

Hazard Prevention and Educational Outreach Efforts

Between 1990 and 2014, the NJDOH conducted four major projects aimed at reducing and eliminating exposure to silica dust:

- Preventing silica dust exposure during cutting and grinding of concrete, brick, or stone – **Page 1**
- Controlling exposure to silica dust in dental laboratories – **Page 2**
- Promoting use of the latest dust control technologies in NJ’s nonmetal mines – **Page 3**
- Preventing worker exposure to silica during stone countertop manufacturing, finishing and installation – **Page 4**

1. Silica Exposure from Dry-Cutting and Dry-Grinding

A hazard surveillance project was conducted to reach workers who cut or grind concrete, brick and stone. The hazard alert, “Dry Cutting and Grinding is Risky Business,” and an accompanying survey were mailed to 2,377 NJ companies. The hazard alert, available on the NJDOH website in English and Spanish, details the health hazards of dry cutting and grinding. It also presents recommendations for controlling dust exposure through the use of engineering controls and personal protective equipment. The mailing packet also included a hazard alert developed by the Massachusetts Occupational Health Surveillance Program aimed at preventing injuries and fatalities associated with storing and moving heavy stone slabs.

Dry Cutting & Grinding is RISKY BUSINESS

FACTS

- New Jersey law (N.J.S.A. 34:5-102) prohibits dry cutting and dry grinding of masonry materials.
- Hundreds of workers die of silicosis each year in the U.S. and hundreds more become disabled and are unable to take care of themselves and their families.
- Since 1966, more than 14,000 workers in the U.S. have died from silicosis.
- More than one million U.S. workers are at risk of developing silicosis.
- The construction industry has one of the highest numbers of deaths due to silicosis.

Some silica-containing materials

- asphalt
- brick
- ceramic tile
- concrete
- granite
- grout
- joint compound
- mortar
- plaster
- roof tiles
- sand
- slate
- some siding
- terrazzo

Types of operations that may result in exposure to silica dust

- cutting
- chipping
- truck painting
- nailing
- polishing
- needle gunning
- drilling
- cleanup
- sanding
- grinding
- coating

Public Health Services Branch
Division of Epidemiology, Environmental and Occupational Health
Occupational Health Service
Occupational Health Surveillance Program

► http://nj.gov/health/surv/documents/dry_cutting.pdf

FACE Facts
FATALITY INVESTIGATION REPORT
Occupational Health Surveillance Program
Massachusetts Department of Public Health
December 2006

MA FACE

Worker Killed When Crushed by Multiple Stone Slabs — Massachusetts

Background: In New England, six workers in the cut stone or stone distribution industry have been killed between August 2004 and April 2006. As with most work-related injuries and fatalities, these deaths could have been prevented.

Incident: A Brazilian male stone worker was fatally injured while retrieving a granite slab located in a vertical slab rack. The granite slab was the second of five stone slabs stored in the rack’s end storage section between one pair of support pins. In order to create enough room to hoist the second slab out of the rack, the victim positioned himself with his back facing the first stone slab. With help from a coworker, the rack’s end support pins were removed and the first stone slab was tilted away from the granite slab and onto the victim’s back for support. The remaining four slabs that were located in the rack’s end storage section started to tilt. All five stone slabs, weighing over 5,700 pounds, fell and fatally crushed the victim against a stone table and injured the coworker.

Recommendations

To reduce crushing hazards when storing and retrieving stone slabs:

- Use slab racks with fixed support pins and individual compartments for each slab.
- Never disassemble any portion of a slab rack that is storing slab materials.
- Ensure all slab racks are designed by registered professional engineers and load capacity documentation is available in the workplace.
- When available, use material handling equipment, such as gantry cranes or forklifts, with proper attachments, to lift and move slabs.
- Never stand under or next to slabs that are being moved.
- Never manually support large stone slabs.
- Always stand at the ends of stone slabs.
- When using racks that hold more than one slab in a section, ensure that:
 1. Slabs are placed in racks by height.
 2. Rack sections are never overcradled with stone slabs.
 3. All slabs stored in the rack are tied down.

In addition, employers should:

- Develop, implement, and enforce a comprehensive written safety program, which includes standard operating procedures (SOPs) for receiving, storing and retrieving stone slabs.
- Provide training to employees on these SOPs and about hazard recognition and avoidance of unsafe work conditions.

MASSACHUSETTS FATALITY ASSESSMENT AND CONTROL EVALUATION (FACE) PROJECT 1-800-338-5223

► <http://www.mass.gov/eohhs/docs/dph/occupational-health/stone-slab-face-facts.pdf>

2. Silicosis in Dental Laboratory Technicians

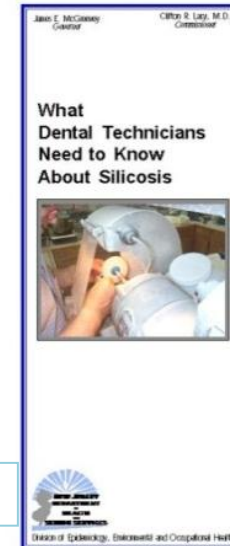
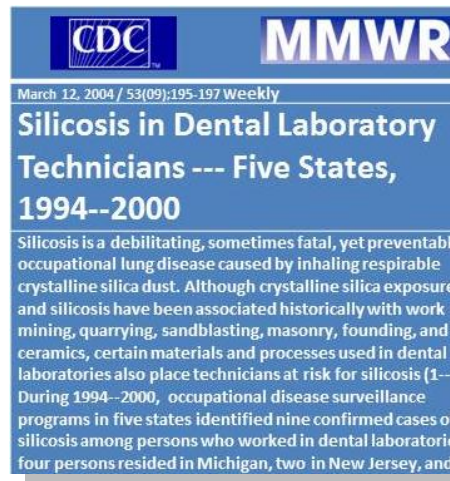
This project was prompted by the identification of two cases of silicosis in NJ dental laboratory technicians. When other surveillance states were contacted, additional cases of silicosis were identified among dental technicians. Upon investigation, the materials used to produce dentures and other castings were found to contain large amounts of cristobalite, a toxic form of crystalline silica. Overexposures to silica dust resulted from sandblasting and grinding these materials without adequate local exhaust ventilation or respiratory protection.

NJDOH developed and distributed an educational brochure, “What Dental Technicians Need to Know About Silicosis,” to all dental laboratories in New Jersey. The brochure was also disseminated by the CDC’s National Institute for Occupational Safety and Health to 15,000 additional labs in the U.S. Recommendations for controlling exposure included: substitution (using materials that do not contain crystalline silica), effective local exhaust ventilation, proper use of personal protective equipment, wet cleanup methods, and use of HEPA vacuums.

In order to alert the healthcare community to the hazard, New Jersey and other surveillance states collaborated on publication of a March 12, 2004 article in the Centers for Disease Control and Prevention’s Morbidity and Mortality Weekly Report entitled: “Silicosis in Dental Laboratory Technicians – Five States, 1994 – 2000.”

► <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5309a3.htm>

► http://nj.gov/health/surv/documents/dent_bro.pdf



 The image shows the cover of a Morbidity and Mortality Weekly Report (MMWR) article. The CDC logo is on the left and 'MMWR' is on the right. The date is 'March 12, 2004 / 53(09):195-197 Weekly'. The title is 'Silicosis in Dental Laboratory Technicians --- Five States, 1994--2000'. The text below the title reads: 'Silicosis is a debilitating, sometimes fatal, yet preventable occupational lung disease caused by inhaling respirable crystalline silica dust. Although crystalline silica exposure and silicosis have been associated historically with work mining, quarrying, sandblasting, masonry, foundry, and ceramics, certain materials and processes used in dental laboratories also place technicians at risk for silicosis (1-- During 1994--2000, occupational disease surveillance programs in five states identified nine confirmed cases of silicosis among persons who worked in dental laboratories; four persons resided in Michigan, two in New Jersey, and'

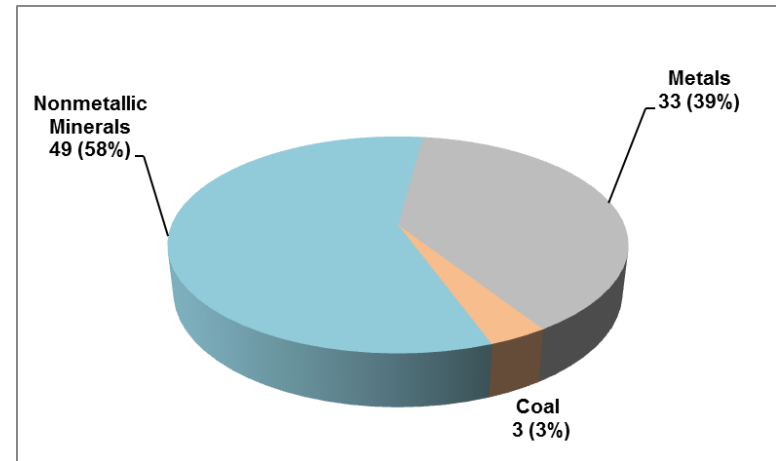
3. Dust Control in Nonmetal Mining

Mining is the second leading industry sector associated with silicosis cases in New Jersey. The majority of silicosis cases were related to extraction of nonmetallic minerals like sand, gravel and stone (Figure 1). NJDOH collaborated with NIOSH’s Office of Mine Safety and Health Research (OMSHR) and the Mine Safety and Health Administration (MSHA) to identify active mines operating in NJ and better understand the silica hazards identified during MSHA inspections at NJ mines. Using this information, NJDOH developed a fact sheet describing the types of mines and occupations where silicosis cases had been identified and the occupations at risk for overexposures. The fact sheet was mailed to all active nonmetal mines in NJ along with the most recent NIOSH dust control publications for this industry. All materials were posted on a new NJDOH mining industry Web page at: <http://www.nj.gov/health/silicosis/mining/index>.

Evaluation of the mailing revealed that while most mine operators knew that cases of silicosis continue to be identified in NJ, the mailing provided them with new information about dust control technology in their industry.

A new collaboration with the Rutgers Environmental and Occupational Health Sciences Institute and the New Jersey Department of Labor and Workforce Development is further evaluating risk factors for lung disease and other occupational illnesses among NJ miners.

FIGURE 1
Distribution of Silicosis Cases by Mineral Industry Sector
New Jersey, 1979-2013
N=85



Educational outreach materials to NJ Mines available at:
<http://www.nj.gov/health/silicosis/mining/index>

The collage displays three educational materials:

- Dust Control Handbook for Industrial Minerals Mining and Processing:** A handbook cover with the RI 9689 identifier and NIOSH logo.
- Best Practices for Dust Control in Metal/Nonmetal Mining:** A poster with the IC 9521 identifier and NIOSH logo, featuring images of mining equipment and workers.
- Tracking Silicosis in the New Jersey Mining Industry - What Have We Learned?:** A fact sheet with the NJDOH logo, containing background information, reasons to track silicosis, and results of tracking from 1979-2011.

4. Worker Exposure to Silica during Countertop Manufacturing, Finishing and Installation

Part of silicosis surveillance includes monitoring the latest medical and industrial hygiene literature. A 2012 publication caught the attention of NJDOH staff. It described a cluster of 25 cases of silicosis in Israeli workers who cut, polished and installed a relatively new engineered stone countertop product. Lung impairment in the workers was serious enough to require lung transplantation. Research by NJDOH staff revealed that the products are now made in 15 countries worldwide and that imports to U.S. have risen dramatically (49% in 2014).

Upon closer review of the literature, 46 similar cases were identified in even younger workers in Spain (median age=33yrs) and, most recently, seven more cases were documented in Italy. The three countries were home to the earliest companies producing these engineered stone or quartz surfacing products in the form of slabs. Although there have been no case reports among manufacturing workers, it is the exposure to silica dust during cutting, grinding and polishing that appears to be the risk.

Concern was heightened when review of the manufacturers' MSDS sheets revealed that the silica content of the newer quartz surfacing products can be twice that of natural granite – 90% or more. Other silicosis surveillance states agreed that action was needed to prevent silicosis among U.S. workers who cut, grind, and polish these products. The following actions have been taken:

- NIOSH Science Blog posted: 3/14 – in response, a Texas occupational physician reported 1st known U.S. case.
<http://blogs.cdc.gov/niosh-science-blog/2014/03/11/countertops/>
- Published Case Report in MMWR (2/15) – “Notes from the Field: Silicosis in a Countertop Fabricator-Texas 2014.”
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6405a5.htm>
- Technical assistance request from Texas resulted in NIOSH Health Hazard Evaluation at fabrication shop of worker (4/15)
- Joint OSHA/NIOSH Hazard Alert issued (2/15) – “Worker Exposure to Silica during Countertop Manufacturing, Finishing and Installation” <https://www.osha.gov/Publications/OSHA3768.pdf>
- NIOSH funded a NORA intramural grant (2/15) – NIOSH Division of Applied Research Technology – “Engineering Control of Silica Dust from Stone Countertop Fabrication and Installation.” NIOSH is evaluating a portable, low-cost dust-control booth through field tests in fabrication shops
- NJDOH staff brought together NIOSH engineers and industry reps (Marble Inst. of America, Stone World Magazine Editor/Writers). NJDOH, NIOSH, and BNP Publishers working together to author articles about practical dust control measures for fabrication shops focusing on literature-based tasks/tools posing greatest risk
- NJDOH sent a mailing containing the OSHA/NIOSH Hazard Alert to 220 stone fabrication shops and 160 occupational health practitioners