

# EHS Laboratory Guidance

## Lab Coats for Working with Flammable Liquids, Flammable Solids and Pyrophorics

### **Introduction/Purpose:**

Lab coats can serve a number of purposes – protection from chemical splash, fire resistance, minimizing the spread of contamination outside the lab, personal clothing protection, or just to look stylish! There are a wide variety of lab coats available. The primary purpose of this document is to focus on the types of lab coats for working with flammable solvents, pyrophorics (spontaneously combustible materials), flammable solids, or other fire hazards in the lab. The related issue of proper laundering of lab coats is also discussed. This document is not intended to be a comprehensive look at lab coats – if you want more information, check with a coat vendor, or a lab safety supply house.

While there are many different style features, from a protection standpoint the best coats have the following characteristics:

- Tight cuffs (knitted or elastic);
- Snap closures on the front for easy removal in case of contamination;
- Proper fit;
- Appropriate material for hazards to be encountered.

Coats with different properties are easy to tell apart. For example, fire-resistant (FR) coats should have outer markings clearly identifying them as FR coats and can be ordered in a different color than other coats used in your lab.



### **Use of Lab Coats:**

A suitable lab coat will provide a removable barrier in the event of an incident involving a spill or splash of hazardous substances. Work with pyrophorics, flammable solids, water-reactive materials that may generate flammable gases, or highly flammable liquids presents an especially high potential for fire and burn risks. EHS recommends the use of fire retardant or fire resistant (FR) lab coats to provide additional skin protection when the individual will be working with these chemicals. Examples of these chemical hazards include:

- Flammable liquids: NFPA Class 1 materials (flash point < 100°F) such as Acetone, Acetonitrile, Benzene, Diethyl ether, Ethanol, Ethyl acetate, Hexane, Pentane, etc.
- Pyrophorics: such as White Phosphorus, Organometallic compounds (e.g. t-Butyllithium), Titanium powder, Potassium dithionite
- Water-reactives: such as Sodium metal and metal hydrides

- Flammable solids: such as desensitized explosives (wet Picric acid, wet TNT); Magnesium pellets, turnings or ribbons; Naphthalene.

It is strongly recommended that labs using pyrophorics, flammable liquids and skin-contact hazardous materials<sup>1</sup>, e.g., acid/bases, toxics, make it their policy to:

- Always wear a lab coat when handling such chemicals;
- Have available one or more fire-resistant lab coats (see below);
- Incorporate the policy into the Laboratory Safety Plan and share with all workers.

### **Lab Coats and Fire-resistance:**

The primary materials used for FR lab coats are FR-treated cotton or Nomex. Though not exhaustive, the following list of lab coat fabrics is in rough order of decreasing fire resistance:

1. Nomex - offers the highest level of lab coat protection from fire. Highly fire-resistant because the fabric thickens, carbonizes and remains intact under fire conditions. Used widely in occupations where fire is a real hazard. Other advantages: strong, flexible, good resistance to tearing, resistant to most solvents and to acids and alkalis, and can be cleaned commercially. Disadvantages: Nomex decomposes if exposed to chlorine bleach; can be hot in certain situations (e.g., outdoors); more expensive.
2. Fire-resistant cotton - cotton coats are available that are treated with a fire-resistant material. However, this capability may dissipate after repeated laundering, particularly if bleach is used. FR-cotton coats are midway in price between untreated cotton and Nomex.
3. 100% Cotton - superior to synthetic blends for fire-resistance, but inferior to those above. Advantages: comfortable, cheaper than coats above. Disadvantages: rarely last more than a year with daily use; can be degraded by acids. 100% cotton coats are currently carried in the Chemistry Storeroom.
4. Synthetic/Cotton Blends - 100% polyester coats, or cotton/polyester blends are the most combustible and are not considered appropriate for working with flammable materials. Blended coats are currently carried in the Chemistry Storeroom.

### **Laundry Services for Lab Coats:**

Do not launder a contaminated coat at home. There are lab coat laundering services available in the Moscow area, including: [Blue Ribbon Linen Supply](#) (Lewiston, 208-743-5521) and [Western Laundry Dry Cleaning](#) (Moscow, 208-882-4231). They will pick up your coats on an agreed-to frequency and return them clean to the lab. These services are not expensive. Also, as noted above, bleaching will degrade Nomex and Fire-resistant cotton coats. Therefore, specify “no bleach” with these laundering services.

Footnote<sup>1</sup>: a chemically-resistant apron, worn over a lab coat, will provide better skin protection than a lab coat alone for corrosives and other skin-contact hazards.