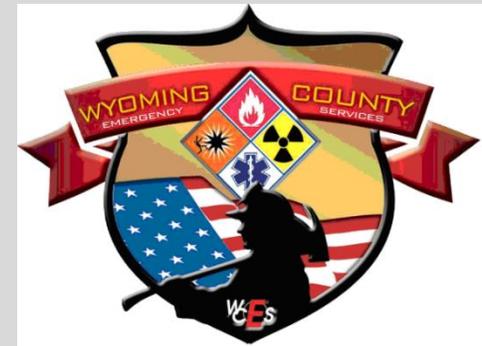


# PPE Cross Contamination Considerations



*Information from this presentation was gathered from Firehouse magazine and the Illinois Fire Service Institute*

*The modern firefighting turnout ensemble provides state-of-the-art protection from the heat and smoke faced on today's fire ground and training ground.*

*However, the firefighters' actions in donning, doffing and cleaning their ensemble can also influence the protection provided by the gear.*

# Doffing Nomex Hood

Firefighters have recognized the value of wearing a hood in reducing exposure and many have sought increased levels of protection. Consequently, manufacturers have made great progress in developing hoods with particle-blocking capabilities that reduce the penetration of fire ground products of combustion. In laboratory tests, these hoods have been shown to improve skin protection by greatly reducing the likelihood for particulate contamination through the hood. The improvements in hood design alone may not be enough to eliminate contamination reaching your neck.

**Procedures matter. If these new hoods are not donned and doffed carefully and appropriately, there are other ways for contamination to reach the skin.**

# Doffing Nomex Hood

The interface between the hood and SCBA face piece is a crucial location to further control exposure risks. While recent SCBA face piece designs have begun to incorporate a larger interface area with ample room for the rubber seal to make skin and hood contact, older designs are not as easy to don rapidly AND effectively. These legacy designs may have short interface areas and/or utilize straps that connect to the lens itself, creating a situation where it is easy for the hood to be held away from the face piece seal. Even in newer designs, there is potential for long harness straps to become caught between the hood and the mask. When this occurs, it is often difficult, if not impossible, for the person wearing the mask to see these gaps in protection. Furthermore, donning PPE at a fire scene will often have to be done in a rapid manner which may limit opportunity for inspection prior to entry into the structure.

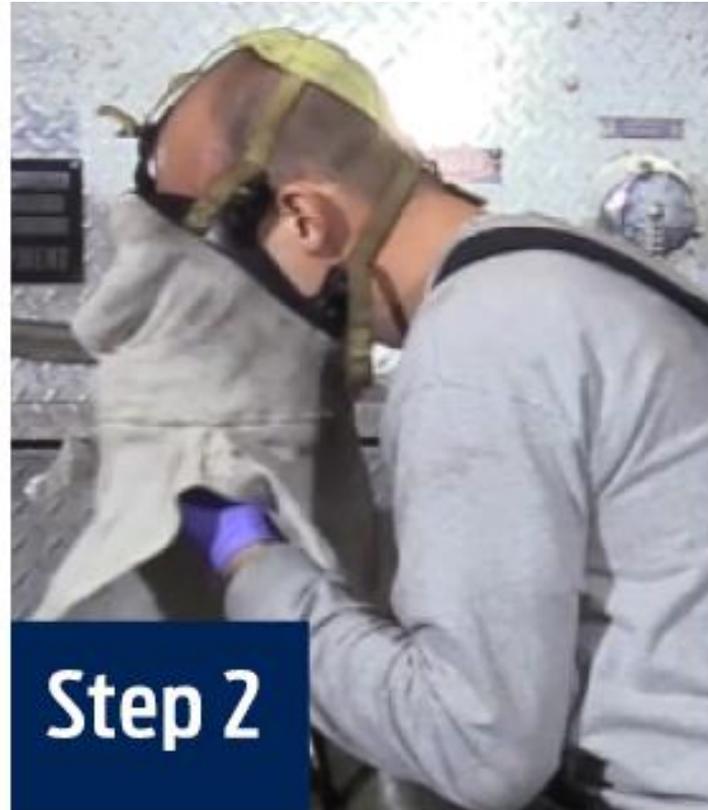


# Doffing Nomex Hood

**LESSONS LEARNED:** Based on these concerns, the following suggestions are provided to reduce the risk of particle exposure:

- Reinforce the importance of donning the hood properly for protection from both heat and smoke. Provide as much training opportunities as possible that focus on getting the interfaces sealed in addition to getting the PPE donned quickly.
- Check your partner after donning your full PPE ensemble to ensure a complete face piece-to-hood seal. This activity can again be reinforced during training so that it becomes muscle memory.
- Keep the harness straps as short as possible to reduce the chance of them getting caught when pulling the hood over the harness to create a seal.
- When spec'ing new hoods and face pieces, carefully study how well your hood will be able to seal on the face piece so that this interface can be easily closed by a single person.

# Doffing Nomex Hood



# Doffing Nomex Hood



# Doffing Gloves

*A firefighter can remove PPE similar to medical glove removal. With this approach, firefighters work their hands out from the gloves in a manner that skin only contacts the interior of the glove.*



A lot of well-deserved attention has been paid to the soot contamination that firefighters find on their neck after a firefight, but less effort has been focused on the firefighters' hands. In the fire ground study, we found that contamination levels on firefighters' hands can be considerably higher than on the neck after structural firefighting. While there is typically thicker skin on the hands than the neck, any skin exposure can still provide a path for absorption. Furthermore, the hands provide a highly mobile route for spreading contamination to other body sites. Consider how often you wipe the sweat out of your eyes or mucus from your nose after just completing a firefight. How often do you eat food with your hands on the fire ground or rehab? Ever think about the contamination on your hands before you go to the bathroom? Finally, hands can further cross contaminate other parts of your PPE, apparatus cab, and station just to name a few.

# Doffing Gloves



# Laundering Is Important, But Have You Managed Cross Contamination?

Until we know more about the transfer of this residual contamination to the firefighter, the following best practices are suggested for your consideration:

- Continue to launder hoods after each fire as this process is effective at removing a large portion of PAH contamination that is among the most abundant contaminant on the hoods. PAH contamination is likely after both fire ground and training fire responses, while flame retardant exposure is much less likely on the training ground.
- Consider segregating firefighter hoods by contamination level to reduce the potential for cross-contamination. If a firefighter responds to a call but is exposed to low levels of contamination compared to the rest of the crew, it may be beneficial to avoid washing with other crew members' hoods. Again, this process is particularly important after fires with typical room and contents combustibles but can be reinforced after training fire scenarios as well.
- Do not launder hoods with base layers or station wear to reduce the risk for cross contamination.
- Get in the practice of laundering hoods and segregating by contamination level after training fires whenever feasible. The reduction in PAH contamination is an important contamination control process after training and can build good habits in department membership.