Laboratory Standard Operating Procedure

(For use of general classes of hazardous materials or equipment in room 409

Name of Procedure: Handling of Organic Solvents

Prepared by: Marina Tanasova **Revision date: 08/27/15**

Location-This procedure may be performed at the following location(s): Chem. Sci. Bld. Room 409

This document outlines the hazards involved with the handling, storage, and use of flammable organic solvents. It will detail procedures to be followed to minimize the risk of exposure of Plasma Fusion Center employees to solvent vapors and fire and explosion hazards.

Hazards- The following materials and equipment associated with this procedure present exposure or physical health hazards. Safety precautions are prudent and mandatory:

Flammable organic solvents routinely used at the PSFC include:

- Ethyl alcohol, reagent grade
- Ethyl alcohol, denatured (not in vacuum)
- Isopropyl alcohol
- Acetone

Acetone has a low flash point and is presents a severe flammability hazard. Ethyl alcohol can also readily form flammable or explosive mixtures with air. Isopropyl alcohol is somewhat less flammable than acetone or ethyl alcohol. Products containing flammable solvents, especially some of the mold release compounds and aerosol spray enamels, may present severe flammability hazards in the presence of an ignition source.

Engineering Controls- Prior to performing this procedure, the following safety equipment must be accessible and ready for use: (ex. Chemical fume hoods, laminar flow hood, chemical spill kits)

- **Flammable liquid storage cabinets.** Approved flammable liquid storage cabinets may be necessary depending on the quantity of stock flammable solvents which needed to be on-hand, and the amount of flammable liquid waste generated.
- **Secondary containers.** All glass containers of flammable liquids shall be stored in secondary containers. It is preferred that all 1 gallon or greater containers be of metal, polypropylene, or plastic coated over glass.
- **Spill materials**. Paper towels or adsorbent materials such as spill control pillows, and chemical resistant gloves (Nitrile are provided). Where quantities of flammable solvents can produce an explosive mixture with air in the laboratory, special absorbent materials such as activated carbon (available through Lab Safety Supply) must be considered to eliminate the explosion hazards.

Protective Equipment-Prior to performing this procedure, the following personal protective equipment must be obtained and ready for use: (ex. Acid resistant gloves, safety eyewear, lab coat, chemical splash apron)

- **Protective gloves**. The lightweight PVC gloves used during light cleaning, assembly, and coating operations should be sufficient to prevent skin contact with small quantities of solvent. Heavier Nitrile gloves are required for cleaning up spills and are always required whenever the hands or fingers must be immersed in the solvent. The Nitrile gloves provided by the PSFC provide adequate protection against alcohols, but are degraded by acetone. Any gloves which are dirty or which have been penetrated by solvent should be discarded.
- **Glasses.** Safety glasses are necessary for most solvent operations. Employees who do not wear glasses or who wear contact lenses must be provided with splash-proof chemical goggles or face shields when handling flammable solvents. Contact lens wearers shall always wear splash-proof goggles when handling solvents.
- **Face shields.** Face shields may be necessary when there exists the potential for splashes or explosions from use of large quantities of solvents.

Waste disposal-This procedure will result in the following regulated waste which must be disposed of in compliance with environmental regulations:

Organic solvents may not be disposed of by pouring into drains or by allowing them to evaporate into the air. Place the used solvent in a designated, properly labeled waste container. Do not mix different kinds of solvents in waste containers unless instructed to do so by the supervisor.

Empty aerosol cans which had contained flammable solvents may be placed in the trash.

Used material may be accumulated in a labeled container in the immediate work area until the container is full or the work is complete. It must be stored appropriately during accumulation with the cap on. It must be inside a secondary container so that uncontrolled spills cannot occur, separated from incompatible materials. Once the container is full, proceed as follows:

1. Obtain a red **"Hazardous Material Tag"** from Safety Office. Fill it out with the name of the material in English (no chemical formulae). Include any major contaminants which are present in the waste. Include the name of the lab and your name, or the name of the PI, and the date
2. If the material is commercially prepared product sold under a tradename, provide an MSDS (these are shipped with the product, and can be easily obtained from the manufacturer if lost.
3. Call/email the Safety Office and ask them to come to the waste accumulation area and pick up the waste.

Unused flammable solvents which are no longer needed should be left in the original containers. Disposal should proceed as in the previous section.

Unneeded epoxy resins containing flammable solvents should be mixed according to the manufacturer's directions, allowed to harden, and placed in the regular trash.

Accidental Spill- In the event that a hazardous material spills during this procedure, be prepared to execute the following emergency procedure:

The major hazard of large spills is the potential release of hazardous concentrations of flammable vapors. Therefore, in the event of a large spill of the material, (i.e., one gallon container), shut off any ignition sources, and call the Safety office. Do not let anyone enter the spill area.

Small spills may be absorbed or wiped up using paper towels. After absorbing any excess liquid, clean-up materials should be placed in an approved metal container with a self-closing lid.

Special absorbent materials are available which absorb the flammable vapors of solvents. They considerably reduce the potential for explosion of flammable vapors. Use of these materials should be considered when developing spill response procedures.

Prior Approval- This procedure is considered hazardous enough to warrant prior approval from the laboratory director. **Yes**

Certification- I have read and understand the above SOP. I agree to contact my Supervisor if I plan to modify this procedure.

Signature_____Name (print)_____
Date_____Room_____