

Asbestos in the Workplace: A Guide to Removal of Friable Asbestos Containing Material

Revised November 21, 2013

Application – Code of Practice

Where asbestos is present or believed to be present in a workplace to which the Occupational Health and Safety Act applies, the owner of the building and any employer whose workplace in the building may contain asbestos have a duty under the Act to take all reasonable precautions to ensure the health and safety of persons at or near that workplace. Employees have a similar duty to protect their own health in their workplace.

This document may be used as guidance for any establishment considering the removal of friable asbestos. In addition, this document may be adopted as a code of practice by an employer who is removing friable asbestos and is ordered to establish or adopt a code of practice by the Director of the Occupational Health and Safety Division, or a delegate of the Director, under Section 66 of the Occupational Health and Safety Act.

Definitions

“100-class filter” means a filter certified as being

- (a) in the “100” class; and
- (b) of the “N”, “R” or “P” class, as appropriate, as defined in Chapter 42, Part 84 of the United States Code of Federal Regulations.

“Airlock” means a system consisting of two-curtained doorways that allows the passage of persons in and out of a contaminated area without permitting the movement of air out of the contaminated area.

“Asbestos containing material” means any material identified by an appropriate laboratory analytical method (e.g. EPA 600/R-93/116, NIOSH 9000, or NIOSH 9002) to contain at least 0.5% of any type of asbestos, and vermiculite that is identified to contain any amount of asbestos using EPA method 600/R-04/004 if other analytical methods do not identify the presence of asbestos.

“Friable asbestos” means any asbestos-containing material that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. The term “friable asbestos” includes previously non-friable asbestos-containing material that has become damaged to the extent that it may be crumbled, pulverized, or reduced to powder by hand pressure.

“Glove bag” means a pre-fabricated bag that is equipped with integral gloves and designed to contain asbestos.

“HEPA filter” means a high efficiency particulate aerosol filter that is designed to capture at least 99.97 percent of particles with an average aerodynamic diameter of 0.3 microns.

“HEPA negative air unit” means a mechanical ventilation unit that passes air through a HEPA filter and exhausts the air.

"HEPA unit test" means a procedure that is carried out by a competent person in accordance with standard industry practice to assess whether a filtration system is functioning with the same efficiency as a HEPA filter.

"Wet removal" means soaking asbestos containing material with water that contains a non-ionic surfactant in a quantity that is sufficient to control the release of dust and asbestos fibres during the removal of friable asbestos.

"Work area" means the immediate area where asbestos-containing material may be disturbed.

Specific Requirements

1. Site Preparation

- (1) Where removal of friable asbestos is performed, a glove bag must be used, or a temporary enclosure must be constructed to prevent asbestos fibres from leaving the work area.
- (2) An enclosure used during the removal of friable asbestos must
 - (a) be constructed of polyethylene sheeting that is at least 0.15 millimetres thick,
 - (b) be labeled with signs to restrict entry to authorized personnel,
 - (c) include provisions for an airlock, clean room, shower area, decontamination room, and holding area for waste materials;
 - (d) be maintained under negative pressure using HEPA negative air units, 24-hours per day for the duration of the work and until the area has passed clearance testing after cleanup;
 - (e) have a minimum of 4 air changes per hour or a static pressure of negative five (-5) Pascal's relative to pressure outside the enclosure, as measured inside the enclosure at a point furthest from the exhaust fan; and
 - (f) have at least one observation window made of a transparent material that, where reasonably practicable, enables a person who is located outside of the enclosure to see work activity that is taking place inside the enclosure.

2. Ventilation – HEPA Testing

- (1) Aside from specific HEPA negative air units that are used to exhaust air from inside the enclosure, all ventilation systems that service the work area must be isolated from the enclosure to prevent contamination by
 - (a) sealing ventilation duct supply and return air openings with poly sheeting; and
 - (b) where reasonably practicable, turning off the air handling systems that service the work area.
- (2) All vacuums and HEPA negative air units that are used to exhaust air from inside the enclosure to any area outside of the enclosure must successfully pass a HEPA unit test
 - (a) after a HEPA filter is replaced; and
 - (b) at least once every 12 months.

- (3) All HEPA negative air units that are used to exhaust air from inside the enclosure to an indoor-area that is outside of the enclosure must successfully pass a HEPA unit test, on-site, immediately prior to use at a given site.
- (4) HEPA testing must include
 - (a) a visual inspection to identify any apparent damage and to examine the integrity of the seal in the filter frame; and
 - (b) a filter testing procedure using dioctyl phthalate (DOP) or other appropriate challenge test material to verify the unit is functioning as the manufacturer intended.
- (5) HEPA testing records must be maintained, including the name of the testing agency, the name of the tester, the date of testing, and the result of the test.
- (6) The employer is also required to maintain all HEPA filters in ventilation systems and vacuum cleaners in accordance with manufacturer's instructions, or as specified by a professional engineer, to ensure that they remain effective.

3. Personal Protective Equipment

- (1) Where a glove bag is used, employees must wear full-body protective coveralls and a half-facepiece, air-purifying, non-powered respirator equipped with a 100-class filter, or equipment offering equal or greater protection.
- (2) Where wet removal of friable asbestos is to be performed without the use of a glove bag, employees must wear full-body protective coveralls (including hood) and a full-facepiece powered air-purifying respirator equipped with a 100-class filter, or equipment offering equal or greater protection.
- (3) Where dry removal of friable asbestos is to be performed
 - (a) monitoring must be conducted in accordance with Section 4;
 - (b) employees must wear full-body protective coveralls (including hood) and are permitted to use a full-facepiece powered air-purifying respirator equipped with a 100-class filter unless the results from monitoring during removal indicate that an employee's exposure is greater than 100 fibres per cubic centimeter; and
 - (c) where exposures are 100 fibres per cubic centimeter or greater, an atmosphere-supplying respirator that has an assigned protection factor of 10000 is required.
- (4) Where respiratory protection is required, the employer must ensure compliance with the latest version of CSA Standard Z94.4, "Selection, Use, and Care of Respirators" for the selection, use, maintenance, and testing of a respirator, as well as the training of employees who use a respirator. This standard specifies that employees who wear a tight-fitting respirator must be clean-shaven, and that quantitative fit-testing must be carried out if a protection factor of 1000 is to be achieved with a full-facepiece powered air-purifying respirator.

4. Dust Control and Monitoring

- (1) Dry removal of friable asbestos-containing materials may be performed only where wet removal is shown to present a hazard to employees.
- (2) When dry removal is conducted and where a full-facepiece powered air-purifying respirator equipped with a 100-class filter is used for worker protection, personal

sampling for airborne asbestos fibres must be conducted on a daily basis during removal to verify the airborne concentrations do not exceed 100 fibres per cubic centimeter.

- (3) Where dry or wet asbestos removal is conducted, a glove bag is not used, and the air from inside the enclosure is exhausted to an indoor area that is outside of the enclosure,
 - (a) daily sampling for airborne asbestos fibres must be conducted outside of the enclosure.
 - (b) immediate action must be taken if the concentration of airborne asbestos is found to exceed 0.01 fibres per cubic centimeter of air in an indoor area that is outside of the enclosure.
- (4) All samples for airborne asbestos fibres must be collected, prepared, analyzed, and reported in accordance with the NIOSH Method 7400, Issue 2: Asbestos and Other Fibers by PCM (August 15, 1994), or NIOSH Method 7402, Issue 2: Asbestos by TEM (August 15, 1994), or by a method that provides for an equivalent or greater level of precision and accuracy.
- (5) Samples must be analyzed within 24 hours and the committee or representative must be notified of the testing, in accordance with Section 35 of the Occupational Health and Safety Act. Where an increase in airborne concentration is detected, the personal protective equipment required must be reviewed and upgraded in accordance with this document.
- (6) Monitoring for airborne asbestos fibres must be conducted during clearance testing, as specified in Section 8.
- (7) The employer must maintain a record of all air sampling data in accordance with subsection 1.15(1) of the Workplace Health and Safety Regulations.

5. Personal Hygiene

- (1) Where a glove bag is used, coveralls and other contaminated clothing must be removed and prepared for disposal prior to removing any respirator or leaving the work area.
- (2) Where removal of friable asbestos-containing material is performed without a glove bag
 - (a) street clothes must be removed and left in the clean area of the enclosure;
 - (b) protective clothing, as set out in Section 3, must be worn in the work area;
 - (c) coveralls and other contaminated clothing must be removed and prepared for disposal or cleaning prior to removing any respirator or leaving the work area;
 - (d) a shower with both warm and cold running water must be provided; and
 - (e) respirators must be worn until the hair and body have been thoroughly wetted.
- (3) Toilet facilities must be provided in or near the clean room on the decontaminated side of the enclosure.
- (4) No eating, drinking, or smoking is permitted in the work area.
- (5) Where washable coveralls are used, arrangements for the proper storage, transportation and cleaning must be made and followed to ensure that asbestos material does not leave the remediation site uncontrolled.

6. Waste Disposal

- (1) Asbestos waste must be disposed of in accordance with all applicable provincial or federal asbestos disposal requirements.
- (2) All asbestos waste must be placed in 0.15 millimetre polyethylene bags with printed asbestos warning labels.
- (3) Bags containing asbestos waste must be closed, and the outside cleaned before being taken to the decontamination area.
- (4) Bags containing asbestos waste must be placed within a second, 0.15 millimetre, labeled bag or a labeled drum. Alternatively, the material must be packaged and placed in accordance with a method approved in writing by the Department of Environment and sent to an approved disposal site.
- (5) When asbestos waste is brought to a disposal site, the employer or representative at the disposal site must be notified of any materials that are suspected to contain asbestos.

7. Clean-Up

- (1) Following the removal of friable asbestos containing materials the work area, the inner surfaces of the enclosure, as well as all tools and equipment, must be cleaned by
 - (a) damp wiping; or
 - (b) vacuuming with a vacuum that has successfully passed a HEPA unit test in accordance with the HEPA unit test after each filter change, and at least once per year.
- (2) Any residual asbestos containing materials that will remain inside the work area after the enclosure is removed must be adequately sealed with a suitable encapsulant.

8. Visual Inspection & Clearance Test

- (1) Following the clean-up requirements noted in Section 7, and prior to removing an enclosure that is not a glove bag, a visual inspection of the work area inside the enclosure must be carried out by a competent person to ensure that there is no reasonable possibility of asbestos fibres becoming airborne. The employer must maintain a record of these inspections in accordance with subsection 1.15(2) of the Workplace Health and Safety Regulations.
- (2) Before sampling for airborne asbestos fibres inside the enclosure, forced air equipment, such as a leaf blower, must be operated for at least 5 minutes per 90 square metres of floor area to dislodge fibres from any walls, ceilings, floors, ledges, and other surfaces inside the enclosure.
- (3) At least one sample for airborne asbestos fibres must be collected for every 270 cubic metres of containment.
- (4) All samples for airborne asbestos fibres must be collected, prepared, analyzed, and reported in accordance with the NIOSH Method 7400, Issue 2: Asbestos and Other Fibers by PCM (August 15, 1994), or NIOSH Method 7402, Issue 2: Asbestos by TEM (August 15, 1994), or by a method that provides for an equivalent or greater level of precision and accuracy.

- (5) The clearance test cannot be passed unless the analysis of each aerosol sample collected indicates that the airborne concentration does not exceed 0.01 asbestos fibres per cubic centimeter of air.
- (6) A competent person must review the results of the visual inspection specified in Section 8(1), and the results of the air sampling specified in Sections 8(3) and 8(4), before determining whether the enclosure can be removed.
- (7) If a competent person indicates that the visual inspection or clearance test is not passed, then the clean-up steps specified in Section 7 must be repeated, and the clearance test must be repeated.
- (8) If a competent person indicates that the clearance test and visual inspection by a competent person are passed, then the enclosure may be removed.

Revising Code of Practice

Where an employer is ordered by the Director or a delegate of the Director to adopt this document as a Code of Practice for the removal of friable asbestos containing materials, the specific requirements outlined in this Code of Practice must be followed and if the employer wishes to alter these requirements, a Code of Practice which includes the alterations must be approved by the Director or a delegate of the Director.