



# Fire Fighter Cancer Awareness and Prevention



## Carcinogenic Exposures

Fire fighters work in uncontrolled environments. They are exposed to hazards at high levels for varying lengths of time, unlike most other occupations. Even though personal protective equipment (PPE) is required for firefighting activities, they do not completely eliminate the risk of exposure. Exposures can occur in all stages of firefighting, including knockdown and overhaul, and back at the station through contaminated PPE or equipment that may be off-gassing or through diesel exhaust.

Chronic exposure to heat, smoke, and toxicants, whether visible or not, can put fire fighters at a higher risk for developing cancer. Fires release many hazardous substances, which can lead to exposures through the lungs (inhalation); the nose, mouth and throat (ingestion); and contact with skin (dermal).

Some of these chemicals are scientifically proven cancer-causing (carcinogenic) agents. The International Agency for Research on Cancer (IARC) groups carcinogenic agents according to the strength of scientific evidence regarding whether or not an agent can cause cancer. IARC Group 1 carcinogenic agents are those for which there is sufficient scientific evidence that the agent can cause cancer. IARC Group 2A and 2B agents are probable and possible human carcinogens, respectively. Group 2A probable carcinogenic agents are those for which there is some evidence of carcinogenicity in humans, sufficient evidence of carcinogenicity in experimental animals or strong mechanistic evidence that the agent is carcinogenic to humans. Group 2B possible carcinogenic agents are those that only satisfy one of the criteria listed for Group 2A.

### **IARC GROUP 1 AGENTS**

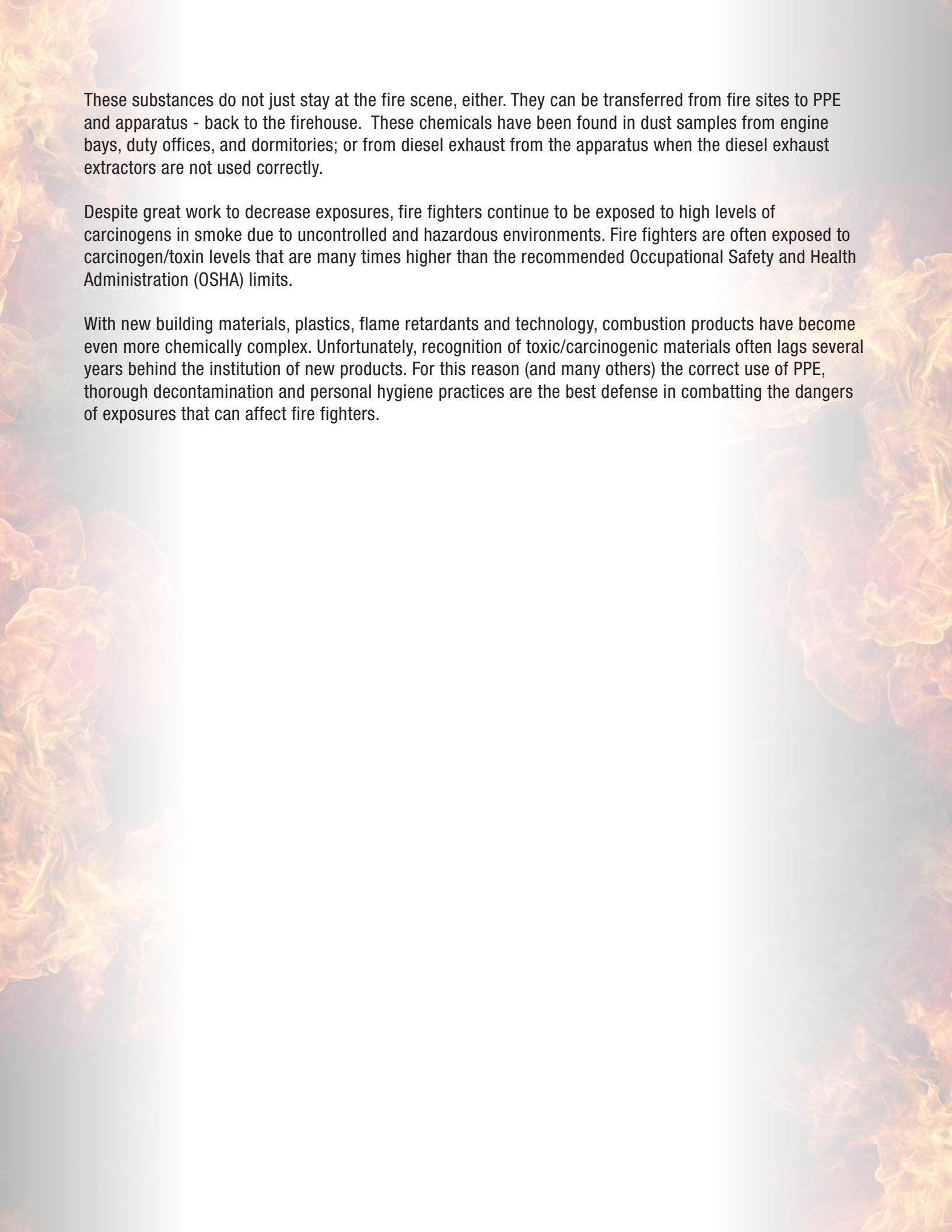
**(including but not limited to)**

- arsenic
- asbestos
- benzene
- cadmium
- 1,3-butadiene
- diesel engine exhaust
- benzo[a]pyrene
- formaldehyde
- polychlorinated biphenyls (PCBs)
- silica
- soot
- vinyl chloride

### **IARC GROUP 2A/B AGENTS**

**(including but not limited to)**

- polycyclic aromatic hydrocarbons (PAHs)
- per/poly-fluoroalkyl substances (PFAS)
- dioxins
- creosote
- products of biomass fuel combustion
- shiftwork with circadian disruption

The background of the page is a vertical gradient from light blue at the top to white at the bottom. On the left and right sides, there are vertical panels of fire and smoke, with the fire being more intense and the smoke being lighter and more wispy.

These substances do not just stay at the fire scene, either. They can be transferred from fire sites to PPE and apparatus - back to the firehouse. These chemicals have been found in dust samples from engine bays, duty offices, and dormitories; or from diesel exhaust from the apparatus when the diesel exhaust extractors are not used correctly.

Despite great work to decrease exposures, fire fighters continue to be exposed to high levels of carcinogens in smoke due to uncontrolled and hazardous environments. Fire fighters are often exposed to carcinogen/toxin levels that are many times higher than the recommended Occupational Safety and Health Administration (OSHA) limits.

With new building materials, plastics, flame retardants and technology, combustion products have become even more chemically complex. Unfortunately, recognition of toxic/carcinogenic materials often lags several years behind the institution of new products. For this reason (and many others) the correct use of PPE, thorough decontamination and personal hygiene practices are the best defense in combatting the dangers of exposures that can affect fire fighters.