



# ASBESTOS

## FACT SHEET ON A DRINKING WATER CHEMICAL CONTAMINANT

### GENERAL INFORMATION

#### Synonyms

- None

#### Chemical Description:

- Generic name for a group of naturally occurring hydrated silicate minerals of the amphibole or serpentine groups which are characterized by fibers or bundles of fine single crystal fibers

#### Properties:

- Asbestos fibers have a high tensile strength, flexibility, heat and chemical resistance, low heat and electrical conductance, low porosity, and favorable frictional properties
- White, gray, green, or brown fibers that do not clump together
- Slightly soluble in water

#### Production and Use:

- Properties of the fibers determine their uses
  - asbestos cement pipe and sheet
  - flooring products
  - roofing products
  - friction products
  - packing and gaskets
  - thermal insulation
  - electrical insulation
  - coatings and compounds
  - filtration media
  - asbestos paper
  - plastics
- Chrysotile (serpentine group) accounts for approximately 94% by weight of asbestos use in the U S

### ENVIRONMENTAL PROFILE

#### Occurrence:

- Common contaminant of domestic water supplies, but EPA has concluded that about 95% of water consumers are exposed to asbestos fiber concentrations of less than one million fibers per liter (MFL)
- Occurs naturally through erosion of mineral deposits of serpentine and other asbestos-containing materials in surface water systems

#### Releases:

- Contamination of drinking water may be attributed to erosion of natural mineral deposits, runoff from tailings from mining operations, improper disposal of asbestos wastes (predominantly household waste), and deterioration and/or tapping of asbestos/cement (A/C) pipes in municipal water distribution systems

#### Environmental Fate:

- Highly persistent in water
- Low potential for bioaccumulation
- Asbestos wastes are discharged predominantly to land, and least to water
- Not likely to migrate to ground water if released to soil

### HEALTH EFFECTS

#### Humans:

- Little data on experiments with humans
- Case studies have indicated that inhalation of asbestos fibers causes cancer in humans, also causes asbestosis (diffuse interstitial fibrosis of the lung)

#### Experimental Animals:

- Exposure via inhalation or ingestion (inhalation is the more common exposure pathway and the more detrimental to health)
- Low acute toxicity:
  - the bulk of inhaled asbestos (the longer fibers) is rapidly cleared from the respiratory tract to the gastrointestinal tract
  - most asbestos fibers entering the gastrointestinal tract are passed through the digestive system and are excreted with the feces; however, evidence indicates that they may penetrate the walls of the tract
- Chronic exposure to asbestos via inhalation causes asbestosis and cancer (lung cancer, cancer of the chest cavity; may also cause cancer of the abdominal wall, digestive system, larynx, ovaries, and uterus)

## REGULATORY PROFILE

### Existing Standards:

- **Clean Air Act (CAA):** Regulated
- **Clean Water Act (CWA):**  
Criteria established
- **Resource Conservation and Recovery Act (RCRA):**  
Not regulated
- **Superfund (CERCLA):**
  - Hazardous waste
  - **SARA:** Toxic substance
- **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):**  
Not registered
- **Toxic Substances Control Act (TSCA):**  
Regulated

## HEALTH INFORMATION

### Maximum Contaminant Level Goals (MCLG):

- Non-enforceable levels based solely on an evaluation of possible health risks and exposure, and taking into consideration a margin for public safety
- Set at 7 MFL to protect against cancer

**MCLG for Asbestos = 7 MFL\***  
(effective July 1992)

### Maximum Contaminant Levels (MCL):

- Legally enforceable levels for contaminants in public drinking water supplies
- Based on health risks associated with the contaminants, analytical methods for their assay, and water treatment feasibility and practicality aspects
- Exceedance of the MCL in drinking water may result in adverse effects which will depend upon the contaminant concentration in water, amount of water/contaminant ingested, length of exposure, and other biological parameters

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### EPA Health Advisories (HA):

- **Short-term HAs:** Provide acceptable concentrations of contaminants in water for up to 10 day exposures, primarily to evaluate the public health risk resulting from an accidental spill or an emergency contamination situation

- **Longer-term HAs:** Provide guidance for persistent water contamination situations to cover a period of up to 7 years
- **Lifetime HAs:** Derived in the same way as or MCLG

### Health Advisories

(EPA has not established HAs for asbestos in water)

## ANALYTICAL METHODS

- Transmission Electron Microscopy  
EPA-600/4-83-043

## WATER TREATMENT

### Permanent Treatment:

#### Best Available Technology (BAT):

- Coagulation/Filtration
- Direct Filtration
- Diatomite Filtration
- Corrosion Control

## SHORT-TERM HAZARD ELIMINATION

- If the drinking water standards are exceeded, install BAT or use an alternative drinking water supply such as bottled water

## ADDITIONAL HELP

- State or county health officials can indicate a certified laboratory for testing
- Experts in the state Department of Environmental Protection or Natural Resources may also be of help
- The EPA has toll-free numbers for further information on drinking water quality, treatment technologies, for obtaining Health Advisories, and for other regulatory information
- EPA Hotlines are available Monday through Friday
  - **Safe Drinking Water:** 800-426-4791
  - **National Pesticides:** 800-858-7378
  - **Superfund/RCRA:** 800-424-9346
- For information on the Clean Water Act, call (202) 260-7301
- For information on the Toxic Substances Control Act, call (202) 554-1404
- For information on the Clean Air Act, call (919) 541-2777

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\* MFL = million fibers/liter (longer than 10  $\mu$ m)



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