

## Particularly Hazardous Substances: Definition

**“Particularly Hazard Substances”** are defined as belonging to one of three groups.

1. Select carcinogens, acutely toxic chemicals, reproductive toxins and chemicals known to have undesirable biological effects. (Refer to the information document “Particularly Hazardous Table” (<https://www.cmu.edu/ehs/Laboratory-Safety/chemical-safety/documents/cmuphstable.pdf>) for lists of PHSs and guidance in identifying them.)
2. Chemicals for which reliable toxicity information is not available, but are highly suspected to be a PHS because of their similarity in chemical structure or function to known toxic agents.
3. Chemicals that are explosive or otherwise violently reactive, such as pyrophorics and water-reactive materials.

**“Select carcinogens”** are any substance that meets at least one of the following criteria:

- Regulated by OSHA as a carcinogen or;
- Listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) or;
- Listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer (IARC) Monographs or;
- Listed in either Group 2A or 2B by IARC or under the category "reasonably anticipated to be carcinogens " by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
  - After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m<sup>3</sup>
  - After repeated skin application of less than 300 mg/kg of body weight, per week or
  - After oral dosages of less than 50 mg/kg of body weight per day

**“Acute toxicity”** is the ability of a chemical to cause a harmful effect after a single exposure. Parameters for assessing the risk of acute toxicity of a chemical are its LD50 and LC50 values. Acutely toxic chemicals meet at least one of the following criteria:

- Chemicals with an oral LD50 in rats <50mg/kg
- Chemicals with a skin contact LD50 in rabbits <200mg/kg
- Chemicals with an inhalation LC50 in rats <200ppm/per hour

**“Lethal Dose 50 (LD50)”** is defined as the amount of a chemical that when ingested, injected, or applied to the skin of test animals under controlled laboratory conditions will kill one-half (50%) of the animals.

**“Lethal Concentration 50 (LC50)”** is the concentration of the chemical in air that will kill 50% of the test animals exposed to it.

**“Reproductive toxins”** are substances that cause chromosomal damage and substances with lethal or teratogenic effects on fetuses.

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