

# Glossary

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**Action level (AL):** A statistically derived concept used to permit an employer to have confidence (e.g., 95%) that if a measured exposure concentration is below the AL, then only a small probability exists that the actual concentration is above the exposure limit. Often established as half of the exposure limit, the AL should be designated for determining when additional controls are needed or administrative actions should be taken to reduce exposures. The purpose of using this reference is to indicate when worker exposures to hazardous substances may be approaching the exposure limit.

**After-service refractory ceramic fiber (RCF):** RCF that has been subjected to greater than 1,800 °F (~1,000 °C) and has partially converted to the silica polymorph cristobalite. In experimental studies, this fiber is also called RCF4.

**Aspect ratio:** The length to width ratio of a fiber.

**Costophrenic angle:** Location on a chest radiograph where the ribs and the diaphragm appear to meet.

**Dyspnea grade 1:** Shortness of breath on exertion, classified as less severe than grade 2.

**Dyspnea grade 2:** Shortness of breath on exertion, excluding shortness of breath associated with hurrying on the level or walking up a slight hill, and classified as more severe than dyspnea grade 1.

**FEF<sub>25-75</sub>:** Forced expiratory flow (liter/second) that is between 25% and 75% of the forced vital capacity.

**FEV<sub>1</sub>:** Forced expiratory volume in one second, or the maximum volume of air that can be forcibly expired during the first second of expiration following a maximal inspiration.

**Fiber counting rules:** Criteria for identifying and counting fibers during air sampling and exposure assessment. The three main conventions for fiber counting are described below (and in Section 4.2.1 and Appendix A).

- **NIOSH “A” rules**—any particle >5 µm long with an aspect ratio (length to width) greater than 3:1 is considered a fiber.
- **NIOSH “B” rules**—any particle >5 µm long with an aspect ratio equal to or greater than 5:1 and a diameter <3 µm is considered a fiber.
- **World Health Organization (WHO) reference method for man-made mineral fiber**—any particle >5 µm long with an aspect ratio equal to or greater than 3:1 and a diameter <3 µm is considered a fiber.

**FVC:** Forced vital capacity or the maximum volume of air (in liters) that can be forcibly expired from the lungs following a maximal inspiration.

**High-efficiency particulate air (HEPA) filter:** A dry-type filter used to remove airborne particles with an efficiency equal to or greater than 99.97% for 0.3- $\mu\text{m}$  particles. The lowest filtering efficiency of 99.97% is associated with 0.3- $\mu\text{m}$  particles, which is approximately the most penetrating particle size for particulate filters.

**Inspirable dust:** The fraction of airborne particles that would be inspired through the mouth and nose of a worker.

**MAN:** A refractory ceramic fiber produced by the Johns Manville Company.

**Occupational medical monitoring (incorporating medical screening, surveillance):** The periodic medical evaluation of workers to identify potential health effects and symptoms related to occupational exposures or environmental conditions in the workplace. An occupational medical monitoring program is a secondary prevention method based on two processes, screening and surveillance. Occupational medical screening focuses on early detection of health outcomes for individual workers. Screening may involve an occupational history assessment, medical examination, and medical tests to detect the presence of toxicants or early pathologic changes before the worker would normally seek clinical care for symptomatic disease. Occupational **medical surveillance** involves the ongoing evaluation of the health status of a group of workers through the collection and analysis of health data for the purpose of disease prevention and for evaluating the effectiveness of intervention programs.

**Pleural plaques:** Discrete areas of thickening that are generally on the parietal pleura and are most commonly located at the midcostal and posterior costal areas, the dome of the diaphragm, and the mediastinal pleura. Presence of plaques is an indication of exposure to a fibrous silicate, most frequently asbestos.

**Radiographic opacity:** A shadow on a chest X-ray film generally associated with a fibrogenic response to dust retained in the lungs [Morgan 1995]. Opacities are classified by size, shape, location, and profusion according to guidelines established by the International Labor Office [ILO 2000] [www.ilo.org/public/english/support/publ/books.htm](http://www.ilo.org/public/english/support/publ/books.htm)).

**Refractory ceramic fiber (RCF):** An amorphous, synthetic fiber (Chemical Abstracts Services No. 142844-00-6) produced by melting and blowing or spinning calcined kaolin clay or a combination of alumina ( $\text{Al}_2\text{O}_3$ ) and silicon dioxide ( $\text{SiO}_2$ ). Oxides may be added such as zirconia, ferric oxide, titanium oxide, magnesium oxide, calcium oxide, and alkalies. The percentage (by weight) of components is as follows: alumina, 20% to 80%; silicon dioxide, 20% to 80%; and other oxides in smaller amounts.

**Respirable-sized fiber:** Particles  $>5 \mu\text{m}$  long with an aspect ratio  $>3:1$  and diameter  $\leq 1.3 \mu\text{m}$ .

**Shot:** Nonfibrous particulate that is generated during the production of RCFs from the original melt batch.

**Standardized mortality ratio (SMR):** The ratio of the observed number of deaths (from a specified cause) to the expected number of deaths (from that same cause) that has been adjusted to account for demographic differences (e.g., age, sex, race) between the study population and the referent population.

**Synthetic vitreous fiber (SVF):** Any of a number of manufactured fibers produced by the melting and subsequent fiberization of kaolin clay, sand, rock, slag, etc. Fibrous glass, mineral wool, ceramic fibers, and alkaline earth silicate wools are the major types of SVF, also called man-made mineral fiber (MMMMF) or man-made vitreous fiber (MMVF).

**Thoracic-sized fiber:** Particles  $>5 \mu\text{m}$  long with aspect ratio  $>3:1$  and a diameter  $<3$  to  $3.5 \mu\text{m}$ . *Thoracic* refers to particles penetrating to the thorax (50% cut at  $10\text{-}\mu\text{m}$  aerodynamic diameter). Mineral and vitreous fibers with diameters 3 to  $3.5 \mu\text{m}$  have an aerodynamic diameter of approximately  $10 \mu\text{m}$ .