

# CERAMICS

## 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!

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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.

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## **Overdoing it?**

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

## **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. 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

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## Survival tips

### 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 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)***

## Before we knew the dangers

**Artist X** is a professional ceramicist and an established exhibiting artist. He works mainly on large pots which he throws on a wheel. The heavy workload finally took its toll. **Artist X** developed carpal tunnel syndrome, a form of repetition-strain injury. He was forced to rest his arm for 6 months. He now takes care to vary his tasks and builds in a rest-break every 30 minutes.

**Artist y** suffered from skin rashes whenever he worked with porcelain clay. He now covers exposed skin, including his hands, with barrier cream or vaseline. He washes his hands and exposed skin thoroughly when he finishes and applies a moisturiser.

**Artist Z** worked in an art school as a ceramics teacher. The kiln, wheels and benches were in one room. There was no ventilation over the kiln or the work stations. A number of highly toxic glazes were used including barium oxide.

**Artist Z** developed a persistent bronchial disorder which alleviated during the school holiday only to return when she resumed work. A medical test showed permanent lung damage **Artist Z** was advised to change her work practices, to wear a protective mask and avoid kiln work.

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## **Educate yourself**

- make sure you know what's in the materials you use v keep a file of Material Safety Data Sheets (available from manufacturers and 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.

## **Setting up a safe studio**

Janine and Peter Pilven are well known Victorian ceramicists. Their concern about health and safety is reflected in the layout of Janine and Peter's studio and in their work practices.

The studio is small but well organised with separate workstations for each process, Double doors at either end of the room are kept open to maintain airflow.

The Kilns are run on LP gas and are ventilated by a stainless steel hood and fan which extracts fumes to the outside. As an extra precaution, they stay out of the room during firing.

Waxing an exhaust fan is used to extract waxing fumes.

The Floor is concrete. Janine and Peter vacuum and wet mop all work surfaces at the end of each day and hose the floor.

## **Safe work Practices**

Glazes Janine and Peter don't use asbestos, barium or lead.

Protection Janine and Peter always wear masks when they mix glazes or load the kiln. They also wear welder's gloves and goggles for kiln work.

Cleaning up the area is regularly wet-mopped. Rags and waste are kept in an airtight 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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## Introduction

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. Many chemicals used in ceramics are hazardous in their powder form.

Many glazes produce toxic gases when heated. Substitute safer glazes where possible. Ventilation is a priority, especially over the kiln (gas and electric) and work benches.

Using pre-mixed glazes will reduce your exposure to toxic powders.

If you must mix your own glazes, use a fume hood or wear a dust mask (twin cartridge of at least Class M standard), goggles and gloves. The most toxic glazes should only be mixed in a sealed dust-mixing box. Add glazes to water, not the reverse.

Protective clothing and equipment should be worn at all times as indicated.

Avoid overuse injuries- take frequent rest breaks when performing repetitive tasks. Separate processes, eg firing, glazing to adjoining rooms.

Work on non-absorbent surfaces that can be wet mopped. Wet mop all surfaces after use.

Don't pour chemicals down the sink. See our section, Exposing others to risk for disposal advice.

## Glazes and Colourants

Many are hazardous in powder form. Some contain metals that vapourize during firing.

The most toxic glazes and colourants are skin, eye and respiratory irritants.

Long-term effects can include allergies, weight loss, major organ damage, asbestosis, silicosis, mesothelioma, lead poisoning, birth defects and cancer. Look out for antimony oxide, asbestine, barium carbonate and barium oxide, bismuth compounds, calcium fluoride, ceramic fibre, chrome oxide, chromite, clays which contain silica, eg alban slip, ball, china (kaolin) and fire clay and grog, cobalt carbonate and cobalt oxide, copper carbonate (mala- chite), copper oxide, black and red (cupric oxide), copper sulphate, cornish stone cryolite, cuprite, feldspars, feldspathoids, flint, fluorspar, hydrofluoric acid, lepidolite, lithium carbonate, malachite, manganese carbonate and manganese dioxide, nepheline and nepheline syenite, petalite, potash, pumice, pyrolusite, sandstone, selenium, soda ash (sodium carbonate), talc containing asbestos and free silica, eg asbestine, steatite and french chalk; vanadium oxide (vanadium pentoxide and/or vanadium trioxide), witherite, zinc oxide, zir- con (zircopax), zirconium silicate. Beware of the following carcinogens (wear a mask and protective clothing) asbestos, beryl, beryllia, beryllium oxide, cadmium oxide and cadmium sulphide, chrome oxide (chromic oxide), iron chromate (chromite), lead chromate or chrome yellow (also contains lead), nickel carbonate and nickel oxide, potassium dichromate (potassium bichromate), uranium oxide, vermiculite, zinc yellow (zinc chromate). Avoid using lead compounds (cause lead poisoning, birth and genetic defects), eg cerrusite, galena, lead basillate, lead frits, lead monosilicate, lead sesquicillate, lead sulphide, litharge, Naples yellow, red lead, white lead.

Do not use lead compounds for food and drink containers. Use lead-free glazes instead.

Always wear rubber gloves, overalls and a particulate mask when you handle glazes and colourants. Avoid spraying, grinding and sanding glazes unless you have a locally ventilated spray booth. Remember local ventilation is the only safe way to work with these chemicals.

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## **Less Toxic Glazes and Colourants**

Are also skin, eye and respiratory irritants. Long term effects can include kidney and lung damage. You must still wear rubber gloves, overalls and a particulate mask when you handle: alumina, bone ash, borax, borax frits and boric acid, calcium carbonate (whiting) and calcium chloride, carborundum (silicon carbide), colemanite (hydrated calcium borate), crocus martis, cullet, dolomite, gum arabic, hematite, red and black iron oxide (don't mix with nickel and chromium), iron sulphate, magnesia (magnesium oxide avoid using in its powdered form), magnesite (magnesium carbonate), potassium permanganate (condy's crystals), plant ash, rutile, silicon carbide, sodium silicate, strontium carbonate, tin oxide, titanium oxide, wollastonite (calcium silicate), zinc oxide, zirconia (zirconium oxide). Avoid spraying glazes unless you have a spray booth. Remember local ventilation is the only safe way to work with these chemicals.

## **Clays and Talcs (see also Glazes & Colourants)**

Avoid using clays and talcs containing asbestos (found mainly in imported clays) and take special care with those containing free silica. Grog, perlite, sand and vermiculite also contain free silica and sometimes asbestos. Wet clays can be skin irritants. Dry clays are hazardous if they contain silica or asbestos. Long-term effects of inhaling dry clay dusts can include silicosis, mesothelioma, talcosis, lung cancer, emphysema and asbestosis. Always wear a particulate mask and overalls, especially when working with dry clay, eg sanding and polishing. Wear surgical rubber gloves or barrier cream for general handling. Substitute safer clays and talcs where possible. Dry clay dust is a potential health hazard. Wet mop all surfaces. It is wise to invest in a concrete floor or non-absorbent floor covering that can be hosed.

## **The Kiln**

As they heat, glazes produce toxic gases and metal fumes, eg fluorine, chlorine, sulphur dioxide, nitrogen oxide and ozone.

Fuel-fired kilns give off additional toxic gases, eg carbon monoxide. Gas and electric kilns should be ventilated by a fan and hood system that extracts contaminants to the outside. If you cannot afford a hood for the kiln, put it outside but protect it from wind and rain. Hot kilns produce infrared radiation. Always wear infrared goggles to check the progress of the firing. Wear an acid gas mask with a particulate filter, protective clothing and thick welding gloves (don't use asbestos gloves) when you work on the kiln. The kiln should be serviced, and all connections checked, regularly.

## **Other equipment**

All machinery, ventilation and gas connections should be checked regularly. Pug mills and dough mixers should be fitted with guards. Make sure that electrical equipment or wiring is protected in wet work areas. Manual handling of equipment if you're picking up heavy weights, try to minimise shoulder, neck and back strain by using trolleys, levers and pulleys. Adjust benches and seats to a comfortable working height.

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The information in this kit reflects the views of the authors and experts consulted and is accurate at time of printing