

A case for cleaning firefighting gear on premise

Here is a look at why two metro fire departments pulled their turnout gear cleaning and inspection in-house

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By Bill Brooks

Fire departments should be well-versed in the hundreds of codes and standards laid down by the National Fire Protection Association. One of these standards, [NFPA 1851](#), focuses specifically on reducing health and safety risks associated with personal protective equipment.

Whether departments send gear to an outside provider or launder and inspect on-site, cleaning to NFPA 1851 standards ensures any lingering toxins and carcinogens that could cause further harm to firefighters' health are removed and that PPE properties remain intact.

According to the Firefighter Cancer Support Network, firefighters are at a significantly higher risk for developing multiple cancers than the general population. The organization also notes in a 2013 white paper that firefighters are developing far more aggressive types of cancers at a younger age than the general population.

This provides further indications that the cancer could be a result of firefighting and the carcinogens that remain on the gear.

NFPA 1851

With the wellbeing of firefighters in mind, NFPA 1851 "establishes requirements for the selection, care, and maintenance of firefighting protective ensembles to reduce health and safety risks associated with improper maintenance, contamination, or damage."

This standard not only covers recommendations for garments, but also includes helmets, gloves, footwear and interface components. NFPA 1851 also outlines the proper way to inspect, test and repair gear — tasks that must be performed by a trained professional.

When it comes to proper cleaning, NFPA 1851 states wash temperature cannot exceed 105°F, and extraction speed must not exceed 100 G-Force in order to protect the safety properties and integrities of high-tech fibers.

High temperatures are not allowed during the drying process, either. Also, gear must be routinely cleaned every time it comes into contact with fire, and an advanced inspection of PPE should occur at least once every year.

Outside services

Because gear cannot be washed in the home, at a commercial dry cleaning facility or at a public laundry, fire departments commonly rely on an outside Independent Service Provider for the annual inspection. An ISP can also make repairs and remove harmful contaminants and carcinogens that become embedded in gear and could pose potential health risks.

This service is in addition to the routine cleanings commonly conducted at individual fire stations with the proper laundry equipment, alongside the partners and expertise needed to easily meet guidelines.

All fire departments follow NFPA standards to the best of their ability, but pressure is higher in Texas where following NFPA 1851 is mandatory. Ensuring regulations are met, and that firefighters' health is protected, is the responsibility of Fred Jandrucko, the captain of the Fort Worth (Texas) Fire Department.

After considering the financial benefits of internally maintaining PPE, the department purchased its own laundry equipment and implemented in-house advanced cleaning in 2009. Jandrucko says the department now has the ability to effectively clean, inspect and repair the city's 980 sets of gear in a central location from 42 stations, and address soiled turnout gear quickly.

"Fort Worth is the only fire department in the nation certified to perform advanced cleaning of PPE," says Jandrucko. "As a verified service provider we have the equipment and the resources to meet the 2014 edition of NFPA 1851, and protect the health of our members at a department facility."

Milwaukee goes in-house

The Milwaukee Fire Department also has the staff and equipment required to perform inspections and cleaning. Dan Schubring, inventory control specialist for the city's fire department, was hired specifically to oversee the maintenance of approximately 2,000 sets of turnout gear for the city's 39 fire stations.

The Milwaukee Fire Department employs 950 members, each with two sets of PPE that go through a thorough inspection and cleaning at the fire department's in-house laundry center once a year. The department has had this capability since July 2013.

"All fire departments and ISPs do their best to follow NFPA standards and procedure manuals, even if adherence is not mandatory," says Schubring. "For Milwaukee, doing our best meant purchasing equipment to get the job done at our own facility."

Jandrucko's team in Fort Worth handles an average of eight sets of turnout gear per day. In Milwaukee, Schubring oversees the maintenance and repair of up to three sets of gear per day. The process for following NFPA 1851 is essentially the same across the two departments.

Employees hired specifically for the job follow a schedule designating which gear is to be picked up and at what station(s). Back at the department's laundry facility, gear is inspected for contamination, recorded on inspection sheets and tagged. Then, it's broken down and sorted by type (liners and shells).

Next, gear of the same type is washed together. Advanced washer-extractors — one in Fort Worth and two in Milwaukee — are automatically programmed to dispense the correct wash formula depending on the material, temperature and soil type. Detergent is dispensed below the water level and never directly onto turnout gear.

Drying time

Once the wash is complete, Jandrucko and Schubring can print a report to ensure water temperature did not exceed maximum temperature regulations and also view other performance data, such as start time, stop time and idle time between cycles for easy labor monitoring.

"The report gives me peace of mind," Jandrucko says. "Another benefit of the advanced washer-extractor is that it drains much faster than the one we had previously, so we can process more gear, more quickly each day."

Next, gear may be hung in a conventional drying rack that pumps air through with a fan — using no heat. This process can take anywhere from overnight to 24 hours to dry gear. To get the job done more efficiently, the Milwaukee Fire Department purchased two PPE drying cabinets designed specifically for the fire industry.

A drying cabinet circulates heated air to not only dry the outside of gear, but the inner lining and its moisture barrier. This is a crucial step, as any remaining moisture on an inner liner can create steam burns if high temperatures are reached during a fire.

Additionally, a drying cabinet's preset programs allow workers to select temperature and time, while staying under maximum heat guidelines. In an efficient drying cabinet, six sets of gear can be ready to use in as little as three hours.

"Since the drying cabinets are designed specifically for the fire industry, we know they are operating within NFPA parameters while gear dries as quickly as possible," says Schubring.

Cost savings

Once gear is dry, verified personnel inspect gear for wear and tear or loose Velcro and make repairs if necessary. A complete liner inspection with water pressure, or a hydrostatic test, may also be performed at this time to locate any specific damage or holes.

At a cost of approximately \$200 per set to send gear out for cleaning, and even more if significant repairs are needed, Jandrucko estimates the on-premises laundry saves the department \$150,000 annually. He arrived at that savings estimate by tabulating the cost of sending 1,750 sets of turnout gear out for cleaning and repair each year minus the cost hiring two technicians and buying supplies — about \$87,500 per year.

While these savings are a nice advantage of having an in-house laundry, both Jandrucko and Schubring are more concerned with their enhanced ability to quickly remove potentially cancer-causing toxins from turnout gear.

"I'm well aware of the risks our members face every day as they perform their life-saving duties, and it's my job to put preventative measures in place," Jandrucko says. "It's crucial that we are able to immediately address a contaminated garment that needs special attention, bag it up and get it washed quickly."

Schubring adds, "With member safety on the line, we don't take any short cuts when it comes to treating gear. Fortunately, we have the ability to inspect, wash, and repair gear, and get it back to the firehouse as soon as possible."

Advanced equipment also allows the Fort Worth and Milwaukee fire departments to extend the lifetime of expensive gear and protect its safety properties. According to Jandrucko, a head-to-toe set of turnout gear costs approximately \$2,600 and its expected life, according to NFPA 1851, is 10 years. That lifespan is rarely met, he says.

"By getting a better clean the first time, negating the need for multiple washes and more wear, we're able to prolong the life of our gear closer to that 10-year mark," says Schubring.

About the author

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