

REDUCE YOUR EXPOSURE TO CARCINOGENS



This factsheet was developed by the International Association of Fire Fighters and the Firefighter Cancer Support Network.

Fire fighters are repeatedly exposed to environments filled with known and unknown chemicals, carcinogens, toxins and diseases. As a result, it has been proven that fire fighters are more prone to certain illnesses and cancers than the general population.

Numerous studies have proven that fire fighters are at greater risk of contracting many cancers as a result of their assigned duties and that proper use of PPE, SCBA, and preliminary exposure protection (i.e., on-scene gross decontamination) are beneficial in limiting the duration of fire fighter exposure to toxins and carcinogens.

Recent studies using PAHs (polycyclic aromatic hydrocarbons) as a measurement of contamination found that wet-soap gross decontamination is most effective. In fact, it was able to remove 85% of the contaminate; dry brushing removes only 23%.¹

CONTAMINATION

When personnel are exposed to environments that can potentially contaminate their clothing, equipment, or self (skin, lungs, etc.), the presumption is that they have been contaminated. Contamination can occur at all stages of fire response when any amount of smoke is present for any duration of time. This includes when smoke is visible and/or when you can smell smoke.

REDUCTION EFFORTS

Pre-Fire Suppression: Arrival and Set-Up

- Upon arrival at the incident, units should stage uphill and upwind to the fire when practical – this includes when establishing the Command Post.
- Keep apparatus windows closed and the AC/heat turned off to minimize airborne contaminants from entering the cab and contaminating the interior.
- If the apparatus is not involved in fireground operations, turn off the motor to reduce the diesel exhaust on the scene.
- Staging and Rapid Intervention Crews (RIC) can be readily available without standing in the smoke.
- Stay outside the smoke envelope – the area surrounding the scene where airborne contaminants are present.
- All crew members should wear SCBA when exposed to products of combustion or hazardous materials.

During Fire Suppression and Rehabilitation

- All personnel engaged in firefighting shall utilize a SCBA from initial attack through overhaul.
 - According to the Firefighter Cancer Support Network (FCSN), wearing a SCBA is the single most protective voluntary activity a fire fighter can complete in today's fire service. Such usage of a SCBA should be conducted not only in interior structural firefighting, but any time smoke or products of combustion are present.
- All fire fighters engaged in suppression activities, overhaul, or exposure to smoke should exchange their contaminated hood for a clean one every time they exit the immediately dangerous to life or health (IDLH) zone on the fire scene.
- Provide rehabilitation and medical monitoring at the scene. Carcinogens can be absorbed, inhaled, and ingested on a fire scene. Proper decontamination and rehabilitation procedures reduce exposures to carcinogens during these critical times.
 - Rehab is located in the "cold zone" — away from diesel exhaust and products of combustion.
 - Contaminated PPE should not be worn in rehab.
 - When entering rehab, fire fighters are to use a personal handwashing station with water, hand soap, and towels. In lieu of soap and water, use disposable wipes for face and neck, and hand sanitizer for hands.

Post-Fire Suppression: Overhaul and On-Scene Gross Decontamination

- SCBA should be used for any work performed inside the structure for the duration of overhaul. SCBA is the "gold standard" for respiratory protection.
- Prior to removing contaminated firefighting ensembles, on-scene gross decontamination shall be performed to remove potentially harmful contaminants. SCBA should also be worn through on-scene gross decontamination and be the last item removed and cleaned.
 - **Wet Decon:** Brush large debris first, then spray gear with water to remove loose particulates from turnouts and equipment. Use a low flow of water to rinse off soap and debris. Do not connect decontamination line to a foam discharge port during foam operations. Do not saturate the inner liner of PPE. Wet decon is 85% effective at removing PAHs.¹
 - **Dry Decon:** During cold weather operations, dry brushing should be conducted to remove the toxic products of combustion. Dry decon is 23% effective at removing PAHs.¹
- After on-scene gross decontamination and before eating or drinking, wash hands with soap and water. In lieu of soap and water, use disposable wipes for face, neck, and all areas of exposed skin, and hand sanitizer for hands. Personnel should wash their hands before rehab, at the end of suppression activities including overhaul, and before returning to living quarters.
 - Using wet wipes can reduce PAHs by 54.1% ¹
- Doff decontaminated gear and seal in a leak-proof bag. Place bagged gear in an outside compartment on the apparatus. Do not transport any contaminated PPE/equipment in the cab of any apparatus as it will transfer contaminants to apparatus seats, resulting in exposure to the next member who enters due to cross-contamination.

- To protect hands from dermal absorption of contaminants while packaging turnouts, wear a minimum of EMS nitrile gloves.

At the Station

- Clean contaminated turnouts, including hood, gloves, boots, and helmets in accordance with NFPA 1851 or send them out to a designated station or to be professionally cleaned.
- Personnel should shower within an hour of returning to quarters or as soon as practical.
- Decontaminate cab to prevent cross-contamination if contaminated gear or equipment was placed in the cab.

EXPOSURE REPORTING

Following fire activities, exposure reporting is necessary to document exposures that can lead to occupational diseases and cancer.

The National Fire Operations Reporting System (NFORS) Exposure Tracker is available as an app for fire fighters, paramedics, or officers to log exposure and incident details in a private, encrypted, and secure online environment. The information gathered will help researchers better understand toxic exposures on the fire scene and develop new treatments and prevention protocols for occupational diseases, including cancer.

Download the NFORS Exposure Tracker app by going to the app store on your mobile device.

REFERENCES

1. Fent KW, Alexander B, Roberts J, Robertson S, Toennis C, Sammons D, Bertke S, Kerber S, Smith D, Horn G. Contamination of firefighter personal protective equipment and skin and the effectiveness of decontamination procedures. *J Occup Environ Hyg.* 2017 Oct;14(10):801-814. doi: 10.1080/15459624.2017.1334904. PMID: 28636458.