

# Photocopying



**T**his guide is intended to help employers and employees assess the health risks associated with photocopying 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.

## PHOTOCOPYING

Photocopying is an indispensable tool in the modern offices. Photocopiers can produce accurate and durable copies of an original text or graphic material by the use of electrostatic charges, light, heat or chemicals. There are four types of photocopying methods :

- 1. Thermography:** The original document absorbs heat energy from infra-red light and transfers it to a special copy paper to form the image.
- 2. Electrostatic photocopying**
  - a. Wet methods:** Although they produce sharper images, wet methods require the handling of liquid chemicals which are liable to spillage and skin contact. They pose a higher health risk to operators and emit more volatile chemicals. These copiers are nowadays replaced by xerography (the dry types).
  - b. Xerography:** While safer than the wet types of copying, this method still has its risks. The toner - a copier's ink - contains chemicals which can cause skin irritation. The high electrical voltages involved in photocopying produces ozone which can cause breathing problems. Light, heat and noise associated with the process can also cause nuisance and discomfort.



- 3. Blueprinting or Whiteprinting:** For large and high quality copies of architectural and engineering plans and drawings, this method may be used. In this process, light is shone through the original document onto a chemically treated paper which is then exposed to an alkaline agent before a copy image is formed. Ammonia vapour emitted in this process is a hazard. Its health risk, though, can be controlled.

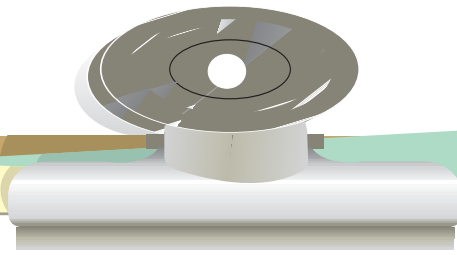


## **RISK ASSESSMENT**

The following checklist is designed to help you assess the health risks at 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 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 2, 6, 7 or 9, the health risks could be imminent and may require immediate remedial actions.

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





**Answers indicating potential hazards**

**Photocopying Environment**

- |                                                                                              |     |
|----------------------------------------------------------------------------------------------|-----|
| 1. Is the photocopying area segregated from other office activities?                         | No  |
| 2. Is the photocopying room or area well ventilated, for example, with a good supply of air. | No  |
| 3. Is it hotter in the photocopying room?                                                    | Yes |

**Machine Design**

- |                                                                                                                                                      |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 4. Does the photocopier have adaptations to reduce gas emissions?                                                                                    | No |
| 5. Does the photocopier have various automatic functions, for example, automatic document feeding, document sorting, double-side copying, and so on? | No |

**Daily Operation**

- |                                                                                                                  |     |
|------------------------------------------------------------------------------------------------------------------|-----|
| 6. Is photocopying very frequent and done by assigned workers?                                                   | Yes |
| 7. a) Has any employee complained of an irritating odour or any illness during or after the use of photocopiers? | Yes |
| b) If yes, has it been followed up?                                                                              | No  |
| 8. Do staff move heavy loads of photocopying paper manually?                                                     | Yes |

**Instruction and Training**

- |                                                                                                                                                          |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 9. Have the photocopier users received any training on the use of the machine? For example, on how to replace the toner or handle the chemical properly? | No |
| 10. Are the users of photocopiers informed of the hazards associated with photocopying?                                                                  | No |
| 11. Is personal protective equipment available and used when handling chemicals such as toner dust?                                                      | No |
| 12. Are staff informed of the procedure for handling chemical spills?                                                                                    | No |

**Maintenance**

- |                                                                      |     |
|----------------------------------------------------------------------|-----|
| 13. Does the photocopier break down frequently?                      | Yes |
| 14. Is there any arrangement for the maintenance of the photocopier? | No  |

## PROBLEMS AND SOLUTIONS

Here are further comments and possible solutions to the problems you may have found when you follow the assessment procedure.

### Photocopying Environment

1. Photocopying can generate noise, light, heat, and hazardous gases and vapours, all of which can cause at best nuisance and at worst adverse health effects to operators or to those working nearby.



- If a room is not available solely for photocopying, it is preferable to isolate the photocopying area with an insulation board to reduce its impact on the office environment.
  - During photocopying, it is necessary to replace the cover properly to avoid light disturbance as far as possible.
2. Blueprinting and whiteprinting can generate ammonia vapour. Electrostatic photocopying emits ozone. These air contaminants are irritating to our eyes, nose and may affect breathing or cause coughing. Hazardous levels of these contaminants can build up if photocopying is frequent and continuous in a poorly ventilated room or area.

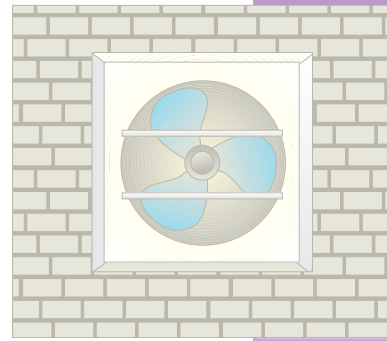


- If a large amount of photocopying is needed, ensure the room is well ventilated. Extra exhaust fans and fresh air inlets can improve ventilation in the photocopying area.

3. Use of photocopiers generate heat. Frequent and continuous photocopying will increase the room temperature which may cause discomfort to those employees nearby.



- It is advisable that the photocopying room has independent air-conditioning controls or is equipped with exhaust fans to keep the temperature down.



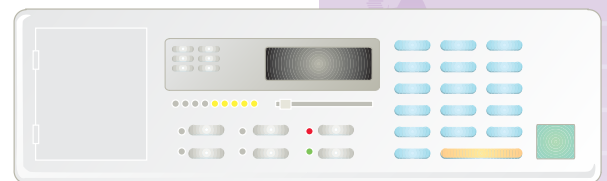
### Machine Design

4. Ammonia vapour used in whiteprinting and blueprinting, and ozone produced from electrostatic photocopying are irritants. Although they can be controlled by good ventilation, it is better to tackle such contaminants from the source.



- New models of copiers have built-in absorbing or filtering devices. These should be considered when replacing copiers.

5. Modern xerography machines have many automatic functions which can reduce the workload and shorten the length of time the user spends with the machine. By using these functions, the degree, duration and frequency of exposure of the user to light, heat and chemicals can be reduced.



- Consider such alterations when planning to replace the existing one.

### Daily Operation

6. Frequent use of photocopiers generate much heat and hazardous gases. The health risks exist if the room is poorly ventilated, and may be increased if only one member of staff is assigned to the photocopying duties because of extended duration working in the photocopying room.



- The room should be well ventilated.
- If possible the worker's duties should be rearranged so he can spend less time with the photocopier.
- Ways of reducing photocopying and shortening the time in the photocopying room should be explored.

- 7.a) Strong light emitted from photocopiers may cause discomfort or glare to the operator. Irritant gases and vapours can cause sore eyes and a sore nose, headaches and breathing problems. Exposure to such hazards may be caused by improper use of the machines, machine defects, poor ventilation or insufficient training.

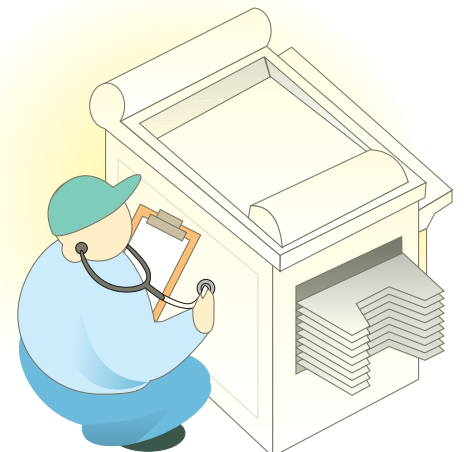


- If there is complaint of illness or irritating odour due to photocopying, follow-up action should be taken immediately. Every possibility should be explored to find the source of the problem and remedial actions should be implemented.

- 7.b) If the exposure to air contaminants exceeds the Occupational Exposure Limits (OELs) issued by the Labour Department, the contaminants are likely to cause injury to workers.



- Conduct an investigation to find out the probable cause.





- If the investigation reveals that it is probably caused by gases emitting from the photocopier, you need to take remedial actions immediately.
- The remedial actions may include improving ventilation, changing the photocopying process, reducing the amount of photocopying and proper maintenance of photocopiers.
- Assistance from experts can be sought for monitoring of air contaminants.

8. Loads of packaged paper may be used for photocopying. Handling heavy loads manually in an improper way may cause injury to the body.



- Handle paper in small quantities and assume correct postures when doing so in order to avoid back injuries.
- For details of regulatory requirements on manual handling operations, please refer to other relevant publications by the Labour Department.

### **Instruction and Training**

9. Although modern photocopier models are user-friendly, employees should follow the instruction to use. In addition, adequate training should be provided including changing of toner cartridges and refilling of consumable chemicals. Untrained workers may come into contact with the hazardous chemicals and contract illnesses such as dermatitis.



- Proper observation of the instructions can shorten the time spent by employees at the machine and avoid contact with chemicals.
- Employees should be instructed to replace the top cover properly to prevent eye irritation from the strong light during copying.

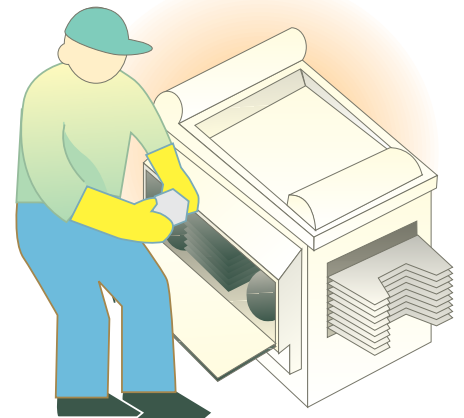
10. Hazards associated with photocopying include those of physical, chemical and ergonomic origins. Proper control of the hazards requires co-operation and participation of employees.



- Employees should be well informed of such hazards, the resultant adverse health effects and control measures required.

11. Employees may have skin contact with or inhale harmful substances in changing toner cartridges and handling chemicals.

- Provide employees with appropriate protective equipment, e.g. impervious gloves.
- Keep the protective equipment in good condition.
- Provide adequate training to the employees on when and how to use the protective equipment.



12. Though chemical spills are rare, handling such incidents improperly may expose employees to harmful substances.

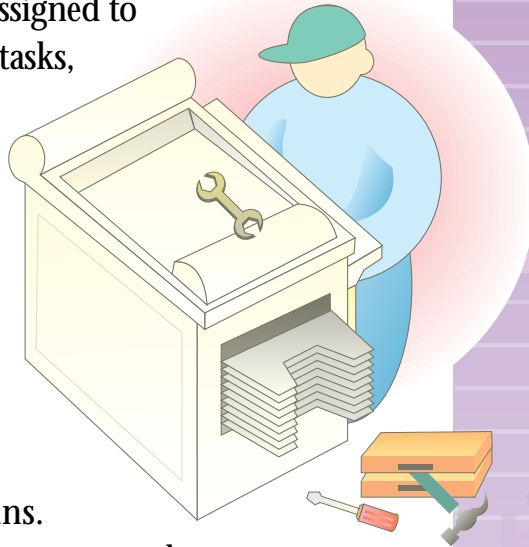
- Prepare proper procedures for handling chemical spills in advance.
- Inform employees of the procedures and provide necessary training.
- Use appropriate personal protective equipment in the cleaning up procedure.

## Maintenance

13. Employees are more likely to be exposed to hazardous chemicals when they check faulty photocopiers.



- Even if an employee is assigned to do simple maintenance tasks, he or she should be given sufficient training and be informed of the hazards involved and control measures.
- Faulty photocopiers should be checked and fixed by competent maintenance technicians. If the machine problems cannot be fixed, you should consider buying a new copier.



14. If there is no maintenance programme for the photocopier, minor defects of the photocopier cannot be spotted and fixed at an early stage and the users may be exposed to hazardous substances.



- Photocopiers should be regularly serviced by competent maintenance technicians.

## ***FURTHER INFORMATION***

For further information about the subject or assistance, please contact

**Address :** Occupational Health Service, Labour Department  
15/F, Harbour Building  
38 Pier Road, Central  
Hong Kong

**Tel :** 2852 4041

**Fax :** 2581 2049

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

**E-mail Address :** [enquiry@labour.gov.hk](mailto:enquiry@labour.gov.hk)

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

### ***Other Titles in the Office Environment Series***

- 1. Introduction and Housekeeping**
- 2. Lighting in Offices**
- 3. Photocopying***
- 4. Ventilation**
- 5. Office Workstation Design**
- 6. Use of Chemicals**
- 7. Manual Handling**

*THIS GUIDE IS*

*The Labour Department's contribution towards safety and health - a shared responsibility - and the Department's endeavour to serve the community.*