The Control of Substances Hazardous to Health Regulations 2002 (COSHH) include specific requirements for the use of carcinogens (Regulation 7.)

All staff working with carcinogens MUST be aware of these requirements, and of the additional guidance on control of carcinogens in Appendix 1 of COSHH.

Definitions
Carcinogens are defined in both COSHH and the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP), although the term “carcinogen” has a wider meaning in CHIP than in COSHH.

1. In CHIP: carcinogens are defined as substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence.

Carcinogens are divided into three categories:

Category 1 - substances known to cause cancer on the basis of human experience.
Category 2 - substances which it is assumed can cause cancer, on the basis of reliable animal evidence.
Category 3 - substances where there is only evidence in animals which is of doubtful relevance to human health (i.e. the evidence is not good enough for category 1 or 2.)

Categories 1 and 2, if purchased from a supplier will carry the "toxic" (T) symbol and the Risk Phrase R45 (may cause cancer) or R49 (may cause cancer by inhalation).
Category 3, if purchased from a supplier carries the "harmful" (Xn) symbol and the Risk Phrase R40 (limited evidence of a carcinogenic effect).

Category 3 carcinogens are not included in the COSHH definition of carcinogen but are subject to the general requirements of COSHH.

2. In COSHH: the term “carcinogen” covers substances or preparations which, if classified under CHIP, would be classified as carcinogen (category 1) or as carcinogen (category 2), plus a number of other substances and processes listed in Schedule 1 of COSHH. The latter is included in the definition because of historic evidence of a risk of cancer in humans, though the precise agent may be unclear (see Appendix 2 of this guidance.)

Several lists of carcinogens are available, and they differ from each other due to different criteria for inclusion. There is a list of substances designated with the risk phrases R45 and R49 in the publication known as EH40 (refs. 3 and 4.)
A comprehensive list of carcinogens is kept by the International Agency for Research on Cancer (IARC). This agency runs a programme on the evaluation of the carcinogenic risk of chemicals to humans, involving the production of critically evaluated monographs on individual chemicals, complex mixtures and other agents. These monographs are available at http://www.inchem.org/pages/iarc.html

A list of chemicals that are subject to EU-wide agreement on their classification and labelling is contained in Annex I to the Dangerous Substances Directive, and is subject to regular updating for technical progress. The UK version of Annex I is known as the Approved Supply List and is published as one of the CHIP Approved Documents (Ref. 5.) A searchable database containing the technical details of Annex I may be viewed at http://www.the-ncdc.com/cselite/

Research on occupational cancer continues to find further substances and processes that are suspected, with varying degrees of confidence, of causing cancer. It is therefore important to have an active precautionary policy of prevention and control based on up-to-date knowledge of the substances that are suspected of being carcinogenic, but which are not yet subject to the special provisions for carcinogens contained in regulation 7 and Appendix 1 of COSHH.

Appendix 1 of this guidance is a list of carcinogens compiled from a number of reliable sources. Because of the changeable nature of the information in these sources, the list should not be regarded as definitive; it is offered as a quick reference guide. Up-to-date safety information should always be obtained from the supplier of a chemical substance at the time of purchase.

Prohibitions
Under the COSHH Regulations there are restrictions on the usage of some specific carcinogens. Carcinogens that are prohibited by COSHH:
2-naphthylamine, benzidine, 4-aminodiphenyl, 4-nitrodiphenyl, their salts and any substance containing any of these compounds, in a total concentration equal to or greater than 0.1 percent by mass. Any use of these is prohibited.
Use of benzene and any substance containing benzene in a concentration equal to or greater than 0.1 percent by mass (other than certain motor fuels and waste) is prohibited except in industrial processes and for the purposes of research, development and analysis.

Risk assessment
Risk assessment of proposed work with carcinogens, teratogens and mutagens should be carried out with the aid of the University’s COSHH assessment form in the normal way. The form can be downloaded from the Safety Services Office CWIS site as a Microsoft Word form, or alternatively
printed copies may be obtained from the Safety Services Offices. Where the assessment involves the use of carcinogens, a copy of the completed form should be sent to the Safety Services Office.

It must be remembered that the principal duty is always to substitute a carcinogen with a less hazardous substance if possible. It should be made clear on the risk assessment form that this has been considered.

It is particularly important to ensure that COSHH assessments for carcinogens take into account all the matters to be considered as listed in Regulation 6(2) of COSHH:

The risk assessment shall include consideration of -

(a) the hazardous properties of the substance
(b) information on health effects, provided by the supplier, including information contained in any relevant safety data sheet
(c) the level, type and duration of exposure
(d) the circumstances of the work, including the amount of the substance involved
(e) activities, such as maintenance, where there is the potential for a high level of exposure
(f) any relevant occupational exposure standard, maximum exposure limit or similar occupational exposure limit
(g) the effect of preventive and control measure which have been or will be taken in accordance with regulation 7
(h) the result of relevant health surveillance
(i) the results of monitoring of exposure in accordance with regulation 10
(j) in circumstances where the work will involve exposure to more than one substance hazardous to health, the risk presented by exposure to such substances in combination
(k) the approved classification of any biological agent
(l) such additional information as the employer may need in order to complete the risk assessment

Additional documentation may need to be appended to the standard COSHH form to provide a complete record of the assessment.
Control of exposure to carcinogens

Regulation 7 of COSHH sets out the controls that must be put in place and further guidance is given in Appendix 1 of COSHH. The principal duty is to substitute a carcinogen with a less hazardous substance if possible. If it is necessary to use a carcinogen, the specific control measures for carcinogens listed in regulation 7(5) must be applied in addition to the appropriate ones for control of exposure to hazardous substances in general, from regulation 7(3). Where reasonably practicable the process and handling systems must be totally enclosed.

Regulation 7 states:

Prevention or control of exposure to substances hazardous to health

7. (1) Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.

(2) In complying with his duty of prevention under paragraph (1), substitution shall by preference be undertaken, whereby the employer shall avoid, so far as is reasonably practicable, the use of a substance hazardous to health at the workplace by replacing it with a substance or process which, under the conditions of its use, either eliminates or reduces the risk to the health of his employees.

(3) Where it is not reasonably practicable to prevent exposure to a substance hazardous to health, the employer shall comply with his duty of control under paragraph (1) by applying protection measures appropriate to the activity and consistent with the risk assessment, including, in order of priority -

(a) the design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials;

(b) the control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and

(c) where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment in addition to the measures required by sub-paragraphs (a) and (b).

(4) The measures referred to in paragraph (3) shall include -

(a) arrangements for the safe handling, storage and transport of substances hazardous to health, and of waste containing such substances, at the workplace;

(b) the adoption of suitable maintenance procedures;

(c) reducing, to the minimum required for the work concerned -

(i) the number of employees subject to exposure,
(ii) the level and duration of exposure, and

(iii) the quantity of substances hazardous to health present at the workplace;

(d) the control of the working environment, including appropriate general ventilation; and

(e) appropriate hygiene measures including adequate washing facilities.

(5) Without prejudice to the generality of paragraph (1), where it is not reasonably practicable to prevent exposure to a carcinogen, the employer shall apply the following measures in addition to those required by paragraph (3):

(a) totally enclosing the process and handling systems, unless this is not reasonably practicable;

(b) the prohibition of eating, drinking and smoking in areas that may be contaminated by carcinogens;

(c) cleaning floors, walls and other surfaces at regular intervals and whenever necessary;

(d) designating those areas and installations which may be contaminated by carcinogens and using suitable and sufficient warning signs; and

(e) storing, handling and disposing of carcinogens safely, including using closed and clearly labelled containers.

**Mutagens and substances toxic for reproduction**

Mutagens are defined in CHIP as substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce heritable genetic defects or increase their incidence.

As with carcinogens there are three categories and they are labelled as toxic or harmful depending on category. The risk phrases are:

R46 May cause heritable genetic damage

R68 Possible risk of irreversible effects

Substances that are toxic for reproduction are defined in CHIP as substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or of male or female reproductive functions or capacity.

Again there are three categories and they are labelled as toxic or harmful depending on category. The risk phrases are:
R60  May impair fertility
R61  May cause harm to the unborn child
R62  Possible risk of impaired fertility
R63  Possible risk of harm to the unborn child

An additional risk phrase, “may cause harm to breast-fed babies” is indicated by R64.

None of the above is subject to special controls in COSHH like carcinogens. They should be handled according to risk assessment, taking into account their classification (toxic or harmful) and any safety phrases on their labels as well as all the matters normally considered in COSHH assessments.

Information, instruction and training
All staff whose work may bring them into contact with carcinogens, mutagens or teratogens must be provided with suitable information, instruction and training as detailed in Regulation 12 of COSHH. In general this requirement can be fulfilled by informing staff of the COSHH assessment and its findings, including the precautions to be taken when handling the substance.

Employees and their safety representatives must be allowed access to relevant safety data sheets should they want to see them.

Further reading


Appendix 1 – list of carcinogens

This list of carcinogens, mutagens and substances toxic to reproduction has been compiled and consolidated from the following sources:

- The lists from IARC: Group 1 (carcinogenic to humans) and 2A (probably carcinogenic to humans).
- The carcinogen lists in EH40, 2002 (“Occupational Exposure Limits”), published by the HSE.
- The lists of carcinogens, mutagens and substances toxic to reproduction in The Dangerous Substances and Preparations (Safety) (Consolidation) and Chemicals (Hazard Information and Packaging for Supply (Amendment) Regulations 2000, SI2897.
- The Control of Substances Hazardous to Health Regulations 2002 and amendment 2003.
- Information supplied by manufacturers.

Where a substance is classified as Group 2 or Category 2 it is denoted by a tick in the table. For these substances the link to the health effect is probable. Where a substance is in Group or Category 1, the link between the substance and the health effect is proven, and the table entry is ‘Cat. 1’.

The ‘R’ and ‘S’ phrase information is derived from several sources, and it must be borne in mind that there is frequently a time lag between a substance appearing on a list of carcinogens, etc, and the dissemination of the new ‘R’ and ‘S’ phrases. Therefore the absence of the ‘R’ phrase that indicates carcinogen, mutagen, etc is due to this time lag.

This information is given as a supplement to your own research, not as a substitute in any way for the gathering and scrutiny of the manufacturer’s data sheets.

Wherever possible synonyms for compounds have been included, however not all substances are listed under all synonyms.

A number of processes, occupations, foodstuffs and beverages, lifestyle factors (e.g. tobacco smoking), infections, radionuclides and radiations defined as carcinogenic have been omitted from this list. A full list which includes these can be obtained from the Biological and Chemical Safety Officer on request.

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Follow link to list: Appendix 1 list
Appendix 2 - Other substances and processes to which the definition of “carcinogen” relates
(Schedule 1 of COSHH 2002)

Please note that there is some overlap between this list and the one in Appendix 1.

Aflatoxins
Arsenic
Auramine manufacture
Calcining, sintering or smelting of nickel copper matte or acid leaching or electorefining of roasted matte
Coal soots, coal tar, pitch and coal tar fumes
Hardwood dusts
Isopropyl alcohol manufacture (strong acid process)
Leather dust in boot and shoe manufacture, arising during preparation and finishing
Magenta manufacture
Mustard gas (β,β’-dichlorodiethyl sulphide)
Rubber manufacturing and processing giving rise to rubber process dust and rubber fume
Used engine oils.