Pressure Vented Caps

On April 2014, a UCSF researcher unknowingly combined ethanol and nitric acid into a 1 gallon bottle. The researcher tightened the screw-type cap and placed the bottle in the fume hood. Several seconds later, a powerful explosion occurred breaking adjacent glass containers within the hood and scattering glass fragments up to 30 feet. The fume hood sash was compromised and lab flooring was contaminated with acid residue. Luckily, the researcher was not injured due to shielding from the hood sash.

To prevent future incidents, EH&S is providing vented caps to laboratories. The vented caps contain a gas permeable liner called Circumvent®. Circumvent® has a unique microporous structure that repels liquids, yet safely allows the free passage of air to maintain equilibrium within a closed container. This cap can be used for acidic mixtures with oxidizers which have the potential to evolve gases which can cause over-pressurization in a closed container (Examples, Piranha, aqua regia and Performic acid solutions). As an added safety measure for oxidizers when inadvertently mixed with organic solvent can cause over-pressurization (example, nitric acid).

The only cap size EH&S currently has will fit many standard 0.25 Liter to 4 Liter sized containers. Users should test the fit of the cap on their container prior to use.
**Safety Considerations:** The cap is designed to vent slowly and will not release pressure from an instantaneous chemical reaction. Always exercise prudent judgment and be cognizant of what you are transferring into another container. When transferring chemicals, always wear appropriate personal protective equipment, work in a fume hood and pour slowly into the container. Always leave at least two inches of headspace in the bottle to allow proper venting.

Laboratories can request the caps from your EH&S Specialist. For questions about the vented caps, please call the Chemical Safety Officer at 2-2413.