DuPont Corian®
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DuPont Corian®

WHITE PAPER

SAFETY—WORKING WITH CORIAN® SURFACES

Dust & Vapor: What You Should Know About This Versatile Material

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.

Corian® products have been marketed and sold since 1967. For more than three decades, a great deal of experience has been recorded on the manufacture, fabrication, application and disposal of these products.

We offer the following information about DuPont Corian® and encourage our Distributors, Authorized Dealers and Certified Fabricators to share it freely with their customers.

What are the chemical components of DuPont Corian® solid surfaces?

Corian® products are composed of two-thirds (by weight) aluminum trihydrate, a natural mineral that is a common ingredient in many products, such as toothpaste.

The other one-third is a polymer known as polymethylmethacrylate, or PMMA for short. PMMA is also found in many products, such as plastic windows and eyeglass frames. PMMA is inert and nonporous, providing benefits including ease of cleaning. The pigments used to color Corian® products are all approved for food contact by the U.S. Food and Drug Administration.

Are there health hazards associated with Corian® products ?

The components of Corian® surfaces are not considered chemical irritants and are rated very low to slightly toxic by inhalation or ingestion. The components of Corian® are bound into the product so there is no exposure from touching or handling the material. Machining operations do create the potential for exposure to fine particles or dust, called nuisance dust.

What is known about the dust created by machining (routing, cutting, sanding) Corian® surfaces?

The type of dust produced by fabricating Corian® surfaces is considered nontoxic and is referred to as nuisance dust. Inhalation of these nontoxic particles can cause irritation to the nose, throat and upper airways. The size of these particles is fairly large in terms of where they are trapped in the respiratory tract.

These large dust particles are caught in the nose, throat and upper airways before they get to the lungs. Coughing and sneezing are the body's way of removing these particles that have collected in the nose and throat. Any particle you can see with the naked eye is too large to enter the lungs.

Smaller particles that bypass the protection of the nose and throat are called "respirable particles" and can enter the lungs. There are respirable particles in the air we breathe every day, and in general, at low levels they do not cause harm.

There may be some odor due to small amounts of vapor being released during fabrication. This is discussed more fully in the section on adhesives.

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What is a high concentration of dust?

The federal government, through the Occupational Safety and Health Administration (OSHA), has established a standard for how much dust is allowed in the air in the workplace. For Corian® products, which are considered by OSHA as essentially nontoxic material, the limit is 15 mg/m^3, 8-hr TWA for total dust; and 5 mg/m^3, 8-hr TWA for respirable dust. When dust levels are below these limits, no harmful effects occur.

Exposure is reported as a time weighted average (TWA). A TWA value represents the average concentration for a conventional 8-hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. The total dust value indicates the combined respirable and nonrespirable dust fractions.

What is the concentration of dust produced when fabricating Corian® surfaces?

DuPont has collected and analyzed dust samples during typical fabrication of Corian®. In a typical fabrication shop working with Corian®, DuPont found area dust samples to be ~10 times *less* than OSHA's recommended limits.

Should I expect similar levels in my shop?

Dust levels will differ depending on shop conditions. Shop ventilation, ceiling and workstation dust collection devices, opened or closed doors and windows, and even housekeeping can affect the amount of dust. The results of the tests done by DuPont are for a typical shop following recommended fabrication procedures. Results in other shops would vary.

How can I reduce dust exposure in my shop?

Good housekeeping practices and local dust collection systems will keep the shop environment cleaner and reduce the potential for exposure to dusts. Dust masks also can reduce the concentration of large dust particles reaching the nose and throat. Employers may choose the option of offering employees dust masks for their comfort, but as part of the offer, the employer must implement a respirator program that meets OSHA requirements as found in Standard (29 CFR 1910.134).

Should I provide respirators for employees?

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. OSHA's first recommendation is to control employee exposure to airborne contaminants through effective engineering controls such as confinement of the operation and general and local ventilation.

DuPont's data and experience indicate that exposure to dust created during fabrication of Corian® can be controlled with good ventilation.

Where industrial hygiene sampling does indicate the potential for overexposure to dusts not controlled by ventilation, the employer must develop a comprehensive written program to establish respiratory protection for employees before supplying respirators. 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.

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What are the potential hazards from adhesive application?

The adhesive used to bond sheets of Corian® during fabrication contains methylmethacrylate, or MMA for short. MMA is one of the building blocks of the PMMA resin used in Corian®. Some MMA vapor is released during adhesive application and curing.

MMA has an odor, and at higher levels can cause eye, nose and throat irritation. Inhalation of MMA vapor can cause headache and nausea. Because MMA has a very low odor threshold, many people can smell it at concentrations of less than one part per million (1 ppm). By contrast, the OSHA 8-hr recommended exposure limit value for MMA is 100 parts per million (100 ppm) TWA.

What concentrations of MMA can I expect during adhesive application?

Sampling conducted at a typical fabrication operation shows that gluing does not appear to produce any significant exposure to MMA vapor. Air sampling while employees performed gluing operations were about 50 times *less* than the OSHA exposure limit. Concentration levels measured indicated that employees would notice the odor, but the observed levels would not be expected to produce discomfort or irritation.

How can MMA exposure be controlled?

MMA vapor will dissipate with good ventilation. Localized ventilation should be used during adhesive application. Because of its low threshold, MMA odor can be noticed even when present at levels far below recommended exposure limits. Odor should not be used as an indication of overexposure.

Are there other fabrication operations that could release MMA?

Temperatures reached while thermoforming Corian® products are high enough to release MMA. In fact, fabrication operations such as sawing, sanding or routing create friction and can result in temperatures high enough to release small amounts of MMA at the cutting tool surface.

What levels of MMA occur during these operations?

MMA samples collected at the exhaust of the thermoforming oven during a typical thermoforming operation contained less than 1 ppm MMA vapor. No detectable levels of MMA vapor were measured during sampling for MMA in a typical fabrication shop where cutting, sanding and routing were in progress. Total MMA exposure will be dependent on the number and length of the operations performed by an individual, especially the amount of time spent on thermoforming and gluing.

What if I have further questions about using Corian®?

The first contact made should be to the Authorized Distributor of Corian® in your area. If the Authorized Distributor is not known, call the Corian® Surfaces Information Center at 1-800-4-CORIAN® (426-7426). They can help you get in touch with your local Authorized Distributor.

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