Flammable Liquid Waste Storage in Large Containers Policy

Summary

*Environmental Health and Safety* (EHS) must approve labs seeking to use any container larger than five (5) gallons for collection of flammable chemical wastes. EHS, upon approval, will provide containers and, if necessary, additional labeling. Before first fill, containers must be grounded, labeled, and correctly staged. Individual laboratories will be responsible for all costs associated with container bonding, grounding, and storage within their laboratory. All drums must remain grounded, labeled, and staged properly at all times, until removed by *Environmental Health and Safety* staff.

Grounding: Minimizing the Risk posed by Static Electricity

Larger than 5 gallon containers, of flammable liquids present special problems with respect to electrostatic discharges (ESD) during use. ESDs can initiate fires which will intensify rapidly due to the large amount of fuel or solvent being stored. Static electricity build-up creates this fire risk around flammable liquids containers subject to repeated pumping, pouring, or transferring, regardless of whether materials move *into* or *out of* the storage container. Risk of discharge is lessened through connection of containers to a grounding system, which safely dissipates electrical charge.

This policy identifies the procedures necessary to ensure that larger containers of flammable liquids are bonded and grounded in order to lessen the fire risk posed by static electricity.

According to the National Fire Protection Association, any flammable liquid with a closed cup Flashpoint (FP) of 100 degrees F or less must be grounded if materials move *into* or *out of* the storage container with a capacity of greater than 5 gallons to eliminate electrostatic discharge.

Procedures for labs requesting a container larger than 5 gallon capacity for storage of flammable liquids:

1. Contact EH&S to notify and determine if it is acceptable to have a larger container for the material and the space requested.
2. If the lab does not want to pay to have the drum grounded, a FP for the material must be determined. This can be determined by one of the options below.
a. If the material is an unused product a SDS may be used to determine the FP.
b. If the material is a waste, a sample must be taken and the closed cup FP must be run.

If it is determined that material has a FP of greater than 100 degrees F, then grounding is not required. A copy of the FP test or SDS must be kept in the labs Blue Book. If this material is a waste the lab must have the FP retested every other year to assure the waste has not changed and the FP is still > 100 degrees F.

Facilities must install proper bonding and grounding equipment when the need is identified. The cost of the equipment installation will be the laboratory’s responsibility. At no time should laboratory occupants attempt to wire a grounding system themselves or use a contractor without the approval of FMD.

Some things to consider regarding grounding systems:

- **Confirm the ground.** Confirm that all grounding conductors and lines are actually grounded by tying into the main incoming building grounding electrode system at install. This check will require a digital multi-meter, or similar device, and competence in device use. Ground should be re-confirmed periodically. The main static ground conductor must be independent of all other ground system risers/cables and must be derived at the building main grounding point/bus bar. The static ground cable shall never be connected to an electrical system ground.

- **Create a Reliable Electrical Connection at the Ground Source.** Attach the grounding conductor or line to the source of ground (grounding bar, stud, etc.) permanently with a means that will assure metal-to-metal contact: mechanical clamps, bare-metal connection via bolt-and-nut, welded connection, etc. The connection must “tight” at all times, even with rough daily use.

- **Use Chisel-Point Clamps.** A conductor that connects a single item to ground should ideally end with a clamp having chisel points. This type of clamp will break through the paint on drums and other items that need to be grounded, assuring metal to metal contact. Chisel point clamps typically, but not always, require tightening with a wrench to create a solid connection. *A word of caution:* be wary of weaker, spring-loaded “alligator” clips and clamps. Spring loaded clamps may need extra help to break through paint layers on drums and other containers.

- **Have a Strong Clamp-to-Conductor Connection.** Make sure the clamp at the end of the grounding conductor is attached to the line in a reliable fashion, which will ensure continued metal-to-metal contact even with rough use: compression fittings, welded connections, etc.

**Labeling: Display Hazard Information**
All larger unwanted materials or waste containers, at first fill, must have labeling as outlined in current Washington University EHS policy. This labeling is necessary to comply with existing mandates, but also provides vital safety information to employees and first responders in the case of an incident or release. In addition, it is required to place orientation markings and DOT labeling on larger containers. The DOT labeling, in particular, provides basic hazard information at a glance. EHS will provide both types of labeling to laboratories cleared to have larger containers.

**Staging: Housekeeping and Spill Prevention**

Larger containers pose a serious risk of both spills and leaks, and either of these may necessitate costly and lengthy clean-up should they occur.

Spills are most likely during container filling or movement. The best prevention to avoid spills is to keep all drums tightly closed when not filling, especially if the container must be moved. Closure should always be confirmed with a wrench: never assume a container is closed by visual inspection. Equally important is the exercise of care when filling containers. “Missing” the storage container during fill or overfilling a drum are both signs of sloppiness, and should be avoided. The use of safety funnels (e.g. “Justrite-style”) may help to keep the storage area cleaner by preventing splashes, while also providing both grounding points and fire suppression capabilities. Overfilling drums will quickly create a very dangerous fire situation, which can be prevented by the use of fill level indicators. EHS will suggest a level indicator for use during accumulation. Purchase of funnels and level indicators are the responsibility of the laboratory.

Leaks are most likely to be noticed during container storage, and are likely to get worse with time. Once a container or drum has failed, it will need to be reported to EHS staff and replaced immediately. Periodic inspections are the key to minimizing the effects of leaking containers.

The effects of both spills and leaks can both be mitigated by the use of appropriate spill containment, which will catch and contain some or all of a container’s contents in the event of a mishap. Larger containers should be placed on some type of spill containment pallet during accumulation and storage. The preferred containment pallet for most applications is an Ultratech Model 1320. The cost of the spill containment pallet will be the laboratory’s responsibility.