Rutgers, The State University of New Jersey
Clinical and Laboratory Coat Use Guidelines

Background

The purpose of this guidance document is to provide assistance for proper selection, use and care of lab coats utilized by faculty, staff and students performing activities in laboratories, clinics, or other designated areas at Rutgers University. Detailed information on options to obtain and launder coats, as well as links to further information of the preferred vendor(s), is found below.

Requirements

Lab coats are required for many laboratory operations. At a minimum, a laboratory coat or equivalent protective clothing, is required for activities involving the use of:

- hazardous chemicals (including but not limited to: flammables, corrosives, toxic, carcinogenic, particularly hazardous substances, etc.), as contained in the Chemical Hygiene or Laboratory Safety Plan (CHP);
- unsealed radioactive materials, as required by the Radiological Safety Guide;
- bloodborne pathogen and biological agents at BL2 or greater, as required by the Exposure Control Plan (ECP), Biological Safety Guide or the Bloodborne Pathogen Guide (BBP); and
- animal handling, as required by the Institution Animal Care and Use Committee (IACUC)

Lab Coat Uses

When properly selected and used, lab coats:

- Provide protection of skin and personal clothing from incidental contact and small splashes;
- Provide protection of skin and personal clothing when working with particulates, toxins or active pharmaceutical ingredients (API);
- Prevent the spread of contamination outside the lab;
- Provide a removable barrier in the event of an incident involving a spill or splash of hazardous substances, radioactive material, infections material or bloodborne pathogens;
- Provide a barrier when handling laboratory animals; and
- Provide flame resistance to pyrophoric, open-flames or other potential ignition sources.

Limitations of Lab Coats

As with any laboratory practice, PPE (including lab coats) are prescribed as part of the hierarchy of controls to protect an individual and should not be used as a substitute for adequate engineering controls (e.g. fume hood, a glove box, biosafety cabinet, process enclosure, isolation etc.), or as a substitute for safe work practices and personal hygiene.

PPE provides minimal protection in the event of a failure in the engineering controls, work practice or an unplanned event (accident). The selection of a lab coat must be based on a hazard assessment of the research or clinical activity performed and selected based on the higher hazard requiring protection. A lab coat can be combined with additional PPE (e.g. apron, gown, cover sleeves, etc.) to achieve adequate protection.

Some known limitations of lab coats include:

- Lab coats are not designed to be the equivalent of chemical protection suits for significant chemical handling or emergencies;
- Lab coats are not designed to be impervious to all liquids or bodily fluids;
- Lab coats are not designed to be compatible with all chemicals;
- Not all lab coats are flame resistant;
- Lab coats are not tested for typical conditions that might be encountered in a research lab;
- There is little or no information provided by manufacturers or distributors about the capability of a lab coat to protect for a combination of hazards;
- One size does not fit all; and
- Lab coats can be difficult to distinguish from each other and for what hazard it has been selected.

Alterations, such as embroidery, should not be made to any lab coat without first consulting the manufacture as any changes or penetrations in the coat material may compromise or reduce the protection provided by the lab coat.

Selection of Lab Coats

Lab coats are manufactured utilizing different materials and it is important to select a coat or coats of appropriate material for the type(s) of hazards in the lab. The first step in this selection process is to determine the type(s) of hazards that exist in your lab and the reason(s) for the lab coat.

Some questions to consider are the following:

- Does your lab work primarily with chemicals, biological agents, radioisotopes carcinogenic, or a mix of these hazards?
- Does your lab work involve animal handling?
- Are there large quantities of flammable materials (>1 liters) used in a process or experiment?
- Are there water reactive or pyrophoric materials used in the open air, e.g. in a fume hood instead of a glove box?
- Are there open flames or hot processes along with a large amount of flammables (>1 liters)?
- How are hazardous chemicals used and what engineering controls are available, e.g. a fume hood or glove box?
- Is there a significant risk of spill, splash or splatter for the tasks being performed?
- What is the toxicity of chemicals used and is there concern about inadvertent spread of contamination?
- Does the lab have an appropriate quantity of lab coats for each user in the event of replacement or laundering?

Choosing the Right Lab Coat

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

- Tight cuffs (knitted or elastic);
- Snap closures on the front for easy removal in case of contamination;

- Coats with different properties should be easy to tell apart (e.g. FR coats should have outer markings clearly identifying them as FR coats and can be ordered in a different color than other coats present in the lab);
- Properly sized to fit the individual with the appropriate length for the sleeves and waist width for closing; and
- Appropriate material for hazards to be encountered.

Once you determine the hazards, you can review information on typical lab coat materials with guidance on use and limitations in the Lab Coat Selection Table below. As noted above under *Limitations of Lab Coats*, there are limited specifications for lab coat materials with respect to typical lab use scenarios.

Lab Coat Selection Table

Laboratory Hazard or Use	Hazard	Laboratory Coat Style			
		Consultation	**Liquid Barrier**	**Flame Resistant**	**Chemical Protectant/ Flame Resistant**
	Consultation[1]	✓	✓	✓	✓
	General[2]	✕	✓	✓	✓
	Biological[3]	✕	✓	✕	✓
	Chemical[4]	✕	✕	✕	✓
	Flammable[4]	✕	✕	✓	✓
	Thermal[5]	✕	✕	✓	✓
	Preferred Color	Any	White	Blue w/ Black Cuffs	Blue w/ Black Cuffs and Black Collar

1. **Consultation Coats** are available for use in public or when patient interaction does not create an increased exposure to infectious material or blood borne pathogens. This coat does not provide personal protection and additional protection (e.g. disposable barriers or other coats) must be used to adequately protect the wearer, when required.
2. **Lab Coats for General Hazard Use** are available for use in laboratories that work with powders, animals, mechanical process, low volume chemical procedures (less than 1 liter of flammable material), biological at BSL 1, radiological hazards, and does not expose the wearer to potential hazards requiring a higher level of protection. General Hazard Use lab coats protection can be increased utilizing additional protection (e.g. disposable barriers, flame resistant coverall/coats, chemical resistant apron or other coats) as needed to adequately protect the wearer. General Hazard Use lab coats must be a medium weight (7 ounce) and a 20/80 (Cotton/Poly) blend or equivalent properties.
3. **Lab Coats for Biological Hazard Use** are work barrier coats which are available for lab workers performing procedures that may expose the wear to infections material, blood borne pathogens and biological material at BSL 2 (e.g. Risk Group 2 or higher). Biological Use-2 barrier coats must meet ANSI/AAMI Classification Level 1 for Barrier Performance as specified in ANSI/AAMI PB70. ASTM F1670 (Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Synthetic Blood) and ASTM F1671

(Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Blood-Borne Pathogens Using Phi-X174 Bacteriophage Penetration as a Test System) also detail applicable testing standards.

4. **Lab Coats for Flammable/Chemical Hazard Use** are lab coats which are available for lab workers performing procedures that expose the wearer to potential risk flame or thermal energy released from chemical reactions when any chemical procedure exceeds 1 liter of flammable material. Chemical Hazard Use lab coats must meet or be equivalent to NFPA 2112/2113. AATCC Method 42 (Water Resistance: Impact Penetration) and ASTM F903 (Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids) also detail applicable testing standards.
5. **Lab Coats for Thermal Hazard Use** are for lab workers performing activities or processes which include but not limited to: pyrophoric material, reactive metals, molten material, high temperature process, combustion, furnaces, sparks, open flames, lasers (class 4), welding, soldering, brazing, and any chemical procedure that exceeds 1 liter of flammable material. Flammable/Thermal Hazard Use lab coats must meet or be equivalent to NFPA 2112/2113 and be selected for the specific hazard. The additional protection must also be selected (e.g. thermal reflective, chemical resistant apron) to effectively protect the wearer when a specific lab coat alone would not.

As previously stated, a single type or style of lab coat may not work for all lab operations.

- Some laboratories or clinics may want to provide a basic cotton or poly/cotton blend coat for most operations and maintain a few lab coats of treated cotton or Nomex accessible for work involving pyrophoric materials, extremely flammable chemicals, large quantities of flammable chemicals, or work around hot processes or operations. If chemical splashes are also a concern, the use of a rubber apron over the flame resistant lab coat is recommended;.
- Other laboratories or clinics may choose to provide a lab coat that is selected for the majority of the hazards and provide disposable compatible coveralls/apron when required for a specific high hazard task.
- All lab coat materials will have a shelf life depending on the fabric, materials used in the lab, how the lab coats are maintained, and the manufacturer's recommendations.
- The lab coat must be chosen to protect the higher hazard in the event of multiple hazards being present while performing tasks
    - a flammable/thermal hazard > a biological hazard
    - a biological hazard > a radiological hazard

Lab Coat Use

When using a lab coat, the following should be observed:

- Wear lab coats that fit properly. Lab coats are available in a variety of sizes. Some lab coat services also offer custom sizes (e.g., extra-long sleeves, tall, petite or gender specific fit). Lab coats should fasten close to the collar to provide optimal protection;
- Lab coats should be worn fully buttoned or snapped with sleeves down; and
- Lab coats must be worn only when in the lab or work area. Remove lab coats when leaving the lab/work area to go home, to lunch, to the restroom, meetings in conference rooms, etc.

Obtaining a Lab Coat

The Supervisor/PI is responsible for determining when and where in the lab PPE is required, including lab coats, and that they are available, utilized and maintained appropriately by lab personnel.

There are several methods in which a lab can obtain lab coats.

- *Rental and Purchase Consultation Coats* – Available for purchase or rental through vendors. This coat does not provide personal protection and should not be utilized as or in place of a lab coat. If consultation coats are being utilized as intended (i.e. only used in public or when patient interaction does not create an increased exposure to infectious material or blood borne pathogens) they may be laundered at local cleaning companies or through the vendor. Contact the vendor for guidance regarding proper laundering.
- *Rental lab coats* - Many laundry companies provide rental coats in a rental/laundry service. The benefits of this type of program are that it limits up-front costs for labs and can include repairs or replacements for coats damaged through normal wear and tear. More information on this type of program offered by Rutgers preferred vendors can be found on in Lab Barrier Coat Preferred Vendor Information (https://ipo.rutgers.edu/rehs/ru-personal-protective-equip)
- *Purchase reusable lab coats* - Lab coats can be purchased from many sources. More information on this type of program offered by Rutgers preferred vendors can be found on in Lab Barrier Coat Preferred Vendor Information (https://ipo.rutgers.edu/rehs/ru-personal-protective-equip) and the University Procurement Services website: https://procurementservices.rutgers.edu) for a variety of coat styles offered by the Rutgers' preferred vendors.
- *Purchase disposable lab coats* - Disposable coats can be purchased from companies such as VWR, Lab Safety, Fisher Scientific etc. In cases where lab coats are rarely needed, or when a type of material not generally available in a reusable style is needed, this can be a viable option.

Laundering of Lab Coats

- Personnel are not allowed to launder lab coats at home.
- Clean non-disposable soiled lab coats routinely by utilizing a specialized laundry service or identified washers and dryers. Frequency of cleaning will depend on the amount of use, contamination, or manufacturer's recommendation.
- The laundering of a lab coat is greatly dependent on its material composition. Contact the vendor for laboratory coat expected lifetime and laundering specific questions. A number of area laundry services provide routine laundering of reusable lab coats. Do not use a local dry cleaner that does not specialize in lab coats as they generally are not familiar with proper handling of potentially contaminated items or they can damage the lab coat by degrading its protective properties.
- Laundry services are not equipped to handle significant contamination of lab coats with hazardous materials, radioactive material, or infections material contamination.
    - **In the event of a significant spill of a hazardous material on the lab coat,** remove the coat immediately. Generally, significantly contaminated coats and clothing will be considered a hazardous waste, and must be managed based on the

type of contamination. If you have questions about potential contamination from a specific incident, please contact REHS.

If skin or personal clothing is also contaminated, appropriately decontaminate by removing any contaminated clothing and washing the affected area by using the sink or emergency shower. Please dial the emergency number for assistance.

Additional Resources

Assistance in performing a hazard assessment and in selecting the proper lab coat is available by contacting REHS (rehs.rutgers.edu).