

INDUSTRY WIDE LABOR-MANAGEMENT SAFETY COMMITTEE

SAFETY BULLETIN #46

PHOTOGRAPHIC DUST EFFECTS

Introduction

A wide variety of materials are used to create photographic dust effects (“dust effects”) in motion picture productions. Some dust effects are comprised of inorganic materials and compounds (e.g., Fuller’s Earth, diatomaceous earth, powdered minerals) while others are made of organic materials (e.g., various starches, powdered coffee creamers, powdered charcoal, crushed nutshells). Diatomaceous earth and Fuller’s Earth are general terms. The actual contents of each product can vary widely, depending on the supplier. Typically, diatomaceous earth is composed of fossilized amorphous silica remains of diatoms, while Fuller’s Earth is characteristically derived from clay minerals.

Each of these materials may have its own risks and hazards (e.g., silica content, flammability, combustibility, allergens) which should be properly evaluated and, if necessary, mitigated by the production. In all cases, proper planning, cast and crew notification and appropriate protective measures must be implemented. Always review each product’s Safety Data Sheet (SDS) and follow manufacturer’s instructions for proper use.

The purpose of this document is to inform productions of the safe use of these materials. It is important that productions fully understand the possible risks of exposure, the potential hazards, and implement proper mitigation measures.

Potential Hazards

- Common effects of exposure to photographic dust are eye, skin, and/or respiratory irritation.
- Cast and crew members with allergies, asthma, or other respiratory illnesses may be more sensitive to photographic dust.
 - Some organic photographic dust, including crushed nutshells, can trigger allergic reactions for some people.
 - If animal performers are involved, they may have allergies, similar to humans, that can be triggered by photographic dust.
- The elderly, children, and people with respiratory conditions or other ailments may have a higher sensitivity to dust effects. Adults with higher sensitivity to dust effects should inform the production of their condition.
 - When there is an infant present at a production using dust effects, steps should be taken to prevent the infant from being exposed. Please see Safety Bulletin #33, “Special Safety Considerations When Employing Infant Actors (Fifteen Days to Six Months Old)” for further guidance.
- Some inorganic photographic dust may contain crystalline or amorphous silica. The use

of materials that contain these types of silica require protective measures to ensure that any exposure to cast and crew remains below the applicable regulatory exposure limit.

- Be aware that crystalline silica has a variety of forms. The SDS may state quartz, cristobalite, or tridymite—each of these is an indication that crystalline silica is in the dust effect material.
- Be aware that the presence of dust effects may affect visibility in an area.

Combustible Materials

Any combustible material (e.g., nutshell dust, cornstarch, flour, sugar, creamers, dust from paper products, wood dust) that, in a finely powdered form, is suspended in the air in sufficient concentration, has the potential to ignite, flash and/or explode.

Potential sources of ignition to avoid include:

- Hot Surfaces: Machinery and equipment that generate heat, such as set lights, electric motors, internal combustion engines, bearings, and friction-generating components.
- Electrical Equipment/Tools: The operation of electrical motors, faulty wiring, malfunctioning machinery, and sparks from switches/grinders/cutting tools.
- Open Flames: Welding and cutting torches, pilot lights and any other process involving open flame.
- Pyrotechnic and Fire Effects: Pyrotechnics include squibs to gerbs and larger effects, firearm discharge, flame bars and other open flame special effects.
- Static electricity: Be aware that electrostatic discharges can be generated from activities including people walking on carpets, handling synthetic fabrics, and moving equipment, especially in dry conditions or low humidity.

Safety Preparations & Procedures

- Know the products that are planned for use, as well as the location and conditions under which they will be used. Minimize direct exposure as much as possible (e.g., camera angles, fans to push away dust effects from cast and crew).
- Determine the Permissible Exposure Limit (PEL) or other applicable regulatory exposure limit(s) for the photographic dust planned for use. Refer to regulations established by OSHA and/or other applicable Authorities Having Jurisdiction (AHJ) for further information and/or regulatory requirements.
- Obtain a current SDS for each planned photographic dust material from the manufacturer. Evaluate the SDS for the potential hazards, exposure limits and applicable laws/regulations associated with that use of the product. The SDS should be made available, upon request, to all cast and crew.
- Consult an industrial hygienist or other qualified professional, as appropriate, to determine whether air monitoring is needed. Compare employee exposure results to applicable OSHA PELs or other regulatory exposure limits. If the product generates combustible dust, evaluate fire or explosion hazards separately using appropriate data,

such as Minimum Explosive Concentration (MEC), as applicable.

- Consider creative alternatives or administrative controls, such as limiting the frequency and/or quantity of photographic dust used. Use only the amount necessary to create the desired effect.
- Use appropriate Personal Protective Equipment (PPE) for the products being used, such as eye protection (e.g., safety glasses, goggles), gloves, and respiratory protection.
 - If the production provides disposable filtering facepiece respirators (e.g., N95 face mask) to employees to use for protection on a voluntary basis, those employees must be made aware of the limitations and proper use of such respirators, as required by OSHA or other AHJ regulations.
- Be aware of the potential impact that dust effects may have on Heating, Ventilation, and Air Conditioning (HVAC) systems. The production should consult with building or facility management to determine appropriate protective measures for HVAC systems.
 - If necessary, consider the use of exhaust, ventilation measures, or air filters, such as High-Efficiency Particulate Air (HEPA) filters. These should be installed and utilized according to the manufacturer's instructions and standards (e.g., appropriate flow rates, seals, filter-replacement schedules).
- Perform a safety evaluation and mitigation procedures:
 - Evaluate whether sampling and exposure analysis are needed prior to or during the photographic dust sequence.
 - Compare results from any sampling and exposure analysis to the PEL and/or the MEC to determine if additional control measures are needed.

Control Measures

The production should implement one or more of the following when using dust effects:

- Utilize qualified technicians when creating dust effects.
- Use the minimum amount of dust effects necessary to achieve the desired effect.
- Limit cast and crew exposure, in both amount and duration, to dust effects.
 - Keep the area clear of non-essential personnel.
- Use additional control measures at worksites where workers are exposed to extended durations of dust effects:
 - Ventilate or exhaust interior sets or stages at appropriate intervals.
 - Provide breaks for all personnel and animals at appropriate intervals.

Safety Meeting

When dust effects are scheduled for use, the production should notify all personnel in advance.

Regular communications with cast and crew, including background, should also occur to discuss operations and precautions associated with the use of dust effects.

A safety meeting should be held by the First Assistant Director, and may include the Special Effects Coordinator or qualified technician(s) familiar with the product, and should address, but not be limited to, the following topics:

- When and where photographic dust will be used.
- What material(s) are found in the photographic dust.
- The safe work procedures, mitigation measures, and methods of control on set and in other areas of potential exposure.
- Ways to limit exposure to photographic dust.
- How to access adequate fresh air.
- Availability and use of respiratory protection if airborne levels are expected to exceed PELs.
- Who to speak with regarding any health or exposure concerns.
- Where to find the SDS.

Cleanup and Disposal

- Have a mitigation and/or cleanup plan in place to reduce the impact of photographic dust on the surrounding environment.
- It is generally recommended that wet methods be used to clean photographic dust. When using dry methods, such as sweeping and/or using blowers, be aware of the potential for elevated airborne concentrations during clean-up procedures.
 - Consider equipment that may be exposed to photographic dust and any necessary equipment protection or special cleanup procedures.
- Where applicable, dispose of photographic dust according to the manufacturer's instructions and SDS, AHJ, location, vendor and/or Studio requirements.

Further Assistance

If you have further questions, please contact your supervisor, Production Management, or the Studio Safety Representative.