



Photocopiers and laser printers health hazards

Historically, there have been concerns from users of photocopiers and laser printers regarding hazards to their health as a result of their requirement to use or sit near such machines during their daily work routines. Technological improvements in design and product safety over the years mean that the hazards posed by such machines are minimal, however, improper installation, maintenance or operation can cause problems. This document outlines the potential health hazards associated with photocopiers and laser printers, and points to consider when purchasing, installing and using machines.

Sources of Possible Health Concerns

Toner

Toner is used in photocopiers and laser printers as part of the printing process. The toner is an extremely fine powder, which in itself is not classed as a substance hazardous to health, but any dust in substantial concentration is, as it may cause respiratory tract irritation resulting in coughing and sneezing.

Toner dust may become airborne for a variety of reasons; toner dust spilled inside the machine becomes airborne by passing through the ventilation fans into the room, the waste toner compartment fills up and causes toner to back up inside the machine, or the most common, careless renewal of the toner cartridge causes a spill of toner into the room. Toner dust is considered a nuisance dust and should have no health effects other than those noted above. However, persons who have an already compromised respiratory system (e.g. suffer from asthma, bronchitis, etc) should avoid changing toner cartridges. If this is not practicable then the operation should be carried out with extreme caution to avoid generating a dust cloud.

Should any toner be spilt, it is best to use a damp cloth rinsed in cold water to soak up the spill, taking care not to generate a dust cloud (do not use a brush to clean up spillages). Hot water should be avoided as it may cause the toner to partially melt and become sticky. Toner may be disposed of as normal waste, though it should be placed in a sealed bag to contain the fine powder.

Carbon Black

Some toner may use small quantities of carbon black. Carbon black has been classified by IARC (International Agency for Research on Cancer) as “possibly carcinogenic to humans” based on an assessment of pure “free” carbon. However, the process for making toner means that the small amount of carbon black used is not expressed as free carbon and therefore the classification does not apply. Carbon black is not classified as a carcinogen under COSHH, and the small content of carbon black is therefore not a cause for concern.



Polymer Resin

The image fixing of the final copy uses a low melt polymer resin; this varies in its composition dependant on the manufacturer. The heat required for this process is just sufficient to melt the resin and vapour produced is minimal and insignificant.

Ozone

Ozone is produced artificially in some photocopiers and laser printers by the high voltage electrical discharge employed in the electrostatic process. This ozone rapidly decomposes into oxygen with a half-life in a typical office of less than five minutes (amount of time needed to reduce the concentration by 50%). Ozone is generated only when the machine is copying or printing.

The risks to health are slight - and in general any symptoms shown will be irritation of the respiratory tract. Most modern laser printers and photocopiers are fitted with filters to reduce ozone emissions to below acceptable standards.

However, it is possible in certain cases to build up levels of ozone in excess of Workplace Exposure Limits (WEL)* in inadequately ventilated rooms.

Manufacturers and suppliers should provide recommendations on the siting and use of such equipment, and in normal use it is unlikely you would need to do more than comply with these recommendations to ensure the WEL is not exceeded. The preferred option is to put the equipment in a dedicated room.

Where this is not practicable, it may be necessary to site the equipment in a well ventilated area. However, if the siting is not in accordance with the manufacturers recommendations, you should make a more detailed assessment of the potential risks.

Schools need to ensure that, where appropriate, their staff are aware of the precautions required to reduce the risks from exposure to ozone, and the control measures that are used. Staff should be told to report any obvious problems, such as a closed ventilation window in a copier room - to their supervisor or School Safety Adviser.

If your risk assessment shows that these are the only sources of ozone in your workplace, and you have followed the above guidance, then you need only keep these measures under review to comply with the Control of Substances Hazardous to Health Regulations, 2002 (COSHH).

*A Workplace Exposure Limit is the concentration of an airborne substance, averaged over a reference period, at which, accordingly to current acknowledge, there is no evidence that it is likely to be injurious to employees if they are exposed by inhalation, day after day, to that concentration. The WELs are approved by the Health and Safety Executive and are applicable only to persons at work. The current WEL for ozone is 0.2 ppm in air, averaged over a 15 minute reference period.



Light and Ultraviolet Light

The lamps in photocopiers emit light in both the visible and ultraviolet ranges. In general, the ultraviolet light does not pass beyond the glass plate in which the original is placed. Estimated operator exposure to visible light is minimal and is well below the permissible exposure level. Nevertheless, as an additional safety measure, keep the cover closed whilst copying. Should the cover have to remain partially open, e.g. to copy a book, look away from the light source.

Noise and Heat

Noise and heat production vary considerably according to the manufacturer and model of the copier machine. Copiers with collating abilities can be particularly noisy and high speed copiers that are heavily used can generate considerable heat. Excessive noise and heat are fatiguing, distracting and stressful to employees. In an office environment, noise levels at or below 50 to 55 decibels are preferable.

Schools should give careful consideration to the location of photocopiers in relation to employee work areas to prevent unnecessary stress from the heat or noise of the machine. Heat production in the room can be dispersed by good room ventilation, air conditioning or dedicated extract ventilation.

Laser Technology

In some electronic printers, the original documents are read and recreated using a laser beam. Laser printers have a series of interlocking safety devices that prevent operator exposure to the laser beam, which is therefore considered non-hazardous.

Recommendations

The responsibility for ensuring that a photocopier or laser printer does not present a health hazard is shared between the manufacturer, the installer and the operator. Whilst the risks to health from photocopier or printer use are slight, the following points should be kept in mind as they are purchased, installed and used.

Purchasing a Photocopier or Printer

Most companies will readily supply Product Safety Data Sheets (PSDS) relating to their machines and, by law, they have to provide, on request, Safety Data Sheets (SDS) relating to the products used with the machine e.g. toner.

The PSDS will give details of siting requirements for the particular machine e.g. minimum volume of the room required for natural ventilation situations, noise emission levels, ozone emission levels, etc.



The SDS will give information on the health risks of the product, if any, e.g. route of entry to the body, symptoms, first aid measures, waste disposal, etc.

It is advisable to ask for the PSDS and SDS before placing the final order for a machine in order to highlight any siting problems or health concerns.

Installing and Using the Photocopier or Printer

Large machines which are capable of collating, or are used regularly for long copy runs, should ideally be sited in dedicated copy rooms with adequate natural or mechanical ventilation. If this is not possible, they should be placed well away from staff workstations and long runs of printing or copying carried out at times when the minimum of stress will be caused to staff e.g. break times.

Smaller machines which are not capable of collating, etc, and are not used regularly for long runs, may be housed within the room occupied by staff, however, it is prudent to observe the following points:

- Air vented from the machine into the room should be filtered (NB: most modern machines incorporate such filters to reduce ozone emission).
- Machines should be sited such that exhaust emissions do not travel over workstations or personnel.
- Ensure regular servicing of the machine.
- Consideration should be given as to the adequacy of the ventilation in the room i.e. size of room, natural or mechanical ventilation.
- Care should be taken when replacing toner cartridges to avoid spillages
- Toner spillages should be cleaned up with care and ideally if persons are known to have compromised respiratory systems they should not be asked to carry out this task.
- Spent toner cartridges should be placed in sealed bags for disposal.

References and Sources of Further Information

- Ozone: Health Hazards and Precautionary Measures. Health and Safety Executive Guidance Note EH38.
- Workplace Exposure Limits. Health and Safety Executive Guidance Note EH40/2005.
- Approved Code of Practice, Control of Substances Hazardous to Health, 6th Edition 2002.
- Hewlett Packard Ltd, Cain Road, Bracknell, Berkshire.
- The Safety of Xerox Products, available at:
https://www.xerox.com/downloads/usa/en/e/environment_safetyfacts.pdf
- Safety Information for Canon Products, available at:
<https://canon.a.bigcontent.io/v1/static/detailed-Safety-Information-for-Canon-Products-document-EN-UK-636855618766611209NI>



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