

Determination of .0009f/cc as clearance value for asbestos air monitoring

Risk Assessment

The IRIS inhalation unit risk for asbestos is 2.3 E-01 per f/cc. Here's how this unit risk is interpreted. Exposure over a lifetime (i.e., 70 yrs) to 1 f/cc of asbestos results in a cancer risk of 2.3 E-1. To get the fiber concentration equating to a 1 E-04 (one-in ten thousand risk - for lifetime exposure) the following equation is used:

$$\frac{.23}{1 \text{ f/cc}} = \frac{.0001}{x}$$

$$x = \frac{.0001}{.23}$$

$x = .0004 \text{ f/cc}$ this is the fiber concentration that equates to a 1 E-04 risk for 70 year exposure.

To adjust the exposure duration to 30 years, multiply .0004 f/cc by $\frac{70}{30} = .0009 \text{ f/cc}$

Analytical Methods

PCM NIOSH 7400 followed by AHERA TEM analysis should be used on all samples. AHERA TEM measures all fibers > .5 um. Additionally, the lab should record all fibers that are > 5 um to determine the PCMe value.

PCMe is determined by counting all fibers > 5 um with a 3:1 aspect ratio by TEM analysis. In our PCMe calculations we are using a conservative approach of counting all fibers >5um.

Therefore, the analytical result of fibers >5 um will be compared to .0009 f/cc to measure success in achieving the clearance value.

Sampling Approach

Air sampling pumps with a maximum flow rate of 15 liters per minute should be used along with sample cassettes with mixed cellulose ester filters having a pore size of .8 um. The minimum sampling volume required is 3600 liters to achieve the clearance criteria.