

Recommendations for Reducing Firefighters' Potential Chemical Exposures from Contaminated Skin or Personal Protective Equipment

The personal protective equipment (PPE) worn during firefighting activities along with the firefighters' own skin can become contaminated with various compounds generated by the burning materials. Some of these compounds will off gas from the PPE, which could result in inhalation or dermal exposures to firefighters. In the matter of actual skin contamination, many of these chemicals have the ability to be absorbed directly through the skin. Several studies have been conducted to characterize fire fighters' exposure to polycyclic aromatic hydrocarbons (PAHs) and other aromatic hydrocarbons both during and after firefighting activities.¹ While one recent study found that measured levels of these chemicals were below occupational exposure limits, every fire response is unique. An additional factor to consider is that many post fire activities are conducted without respiratory protection.

Based on current knowledge, recommendations have been made to reduce fire fighters' potential chemical exposure from contaminated skin or PPE.^{2,3} Some of these recommendations are listed on the following page.

If you have any questions or comments, please contact Ann Jurkowski at (608) 438-6331 or ann.jurkowski@wisconsin.gov.

¹ **Kenneth W. Fent, Douglas E. Evans, Donald Booher, Joachim D. Pleil, Matthew A. Stiegel, Gavin P. Horn & James Dalton** (2015) Volatile Organic Compounds Off-gassing from Firefighters' Personal Protective Equipment Ensembles after Use, *Journal of Occupational and Environmental Hygiene*, 12:6, 404-414

² **National Institute for Occupational Safety and Health (NIOSH):** *Health Hazard Evaluation Report: Assessment of Dermal Exposure to Polycyclic Aromatic Hydrocarbons in Fire Fighters*, by K.W. Fent, J.Eisenberg , D. Evans , et al. (Report No. 2010-0156-3196). NIOSH, December 2013.

³ **Firefighter Cancer Support Network**, *Taking Action Against Cancer in the Fire Service*, August 2013 (V2)

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To minimize breathing contaminants:

- Maintain and test SCBA routinely to ensure its proper function
- Use SCBA from initial attack to finish of overhaul
- Remain upwind of the fire if not directly involved in the response
- Provide as much natural ventilation as feasible to burned structures before starting investigations and when responders are not wearing respiratory protection

To minimize skin absorption:

- Wear long hoods that are unlikely to come untucked during operations
- Keep protective ensembles on during overhaul
- Do gross field decon of PPE to remove as much soot and particulate as possible
- Use moistened wipes to remove as much soot as possible from head, neck, jaw, throat, under arms and hands immediately and while still on the scene
- Wash hands immediately and shower as soon as possible after a fire response
- Launder turnout gear routinely
- Clean your PPE, gloves, hood and helmet immediately after a fire

To minimize inhalation of chemicals that maybe released from contaminated gear:

- Remove SCBA and hood last when doffing gear
- Doff gear before entering the rehab area
- Store gear on the outside of the apparatus during the ride back to the station
- Do not take contaminated clothes or PPE home or store them in your vehicle
- Decon fire apparatus interior after fires