

PRINTMAKING

Introduction

We won't stop making art but we can stop making ourselves sick!

This kit was designed by artists to warn you of the dangers and give you some tips to improve your working conditions.

Here's to a long, healthy working life!

No 1

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PROTECT YOURSELF!

What are my art materials doing to me?

All art materials contain chemicals; many can harm or even kill you if they get into your body. You can breathe them in, absorb them through skin contact or swallow them accidentally if you eat, drink or smoke in the studio.

Inhalation (you're breathing it in)

Art materials produce dusts, gases, fumes and vapours which can damage your lungs. From there they can enter the bloodstream, and in some cases deposit toxins in your organs and fat tissue. Damage is not always immediately obvious, it can happen over a period of time. By the time symptoms appear, the damage may be permanent.

Skin contact (you're soaking in it)

Your skin absorbs some chemicals, particularly solvents, and carries them into the bloodstream. Unprotected cuts and sores are an open doorway for chemicals to enter your body. Solvents, acids, alkalis and bleaches destroy the protective barriers in your skin, which can cause eczema, dermatitis and allergies and allow other chemicals to enter your body.

Ingestion (you're swallowing it)

Would you eat your art materials if they were served to you on a plate? You may as well if you eat, drink or smoke in your studio! Gases, vapours and dust settle on everything including food and drink. Unwashed hands contaminate whatever they touch too. If you swallow chemicals they can damage your mouth, throat, stomach, nervous system, liver and kidneys. Chemicals can make you seriously ill.

Other factors

The effect of chemicals on your body will be *worse* if you smoke, drink heavily, or suffer from allergies or chronic illness, eg asthma, epilepsy. You should take special care if you are pregnant.

Bad work conditions and chemical exposure can contribute to *stress related* illness and weaken your resistance to disease.

So where's the proof?

Many artists are so used to feeling unwell that it makes it hard to identify the symptoms of chemical poisoning. Some of us don't register anything much until it's too late. You could be feeling the effects of chemical poisoning if you regularly suffer from:

- headaches, tiredness, dizziness or faintness, extreme mood swings (generally after leaving the studio) allergies
- skin irritations, rashes, spots
- aches and pains in joints and muscles
- breathing problems at night and during exercise (like walking up the stairs!)

Have you noticed that these symptoms are not as severe when you're away from the studio for more than a few days?

What about my art equipment?

Ergonomically speaking like they say, it ain't what you do but the way that you do it that counts. Dangerous work practices make it harder to function efficiently and can cause accidents. Backaches and muscle-strain injuries are often the result of working at benches and easels that aren't adjusted to your height.

Overdoing it?

Working for long periods, particularly on repetitive tasks, can cause permanent injury to overused muscles and result in accidents.

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What's that you say?

Working regularly in a noisy environment, eg sculpturing with power tools, increases the risk of deafness, high blood pressure and stress.

What can I do about it?

Right Away You can clean up your act and that includes your studio! Pull up carpeting and lay down cheap linoleum or another non-absorbent surface that can be wet-mopped or vacuumed (sweeping stirs up dust).

Organize your studio so that everything has a place including separate storage for dangerous chemicals. Store your materials in suitable containers (refer to Material Safety Data Sheet on the product). Label your materials clearly.

Set your benches and chairs to a good working height, see Diagram 1. Use an adjustable overhead lamp, eg daylight, colour corrected tube.

Breathe Easy You need air in your studio- if you can't afford exhaust ventilation, open a window or an outer door. A basic rule of thumb is that air should move from behind you, across your work and away from your face to the outside, see Diagram 2.

When you work with dangerous chemicals, protect yourself with overalls, correct gloves and masks. *Remember*, a mask is no substitute for ventilation. The mask must fit your face properly, making an air-tight seal. Make sure you have the correct cartridge for the chemical you are using and change the cartridges regularly.

Survival tips

Don't

- eat, drink or smoke in the work area
- use solvents to clean your hands- use a safe, non-toxic hand-cleaner, eg baby oil
- expose yourself unnecessarily to dangerous chemicals
- work in your bedroom, kitchen or other living area
- work in a pile of garbage
- put solvents or other toxic chemicals in the sewer
- work with solvents if you are pregnant (foetal damage may result)
- expose children, pets or friends to solvents and other dangerous art materials
- store art materials in food containers or the domestic fridge
- use eating utensils to mix or store your materials, and don't prepare or use them in the kitchen
- overload your domestic power system or run a tangle of cords that can trip you up

Do

- protect yourself
- use safer chemicals where possible (non-toxic or less toxic art materials are available)
- work in a well ventilated area. If you can't afford local ventilation open an outer door or window, or work outside
- wash hands before eating, drinking, smoking or going to the toilet
- use an appropriate mask, splash goggles and protective clothing when you handle solvents, acids and inks
- keep lids on containers and trays when not in immediate use
- label containers clearly and store all flammable chemicals in a fire-proof cabinet away from flames and heat
- Tie back your hair, don't wear loose-fitting clothing and remove jewellery when you work with machinery. Learn operating and emergency stop procedures
- Have a regular medical check-up (give your doctor a list of the chemicals you use and the tasks you perform)

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Before we knew the dangers

The following is a case study of an artist whose health is permanently effected as a result of unsafe exposure to toxic chemicals. Due to possible legal proceedings we cannot name either the artist or the art school concerned.

Artist X is a teacher of printmaking and an established exhibiting artist. He developed hyper-sensitivity to toxic chemicals, especially those used in screenprinting, after years of working in poorly ventilated studios where health and safety procedures were not followed. There was no information provided about the dangers of art materials or safety procedures when he was a student of printmaking at

The situation was no better when he studied under a silkscreen artist who later died of lung cancer at the age of 41.

Artist X set up a silkscreen studio in his home. Because he was unaware of the need for ventilation, toxic ink and solvent fumes spread throughout the house, meaning that he was exposed to dangerous chemicals whether he was working or not.

Artist X took up a teaching position at **Z** where there was no local exhaust ventilation in the printmaking studios, acid baths stood exposed on benches where people were working and dry and wet work were all performed in the same area. The air-conditioning circulated dangerous fumes from one end of the building to the other.

Artist X was diagnosed with pleurisy. His doctor advised him to give up printmaking and smoking.

Now that he knows the dangers, **Artist X** ensures that his students are well-informed and observe health and safety procedures.

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Educate yourself

- Make sure you know what's in the materials you use. Keep a file of Material Safety Data Sheets (available from manufacturers & suppliers)
 - Organize yourself
 - Make a place for everything and put it all away at the end of the day
 - Keep clean and dirty rags separate. Store dirty rags in metal bins with lids. Dispose of rags frequently
- Adjust work benches and chairs to a safe working height
- Maintain a first aid kit with burn cream, bandaids, eye wash (for chemical burns) and antiseptic cream
- Keep a small chemical fire extinguisher on hand (BCF type for multipurpose use)
- Wet-mop your work area regularly (sweeping stirs up dust). Mop up spills immediately (refer to Material Safety Data Sheet for correct procedure)

Spoil yourself

- Take frequent rest breaks when you perform repetitive tasks
- Wash hands and exposed skin in soap and water immediately after work
- Shower and change into uncontaminated clothing as soon as possible after work (or you and your friends will be soaking in chemicals all night)

Assert yourself

- Insist that manufacturers and suppliers provide thorough Material Safety Data Sheets: don't buy from people who won't
- Lobby for public access studios with good health and safety provisions

Accidents

- If chemicals have been accidentally swallowed do not induce vomiting unless specified on the product label. Call an ambulance immediately.
- Skin contact with chemicals flush the area with cold, soapy water for at least 15 minutes.
- Eye contact with chemicals flush the eye with cold water for at least 15 minutes.
- Seek medical attention for severe burns or exposure to fumes. Call you local Poisons Information Centre

Setting up a safe studio

Lesley Duxbury is a well known Melbourne printmaker. Her concern about health and safety is reflected in the layout of her studio and in her work practices.

Her studio is small but well organised with a separate area for work that involves more toxic chemicals.

The Printing Area is confined to an alcove with its own roof vent. Inks and solvents are kept sealed, even while working and are stored on a shelf above the inking bench. The press is next to the bench. This set-up is efficient and keeps spills and fumes to a minimum.

The Painting Area oil paints and solvents are kept sealed when not in immediate use.

Safe work Practices

Alternatives Lesley uses only ferric chloride for etching because it is odourless and less toxic (goggles & gloves must be worn to avoid burns). Ferric chloride will also give a more accurate etch than nitric acid.

She keeps her exposure to toxic chemicals to a minimum by working mainly in drypoint and by producing only small print editions in her studio. When she needs to work in processes that involve more toxic chemicals or larger print runs, Lesley uses an access studio with ventilation designed specifically for the purpose.

Protection Lesley always wears gloves when she works with inks, acids and solvents.

Cleaning up the area is regularly wet-mopped. Rags and waste are kept in an air-tight metal bin.

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What you do effects everyone else: the people you live and work with, your friends and the general community.

The chemicals you use go into the air we breath and if you're careless they can end up in our water and food.

Exposing others to risk

The Environment

- There is no safe exposure to cancer-causing materials; substitute other products. Aerosols often contain toxic, flammable propellents that will harm you and the environment; use an atomiser instead but remember to use a suitable mask, goggles and gloves.
- Dispose of all your materials carefully. Almost everything you use can be recycled.
- Your local council can also pick up paper and waste for recycling. Commercial recycling companies accept artists' refuse and, in some cases, pay money for them. Don't mix your chemicals, store them separately for disposal.

Teaching

- Maybe you don't care what happens to you but you shouldn't impose unsafe work practices on others. Besides that, *you could get sued* for negligence!
- It's your responsibility as a teacher to be informed about the chemicals you are using and to ensure that your students use art materials safely. Make sure you know how to treat injuries and deal with accidents.
- Adults with chronic illnesses and all young children should *not* be exposed to solvents, solvent-based adhesives, oil paints, permanent marker pens, aerosol sprays, acids, indian inks, non water-based paints and inks, dyes, clay dusts, glazes and oxides, epoxy resins and photo chemicals.

Your Rights

The Occupational Health and Safety Act outlines rights and responsibilities for art schools, teachers, artists, suppliers and manufacturers.

Manufacturers and Suppliers: insist that manufacturers tell you what is in their products (ask for a Material Safety Data Sheet or MSDS). The MSDS lists the contents of the product, safety procedures for ventilation, protective clothing, fire and spillage, storage and first aid. If the supplier or manufacturer won't give you an MSDS, refuse to buy their product. Choose products that are well labelled. A product is not necessarily safe just because the label says *non toxic*.

Other Artists: don't let the people you work with inflict their bad habits on you. Discuss safe work procedures with your colleagues. You can use the Studio Checklist in the back of this kit to assess the safety of your studio.

Self-Employment: nobody else is going to take care of you. Budget for health and safety in your grant applications, when you take on commissions, or other employment as an artist. Build in a health and safety component when you price your artwork for sale. You can also declare your health and safety expenses, including fans, protective clothing and materials, on tax; keep all your receipts.

Art Schools and Public Access Studios: should provide a safe work environment but poor funding limits their ability to do this. You can help them to help you by lobbying for health and safety funding.

One well-equipped, safe public access studio is worth more than all the converted bathrooms, bedrooms and kitchens in Victoria. Contact your access studios and galleries and start lobbying for better conditions.

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It's important to know what's in the chemicals you're using. This is a brief guide to tell you what to look out for. Products used in printing can be toxic in their dust, fume, vapour, gas and liquid form. Substitute safer products where possible.

A local ventilation system is a priority.

Wear a particulate, gas or acid gas mask, gloves, goggles and protective clothing as indicated. You can wear barrier cream instead of gloves when mixing and printing inks, but wear gloves when using photo-sensitive products (barrier cream increases photo-chemical absorption).

Buy pre-mixed inks. If you must mix your own pigments and metallic powders, do so in a dust cabinet, wear a particulate mask, gloves and goggles. Wet mop surfaces after use.

Keep lids on inks when not in use. Keep dirty rags and waste in a separate, sealed metal bin and empty regularly. Store solvents in fire-proof kettles and cupboard.

Don't pour acids, inks or solvents down the sink. See our section *Exposing others to risk* for disposal advice.

Pigments in powder form

Are colourants in all printing inks; many are highly toxic when ingested, inhaled or absorbed through the skin. Toxic pigments can be skin, respiratory and gastro-intestinal irritants. Long-term effects can include asthma, major organ and nervous system damage, birth defects and cancer. The most toxic pigments are benzidine or diarylide orange and yellow, berlin-, prussian-paris-, iron or milori blue (don't heat these blue pigments, the fumes are toxic), burnt umber, cadmium pigments, carbon or lamp black, cerulean blue, chinese white, chrome pigments, cobalt pigments, cyan blue and green (phthalocyanine blue and green), fluoro colours, hansa red and yellow, lithol red, mars brown, molybdate orange, monastral blue, para red, raw umber, red lake c, talc, thalo blue, and green, van dyke brown, white lead, zinc yellow. Wear a gas mask (if pigments are carried in a solvent base) or a particulate mask (if grinding or sanding, or if pigments are carried in a water-base), gloves and protective clothing. Remember local ventilation is the only safe way to work with these chemicals.

Safer pigments in powder form

Can still be eye, skin and respiratory irritants. Safer pigments are alizarin crimson, barium white (blanc fixe, pigment white), bone black, burnt sienna, chalk, english red, frankfurt black, indian red, ivory black, magnesium carbonate, mars pigments (except mars brown), raw sienna, titanium oxide, ultramarine pigments, venetian red, vine black, yellow ochre, zinc white.

Wear a gas mask (if pigments are carried in a solvent base) or a particulate mask (if grinding or sanding, or if pigments are carried in a water-base), gloves and protective clothing. Remember local ventilation is the only safe way to work with these chemicals.

Etching

Grounds can be skin, eye and respiratory irritants, they also cause narcosis. Long-term effects can include dermatitis, asthma, skin cancer. Look out for solvents (see Solvents section), bitumen which is a carcinogen (gas mask), powdered rosin (particulate mask). Inking and cleaning plates wear gloves or use barrier cream for inking and gloves for cleaning.

Plates can also be inked and wiped with cheesecloth, tarlatan or card. Clean plates and inking surfaces with turpentine or ace-tone (gas mask for both). Avoid using benzine-based products, eg shellite, which are highly flammable.

Photoetching avoid exposure to toxic chemicals by using

Mitsui pre-coated plates (zinc only). The developer is mildly caustic- use gloves. Plate exposure don't use carbon arc lamps (produce toxic fumes and gases) unless the area is locally ventilated. Use metal halide or quartz mercury instead.

All exposure lamps emit ultraviolet radiation- wear sunglasses to protect your eyes. Remember local ventilation is the only safe way to work with these chemicals.

Aquatint

Rosin dust causes respiratory allergies, eg asthma and is volatile. Always wear a particulate mask. Rosin dust is potentially explosive. Acid boxes should have non-sparking moving parts, and be located away from naked flame or heat sources.

Do not use bitumen/asphaltum in powdered form- it is a carcinogen.

Acids

Are skin, eye and respiratory corrosives and irritants. Long-term inhalation can cause pulmonary oedema, bronchitis, allergies, emphysema, gastritis, major organ and nervous system damage, cancer. Acids produce toxic gases, eg chlorine, nitrogen oxide, which can cause death. Acids should be contained under a fume hood. Wear gloves, acid gas mask and goggles when mixing and add acid to water, not the reverse. Wear heavy gloves to handle plates in the acid bath. Many acids react with organic materials, eg rosin, and produce toxic gases.

Remember local ventilation is the only safe way to work with these chemicals.

Toxic acids acetic acid, chromic acid, dutch mordant (mixture of potassium chlorate and hydrochloric acid), nitric acid, sulfuric acid (don't heat).

Don't use carbolic acid (single contact can be fatal or cause major damage). Safer acids ferric chloride (iron perchloride), tannic acid (tannin).

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Avoid using chlorinated hydrocarbons, eg carbon tetrachloride, methylene chloride; glycols, eg methyl cellosolve. Always substitute a safer solvent for cleaning. Safer solvents acetone, ethanol (ethyl, grain or denatured alcohol), methanol (methyl, wood alcohol, methylated spirits), amyl alcohol (isoamyl alcohol, fusel oil), mineral turpentine. Wear a gas mask and gloves for all solvents. Never use solvents to clean your hands, use a lanolin handcleaner.

Remember:
local ventilation is the only safe way to work with these chemicals.

Woodcuts

Wood dusts can be skin, eye and respiratory irritants. Long-term effects can include nose bleeds, dermatitis, asthma, kidney and eye damage, swelling of the scrotum and nasal and sinus cancer. Moulds, fire retardants and anti-fungicides present in wood dusts can cause asthma, hypersensitivity pneumonia and systemic poisoning. Avoid using woods that are known carcinogens african mahogany and african walnut, douglas or oregon fir, european beech, european elm and european walnut, european and japanese oak, south american cedar, white cyprus pine. Look out for african boxwood, american and grey box, australian blackwood, red cedar, birch, boxwood, bralilwood, cherry, chestnut, dogwood, east indian satinwood, ebony, mo~. ,tain ash, mulga, myrtle, new guinea rosewood, oak, palm, pine, poison walnut, poplar, whitewood, redwood, sandalwood, sempilor (rimu), silver fir, south american cedar, spotted and yellow gum, white cypress pine and new zealand white pine, teak, walnut, yew. Wear a particulate mask and protect your skin with barrier cream or gloves. Wet mop or vacuum wood dust. Tools cut away from yourself, with your free hand behind the tool.

Solvent-based screenprinting

Is one of the most hazardous artforms. Consider whether you need to use it. If you must screenprint, work only in a studio that has local ventilation over the printing table, mixing and cleaning bench, and the drying rack. Wear protective clothing, gas mask, gloves and cover exposed areas with barrier cream.

If you mix metallic or pigment powders you will also need a particulate filter on your gas mask. Oil-based screenprinting inks and solvents can be skin, eye and respiratory irritants and cause narcosis. Long-term effects include dermatitis, asthma, allergies, major organ and nervous system damage, cancer, birth and genetic defects. Contents turpentine, benzine, naptha, bentonite, aluminium stearate, aluminium palmitate, aromatic hydrocarbons, eg xylene, toluene, alkyd resin, pigment. Highly toxic solvents are the main ingredient in all oil-based inks, bases, thinners and retarders. Commercial degreasers are highly toxic; household detergent is just as effective, cheaper and much safer. Photo-emulsions avoid using emulsions containing potassium dichromate and ammonium dichromate. Quick-drying blackout is highly toxic, use slow drying instead. Lacquer-based stencils use highly toxic lacquer thinners; substitute water-base stencils instead. Improved and safer water-based inks are available, try them.

Lithography

Materials used in lithography can irritate skin, eyes and respiratory tract. Long-term effects can include pulmonary oedema, bronchitis, allergies eg dermatitis, asthma, emphysema, gastri-tis, major organ and nervous system damage, cancer. Look out for acids, asbestos (some talcs, eg french), bitumen/asphal-tum, chrome alum, rosin, lamp black (lithographic crayons and tusches), solvents: methyl cellosolve, ketones, alcohols, benline, aromatic hydrocarbons, eg xylene, toluene, chlorinated hydrocarbons, eg methylene chloride. Substitute mineral turpentine which is a safer solvent. Wear barrier cream to protect you against lamp black and other toxic chemicals. Use Johnson's baby powder instead of commercial grades of talc. Replace super slip (methyl ethyl ketone) with vaseline or grease. Wear a gas mask with a particulate filter fitted over the cartridge. This will protect you against solvents and rosin and talc dust.

Remember local ventilation is the only safe way to work with these chemicals.

Solvents

Can be skin, respiratory and eye irritants, cause tiredness, headaches and narcosis. Long-term effects are allergies, major organ and nervous system damage, cancer, miscarriage and birth and genetic defects. Solvents are used in inks, cleaning products, tusche, resins and glues. The most toxic are the aromatic hydrocarbons: toluene and xylene. Don't use them.

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