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A SOUND FOR SORE EARS

THE FRENCH TURN THE VOLUME DOWN

Personal stereos [walkpersons] in France will be limited to 100 dB, the French National Assembly voted last March. The move might delight passengers on the Paris Metro who are sick of the intolerable tinny hiss from the ear pieces of personal stereos, but is really designed to protect the hearing of the music lovers who use them.

"We're producing a generation of deaf people," claimed one deputy of the Assembly, Jean-François Mattei.

If the amendment is passed by the Senate, all personal stereos will be limited to 100 dB and labelled with a warning, stating that "prolonged use at full power can damage the ear of the user".

Another deputy, Jean-Pierre Cave, who is also an ear surgeon, said that a few hours' listening to music at 100 dB could result in permanent hearing damage. Headsets turned up to 115 dB could cause damage within minutes.

According to a leading stereo retailer, most personal stereos had a maximum output above 100 dB, and some could reach 126 dB.

However, it would be difficult to act on the proposed amendment, since there were no accepted international standards against which to measure the output volume of the stereo equipment.

The reason for the move is a sharp increase in young people with hearing damage. Only ten years ago, 1 in 10 showed hearing loss. Today, the figure is more like 1 in 5, according to recent surveys.



AMBIENT NOISE MORE HARMFUL

French hearing specialist Christian Meyer-Bisch has found that rock concerts and entertainment venues such as clubs are even more likely to cause hearing damage. He has proposed that output at concerts be limited to 100 dB. It seems that the National Assembly is listening: deputy Cave said that the clamp-down on personal stereos is only a first step, and is busy writing amendment proposals that would also turn down the volume at live performances.



Source: Patel, T., 1996; *France takes steps to turn down the volume*, New Scientist, 23 March, p 5

IT DOESN'T COMPUTE!

— A FEW TIPS FOR COMPUTER USERS

Even if you have a table and chair of the highest quality, an ergonomically designed key board and mouse, and the best there is in office equipment, your surroundings may be **INCOMPATIBLE** with your body.

Here are a few handy tips for computer users:



MAKE SURE...

- there are no reflections from windows or lights on your computer screen
- there are no blinding or disturbing light sources right in front of you, such as a window with the sun shining through
- there are no disturbing movements in front of you as you watch the screen
- your neck is straight and not stretched out, and your eyes looking slightly downwards.
- tools you use often are placed within comfortable reach.
- tools you use rarely are placed so that you have to get up of your chair to get them.
- your table surface is not white, nor very dark.
- your legs fit comfortable under the table-top.
- your table is deep enough to accommodate your arms as you work.
- your wrist is not angled in any way as you use the mouse.
- the height of the table lets you rest your elbows on it comfortably.

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Source: Forskning pagar, 1996; *God arbetsmiljo vid bildskarmen*, No 1, p 4

**TRAINING PEOPLE
comes before
UPGRADING EQUIPMENT**

DANGEROUS LEGION

— THE HAZARDS OF WATER STORAGE

Legionnaire's disease is a relatively recently discovered condition, dating back to 1976. At a convention held in the Bellevue Stratford Hotel, Philadelphia, USA, 182 people developed pneumonia-like symptoms. Twenty-eight people died of the mysterious illness. The convention was the 58th gathering of the American Legion of people who served in the US military — thus the name "Legionnaires' Disease".

Legionnaire's disease has been documented many times since the US incident. It is rare, but when it happens, it is often a killer disease. The culprit is a bacterium known as *Legionella pneumophila*, which is often (and erroneously) thought to occur only in enclosed warm-water environments such as cooling towers, ventilation ducts and air conditioning systems, but which actually occur almost everywhere: in fresh-water environments, in both natural and man-made water sources, and even in the soil.

The bacterium is quite tough: it will survive temperatures ranging from a freezing minus 80°C to a sweltering +60°C. The optimum multiplying temperature is around human body heat, but *Legionella* can breed actively in conditions spanning from room temperature to about 45 degrees centigrade. Rapid multiplying can occur in ideal conditions, where the temperature is right, the environment is wet, oxygen and CO₂ are present, algae and slime and microbes are plentiful, atmospheric dust and debris littering the water, and where corrosion and scaling goes on. The bacterium is very responsive to the corrosion products of rusting galvanised iron, which is therefore a poor choice of material for cooling towers and other constructions.

A SPREAD OF GERMS

Heating/cooling systems provide excellent growing grounds for the *Legionella* bacteria. Moreover, these systems also allow the bacteria to spread, because the water is dispersed into the immediate atmosphere. The tiny droplets of water containing *Legionella* bacteria may be breathed in by susceptible people, who may consequently contract the disease.

The bacteria can also spread through soil. For instance, if water from a cooling tower is leaked

or drained into the surrounding soil, bacteria may spread through earth-moving operations or prevailing wind conditions.

WHO CAN GET LEGIONELLOSIS?

As stated before, legionnaires' disease is not common, and statistical information is scarce and inconclusive. The effects of the bacterium on a person depends on a number of preconditions, such as previous respiratory problems, smoking habits, or inability to develop antibodies.

It must be kept in mind, though, that maintenance workers in cooling towers and similar constructions may be at risk. Since the main cause of infection is by inhalation, respiratory protection may be considered for work in these areas. Also at risk may be people working inside a building whose faulty construction allows air from the cooling tower to enter the air conditioning system where it is ducted to the work place.

Health workers caring for legionellosis sufferers are not considered to be at risk.



SYMPTOMS

Legionellosis is a type of pneumonia. There are no distinctive features, and the disease has to be determined through laboratory findings. The disease sets in between two to ten days after exposure to the bacteria. The disease usually progresses as follows:

1. Aches and pains
2. Rapid rise in fever
3. Shivering attacks
4. Coughing
5. Shortness of breath
6. Solidification patches in the lungs (showing on X-ray)

CONTROL MEASURES

The main control measure is to avoid the factors that promote rapid growth of the *Legionella* bacterium: temperature around 37 degrees, stagnant water, dust and debris, slime and algae, rust and corrosion — particularly of iron and zinc products, and the formation of water in aerosol form.

Regular inspections for scale formation, corrosion and biological growth should be conducted.

Remember: regularly and properly maintained cooling towers are not known to be associated with an outbreak of legionnaires' disease.

In cases where tests point to a possible risk, cooling towers can be disinfected by chlorination or by the use of biocides. However, these chemicals should not be used to replace regular inspections and good maintenance.

In hot water systems, the hot water temperature should be kept at or above +60 degrees, and the cold water supply below +20 degrees. Disinfection can be achieved by raising the temperature to +70°C or by chlorination followed by flushing.

Tepid water systems, maintaining a water temperature of around 40-45 degrees, are not acceptable. Other solutions should be found.

PERSONAL PROTECTION FOR MAINTENANCE WORKERS

Maintenance workers should wear personal protective equipment, such as respirators, eye goggles and skin protection. When selecting respirators, remember that aerosol particles are less than 10 micrometres in diameter, and the protective device should be able to filtrate these particles efficiently.



Source: WorkSafe Australia, 1989, *Legionnaires' Disease and related illnesses*, Australian Government Publishing Service, Canberra; Harvard, C. W. H. (Ed), 1987, *Black's Medical Dictionary*, A & C Black (publishers), London

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I'M ALL SHOOK UP!

THERE ARE NO GOOD VIRES IN WORK WITH VIBRATING TOOLS AND MACHINERY.

White fingers is a condition caused by exposure to vibration. Any kind of vibrating tools, ranging from heavy pneumatic machines to a dentist's precision drill, can cause damage.

The name "white fingers" derives from the pale discolouration of the skin as the sense of touch is lost and the numbness sets in after repeated exposure to vibrations. The disease progresses in two stages:

ACUTE SYMPTOMS:

- Reduced sensitivity in the fingers
- Tingling
- Numbness
- Difficulty in buttoning a shirt, holding a pencil, picking up a coin etc.
- Sense of touch is temporarily deadened at work, but returns after exposure to vibrations is discontinued

CHRONIC SYMPTOMS:

- Cold fingers
- Swelling
- Stiffness
- White discolouration of the fingers, starting at the tips and spreading towards the palm

An attack of white finger can occur without warning. It usually happens after work — rarely during the actual exposure to vibration. The whiteness can last for several hours, and the condition can become very painful as the blood returns after an attack.

There is no cure for white finger, other than to stay away from vibrating tools and machinery.

NOT JUST HEAVY MACHINERY

Vibration damage occurs across the occupational fields, and is not confined to heavy labour.

Certainly, many heavy industries are particularly affected, due to the type of machinery used.

Examples include pneumatic hammers, riveters, pneumatic nut tighteners, chisel and rivet hammers, grinders and similar machines. And it's not a small problem confined to a limited number of people; for example, one study found that 30 per cent of ship workers who used grinders and chisel hammers suffered from white finger, and no

fewer than eight in every ten workers reported acute symptoms, such as tingling sensations in the fingers.

Light precision tools can also lead to white finger. Dentists' drills and physiotherapists' ultrasound equipment are two examples. A dental drill operates at half a million revolutions per second, exposing the dentist to at least 1,000 Hz vibrations. Ultrasound tools can vibrate at extremely high frequencies, causing numbness, reduced sensitivity and white finger in physiotherapists and other specialists. For these professionals, a keen sense of touch and high dexterity are essential to the job. Vibration damage may ruin their ability to continue working in their profession.

HOW DOES IT HAPPEN?

Most researchers believe that white finger is caused by disturbances in the surface blood vessels and nerves, but disagree in the actual damage mechanism. Some of the possibilities include:

The body's defence mechanisms are sensitive to vibration, and cause the blood vessels to contract or expand.

The muscles in the blood vessel walls become "exercised" during vibration and start to grow, thus narrowing the diameter of the vein, causing less blood circulation. This in turn results in a vascular spasm experienced as a tingling sensation (almost like a hand or a foot "going to sleep" due to impeded blood flow to the limb).

The mechanoreceptors (touch receptors) themselves are damaged. Alternatively, the sensory nerve fibres that serve the mechanoreceptors could be damaged by vibration.

OTHER CAUSES

White fingers, tingling, numbness and loss of touch can occur through other causes than vibration. Raynaud's syndrome is a hereditary disease with these symptoms, and is found predominantly in women (nine in ten sufferers are women). The difference between occupational vibration damage and hereditary white finger may be difficult to establish. One small help in the diagnosis is that hereditary white finger affects both hands equally, whereas occupational white finger is usually stronger on the hand that operates the vibrating tool.

There are also many chemicals that can cause numbness, tingling and impaired sense of touch. They include:

TOUCHY MATTERS:

ARSENIC

LEAD, COPPER, GOLD

PESTICIDES

MERCURY

ACRYLAMIDE

NITROGLYCERINE

PCB

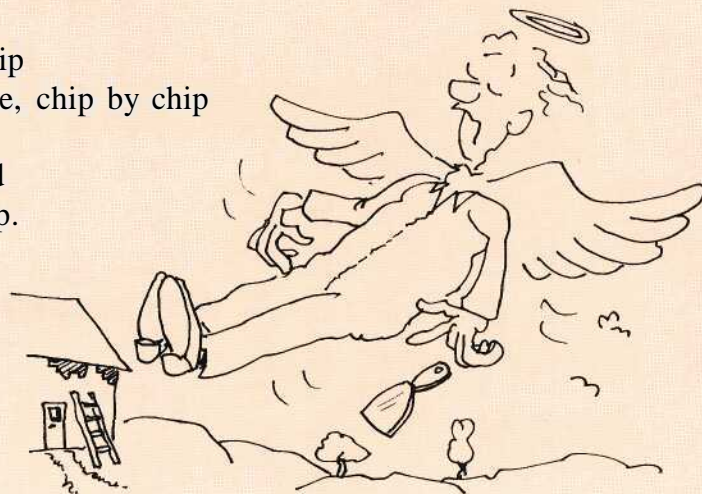
DIOXINS

VINYLCHLORIDE



Source: Forskning & Praktik, 1993; *Vibrating tools damage fingers*, No 4, pp 26-31.

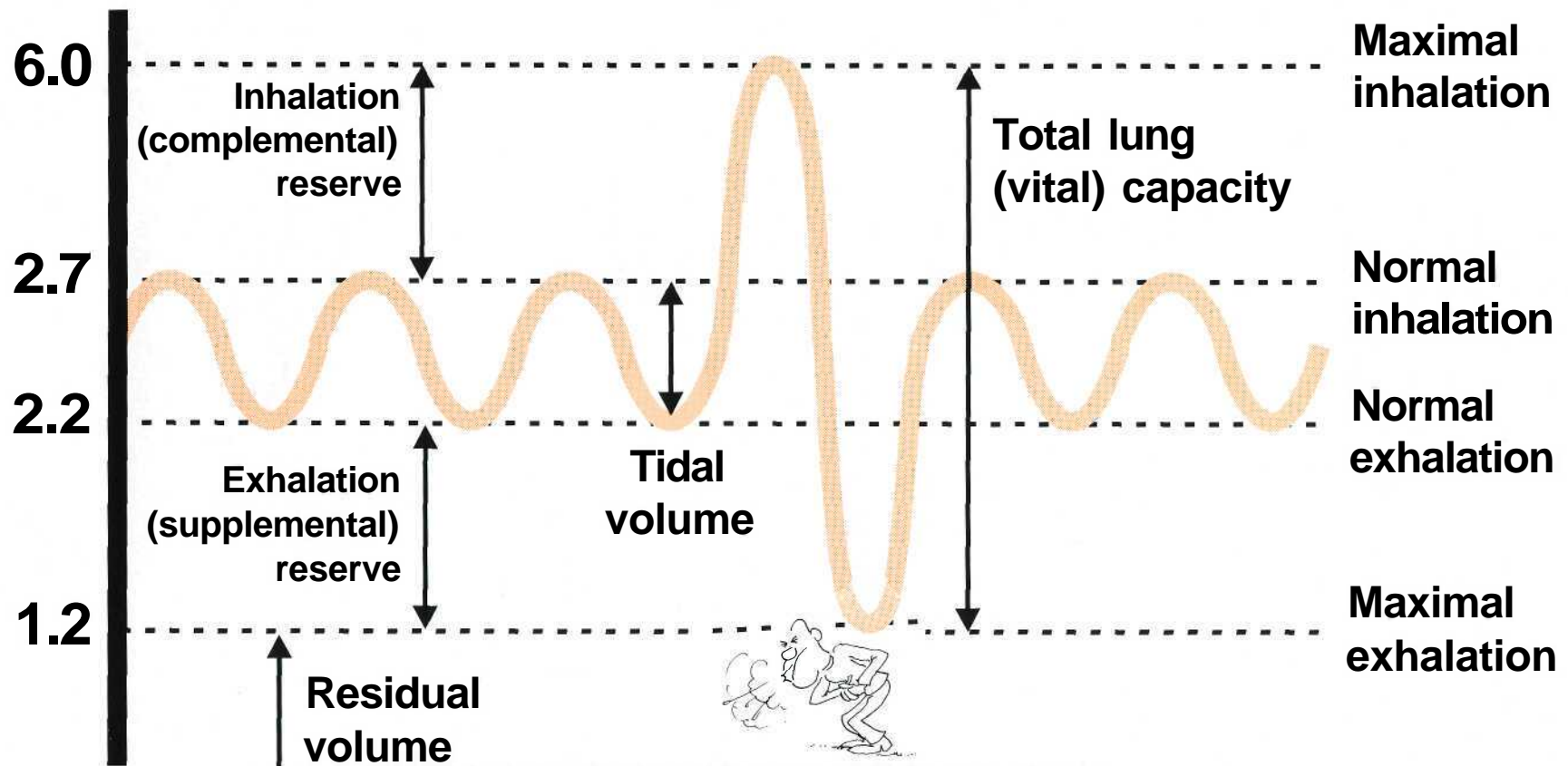
A Macedonian painter from Stip
Stripped the paint off his house, chip by chip
He inhaled so much lead
That his brain went quite dead
And he left on his ultimate trip.



WHAT'S IN A BREATH?

Your lungs can hold about five litres of air. But a normal breath is only a tenth of that, or about half a litre. Here are a few basic useful concepts if you want to understand the breathing cycle:

Air volume in the lungs (litres)



Lung capacity The greatest volume of air that can be held in the lungs (5-6 litres)

Tidal volume The volume we use in a normal breath (usually around 0.5 litre).

Inhalation reserve The extra volume of air we can breathe in (about 3 litres), This happens when we yawn, sigh, laugh, sneeze, or perform hard work.

Exhalation reserve The volume of air we can breathe out if we really try to exhale "all the way out". (About 1.3 litres).

Residual volume The air that remains in the lungs after a maximal exhalation (and even after death) Simply the amount of air by which you can't breathe out. (About 1.5 litres),

Vital capacity The difference between a maximal inhalation and a maximal exhalation. In short, the total volume of air our lungs can breathe.

ALLERGIES EAST AND WEST

Researchers believe that the Western lifestyle may cause more allergies than the Eastern.

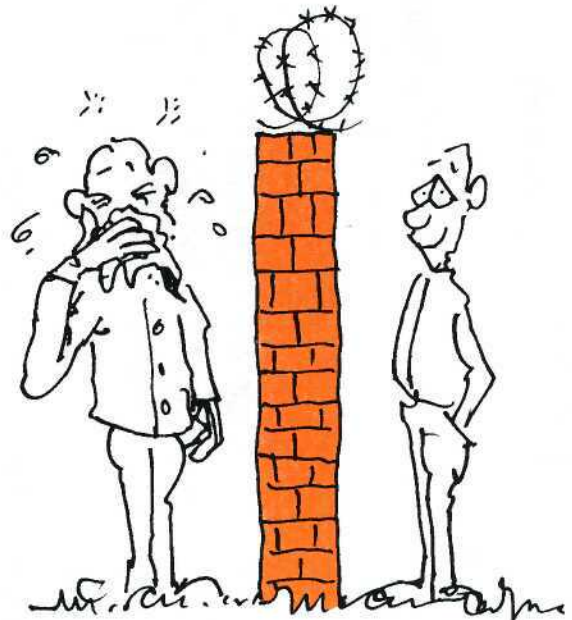
A research team in Germany has found that the population in the former West Germany suffer more frequently of allergies and asthma than their Eastern compatriots. Moreover, as the life style in former East Germany catches up with the West, allergy complaints are on the rise there. During 1990—1992, asthma and hay fever were twice as common among the inhabitants of Hamburg than in the city's East German counterpart, Erfurt.

When the same survey was repeated during 1994—1995, the allergy level was unchanged in Hamburg, but the citizens of Erfurt showed a 20-50 per cent increased incidence of asthma and allergies.

The reason is unclear. The changing lifestyle in the former East Germany has brought more isolated living conditions, more wall-to-wall carpeting, more pets and increased traffic levels.



Source: *Dagens Nyheter*, 1996, *Fler allergiker i vastin i öst*, 04 Feb., p A5



NICE SAUCE... OR NOISE SOURCE?

IS YOUR FAVOURITE RESTAURANT TOO LOUD?

A recent survey performed by the Sydney Morning Herald newspaper found that some of Sydney's most popular restaurants were also the noisiest. Several eating venues served up a dining experience bordering on the unsound.

Triggered by an increase in mail from disgruntled dinner guests with hoarse voices and ringing ears, the newspaper's *Good Living* section went out into Sydney's nightlife armed with Cirrus 701 Data Loggers supplied by the National Acoustic Laboratories to measure the noise level at ten restaurants.

Nine out of the ten venues reported noise levels over 70 dB(A), and four over 80 decibel. The noise level at one of Sydney's most popular restaurants measured 84 dB(A), very close to the level above which, in an industrial location, hearing protectors would be mandatory.

From a diner's enjoyment point of view, noise levels above 70 decibel require you to raise your voice for face-to-face conversation across a table for two. According to the National Acoustic Laboratories, if the *ambience* reaches 80 dB, you'll have to shout.

h h
HANDY HINT

**SINGLE USE
MEANS JUST THAT:
ONCE ONLY!**

From an occupational health point of view, none of the restaurants tested reached noise levels considered to be harmful to the hearing (but at least two came very close). However, noise is something that adds up. If you are subjected to noise in your workplace, extra noise exposure after work could add up to a total noise dose that is not good for you. If you listen to loud car radios, use power tools and lawnmowers on the weekend, visit rock concerts or loud sports events or, indeed, noisy restaurants, you may do well to watch your total dose of noise.

Restaurateurs have sometimes gone to extreme lengths to keep the noise down in their venues. Some have spent tens of thousands of dollars on professional sound consultants, and even more on noise absorption and deflection equipment.

But it's not easy. Restaurant noise is a delicate matter — on the one hand, diners want to communicate with each other face-to-face; on the other, they *expect* some noise that adds to their dining experience. After all, nobody wants to eat in dead silence.

The problem is compounded by modern design fads: today's eateries are often slick, steely, chrome-and-glass venues with stark decor and tiled floors. Perhaps we should go back to the old plush club-style with padded chairs and thick carpets and heavy curtains look? That might be a sound idea.



Source: Durack, T., 1996, "I'll SHOUT you dinner", Sydney Morning Herald, "Good Living" supplement, April 23, pp 1-2

POOR TRAINING
is the
GREATEST HAZARD

DANGEROUS SUBSTANCES
plus
POOR HANDLING
equals
BAD CHEMISTRY!

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INFORMATION

RIPPER STRIPPER

GETTING RID OF OLD LEAD PAINT

Professional painters and private home renovators alike should think twice about stripping paint off buildings older than 15 years. Before 1970, high lead content paint was used regularly. Before 1950, concentrations of up to 50 per cent lead were not uncommon. A recent hook from the Australian Environment Protection Agency urges painters to take care, and gives plenty of practical advice.

Until December 1997, the recommended lead content in Australian paints is 0.25 per cent. After that date, the maximum limit will be 0.1 %. The reason for such low limits is that lead has many severe health effects.

HOW DANGEROUS IS LEAD?

Lead that is inhaled or ingested is something you won't get rid of: it stays in your bones, teeth and blood for the rest of your life. It is a potent poison: even low levels of lead in children can affect the intellectual development and behaviour. Children stand a particularly high risk, since they can absorb lead at a rate five times greater than adults. About half of the inhaled or ingested lead stays in the body of a child, whereas an adult absorbs about one tenth of the lead.

Lead can also be passed on from a pregnant mother to her unborn child.

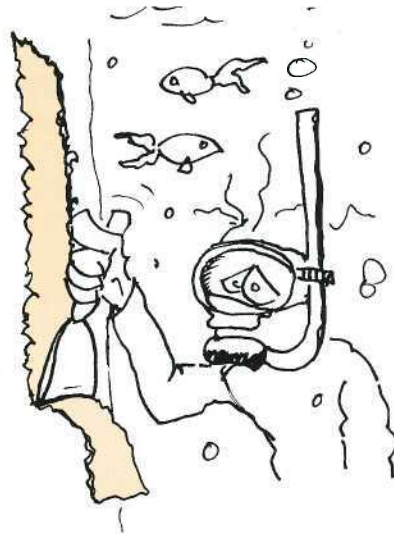
One of the biggest hazards occurs when old lead paint starts to flake or chalk, or is stripped in preparation for a new coat of paint. Handypeople and professionals should take great care. This is serious business, and can be illustrated by the fact that if you happen to swallow flake of old lead paint the size of a five cent piece, your blood-lead level can be significantly increased for weeks.

HOW DO I KNOW IF THERE'S LEAD?

Lead paint was used in a wide variety of ways: in the undercoat of timber, both exterior and interior; on plaster rendering; window frames, skirting board, cupboards, gutters and fascia boards. It was also used on walls and ceilings.

If you are unsure whether the paint to be stripped contains lead, you can purchase a lead detection test kit for less than \$20 (call the lead alert hotline on 008 803 772 for more information).

These test swabs can sometimes give a false result — if the test gives you the clear and the house is old, and particularly if there are young children or pregnant women about, it is best to either assume that the paint does contain lead, or conduct a laboratory test.



THINK IT OVER

If young children or pregnant women live in the house, think twice before you start disturbing the paint. Is it in good condition? Maybe you could delay stripping and painting until the children are older? Maybe you could simply paint over the old paint without stripping it? If the old paint is in poor condition, flaking or chalking, perhaps you could cover it with some other material?

If you feel that you have to proceed with the job anyway, you should do everything you can to minimise the risk of exposure to lead flakes, fumes or dust.

Flakes, fumes and dust are all generated by the most common methods of stripping old paint: scraping (flakes), blowtorching (fumes) and sanding (dust). So what other methods are there?

Wet scraping means that you wet the paint with a spray bottle as you scrape. It's hard work, but can be useful if the coat of paint is flaky. Wear a Standards approved particle respirator, and make sure falling flakes are collected properly.

Chemical stripping is fairly effective, and does not generate any dust. But there are downsides, such as high flammability, hazardous fumes, and extremely corrosive effects on unprotected skin. Take all necessary personal protection precautions, such as gloves, boots, overalls, goggles, face and head protection, and a Standards approved respirator with organic gas filter.

Wet sanding means wetting the paintwork before rubbing down with wet sandpaper. Do NOT use dry sandpaper, or an ordinary power sander. Some professional power sanders have extraction attachments with in-built high efficiency particulate air (HEPA) filters. They should only be used by experienced personnel, and are usually not completely dust-free.

Low-temperature heat stripping can be used to soften thick paint. The temperature should be below 370°C to prevent lead fumes from forming. Blowtorches and high-temperature heat guns should NOT be used, since they are likely to release toxic lead fumes from the paint. Wear a Standards approved respirator. Scrape off the paint immediately into a disposable container.

GOOD WORK PROCEDURES

The first thing to consider is other people: children and pregnant women should stay away from the site until the clean-up is completed. And think about neighbours: inform them about what you're doing, and don't work outdoors on windy days.

The second consideration is your own safety: use proper protective equipment, maintain your respirator and use it correctly. Adopt sensible work routines, such as keeping on the respirator while you remove your clothing, not eating, drinking or smoking in the work area, and washing your protective clothing apart from other clothes.

The third task is to perform the stripping job in a safe manner, using the correct tools and best materials. Cover the floors or ground with plastic drop-sheets that are slightly walled-up to contain the wetting liquid. Make sure dust and flakes aren't blown away by wind. Keep windows and doors shut. Cover all children's sandpits and play equipment. If you're stripping indoors, move away all furniture, turn off all air conditioning and cover all vents and ducts to prevent lead dust from moving to other rooms. Use a lot of tape to effectively seal off the area.

In short, do your utmost to ensure that:

- Unprotected people are not present
- Dry dust and flakes are not generated
- Wet dust and flakes are captured, contained and cleaned up
- No lead paint fragments or dust move to other parts of the house or the neighbourhood

CLEANING UP

The site should be cleaned at least once a day during the stripping job. All cleaning should be done only after wetting down the dust and debris with water spray. Don't try to re-use plastic drip

sheets — wrap up and throw away the entire sheet. Minimise dust at all times: don't sweep with a broom or use a conventional vacuum cleaner. This will only generate more lead dust throughout the area. Make sure that mops, rags, sponges, brushes and cleaning solutions (tri-sodium phosphate or sugar soap) do not themselves become sources of lead contamination.

Naturally, a final thorough clean-up should be performed before children are permitted back into the area.

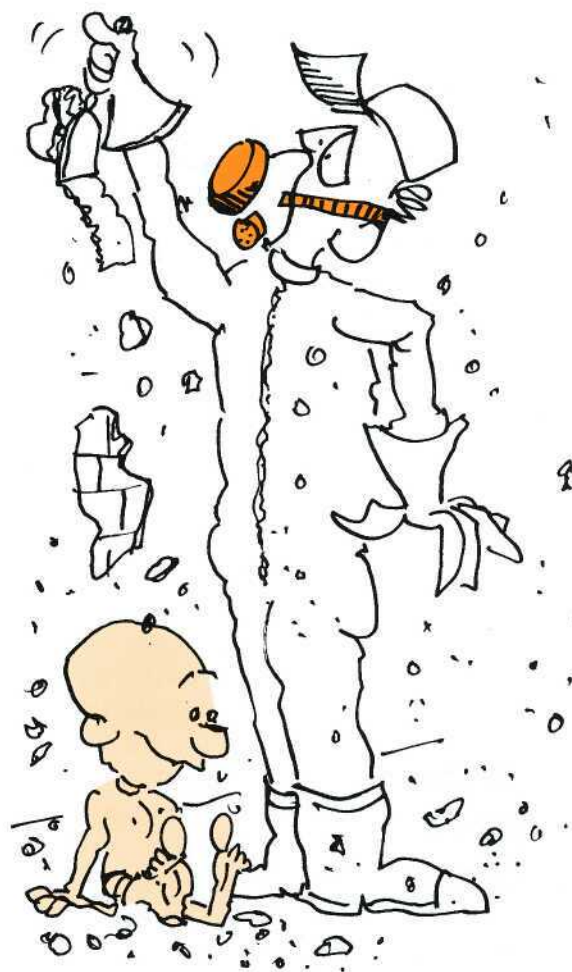
Disposal methods depend on current State government legislation.

MORE INFORMATION

Before undertaking a painting job on a house built before 1970, contact the Environment Protection Agency on 008 803 772. The book "Lead Alert — painting your home" is a valuable source of information for both professional painters and home renovators.



Source: *Lead alert — painting your home?*, 1995; Environment Protection Authority, Australia



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TO:

SUMMARY

Personal stereos limited (Page 1)

Frome wants to limit the noise level of personal stereos to 100 dB. The number of young people hearing damage has doubled in just 10 years.

Tips for computer users (Page 2)

Even with the best technology and ergonomic design, do you adjust your computer equipment correctly? A few pointers to a healthy set-up of your work station.

Legionnaires' disease (Page 3)

Legionellosis is a rare but often fatal disease. Legionella bacteria live practically everywhere in fresh water, in soil, in air, in water, in soil. The trick is not to inhale the ideal microorganisms that let the bacteria multiply uncontrollably.

Vibrating tools and white fingers (Page 4)

The "white fingers" disease is not confined to just heavy machinery; it can be contracted by using vision tools as well.

Wallchart: "What's in a Breath?" (Page 5-7)

Allergies East and West (Page 8)

Allergies twice as common in West Germany as in East Germany before the Berlin wall came down. Now, East Germans suffer an increase in allergies of up to 50 percent.

Restaurant noise (Page 8)

Some of Sydney's most popular restaurants were surveyed with noise measuring equipment. Several provide noise in the 80-85 dB range. Should you wear coats when you go to dinner?

Lead poisoning (Page 11)

Household paint before 1970 were often covered in paint with high lead contents. Before 1950, paints could contain as much as 50% lead. Thinking of stripping and repainting? Read this first.

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