

Selecting the right personal protective equipment for residential bushfire clean-up

Tech Update.

Proper use of personal protective equipment (PPE) in the aftermath of a bushfire is a critical component in the safe cleanup of fire debris. Selection of PPE depends on both anticipated hazards and the tasks to be performed.

In residential and commercial cleanup situations, the severity of damage, age of the home or building and intended remediation must be considered when determining what hazards may be present and the appropriate PPE to protect workers who have to deal with this environment.

It is also crucial to note that PPE must always be used in combination with safe work practices and in accordance with all user instructions and warnings to help ensure a safe cleanup.

Guidance on use of PPE can apply not only to the professional responder or contractor, but also the businesses and homeowners attempting to protect and salvage their property, and the numerous volunteers who are willing participants. As these individuals represent such a diverse group, their knowledge and experience in the use of PPE may vary significantly.

At a minimum, a basic understanding of the use and limitations of each type of PPE is necessary. For professional workers falling under the scope of state and territory workplace health and safety regulations, specific regulatory requirements apply when using PPE. For others, following basic best practice guidelines will help reduce exposures to bushfire related hazards.

If questions arise concerning the proper use of PPE, refer to the product *User Instructions* or contact the manufacturer directly.

Potential Cleanup Hazards

Numerous hazards may be present throughout the cleanup process. Prior to beginning the work, certain considerations in addition to the fire damage are necessary to accurately assess all potential hazards. The age of the home may suggest the potential for specific additional hazards, such as lead, asbestos and/or PCB (Polychlorinated /polybrominated biphenyls)

or organic compound exposures. Other hazardous materials, such as bulk pesticides, paints and fuels (e.g. gasoline, propane), are common in residential areas.

Inhalation of mould spores is also a potential hazard during cleanup and restoration phases. In water-damaged homes, mould growth can occur within 48 hours depending on environmental conditions. Porous materials such as plaster sheets, vinyl wall covering and wood products are particularly susceptible.

Using properly qualified contractors to handle and remove materials that contain asbestos, lead, PCBs, large amounts of mould or other hazardous substances may be required by law and is recommended in order to minimize health risks and ensure proper disposal. Other potential hazards that may commonly be encountered throughout the cleanup include:

- Inhalation, eye and skin contact with:
 - Ash, soot and demolition dusts, including those containing hazardous materials.
 - Cleaners and disinfectants used during cleaning and restoration.
 - Various nuisance dusts, paint/adhesive vapours, etc. throughout the reconstruction.
 - Other additional materials that could cause an adverse reaction.
- Operation of carbon monoxide producing equipment (e.g. pumps, generators, pressure washers) in poorly ventilated or confined areas.
- Electrical hazards from downed power lines or water damaged equipment and building electrical systems.
- Ergonomic hazards from repeated lifting, twisting, working on irregular, uneven surfaces.
- Engulfment and atmospheric hazards in open excavation, trenches, and pits.
- Heat stress and cold stress due to work outdoors
- Fall hazards due to working at elevated heights
- Slips and trips due to work around unstable, wet and slippery surfaces, uneven terrain and steep grades.
- Any other risks that may arise at the individual scene

Slips, Trips and Falls

After a significant event, such as a bushfire, we instinctively want to get back up on our feet and start the recovery process. Part of this includes inspecting damage, cleaning up debris and making the necessary repairs. During this time, it is critical to protect ourselves and others from slips, trips and falls. As entries are made into affected areas, paths should be cleared to prevent stepping upon or over objects. In areas where the walking surface cannot be seen or where there is standing water, the floor should be checked or prodded before stepping forward. All hazards that cannot be moved should be identified and marked to help others. When inspecting or repairing roof surfaces, a visual inspection from the ground should be conducted first. Ladders need to be secured to prevent slippage and a personal fall arrest system which includes a full body harness, energy absorber and solid anchor should be employed. Additional information regarding fall protection can be obtained by calling our customer service team at 1300 363 565 (Au) or 0800 252 627 (NZ).

General Types of PPE

Appropriate selection of personal protective equipment (PPE) and other safety equipment is critical to help control recognized hazards. The following describes the general types of PPE that are commonly applicable to bushfire cleanup. Refer to the end of this document for suggested 3M safety products that may be suitable for these applications.

Respiratory protection may be needed in all phases of natural disaster response. Appropriate selection is needed to assure the correct respirator is being worn for the work environment. In certain situations, the site may present inhalation exposure risk to unknown contaminants. Entry into these areas should be prohibited until adequately characterized. All respirators used should be tested and comply with AS/NZS 1716. When selecting a respirator for particulate hazards, a disposable respirator or reusable half/full facepiece with a minimum P2 class particulate filter (e.g. 3M 9322A+ P2 valved, 3M 9320A+ P2 un-valved) is suitable for most types of dusts. Fire or smoke related odours may require a particulate respirator with additional activated carbon cartridges. Disposable particulate respirators are also available with a carbon layer built-in to help reduce exposure to airborne dusts as well as provide odour relief. For gases and vapours, a reusable respirator with an appropriate cartridge is needed, depending on the specific contaminant.

Air purifying respirators do not filter all by-products of combustion, such as carbon monoxide, and they do not supply oxygen. They should not be used in confined spaces, where high levels of carbon monoxide or low oxygen levels may be present. A safety professional such as a certified industrial hygienist should be called in to assess these situations and make site specific recommendations.

A higher level of respiratory protection, such as a full facepiece respirator, or Powered Air Purifying Respirator (PAPR) may be needed for certain tasks, such as clean-up in buildings/homes that may contain lead, asbestos, PCB's and heavy mould contamination. Each state and territory regulation require specific respirator selection requirements for asbestos and must only be handled and removed by licensed asbestos removalists.

Respirators must be used in accordance with the AS/NZS 1715:2009. AS/NZS 1715 requires a written respiratory protection program established by the employer/PCBU. Program elements include selection, employee training, fit testing, medical evaluations, maintenance and inspection, and record-keeping. Any air purifying respirator, which includes disposable, reusable half and full facepiece and PAPRs, should never be used in IDLH (immediately dangerous to life and health) environments. AS/NZS 1715 prohibits use of tight-fitting respirators by anyone with facial hair.

Eye, head and face protection can help reduce the risk of injury due to falling or flying debris, or airborne dusts. Eye and face protection may include safety glasses or goggles and face shields. Use of safety glasses with side shields should be considered minimum protection at all-natural disaster sites. Unvented or indirectly vented safety goggles may be used for dusty environments or situations where splashing can occur and may fit over prescription eyewear. Safety glasses with a foam seal around the lens area forming a partial seal are also suitable for dusty environments or for environments where debris may be falling or floating in the air. Protective eyewear should meet the requirements of the recommended practices in occupational eye protection. As per AS/NZS 1337.1 requirements, medium impact rated eyewear will be marked with a I or F. Face shields are considered supplemental protection and should be used only in combination with approved safety glasses or goggles.

Hard hats should meet the requirements of AS/NZS 1800. Look for a sticker or markings on the inside of the hard hat indicating that it meets this standard. The sticker or markings will also state the type and class of hard hat. A type 1 hard hat is suitable for construction, building, general industry, mining and forestry with to protect against falling hazards and strikes from the side. Type 2 hard hats are for environments with high heat such as foundries and smelters. Type 3 is also suitable for high heat environments specifically bush fire and bushfire fighting. The type and class of hard hat selected will depend on the anticipated hazards present at the site.

Hearing protection is usually necessary when operating heavy machinery or power tools. Both earplugs and earmuffs are available. Hearing protectors are required to have a Sound Level Conversion (SLC80) rating, which is the reduction (in decibels) that the hearing protection device (HPD) is expected to provide to 80% of workers who are part of a well-managed hearing

protector program. An individual user may receive less noise reduction than indicated by the SLC80 due to variation in hearing protector fit, fitting skill and motivation of the user. 3M strongly recommends fit testing of hearing protectors.

Comfort is also an important factor to consider. If the HPDs are comfortable, they are more likely to be worn and to be worn correctly. Likewise, the hearing protectors must be compatible with the other gear that needs to be worn during a natural disaster response. Selecting a hearing protector that also offers communication capabilities is a vital consideration when both noise attenuation and communication between response workers is needed. Hearing protectors are available that physically connect to portable radio systems, or provide all-in-one, fully contained wireless protective communication solutions. Level dependent environmental microphones are also available to help wearers maintain important situational awareness and face to-face communications, while still protecting them from harmful noise levels.

Protective clothing, gloves, and boots require consideration of the types of anticipated contaminants, and environment/ work conditions to be encountered. Selection criteria may need to address both chemical and physical protection. These may include:

- Preventing skin contact, while maintaining durability and dryness.
- Heat and cold stress prevention.
- Worker visibility, particularly in high traffic or low visibility areas.
- Electrical hazards.
- Task specific protective clothing, such as welding and cutting

Follow the manufacturer's recommendation for donning of protective clothing, gloves and boots to assure proper fit, performance and comfort.

State and territory regulations, such as confined space, lockout/tagout, and fall protection may also identify other types of safety-related equipment that are required. Unlike other PPE that protect specific body areas (respiratory, hearing, head, eyes, hands, and feet), fall protection equipment is designed to help protect the whole body in the event of a fall. When selecting fall protection for a natural disaster application, careful consideration for the work environment is needed. Hazards typically include unstable shifting materials, sharp edges, and numerous slip/trip/fall conditions. Fall protection equipment may include confined space, rescue systems, body harnesses, ropes/lanyards, and anchorage devices. Use of this equipment requires specialized training that must include information related to intended use, as well as capabilities and limitations.

Suggested 3M Products for Workers

It is always the employer's responsibility to evaluate PPE needs and to select a proper product for the intended use by workers. Additional or alternative 3M products may be available in addition to those listed. Visit 3m.com.au/ppesafety or 3m.com.nz/ppesafety for a complete and up-to-date listing.

Response/Recovery

Communication Solutions

(Protective Hearing, Wired & Protective Communication Solutions)

- 3M™ PELTOR™ Tactical Earplug Kit, TEP-200 (Protective In-Ear Hearing Solution)
- 3M™ PELTOR™ CH-3 FLX2 Headset with PTT (Wired Communication Solution)
- 3M™ PELTOR™ WS™ ProTac XPI Headset (Protective Communication Solution)
- 3M™ PELTOR™ WS™ LiteComPlus with Bluetooth® (Protective Communication Solution)

Response/Clean-up

Respiratory Protection (Reusable):

- 3M™ 6000 series Half or Full-Face Respirator with 2125 P2 or 2135 P3 filters
- 3M™ HF-800SD series Half Face with speech diaphragm with D3125 P2 filters

Respiratory Protection (Disposable):

- 3M™ Aura™ Particulate Respirator 9322A+
- 3M™ Comfort Cupped Particulate Respirator 8322
- 3M™ Classic Cupped Particulate Respirator 8822
- 3M™ Classic Cupped Particulate Respirator 8210
- 3M™ Cupped Particulate Respirator 9923V with Nuisance Level* Organic Vapour Relief
- 3M™ Flat Fold Particulate Respirator 9542A with Nuisance Level* Organic Vapour Relief

Eye Protection:

- 3M™ GoggleGear™ 500 Series
- 3M™ Fahrenheit Goggle

Head Protection:

- 3M™ TA500 Series
- 3M™ HH/HF Bushfire Helmet Series

Hearing Protection (Passive):

- 3M™ E-A-R™ Express™ Pod Plugs™ Push-To-Fit Earplugs
- 3M™ PELTOR™ X4A Over-the-Head Earmuffs

Protective Clothing:

- 3M™ Disposable Protective Coverall Safety Work Wear 4520

Fall Protection:

See www.3M.com.au/FallProtection for a complete list of products.

- Full Body Harnesses
- Confined Space
- Rescue and Descent

References

1. 3M, www.3M.com/wildfires.
2. EPA, <https://www.epa.gov/mold>, information about mould in the home.
3. CDC, <https://www.cdc.gov/niosh/docs/2003-144/pdfs/2003-144.pdf>, information about selecting respirators for preparedness at home and work.
4. <https://www.safeworkaustralia.gov.au/safety-topic/managing-health-and-safety/personal-protective-equipment-ppe> Information about your duties when providing PPE for workers
5. <https://www.safeworkaustralia.gov.au/safety-topic/managing-health-and-safety/identify-assess-and-control-hazards/managing-risks>, Information about managing workplace risks.
6. <https://www.safeworkaustralia.gov.au/safety-topic/hazards/noise/overview>, information about duties, and noise control in a workplace.
7. <https://www.safeworkaustralia.gov.au/doc/model-code-practice-confined-spaces>, information about confined spaces.
8. <https://worksafe.govt.nz/topic-and-industry/personal-protective-equipment-ppe/>, information about personal protective equipment for businesses and workers.

NOTE: Products indicated are rated for protection against certain substances only - each application will be different and an assessment of each is required. The user/PCBU is responsible for determining the suitability of the product for its intended use. Contact 3M for specific advice.



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