

Carcinogens

Risk

Will being exposed to a carcinogen result in cancer?

Some chemicals alter DNA, which can lead to cancer if your body does not correct the damage.

Your risk for developing cancer increases with increased frequency of exposure to carcinogens. Exposure prevention is best.



Who Identifies & Classifies Carcinogens?

1. *The International Agency for Research on Cancer (IARC); &*
2. *The Department of Health and Human Services National Toxicology Program (NTP)*

IARC and NTP carcinogen classifications can be found:

1. *On Safety Data Sheets (SDS)*
2. *Online by accessing NTP [Annual Report on Carcinogens](#)*
3. *Online by accessing IARC [Monographs on the Evaluation of Carcinogenic Risks to Humans](#)*

Note: IARC and NTP carcinogen classifications are recognized by OSHA.

IARC & NTP Classifications

IARC

Group 1 - Carcinogenic to humans

Group 2A - Probably carcinogenic to humans

Group 2B - Possibly carcinogenic to humans

Group 3 - Unclassifiable

Group 4 - Probably not carcinogenic

NTP

Known to be carcinogenic

Reasonably anticipated to be carcinogenic

Key

OSHA refers to these substances as "select" carcinogens

OSHA refers to these substances as "select" carcinogens if there is statistically significant tumor incidence in experimental animals.

ACGIH Classification

Other meaningful classifications are provided by the American Conference of Governmental Industrial Hygienists (ACGIH), and can commonly be found on Safety Data Sheets (SDS):

ACGIH

A1 - Confirmed human carcinogen

A2 - Suspect human carcinogen

*A3 - Confirmed animal carcinogen
with unknown relevance to humans*

*A4 - Not classifiable as a human
carcinogen*

*A5 - Not suspected as a human
carcinogen*

*OSHA refers to these substances as
"select" carcinogens*

*The American Conference of Governmental
Industrial Hygienists (ACGIH) bases their
classification upon information such as that
provided by IARC and the NTP.*

Safety Data Sheets (SDS)

The following signal word and hazard statement will be found on SDS's that pertain to "select" carcinogens:

Benzene



Signal Word:

Danger

Hazard Statement:

May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. May cause genetic defects. **May cause cancer.** Suspected of damaging fertility of the unborn child. Toxic to aquatic life with long lasting effects. Highly flammable liquid and vapor.

An SDS might also include:

Chronic Effects and Carcinogenicity

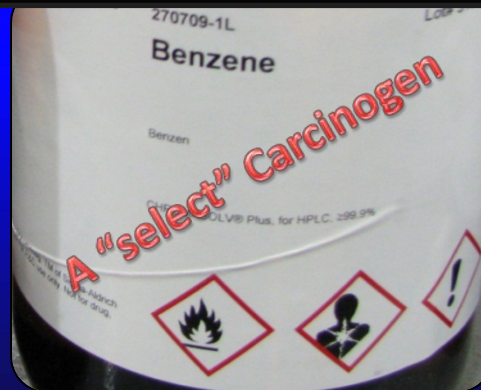
Carcinogenicity: OSHA: Yes IARC: (1) NTP: Yes ACGIH: (A1)

Note: by the end of 2015 chemicals will be shipped with an SDS, rather than an MSDS, and be labeled in a manner consistent with their SDS.

Use of “Select” Carcinogens

If you must use a “select” carcinogen then measures must be taken to ensure all exposures are kept to the lowest practical level.

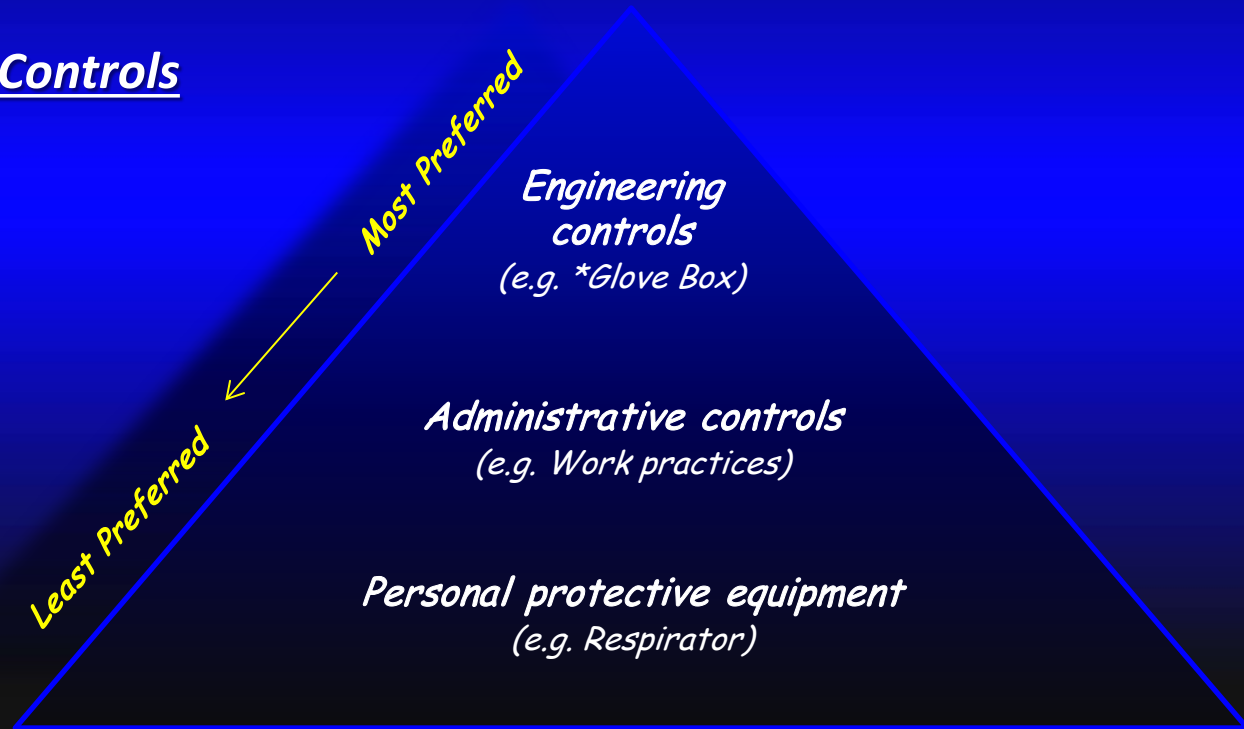
This not only applies to lab workers but also individuals like custodians, security personnel, utility workers, and others who may enter the work area.



Controlling Exposures

When exposures can't be eliminated, they must be controlled using various means. Some control measures are preferred above others due to effectiveness and the degree of human interaction required for the control to work properly.

Hierarchy of Controls



It is common for there to be a need to implement a combination of control measures.

Designated Areas

Use carcinogens only in areas designated for such use. A designated area is determined by the supervisor of those performing the work.

Doing so in conjunction with proper signage will help protect individuals like custodians, security personnel, utility workers, and others who may enter the laboratory.

Use signs like this to identify a designated area.

DESIGNATED AREA

- Explosive/Implosive Conditions
- Use of Select Carcinogens
- Reproductive Toxins
- Highly Toxic Chemicals

(Check those that apply)

Authorized Personnel Only

version 2.0

Substances: Benzene, Formaldehyde, Nickel

A sign template is provided at the end of this presentation.

OSHA Requirements

Requirements for all "Select" Carcinogens

- 1. Written procedures detailing how to properly use the substance(s) and how exposures will be controlled.*
- 2. Strict hygiene procedures.*
- 3. Secured Access - Designated areas are only accessed by authorized persons*
- 4. Training*

Consult with Risk Management (422-4468) or the college Health & Safety Officer (422-6589) if you have any questions.

OSHA Requirements for the following 13 Carcinogens

OSHA's 13 Carcinogens

2- Acetylaminofluorene
3, 3'- Dichlorobenzidine (and its salts)
4- Aminodiphenyl
4- Dimethylaminoazo- benzene
4- Nitrobiphenyl
Alpha- Naphthylamine
Benzidine
Beta- Naphthylamine
Beta- Propiolactone
Bis- Chloromethyl ether
Ethyleneimine
Methyl- Chloromethyl ether
N- Nitrosodimethylamine

1. *Use of the substance must be in an isolated or a closed system (e.g. glove box)*
2. *Use adequate local exhaust ventilation (e.g. lab hood) when opening a closed system to transfer the substance. Full body protection must be worn while performing the transfer. And, before leaving the designated area following transfer of the carcinogen all clothing must be removed and placed in designated laundry collection containers and individuals must wash their bodies using designated washing facilities provided by the employer.*
3. *Spills or leaks must be addressed while wearing impervious full body protection; and individuals must decontaminate in a manner similar to item 2 above before leaving a designated area.*
4. *Reports are to be submitted to the OSHA office.*
5. *Medical surveillance must be performed.*

Please consider using a different chemical or not performing the work if one of the 13- carcinogens would otherwise be used.

Other Substance Specific OSHA Requirements

Requirements for:

Asbestos

Inorganic Arsenic

Benzene

1,3-Butadiene

Cadmium

Ethylene Oxide

Formaldehyde

Vinyl Chloride

- 1. Exposure characterization (e.g. air monitoring and identifying tasks where exposures are high)*
- 2. Inclusion in the University respiratory protection program if exposures warrant such.*
- 3. Medical surveillance when exposures warrant such.*
- 4. Change rooms for individuals whose clothing may become contaminated.*
- 5. A shower facility in the designated area for routine wash down of individuals who work with arsenic, lead, or cadmium if exposures exceed an action level.*
- 6. Recordkeeping (e.g. air monitoring & medical surveillance records)*

Protect Everyone

Dispose of paper towels, gloves, rags, containers, or any other items contaminated with a carcinogen according to Hazardous Materials Management (801-422-6156) recommendations.

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