



# Asbestos: An Occupational Health Overview

FACT SHEET 65-007-0813

## Introduction

Asbestos is a general term used to describe six (6) naturally occurring fibrous mineral silicates. Asbestos is resistant to both alkaline and acidic substances and heat, and as a result has been widely used in industrialized and developing countries. Asbestos has been commonly used as insulation around pipes and furnaces, as a strengthener in concrete, in floor tile and siding, as a component in brake shoes and as an additive in paints. Outdoor air in all large cities contains some level of asbestos, either naturally occurring or as a result of previous commercial use. The Occupational Safety and Health Administration (OSHA) established acceptable airborne levels for the work environment. If levels exceed these established standards, medical surveillance and the use of Personnel Protective Equipment (PPE) is required. The PEL (Permissible Exposure Limit) is 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA). The Excursion Limit (EL) is 1.0 fiber per cubic centimeter of air as averaged over a sampling period of thirty (30) minutes. Over the past decade, exposure to asbestos to Army personnel has decreased due to abatement activities and the contracting out of asbestos work.

## Health Effects

Short term (or acute) effects from exposure to asbestos are rare, occur immediately after exposure and are due to the irritant effects of the fibers. They can include shortness of breath, chest or abdominal pain, and irritation of skin and mucous membranes.

Long term (or chronic, latent) effects can occur as long as 20 to 30 years after exposure and include asbestosis, a form of chronic lung disease, lung cancer and mesothelioma, a cancer of the lining of the lung and pleural cavity. The likelihood of developing these diseases is dose dependent, with longer exposures and exposures to higher concentrations increasing risk. Asbestos workers who smoke are 10 times more likely to develop lung cancer than similarly exposed non-smokers. The importance of smoking cessation for asbestos workers cannot be overstated.

## Signs and Symptoms

Acute exposures: shortness of breath, chest or abdominal pain, and irritation of skin and mucous membranes. Treatment of symptomatic acute exposures is supportive in nature.

Chronic or delayed effect: shortness of breath; dry cough; broadening and thickening (clubbing) of the ends of the fingers; and bluish discoloration of the skin. Testing may reveal pulmonary function test abnormalities and chest x-ray changes (pleural thickening and plural plaques).

## Prevention

Exposures are controlled by following the requirements outlined within the Army Asbestos Management Program and OSHA asbestos standards. When asbestos airborne particles exceed these standards, the use of engineering and work practices controls along with the proper wear of PPE will help prevent illness and injuries. In addition, care must be taken to avoid bringing asbestos dust into the home environment.

## Medical Surveillance

The purpose of medical surveillance is to assure that workers are capable of safely performing their job and to identify any work related illnesses or injuries. General industry workers (covered by CFR 1926.1001) who are assigned to an occupation with exposure to airborne concentrations of asbestos at or above the OSHA PEL or EL are required to have preplacement, annual and termination medical examinations. Construction and asbestos abatement workers fall under 29 CFR 1926.1101 and are required to have preplacement, annual and termination medical exams when they are exposed above the PEL or engage in Class I, II, or III work for 30 or more days per year.

a. Preplacement examinations. These examinations include a comprehensive medical and work history to document symptoms of respiratory disease, smoking history, and any past exposure to asbestos. A physical examination with emphasis on respiratory, cardiovascular, and gastrointestinal systems should be performed along with a chest x-ray and pulmonary function tests.

Additionally, an OSHA or equivalent standardized respiratory disease questionnaire (DD Form 2493-1) must be completed if the worker will be required to use a respirator.

b. Annual examinations. Workers receive an annual examination when exposed to asbestos at or above the OSHA PEL or EL. Annual exams are the same as the preplacement except:

(a) Chest x-ray evaluations will be conducted at the discretion of the physician for construction and abatement workers as discussed in 29 CFR 1926.1101

(b) Chest x-ray evaluations for all other workers will be conducted every five (5) years until the elapsed time since first exposure reaches 10 years or greater. Then the frequency of chest x-ray evaluation will be every two (2) years for workers between 35 and 44 years of age, and yearly for workers 45 years or older.

(c) Termination of exposure or employment examinations. Personnel who are no longer exposed to asbestos at or above the OSHA PEL or excursion limit will be removed from the asbestos medical monitoring program and will receive a medical evaluation within 30 calendar days before or after termination of employment or asbestos exposure. No examination is required if the employee has undergone an examination within the past year.

(d) DD Form 2493-2 is used for annual and termination exams.

(e) Medical records will be kept for employment plus 30 years.

### **Definition and Terms**

**Asbestos:** General term used to describe six distinctive varieties of fibrous mineral silicates; chrysotile, amosite, crocidolite, tremolite, anthrophyllite, and actinolite.

**Asbestosis:** A chronic form of lung disease (pneumoconiosis) caused by inhaling large quantities of asbestos fibers.

**Excursion Limit (EL):** It is the regulatory limit set by OSHA for exposure to a substance over a short period of time, usually thirty (30) minutes.

**Latency Period:** A period where the symptoms of an exposure are not apparent. Effects become apparent at a time remote from the actual exposure. A latent period is common to both cancer causing and infectious agents.

**Permissible Exposure Limit (PEL):** It is the regulatory limit set by OSHA for exposure to a substance over a work shift, usually eight (8) hours time weighted average.

**Personnel Protective Equipment (PPE):** Equipment worn by an individual to protect them from environmental hazards. Gloves, coveralls and respirators are common forms of PPE.

**Respirators:** Respirators are devices that provide clean breathing air to the worker. The respirators can clean the air by using a filter or it can provide an external source of clean air. Respirators are designed to protect the workers from airborne contaminants. Types of respirators include disposable dust/mist mask and self-contained breathing

apparatus (SCBA) respirators. Respirators must be NIOSH certified or Army approved. Respirators should be selected only by the recommendations of industrial hygiene, safety or the installation respirator program director. An employee who uses respirators must be part of the Respiratory Protection Program.

### **References:**

DA PAM 40-513, Occupational and Environmental Health Guidelines for the Evaluation and Control of Asbestos Exposure, 10 July 2013

DODI 6055.05M, Occupational Medical Surveillance Manual, 2 May 2007

AR 11-34, The Army Respiratory Protection Program, 25 August 2013

AR 200-1, Environmental Protection and Enhancement, 27 December 2007

AR 420-70, Buildings and Structures, 10 October 1997

TB MED 509, Spirometry in Occupational Health Surveillance, 24 December 1986

Public Works Technical Bulletin 420-70-8, Installation Asbestos Management Program, 23 March 1998

Memorandum from DASG-PPM-NC, Subject: Interim Changes to TB MED 502 and TB MED 509, for Medical Examinations and the use of Spirometry in Medical Respirator Clearance, dated 9 April 2002

Title 29 Code of Federal Regulations (CFR) Part 1910.1001, Occupational Safety and Health Standards (General Industries), Asbestos, Revised August 1994

Title 29 CFR Part 1926.1101, Occupational Safety and Health Standards (Construction Industries), Asbestos, Revised August 1994

Title 29 CFR 1910.134, Respiratory Protection Standard, 8 January 1998