approaching that mark. This could again result in the loss of years of research and product development.

Comparison chart of US versus European standards of fire testing:



US standards according to FM/UL, NFPA 30

- Maximum allowed temperature in the cabinet in acc. with FM/UL = 163 °C (325 °F).
- Temperature profile in accordance with NFPA 251 in the open fire chamber.
- Example of the rising temperature in an FM/UL cabinet during the fire test, monitored with 1 thermometer.

European standard DIN EN 14470-1.

- Maximum allowed temperature in the cabinet in acc. with DIN EN 14470-1 = 200 °C (392 °F).
- Temperature profile in accordance with DIN EN 1363-1 in the closed fire chamber.
- Example of the rising temperature in a Type 90 cabinet during the fire test, monitored with 11 thermometers.

www.dueperthal.com

Intelligent Control for Safety and Automation

Düperthal has released their new intelligent data option, Cabi2Net. There are 80,000 programmable options available with this feature that can be pre-customized to suit your needs. Possibilities include an SMS or email notification if a door is left ajar, or an alarm for increased, heated temperature or vapors in the air of your laboratory. Electronic level control includes a warning signal before overfilling and optional shutoff of the HPLC. Additional security measures can also be customized, including a lighting system on your laboratory wall that displays a red light if a door is left open. Everything in this system is actively documented through the software and allows for report generation to show exactly what time significant events took place within the unit. Access to the system is not limited to the internal network of your organization. Because it is web compatible, you can receive prompt alerts even whilst in another country, and remote access to information at any given time. Up to 120 cabinets can be connected to the Cabi2Net system.

Cabi2Net features:

- Touchscreen display
- Network capability
- Exhaust air flow monitoring
- Level monitor (supply/disposal) capacitive sensor
- Temperature monitoring
- Opened door status
- Customizable to your individual needs

Ventilation at Every Level

Another new addition to the HPLC Service Station is the introduction of the ACTCOM Type 90 line which features a taller cabinet option that allows you to store your flammable liquids supply on the highest shelf of the cabinet for easier access, thanks to the cabinet's opening at the top providing ventilation at every level, and pipe penetration that connects to the HPLC machine with a tube. This tube allows the flammable liquid or waste from your HPLC machine to enter the pipe penetration and flow through to the bottom of the cabinet, where the flammable waste will be collected in the container. This efficient new attribute eliminates the need for laboratory workers to monitor their waste collection process which can often last up to 24 hours. With Düperthal's Smart Control application, it's now easier than ever to maintain a timely exchange of collection

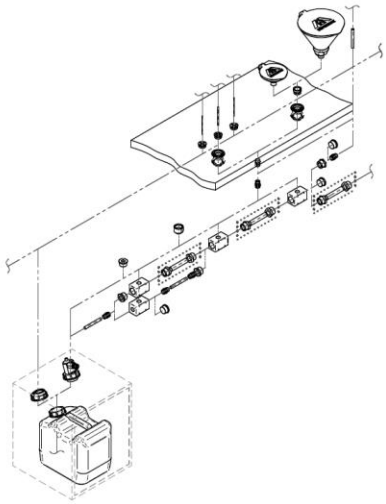
containers, which is automatically triggered by the Smart Control's integrated fill level monitor, which also minimizes the risk of substance overflow.

ACTCOM XL Safety Storage Cabinet for storing active substances

Recreating a Modular Laboratory Environment

Already utilizing Düperthal safety storage cabinets for active storage? An alternative to the HPLC Service Station is the VisiCon Waste Collection System. This new system has been designed to efficiently and effectively consolidate your laboratory space and processes, by integrating with your existing safety storage cabinets. Its individual components are all conductive to prevent the formation of ignition sparks, and come together to provide a direct feed of hazardous wastes through the cabinet and into the container.

There are laboratories that utilize a disposal underbench unit for collecting waste, however the unit is connected to a remotely positioned HPLC machine. These units are then tied back to the disposal system by way of exposed drain lines that can be easily damaged or interfered with. This layout is cause for concern due to the high risk of overflow of hazardous waste. With the VisiCon Waste Collection System, you now have the option to connect multiple HPLC machines to one single tube and waste collection system thanks to VisiCon's customized tubing, which can extend up to 50 meters. This eliminates the need to purchase a whole new waste collection station for each HPLC machine being utilized. Having just one HPLC service station utilizing just one fume hood or fan for ventilating a single cabinet to your laboratory exhaust, is more cost effective than needing to ventilate three, for example, due to multiple stations around your workspace. You achieve higher efficiency by merging wastes from several workplaces to a central collection point. Longterm, this means you'll only require maintenance or parts replacements for one system versus multiples. Not only does VisiCon save you money and consolidate your laboratory workspace, but it also gives you safety without the compromise, by reducing the risk of accidents or fire which is heightened every time you add additional tubing, because adding additional tubing means adding a new connection point which poses a risk for leakage.



VisiCon module structure

Collect flammable media flexibly and centrally

Connection to earthing and T-distributor made of stainless steel

Conclusion

When you're looking to select the best system for collecting and storing HPLC or hazardous wastes in your laboratory workspace, keep some critical factors in mind:

- Ensure your storage process involves utilizing labeled, closed containers (except when it's necessary to add or remove the waste)
- Invest in a safety cabinet made of quality materials that will deflect the rising temperature of a fire, and withstand the highest level of fire resistance as certified by independent tests

- Seek to incorporate electrically conductive equipment that reduces the risk of static shock that could ignite a flammable liquid
- Look for a flexible and scalable system that will easily adapt to the rigorously changing laws and codes of regulations
- Opt for systems with innovative safety features such as integrated and customizable security software and safety cabinet doors that automatically seal shut in the event of a fire

Employee safety, research preservation, and process efficiency should be kept at the forefront of your laboratory operations by investing in a quality, tested and certified, HPLC system that can be continually tailored to meet your individual requirements. The system you select now will have a lasting impact on how easily your laboratory will be able to adapt to growing safety laws, and provide maximum protection for laboratory workers and first responders in the event of an emergency.

https://www.steqamerica.com/products/safety-storage-cabinets/hplc-service-station/

*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

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.

References:

1. Appendix A to 1910.1450 – National Research Council Recommendations Concerning Chemical Hygiene in Laboratories

2. Environmental Protection Agency (EPA) Standards: Title 40: Protection of Environment, CFR Part 264, Subpart 173

3. Purdue University "High Performance Liquid Chromatography (HPLC) Waste". Link: https://www.purdue.edu/ehps/rem/hmm/hplcwaste.htm

4. Occupational Safety and Health Administration (OSHA) 29 CFR, Part 1926, 1926.152(a)(1), "Fire Protection and Prevention"

5. Occupational Safety and Health Administration (OSHA) 29 CFR, Part 1910.120, "Hazardous Waste Operations and Emergency Response".

6. National Fire Protection Association (NFPA), NFPA 30: Flammable Combustible Liquids Code, 2015.

7. Düperthal Sicherheitstechnik GmbH & Co. KG, Frankenstraße 3, 63791 Karlstein, Germany, www.dueperthal.com

8. NIH Waste Disposal Guide 2014 (http://wastepickup.nih.gov/), or 301-496-4710

9. "Stericycle in Morton Fined $72,000 for Waste Handling" by Justyna Tomtas. June 1, 2015. The Chronicle Newspaper

10. "U.S. EPA Fines Two Local Operations for Hazardous Waste Storage Violations" by Howard Fine. August 3, 2016. Los Angeles Business Journal