Bio Basics Fact Sheet: 
Glove Selection and Use

Background:

Gloves are worn in labs and animal rooms to protect workers from hazardous chemicals, biological materials, radioactive materials, sharp objects, or a combination of these. No one glove is available to protect laboratory workers against all potential hazardous exposures. It is crucial that the type of glove being used is the right one for the job since incorrect gloves may provide no protection and even cause a fatal incident. A Dartmouth College chemistry professor died in 1997 from exposure to dimethylmercury, which penetrated her latex gloves.

Glove Selection:

Proper glove selection is essential to insure glove performance as a barrier to hazards. Selection of the proper hazard-resistant glove begins with an evaluation of potential hazards associated with the task.

Biological Hazards

Standard latex exam gloves provide protection for biological hazards. Non-latex gloves such as synthetic rubber, nitrile, vinyl, or neoprene also provide acceptable barrier protection against virus and other microorganisms without the potential to cause severe allergic reactions associated with latex. **Note:** If a biological material, such as DNA, is being prepared in phenol/chloroform, a glove protective for both chemicals is required to prevent the exposure from occurring.

Latex Glove Concerns

Latex gloves, especially thin, disposable exam gloves, are widely used in labs. Two considerations to be aware of: 1) because of the organic material used in latex gloves, they may offer limited protection from commonly used chemicals and 2) many workers have developed latex allergies because of proteins in the gloves. Appropriate work practices are needed to reduce the chance of reactions to latex in the workplace.

- Be cautious using latex gloves with chemical materials. Consult the Chemical's Material Safety Data Sheet (MSDS) or manufacturer's chemical resistance data for information on glove selection.
- Don't use latex gloves with dry toxins since latex generates static electricity.
- Don't use oil-based hand creams or lotions when wearing latex gloves. They can compromise the integrity of the glove.
- Use powder-free, reduced protein latex gloves since sensitized workers may react to inhalation of airborne powders.
- Wash hands with a mild soap and dry thoroughly after removing all gloves.
- Frequently clean areas and equipment contaminated with latex-containing dust.
- Learn to recognize the symptoms of latex allergy: skin rash; hives; flushing; itching; nasal, eye, or sinus symptoms; asthma; and (rarely) shock. See NIOSH 6/97 alert at [www.cdc.gov/niosh/lalexalt.html](http://www.cdc.gov/niosh/lalexalt.html).
Chemical Hazards
Glove selection guides are available on the DEHS web site. However, glove-resistance to various chemicals materials will vary with the manufacturer, model and thickness. Therefore, review a glove-resistance chart from the manufacturer you intend to buy from before purchasing gloves. When guidance on glove selection for a particular chemical is lacking, double glove using two different materials, or purchase a multilayered laminated glove such as a Silvershield or a 4H.

Radioactive Hazards
For radioactive hazards, glove selection is based on the carrier material (i.e. water, toluene, etc.). (Radioiodination procedures require double gloving.)

Sharps Hazards
Leather gloves may be used for protection against sharp edged objects, such as when picking up broken glassware or inserting glass tubes into stoppers.

Glove Use:

- Wear gloves of a material known to be resistant to permeation by the substances in use. Consult the relevant MSDS which may recommend a particular glove material. For specific glove selection, refer to the manufacturer's chemical compatibility specifications. Chemical resistance gloves selection guides are also available on the DEHS web site.
- Look for an expiration date on individual packages of gloves.
- Before use, check gloves (even new ones) for physical damage such as tears or pinholes. Check reusable gloves for previous chemical damage.
- Dispose of gloves when they show any sign of leakage or deterioration.
- Select gloves of the correct size and fitting; gloves that are too small are uncomfortable and may tear whereas overlarge gloves may interfere with dexterity.
- Some gloves, especially lightweight disposables, may be flammable: keep hands well away from flames or other high temperature heat sources.
- Replace gloves periodically, depending on the frequency of use and their permeation and degradation characteristics relative to the substances handled.
- In order to prevent the unintentional spread of hazardous substances, remove gloves before handling objects such as doorknobs, telephones, pens, and computer keyboards.
- Remove gloves before leaving lab area.
- Wash reusable gloves appropriately before removing them. (Note: some gloves, e.g., leather and polyvinyl alcohol, are water-permeable.)
- When removing gloves, do so in a way that avoids skin contact with a possibly contaminated glove exterior.
- Always wash hands after removing gloves.
- Dispose of contaminated gloves properly.
- Do not attempt to re-use disposable gloves.

Reference: