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# Standard Guide for Administrative and Engineering Controls for Silicon Carbide Whisker Work Areas[1]

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## 1. Scope

1.1 This guide applies to workplaces where unbound silicon carbide whiskers are manufactured, processed into products, or otherwise used.

1.2 This guide offers guidance for controlling workplace exposures to airborne silicon carbide whiskers.

1.3 All applicable federal, state, county, and local regulations must be complied with when this guide is used.

1.4 *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:* [2]

E 1437 Practice for Handling Silicon Carbide Whiskers

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

E 1716 Guide for the Selection and Use of Personal Protective Equipment for Humans Working with Respirable Silicon Carbide Whiskers

E 1717 Guide for Workplace Health and Safety Training for Respirable Silicon Carbide Whiskers

## 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

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

3.1.2 *silicon carbide whisker work area*—a hood, laboratory, room, building, facility, or other defined area where unbound silicon carbide whiskers are handled, and to which potential airborne silicon carbide whiskers can be reasonably restricted.

3.1.3 *unbound silicon carbide whiskers and fibers*—whiskers and fibers with the potential to become airborne.

## 4. Controls for Unbound Silicon Carbide Whisker Work Areas

4.1 *Application*—The following controls should be followed for areas where unbound silicon carbide whiskers are handled outside of closed containers, or where silicon carbide whisker airborne concentrations are known or expected to be present in any quantity, regardless of duration.

4.2 *Administrative Controls*:

4.2.1 All employees associated with a silicon carbide whisker workplace should be trained in accordance with Guide E 1717 and Practice E 1437.

4.2.2 Eating, drinking, or smoking are not permitted in silicon carbide whisker work areas.

4.2.3 Shoe cleaners, tacky mats, or other type of control for materials tracked by shoes, should be provided at appropriate locations to prevent introduction of unbound silicon carbide whiskers to non-work areas.

4.2.4 Rotation of workers to reduce 8-h time weighted average exposures to silicon carbide whiskers is not recommended.

4.3 *Personal Protective Equipment*—Consult Guide E 1716.

4.4 *Engineering Controls*:

4.4.1 Local exhaust controls engineered for a process are preferred. General exhaust controls are acceptable, but generally less effective than local exhaust. Exhaust air from central collection points should be externally exhausted, filtered as appropriate to meet applicable standards. Small self-contained units may be exhausted to the work area, if the air stream is first HEPA filtered before reintroduction to the work area.

4.4.2 Vapor capture velocity parameters are sufficient for the design of exhaust controls for silicon carbide whisker work areas or points of operations. Higher design velocities may be

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

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.