



Standard Guide for Selection and Use of Personal Protective Equipment for Humans Working With Respirable Silicon Carbide Whiskers¹

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1. Scope

1.1 This guide describes special considerations for selection and use of personal protective devices for work situations that present a risk of exposure to respirable silicon carbide whiskers.

1.2 This guide is intended to provide supplementary information for equipment selection and use and does not take the place of other standards and requirements such as OSHA regulations, ANSI standards, manufacturer recommendations as listed on material safety data sheets, or other ASTM standards that relate to personal protective equipment.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 1437 Practice for Handling Silicon Carbide Whiskers²

E 1451 Guide for Disposal of Wastes Containing Silicon Carbide Whiskers and Fibers²

2.2 OSHA Standard:³

Title 29 CFR 1910 Personal Protective Equipment, Subpart 1

2.3 ANSI Standard:⁴

Z88.2 Respiratory Protection

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *respirable silicon carbide whiskers*—a crystalline silicon carbide material, approximately cylindrical in shape, with an aspect ratio equal to or greater than 5, and a diameter less than or equal to 3.0 μm with the potential to become airborne.

3.1.2 *HEPA*—high-efficiency filtration, tested to be 99.97 % efficient for 3.0-μm test particles.

4. General Considerations for Selection and Use of Protective Devices

4.1 Where feasible, protective devices should be selected that have a color that contrasts with the silicon carbide whiskers (or the whisker-containing materials). Practice E 1437 is recommended for guidance in handling silicon carbide whiskers.

4.2 Outer garments should be selected for their ability to withstand penetration of whiskers.

4.3 Outer garments should be easy to decontaminate or should be disposable.

4.4 Contaminated protective equipment should be stored or disposed of in a manner that will prevent or minimize the spread of whiskers to street clothing or to other work areas. Guide E 1451 should be reviewed for guidance on waste disposal.

4.5 Prior to removing visibly contaminated equipment, whisker contamination should be removed, to the extent possible, with HEPA vacuum cleaner or by wet wiping. In cases where protective clothing is heavily contaminated with whisker materials, respiratory protection should be worn until outer garments are wiped or vacuumed off.

4.6 In situations where contaminated equipment is handled by persons other than the user (for example, laundry workers), these individuals should be provided with hazard information such as that contained in the material safety data sheet.

4.7 Engineering controls such as well-designed local exhaust ventilation systems and use of enclosed systems are preferable to use of personal protective equipment for preventing personnel exposures.

5. Protective Equipment for Low-Level Contact/Exposures

NOTE 1—Below 0.2 whiskers per cubic centimetre of air; example, laboratory use.

5.1 For tasks that are judged or known to result in incidental exposures below 0.2 whiskers per cubic centimetre, the minimum respiratory protection of a half-mask air purifying respirator with HEPA filter is recommended. ANSI Z88.2 is recommended as a guide.

5.2 Plastic or rubber types of gloves are recommended to prevent skin contact. In situations that require continuous use of gloves for more than 30-min periods, it is recommended that

¹ This guide is under the jurisdiction of ASTM Committee E-34 on Occupational Health and Safety and is the direct responsibility of Subcommittee E34.70 on Single Crystal Ceramic Whiskers.

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² Annual Book of ASTM Standards, Vol 11.03.

³ Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.