

# GLOVING SAFETY NOTE

One of the most important pieces of personal protective equipment (PPE) in the lab are your gloves. Coming in a wide range of materials and designs, gloves serve as crucial barriers between your skin and laboratory hazards. Unfortunately, there is no universally comfortable, flexible, and safe glove that protects against all hazards. Instead, your choice of gloves is dependent upon a variety of factors and often involves tradeoffs that you must consider.

### **Chemical Compatibility**

- Chemical compatibility includes breakthrough time and permeation rate:
  - Breakthrough time is the amount of time it takes for the first molecule of chemical to penetrate the glove
  - Permeation rate is the rate at which chemicals are transported through the glove material
- Compatibility is determined by glove material, thickness, design, and quality
- Most manufacturers release chemical resistance guides that specify which chemicals their gloves are designed to resist (as can be seen [here](#) and [here](#)). Seemingly-identical gloves from different manufacturers can have significant differences in chemical compatibility
- Glove selection charts, such as the ones offered by [OSHA](#) and [All Safety Products](#), provide **general** glove compatibility information

1. EHS Today Staff. (2000, July 31). *Protecting Hands Against Chemical Exposures*. EHSToday. <https://www.ehstoday.com/ppe/hand-protection/article/21908760/protecting-hands-against-chemical-exposures>

- Chemical compatibility is **not solely determined by glove properties** but also by external factors such as chemical concentration and exposure time

### **Dexterity and Comfort**

- Gloves with adequate dexterity and comfort help ensure that experiments can be conducted safely and effectively while also increasing glove-wearing compliance
- Complaints of gloves getting in the way of research or work being conducted are one of the most cited reasons for not wearing gloves in hazardous environments<sup>1</sup>

### **Impact of Experimental Design**

- Chemical compatibility is context dependent
  - Consider concentration, exposure time, and other factors when determining chemical compatibility
  - A glove may be suitable for handling low concentrations of a chemical for up to 30 minutes but would fail when handling the same chemical at higher concentrations or for longer periods of time
- Base glove choice not only on the chemicals but also the specific experimental design. Redesign the experiment if necessary to make it compatible with existing gloves. This may mean changing chemicals or using different apparatus or techniques.

## **LESSONS LEARNED**

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- Are our gloves compatible with the chemicals with which we work?  
How do we know for sure?

## Not Rocket Science: A JHU Safety Note

- Sometimes researchers are reluctant to use PPE such as gloves. How could we address this issue?
- Do we use high-concentration chemicals or techniques that might produce long exposure times? Can we avoid this situation?

1. EHS Today Staff. (2000, July 31). *Protecting Hands Against Chemical Exposures*. EHSToday. <https://www.ehstoday.com/ppe/hand-protection/article/21908760/protecting-hands-against-chemical-exposures>