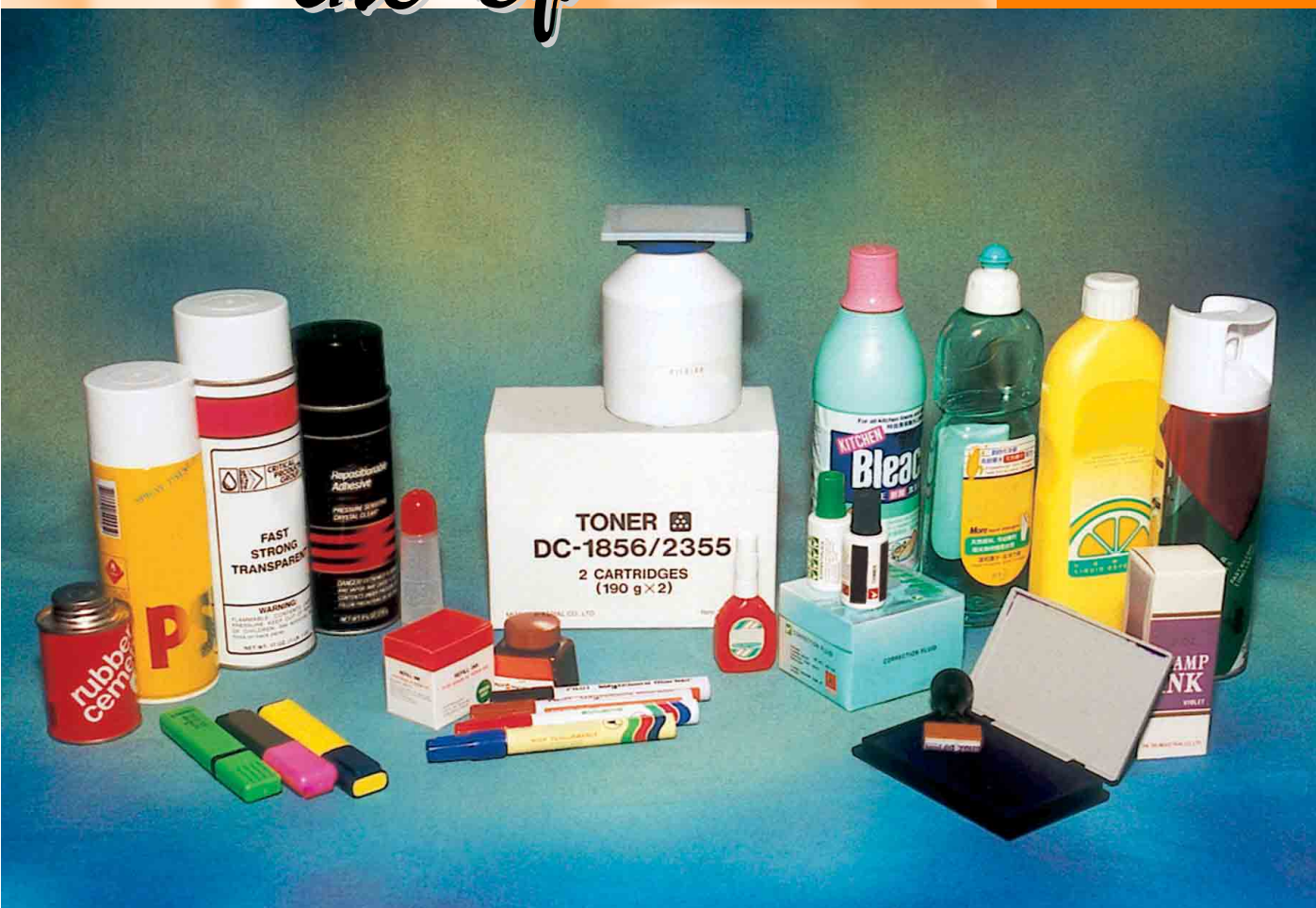


A Simple Guide to Health Risk Assessment

Office Environment Series OE 6/2003

Use of Chemicals



Occupational Safety and Health Branch
Labour Department



Occupational Safety and Health Council



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Introduction

This guide is intended to help employers and employees assess the health risks associated with the use of chemicals in their workplace. Such assessments can be no more than an examination of what, in the course of work, could possibly cause harm to people. By following this guide, you may identify hazards, the degree of risk and the possible solutions.

Chemicals

Chemicals are a part of life in a modern world. They are used to clean, to disinfect, to run machines, to treat diseases and to fertilize. However, they may pose a high health risk if used improperly. Likewise, chemicals are used in offices although not as extensively as in the construction or manufacturing industries. All office employees should be aware of the potential hazards of being exposed to chemicals encountered in offices.

Chemicals commonly encountered in offices include fragrances, correction fluid, printing ink, instant glue, rubber cement, spray adhesive, spray paint, solvent for permanent markers and white-board markers, cleaning agents and pesticides. These chemicals may contain substances that are hazardous to health and can be harmful, irritant, corrosive or toxic. Excessive inhalation, skin or eye contact, or accidental ingestion should be avoided.

A list of the chemicals commonly encountered in offices and their potential hazardous ingredients, health effects and required precautions are given in Appendix. Please note that the list is not exhaustive but is intended to arouse office employees' awareness of the potential health effects of the chemicals used at work.

This booklet deals with the health hazards of chemicals. Other safety issues relating to chemicals, such as fire hazards, are not included in this booklet.



A variety of chemicals are used in offices. Some may be hazardous and can cause adverse health effects. Precautionary measures should be taken in purchasing, storage, handling and disposal of these chemicals in order to minimize the health risks.

RISK ASSESSMENT

The following checklist is designed to help you assess the health risks in your workplace. Answer all the questions and if your answer(s) is the same as that indicating "potential hazards", there are deficiencies in the safety management system or there are situations that can cause health hazards/accidents. You are advised to go through the guidance materials presented in the following sections and apply suitable solutions to eliminate or reduce the health hazards. Should you get matched answers in question 7, 8, 9 or 12, the health risks are imminent and immediate remedial actions have to be considered.

The checklist may not cover all the situations in your workplace. You are free to add more questions or modify them to suit your specific needs.

Answers indicating potential hazards

Purchasing

- | | |
|--|----|
| 1. Are the persons responsible for the purchase of chemicals aware of the health hazards of the chemicals and the safety precautions required? | No |
|--|----|

Uses/handling

- | | |
|---|-----|
| 2. Are chemicals containing hazardous substances, i.e. harmful, irritant, corrosive or toxic substances, extensively used in the office? | Yes |
| 3. Before the chemicals are used, handled or disposed of, do the employees know if the chemicals contain any hazardous substances and the necessary precautions required? | No |
| 4. Is personal protective equipment, e.g. impervious gloves and work clothing, provided to the users when frequent skin contact with chemicals is likely? | No |
| 5. When the chemicals containing hazardous substances are handled, are the precautions prescribed by the manufacturers (such as avoiding skin contact or breathing in solvent vapours) taken to prevent excessive exposure? | No |
| 6. Is there any special or irritating smell during the use of the chemicals? | Yes |
| 7. Has any member of staff reported any illness or discomfort during or after the use of the chemicals? | Yes |

Storage

- | | |
|--|----|
| 8. Are the chemicals kept away from hot sources, e.g. oven or water heater? | No |
| 9. Are the chemicals securely covered and properly stored when not in use? | No |
| 10. Are bulk chemicals containing hazardous substances stored in a locked room or cupboard so that they are not readily accessible to trespassers? | No |

Housekeeping

- | | |
|---|----|
| 11. Do the chemical containers have clear, legible labels in English and Chinese, bearing the names of the hazardous substances, hazard symbols, the particular hazards involved and the safety precautions required? | No |
| 12. Are precautions taken to prevent staff from being exposed to hazardous substances during in-house maintenance or refurbishment activities? | No |

PROBLEMS & SOLUTIONS

Here are the comments and possible solutions to the problems that you may have found in the assessment.

Purchasing

- Before purchasing any chemicals, it is essential to ensure that they will not create any unacceptable health hazard to the users or any other persons.

Solutions

- Collect information on health hazards and necessary safety precautions before purchasing any chemicals. The information may be obtained from product labels, instruction sheets and material safety data sheets obtained from the suppliers or by consulting relevant experts or manufacturers' internet websites.
- Always select less hazardous substances.

Uses/handling

- The exposure to chemicals increases with the frequency and duration of use. If only a small quantity of hazardous chemicals is occasionally used, the health effects may not be significant. When chemicals containing hazardous substances are extensively used, the health effects are likely to be significant.

Solutions

- Minimize the use of hazardous chemicals.
- Replacement by less hazardous chemicals is strongly recommended.



Although correction fluid contains harmful organic solvent, normal usage is safe.

3. If employees do not possess proper knowledge of the chemicals, they may handle them without taking the necessary precautions and be injured.

Solutions

- On issuing the chemicals to users, information on the hazardous ingredients and the required safety precautions should also be given, so that the users can properly protect themselves and others in their application and disposal as waste.
- If the health hazards of the chemicals are not certain, the following general precautions should be taken:
 - use the minimum quantity required,
 - avoid skin and eye contact,
 - use only in a well-ventilated area,
 - handle carefully to minimize emission.

4. Some chemicals may attack or penetrate the skin and cause adverse effects.

Solution

- Appropriate impervious gloves and work clothing should be provided to avoid skin contact.



Appropriate gloves should be worn, when required, to prevent contact with hazardous chemicals.

5. The precautions prescribed by the chemical suppliers are always the minimum requirements for handling the chemicals safely. Failure to observe these precautions may lead to excessive exposure.

Solution

- Special precautions are required when certain chemicals are used, e.g. good ventilation when applying spray adhesive. These precautions should be observed to minimize exposure.

6. A special or irritating smell during the use of chemicals may indicate that air is being contaminated by chemicals. Caution should be taken as some chemicals have little smell.

Solutions

- Keep your senses alert to any unusual odour, visible gas or dust in the work area.
- The exposure may be reduced by:
 - minimizing the quantity used,
 - replacing the chemicals by safer alternatives, or
 - improving the ventilation.

7. Some chemicals have acute health effects. Illness or discomfort during or after use may indicate excessive exposure. Caution should be taken as some chemicals have chronic health effects which may only be revealed after prolonged exposure.

Solutions

- An investigation should be undertaken when such illness or discomfort occurs.
- Remedial action should then be taken to improve the working conditions.



Be alert to any illness or discomfort during or after use of chemicals.

Storage

8. High temperatures enhance evaporation and/or decomposition of the chemicals.

Solution

- Always keep chemicals in suitable containers in a cool, dry and sheltered area.
9. Securely covered containers can prevent unnecessary evaporation of chemicals and thus reduce exposure by inhalation. Placing the chemicals in the right locations can minimize the risk of breakage and spillage.

Solutions

- Always securely cover the chemicals when not in use.
 - Place dangerous chemicals in stable locations where they will not easily be knocked down.
10. Proper storage of bulk chemicals is essential to prevent misuse by persons without adequate knowledge of the chemicals and the appropriate precautions.

Solutions

- Large amounts of dangerous chemicals should be stored in a locked room or cupboard.
- Chemicals under the control of the Dangerous Goods (General) Regulations should be stored in an approved dangerous goods store.

Housekeeping

11. For chemicals containing hazardous substances, there should be a proper warning label on the container. This serves to provide readily available information to alert users on the safety precautions. Some commercial chemicals do not carry such information. This may not mean that they are free of hazardous substances and verification from the suppliers or relevant experts is required.

Solution

- A proper label for hazardous substances should concisely and precisely contain the following information in both English and Chinese:
 - a. the name of hazardous substances;
 - b. a risk symbol;
 - c. the particular risks involved;
 - d. the safety precautions required.



Be alert to risk labels

12. During in-house maintenance or refurbishment, office staff may be exposed to a variety of contaminants generated throughout the operations. These may include solvent vapour from painting or applying adhesive; dust from machining wooden furniture or partition walls and bacteria and fungi from cleaning air-conditioning systems.

Solutions

It is necessary to isolate these renovation operations by:

- isolating the ventilation system,
- erecting partitions to separate the work area, or
- undertaking the renovation work outside office hours.



Carpet laying emits harmful organic solvent vapour into the air. The work area should be isolated from other office space.

Appendix

Chemicals Commonly Encountered in Offices

Group 1: Chemicals more likely to cause problems in offices

Chemicals	Possible Hazardous Ingredients	Potential Health Hazards	Required Precautions
Ammonia solution for blueprinting machine	ammonia	eye, skin and respiratory irritation	use only in well-ventilated area; avoid skin and eye contact
Spray adhesive	organic solvent, e.g. cyclohexane, isobutane, dimethyl ether, dimethylbutane, vinyl acetate, n-butanol	eye, skin and respiratory irritation	use only in well-ventilated area; avoid skin and eye contact
Spray paint	organic solvent, e.g. n-hexane, ethyl acetate, methyl ethyl ketone,	eye, skin and respiratory irritation	use only under exhaust ventilation; avoid skin and eye contact
Toilet bowl cleaner	sodium hydroxide, strong acids	toxic, corrosive, mixing with bleaching agent or detergent may liberate toxic gases	avoid skin and eye contact; do not mix with bleaching agent or detergent
Cleaning agent	disinfectant, ammonia, bleach, alcohol	eye and skin irritation	minimize skin contact; avoid eye contact
Insecticide	organic phosphorus compound, organic chlorinated compound, carbamates, pyrethroids, rodenticides, etc.	toxic	avoid inhalation of the spray; evacuate and ventilate the space well after spraying
Bleaching agent	hypochlorite	skin and eye irritation, mixing with acids may liberate toxic gases	do not mix with acidic cleaner or oxidizing agent; avoid direct sunshine or overheating; avoid skin and eye contact

Group 2: Chemicals of lower risk than Group 1

Chemicals	Possible Hazardous Ingredients	Potential Health Hazards	Required Precautions
Correction fluid	organic solvent, e.g., 1,1,1-trichloroethane, methyl-cyclohexane	skin and eye irritation, harmful by inhalation	avoid skin and eye contact
Instant glue	cyanoacrylate, organic solvent	skin and eye irritation	avoid skin and eye contact
Solvent for permanent markers and white-board markers	organic solvent	harmful by inhalation	conduct only in well-ventilated area if extensive use is required; avoid skin and eye contact
Printing ink	organic solvent, e.g. methyl-cellosolve, isophorone, cyclohexanone	harmful by inhalation	use only in well-ventilated area; avoid skin and eye contact
Rubber cement	organic solvent, e.g., n-butanol, naphtha, hexane, carbon disulphide, carbon tetrachloride, 1,2-dichloroethane, xylene	skin and eye irritation, toxic	use only in well-ventilated area; avoid skin and eye contact
Toner for photocopier	depending on suppliers and types, may contain pigment, carbon black, iron oxide, chromium/azo dye complex, titanium dioxide, polypropylene wax, ammonium salt, hydrocarbon solvent, etc.	some may cause eye, skin and respiratory irritation	avoid skin and eye contact and inhalation of powder

The above lists contain only some of the chemicals commonly used in offices. Before purchasing or using any chemical, its hazardous ingredients, health effects and required precautions should be known so that it can be safely used.

Further Information

For further assistance or information about the subject, you can contact

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Hong Kong

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Fax : 2581 2049

Home Page address : <http://www.labour.gov.hk>

E-mail address : enquiry@labour.gov.hk

Information on the services offered by the Occupational Safety and Health Council can be obtained through hotline 2739 9000.

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