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OSHA Standard Development Update:

Crystalline Silica

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Assistant Regional Administrator

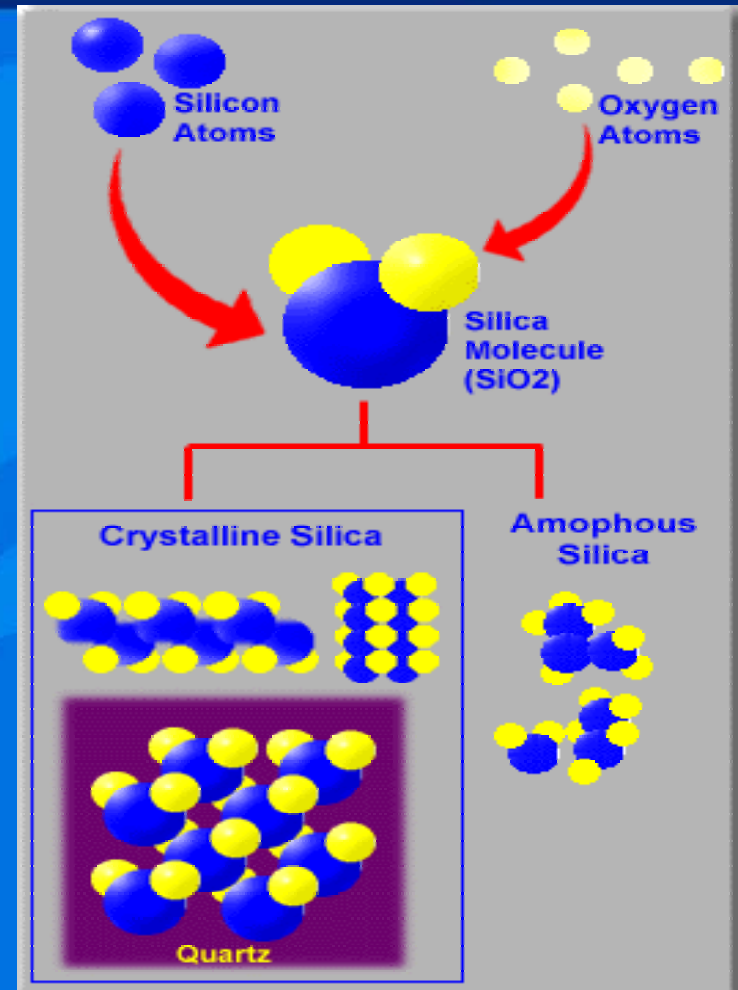
Occupational Safety and Health Administration

Region VII



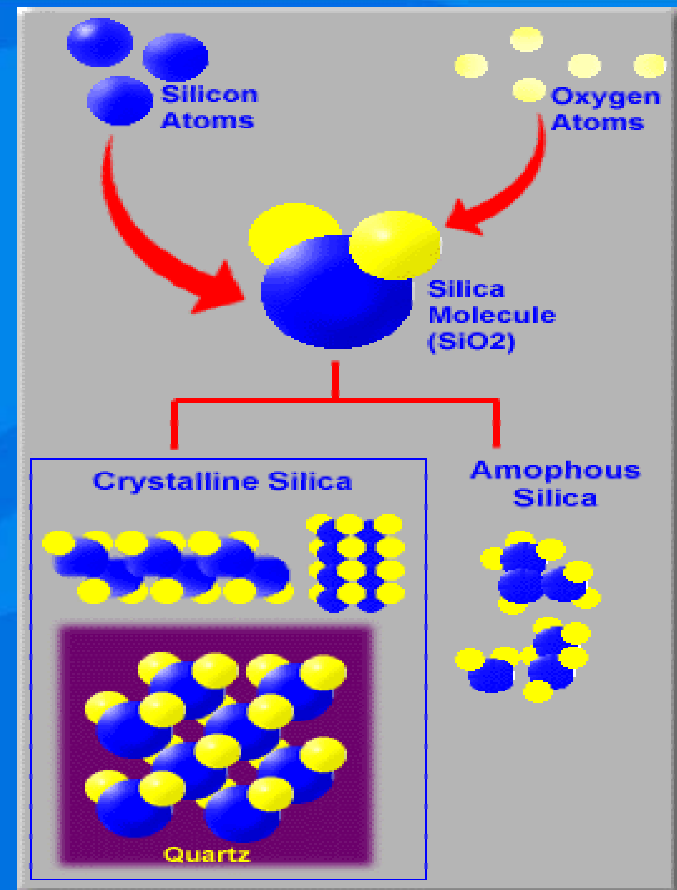
Basics on Silica

- Silica is a mineral compound made up of one silicon atom and two oxygen atoms. Oxygen and silicon are the first and second most abundant elements in the earth's crust. Due to such abundance, the formation of the compound silica in nature is very common.



Basics on Silica (cont) -

- If the individual silica molecules are lined up in order and create a repeatable pattern, then the silica is in crystal form. We call it "crystalline" silica.
- Crystalline silica is significantly more hazardous to workers.



WHY Target Crystalline Silica?

- Widespread occurrence & use
 - Maritime
 - Agriculture
 - Construction
 - General Industry
- Number of related deaths
- Number of exposed workers
- Health effects

Occurrence of Crystalline Silica

- Silica is one of the most common minerals in earth's crust.
- It's a basic component of sand, quartz, & granite rock.
- Various activities that produce airborne crystalline silica include:

Sandblasting
Rock drilling
Roof bolting
Foundry work

Stonecutting
Drilling/Cutting
Quarrying
Tunneling

Industries with Silica Exposure

- Electronics
- Foundries
- Ceramics, clay & pottery, stone, & glass
- Construction
- Agriculture
- Maritime
- Mining
- Railroad (setting & laying track)
- Slate & flint quarrying & flint crushing
- Use & manufacture of abrasives
- Manufacture of soaps & detergents

Number of Silica-Related Deaths¹

- Total US deaths from 1968-1990, there were 13,744 where silicosis was reported on death certificate.
- 6,322 of these deaths had silicosis reported as underlying cause of death.
- 68% of silica-related deaths reported in 12 states.
- 10% of silica-related deaths reported from construction industry, and iron and steel foundries accounted for another 5.4%.

¹Study by Bang *et al.*, 1995

Silica-Related Deaths Continue to Occur

- **Between 1990 and 1996, 200 to 300 deaths per year are known to have occurred where silicosis was identified on the death certificates as an underlying or contributing cause of death. This trend continues to the present.**
- **At the current OSHA permissible exposure limit (PEL), a number of studies have shown that close to 50% of workers exposed to silica working 45 years will develop silicosis.**

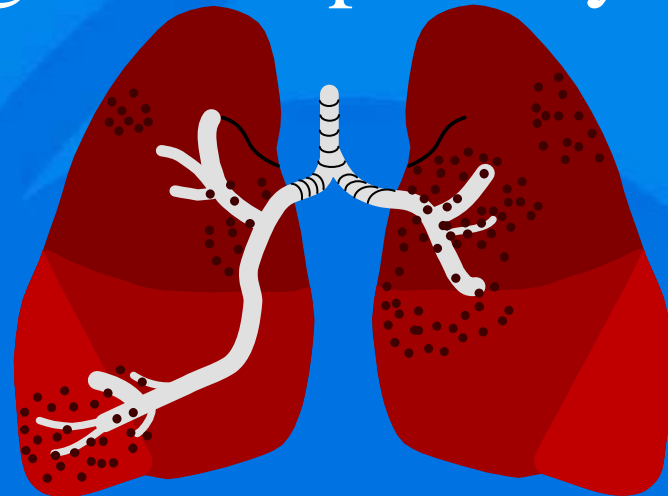
Number of Exposed Workers

- It's estimated that over two million workers are exposed to crystalline silica dust in general industry, construction and maritime industries.



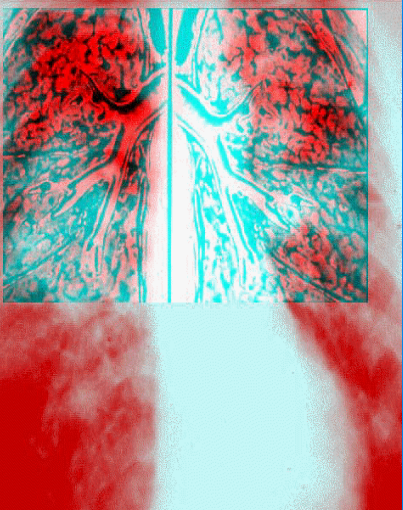
Health Effects

- Pulmonary fibrosis (silicosis)
- Possible lung cancer
- Increase risk of developing TB and other non-malignant respiratory diseases



The Basics on Silicosis

- Silicosis is an often fatal fibrotic lung disease caused by the inhalation and deposition of crystalline silica particles.



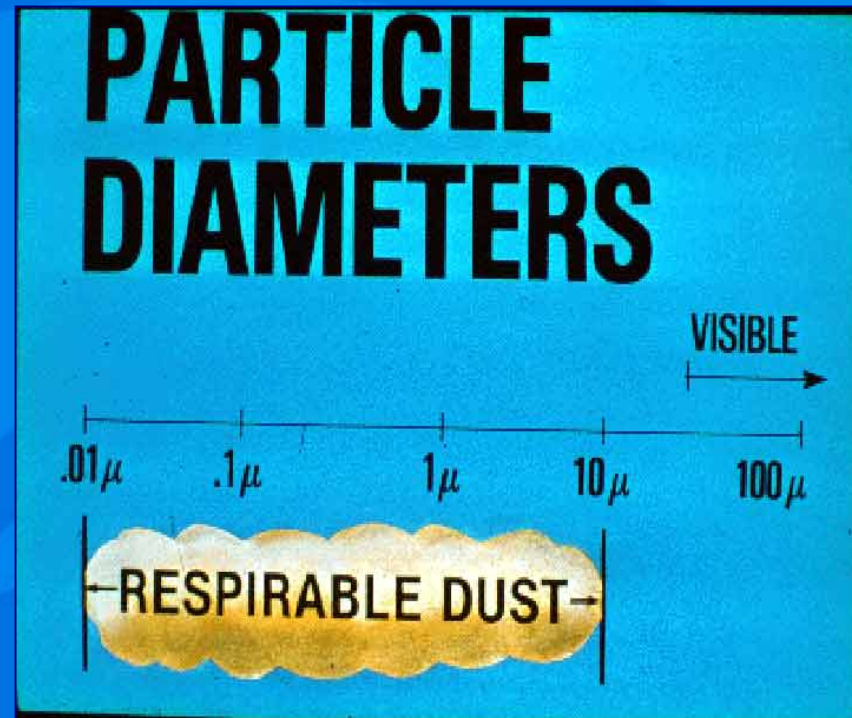
- Scar tissue forms in the lungs and reduces the ability to extract oxygen from the air.

Symptoms include:

- fever
- shortness of breath while exercising
- occasional bluish skin at ear lobes or lips
- fatigue
- loss of appetite

The Basics on Silicosis (cont.)

- Individuals are at risk in the workplace if:
 - the silica can become airborne,
 - the airborne particles are a certain size,
 - the worker breathes in the silica.
- While the disease is incurable, it's 100% preventable if appropriate steps are taken.



The Basics on Silicosis (cont.)

- There are three kinds of silicosis, based on amount of exposure and length of time:
 - **Chronic**
 - occurs after 10 or more years of mild overexposure to silica
 - the most common of all types
 - may go undetected for years
 - **Accelerated**
 - develops between 5 and 10 years of moderate overexposure
 - **Acute**
 - develops within weeks up to five years due to breathing very large amounts of silica

Alternatives to Rulemaking

- Reducing and ultimately eliminating the workplace incidence of silicosis has been a primary goal of OSHA since its inception.
- A variety of non-regulatory approaches have been utilized by OSHA in the past to try and achieve this goal including:
 - The issuance of guidelines in 1972 for conducting inspections in workplaces with significant silica exposure.

Alternatives to Rulemaking (cont.)

- A Special emphasis on the Prevention of silicosis in foundry workers in the early 1980s.
- In 1996, a Special Emphasis Program to reduce the workplace incidence of silicosis.
- Sponsorship with NIOSH and MSHA of a National Conference to Eliminate Silicosis in 1997, and
- Dissemination of guidance information on crystalline silica via our website.

Alternatives to Rulemaking (cont.)

- More recently, a new National Emphasis Program (NEP) for silica has also been under development.
- This NEP will address targeting of worksites with elevated exposure to crystalline silica, as well as silica-related inspection procedures and compliance assistance.
- The NEP has received concurrence and final approvals and is now awaiting the Assistant Secretary's signature.

Draft Regulatory Alternative

- A Draft regulatory alternative (Crystalline Silica Docket, H 006A).
- A Preliminary initial regulatory flexibility analysis (PIRFA) was developed by OSHA with 2 exhibits.

Silica PIRFA

- 1. A Draft regulatory option for construction.**
- 2. A Draft regulatory option for General industry.**

Silica PIRFA

- **The analysis is seeking Draft regulatory options, including the Determination of a Proposed Permissible exposure limit (PEL) for Crystalline silica.**
- **Proposed options include levels of 50, 75, and 100 micrograms/m³.**

S B R E F A P r o c e s s

- **Last Fall, an O S H A / S B A / O M B Panel was convened under the Small Business Regulatory Enforcement and Fairness Act (S B R E F A), to review comments from various Small Entity Representatives (S E R S) on the Draft O S H A standards for silica.**
- **On December 19, 2003, the S B R E F A Process was completed with a report of recommendations to the Assistant Secretary.**

SO, Where are we Presently?

- The Semiannual Regulatory Agenda was Published in the Federal Register on June 28, 2004.
 - Occupational exposure to crystalline silica was included in the Pre-rulemaking Agenda with a „Preliminary Determination that workers are exposed to a significant risk of silicosis and other serious disease and that rulemaking is needed to substantially reduce the risk.%o

Where are we Presently? (cont.)

- In Developing a Proposed standard, OSHA is considering several options:
 - Comprehensive standards simultaneously for General industry, construction, and maritime;
 - Focusing the proposal on one or more specific issues such as:
 - Modernizing the construction and maritime Permissible exposure limits (PELs); or
 - Standardizing sampling and analytical methods to ensure reliable data on employee exposures.

Silica PROPOSED Rule Timetable

- **The Agency is currently working on a feasibility assessment and risk analysis for the Proposal.**
- **The next goal . By February 2005 . will be an external peer („disinterested experts“ review of the Agency’s risk assessment.**

Silica Proposed Rule Timetable

- **While the external peer review is ongoing, OSHA will be drafting a preamble and a regulatory analysis.**
- **Following input from the peer review process regarding risk assessment, options for how to structure a proposal will be prepared for the Assistant Secretary.**

SiLiCa P r o P o s e d R u l e T i m e t a b l e

- There's Been no Decision at this Point on the Content of a Proposed rule.
- Before a Notice of Proposed Rulemaking can Be Published in the Federal Register, Both the Department and the Office of Management and Budget (OMB) must review and approve the Proposed „Package.“
- At Best, we are Projecting that this Overall Process will take until the last half of 2005.

Q u e s t i o n s ?

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Thank You!

G l e n n E . T a y l o r

A s s i s t a n t R e g i o n a l A d m i n i s t r a t o r

O S H A R e g i o n V I I

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The Standards Development Process

OSHA can begin standards-setting procedures on its own initiative, or in response to petitions from other parties.

The Standards Development Process

Those parties include:

- NIOSH
- Secretary of HHS
- Nationally recognized standards producing organization
- State & local governments
- Employers, employees, or any interested person

Advisory Committees

If OSHA determines that a specific standard is needed, any of several advisory committees may be called upon to develop the specific recommendations.

Two Standing Advisory Committees

1. National Advisory Committee on Occupational Safety and Health (NACOSH)
2. Advisory Committee on Construction Safety and Health

Committee Formation including Ad Hoc Committees

**Each committee must have
members representing:**

- Management**
- Labor**
- State Agencies**
- One or more designees of the
Secretary of HHS**

Standards Adoption

Once OSHA has developed plans to propose, amend, or revoke a standard it publishes these intentions in the Federal Register.

Standards Adoption

1. Publication

- “Notice of Proposed Rulemaking”
- “Advance Notice of Proposed Rulemaking”

2. Consultation with

- OMB
- SBREFA

Standards Adoption

Specific time set for public response (at least 30 days, but usually 60 days or more).

Interested parties may request public hearing on the proposal when none has been announced in the proposal.

Standards Adoption

After the close of the comment period and public hearing OSHA must publish in the Federal Register the full, final text and the date it is to become effective.

Standards Development Update

- **Hexavalent Chromium**
- **Crystalline Silica**
- **Beryllium**

Update on Silica

At the current OSHA permissible exposure level a number of studies have shown that close to 50% of workers exposed to silica working 45 years will develop silicosis. There are currently about 300 deaths reported annually, and the actual number is believed to be much higher.

(continued)

Update on Silica

On December 19, 2003 the SBREFA process was completed and a report of recommendations was completed.

Draft Regulatory Alternative

**A draft regulatory alternative
(Crystalline Silica H006A)**

**A preliminary initial regulatory
flexibility analysis (PIRFA) was
developed with 2 exhibits.**

Silica PIRFA

- 1. A draft regulatory option for construction**
- 2. A draft regulatory option for general industry**

Silica PIRFA

The analysis is seeking draft regulatory options including the determination of a proposed PEL for Silica.

Proposed options include levels of 50, 75, and 100 micrograms/m³.

NEP for Silica

The Silica National Emphasis Program (NEP) has been developed and has received concurrence and final approvals. An information packet for the Office of Communications is being prepared prior to final release of the NEP.

(continued)

NEP for Silica

This directive was developed through the Directorate of Enforcement Programs. It is intended as a collaborative effort among enforcement, standards, training, and outreach programs.

Thanks for Assistance

**Hexavalent Chromium and Beryllium
information provided by**

**Amanda Edens, Director Office of
Chemical Hazards – Metals**

**Directorate of Standards and
Guidance**

and

Thanks for Assistance

Silica information provided by

**Bill Perry, Industrial Hygienist
Office of Chemical Hazards – Non
Metals**

**Directorate of Standards and
Guidance**

and

Thanks for Assistance

**Additional information and assistance
provided by**

**Glenn Taylor, ARA for the
Office of Technical Support**

Sources of Information

At the Local Area OSHA Office

- Duty Officer
- Compliance Assistant

On the web at

- <http://www.osha.gov>
- <http://www.info.gov>

THANK YOU!

Samuel A. Stuck, IH

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