



WHITE PAPER

A Guide to Cleaning and Sanitation of Firefighter Turnout Gear

What You Need to Know to Meet
NEPA 1851 Guidelines

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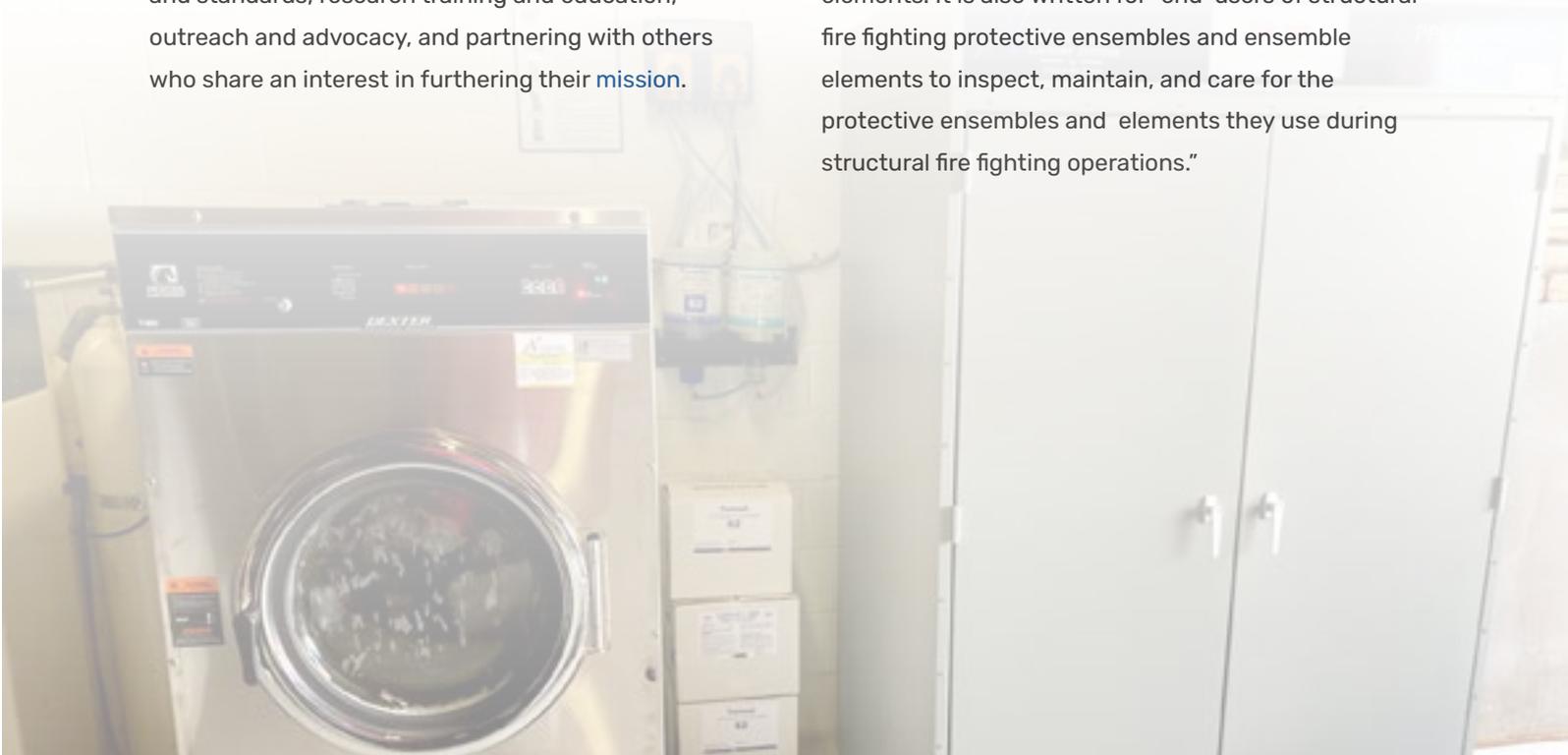
NFPA requirements regarding the cleaning of PPE equipment

Fire outbreaks today are more dangerous than ever. Buildings are built with a lot more than just wood, bricks, and glass. When flames interact with synthetic material, electronic equipment, and plastic, it causes carcinogens to be released into the atmosphere.

Once released, these carcinogens can lead to fatal illnesses, including [myeloma](#), [non-Hodgkin lymphoma](#), [prostate](#), and [testicular cancers](#). Firefighters are vulnerable to disease not only because pathogens are in the air, but they can also stick to exposed gear, ultimately passing onto the skin and into the bloodstream.

The National Fire Protection Association (NFPA) was established in 1896 as a self-funded, nonprofit organization focused on eliminating death, injury, property, and economic loss due to fire, electrical and related hazards. They deliver information and education through more than 300 consensus codes and standards, research training and education, outreach and advocacy, and partnering with others who share an interest in furthering their [mission](#).

One of the critical standards first delivered in 1971 was the NFPA 1851 Standard on Protective Ensemble for Structural Fire Fighting, NFPA 1971. Over the years, the standard has been updated to include the risks emergency responders face and, among other things, their specific needs for protective clothing and related elements. It is also written for “end-users of structural fire fighting protective ensembles and ensemble elements to inspect, maintain, and care for the protective ensembles and elements they use during structural fire fighting operations.”



Introduction to the NFPA 1851 standard

Under the 2014 ruling, the NFPA 1851 required fire departments to conduct advanced cleaning of firefighter PPE at least once a year but indicates clothing should be cleaned whenever contaminated or soiled.



For the 2020 edition of the standard, the program requires two advanced cleanings each year. Protective clothing should be subject to advanced cleaning whenever exposed to combustible products, such as smoke particulates and fire gases.

These updated requirements for fire departments in selecting, caring, and maintaining firefighter protective clothing and equipment detail how PPE should be cleaned.

The standard also requires fire departments to develop written SOPs (standard operations procedures) describing the program's components and defining roles and responsibilities. Specifically, NFPA 1851 establishes needed criteria for setting up a program to reduce potential safety and health risks due to poorly maintained, contaminated or damaged protective gear.

The program covers selection, inspection, cleaning and decontamination, repair, storage, retirement, and record keeping. While several detailed specifications are in place, this white paper will discuss PPE maintenance and cleaning specifics.

Summary points of the NFPA 1851 rules and regulations

Highlights to note* :

- You should provide documentation on the steps taken by the organization to ensure PPE in service continues to provide sufficient protection, including details on what to do in case of injury or loss of life.
- Perform a risk assessment before any purchasing to determine the PPE is suitable for the hazards most likely to be faced by your department.
- Perform routine inspections to look for soiling, contamination, physical damage, missing items, and loss of seam integrity. It also requires a more detailed assessment of the garments' separable layers, including the moisture barrier.
- Repairs must be performed by the original manufacturer, a verified, trained service provider, or a trained individual in your organization.
- Identify the parties responsible for the routine cleaning of their issued gear and instructions on cleaning and drying based on the manufacturer's recommendations. It also recommends advanced cleaning for soiled or contaminated equipment before it is used.
- Storage requirements are also detailed regarding the necessity for gear to be cleaned and dried before storage in a well-ventilated area (i.e., drying cabinet) and hung to limit the damage caused by folding. Several points are also noted about where not to store your gear.
- Lastly, standards are set for the retirement of gear (no more than ten years from the date of manufacture) and when components of the radiant reflective outer shell are a max of 5 years. It also states that items must be retired if they are not compliant with the NCPA standards or are worn, damaged, contaminated, or defective beyond repair.

While the updated requirement creates some challenges for many fire departments that are currently not staffed with the resources to provide frequent cleaning of turn-out gear, AAdvantage Laundry Systems is working to [provide solutions to support the new standard](#).

[Contact us](#) to learn more about how washer-extractors, dryers, and drying cabinets can help limit exposure to harmful carcinogens and extend the life of your personal protective equipment.

Challenges to turnout gear for fire departments

As noted, firefighters are constantly exposed to hazardous contaminants such as chemicals, bodily fluids, and other elements absorbed in the skin, causing a danger to themselves, the public, and the protective gear. Some substances, like polycyclic aromatic hydrocarbons (PAHs), can even cause DNA mutations and cancer caused by smoke. Your fire department can't meet all the safety and sanitation guidelines needed to protect firefighters and their families without thoroughly cleaned gear.

NFPA guidelines are specific about what must be cleaned and how often, but the missing element is knowing how laundry machines can affect PPE equipment and how to use them properly.

Based on the standard, proper cleaning creates challenges to fire department laundry (i.e., washing and drying gear without damaging the protective fibers). Below is what you need to know about specific types of machines for PPE:

Challenge 1: Cleaning Can Not Harm the Fabric

Due to the danger the contaminants cause, specific washing guidelines are required to purge the gear. However, speed and power on their own are not the answer. Machines that are not calibrated for the type of gear may end up gear fabric, thereby lowering its protective qualities and increasing the danger firefighters already face. We recommend only using programmable washers and air drying equipment designed for this type of cleaning.



Challenge 2: Know Your Guidelines and Be Prepared to Follow Them

The NFPA publishes more than 300 consensus codes and standards to reduce the possibility and effects of fire and other risks. The NFPA 1851 standard is intended to outline advanced cleaning of PPE gear and includes frequency, machine considerations, detergent selection, and other advanced cleaning programs. You should know that the most commonly available commercial laundry equipment is not made for firefighter use. Machines like the [Dexter's 100 G Series Washers](#) and the [Circul Air Express PPE drying cabinet](#) are designed to remove contamination without damaging the fabrics. These units are programmable with lower washing speeds and speed cycles calibrated to meet the washing guidelines of the NFPA.

Challenge 3: Equipment Must Be Available without Downtime

24 hours a day, 7 days a week. It's the nature of a firefighter's job. People's lives depend on it as well. Proper equipment means ensuring their gear is ready whenever the call arrives. Uptime is a necessity, not a choice.

Highly programmable laundry equipment is the best and most efficient way to ensure firefighter gear is clean and safe when it matters most. Programmable controls might include:

- For PPE: Low wash and extract cycles
- For towels, sheets, and other clothing: High speeds and fast drying times
- Temperature and water level control
- Additional rinse cycles



Specific laundry equipment, such as the [Dexter 100 G Series Washers](#) and the [Circul Air Express PPE drying cabinet](#), works by removing pathogens from your crew's gear. They are designed with [industry-specific cycles, temperature recording, and fire response systems](#). These units decontaminate your equipment while curtailing damage and the life of the gear.

5 Benefits to Cleaning Firefighter Turnout Gear with a Washer Extractor

Firefighter gear requires proper washing to remove contaminants and reduce firefighter's exposure to carcinogens. Experts recommend cleaning turn-out gear with washer extractors—commercial grade laundry machines designed to effectively remove soot, chemicals, and even bodily fluids from soiled gear while preserving its protective qualities.

Here are just a few of the specific benefits of using washer-extractors instead of residential or other types of washing machines when cleaning firefighter gear.



Ease of Use

Most washer-extractors feature simple one-touch operation. Simply select a cycle, and the extractor will calculate the optimal cycle time, water temperature, and detergents to ensure proper cleaning of your gear. At AAdvantage Laundry Systems, you'll find a range of [Dexter](#) and [Continental Gibrau](#) machines with easy programming functions that provide consistent cleaning results. These washers also allow for automatic chemical injection, thereby reducing the risk of damage to your gear by overuse of detergents.

Compliance with NFPA Requirements

The National Fire Protection Association requires that fire protection gear be cleaned according to specific standards. These standards are regularly updated as new protective fabrics are developed. The washer-extractors at AAdvantage Laundry Systems meet or exceed the following NFPA washing requirements:

- The machines must be front loading
- They must have a maximum water temperature of 105 degrees Fahrenheit
- Use a pH neutral cleaner
- Requires a 100 G-Force maximum, and
- Forced ventilation air

Programmability

Firefighters' boots, gloves, masks, and self-contained breathing apparatuses must be laundered according to precise manufacturers' guidelines to prevent damage. Our washer-extractors allow you to choose from different programmable cycles to wash various items according to NFPA personal protective equipment (PPE) cleaning standards.

Reduced Health Risks

Burning materials produce carcinogens that can significantly increase a firefighter's risk of developing brain, skin, colon, prostate, and stomach cancers. Some residential washing machines may be too harsh for protective fabrics, while others may not be powerful enough to remove carcinogens effectively.

Using a washer extractor eliminates the guessing game and limits the spread of potentially life-threatening contaminants. Simply toss your equipment into the washer extractor, add your pH-neutral cleaner, select the desired preset cycle, and push start.

Large Capacity

A washer-extractor offers up to 30 times the capacity of a residential washing machine. This larger capacity, combined with high-speed centrifugal spinning force, translates to less time washing and drying personal protective equipment (PPE).

Safety and Protection are our Top Concerns

When cleaning firefighter gear, a careful approach must ensure thorough decontamination and maintain protective fabrics' integrity. Our team of commercial laundry professionals can help you find a suitable washer extractor for your needs.

Contact [AAdvantage Laundry Systems](#) to learn more about how a washer-extractor can help limit exposure to harmful carcinogens and extend the life of your personal protective equipment.

Frequently asked questions about extractors and turn-out gear

The following questions are most asked from our fire department customers regarding cleaning their turn-out gear.

What is the difference between hard mount and soft mount washer-extractors?

There are no springs or shock absorbers in a hard or rigid mount washer. The machine is secured to the concrete floor using bolts, and it is anchored to a concrete or steel slab, which is subsequently bolted to the floor. Because the foundation must be fortified, it cannot be used on hardwood floors or in basements unless steel or concrete is installed beneath them. The slab beneath it must be firm; otherwise, your floors will break, and your equipment will cause structural damage to the building.

Soft-mounted washers, on the other hand, do not need to be belted to a surface. Internal suspension and shock systems in soft-mount washers absorb up to 97 percent of vibrations. Soft-mount machines can be installed over basements on the second floor and in other areas where space is limited. Simply set the soft-mount washer on the floor, level it, connect the utilities, and you are ready to use it.



Safety and Protection are our Top Concerns

Your team will need to determine how many sets of gear you would want to wash at a time. In addition to determining the requirement for a new commercial washer for your gear. We usually recommend the following sizes:

- 20 lb. Washer – 2 sets of gear
- 30 lb. Washer – 3 sets of gear
- 40 lb. Washer – 4 sets of gear
- 60 lb. Washer – 5 sets of gear
- 80 lb. Washer – 5 sets of gear
- 90 lb. Washer – 9 sets of gear

While these are recommendations, it isn't exact because larger pieces of bunker gear take up more space. Outers and liners must be cleaned separately as well.

Is your department using too much or not enough chemicals on each load?

A washer-extractor with an automatic chemical injection can automatically inject the exact amount of cleaning chemicals at precisely the right time in the wash process and water temperature in the wash process. Fire departments must choose a washer-extractor with this feature because it prevents chemical overuse and damages the fabric – and it saves the department money through mere efficient use of these chemicals. Our professionals can program your cycles and place a reference chart showcasing what each cycle is intended for after the specific cycle is selected. The internal programming takes over to ensure the turn-out gear is cleaned properly.

Click to download the Infographic: FAQ Extractors and Turn-out Gear for Fire Departments

Heavy-duty washer-extractors from AAdvantage Laundry Systems are designed to handle your firehouse's largest laundry loads – including turn-outs, bed linens, towels, mats, coveralls, and more. Our Dexter commercial laundry equipment will also help you meet NFPA laundry guidelines and increase the life of Personal Protective Equipment (PPE) through proper maintenance and cleaning.

Frequently Asked Questions About Extractors and Turnout Gear For Fire Departments

What are NFPA 1851 Guidelines?

The National Fire Protection Association provides a set of guidelines for fire departments to ensure that their protective gear is properly maintained. This includes cleaning, inspecting, and repairing turnout gear. NFPA 1851 also provides a checklist for fire departments to ensure they are following the guidelines.

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What's The Difference Between Hand-Mount & Soft-Mount Washer-Extractors?

Hand-mount washers are designed to be used in a firehouse or other facility where space is limited. They are typically smaller and more compact than soft-mount washers. Soft-mount washers are designed to be used in a firehouse or other facility where space is not limited. They are typically larger and more robust than hand-mount washers.



How Many Sets of Turn-out Gear can you Wash at a Time?

The number of sets of turn-out gear that can be washed at a time depends on the capacity of the washer-extractor. AAdvantage Laundry Systems offers a variety of models with different capacities.

- 2000 Washer - 2 sets of gear
- 3000 Washer - 3 sets of gear
- 4000 Washer - 4 sets of gear
- 5000 Washer - 5 sets of gear
- 6000 Washer - 6 sets of gear



Is your department using too much or not enough PPE chemicals on each load?

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Dexter On-Premise Laundry for Firehouses

Dirty, soot-covered turn-out gear used to be a badge of honor, and it was a sign of courage and willingness to put your life on the line. However, fires today are more dangerous than in the past. The days of solid wood and natural fibers have given way to synthetics and plastics, making for hotter, faster, and more dangerous fires filled with carcinogens. In this new environment, clean gear has become a vital part of the job.

We understand the importance of cleaning your gear correctly to ensure that it continues to keep your crew safe. All of Dexter's products are designed, built, and assembled in the US at Dexter headquarters. We employ local firefighters as engineers, welders, assemblers, and service technicians. We take their safety and yours very seriously. That's why all Dexter washers & dryers are designed to meet the NFPA 1851 guidelines.



The products you need to be NFPA 1851 compliant

Dexter products are designed to show up work cycle after cycle in even the harshest environments. Designed to meet NFPA 1851 guidelines, Dexter machines are durable yet flexible enough to handle all of your firehouse needs. PRODUCTS TO FIT YOUR NEEDS Choose between Dexter's state-of-the-art O-Series control or standard 6-cycle control with simple, programmable options to fit your laundry needs.

Ultimate flexibility industry-specific cycles

Dexter O-Series controls offer preset cycles specific for turn-out gear and other firehouse laundry. With 100 programmable cycles and many customizable options, you can create any cycle you need. All of the programming options are easy to set using DexterLive.com. TEMPERATURE RECORDING Temperature recording is available on select O-Series washers to ensure that NFPA 1851 guidelines are met.

Peace of mind safe turn-out gear cycles

Correctly cleaning your turn-out gear is vital to your crew's safety. All Dexter washers are available with low extract speeds, and Dexter dryers offer no-heat cycle options to keep your gear safe and clean. Preset turn-out gear cycles are available on O-Series washers. FIRE RESPONSE SYSTEM O-Series dryers feature Dexter Fire Response System which senses when a load is unexpectedly increasing in temperature. Water-based response models are available.

Quality you can trust proven reliability

Every washer model is designed to withstand Dexter's extreme 1,000-hour test, running at maximum extract with an extreme out-of-balance load. INDUSTRY-LEADING WARRANTIES Our industry-leading warranties cover the major components on Dexter washers for 10 years and dryers for five years, and a 3-year parts warranty covers the rest. Plus, all of Dexter's products are backed with lifetime technical support.

Summary: NFPA 1851 compliant laundry equipment

While there are several commercial washers and dryers available on the market, your crew needs a system that can clean gear quickly and efficiently, making it available for emergencies as they happen. As a leading distributor of commercial laundry equipment for firefighters, **AAdvantage Laundry Systems can provide the top equipment for fast wash and drying times along with specific product features that remove dangerous chemicals and carcinogens.**

Specific on-premise laundry equipment, such as [Dexter washers](#), [Dexter dryers](#), and [Circul-Air PPE drying cabinets](#), remove pathogens from your crew's gear and come with [industry-specific wash cycles](#), [temperature recording](#), and [fire response systems](#). These decontaminate your equipment while minimizing fabric damage, extending gear life, and saving you from spending on constant repairs to your machines.



That's not all. We understand that firefighters' turn-out gear requires adherence to safety protocols. Hence, we comply with NFPA 1851 (National Fire Protection Association) rules and regulations when providing service to fire stations.

Moreover, being a full-service provider, our certified representatives can guide and train your personnel in laundry procedures from start to finish.

As part of our firehouse solutions, our experts deliver the equipment to your station's doorstep, install dispensing equipment, set up appropriately timed wash cycles, and provide you with valuable tools to help you work with our commercial washers and dryers.

We can also provide biodegradable, antibacterial disinfectants, as well as automatic chemical injection pumps.

Firefighters are heroes. They risk their lives by jumping into burning buildings and rescuing them from dangerous situations. Offer them the best protection possible in the aftermath of exposure to fire through decontaminated gear.



**Contact us today for a no-obligation review of your
fire department's laundry needs.**



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*This is an overview, and not an exhaustive list or details of processes. Refer to the NFPA
standard for detailed information and processes.
<https://www.nfpa.org/overview>*