

## FIREHOUSE SUPPLEMENT



# Turnout Gear & Equipment Cleaning

When it comes to creating a decontamination laundry area at a firehouse, it's essential to know the basics and to plan ahead.

O

by Robert Mitchell

ver the past few years, the fire service has learned much about the dangers of contaminants that travel from the fire scene back to the station. Research and experience have taught us that a well-designed decontamination space in the station is essential to firefighter health and safety. The layout of the decontamination laundry can support decon protocols for the cleaning of personnel and PPE returning from the fire scene.

### Some basics

Our current understanding of the health risks to firefighters and the importance of decon has much in common with the transformation of healthcare practices that occurred in the 19th century. That was a time when practitioners began to more fully understand how infections spread. Doctors who proudly wore bloodied aprons

through their long days of surgery learned to change surgical gowns and to wash their hands between patients. Instruments were cleaned using newly designed sterilizing equipment. Surgical suites were modified for ease of cleaning. Incidents of infection decreased.

Today in the fire service, our understanding of the risks that are posed by exposure to toxins and carcinogens has led to new protocols at the fire scene and a significantly greater emphasis on decon at the station. Whether building a new facility or retrofitting an older station, it's essential for those who are involved in the design of the facility to understand operational needs and how to scale the decon laundry area to meet those needs. The area that's set aside for decon can vary in size from around 500 sq. ft. to more than 1,000 sq. ft. This is determined by operations, size of staff and frequency of fires.



## Installation & Maintenance Tips



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Without careful planning, one might find oneself shoehorning in a washer, only to find out that it can't be serviced (because the space doesn't accommodate it), that the drainage system can't handle the flow or that wall surfaces don't stay clean because of exposed piping or a rough finish.

### Decon laundry plan: area by area

Best practices of a proper decon laundry include:

*The Pathway.* Members who are returning to the station should enter directly into a gross decon area, then the laundry, the showers that



Gross decon area elements are metal shelving, a tub sink and a gross decon chamber.

### Countertops and Shelving

- Should be made of stainless steel for easy cleaning
- Some should be deep enough so PPE can be laid out without falling to the floor

### Surfaces

- When possible, install smooth surfaces; they are particularly easy to clean; watch out for nooks and crannies that can harbor dirt and germs
- All piping should be buried in the wall to ensure smooth, easily cleaned walls
- The ceiling is difficult to clean and often is neglected; consider a washable suspended ceiling
- Install sanitary coving at the wall and floor junction

### Clearances

- Required equipment maintenance defines acceptable clearances; absolutely follow manufacturer specifications, which can vary from one to the other
- Watch room door sizes; future and potentially larger equipment might require wider door openings

### Anchoring and slab requirements

- Equipment anchoring isn't trivial; anchors must be strong enough to secure a washer/extractor that can weigh 4,500 lbs. or more and can produce significant G-force during extraction; always be sure to refer to manufacturer recommendations
- The slab under the washer/extractor must be designed specifically to handle the load

### Plumbing and drainage

- Make sure that the plumbing engineer is aware of all of the specifications before work starts
- A typical 65-lb.-capacity machine discharges approximately 25 gallons or more of water in 30 seconds at the start of extraction; drainage must accommodate that
- Laundry equipment manufacturers generally prefer trench drains; stainless steel is preferred; it should be in-slab for new construction but can be an above-slab box for renovation





Failure to plan plumbing and bury it in the wall leaves a room impossible to keep clean.

have clean clothes lockers and the living area. The end result of all of this is members entering the Cold Zone of the station are clean and ready either to participate in a debrief session, to return to the station living quarters or to return home.

*Location, Location, Location.* It's essential that the decon laundry is located in the Hot Zone, so there's no need for personnel to cross into the Warm or Cold Zones for the decon process. The decon laundry must be separated physically from the apparatus bay and from the administrative/living space of the station. In addition, contaminants should be kept inside of the decon area by

## Key Messages

Members of the department know its operations. Get them involved early and keep them involved through construction.

How all of the parts and pieces fit together must be understood, so the decontamination area layout and equipment support the department's protocol, properly address health and safety, and are easy to maintain. By designing a well-thought-out and properly equipped decon area, the importance of the decon process is demonstrated to staff and the public.

### Remember:

- Determine your protocol and design to it
- Evaluate the required throughput rate and number of people in the space
- Allow for ergonomics of the tasks
- Consider proposed and future equipment
- Understand manufacturer requirements
- Design the area so that it's easy to clean, and keep it clean

maintaining a negative air pressure differential via correctly designed ventilation.

The ventilation rate in the decon laundry when it's occupied should be six air changes per hour. An occupancy sensor should be installed to determine when it's time to turn the fan to the higher rate.

### Gross decon area

The central elements of this space are metal shelving to hold contaminated PPE, a general-purpose tub sink that includes drip-dry racks and a gross decon chamber that has a high-volume hand sprayer (the kind that might be found in a commercial

kitchen). A washing machine or ultrasonic cleaner for SCBA face masks, air bottles, and helmets often is included.

### Laundry area

Once member gross decon is complete, the laundry area of the station comes into play.

Two kinds of washers are located here: a washer/extractor that's designed for decontaminating PPE and a residential washer that can produce higher temperatures for suitable PPE and members' personal clothing that was at the incident scene (see "Hot Picks: Clothes Washers & Dryers," [firehouse.com/21256885](http://firehouse.com/21256885)).



The laundry area of a firehouse should include a washer/extractor that's designed for PPE and a high-temperature residential washer for suitable PPE and personal clothing.



Failure to plan proper spaces in a firehouse's decon laundry area can lead to equipment being installed in a way so that it can't be repaired without the removal of both the disconnect and the machine.





Privacy is a vital element of the design of Hot Zone showers and lockers.

Because toxins from the fireground can pass through PPE and undergarments and can enter the skin, undergarments should be washed at the station in the decon area. They shouldn't be washed in the living quarters nor sent home for laundering, per *NFPA 1851: Standard on Selection, Care, and Maintenance*

*of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting.*

Determining the size of the washer/extractor that's required should happen during programming before the design process of a new station begins. Be sure to consult NFPA 1851 recommendations.

A washer/extractor that has a capacity of 60–65 lbs. can meet the needs of many departments, but the choice should be based on the size of staff and the number of calls for the department.

Individual manufacturer recommendations for machine capacity might vary, so ask questions and be careful not to oversize. Bigger isn't always better. If your typical laundry load is too small for the size of the machine, the load can become unbalanced and make for extra wear and tear on seals, bearings and bushings. In the same vein, don't undersize the laundry load. A load that's too big for the machine can decrease the effectiveness of the cleaning process.

Whenever selecting and installing any equipment, be sure to follow all manufacturer recommendations and to understand and follow specifications. That said, not all manufacturers publish such information. If that's the case, demand it. Keep in mind that the more that you know, the better the questions that you can ask.

Plan for soap storage. This might seem as though it's a minor matter, but far too often, containers that feed the machine and that are stored for future use end up on the floor of the room, which can create trip hazards and cleanup problems.

You must consider time, space and air-contamination issues that are related to gear dryers. There are two basic types of gear dryers: the externally vented cabinet and the tubular, internally vented rack. As much as 40 percent of polycyclic aromatic hydrocarbons (PAH) that can contaminate PPE on the fireground remain in the gear

after washing. Rack drying can be a quick option, but contaminants that remain in the gear will vent directly into the room. A solution that's used in some stations is to locate racks in a separate drying room that can be ventilated out of the station.

Typical time for the gear washing process is 45 minutes, but drying of the gear can require 2–3 hours. To address this time difference, install hanging racks for the gear that's waiting for dryer time. Tubular racks in a separate room allow minimum turnaround time while not reintroducing contaminants into the air stream.

## Shower and locker area

Next to the effectiveness of personnel decontamination, privacy is a number one concern in the shower and locker area. To address the matter, one should include individual shower stalls that are enclosed with doors that are designed to ensure privacy. Those who are involved in the design of the stalls should include a dry area for dressing. Beyond that is a curtained shower.

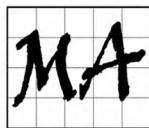
Nearby to all of this should be a locker area where each firefighter can keep street or station clothing to bring into the shower stall for changing. ■



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