

Technical Data Bulletin

#182 – Personal Protective Equipment During Cleanup of Residential Wildfire Debris

3M Personal Safety Division

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Replaces all previously published Bulletins until superseded.

Proper use of personal protective equipment (PPE) in the aftermath of a wildfire 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 cleanup situations, the severity of damage, age of the home and intended remediation must be considered when determining what hazards may be present and the appropriate PPE. 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.

Individuals participating in clean-up efforts may include professional workers, volunteers and homeowners. Each group's knowledge and experience in the use of PPE, especially respiratory protection, will vary significantly. At a minimum, everyone needs to review user instructions and understand the proper use – and limitations – of personal protective equipment prior to initial use. For professional workers falling under the scope of either Federal or Provincial Health and Safety jurisdictions, additional PPE specific regulatory requirements including documentation of hazard assessments and training are also required.

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 lead, asbestos or PCB exposures. Homes built prior to 1980 commonly used lead-based paint coatings, asbestos-containing insulation and fireproofing and PCB-containing caulks. Other hazardous materials, such as bulk pesticides, paints and fuels (e.g. gasoline, propane) are common in residential areas.

Inhalation and skin contact with mold and mold spores is also a potential hazard during cleanup and restoration phases. In water-damaged homes, mold growth can occur within 48 hours depending on environmental conditions. Jute backed carpets, vinyl wall covering, drywall and wood products are particularly susceptible.

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

- Inhalation, eye and skin contact with:
 - Ash, soot and demolition dusts 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.

TYPES OF PPE

Protective measures to address recognized hazards include both safe work practices and proper use of PPE. Safe work practices are methods outlining how to perform a task with minimum risk to people and equipment. Safety professionals, government pamphlets and equipment manufacturer's user instructions are sources of information on safe work practices. The following describes the types of PPE that are available and their application to wildfire cleanup. See the end of this bulletin for specific 3M products to assist users who determine they have certain needs.

Eye, head and face protection can help reduce the risk of injury due to airborne dusts, and falling or flying debris. 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 cleanup sites. Unvented or indirectly vented safety goggles may be used for dusty environments or situations where splashing may occur and will fit over most prescription eyewear. Protective eyewear should meet the requirements of the Canadian Standards Association (CSA) standard Z94.3 and/or the American National Standards Institute (ANSI) Standard Z87.1 for safety eyewear, marked on the safety eyewear and packaging. Face shields are considered supplemental protection and should be used only in conjunction with safety glasses or goggles.

Hard hats shall meet the requirements of CSA Z94.1 and/or ANSI Standard Z89.1. This information could be molded into the shell or printed on a sticker inside the hard hat that states it meets these standards. The sticker will also state the type and class of hard hat. Type refers to impact performance. Type I hard hats reduce the force of impact resulting from a blow to the top of the head. Type II hard hats reduce the force of impact resulting from a blow to either the top or side of the head. Class refers to electrical performance. Class G (General) hard hats reduce the danger of contact exposure to low voltage (tested at 2200 volts). A Class E (Electrical) hard hat reduces the danger of exposure to high voltage conductors (tested at 20,000 volts). A Class C (Conductive) hard hat is not intended to protect against contact with electrical conductors. Which type and class to use will vary with specific cleanup site needs identified by the user.

Respiratory protection may be necessary in all phases of the wild fire cleanup. All respirators used for cleanup should be tested and certified by the National Institute for Occupational Safety and Health (NIOSH). In general, to help reduce exposure to ash, soot and other nuisance type particles common to the cleanup, a reusable respirator with “N95” or “P95” rated particulate filters would be appropriate. “95” is a NIOSH classification referring to the particulate filtration efficiency of the respirator (an N95 or P95 has at least 95% filtration efficiency). 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.

N95 and P95 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.

It is important to note that certain tasks may require a higher level of respiratory protection. Cleanups involving homes with potential lead, asbestos, PCB or heavy mold contamination typically require a Class 100 filter (e.g., P100) with a negative pressure half or full facepiece respirator, or a Powered Air Purifying Respirator with high efficiency (HE) filters. CSA has specific respirator requirements for both lead and asbestos.

The respirator manufacturer or a health and safety professional should be consulted if there is any question regarding respirator selection or use or if any of the dangerous conditions outlined above are present. Users must also understand respirator capabilities, as well as limitations, and follow the user instructions in order to receive the assigned level of protection. Misuse of any respiratory protection device may result in sickness or death.

Workplace/Occupational Respirator Applications

For professional or hired cleanup workers, respirators must be used in accordance with CSA Standard Z94.4 and the requirements of the authority having jurisdiction in your area. Mandatory use of respirators requires a respiratory program be established by the employer. Program elements include: selection, employee training, fit testing, medical evaluations, maintenance and inspection, and recordkeeping.

Volunteers/Homeowners Respirator Applications

Volunteers, and homeowners, should, at a minimum, be aware of basic information on the use and limitations of respirators. The following guidelines are offered for non-occupational users of respiratory protection during clean-up:

- Check with the organization/agency to determine if they have a respirator program. If the organization is not providing respirators, ask if respiratory protection is needed for the anticipated work. Contact the local department of health or the respirator manufacturer if assistance is needed selecting a respirator.
- Contact your physician if you have any doubts about your physical ability to safely wear a respirator. Wearing a respirator adds physical stress in the form of additional weight and increased breathing resistance. Discuss the type of work you will be doing, the respirator you intend to use and the anticipated contaminants.
- Follow the respirator manufacturer's instructions for proper respirator donning and doffing procedures. A user seal check is required each time the respirator is worn. Also check instructions to determine if there are any time use limitations for the respirator. Misuse of any respiratory protection device, including improper donning and doffing, may result in sickness or death.
- For tight-fitting respirators to be effective, the user must be clean-shaven in the area where the respirator contacts the face. Hair, jewelry, scarves, etc. must not come between the respirator and the skin.
- Follow the respirator manufacturer's recommendations for cleaning and storing reusable respirators. Daily cleaning is typically recommended.

Users should consider other conditions, including work rate, physical condition, ambient temperature and humidity, should also be considered when making the personal decision to wear a respirator.

Hearing protection is usually necessary when operating heavy machinery or power tools. Both ear plugs and ear muffs are available. To evaluate the effectiveness of hearing protection devices, the Noise Reduction Rating (NRR) and/or CSA Class is used. The NRR is the theoretical reduction (in decibels) that the hearing protection device (HPD) can provide when worn correctly. In the real world, noise reduction offered by the HPD is usually about one-third to one-half of the laboratory-derived value that the NRR is based upon. Although NRR values may vary between manufacturers for the same type of HPD, there may be very little difference in noise reduction under actual use conditions. Consideration of other factors, such as overall comfort, can also be important when selecting a HPD.

Protective clothing, gloves, and boots, or “head to toe” protection, requires consideration of the types of contaminants, environmental, and work conditions to be encountered. Selection criteria may need to address both chemical and physical protection, such as the following:

- Site conditions – Selection based on preventing skin contact, durability and keeping dry. Demolition, which typically will include wet and/or dirty conditions, may have the greatest need for head to toe protection. Consideration for clothing durability including cut, puncture, abrasion and slip resistance, may also be necessary.
- Heat stress – Lighter weight clothing, such as disposable poly-coated coveralls, may be necessary for work in hot environments.
- Cold stress – Insulated clothing may be necessary for cold weather work.
- Worker visibility – Need for high visibility reflective materials in high traffic or low visibility areas (e.g. safety vests).
- Electrical hazards – Need for specialized clothing, rubber gloves, dielectric boots and tools to prevent electrical related injuries.
- Task specific protective clothing – Need for specialized equipment based on the task performed, such as welding and cutting.

Consideration of specific CSA regulations and for other types of safety-related equipment, such as fall protection and confined space, may also be necessary in order to provide complete personal protection.

Pre-planning for personal protection is essential at a wildfire cleanup. An understanding of the hazards involved and the types of protective equipment available will help ensure worker safety is maintained.

For more information in Canada:

www.3M.ca/Safety

<http://safetytownsquare.3mcanada.ca/>

Technical Service: 1-800-267-4414

Customer Service: 1-800-410-6880

SUGGESTED 3M PRODUCTS

It is always the user's responsibility to evaluate PPE needs and to select a proper product for the intended use. Additional or alternative 3M products may be available in addition to those listed. Check www.3M.ca/Safety for a complete listing.

Respiratory Protection

Disposable Respirators

[3M™ Particulate Respirator, 8210, N95](#)

[3M™ Particulate Respirator, 8210V, N95](#)

[3M™ Particulate Respirator, 8110S, N95](#)

[3M™ Aura™ Particulate Respirator, 9210+](#)

[3M™ Aura™ Particulate Respirator, 9211+](#)

Reusable Respirators

[3M™ Half Facepiece Respirator 6000 Series: 6100 Small, 6200 Medium, 6300 Large](#)

[3M™ Full Facepiece Reusable Respirator 6000 Series: 6700 Small, 6800 Medium, 6900 Large](#)

Filters and Cartridges for Reusable Respirators

[3M™ Particulate Filter, 2091, P100](#)

[3M™ Particulate Filter, 2097, P100](#)

[3M™ Advanced Particulate Filter, 2291, P100](#)

[3M™ Advanced Particulate Filter, 2297, P100](#)

[3M™ Multi Gas/Vapour Cartridge/Filter, 60926, P100](#)

Head, Eye and Face

Hard Hats

[3M™ Hard Hat, H-701R, Four-Point Ratchet Suspension, White](#)

[3M™ Hard Hat, H-702R, Four-Point Ratchet Suspension, Yellow](#)

Faceshields

[3M™ Ratchet Headgear, H8A, 82501 with 3M™ Clear Polycarbonate Faceshield, WP96, 82701](#)

[3M™ Peltor™ Brush Defender Visor System, V40AH31A](#)

[3M™ Peltor™ Lumberjack Kit, G2000, PG2008MUV-1P](#)

Protective Eyewear

[3M™ SecureFit Protective Eyewear, SF401AF-CA, Clear Anti-Fog Lens](#)

[3M™ SecureFit Protective Eyewear, SF402AF-CA, Grey Anti-Fog Lens](#)

[3M™ SecureFit Protective Eyewear, SF403AF-CA, Amber Anti-Fog Lens](#)

[3M™ Solus Protective Eyewear with Clear Scotchgard™ Anti-Fog Lens 1000-Series Kit, S1101SGAF-KT](#)

[3M™ Solus Protective Eyewear with Grey Scotchgard™ Anti-Fog Lens, S1102SGAF](#)

[3M™ Goggle Gear Splash Goggle with Clear Scotchgard™ Anti-Fog Lens, GG501SGAF](#)

Hearing Protection

Uncorded Earplugs

[3M™ E-A-R™ Classic Uncorded Earplugs, 312-1201](#)

[3M™ E-A-Rsoft Yellow Neon Uncorded Earplugs, 312-1250](#)

Corded Earplugs

[3M™ E-A-R™ Classic Corded Earplugs, 311-1101](#)

[3M™ E-A-Rsoft Yellow Neon Corded Earplugs, 311-1250](#)

[3M™ E-A-R™ Push-Ins Corded Earplugs, 318-1005](#)

[3M™ E-A-R™ UltraFit Corded Earplugs, 340-4014](#)

Earmuffs

[3M™ Peltor™ Cap-Mount Earmuffs, X4P5E](#)

[3M™ Peltor™ Over-the-Head Earmuffs, X4A](#)

3M/Capital Safety Fall Protection

Your go-to when compliance at heights matters most. Contact Capital Safety Customer service to order at 1-800-387-7484

Roofer's Kits

Pass-Thru Buckle Part# 2199910

Tongue/Buckle Part# 2199914

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