



Designation: E 1132 – 99a

Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica¹

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INTRODUCTION

Silicon dioxide (silica, SiO_2) is encountered in nature and industry in a wide variety of forms. These range from essentially anhydrous types with or without a very high degree of crystallinity, to highly hydroxylated or hydrated types which are amorphous by x-ray diffraction examination. Crystalline silica² exists in a number of forms or polymorphs. The three major forms, quartz, cristobalite, and tridymite, pertain to this practice. Quartz (or alpha quartz) is the more common form encountered as airborne particulates. Two of the polymorphs, cristobalite and tridymite are formed at elevated temperatures and are much less common in nature, but might be encountered in several occupations where silicas are fired (calcined) at high temperatures.³ These silica materials have a broad range of physical and chemical properties.

1. Scope

1.1 This practice covers a description of several actions that could be taken to reduce the probability of harmful occupational exposures to humans in environments containing respirable crystalline silica.

1.2 Nothing in this practice shall be interpreted as requiring any action that violates any statute or requirement of any federal, state, or other regulatory agency.

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.* It is the responsibility of the user to consult all material safety data sheets and labels pertaining to any hazardous materials used in this standard.

2. Referenced Documents

2.1 ASTM Standards:

¹ This practice is under the jurisdiction of ASTM Committee E34 on Occupational Health and Safety and is the direct responsibility of Subcommittee E34.16 on Silicas.

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² Smith, Deane K., Opal, cristobalite, and tridymite: Noncrystallinity versus crystallinity, nomenclature of the silica minerals and bibliography, *Powder Diffraction*, Vol 13, 1998, pp 1–18.

³ Miles, W.J., Crystalline silica analysis of Wyoming bentonite by X-ray diffraction after phosphoric acid digestion, *Analytical Chemistry Acta*, Vol 286, 1994, pp 97–105.

E 1238 Specification for Transferring Clinical Observations Between Independent Computer Systems⁴

E 1239 Guide or Description of Reservation/Registration-Admission, Discharge, Transfer (R-ADT) Systems for Automated Patient Care Information Systems⁴

E 1384 Guide for Content and Structure of the Computer-Based Patient Record⁴

E 1633 Specification for Coded Values Used in Computer-Based Patient Record⁴

E 1715 Practice for an Object-Oriented Model for Registration, Admitting, Discharge, and Transfer (RADT) Functions in Computer-Based Patient Record Systems⁴

2.2 ANSI Standards:⁵

Z9.2 1979 Fundamentals Governing the Design and Operation of Local Exhaust Systems

Z88.2 1992 American National Standard Practice for Respiratory Protection

2.3 Code of Federal Regulations:⁶

29 CFR 1910.134, Respiratory Protection

29 CFR 1910.1000, Air Contaminants

29 CFR 1910.1200, Hazard Communication

42 CFR 84 Title 42, Part 84, Approval of Respiratory Protective Devices, Tests for Permissibility, Fees

30 CFR 56, Title 30, Subpart D, Air Quality, Radiation, and

⁴ *Annual Book of ASTM Standards*, Vol 14.01.

⁵ Available from American National Standards Institute, 11 W. 42nd St., 13th floor, New York, NY 10036.

⁶ Available from Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.