

Queen's University Environmental Health & Safety



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1. Introduction

The Environmental Health and Safety Standard Operating Procedure for lab coats was developed by the Department of Environmental Health and Safety in accordance with the University's Policy Statement on Health and Safety and to ensure compliance with all applicable legislation.

Lab coats are knee-length outer coats or smocks worn to protect street clothes and skin from contamination from chemical, radiological, or biological agents. This design also provides protection from spills, sprays and other releases of fine particles and liquids.

2. Scope

This SOP applies throughout the University and all off campus sites. This SOP also applies to all faculty, staff, and students who are undertaking studies, doing research, or carrying out any other work that takes place off-campus and is under the purview of the University.

3. Applicable Legislation

Occupational Health and Safety Act
(R.S.O. 1990)

Canadian Nuclear Safety Commission
General Nuclear Safety and Control Regulations

Canadian Nuclear Safety Commission
Radiation Protection Regulations

Health Canada
Laboratory Biosafety Guidelines 3rd Edition - 2004

4. Responsibilities

4.1 Responsibilities of Directors, Department Heads and Managers

Each has the following responsibilities under this standard operating procedure

- Ensure that a written assessment of potential hazards has been completed for all areas under his/her authority.
- Ensure that this SOP is implemented in all facilities under his/her authority.

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- Ensure that all pertinent supervisors, employees and students are aware of this SOP and have been informed of the proper use care and maintenance of lab coats.

4.2 Responsibilities of Supervisors

Supervisors must be knowledgeable about the hazards in their area. They must:

- Ensure that all staff and students are aware of the hazards present and have been informed of the proper use, care and maintenance of lab coats.
- Ensure that workers wear lab coats at all times in areas where skin contamination hazards exist.

4.3 Responsibilities of Staff and Students

Staff and Students must

- Wear lab coats at all times in areas where skin contamination hazards exist
- Maintain lab coats in good condition.

5. Lab Coat Material

Material	Splash Resistance/ Chemical Resistance	Flame Resistance	Comfort	Uses/ Comments
Polyester/Cotton Blend Recommended 65%/35% for chemical research lab setting	Splash Resistant Unknown chemical resistance. Better for work with acids than cotton	No Coats with more cotton will burn less readily.	Lightweight, breathable. The more cotton the more breathable.	Good for clinical settings (hospitals, clinical labs) and labs handling biological materials and small amounts of flammables.)
100% Cotton	Not splash resistant or fluid proof. Degraded by acids. More resistant to solvents.	No. Burns less readily than poly/cotton blends.	Lightweight, breathable	Good for labs where acid handling is limited and splash resistance is not a concern, and there is some work with flammables, heat and flame.

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Material	Splash Resistance/ Chemical Resistance	Flame Resistance	Comfort	Uses/ Comments
				Should supplement with an apron for acid handling.
Cotton treated with flame retardant.	<p>Not necessarily fluid proof.</p> <p>Degraded by acids.</p> <p>More resistant to solvents.</p> <p>Not generally tested for chemical resistance.</p>	Yes	No information	<p>Appropriate for lab settings where there may be a significant fire hazard, with an understanding of the limitations of the testing criteria for flame resistance. May be appropriate to supplement with an apron for acid handling.</p> <p>More costly.</p> <p>Will not lose flame resistance with laundering over typical use life of coat.</p> <p>No bleach should be used by the laundry service.</p>
Dupont Nomex	<p>Unknown splash and chemical resistance.</p> <p>There is a claim for chemical resistance, including acids, alkalis, and most solvents, but specific testing information could not be found.</p>	Yes	Breathable	<p>Expensive.</p> <p>Flame resistance is maintained even with laundering, provided bleach is not used.</p> <p>Good for settings where there may be an arc flash or flash fire.</p> <p>Used in petrochemical industry.</p>

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Material	Splash Resistance/ Chemical Resistance	Flame Resistance	Comfort	Uses/ Comments
Polypropylene lab coat	No	No	Yes	Intended for protection from dirt, grime, dry particulates in relatively non-hazardous environment such as animal handling and clean rooms. Burns readily.
VWR Microbreathe Lab Coat (Disposable)	Splash resistant for blood and body fluids and chemicals.	No	Yes	For clinical and biological lab settings, and some chemical labs. Snap front, so can be readily removed. Not good for settings with significant fire hazard.

6. Lab Coat Selection

In general, protective clothing, including lab coats, should not be used as a substitute for engineering controls such as a fume hood, a glove box, process enclosure, etc., or as a substitute for good work practices and personal hygiene. It may also be necessary to supplement lab coat use with additional protective clothing, for example, a rubber apron for handling large quantities of corrosives or hydrofluoric acid.

Lab coats:

- Provide protection of skin and personal clothing from incidental contact
- Prevent the spread of contamination outside the lab (provided they are not worn outside the lab)
- Provide a removable barrier in the event of an incident involving a spill or splash of hazardous substances

Lab coats are not designed to be the equivalent of chemical protection suits for major chemical handling or emergencies. With the exception of a splash resistance requirement under the OSHA bloodborne pathogen standard, there are no specific requirements in standards or guidelines for the type of protection that a lab

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coat is to provide. What this means is that:

- Lab coats are not tested for typical conditions that might be encountered in a research lab with respect to chemical use, or combined research activities.
- There is little or no information provided by manufacturers or distributors about the capability of a lab coat for a combination of hazards. A coat that is 'flame resistant', such as treated cotton, may not be chemical resistant or acid resistant.
- A coat that is advertised as flame resistant has not been tested with criteria involving flammable chemicals on the coat. The term 'flame resistant' refers to the characteristic of a fabric that causes it not to burn in air. The testing criteria involves applying an open flame to the bottom edge of a strip of fabric in a test chamber for 12 seconds and then looking at char length, after flame, and after glow, testing the self extinguishing properties of the fabric. The flame resistance test criteria were intended to simulate circumstances of a flash fire, or electric arc flash, not a chemical fire.

With the limitations above in mind, lab coats are made of different materials, and it is important to select a coat of appropriate material for the types of hazards in the lab. The first step in this selection process is to determine the types of hazards that exist in your lab and the reasons for the lab coats.

Some questions to consider are the following:

- Does your lab work primarily with chemicals, biological agents, radioisotopes, or a mix of things?
- Are there large quantities of flammable materials or pyrophoric materials used in the open outside a glove box?
- Are there open flames or hot processes along with a significant amount of flammables?
- 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 splash or splatter for the tasks being done?
- What is the toxicity of chemicals used?
- Is there a concern of inadvertent spread of contamination?

Once you determine hazards, you can review information on some typical lab coat materials in the 'Lab Coat Material' (Section 5) and determine options for your lab. One coat may not work for all lab operations.

Some people may want to provide a basic Poly/Cotton blend coat for most operations, but have available lab coats of treated cotton or Nomex for work involving pyrophoric materials, extremely flammable chemicals, or large quantities of flammable chemicals. If chemical splash is also a concern, use of rubber apron over the flame resistant lab coat might be an option for these circumstances.

There are also options for reusable, limited use, or disposable one time use lab coats.

6.1 Lab Coat Closures

Lab coats typically opened at the front and close using buttons, zippers or snap closures. Snap closures are



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recommended since they can be removed quickly in the event of fire, chemical, radiological or biological spills.

Lab coats must be worn completely "buttoned" up.

6.2 Lab Coat Pockets and Slits

Coat pockets should be conveniently placed preferably NOT with side-slits that allow easy access to any pocket worn underneath.

6.3 Lab Coat Sleeves

Lab coats are provided with long sleeves to protect the upper and lower arms. Lab coats should never be worn with the sleeves rolled up.

If there is a hazard with lab coat sleeves becoming entangled/catching on equipment lab coats with knitted/elasticised cuffs may be purchased.

Short sleeved lab coats should NOT be used in laboratories.

6.4 Lab Coat Length

Lab coats should extend to or slightly below the knee. Any exposed skin below the lab coat must be covered.

7. Use of Lab Coats

Wear lab coats only in the lab or work area. Lab coats must be removed when leaving the lab/work area to go home, to lunch, to the restroom, or meetings in conference room.

Lab coats must be worn when transporting hazardous materials outside of the laboratory.

Take care when putting your lab coat on in the lab to ensure that it doesn't hit many materials or equipment.

Chemical Laboratories

Lab coats must be worn by all lab personnel whenever the assessed hazard is present.

Radioactive Labs

Lab coats must be worn by all personnel when working with open source radioactive materials in Basic or Intermediate labs. All personnel must wear lab coats at all times in High level labs.

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Biohazardous Labs

Lab coats must be worn by all personnel working in any biohazard laboratory.

8. Storage of Lab Coats

- Laboratory clothing must not be stored in contact with street clothing.
- Used lab coats, when not in use, must be stored individually (eg not more than one coat per hook).
- For **Undergraduate labs**: Alternate storage (e.g. turn inside out and store in plastic bag)

9. Cleaning/Laundrying Lab Coats.

Lab coats should be cleaned routinely, by use of a professional laundry service. If lab coats cannot be decontaminated prior to cleaning, ensure that the cleaner is aware of the type of contamination.

10. Disposal of Lab Coats

Lab coats that are grossly contaminated must be disposed of as per the waste disposal policy. Coats contaminated with biohazardous materials must be decontaminated prior to disposal.