CHEMICALS: where to start?

The vast majority of chemicals used at work have never been fully tested before going onto the market. It is essential that some of these are banned and phased out. The following are a few basic questions to get you started.

A CHECKLIST TO GET STARTED ON CHEMICAL SAFETY

	Yes	No
Are all hazardous substances and materials properly labelled?	❑	❑
Are the appropriate Safety Data Sheets provided or located in the areas in which the hazardous substances and materials are stored or used?	❑	❑
Is there a Manifest for all Dangerous Goods on site and a Register for all Hazardous Chemicals on site?	❑	❑
Is there a minimum of 1.5 metres between incompatiable Dangerous Goods e.g. class 8 and class 5.1?	❑	❑
Are all Dangerous Goods stored away from ignition sources e.g. welding?	❑	❑
Is there appropriate signage in regard to the dangferous goods and the risk of fire or explosion.	❑	❑
Is all lighting in Dangerous Goods areas flame proof?		
Are all flammable liquids stored properly?	❑	❑
Is work organised to eliminate or minimise the handling of hazardous substances?	❑	❑
Where direct handling is unavoidable, are workers provided with suitable clothing, respirators and gloves?		
Are there emergency procedures and facilities for dealing with chemical spillages and other accidents?	❑	❑
	❑	❑
Are all workers who are portentially exposed given information, instruction and training on the hazards of the materials?	❑	❑
Have safer materials and substances been substituted where possible?	❑	❑
Are dusts or fume producing machines enclosed or isolated?	❑	❑

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	Yes	No
Are the sources of hazardous gases or fumes completely enclosed or sealed?	❑	❑
Is local exhaust ventilation adequate? Is it regularly maintained?	❑	❑
Is suitable protective equipment provided where exposure cannot be controlled by other means?	❑	❑
Is there adequate training in the use and dangers of the particular substances or materials?	❑	❑
Have you checked to see if any of the chemicals include any of those on the lists below?	❑	❑

Printing

The printing process uses inks, paints and solvents. As it is not possible to eliminate these, the health and safety aim must be to use safer and healthier products. The checklist below is a start to seeing how you print shop is doing on some of the basics. This is of course after any chemicals on the lists in section 2 of this chapter have been removed or used very little.

Chemicals which are volatile i.e they evaporate easily are more likely to be breathed in by workers than those which take a long time to evaporate. The following checklists will help you look at that problem.

A CHECK LIST FOR PRINTING WORKPLACES

	Yes	No
Does your workplace use any chemicals with a Flashpoint of less than 55^0 C?	❑	❑
Do any of the rollers or blanket washing cleaning solutions have a flash point of less than 21^0 C?	❑	❑
Do any of the blanket revivers or ink stripping products contain		
⇨ n-hexane	❑	❑
⇨ hydrocarbons containing chlorides, fluorides or bromides	❑	❑
⇨ terpenes	❑	❑

⇨ amines or amides?	❑	❑
Do any of the solvents have benzene content greater than 0.1%?	❑	❑
Do any of the solvents have a toluene or xylene content of greater than 10%?	❑	❑
Is the percentage of isopropyl alcohol (IPA) in font solvents greater than 10%?	❑	❑
Are the appropriate SDSs not located in the areas in which the hazardous substances and materials are stored or used?	**Yes** ❑	**No** ❑

If you have answered YES to ANY of the above questions then the chemicals in your workplace are unnecessarily hazardous.

If you answer Yes to the next two questions your workplace is making moves to improve chemical safety.

Does your workplace use solvents with a flash point greater than 100^0 C?	**Yes** ❑	**No** ❑
Does your workplace use vegetable cleaning agents?	❑	❑

Engineering, metals and vehicle manufacture

A quick check list for engineering, metals and vehicle

	Yes	**No**
Does your workplace use any chemicals with a Flashpoint of less than 55^0 C?	❑	❑
Do any of the solvents have a flash point of less than 21^0 C?	❑	❑

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Do any of the solvents/cleaning agents products contain		
⇨ trichloroethylene, tricholoroethane or methylene chloride	❑	❑
⇨ formaldehyde or epoxy resins	❑	❑
⇨ chlorides, fluorides or bromides	❑	❑
⇨ hydrofluoric acid	❑	❑
⇨ amines or amides	❑	❑
⇨ heavy metals?	❑	❑
Do any of the solvents have benzene content greater than 0.1%?	❑	❑
Do any of the solvents have a toluene or xylene content of greater than 10%?	❑	❑
Do any of the paints contain isocyanates e.g. TDI or MDI?	❑	❑
Do any of the paints contain Chromium (IV) i.e. Hexavalent Chromium?	❑	❑
Do any of the coolants/cutting oils contain carcinogens, fungicides or bactericides?	❑	❑

If you have answered YES to ANY of the above questions then the chemicals in your workplace are UNNECESSARILY hazardous.

If you have answered YES to ANY of the questions below then your workplace is making some moves to remove hazardous chemicals.

	Yes	**No**
Does your workplace use solvents with a flash point greater than 100^0 C?	❑	❑
Does your workplace use coolants and cutting oils that are bio balanced which are free of bactericides and fungicides?	❑	❑

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What's the problem with solvents

In our industry, solvents are commonly used as cleaning/degreasing or thinners or as part of paints, varnishes and adhesives. Many solvents are effective, easy to use and readily available from chemical suppliers.

For solvents, the most common pathway into our bodies is via the lungs ie we breathe them in. An adult at rest breathes about 5 litres of air per minute. During hard work this may increase to 20 litres per minute. The heart pumps about 5 litres of blood per minute and about twice as much during physical work. This means, the harder you are working the more air you inhale and the faster your blood circulates. This means more solvent can be breathed in and circulated around the body

In a SDS (see below) a low boiling point tells you that more vapours are likely to be given off. To decrese the amount of a solvent that enters the air, solvents of higher boiling points or vegetable based oils should be used. A higher boiling point solvent evaporates more slowly; this means there are less vapours in the air available to be breathed in.

A worker using a solvent with a low boiling point (a volatile solvent), i.e. a flash point below 21, can inhale 5.5 litres of solvent vapour during an eight hour day. This compares to a worker using white spirit, which has a flash point 21 - 55, may only inhales 1.7 litres of solvent.

Vegetable oil-based cleaning agents or high boiling point solvents virtually eliminate the inhalation hazards of solvents.

What is an SDS?

The Safety Data Sheet (SDS) is an important means of communicating information about hazardous substances in the workplace. The MSDS must be prepared by the manufacturer or importer of a chemical product, and is provided to purchasers. Employers who use the product are required to make the MSDS available to their workers.

The AMWU can help you obtain an SDS

Note that many SDSs are incomplete and/or inaccurate. The AMWU Help Desk 1300 732 698 and OHS officers have on-line access to the extensive ChemWatch database. When in doubt about the information on a SDS provided to you by an employer, you can request the AMWU to provide you one from this database. These can be provided in different languages.

The following information should be found on every Safety Data Sheets:

Identity

The name of the chemical product

Section I: Manufacturer

This section gives the manufacturer's name, address, and emergency telephone number.

Section II: Hazardous Ingredients
This section includes a list of all ingredients in the product that are defined as hazardous substances by law. The concentration (percentage) is given for each hazardous ingredient. If an ingredient has an established workplace exposure limit, that is also found here. Limits are usually expressed as Permissible Exposure Limits (PELs) or Threshold Limit Values (TLVs).

Section III: Physical/Chemical Characteristics
This section gives the boiling point, vapor pressure, vapor density, solubility, specific gravity, melting point, and evaporation rate. Information on appearance and odor is also found here.

Section IV: Fire and Explosion Hazard Data
This section should clearly state whether or not the product is flammable. If it is flammable, information should be given on the type of fire extinguisher to use, and any special precautions involved in fighting that type of fire. (For example, certain substances never should have water applied when they are burning.) The "flash point" is also given. If the flash point is below 50 degrees C, Special precautions are required in handling the product.

Section V: Reactivity Data
This section should state the potential of an unstable product to react with other materials to produce fire, explosion, or new toxic substances. It should list the conditions to avoid, such as proximity to incompatible chemicals, extreme temperatures, shaking or jarring etc.

Section VI: Health Hazard Data
Routes of entry (skin contact, inhalation, and/or ingestion) should be listed here. Information should be included on signs and symptoms of exposure, as well as acute (short-term) and chronic (long-term) health effects. This section should also state whether the product may cause cancer (a carcinogen). Emergency and first aid procedures are described here as well.

Section VII: Precautions for Safe Handling and Use
This section describes how spills and leaks of the product should be handled— what equipment to use and what precautions to take. Safe handling, storage, and waste disposal methods for the product are also included.

Section VIII: Control Measures.
This section will state whether a respirator or special ventilation are required when using the product. The type of respirator needed should be given. Information should be included on other protective equipment and clothing needed (eye protection, gloves, etc).