

## **Minimizing Respirable Crystalline Silica Dust During Fabrication and Installation**

**Z-2001-011**

DuPont is committed to selling only products that can be produced, handled and disposed of in a manner compatible with human safety and environmental best practices. This technical bulletin is designed to help fabricators and installers minimize respirable crystalline silica dust generation during fabrication and installation of quartz surfaces.

Zodiaq<sup>®</sup> quartz surfaces are composed of 93% quartz, a natural mineral that is commonly found in granite. Respirable crystalline silica dust represents a potential health risk. The health risk associated with respirable crystalline silica is silicosis and lung cancer.

The federal government, through the Occupational Safety and Health Administration (OSHA), has established a standard for how much respirable and total crystalline silica dust is allowed in the air in the workplace. The equation used to calculate the PEL, or permissible exposure limit for respirable crystalline silica is  $(10 \text{ mg/m}^3)/(\% \text{ SiO}_2 + 2)$ . For Zodiaq<sup>®</sup>, quartz surface this translates to a PEL for respirable crystalline silica of  $0.105 \text{ mg/m}^3$ . The equation used to calculate the PEL, or permissible exposure limit for total crystalline silica is  $(30 \text{ mg/m}^3)/(\% \text{ SiO}_2 + 2)$ . For Zodiaq<sup>®</sup>, quartz surface this translates to a PEL for total crystalline silica of  $0.316 \text{ mg/m}^3$ . In addition, the current American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Value or TLV is  $0.05 \text{ mg/m}^3$  (Suspected Human Carcinogen), measured as respirable crystalline silica dust.

As set forth in OSHA regulation, 29CFR1910.1000(e), the first recommendation is to control employee exposure to airborne contaminants through effective engineering controls. There are several types of effective engineering controls possible to reduce employee exposure to respirable crystalline silica during the fabrication and installation of quartz containing materials. One type of engineering control is to use wet fabrication techniques where all cutting, grinding, and shaping is done wet.

In stone fabrication shops much of the equipment is already operated with the use of water. This equipment includes bridge saws, linear edgers, and CNCs. Silica monitoring of these wet operations including the use of bridge saws, linear edgers, and CNCs indicate that the levels of respirable crystalline silica are typically below both the PEL of  $0.105 \text{ mg/m}^3$  and TLV (Threshold Limit Value) of  $0.05 \text{ mg/m}^3$ .

The information contained in this Technical Bulletin is given by the E. I. du Pont de Nemours and Company free of charge. It is based on technical data which DuPont believes to be reliable and is intended for use by persons having knowledge of this technical area at their own discretion and risk. Seller assumes no responsibility for results obtained or damage incurred from the use of this Technical Bulletin either in whole or in part by a buyer of Zodiaq<sup>®</sup>.

Zodiaq<sup>®</sup> is a DuPont registered trademark for its quartz surfaces.  
Copyright 2001 E. I. du Pont de Nemours and Company. Printed in the U.S.A

## **Minimizing Respirable Crystalline Silica Dust During Fabrication and Installation**

### **Z-2001-011**

However, there are several tasks that have traditionally been done dry. These include dry cutting, dry grinding, and dry sweeping. Silica monitoring of dry cutting, dry grinding, and dry sweeping indicate that the levels of respirable crystalline silica are typically above the PEL and TLVs for respirable crystalline silica.

In order to minimize the amount of respirable crystalline silica in the air, dry cutting and grinding need to be eliminated. This can be accomplished by purchasing tools that can be operated in a wet environment. By switching to pneumatic tools or electric tools that are designed for wet operation, respirable crystalline silica dust generated during cutting and grinding can be significantly reduced. One electric tool that meets the electrical requirements necessary to operate wet as well as having a central water feed is the Flex LW1509. There may be other electric tools that meet the same requirements. Each fabricator must make their own determination of the equipment used in their operations.

Dry sweeping is another task that needs to be eliminated. The water containing crystalline silica residue should not be allowed to dry out on surfaces. Wet hosing rather than compressed air should be used for clean up.

A second type of engineering control is to use ventilation and filtration systems to selectively collect particles in the respirable range. HEPA, high efficiency particulate air, filter systems are designed to collect respirable particulate.

While not an engineering control, respirators with high efficiency particulate air (HEPA) filters may also be effective in minimizing inhalation risk. Where industrial hygiene sampling does indicate the potential for overexposure to dusts not controlled by effective engineering controls, the employer must develop a comprehensive written program to establish respiratory protection for employees before supplying respirators. OSHA's Respiratory Protection Standard (29 CFR 1910.134), found in the Code of Federal Regulations' most recent edition, outlines the specifics of a respirator program. The program also covers use of respirators by employees when respirators are not required, and information on voluntary use of dust masks by the employee.

The information contained in this Technical Bulletin is given by the E. I. du Pont de Nemours and Company free of charge. It is based on technical data which DuPont believes to be reliable and is intended for use by persons having knowledge of this technical area at their own discretion and risk. Seller assumes no responsibility for results obtained or damage incurred from the use of this Technical Bulletin either in whole or in part by a buyer of Zodiac<sup>®</sup>.

Zodiac<sup>®</sup> is a DuPont registered trademark for its quartz surfaces.  
Copyright 2001 E. I. du Pont de Nemours and Company. Printed in the U.S.A