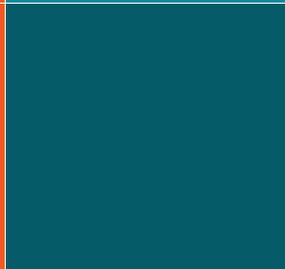
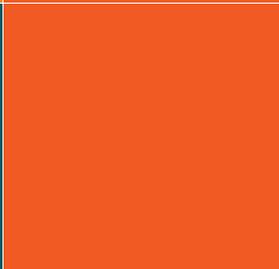
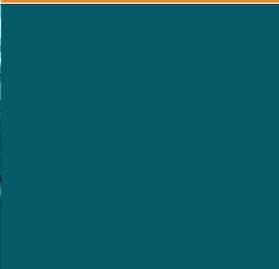
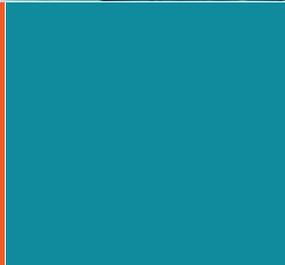
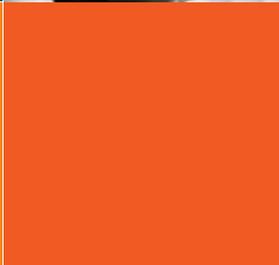
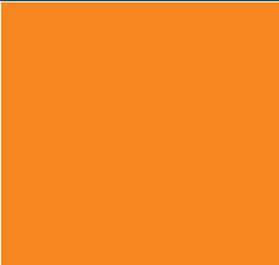
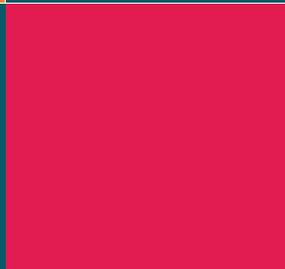


**PROMOTING A  
SAFE AND  
HEALTHY  
WORKING  
ENVIRONMENT  
AND PREVENTING  
INJURIES AND  
DISEASES**

# **HEALTH AND SAFETY**

**IN CHEMICAL INDUSTRIES**





◀ Chemicals include household items such as dish-washing soap and floor cleaners

## Introduction

Every year many workers are injured, become ill or are killed because of exposure to harmful chemical substances. These incidents cause human suffering, loss of production and high medical cost. This pamphlet aims to give assistance and guidance to employers and workers to promote a safe and healthy work environment and prevent injuries.

## Occupational Health and Safety

Occupational health and safety is about preventing people from being harmed by work or becoming ill from work by taking adequate precautions and providing a safe and healthy work environment.

## Hazardous Chemical Substances (HCS)

According to the Regulations for Hazardous Chemical Substances (1995), HCS means any toxic, harmful, corrosive, irritant or asphyxiant substance or a mixture of such substances for which:

- a) an occupational exposure limit is prescribed
- b) an occupational exposure limit is not prescribed, but which creates a hazard to health.

## Health and Safety Risks in Chemical Industries

Working with chemicals and/or in a chemical industry poses many risks, including causing the following diseases/injuries:

Chemical burns  
Asthma  
Allergies  
Irritant contact dermatitis  
Allergic contact dermatitis  
Skin infections  
Skin injuries  
Skin cancers  
Other cancers  
Asphyxiation  
Reproductive problems  
Death.



← All hazards associated with chemicals should be identified.

## Risk assessment of chemicals

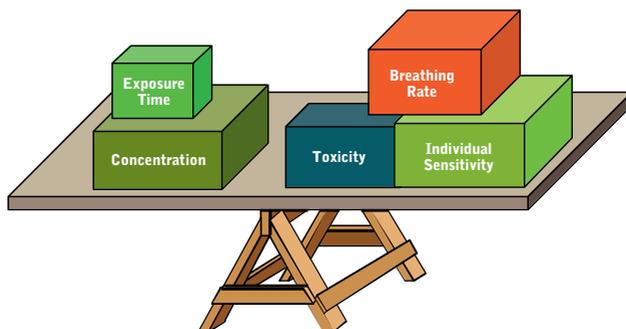
A risk assessment is simply a careful examination of what, at work, could cause harm to workers. Accidents and ill health can ruin lives and affect business if output is lost; machinery is damaged, insurance costs increase. All risks in the workplace must be identified and assessed for control measures to be put in place.

Follow the five steps of hazard identification, risk assessment:

- Identify the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide on precaution
- Record your findings and implement them
- Review your assessment and update if necessary.

### Note:

- A hazard is anything that may cause harm, such as chemicals, electricity, working from ladders, an open drawer
- The risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.



## Occupational Exposure Limit

Workers exposed to chemicals at work may NOT be exposed to levels of chemicals exceeding the occupational exposure limit (OEL).

“OEL” or “occupational exposure limit” means a limit value set by the Minister for a stress factor in the workplace as revised from time to time by notice in the Government Gazette.

Limit the number of workers and time exposed to chemicals >



## Commonly occurring hazardous chemicals

Acetone	Manganese tetroxide
Ammonia	Methanol
Arsine	Methylal
Benzene	Nicotine
Benzoyl peroxide	Nitric acid
Beryllium	Nitromethane
Chlorine	Oxaloniirile
Chloroform	Ozone
Chromium	Phenol
Cyclohexene	Phenylethylene
Diethylene glycol	Picric acid
Dimethyl sulphate	Piperidine
Ethanol	Quinone
Ethyl chloride	Resorcinol
Fluorine	Selenium
Formic acid	Silica dust
Glycerol mist	Sodium fluoroacetate
Glutaraldehyde	Strychnine
Heptachor	Sulphur monochloride
Hexylene glycol	Tetrabromomethane
Hydrogen chloride	Tetramethyl pyrophosphate
Iodine	Tetryl
Iron oxide	Tolene
Isophorone	Vunyl acetate
Ketene	Xylene
Liquified petroleum gas	Yttrium
Lithium Hydroxide	Zirconium compounds

## Exposure to chemicals

Using chemicals or other hazardous substances at work can put people's health at risk, causing diseases including asthma, dermatitis or cancer.

A worker's skin may be exposed to hazardous chemicals through:

- direct contact with contaminated surfaces
- deposition of aerosols
- immersion
- splashes.

*Skin should be protected  
against exposure to chemicals*



*Chemical burns sustained  
from sulphuric acid spilled  
from car battery*

## Contact dermatitis caused by chemicals

Contact dermatitis is inflammation of the skin caused by contact with a wide range of materials, most commonly contact dermatitis in the workplace is caused by chemicals. The most commonly affected area on the body is the hands.

The severity of contact dermatitis depends on many factors:

- Characteristics of the hazardous agent
- Concentration of the hazardous agent
- Duration and frequency of exposure to the hazardous agent
- Environmental factors (temperature, humidity)
- Condition of the skin (damaged skin, dry or wet).

Avoiding contact with chemicals will prevent contact dermatitis. Avoid contact through the following methods:

- Substitute a hazardous material with a safer alternative
- Automate the process
- Enclose the process
- Handle materials mechanically
- Don't handle materials directly with hands
- Observe a safe work distance.

If contact cannot be avoided, the skin will need protection:

- Train workers on risks of chemicals they use in the workplace
- Promote good personal hygiene
- Provide washing facilities, including soap and drying facilities
- Provide proper protective equipment (gloves, aprons)
- Train workers on the correct use of protective equipment
- Replace protective equipment when necessary.

## Information workers should know regarding hazardous chemicals

An employer shall, ensure that the employee is adequately trained with regard to:

- The contents of the regulations for hazardous chemical substances
- Potential source exposure to chemicals
- Potential risks to health caused by exposure
- Potential detrimental effect of exposure on his/her reproductive ability
- Measures taken by the employer to protect employees against any risk from exposure
- Precautions to be taken by an employee to protect himself against the health risks associated exposure
- Correct use, maintenance of safety equipment, facilities and engineering controls
- Importance of good housekeeping at the workplace and personal hygiene
- Safe working procedures
- Procedures to be followed in the event of spillages or leakages.

*Chemicals decanted into unlabeled containers should not be allowed* >



## Labeling of hazardous chemical substances

Labels on chemicals can help identify more hazardous chemicals, tell about the dangers to health and inform on safeguarding methods.

All chemical containers should be properly identified and classified and smaller decanting containers should be clearly labeled with regards to the contents of the container.

Information that should be available on all chemicals used in the workplace:

- Product identification
- Company identification
- Composition/information on ingredients
- Hazards identification
- First-aid measures
- Fire-fighting measures
- Accidental release measures
- Handling and storage
- Exposure control/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal considerations
- Transport information
- Regulatory information and
- Any other relevant information.

## Points to remember about types of chemicals found in the workplace:

- The physical form of a chemical can affect how it enters your body and, to some extent, the damage it causes
- The main physical forms of toxic chemicals are: solids, dusts, liquids, vapors and gases
- Solids are the least likely of the chemical forms to cause chemical injuries. However, some chemicals in solid form can give off toxic dusts or vapors which can be inhaled. Effective control measures should be used with chemical solids, especially during work processes that may change them into more hazardous forms
- Workers can be exposed to occupational dust from materials that normally exist in dust form or from work processes that create dust. The main danger from harmful dusts is that it can be inhaled. Effective control measures should be used to keep occupational dusts at "safe" levels
- Some liquid chemicals give off vapors which can be inhaled and which may be highly toxic depending on the chemical. Liquid chemicals can be absorbed by skin. They can also cause burns or eye damage due to eye splashes. If absorbed, they can cause skin damage and/or internal



- (systemic) health effects. Effective control measures should be used with liquid chemicals to eliminate or reduce the possibility of inhalation and skin exposure
- Vapors are tiny droplets of liquid suspended in the air. Vapors can be inhaled and, depending on the chemical, can be highly toxic. Some vapors irritate the eyes and skin. Certain vapors are flammable or explosive
  - Some chemicals are in the form of a gas when they are at a normal temperature. However, some liquids and solids become gases when they are heated. Some gases have strong odors or colours while others are odorless and colourless (and can be highly toxic). Gases can be inhaled. Certain gases can produce immediate irritant effects, while others produce noticeable effects only after serious damage to your health has already occurred
  - Chemicals that are improperly disposed of may eventually get into your drinking water and food. Chemical wastes should only be disposed of in approved and well-maintained disposal sites
  - To prevent bringing workplace chemicals home, wash/shower and change clothes when necessary before leavening work. Wash contaminated clothes separately — never with the family wash!

## Tips for storing chemicals

- Store chemicals inside a closeable cabinet or on a sturdy shelf with a front-edge lip to prevent accidents and chemical spills
- Secure shelving to the wall or floor
- Ensure that all storage areas have doors with locks
- Know what chemicals are stored inside – provide an alphabetic list
- Keep chemical storage areas off limits to any unauthorized personnel
- Ventilate storage areas adequately
- Segregate different types of chemicals during storage and use
- Store flammables in an approved flammable liquid storage cabinet
- Do not place heavy materials, liquid chemicals, and large containers on high shelves
- Do not store chemicals on the floor, even temporarily
- Do not store chemicals on shelves above eye level
- Do not store chemicals with food and drink
- Do not expose stored chemicals to direct heat or sunlight, or highly variable temperatures
- Never use food containers for chemical storage
- Make sure all containers can close properly
- Properly dispose of empty containers.



## Reporting chemical injuries/ incidents

All chemical injuries must be reported within seven days to the Chief Director: Provincial Operations of the Department of Labour.

The following information should be gathered on all chemical injuries or incidents:

- Name of the injured person
- Address of the injured person
- Name of the user, employer or self-employed person
- Address of the user, employer or self-employed person
- Telephone number of the user, employer or self-employed person
- Name of contact person
- Details of incident:
  - (i) What happened
  - (ii) Where it happened (place)
  - (iii) When it happened (date and time)
  - (iv) How it happened
  - (v) Why it happened
  - (h) Names of witnesses.

# CONTACT THE DEPARTMENT OF LABOUR



## Labour Head Office:

Telephone Number(s): (012) 309 4000    Fax Number(s): (012) 320 2059  
Email Address: [webmaster@labour.gov.za](mailto:webmaster@labour.gov.za)

## Provincial Offices:

Eastern Cape Provincial Office  
Telephone Number(s): (043) 701 3128    Fax Number(s): (043) 722 1012/743 9719

Free State Provincial Office  
Telephone Number(s): (051) 505 6200    Fax Number(s): (051) 447 9353

Gauteng Provincial Office  
Telephone Number(s): (011) 853 0300    Fax Number(s): (011) 853 0470

KwaZulu-Natal Provincial Office  
Telephone Number(s): (031) 366 2000    Fax Number(s): (031) 366 2300

Limpopo Provincial Office  
Telephone Number(s): (015) 290 1744    Fax Number(s): (015) 290 1608

Mpumalanga Provincial Office  
Telephone Number(s): (013) 655 8700    Fax Number(s): (013) 690 2622

North West Provincial Office  
Telephone Number(s): (018) 387 8100    Fax Number(s): (018) 384 2745

Northern Cape Provincial Office  
Telephone Number(s): (053) 838 1500    Fax Number(s): (053) 832 4798

Western Cape Provincial Office  
Telephone Number(s): (021) 441 8000    Fax Number(s): (021) 441 8135





### **Eastern Cape Province Labour Centres**

Aliwal North (051) 633 2633  
Butterworth (047) 491 0656/0490  
Cradock (048) 881 3010  
East London (043) 702 7500  
Fort Beaufort (046) 645 4686  
Graaff-Reinet (049) 892 2142  
Grahamstown (046) 622 2104  
King William's Town (043) 643 4756/7  
Lusikisiki (039) 253 1996/7  
Maclear (045) 932 1424/6  
Mdantsane (043) 761 3151  
Mount Ayliff (039) 254 0282/89/91  
Mthatha (047) 501 5620/5617  
Port Elizabeth (041) 506 5000  
Queenstown (045) 807 5400  
Uitenhage (041) 992 4627

### **Gauteng Province Labour Centres**

Alberton (011) 861 6130 / 907  
Atteridgeville (012) 373 4435/8  
Benoni (011) 747 9600/01  
Boksburg (011) 898 3340  
Brakpan (011) 744 9000  
Bronkhorstspuit (013) 932 0197  
Carletonville (018) 788 3281  
Garankuwa (012) 702 4525  
Germiston (011) 345 6300  
Johannesburg (011) 223 1000  
Kempton Park (011) 975 9301  
Krugersdorp (011) 955 4420  
Mamelodi (012) 812 9500  
Nigel (011) 814 7095  
Pretoria (012) 309 5050  
Randburg (011) 781 8144  
Randfontein (011) 693 3618  
Roodepoort (011) 766 2000  
Sandton (011) 444 7631  
Sebokeng (016) 592 3825  
Soshanguve (012) 799 7395

Soweto (011) 939 1200  
Springs (011) 365 3700  
Temba (071) 871 6509  
Vanderbijlpark (016) 981 0280  
Vereeniging (016) 430 0000

### **Mpumalanga Province Office Labour Centres**

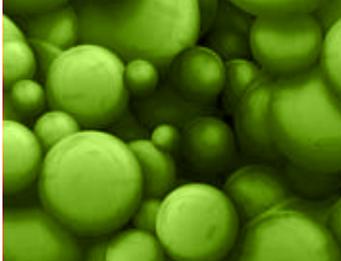
Barberton (013) 712 3066/3353  
Bethal (017) 647 2383/5212  
Carolina (017) 843 1077/2111  
Emalaheni (Witbank) (013) 653 3800/656  
Eestehoek (017) 883 2414  
Ermelo (017) 819 7632/3010  
Groblersdal (013) 262 3150/2983  
KaMhlushwa (013) 785 0010  
KwaMhlanga (013) 9473173/2484/3378  
Mashishing (Lydenburg) (013) 235 2368/9  
Mbombela (Nelspruit) (013) 753 2844/5/6  
Middelburg (013) 283 3600  
Piet Retief (017) 826 1883/4  
Sabie (013) 764 2105/6  
Secunda (017) 631 2585/2652  
Standerton (017) 712 1351/4809

### **Northern Cape Province Labour Centres**

Calvinia (027) 341 1280  
De Aar (053) 631 0455  
Carolina (017) 843 1077/2111  
Kimberley (053) 838 1500  
Kuruman (053) 712 3870  
Postmasburg (053) 313 0641  
Springbok (027) 718 1058/9  
Upington (054) 331 1098

### **Free State Province Labour Centres**

Bethlehem (058) 303 5293  
Bloemfontein (051) 411 6400  
Botshabelo (051) 534 3789  
Ficksburg (051) 933 2299  
Harrismith (058) 623 2977



Kroonstad (056) 215 1812  
Petrusburg (053) 574 0932  
Phuthaditjhaba (058) 713 0373  
Sasolburg (016) 970 3200  
Welkom (057) 391 0200  
Zastron (051) 673 1471

### **KZN Province Labour Centres**

Dundee (034) 212 3147/8  
Durban (031) 336 1500  
Estcourt (036) 342 9361  
Kokstad (039) 727 2140/5643  
Ladysmith (036) 638 1900/1/2/3  
Newcastle (034) 312 6038/3334  
Pietermaritzburg (033) 341 5300  
Pinetown (031) 701 7740  
Port Shepstone (039) 682 2406/7  
Prospecton (031) 913 9700  
Richards Bay (035) 780 8700  
Richmond (033) 212 2768  
Stanger (032) 551 4291  
Ulundi (035) 879 8800  
Verulam (032) 541 5600  
Vryheid (034) 980 8992/8820

### **Limpopo Province Labour Centres**

Giyani (015) 812 9041  
Jan Furse (013) 265 7210/7125  
Lebowakgomo (015) 633 9360  
Lephalale (014) 763 2162  
Makhado (015) 516 0207/1025  
Modimolle (014) 717 1046/8  
Mokopane (015) 491 5973  
Phalaborwa (015) 781 5114  
Polokwane (015) 299 5000/5010  
Seshego (015) 223 7020/7220  
Thohoyandou (015) 960 1300/16  
Tzaneen (015) 306 2600

### **North West Province Labour Centres**

Brits (012) 252 3068  
Christiana (053) 441 2120  
Klerksdorp (018) 464 8700  
Lichtenburg (018) 632 4323  
Mafikeng (018) 381 1010/11  
Mogwase (014) 555 5693  
Potchefstroom (018) 297 5100  
Rustenburg (014) 592 8214  
Taung (053) 994 1679  
Vryburg (053) 927 5221

### **Western Cape Province Labour Centres**

Beaufort West (023) 414 3427-67  
Bellville (021) 941 7000  
Cape Town (021) 468 55002/4  
George (044) 801 1200  
Knysna (044) 302 6800  
Mitchell's Plain (021) 391 0591  
Mossel Bay (044) 691 1140/1  
Oudtshoorn (044) 272 4370/297-2386  
Paarl (021) 872 2020 / 74  
Somerset West (021) 852 2535  
Vredenburg (022) 715 1627  
Worcester (023) 347 0152

**CONTACT THE  
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**HEALTH  
AND  
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**labour**

Department:  
Labour  
REPUBLIC OF SOUTH AFRICA