Chemical Handling & Storage

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Introduction:

These days' chemicals play a vast part in our homes, unregulated storage, usually under the kitchen sink.

We store there cleaning chemicals that by nature are reactive and toxic if mixed, and use them without PPE, and without a second thought.

Fortunately for work places, there are regulations on storage and handling of chemicals, with a lot of industrial chemicals similar to the ones under the kitchen sink, and having the same nasty properties.

This ebook will help guide the reader to how chemicals in the work place should be stored and handled, and perhaps might change the way your cleaning chemicals at home are stored as well.
What is a storage and handling system?

A storage or handling system is a container, or any other plant and associated pipe work and safety systems (e.g. spill containment system, safety relief devices) that comes into contact with the hazardous chemical. A storage and handling system includes things such as bottles, packages, cylinders, drums, carboys, intermediate bulk containers (IBCs), tanks, vessels, reaction vessels, blending and mixing equipment, and associated pipework and connections.

Performance characteristics of packages are specified in the Australian Dangerous Goods (ADG) code. Information on the design, construction, location and installation of bulk containers for hazardous chemicals can be found in various Australian Standards. A few examples include:

- AS1692: Tanks for flammable and combustible liquids
- AS1940: The storage and handling of flammable and combustible liquids
- AS4897: The design, installation and operation of underground petroleum storage systems
- AS2022: Anhydrous ammonia- Storage and handling
- AS3780: The storage and handling of corrosive substances.

Safety duties:

A person conducting a business or undertaking (PCBU) must ensure, so far as is reasonably practicable, that a system used at the workplace for the use, handling or storage of hazardous chemicals is used only for the purpose for which it was designed, manufactured, modified, supplied or installed. A PCBU must also ensure that a storage and handling system is operated, tested, maintained, installed, repaired and decommissioned having regard to the safety or workers and other persons at the workplace.

The person must ensure that sufficient information, training and instruction is given to a person who operates, tests, maintains or decommissions a hazardous chemical storage and handling system for the activity to be carried out safely. Such information may include safety features included in the design, required maintenance regimes, instruction manuals, design specifications and safe working parameters (e.g. temperature and pressure).

When a storage and handling system is a bulk container, the container and its associated pipework must have stable foundations and supports, and are secured to the foundations and supports to prevent any movement between the container and pipework and attachments to prevent damage.
**Identification of hazardous chemicals:**

The hazardous chemical contents of storage and handling systems must be identified and specific requirements apply depending on the type of storage and handling system. For example:

- Packages require correct labelling (section 342)
- Bulk containers require tank placards displaying the proper shipping name, UN Number, Hazchem code and dangerous goods class label as specified in the ADG Code.
- Pipe work is identified by a label, sign or another way on or near the pipe work.

**Preventative maintenance and integrity testing**

Systems for the storage and handling of hazardous chemicals generally require on-going maintenance and testing to ensure that they continue to be safe for the intended use and that they maintain their operational integrity. Such systems include, but are not limited to, reaction vessels, chemical transfer lines, pumps, spill bunding and storage tanks.

To ensure that the integrity of hazardous chemical handling systems is preserved, planned maintenance programmes should be designed and carried out at regular intervals, consistent with manufacturer’s instructions or advice provided by other competent persons. If this is not reasonably practicable, inspections and maintenance should be carried out annually.

**Examples of preventative maintenance and integrity testing might include:**

- Inspection of glass linings on steel or metal alloy reaction vessels to ensure there are no cracks or holes which might allow contact of incompatible materials with the metal vessel.
- Regular checking of bursting (rupture) discs and pressure-relief systems on pressure vessels to ensure they have not 'blown' and are of the correct pressure rating for the work being performed. Bursting or rupture discs are safety features for pressure systems that help to prevent damage or injury from over-pressurisation.
- Checking spill bunding walls for cracks or other signs of wear to ensure that, in the event of a spill, the bunding will not leak or fail.
- Checking for signs of corrosion or degradation on tanks, pipework and compressed gas fittings.

Preventative maintenance and integrity testing may range from visual inspections through to more sophisticated techniques such as non-destructive testing (NDT) and risk-based inspections (RBI). If preventative maintenance checks show that the integrity of any chemical handling system is in doubt or not performing as it is intended, repair or replacement of the faulty system should be carried out as soon as practicable and before its next use.

**What is a safety data sheet (SDS)?**

An SDS (previously called a material safety data sheet) is a document containing important information about a hazardous chemical (which may be a hazardous substance and/or dangerous good) and must:

- Be in English
• Contain unit measures expressed in Australian legal units of measurement (Metric)

• State the date it was last reviewed (must be at least once every five years), or if it has not been reviewed, the date it was prepared

• State the name, Australian address and business telephone number of the manufacturer or importer

• State an Australian business telephone number from which information about the chemical can be obtained in an emergency.

**An SDS for a hazardous chemical must also state the following information about the chemical (refer to the Work Health and Safety Regulation 2011- Schedule 7):**

• Section 1 - Identification: Product identifier and chemical identity

• Section 2 - Hazard(s) identification

• Section 3 - Composition and information on ingredients, in accordance with Schedule 8

• Section 4 - First-aid measures

• Section 5 - Fire-fighting measures

• Section 6 - Accidental release measures

• Section 7 - Handling and storage, including how the chemical may be safely used

• Section 8 - Exposure controls and personal protection

• Section 9 - Physical and chemical properties

• Section 10 - Stability and reactivity

• Section 11 - Toxicological information

• Section 12 - Ecological information

• Section 13 - Disposal considerations

• Section 14 - Transport information

• Section 15 - Regulatory information

• Section 16 - Any other relevant information.

An SDS is an important information source for eliminating or minimising the risks associated with the use of hazardous chemicals in workplaces.

**What are the duties in relation to the preparation of an SDS?**
Manufacturers and importers of hazardous chemicals have duties under the WHS Regulation (Section 330) to provide current information about the hazardous chemical in the form of an SDS.

A manufacturer and importer of a hazardous chemical must:

• Prepare an SDS for the hazardous chemical before first manufacturing or importing the hazardous chemical or if that is not practicable, as soon as practicable after first manufacturing or importing the hazardous chemical

• Review the SDS at least once every five years and amend whenever necessary to ensure it contains correct current information.

Access to an SDS:

Access to an SDS can be provided to workers in the work area in several ways:

• Paper copy collections of SDS

• Computerised and internet-based SDS databases.

*Note* Relevant SDS must be present near the storage area of the particular chemical, and a copy of the SDS must be placed in the Hazmat box for the Emergency Services.

When a workplace adopts a computerised or internet-based SDS database, ensure that the relevant workers have ready access to the information in the work area. Ensure workers have the necessary computer skills to login and access the SDS when required. Also consider how this information can be accessed in an emergency situation if the power is isolated.

The WHS Regulation provides for an exemption for having to obtain and give access to an SDS when:

• Hazardous chemicals are in transit

• The PCBU is a retailer and the hazardous chemical is a consumer product and intended for supply and not intended to be opened on the premises

• The hazardous chemical product is a consumer product used in quantities and a manner which is consistent with household use.

In these circumstances, the PCBU must ensure sufficient information about the safe use, handling and storage is readily accessible to a worker, emergency service worker or anyone else likely to be exposed to the hazardous chemical at the workplace.

Registers:

The register of an SDS is required, and should be used as an information tool to make sure everyone is involved in managing hazardous chemicals exposure at the workplace. A register is a list of the hazardous chemical products and the current SDS for each of those products that is readily accessible to a worker and anyone else who is likely to be affected by the hazardous chemical.
For an overseas SDS, it is acceptable to have a translation of the SDS attached to the original SDS, provided the appended information clearly states the translation is not part of the original SDS. The original SDS is the SDS prepared in accordance with the WHS Regulation. If an overseas manufacturer’s SDS does not comply with the requirements of the WHS Regulation, the importer is responsible for preparing an SDS that does comply.

Labelling of hazardous chemical containers:

Manufacturers, importers, suppliers, and PCBUs have specific labelling duties in relation to the correct labelling of workplace hazardous chemicals. Refer to sections 335, 338 and 342 of the WHS Regulation.

The format and content for a hazardous chemical product label is set out in the Labelling of Workplace Hazardous Chemicals published by Safe Work Australia.

What is on the label?

The label must be in English and contain the following:

- Name of the product
- The name, Australian address and business telephone number of either the manufacturer or importer
- Identity and proportion disclosed, in accordance with Schedule 8 of the WHS Regulations for each chemical ingredient
- Any hazard pictogram(s), hazard statement(s), signal word and precautionary statement(s)
- Any information about the hazards, first aid, and emergency procedures relevant to the chemical, which are not otherwise included in the above
- The expiry date of the chemical, if applicable.

If the manufacturer has amended an SDS, the label should be changed to ensure that it is consistent with the information in the amended SDS.

The WHS Regulations (Schedule 9) include special provisions for specific circumstances including:

- Small containers
- Research chemicals or samples for analysis
- Decanted or transferred hazardous chemicals
- Hazardous chemicals with known hazards that are not supplied to another workplace
- Hazardous waste products
- Hazardous chemicals classified in the explosive hazard class
- Hazardous chemicals that are dangerous goods packaged for transport and in transit
Chemical Hazards and hazard prevention:

1. Fire and explosion risks
2. Safety duties
3. Hazardous areas
4. Risk control measures
5. Controlling flammable substance emissions
6. Controlling ignition sources
7. Controlling static electricity
8. Controlling hot work

Fire and explosion can result in catastrophic consequences, causing serious injuries or death of workers and others, as well as significant damage to property. A person conducting a business or undertaking (PCBU) must prevent the possibility of fire or explosion from an ignition of flammable substances associated with a hazardous area or a hazardous atmosphere.

Safety duties:

Section 355 of the Work Health and Safety Regulation 2011, requires specific controls for prevention of fire and explosion associated with hazardous chemicals. A PCBU must ensure an ignition source is not introduced into a hazardous area (from outside or within the space).

Section 52 of the WHS Regulation requires a PCBU to manage risks to health and safety associated with an ignition source in a hazardous atmosphere. With respect to flammable substances, a hazardous atmosphere is an atmosphere where the concentration of flammable gas, vapour, mist, or fumes exceeds 5% of the lower explosive limit (LEL) for the substance. The LEL is equivalent to the lower flammability limit (LFL) and may be found in Section 9 Physical and chemical properties in a product's safety data sheet.

Hazardous areas:

A hazardous area is an area (three-dimensional space) in which a flammable atmosphere is or may be expected to be present, and require special precautions for the construction, installation and use of equipment. Examples of hazardous areas are:

- Flammable liquid and gas storage tanks and associated equipment (e.g. release points such as vents, fill points, dip points, safety relief devices)
- Flammable liquid and gas dispensing equipment (e.g. service stations, depots and airports, LP gas filling stations)
• Storage areas for flammable liquids in packages (e.g. warehouses, store rooms, workshops)
• Storage areas for flammable gases in cylinders
• Mixing and blending vessels for flammable product formulations road and rail tanker loading facilities for flammable liquids and gases
• Fume cupboards used for flammable liquids and gases
• Laboratory areas where flammable liquids are used and stored
• Spray painting booths used for flammable paints and lacquers
• Landfill gas (e.g. methane), sewage treatment and sewage pumping plants
• Flammable solvent printing processes
• Accidental puncturing and spilling contents of containers containing flammable liquids
• Application of flammable sealants and adhesives in enclosed areas
• Areas around activities generating fine dusts of combustible material (sugar, grain, polymers, dry organic residues).

Wherever flammable liquids, vapours, and gases, and combustible dusts are generated, used, stored and handled, a hazardous area assessment should be conducted to determine the extent of applicable exclusion zones for potential ignition sources. Exclusion zones are divided into zone 0, 1, or 2 based on the probability of a flammable atmosphere being present as follows:

• Zone 0 hazardous area is an area where a flammable atmosphere is present continuously or for long periods or frequently
• Zone 1 hazardous area is an area where a flammable atmosphere is likely to occur in normal operation occasionally
• Zone 2 hazardous area is an area where a flammable atmosphere is not likely to occur in normal operation but, if it does occur, it will exist for a short period only.

Once hazardous areas and applicable zones are identified, potential ignition sources can be identified and either eliminated or controlled to prevent a fire or explosion. An ignition source provides a source of energy sufficient to ignite a flammable atmosphere. Examples of ignition sources include:

• Naked flames, smoking, pilot lights
• Portable electrical equipment such as tools, radios, and fans
• Fixed electrical systems and powered circuits with potential for arcs, sparks, short circuits
• Hot work activities such as welding, hot-cutting, grinding (can throw hot metal shavings considerable distances)
• Operating equipment with combustion engines such as forklift trucks, generators, compressors
• Hot surfaces, exhaust pipes, hot flues and ducts and frictional heating
• Mechanical sparks from impacts, e.g. lawn mower blades striking a rock, forklift tines on concrete
• Static electricity leading to electrostatic discharges generated incidentally or by processes or activities including:
  ◦ low conductivity liquids, e.g. liquid hydrocarbons, flowing at high velocity through pipes and associated fittings
  ◦ Flow of powdered or granular solid materials (particularly non-conducting materials like plastic beads), e.g. moving through shutes and hoppers, and mixing and sieving
  ◦ Non-conducting drive or conveyor belts in motion
  ◦ Movement of people when insulated from earth, particularly if wearing clothing of synthetic fibres.

Risk control measures:

Key control measures for managing these risks include:

• Identifying and managing hazardous areas
• Controlling emissions of flammable vapours, gases and mists (see below)
• Use of ventilation systems to control vapours during both normal and abnormal conditions (e.g. leak or spill)
• Eliminating ignition sources from hazardous areas (see below)
• Installing systems to detect leaks of flammable gases or vapours and enable response actions to be taken
• Using intrinsically safe or flameproof equipment
• Substituting flammable materials for ones that are less flammable or combustible
• Ensuring incompatible materials (e.g. oxidizers and oils) are separated or segregated
• Reducing quantities of flammable and combustible materials, including items that contribute to the fire load but that are not hazardous chemicals themselves (e.g. wooden pallets, oil)
• Ensuring equipment used in handling flammable hazardous chemicals is maintained in accordance with manufacturer’s instructions
• Adopting good housekeeping practices to minimise accumulation of combustible dusts.

Controlling flammable substance emissions:

Accumulation of vapours, gases, mists creates the potential for a hazardous area to exist. Vapour emissions resulting from processes can be minimised by:

• The use of enclosed container and transfer systems and vapour recovery connections
• Keeping lids open only for the minimum period required for transfer
• Minimising exposed surface areas (e.g. area of spread for leaked or spilled liquid)
• Avoidance of splash filling
• Minimising the temperature of liquids being processed or transferred
• Providing ventilation, e.g. mechanical extraction for all sources of vapour and vent to a safe area.

When heated, the vapour pressure of flammable and combustible materials may increase resulting in higher vapour emissions. Containers of hazardous chemicals should therefore be stored away from sources of heat (e.g. heaters or other heating appliances). Heat may also deteriorate packaging and increase the risk of failure of the container and product loss. Hot surfaces may also exceed a substance’s auto-ignition temperature.

Controlling ignition sources:

Controlling potential sources of ignition in a hazardous area may be achieved by:

• Use of suitably-rated electrical equipment (e.g. intrinsically safe or flame-proof)
• Ensuring electrical equipment is effectively maintained where poorly maintained electrical equipment can present a significant risk for example, through worn brushes
• Ensuring electrical equipment is properly earthed
• Ensuring the auto-ignition temperature of the hazardous chemical is considered as some hazardous chemicals may ignite spontaneously above certain temperatures
• Implementing administrative controls such as permit systems preventing hot work (for example, welding) in these areas (see below).

Where electrical installations or equipment are required to be located or used in a hazardous area e.g. lighting, mixers and stirrers, pumps, control systems, forklift trucks, detectors, torches etc. These items must be designed and constructed so that they cannot release energy within the hazardous area that is sufficient to cause an ignition. That is, such equipment must be suitably rated for use in a hazardous area.

Such design and construction techniques include ‘intrinsically safe’ or ‘flame-proof/encapsulated’ equipment. Any equipment designed and constructed to operate within a hazardous area must also be supplied with documentation stating which zone (i.e. 0, 1 or 2) it is suitable to operate within.

Controlling static electricity:

Static electricity can be created from a range of activities including the transfer of hazardous chemicals. Information on control of static electricity can be found in AS1020: The control of undesirable static electricity and includes methods such as earthing and bonding to ensure any build-up of static electricity is dissipated before a hazardous electrical discharge can occur.

Emergency planning for hazardous chemicals:
Safety duties

The purpose of emergency planning is to minimise the effects of an emergency that occurs at a workplace involving hazardous chemicals. An emergency may involve an explosion, fire, harmful reaction or the evolution of flammable, corrosive or toxic gases and vapours or an escape, spillage or leak of a hazardous chemical.

Safety duties:

Under section 43 of the WHS Regulation, all workplaces have an obligation to prepare, maintain and implement an emergency plan that provides for the following:

- Emergency procedures including an effective response to an emergency
- Evacuation procedures
- Notifying emergency service organisations at the earliest opportunity
- Medical treatment and assistance
- Effective communications
- Testing of the emergency procedures including the frequency of testing
- Information, training and instruction to relevant workers in relation to implementing the emergency procedures.

When preparing the emergency plan, the PCBU must consider all relevant matters including:

- The nature of the work being carried out at the workplace
- The nature of the hazards at the workplace
- The size and location of the workplace
- The number and composition of the workers and other persons at the workplace.

Section 43 applies to all workplaces and is not related to quantity of hazardous chemicals.

Under section 359 of the WHS Regulation, a PCBU must ensure the workplace is provided with fire protection and fire fighting equipment that is designed and built for the types of hazardous chemicals at the workplace:

- In the quantities in which they are used, handled, generated or stored, and
- the conditions under which they are used, handled, generated or stored, having regard to - i. the fire load of the hazardous chemicals; and
  ii. The fire load from other sources; and
iii. The compatibility of the hazardous chemicals with other substances and mixtures at the workplace.

In each state, fire protection and fire fighting equipment must be compatible with fire fighting equipment used by the states Fire and Rescue Services.

The fire protection and fire fighting equipment must be properly installed, tested and maintained with a dated record kept of the latest testing results and maintenance until the next test is conducted.

If a part of the fire protection and fire fighting equipment provided at the workplace becomes unserviceable or inoperative, the implications must be assessed and alternative measures are to be taken to manage the risks. Affected fire protection and fire fighting equipment must be returned to full operation as soon as practicable.

Section 360 of the WHS Regulation requires that equipment is always available at the workplace for use in an emergency.

Manifest quantity workplaces:

Section 361 of the WHS Regulation requires manifest quantity workplaces to provide a copy of the emergency plan prepared under part 3.2, division 4 for the workplace to the primary emergency service organisation (i.e. State Fire and Rescue Service). A manifest quantity workplace is a workplace that uses, stores or handles hazardous chemicals in quantities exceeding the prescribed manifest quantity in column 5 of schedule 11.

This is in addition to the requirements to:

- Provide an emergency services manifest and site plan at the workplace (refer to Manifest requirements for hazardous chemicals.
- Notify the regulator.

Your State Fire and Rescue Service provides further details on

- Emergency plans for manifest quantity workplaces
- The process for providing a copy of the emergency plan for review
- Locating the manifest in a suitable location for emergency services.
Safe storage of chemicals:

- Chemicals must always be stored in a safe place with similar type chemicals. You should never store chemicals with food items.

- Most chemicals will belong to a specific category and you need to make sure that only chemicals from the same category are stored together. If you're not sure what category a chemical belongs to, always check its label, or refer to its SDS. Categories might include:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flammable chemicals</strong></td>
<td>Chemicals such as methanol, ethanol and kerosene are very flammable and need to be kept away from heat and substances that might cause them to ignite or explode. In most workplaces, flammable chemicals are stored in a special cupboard or cabinet that has been specially designed for them.</td>
</tr>
<tr>
<td><strong>Oxidising substances</strong></td>
<td>Oxidising chemicals quickly and easily react with other chemicals. Because of this, they should only be stored with other oxidising chemicals.</td>
</tr>
</tbody>
</table>
Corrosive chemicals
Chemicals such as acids can corrode substances. They can also react violently and explosively if they come into contact with other types of chemicals.

Toxic chemicals
These chemicals are poisonous and can kill you if it comes into contact with your skin, if you accidentally breathe it in, or if you accidentally swallow it.

Many chemicals come with a 'Used by' date. After this date, the chemical will lose its strength. Make sure you check the 'Use by' date of chemicals before using them to find out if the chemical will still work.

A good chemical storage area should have:

- good ventilation (vents in the walls, ceiling, or open windows) to keep the store cool and prevent the build up of fumes or gases
- solid walls and roof to protect the contents of the store from wind and rain
- solid and water-proof floor so that spills don't soak into the earth and pests can't dig their way in
- good lighting so you can see what you're doing in the store
- shelves or cabinets for storing items that should not be stored together
- cloths and sponges nearby to clean up spills
- a water supply and hose nearby for clean up
- personal protective equipment such as gloves, aprons and respirators outside so that these can be worn before you enter the store
- a lock on the door

Follow correct safety procedures when transporting chemicals:

Chemicals will often need to be transported from one location to another. You might be required to transport chemicals when:

- You take them to a site for their application or use
- Removing unused amounts of chemicals from a site after use
- Picking up or delivering purchased chemical products.
- Follow these guidelines to help you transport chemicals safely:
- Don't transport hazardous substances with food, animal feed, or consumer goods.
- Make sure chemicals are not transported inside the vehicle compartment. Many chemicals give off toxic fumes that can affect the driver and passengers. Or, chemicals could spill during transport and affect passengers or the driver.
• Always check the product label or SDS for chemicals you are transporting to find out any safety issues that you need to consider when transporting the chemical.
• Some chemicals shouldn't be transported or stored with other chemicals. If you need to transport these types of chemicals at the same time, put each of them inside an approved segregation unit. This makes sure that there isn't the risk of each chemical coming into contact with the other chemical.
• Don't expose chemicals to moisture or heat during transportation.
• Examine chemical packages, containers and bottles for damage before you take them away. Look for leaking containers, loose lids and torn cartons. Don't transport open or leaking containers.
• Check the vehicle tray or surface where you will be placing the chemicals for anything that might damage chemical containers and cause a leak. Keep your eye out for screws and nails that might stick out.
• If you are carrying the chemicals on a wooden surface, cover the surface with plastic because timber can absorb spilled chemicals.
• Stack chemical containers carefully when you load them on or into the vehicle. Don't place them randomly in the vehicle.
• Make sure all chemical packages and containers are fastened securely to prevent movement and spills.
• Put a sign on your vehicle's front and rear that shows the appropriate hazard symbol for the chemicals you're transporting.
• Make sure the vehicle is roadworthy.
• Have a suitable fire extinguisher in your vehicle.
• Carry suitable personal protective equipment in your vehicle in case you need to handle the chemical during the transportation process.

**Check the SDS of chemicals used:**

The SDS (Safety Data Sheet) provides you with information about the chemical, its properties and, most importantly, how it should be used and handled safely. Most SDS will provide the following information about the chemical:

• The name of the chemical.
• Its product code.
• Its key ingredients.
• The physical description and properties of the chemical (for example: colour, odour).
• Hazard information about the chemical and its effects on humans
• Safety equipment to use when handling the chemical.
• Safe methods to store and transport the chemical.
• You should refer to a chemical's SDS if you need to find out:
  • How to store the chemical
  • How to handle the chemical
  • What to do in case of an emergency (such as a chemical spill).
Wear protective gear when handling chemicals:

Many chemical substances can harm you if they get on your skin, or if you accidentally breathe in their fumes, or swallow them. For this reason, you should always put on protective equipment when handling chemicals. The types of protective gear used will depend on the type of chemical. You should always check the SDS of the chemical to find out the types of hazard associated with the chemical and the safety equipment you should use when handling it. Safety equipment can include latex gloves, aprons, dust masks, respirators, safety glasses and safety shields. If using respirators, ensure that the cartridge filter matches for the chemical you intend to use it for.

PPE (Personal Protective Equipment)
Don't touch, taste or smell chemicals:

Most chemicals are harmful and can cause damage and injury if they get on your bare skin or enter your body.

- Never try to sniff any chemical substance directly. If you need to smell a chemical, hold it away from your face and use a wafting motion with your hand to send some of the smell towards your nose.
- Use a fume cupboard when handling chemicals. The cupboard will ventilate any harmful fumes given off by the chemical. If your workplace does not have a fume cupboard, then handle chemicals in a well-ventilated area. If you are handling chemicals in a room, open all windows to allow air to move through the room.
- Always wear protective gear such as gloves or an apron when handling chemicals. Some chemicals, such as pesticides, can get absorbed by your skin and make you very sick. Other chemicals, such as formalin, can kill you in a few seconds if it gets on your skin.
- When pipetting or transferring chemical fluids, use a pipette pump, not your mouth, to draw the liquid into the pipette.
- Always have your hand underneath the chemical container when you carry it. Otherwise, it might drop and spill its contents over you.
- Always wash yourself thoroughly after handling chemicals.
- If a chemical spills over you, wash it off at once. Some workplaces have a chemical shower that you can use to get cleaned up quickly.
- Don't eat, drink or smoke when you're handling chemicals. You could accidentally swallow some chemicals, or accidentally ignite flammable chemicals if you're smoking.

CHECK LABELS ON CHEMICAL CONTAINERS

Every chemical container must have a warning label.
Remember!

- Treat **EVERY** chemical you use or work with as **TOXIC**!
- **ALWAYS** wear the **CORRECT PPE** for the chemical.
- **ALWAYS** clean up spills.
- **ALWAYS** wash your hands and face after handling chemicals, if possible have a shower and wash your clothes, treat them as contaminated, even if no chemical seems to be on them.
- **Remember the environment**, do not pollute by tipping chemicals down drains.