Using Vacuum Generating Equipment

This SOP is for the use of the vacuum itself (vacuum distillation, vacuum ovens, desiccators and the like). A separate SOP is available for the varying kinds of vacuum creation systems.

Implosions are always a possibility when using systems and equipment under vacuum. If vacuum failure would result in chemical release, then the vacuum system should be in a fume hood. Appropriate gloves and other personal protective equipment suitable for the contents should be worn.

Before subjecting the system to vacuum, inspect all parts of it for cracks or flaws. Large glass pieces (desiccators) should be in protective cages to contain implosions. Do not use any protective method that would preclude this inspection. Plastic netting is recommended for all glass systems that will not be heated. It can be shifted slightly in use so all parts of the glass can be checked. Tape cannot be moved and thus flaws may be concealed from the user during repeated use. Hoses should be checked for cracks and abrasions, replace as necessary. Ground glass joints and other such mating surfaces (desiccators, bell jars) may need to be greased.

In vacuum distillations and other heated vacuum operations always bring the system to the full desired vacuum before beginning the heating. The cooling system should also be brought online before heating begins. Water/coolant hoses must be checked for cracks and flaws and that they are tightly fasten (clamped/wired) to condensers as appropriate. Inspections of drains and return lines should also be done before the water flow is started. Only after all of these are verified should the heating begin.

At the end of the procedure (or as new flasks are added in a distillation) slowly release the vacuum to the system. Rapid repressurization can cause equipment failure. If the vacuum release is at the end of the procedure (rather than a flask change) turn any heat sources off before repressurizing. If what remains in the hot vessel might react with incoming air then designing the system to repressurize with inert gas is necessary.

Temporary systems should be disassembled as soon as practicable to prevent joint seizure and permit thorough cleaning between uses. Permanent systems should also be disassembled periodically for cleaning and inspection.