

**Review of Common
Set Dressing
Materials**

November 2002

Prepared for:

S.H.A.P.E.

Suite 280-1385 w. 8th Ave

Vancouver, BC

V6H 3V9

02-0757-0200

Dillon Consulting Ltd.

130-10691 Shellbridge Way

Richmond, BC

V6X 2W8

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Introduction

This review is a summary of the hazards and recommended precautions when working with materials commonly used by Special Effects, Costumes, and Set Decorating to create photographic dust effects, “worn” costumes, and “dusty” sets.

The information contained in the following tables was taken from the Material Safety Data Sheets (MSDSs) of the various materials with supplemental information from the WCB Table of Chemical and Biological substances. The tables have summarized some of the known or suspected hazards as reported on the MSDSs of specific products. The tables can be used to compare similar products with different hazardous properties. This document was not developed to exempt members from consulting the product’s up-to-date MSDSs. However, it provides a quick overview of some of the hazards associated with the materials film industry personnel use on a daily basis. The WHMIS requirement under the WCB Occupational Health and Safety Regulation (OHSR) will still have to be met by acquiring the actual MSDSs for the controlled products used at a work place.

In the film industry, there are a variety of ways that products are used. Every situation may be unique and the health and safety considerations of products must be discussed on a case by case basis. Some examples of common uses of these products are:

- Photographic dust effects (earthquakes, demolitions, explosions, storms);
- Set decorating and dressing; and
- Breakdown applications, for costumes.

Potential Health Effects of Dust:

Normally, when humans inhale dust or particulates, the upper respiratory system filters the larger particulates through the nose and throat. However, if the dust particle is small enough, it is able to settle in the deeper lung areas. Generally, dust can cause respiratory health effects in two ways: by being trapped in the lungs and cause local damage or irritation, or by absorption directly into the bloodstream. Ingestion of toxic dust can also cause health effects by absorption through the digestive system. All dust in high concentrations can be an irritant and cause symptoms.

For low exposures, the human body has a defense mechanism to expel foreign material from the body. In low concentrations, dust can cause irritation of the eyes, nose and throat. Smoking can slow down or inhibit the body’s natural defenses against eliminating foreign materials. Existing medical conditions can be aggravated by exposures to dust as well. Some people may have allergies to particulates, such as pollen, fungal spores, and organic materials such as wood, fur, nuts, and grains. Select groups of the population, such as pregnant women, young children and persons with compromised immune systems can be more susceptible to the effects of dust.

Inhaling too much inorganic dust can cause pneumoconiosis, or “dusty lung” where fibrosis or scarring of the lung tissue occurs. One of the symptoms of pneumoconiosis is shortness of breath. However, the diagnosis for pneumoconiosis should not be made solely from this symptom since there are many causes for shortness of breath. Further tests are required by a specialist for a proper diagnosis.

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Potential Health Effects of Silica:

Most people are concerned with silica when they think about dust exposures. The term *silicon dioxide* refers to amorphous silica (noncrystalline), crystallized silica, such as sand (quartz) and silicates, such as clay (aluminum silicates). It is only the crystalline (free silica) found in quartz, tridymite, cristobalite and other nonsilicates that cause silicosis. Silicosis is a lung disease caused by the inhalation of free silica particulates after years of exposure. The percentage of crystalline silica in a dust mixture is commonly used to evaluate the hazards associated with breathing in dust mixtures. It has been theorized that crystalline silica has physical and chemical properties (sharp edges and hardness) that cause toxic effects in the lungs. The defense mechanism of the lung is unable to effectively remove the silica and causes scar tissues to form. The fibrous tissue is not as elastic as the normal lung tissue and the gas exchange is impeded. Therefore, the lung volume is reduced and causes shortness of breath.

Exposure to amorphous silica, and silicates do not normally cause serious lung diseases such as those produced by free crystalline silica. However, certain talc and clay can cause disabling pneumoconiosis when exposed to high concentrations, even though they are silicates (not free silica) because the body's defense mechanism cannot handle the inhalation of high concentrations of dust.

Fullers Earth

"Fullers Earth" used to be a commonly used product for photographic dust effects in the film industry. The term "Fullers Earth" has neither a compositional nor a mineralogical connotation. It became a generic term to describe a variety of kaolin (clay) containing aluminum magnesium silicate and may also be known as montmorillonite, kaolin, kaolinite, flordin, bentonite, wilkonite and halloysite.

It is not widely used in the film industry anymore because of the product's historically high free silica content. It is important to obtain a current Material Safety Data Sheet (MSDS) for the specific product you are using. Although a product is not called Fullers Earth, it does not mean it is free of crystalline silica. Check the MSDS!

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Factors that Affect the Hazardous Properties of Set Dressing Products:

When considering any of the following set dressing materials, there are many factors that will affect the degree that these products will be a potential health and safety hazard during its use. Be familiar with these factors when materials are being considered for set dressing effects.

The recommendations provided below are in an order of prioritization. The priority of control measures should be adhered to whenever possible.

What is the product?

The potential health effects of various set dressing materials will depend on the chemical and physical properties of the material. It is very important to understand the product you are considering to use. Set dressing products can be categorized into two different types of composition: organic (plant or animal products) or mineral (metal oxides, silicates), each with its own hazards.

Obtain the Material Safety Data Sheets for the product. Read the hazardous ingredients contained in the material. Check to see if it contains a known carcinogen or a sensitizer. Look at the percentage of the hazardous ingredients. Similar products may contain different percentages of hazardous ingredients.

Consider the potential allergic reactions of people who may be exposed to certain products. For example, when using a nut-based product, consider the possibility of allergic reactions among the cast and crew members.

The size of the particulate is important consideration for the potential health effect on the human body. The size determines where in the respiratory tract the dust will be trapped in the human body. The smaller the particle, the deeper it travels into our lungs and potentially causing lung disease.

Also, some dust, such as wood and flour dust can potentially create a deadly explosion hazard under certain conditions.

Some recommendations to reduce the risk:

- Avoid using products containing known carcinogens, sensitizers, or As Low As Reasonably Achievable (ALARA) substances. Look in Table 5-4 in the *Occupational Health and Safety Regulation* for the designation of the hazardous ingredients.
- Avoid using combustible materials when large amount of the product is required for the desired effect.
- If you cannot substitute a product with a safer one, select products with the least percentage of hazardous ingredients.
- Inform all cast and crew about the product being used and any potential health effects. The necessary precautions can be added to call sheets.
- Use products bound in medium whenever possible, e.g., “Schmere” wax based pigment product.
- Mix products with a liquid medium (e.g., water, baby oil) of low toxicity to make it less likely to become airborne.

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- Provide Personal Protective Equipment (PPE) as necessary to minimize exposure to the product.

How will the product be used?

The exposure to set dressing materials will depend on how the product is used, i.e., sprinkled by hand, blown by fans, mixed with a liquid medium, use of adhesive products. In general, the more airborne the material is, higher the potential for the material to be inhaled. Typically, using set dressing products outdoors can be less hazardous than using it indoors.

Some recommendations to reduce the risk:

- Use products outdoors whenever possible. When using dusty products indoors, provide exhaust ventilation during breaks or between takes.
- Wet product whenever possible.
- For set decorating, apply the product after hours or when there are less people around. Let it settle out over night.
- Use methods of application that minimizes the frequency of re-application. Using adhesive medium with set dressing material can prolong the time the products stays on.
- When applying products to costumes, apply the product while the clothing is not on the cast member, like on a mannequin. Apply products to areas away from the face and head.
- When cleaning up the material afterwards, use cleaning methods that minimize re-entrainment of the material. For example, sprinkling dust suppressant products, vacuuming or wet mopping, or dampening the area with mists of water. Avoid dry sweeping large quantities of dust material.

How much of the product will be used for the desired effect?

The potential hazard of various set dressing products can also depend on how much the product is used. Generally, the more you use, the more product you will be exposed to during its use.

Some recommendations to reduce the risk:

- Use the minimal amount of product necessary to create the desired effect.
- Provide Personal Protective Equipment (PPE) as necessary to minimize exposure to the product for crew members and to cast between takes.
- Take breaks in fresh air, away from the dusty area.

How long will the product be used?

In general, the longer the product is used, the duration of exposure to the product increases.

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Some recommendations to reduce the risk:

- Limit the number of people in the area to be exposed.
- Provide Personal Protective Equipment (PPE) as necessary to minimize exposure to the product.
- Once the scene is finished, the cast and crew members should change out of contaminated clothes into clean clothes. Re-usable clothes can be washed thoroughly.

Keep in mind that these are general recommendations are for a variety of products. There may be unique product or situations that may warrant more stringent precautions prior to use.

If you have a question regarding a specific product or material, call the **S.H.A.P.E.** office at (604) 733-4682 for assistance.

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Nutshell Products	
Example Products:	<i>Agrashell products, Louisiana Reduction Company</i>
Intended Industrial Use	Nutshell flour can be used as filler, adhesive extender, filter media, cosmetic grade are used in hand soaps, face and body scrubs.
Main Hazardous Components	Ground nutshell flour – apricot pit, walnut shell, pecan shell
Potential Health Effects	Potential allergic effects from exposure for some susceptible people
Other Health and Safety Considerations	Explosions can occur when high concentration of dust is suspended in air with a source of ignition.
See Material Safety Data Sheet of the specific product for further details.	

Food Grade Products	
Example Products:	<i>Cocoa Powder, Wheat and Rice Flour, Icing sugar, Corn Starch</i>
Intended Use	Consumption
Main Hazardous Components	Organic material
Potential Health Effects	General irritation of nose, eyes and throat if exposed to high airborne concentrations. Potential allergenic effects from exposure.
Other Health and Safety Considerations	Explosions can occur when high concentration of dust is suspended in air with a source of ignition.
See Material Safety Data Sheet of the specific product for further details.	

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Wood Dust	
Example Products:	<i>Saw dust from various wood</i>
Intended Industrial Use	Generated by cutting, sanding wood products. Most often used as a spill absorbent material.
Main Hazardous Components	It is suspected that concentration of tannin and similar compounds in certain wood are causing adverse health effects
Potential Health Effects	Some types of wood dust are associate with causing cancer (beech, oak, mahogany, birch, teak, walnut) Exposure to Western Red cedar dust is known to cause asthma.
Other Health and Safety Considerations	Explosions can occur when high concentration of dust (>40grams/m ³) is suspended in air with a source of ignition.
Better Choices	Better to use non-allergenic softwood, such as fir, elm, than allergenic hardwood and softwood.
See Material Safety Data Sheet of the specific product for further details.	

Metal Oxide (pigment) Products	
Example Products:	<i>“Dirt Bag” by Dirt Worx,</i>
Intended Industrial Use	Metal oxides are often found in pigments
Main Hazardous Components	Iron oxide, crystalline silica, carbon, manganite, manganese and other metal oxides.
Potential Health Effects	Silicosis, iron lung, lung fibrosis if exposed to high concentrations, carbon has been associated with cancer, certain metal oxides are associated with toxicity.
Other Health and Safety Considerations	Some metals can react with other substances or heat to produce hazardous gases and decomposition products.
See Material Safety Data Sheet of the specific product for further details.	

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Silicates	
Example Products:	<i>Fullers Earth, Rottenstone, Pyrolite, Talc</i>
Intended Industrial Use	Fillers, abrasive powder
Main Hazardous Components	Aluminum magnesium silicate, Aluminum silicate (some contain crystalline silica in various concentrations),
Potential Health Effects	Irritation of eyes, nose and throat, dermatitis. Repeated exposure to high concentration of crystalline silica can cause bronchitis, silicosis (scarring of the lung) and lung cancer.
Other Health and Safety Considerations	Not flammable.
See Material Safety Data Sheet of the specific product for further details.	

Fly Ash	
Example Products:	<i>Fly Ash</i>
Intended Industrial Use	Used as fillers in concrete and asphalt applications
Main Hazardous Components	Amorphous silica and low levels of crystalline silica
Potential Health Effects	Inhalation of high concentrations may cause chronic bronchitis, and airflow obstructions. Repeated exposure to high concentration of crystalline silica can cause bronchitis, silicosis (scarring of the lung) and lung cancer.
Other Health and Safety Considerations	Not flammable.
See Material Safety Data Sheet of the specific product for further details.	