What is the problem?

Timber treatment (e.g. with CCA) and its downstream use may cause exposure to arsenic and other chemicals.

Problem assessment

Environmental measurements can indicate the concentration of arsenic in the breathing zone.

Biological monitoring involves urine testing for inorganic arsenic plus its organic metabolites (dimethyl arsenic and methyl arsenic acids), while abstaining from seafood for a few days prior to testing (!) This is best done at end of a shift at the end of the week. The BEI is 100 µg/L. (~1.3 µmol/l).

Control measures –

Timber treatment

- Integrity of the process and the plant
- Adherence to operating procedures - implied elimination of contact with chemicals.
- Drip-free exit from pressure vessels.
- Subsequent handling of wet timber requires waterproof gloves, overalls and aprons.

Subsequent usage

- Sawing, (plus maybe though unlikely routing and planing) of treated timber may cause airborne dust but the risk is time dependent — and will be significant only if it goes on long enough.
- Prudent avoidance (only) is advised — wearing gloves and dust masks when sawing, routing and planing.
- Hand hygiene.

DOL References

1. Approved Code of Practice for the Safe Use of Timber Preservatives and Antisapstain Chemicals
2. Working with Timber Treatment Chemicals
Asbestos

What is the problem?

Asbestos exposure can cause serious lung diseases (asbestosis, lung cancer and mesothelioma) and cancers in other parts of the body.

Asbestos is found in brake and clutch linings and in certain building products formerly used in New Zealand. These products include asbestos cement cladding, textured ceiling coatings, thermal insulation around pipes and boilers, and fire-protective linings on structural steel (limpet asbestos).

Asbestos exposure can occur during: its removal demolition work floor sanding car repair work (brake linings)

Problem assessment

Laboratory analysis will be required to see if a suspicious fibrous material contains asbestos.

The Asbestos Regulations

Work with asbestos is regulated under the Health and Safety in Employment (Asbestos) Regulations 1998.

These Regulations specify particular tasks involving asbestos as restricted work that must be notified to the Department of Labour before work begins.

These tasks must be carried out by a person holding a certificate of competence for this work, or by someone under direct supervision of a person holding a certificate. The regulations also specify controls that apply to anyone working with asbestos.

Control measures

Where contact with asbestos-containing products cannot be avoided, then all practicable steps must be taken to minimise exposure to asbestos fibres. This may be achieved by:

Ensuring that effective steps are taken to stop or limit the release of asbestos fibres into the air. Ensuring that sound work practices are used to avoid the spread of asbestos contamination on clothing and footwear (wearing disposable outer clothing is recommended). Use dust extraction equipment where the generation of fibres from a process cannot be avoided. Where all other steps
DUST HEALTH HAZARDS

have been taken, and the possibility of excessive exposure remains, minimise the inhalation of asbestos fibres by using appropriate respiratory protection.

Health surveillance

Due to the particular hazards of work with asbestos, it is essential to monitor employees who carry out restricted work with asbestos.

This monitoring may include chest x-rays and lung function tests. The DOL Departmental Medical Officer may also require any other person undertaking work with asbestos to have a medical examination.

Employees who may have been exposed to asbestos are also invited to enter their names and appropriate exposure details in the Asbestos Exposure Register administered by DOL.

Hard Metal Disease

What is the problem?

Milling tungsten carbide tips (during saw sharpening) can cause airborne dust concentrations great enough to lead to ‘hard metal’ lung disease. Cobalt (a binder) is considered a crucial factor in producing this disease, though this may involve an interaction with the tungsten carbide itself. Fluxes used in the brazing process (when the tips are attached to the saw blade) can cause respiratory reactions (this is a separate issue).

Problem assessment

Environmental measurements can indicate the concentration of airborne dust. Analysis for cobalt should be carried out on the dust sample. WES = 0.05 mg/m³.

A BEI of 15 µg/l (urine) and/or 1 µg/l (blood) has been proposed for this metal, samples to be taken at the end of work shift at end of week. The worker should also undergo periodic health surveillance, including lung function tests. A questionnaire was compiled by the Department in 2001.

Control measures

- Local exhaust ventilation – to control the spark shower from dry grinding processes.
- Wet mist ventilation in automated sharpening is common in sawmills.
- If neither is in place, use PPE.
Lead

Foundries, battery manufacture, radiator repair, paint stripping, sundry casting (fishing sinkers).

What is the problem?

Airborne lead dust can cause lead poisoning. Ingestion is also a significant route of exposure.

Problem assessment

Environmental measurements can indicate the concentration of lead in the breathing zone. Biological monitoring is available. WES = 0.1 mg/m3. Lead in blood – 1.5 µmol/l in red blood cells Lead in urine – 0.72 µmol/l action level.

Control measures

Generic control measures include: strict hand hygiene, the use of PPE (see below). Biological monitoring indicates the level of lead absorption and is required when people are exposed to lead routinely.

Foundries:

Lead paint can contaminate ferrous metals and brass scrap contains lead. Gas cutting/gouging and furnace heat may produce lead fume. To control these exposures, use enclosed processes and local exhaust ventilation where possible. PPE should consist of the above plus the appropriate lead fume respirator.

Battery manufacture:

Where possible isolate via automated and enclosed processes; minimise through properly designed and maintained local exhaust ventilation; and use damp processing.

Radiator repair:

Very occasionally you may find a gas torch being used to disassemble a radiator. If so, and if exposure is ongoing, seek advice from the Department of Labour. Temperatures > 330, the melting point of lead, are needed. Check the biological monitoring status of the exposed worker.
DUST HEALTH HAZARDS

Paint stripping:
Sanding or removal of paint from old houses with a blowtorch can produce lead dust and fume. Identify the presence of lead with a test kit from a paint shop.

Use a wet process where possible but prevent lead leaching into garden soil as it could go on to cause sickness in children or pets.

Use PPE – an appropriate respirator for dust or fume, overalls, hair covering and gloves.

Take care to prevent secondary exposure when taking clothing off and laundering.

Sundry casting
(e.g. boat keels, fishing sinkers): Avoid exposure to fume and dust with good ventilation and PPE.

Leadlight windows:
Avoid exposure to fume and dust with good ventilation and PPE.

Loading ammunition:
Avoid exposure to dust with good ventilation and PPE.

Personal protective equipment:
Appropriate (dust or fume) respiratory protection; overalls; apron; gloves; hair covering. Do not expose anyone to dust when taking off or laundering PPE.

Hygiene:
Strict attention to hand hygiene and other hygiene practices is required to prevent ingestion.

References
- Guidelines for the Medical Surveillance of Lead Workers
- Repainting Lead-Based Paint
- Lead Hazards in Radiator Repair
- Guidelines for the Medical Surveillance of Lead Workers
- Guidelines for the Management of Lead-Based Paints
Silica dust can be present in the settings listed due to the use of sand or when rock is crushed. Continued exposure can produce serious lung disease.

Problem assessment

Employers should carry out air sampling to assess the level of risk.

WES = 0.1 or 0.2 mg/m3 repairable/ inspirable dust depending on crystal type. Analysis of solid samples of parent rock or sand can show its silica content and may help to predict whether air concentrations of dust are likely to be hazardous or not. New Zealand sands are usually high in silica, but most sandblasting appears to be with silica-low or silica-free sand or glass beads.

Control measures

Foundries
Substitution of silica-free sand may not be possible. Instead, local exhaust ventilation, enclosure of processes and the informed use of personal protective equipment (PPE) should be undertaken.

Abrasive blasting
Substitution by silica-free alternatives is widely practised. Properly designed booths and PPE should be used.

Quarries and mines
- road making:
- process isolation
- positively pressurise vehicle cabs and process control rooms
- water damping where possible
- use of PPE when outside
- Adequate dilution ventilation.

Concrete cutting
Use of wet processes. In confined spaces – damp dust before sweeping up.
Wood dust

What is the problem?

The most serious concern relates to the risk of cancers of the nose (adenocarcinoma) and sinuses (ethmoid), which have been observed historically with exposures to hardwoods (beech, walnut, oak, mahogany, maple). The risk from soft woods is considered much less, but should not be entirely discounted.

Some wood dusts can cause allergic respiratory disease (e.g. asthma, sinusitis, alveolitis), and/or or allergic dermatitis. Implicated components include resin acids (plicatic, abietic and pimaric acids) rosins (colophony) and terpenes (pinenes and carenes).

Wood can be contaminated by microorganisms including fungi or microbial products (e.g. endotoxins) which may cause other lung reactions. Remember the potential for dust explosions.

Problem assessment

Furniture manufacturing and joinery have high dust exposures. Assess by air sampling and comparison with the WES. Use a Tyndal Lamp to indicate the efficiency of controls.

Control measures

- Avoid the indiscriminate use of compressed air to remove dust
- Isolate fine dust producing process
- General housekeeping
- Appropriately designed hoods and extraction devices mounted directly onto individual powered equipment
- Capture of dust as close as possible to the source of emission
- Adequate PPE for high-risk tasks
- Remove dust from flat surfaces
- Regular maintenance of ventilation systems.