7 MINUTE Safety Trainer

Working Safely with Silica

GOALS

This safety session teaches employees to:

- Understand the hazards of working with silica.
- Recognize symptoms of silicosis.
- Take precautions to reduce silica dust exposures.

Applicable Regulations: 29 CFR 1910.1053, 1926.1153, 1910.1200, and 1926.59

1. What are the hazards of silica?

- Crystalline silica is a basic component of soil, sand, granite, and many other minerals.
  - —Quartz is the most common form of crystalline silica.
- Silica dust is formed when workers chip, cut, drill, or grind objects that contain silica.
  - —It is a common hazard during concrete demolition construction sites as well.
- Breathing silica dust can cause cancer and a disease called silicosis.
  - —There is no cure for silicosis, and it can be disabling or even fatal.
- Silicosis develops when silica dust enters the lungs and causes the formation of scar tissue, which reduces the ability of the lungs to take in oxygen.
- Since silicosis affects lung function, it makes people more susceptible to lung infections like tuberculosis.
  - —Smoking adds to the damage caused by breathing silica dust.

2. What are the symptoms of silicosis?

- Silicosis is classified into three types: chronic, accelerated, and acute.
- Chronic silicosis, the most common, occurs after 15 to 20 years of moderate to low exposures to silica dust.
  - —Symptoms may not be obvious, and a chest X-ray is required to detect lung damage.
  - —As the disease progresses, symptoms include shortness of breath and signs of poor oxygen/carbon dioxide exchange in the lungs.
  - —In later stages, symptoms include fatigue, extreme shortness of breath, chest pain, or respiratory failure.
  - —Accelerated silicosis can occur after 5 to 10 years of high exposures to silica dust.
  - —Symptoms include severe shortness of breath, weakness, and weight loss.
  - —Acute silicosis occurs after a few months to 2 years following exposures to extremely high concentrations of silica dust.
  - —Symptoms of acute silicosis include severe, disabling, shortness of breath; weakness; and weight loss, which often lead to death.

3. Why is silica a concern for workers during hydraulic fracturing?

- Large quantities of silica sand are used during hydraulic fracturing ("fracking"), exposing workers to silica dust.
- Seven primary sources of silica dust exposure during fracking operations have been identified:

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1. Dust ejected from thief hatches ("access ports") on top of the sand movers during refilling operations while the machines are running ("hot loading");
2. Dust ejected and pulsed through open side fill ports on sand movers during refilling;
3. Dust generated by on-site vehicle traffic;
4. Dust released from the transfer belt under the sand movers;
5. Dust created as sand drops into, or is agitated in, the blender hopper and on transfer belts;
6. Dust released from operations of transfer belts between the sand mover and the blender; *and*
7. Dust released from the top of the sand transfer belt ("dragon's tail") on sand movers.

4. What can you do to reduce the risks of silica exposure?

- Be aware of the operations and jobs that create crystalline silica exposures.
- Use engineering controls such as local exhaust ventilation and blasting cabinets.
- Wear an N95 National Institute for Occupational Safety and Health (NIOSH)-certified respirator or a Type CE abrasive-blast supplied-air respirator for abrasive blasting.
- Use available work practices such as water sprays to control dust exposures.
- Vacuum the dust from your work clothes when you are finished working in operations where silica dust is produced.
- Remove work clothes and wash or shower before putting on street clothes.
- Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.
- Don't smoke, since smoking adds to the lung damage caused by silica exposures.
- Don't eat, drink, smoke, or apply cosmetics in areas where silica dust is present.
  —Wash your hands and face outside of dusty areas before performing any of these activities.

DISCUSSION POINTS:

Identify sources of silica dust in your operations, and discuss procedures for reducing exposures.

CONCLUSION:

- Be aware of silica hazards and take precautions to reduce exposures.
- Silica dust is harmful to your health and can cause cancer and silicosis. Take proper measure to reduce exposures and participate in training, exposure monitoring, and health screening and surveillance programs

TEST YOUR KNOWLEDGE:

Have your employees take the Working Safely with Silica quiz. By testing their knowledge, you can judge their ability to work safely with silica and whether they need to review this important topic again soon.

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QUIZ 1362

C-1E

WORKING SAFELY WITH SILICA QUIZ

1. **Silica is very rare in nature.**
   a. True b. False
2. **Breathing silica dust can cause:**
   a. Cancer
   b. Permanent lung damage
   c. Both a and b
3. **Silica dust is a concern for people who work in hydraulic fracturing operations.**
   a. True b. False
4. **Which type of silicosis appears after many years of moderate exposure to silica dust?**
   a. Acute
   b. Chronic
   c. Accelerated
5. **There is a very effective cure for silicosis.**
   a. True b. False
6. **Respirators are ineffective in reducing silica dust exposure.**
   a. True b. False
7. **Wash carefully before:**
   a. Eating or drinking
   b. Changing into street clothes
   c. Both a and b
8. **Don't smoke if you are exposed to silica dust on the job.**
   a. True b. False
9. **When silica dust enters the lungs, the lungs take in too much oxygen.**
   a. True b. False
10. **No one dies from silicosis.**
    a. True b. False

When you have completed this quiz, turn it in to your supervisor.

Name:_____ **Date:**_____

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ANSWERS TO WORKING SAFELY WITH SILICA QUIZ

1. b. False. Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica.
2. c. Both a and b. Breathing silica dust can cause cancer and silicosis, which damage the lungs.
3. a. True. Large quantities of silica sand are used during hydraulic fracturing ("fracking"), exposing workers to silica dust.
4. b. Chronic silicosis can develop after 15 to 20 years of moderate to low exposures. Acute silicosis develops after 5 to 10 years of high exposures. And accelerated silicosis develops within months or up to 2 years after exposures to very high exposures.
5. b. False. There is no cure.
6. b. False. Respirators are effective in reducing exposure and should be worn when required. If you are not sure when you need to wear a respirator, ask your supervisor.
7. c. Always wash carefully after any exposure to silica dust.
8. a. True. Smoking adds to the lung damage caused by silica dust. If you are exposed to silica dust on the job and you smoke, quit smoking.
9. b. False. Silica dust in the lungs causes the formation of scar tissue, which reduces the ability of the lungs to take in oxygen.
10. b. False. Silicosis can be fatal. Even in milder forms it can be disabling. It is a serious disease you should do everything you can to avoid, which you can do if you take proper precautions to prevent exposures.