

Flammable Liquid Storage Cabinet Concern!!!

Recently a metal shelf in a flammable liquid storage cabinet was dislodged from the supports causing the entire contents of the shelf, approximately 10 one-gallon glass bottles of tetrahydrofuran (THF), to fall to the floor and break. The Madison Fire Department Hazardous Incident Team responded, secured the site, and eliminated the fire hazard before the university's contracted hazardous materials spill response team removed all the hazardous materials from the site. Total cost for the response was nearly \$4600 – and this does not include lost materials, time, and research.

The cause of the spill was investigated by the EH&S Chemical Safety Office. It was determined that a researcher, while removing a solvent container from the bottom shelf of the storage cabinet, inadvertently bumped into and lifted up one of the upper shelves off the shelf support with his shoulder. When the shelf came down it missed the support tab thus causing the contents to fall. Figure 1 shows the shelf support system. In this design, common to a number of manufacturers, the shelves rest on the support tabs and are not anchored in place. This design can support the necessary weight and the shelf height is easily changed.



Figure 1. Shelf Support System



Figure 2. Containers with Insufficient Clearance

What Can You Do to Prevent Another Occurrence?

After consulting with the manufacturer and other safety professionals within the university and elsewhere the Chemical Safety Office has found no reports of similar incidents. So while the occurrences appear to be rare, the results can be expensive and potentially devastating. There are a few things that you can do to minimize the possibility of another event.

- Be careful when removing heavy solvent containers out of the bottom shelf. Gently lift the container over the lip and pull out.
- Make sure there is enough clearance between shelves so that when you remove containers you have enough room to prevent bumping into the shelf (see **Figure 2**).

- The shelves can be anchored onto the supports by drilling a hole into the shelf and the support tabs. These can then be connected via a number of different means (wire, clips, screws). **Do not** drill through the actual side of the cabinet. Doing so can compromise the performance of the unit during an actual fire.
- Alternatively, simple rubber shims are available which can be used to wedge the shelves into place (see **Figure 3**). This will not prevent the shelves from moving but will increase the force needed to move the shelf. The shims can also be readily removed if the shelf needs to be moved.



Figure 3. Rubber Shims for Shelf



Final Thoughts

This is a very good example of a truly unanticipated event and underscores the need for all lab staff to understand how to respond to emergency situations – be it spills, injuries, or other events. In this instance the lab staff correctly evacuated the room, pulled the fire alarm and met the responders to describe the situation.

Figure 4. Lab after Madison Fire Department Hazardous Incident Team responded

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