

Health and Safety Guidelines for Painting

In industry, the most popular method of applying paint is to spray it on, using compressed air, a high velocity airless spray or an electrostatic applicator. Paint can also be applied with brushes. The material itself is the primary hazard when painting. Painting may expose you potentially dangerous chemicals which may damage your health. This guide outlines some of the hazards associated with painting and provides information on how to work safely while painting.

Choose paint materials with safety in mind. Never use materials which are unlabeled their contents cannot be determined. Always follow the safety recommendations for the material being used.

Health hazards

Overexposure to a substance means too much has been breathed in, swallowed or absorbed through the skin. The possible effects of overexposure to paint and the chemicals it contains vary according to the type of paint. Some health problems caused by overexposure to paint material are:

- drowsiness;
- dizziness/light headedness;
- disorientation;
- nausea/vomiting;
- eye and throat irritation;
- dermatitis;
- general allergic response such as hives;
- asthma-like wheezing with tightness in the chest;
- heavy metal poisoning (lead, chromium, nickel and cadmium); or
- nerve, kidney or liver damage.

A wide variety of ingredients are used in paints and thinners. These chemicals are not found in all paints, but you have probably come into contact with some of them at one time or other. The following is a list of common ingredients of paints and thinners:

Pigments

- white lead
- red/brown iron oxide
- chromium oxide
- iron blue
- cadmium yellow
- lead powder

Solvents – thinners

- toluene

- xylene
- carbon tetrachloride
- perchloroethylene
- isopropyl alcohol
- cyclohexanol
- n-amyl acetate
- methyl ethyl ketone
- cyclohexanone
- methylene chloride

Resins

- isocyanates (contained in urethane resins)
- epichlorohydrin (contained in epoxy resins)

You may already be familiar with the paints you use regularly, but do you know their possible harmful effects? Ask for the Materials Safety Data Sheet (MSDS) (see below) for each paint. These are available from the manufacturer or paint supplier. The MSDS will describe the possible hazards and what precautions are needed. All of the above listed ingredients have standards for worker exposure.

Spray Painting Safety

Spray painting is a common and effective way to protect and beautify parts, products, vehicles, and buildings. Spray painting allows coverage of large areas with even coats of primer, paint, sealers, and other coatings. However, workers in spray painting operations need to recognize and guard against the hazard associated with spray painting processes.

Hazardous chemicals in coatings and solvents can enter the body several ways. Workers can inhale chemical vapors from spraying, absorb the chemical by skin contact or inject the chemical with high pressure spray painting equipment.

As proper ventilation is important when working with paint coatings, a spray booth is an excellent way to remove spray paint vapors and debris from a worker's breathing zone. Many coatings contain flammable substances that are aerosolized when sprayed through powered equipment and without proper ventilation, such as in a spray booth, these vapors can build up and create an explosion and fire danger. But to provide maximum protection, the spray booth must be properly maintained, including regular cleaning of filters and overspray. And to prevent sparking a flammable substance, smoking and other sources of flame near spray painting operations should be prohibited and tools should be properly rated and grounded for work in a spray painting area.

Because much of the equipment used for spray painting and surface preparation uses compressed air, workers should be aware that noise can be a risk, so should wear hearing protection when working with air powered tools.

How to Control Health Hazards

Following a few sensible rules can help to reduce exposure to chemical hazards.

Environmental Control

Whenever possible, painting or priming operations should be done in a spray booth or room. These areas have been designed to reduce exposure to paint vapors and additives – use them correctly. You should make sure that the ventilation in the spray booth or room is adequately maintained and working properly.

Before using the spray booth or room:

- turn on the ventilation system,
- check the spray booth filters and change if necessary, and
- turn on the make-up air unit.

When painting in an enclosed space (a room):

- provide outside ventilation air with fans or open windows,
- turn off ignition sources like wall heaters

When painting:

- follow the equipment manufacturer's instructions,
- avoid using plastic drop cloths on the floor (slip hazard)
- never point a spray gun at yourself or anyone else,
- position yourself so the piece you are spraying is between you and the exhaust fan,
- do not over spray, and
- use appropriate personal protection.

Personal protection

One positive step you can take to ensure continuing good health is to use personal protective equipment. Here is a brief description of some of the protective equipment available.

Respirators

Two types of respirators, the air-purifying and the atmosphere supplying, are commonly used in spray painting. **IMPORTANT** – you **MUST** use the correct type of respirator for the job being done and the chemicals being used.

The air-purifying type of respirator should be used only during exposure to those specific chemicals, or groups of chemicals, described on the respirator cartridge. These cartridges are good only for a limited time and must be replaced with new ones when:

- you can smell vapors in the mask,
- they become difficult to breathe through, or
- they have been used for their specific lifetime.

The atmosphere-supplying type of respirator must be used in some paint spraying operations, particularly with urethane paints or when painting in a confined space e.g. inside a tank.

REMEMBER — whichever respirator is used, it must **FIT** properly to ensure adequate protection (check the manufacturer's instructions). Respirator maintenance and cleaning is important. No one wants to use a dirty, leaky respirator which has been worn previously by someone else. Keep your respirator in good condition by cleaning and sanitizing it regularly. Store it in a clean place. Check it for pliability and signs of deterioration before you wear it. If the respirator needs repair,

use only the manufacturer's recommended replacement parts. With a little thought, and a small amount of effort, your respirator will protect you for a long time.

Eye and Hearing Protection

Without good eyesight you cannot do your job properly — so why risk eye damage, or loss of eyesight from solvent spray or splashing. Wear your SAFETY GOGGLES to protect your eyes from paint materials as well as the particulates created during sanding and grinding.

Some painting equipment such as grinders and compressors create loud noise. Hearing protection is required when noise levels exceed 85 db.

Protective clothing

Some of the chemicals you work with can injure skin or cause dermatitis. Coveralls and gloves prevent these chemicals from coming into contact with your skin, reducing the risk of damage. Wear your coveralls and gloves whenever working with chemicals. Clean your gloves and wash your coveralls regularly to prevent chemicals from accumulating, especially around the cuffs where they can easily come into contact with your skin. As an additional protective measure, use BARRIER CREAMS on your hands, face and neck. Check to make sure you have the correct barrier cream for the chemicals being used.

Fire and explosion hazards

Because of the danger of fire and explosion where paints which contain flammable solvents are being used, care should be taken to remove all potential sources of ignition before starting work. This means naked flames, cutting and welding torches, gas fired heaters and materials which may give off sparks, whether electrical, mechanical, friction or static, and there must be no smoking. Make sure the correct types of fire extinguishers are available at the work site.

REMEMBER different types of fires require different types of extinguishers.

IMPORTANT: Flammable materials are required to be stored in flammable materials storage cabinets. Many Paint and solvents are flammable materials.

Dust and Preparation

Many painting projects require preparation of the materials to be painted. Preparation often involves sanding of the surface which creates a health hazard if dust masks are not worn. Ideally dust collection systems should be used to prevent large amounts of small particulates from entering the air.

Sanding and scraping of old paint may hold additional hazards if the old paint contains lead.

Things to do and not to do before painting

- DO** Post “No Smoking” and “No Welding” signs
- DO** Remove portable lamps and heaters from the area
- DO** Make sure painting is done away from naked flames, sparks, non-explosion proof motors or any other source of ignition.
- DO** Check the ventilation system to make sure it is on and working correctly.
- DO** Electrically ground all spraying equipment

- DO** Make sure approved respirator, eye goggles and any other protective equipment required for the job are worn
- DON'T** Smoke
- DON'T** Take more paint out of the store room than you can use in one day.

Material Safety Data Sheet

What is a Material Safety Data Sheet (MSDS)?

A Material Safety Data Sheet is a document that contains information on the chemical make-up, use, storage, handling, emergency procedures and potential health effects related to a hazardous material. The MSDS contains much more information about the material than the label on the container. MSDSs are prepared and written by the manufacturer of the material.

What is the purpose of an MSDS?

The purpose of an MSDS is to inform you of:

- The material's chemical make-up.
- The material's physical properties or fast acting health effects that makes it dangerous to handle.
- The level of protective gear you need to wear to work safely with the material.
- The first aid treatment to be provided when someone is exposed to the material.
- The preplanning needed for safely handling spills, fires, and day-to-day operations.
- How to respond to accidents.

What information is on the MSDS?

There are 9 categories of information that must be present on an MSDS. These are:

- Chemical Identity
- Health Hazard Data
- Manufacturer information
- Precautions for Safe Handling and Use
- Hazardous ingredients
- Exposure controls/personal protection
- Physical and chemical properties
- Fire and Explosion Hazard Data

Reactivity Data

Even with all of the above information on an MSDS, it might not have everything you need to know about a material. For example, health hazard information is usually presented in general terms. Your health and safety specialist should be able to help you find more information if it is needed.

Why is an MSDS hard to read?

Originally, MSDSs were intended to be used by industrial hygienists, chemical engineers and safety professionals. Now, MSDSs are used by employers, employees, emergency responders and anyone else requiring information on a material. Some MSDSs look very different from

others. This is because law specifies the content of the MSDS, but the format is left up to the manufacturer of the material.

When would I use an MSDS?

You should always know the hazards of a material before you start using it. For most people who work with a material, there are sections of the MSDS that are more important than others. You should always read the name of the material, know the hazards, understand the safe handling and storage requirements, and understand what to do in an emergency.

Hazard Communication Standard

MSDSs form the cornerstone of this standard. The Hazard Communication standard requires employers to; maintain an inventory of hazardous materials, provide employees training on the potential hazards associated with a material, obtain and maintain MSDSs for each material onsite, establish proper methods and types of labels, and inform contractors of the hazards that their employees may be exposed to in their work area.

More MSDS Information

For more detailed information, discuss your questions with your safety and health representative, or visit the website maintained by the Occupational Safety & Health Administration.

Ladder Safety

Ladders are commonly used for painting. Ladder safety begins with selecting the right ladder for the job and includes inspection, setup, proper climbing or standing, proper use, care, and storage. This combination of safe equipment and its safe use can eliminate most ladder accidents.

Always check a ladder before using it. Inspect wood ladders for cracks or splits. Inspect metal and fiberglass ladders for bends and breaks. Never use a damaged ladder. Tag it "Defective" and report it to your supervisor/teacher.

When setting up a ladder, make sure it's straight and sitting firmly on the ground or floor. If one foot sits lower, build up the surface with firm material, don't set it on boxes, bricks or other unstable bases. Lean the ladder against something solid, but not against a glass surface. Make sure the ladder is placed at a safe angle, with the base away from the wall or edge of the upper level about one foot for every four feet of vertical height. Keep ladders away from doorways or walkways, unless barriers can protect them.

Keep the steps and rungs of the ladder free of grease, paint, mud or other slippery material. And remember to clean debris off your shoes before climbing. Always face the ladder when climbing up or down, using both hands to keep a good grip on the rails or rungs. Never carry heavy or bulky loads up a ladder. Climb up yourself first, and then pull up the material with a rope or bucket.

Many ladder accidents occur because of slipping or skidding. You can prevent these accidents by equipping the ladder with non-slip safety feet, blocking its base or tying it to a sound, permanent structure.

Overreaching is probably the most common cause of falls from ladders. A good rule is to always keep your belt buckle inside the rails of a ladder. Don't try to move a ladder while you're on it by rocking, jogging or pushing it away from the supporting wall.

When you've finished the job, properly store the ladder so it won't be exposed to excessive heat or dampness and will be in good condition for the next time.

Solvents

Solvents are so common in many work places that workers forget how dangerous they are. A solvent can be generally described as a substance, usually a liquid, that is used to dissolve another substance. Although solvents can be used safely, health problems can result from skin contact with solvents or from inhalation of their vapors. In addition to the health hazards, many solvent vapors are flammable and explosive.

One of the most common health hazards associated with exposure to solvents is dermatitis. Contact dermatitis can develop from a single or from multiple exposures. It can leave the skin susceptible to a short-term infection or to a chronic condition. Exposure can also result in sensitization to the solvent, which is a delayed allergic reaction that often becomes more severe with subsequent exposures.

One big danger with solvents is that they can cause trouble before you realize what's happening. Depending on the type and concentration of the solvent, exposure effects can range from mild respiratory irritation to severe damage to body organs and systems. In extreme cases, overexposure to solvent vapors can cause respiratory failure and death.

When working with solvents, it's important to know what solvents are being used and what steps should be taken to protect against harmful or dangerous exposures. To optimize safety follow these suggestions:

- Know what solvents you're working with.
- Read the labels and the material safety data sheets of the solvents. They list the hazards, health effects, and safe handling procedures.
- Make sure the workspace is properly ventilated.
- Use recommended gloves, eye and face protection, boots, other protective clothing, or barrier creams as required.
- If respiratory equipment is used, make sure it gives appropriate protection for the exposure.
- Take care when pouring solvents from one container to another, as fire or explosions can occur from static electricity buildup.
- Clean up solvent spills promptly.
- Never wash your hands with solvents.
- Prohibit welding, cutting, soldering, and other sources of ignition in areas where solvents are used.
- Store flammable solvents in well-ventilated areas constructed of fire-resistant materials.
- Ground and bond all tanks and equipment for storage.
- Install readily accessible fire extinguishers in storage and work areas.

As with other toxic substances in the workplace, the preferred methods of hazard control are substitution of a less toxic substance in an operation, local exhaust ventilation, and enclosure.