



White Paper

Changing the Narrative: Cultivating a Culture of Clean in the Fire Service Industry

The stakes are high in the fire service industry—the hazards facing firefighters are undisputed; yet they are also facing unseen threats. Emerging research about these threats, carcinogens chief among them, are prompting the entire industry to rethink how it cleans and maintains PPE. Once dirty gear was seen as a badge of honor, this white paper outlines why clean gear is important and provides actionable tips on how to implement that culture shift in your own firehouse.

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In the past, a firefighter's dirty turnout gear was seen as a badge of honor. It was a display of experience, an illustration of hard work, a marker of duty. The more soiled the turnout gear, the more accomplished the wearer appeared. Today, however, that sentiment is undercut by new research, which shows soiled turnout gear retains toxins that negatively impact the health of firefighters. These toxins have been linked to an increased likelihood of brain, digestive tract, genitourinary tract, and lymphohematopoietic organ cancers and double the chance of mesothelioma^{1,2}. Wearing unwashed turnout gear not only puts a firefighter in direct contact with potential carcinogens but expands the exposure risk to include everyone who comes into contact with the unwashed gear while spreading carcinogens to other environments. Proper cleaning procedures for turnout gear, therefore, are instrumental in supporting the ongoing health and well-being of those who risk their lives to protect us.

The New Landscape of Firefighting Hazards

Most firefighters are aware of the occupational hazards facing the fire service industry; however, as our understanding of those hazards evolves so has our understanding of their lingering impacts.

In the past, the primary hazards facing firefighters were heat and flames. As we progress as a society, incorporating modern conveniences and technological advancements into everyday life, manmade building materials and plastics are increasingly used. When those manmade materials burn, they off-gas hazardous toxins, which can have harmful impacts when they come in contact with human skin or are inhaled³. Because of this, firefighters continue to contend with the clear dangers of heat and flames while also dealing with a lesser-known but potentially more harmful hazard—carcinogens.

Carcinogens are cancer-causing radicals, which can be transmitted to objects and people simply through exposure to the particles and can greatly increase the risk of other illnesses. Due to the regular exposure of these toxins over the course of their work, firefighters have a higher risk of getting cancer. In fact, cancer was responsible for 70% of career firefighter deaths in 2016 alone and has been the leading cause of firefighter death since 2005^{4,5}.

Carcinogens from a fire can linger on unwashed gear, tools, skin, hair, and vehicles long after leaving a call site—a longer exposure period than many expect. Because of this, firefighters certainly experience an elevated risk, and their colleagues and families may face an elevated risk, of exposure to cancer-causing radicals. While awareness is an important step

towards mitigating this hazard, it is not enough to stop exposure entirely. Firefighters must stop carcinogen exposure at the source—by removing them with thorough cleaning protocols.

Changing the Narrative from Dirty to Clean

Because of the grit it represents, the fire service industry does have an inclination towards dirty, “battle-hardened” personal protective equipment (PPE). Little emphasis was placed on cleaning gear, and while gear was in usable condition, rarely was it fully decontaminated. The impact, therefore, is that gear, tools, and service vehicles become a hotbed for carcinogens long after firefighters leave a call.

In this landscape, it becomes imperative that the illusion of dirty gear be replaced with the factually based idea that clean gear is safer gear. On this foundation, firefighters become instrumental in lessening carcinogen exposure risks for themselves, their colleagues, and those with whom they come in contact.

While research is ongoing about how to eliminate carcinogen exposure completely, five simple steps to help reduce exposure can be implemented immediately in PPE cleaning and maintenance protocol:

1. Perform a gross PPE decontamination before leaving the scene of a call.
2. Bag PPE to prevent any remaining toxic radicals from coming in contact with others.
3. Launder PPE either in a firehouse extractor or send it to an industrial laundering service to remove any remaining toxins.
4. Encourage first responders to shower within an hour of leaving a fire to prevent toxins from being absorbed into the skin.
5. Establish and adhere to zoning protocols in the firehouse to help reduce exposure for all who enter the facility.
 - a. Red zones are areas where toxins may be present, such as the apparatus bay or gear storage rooms. These areas need separate ventilation systems to prevent toxins from entering the firehouse through heating and cooling units.
 - b. Yellow zones are transition zones between red and green zones.
 - c. Green zones are areas where no toxins should be present, including living and working quarters.

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Four Practical Steps Towards a Culture of Clean

Knowing these steps, however, aren't enough. A marked culture shift such as this—where firefighters are encouraged to see clean gear as safer gear—takes planning and consistent reinforcement for it to become the norm. In essence, it requires a cultural shift within the industry and starts within each firehouse.

Performance Solutions by Milliken, Milliken's consulting business focusing on operational and safety excellence, helped outline practical steps to lead a culture shift. "The key is to see this as a move from a reactionary mindset to a proactive one," shares Meghan Patel, continuous improvement manager for Performance Solutions by Milliken. "By empowering your team and encouraging them to buy into the process, this shift becomes a tangible, individual decision—rather than a forced mandate."

- 1. Assess where you are now.** Understanding what the current culture in your firehouse is today is the best way to gauge your starting point and the areas that need to be addressed. For example, what is the general feeling toward clean versus dirty gear? Who is influencing either perspective? Once you have this baseline, then you can create a plan for the future.
- 2. Define what your future looks like.** What do you want this new cleaning protocol to look like? Why is it important to implement? How do we get to the point where the protocol is second nature? Reviewing these and other questions helps you arrive at the motivators that will support your shift, as well as provides feedback on how to achieve your goals.
- 3. Clearly and concisely set expectations.** This is the key step, as you want to drive from a firefighter-led system. Each person is responsible for their own safety, but you also want to clearly outline what that looks like in daily practice. This can include things like:
 - Developing a steering committee of 'influencers' within the firehouse to be peer leaders when implementing protocol.
 - Standardizing training and educational materials so they are united in message. This lessens the ambiguity of what may be substantial changes and also helps lessen the mental load of new information.
 - Posting visual aids and reminders throughout the firehouse and in trucks. These reminders prompt team members to remember and increase accountability.
 - Budgeting for appropriate safety and maintenance measures.

Protecting firefighters is important, so ensuring proper equipment and cleaning agents are available and accessible is essential in keeping them safe. This includes providing the financial means to purchase and supply any needs.

- 4. Execute your plan and consistently assess progress.** Once you have your plan in place, it is time to put it into action. But once you enact your plan, it is important to monitor progress over time to ensure you are meeting any goals, addressing any barriers, and helping your team reach their potential.

Creating a culture that encourages and supports properly cleaned and maintained gear will not only help protect firefighters, it also ensures the ongoing health of the station house, their families, and the community. Firefighters are symbols of safety and adding to their arsenal of protection protocols will enhance their health and safety for the benefit of the districts they serve. For additional information on maintaining and cleaning PPE, refer to NFPA 1851.

References

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With a master's degree in textile technology and more than 11 years of experience in flame resistant (FR) fabrics, David Eskew is well-versed in the technical background and real-world application of protective fabrics. His career centers on the military and fire service industries, where protective fabrics help ensure the safety and well-being of those facing extraordinary circumstances. David routinely counsels customers in the fire service market to help them create, implement, and maintain FR programs that harness advanced R&D, proven fabric technology, and industry best practices for the benefit of front-line firefighters.

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As Business Supply Chain & Continuous Improvement Manager for Milliken's consulting business Performance Solutions by Milliken, Meghan Patel helps companies across the U.S. enhance operational excellence. She specifically addresses performance facilitation and project management, as well as leadership development and lean process improvement. With her Six Sigma Black Belt and nearly 16 years of industry experience, Meghan comes alongside clients to envision improvement methodologies that enable companies to grow and thrive.

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