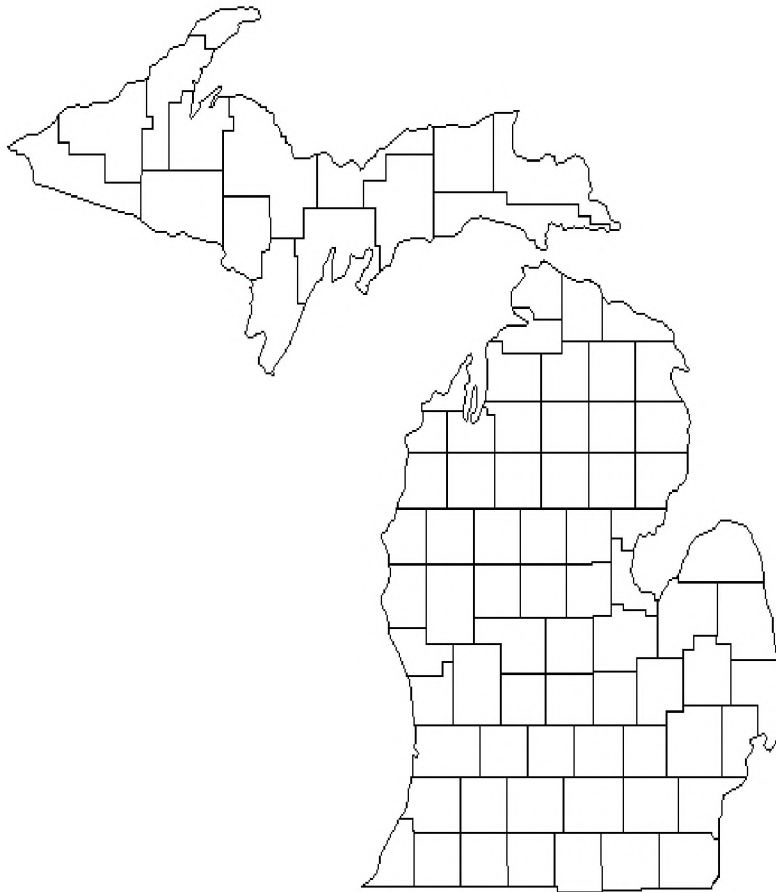


ABRASIVE BLASTING TRAINING
PREVENTING SILICOSIS

BEFORE IT PREVENTS YOU FROM ENJOYING LIFE



MICHIGAN STATE UNIVERSITY
College of Human Medicine
Department of Medicine
Occupational and Environmental Medicine
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PREVENTING SILICOSIS ABRASIVE BLASTING TRAINING

Agenda

8:00 A.M.	Introduction and Overview
8:30	“20 Questions” Exercise
8:45	“Plain Talk About a Serious Problem - Silicosis” (Film)
9:05	Health Hazards of Abrasive Blasting
10:00	--- Break ---
10:15	Silica Substitutes - HANDS ON DEMO
11:15	Cutting Airborne Silica
12:00	--- Lunch ---
12:35	Air Monitoring - HANDS ON DEMO
1:15	--- Stretch Break ---
1:20	Respiratory Protection and PPE - HANDS ON DEMO
2:30	--- Break ---
2:40	Getting Organized
2:55	Safety Training
3:15	Cleaning Up
3:30	--- Stretch Break ---
3:35	Medical Monitoring
3:50	Keeping Your Family Safe
4:00	Questions and Answers
4:15	Course Evaluation

Purpose

This manual was produced by Michigan State University's Department of Medicine, Occupational and Environmental Medicine Division, to deal with the hazards of silica and silicosis in abrasive blasting shops in Michigan. The manual was developed and written by Aaron Ells, Debra Chester and Ken Rosenman, M.D. Assistance and review were also made by Mary Jo Reilly at Michigan State University, Mike McCawley of NIOSH and Greg Grubb of MIOSHA.

Silicosis is a lung disease which is associated with the inhalation of silica dust. It is a progressively debilitating disease that can develop after you breathe in microscopic, crystalline silica particles. There is no cure for silicosis. However, it is completely preventable.

Michigan's surveillance efforts have confirmed 749 cases of silicosis from 1985-1998. Each year approximately 50-70 new cases are confirmed; in 1996, 64 cases were identified. More than 250 American workers die with silicosis every year. More than one million U.S. workers are exposed to crystalline silica.

Abrasive blasting with sand is known to be one of the most hazardous work practices that involves the use of silica. Reports from NIOSH (CDC, 1992) and in the medical literature document the continuing hazards of sandblasting. Workers who perform sandblasting are at risk not only of developing chronic silicosis but also acute and accelerated silicosis.

Forty years ago, European countries took steps to ban the use of silica for abrasive blasting. Despite the number of silica-free substitute abrasive medias, silica is still the most common abrasive used in sandblasting in the United States.

This training manual has been developed for the purpose of training abrasive blasters on how to do abrasive blasting safely. By providing employees and employers with information regarding the hazards of silica and possible control measures, and with the knowledge necessary to implement protective measures, we believe this training can result in removing barriers to successful prevention of silicosis.

This worker's training manual may be reproduced and distributed for non-profit educational purposes. The format for this manual was modeled from the publication: Prevent Lead Poisoning Before it Poisons Your Business, produced by the California Occupational Health Program to deal with the hazards of lead in radiator shops.

Funding for this project has been provided by the National Institute for Occupational Safety and Health (U60/CCU5122320).

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How to Use This Manual

➡ ➡ ➡ WHAT IS THE PURPOSE OF THE MANUAL?

This project's goal is to prevent silicosis among the workers of Michigan companies that use silica sand as an abrasive media during the abrasive blasting process. The project included pre- and post- surveys of work sites, employee and employer health and safety training and other technical assistance.

This manual was designed to be used by companies performing abrasive blasting operations. The most important steps are first. Companies should start with Chapter 1, Silica Substitutes, and work through each chapter, one step at a time.

➡ ➡ ➡ HOW THE MANUAL IS ORGANIZED.

This manual is organized to make it easy for you to use. It is broken down into chapters which address different areas related to the prevention of silicosis.

It is recommended that as you work through the elements of this manual, you keep track of your progress. Keep these "Progress Reports" for your records. They will provide a way to record your achievements. If MIOSHA (Michigan Occupational Safety and Health Administration, the State OSHA plan) investigates your company, the Progress Reports you have kept can prove that you have taken steps in good faith to comply with existing standards and regulations. Progress Reports can also document that you have pursued health and safety programs designed to protect you and your coworkers.

Many state, local, public and nonprofit agencies can help you create a safe and healthy workplace. They are listed throughout the training manual.

Summary

➡ ➡ ➡ WHAT IS THE DANGER?

Abrasive blasters using silica sand as an abrasive may contract a dust disease of the lung called silicosis. The common silicosis symptoms may be virtually unnoticeable in the beginning. Over time, silica can damage the lung tissue. This damage can cause permanent disability, secondary disease and death. Recently, there has been agreement that silica can also cause lung cancer.

➡ ➡ ➡ WORKSITE CONDITIONS WHERE SILICOSIS MAY BE A PROBLEM:

- ⇒ **Failure to substitute non-silica abrasives**
- ⇒ **Inadequate engineering controls (such as ventilation) and work practices**
- ⇒ **Inadequate respiratory protection for workers**
- ⇒ **Failure to conduct adequate medical surveillance programs**

➡ ➡ ➡ CAN SILICOSIS BE PREVENTED?

Yes. Technology for protecting you and your coworkers has been on the market for several years. In the majority of cases, the easiest steps can solve the most arduous problems. Many owners discover unexpected benefits from changing to non-silica abrasive substitutes and are surprised to find out that the long range costs are affordable.

This manual was produced by Michigan State University to help you and abrasive blasting shop owners protect themselves from silicosis. We believe you and your shop will choose to develop a safe and healthy workplace if you are given the basic knowledge and resources. To help you create your health and safety program, this manual includes information and instructions which are easy to follow. The manual focuses on the most important steps and presents easy hints for getting cost-effective results.

➡ ➡ ➡ WHY ARE THERE SO MANY REGULATIONS?

This manual does not add new regulations. MIOSHA and OSHA have required most of the steps since 1973, and they will enforce their standards and regulations when applicable. Of course, other federal, state and local agencies also have regulations dealing with the safe use, handling and storage of silica sand, including hazardous waste disposal, waste water treatment, and air pollution.

Overview

➡ ➡ ➡ FIND OUT IF YOUR SHOP IS USING SILICA-CONTAINING ABRASIVE

- ◆ Read the Material Safety Data Sheets (MSDSs) for the abrasive or perform air sampling.

➡ ➡ ➡ IF YOUR SHOP USES SILICA ABRASIVES, YOU SHOULD:

- ◆ **Determine if substituting a non-silica abrasive is feasible.**

See Chapter 1.

- ◆ **Find out if you and your company have a possible silicosis problem.**

This can be done by air sampling as described in Chapter 4.

- ◆ **Set up a silica health and safety program to meet your needs.**

Most abrasive blasting shops must also take some other basic steps. The common elements of a silica safety program are shown on pages 7-8 of this overview.

➡ ➡ ➡ WHY IS A SILICA HEALTH AND SAFETY PROGRAM IMPORTANT?

Silica and silicosis threaten the health of abrasive blasters, and potentially, their families. The number one abrasive media used in the United States is silica. Workers at many companies have so much exposure to crystalline silica that they are slowly killing themselves. Owners of small shops who blast also face the same risks.

Silica and silicosis also threaten the health of your company. The overall cost of silica problems can be staggering: medical costs, workers' compensation cases, lost work days, and poor employee morale. If your company has serious MIOSHA violations, you could be cited and fined.

➡ ➡ ➡ WHAT ARE THE LEGAL REQUIREMENTS?

OSHA (the Occupational Health and Safety Administration) and MIOSHA have many regulations for protecting workers in silica-using companies. OSHA and MIOSHA adopted these rules in 1973 with additional requirements implemented over several years. The MIOSHA regulations mentioned throughout this manual are included in the Appendix and Standards section.

Overview

A SILICA HEALTH & SAFETY PROGRAM WHAT SHOULD IT INCLUDE?

➡ ➡ ➡ SILICA SUBSTITUTES.

The amount of silica dusts in the air can be greatly reduced by substituting silica-free abrasives.

See Chapter 1.

➡ ➡ ➡ HEALTH HAZARDS OF ABRASIVE BLASTING.

Silicosis is not the only health hazard associated with abrasive blasting.

See Chapter 2.

➡ ➡ ➡ GETTING ORGANIZED.

How do I get started in developing a silica health and safety program?

See Chapter 3.

➡ ➡ ➡ AIR SAMPLING.

Air sampling should be performed to find out whether your company has a silica exposure problem.

See Chapter 4.

➡ ➡ ➡ CUTTING AIRBORNE SILICA.

The best method to cut and control airborne crystalline silica is to SUBSTITUTE NON-SILICA ABRASIVES. Other control methods, such as engineering controls, safer work and personal hygiene practices should be developed.

See Chapter 5.

Overview

➡ ➡ ➡ RESPIRATORY PROTECTION.

MIOSHA requires you wear a NIOSH (the National Institute for Occupational Safety and Health) approved Type CE Abrasive-Blasting Supplied-Air respirator while you perform abrasive blasting operations. It is also recommended that you wear a Type CE respirator during cleanup operations. You should wear an approved respirator AT ALL TIMES when working in or near the blast site.

See Chapter 6.

➡ ➡ ➡ SAFETY TRAINING.

Your efforts to create a safe and healthy workplace may be wasted if you and the shop employees don't understand the importance of working safely.

See Chapter 7.

➡ ➡ ➡ CLEANING UP.

One of the main ways you are exposed to crystalline silica is during cleanup operations. Cleanup operations include YOU: sink, soap and water; where you eat and take your breaks; and how you maintain your protective clothing. Cleanup operations include your SHOP: cleanup methods, rules concerning locations where eating, drinking, smoking, etc. are permitted; and properly disposing of waste materials.

See Chapter 8.

➡ ➡ ➡ MEDICAL MONITORING.

If you are exposed to crystalline silica dust, you should have routine medical monitoring. Monitoring should include a baseline medical and occupational history for each new employee. The baseline should include a complete physical, chest x-ray and a pulmonary function test. If you or any employee show signs of overexposure, scarring of the lungs, or nodules forming in the lungs, reassignment to a silica-free area should occur.

See Chapter 9.

➡ ➡ ➡ KEEPING YOUR FAMILY SAFE

This manual is mainly about protecting you against silicosis and crystalline silica exposure. It's also important to protect your family, neighbors, and your community.

See Chapter 10.

Overview - Notes