

examinetics

Occupational Health Pathfinder

Overview

Cadmium (Cd) is a blue-white metal compound with highly toxic and carcinogenic (cancer causing) properties. The metal has a number of applications in industry including the content of batteries (eg Nickel-Cadmium), some pigments, paints and coatings, stabilizing plastics and electroplating (eg steel nut and bolt anti-rust coatings). Workers involved in the production or use of those applications are potentially exposed to the harmful health effects of Cadmium and its oxides (through dusts or fumes) unless stringent protective and preventative measures are in place. Welders are also at risk from the fumes produced when inadvertently processing base metals which contain the chemical.

Health effects of Cadmium exposure

There is a plethora of research surrounding the toxicological and carcinogenic profile of Cadmium. A very recent (2008) profile titled '*Draft toxicological profile for Cadmium*' has been documented by the Agency for Toxic Substances and Disease Registry and is listed under our 'Medical Director Review'. The document is extremely comprehensive; Chapter 3 of that document discusses the health effects of the chemical. It states that the main routes of exposure in the occupational setting are through inhalation of fumes and/or dusts and through accidental ingestion from contaminated hands while eating or smoking. Incidentally, smokers inhale cadmium through smoking as tobacco leaves are known to bio-accumulate the metal.

Acute inhalation of Cadmium causes damage to the lungs and respiratory conditions such as respiratory edema and can eventually lead to respiratory failure and death. If low levels of cadmium are inhaled or ingested over a long period of time, the chemical is known to accumulate in the kidney and cause kidney damage and disease. Acute high level ingestion of the metal causes irritation of the stomach and sometimes death.

Regulatory measures

Given the health risks arising from the toxic and carcinogenic properties of cadmium, working with the metal and its oxides is regulated tightly. Employers are advised to read the regulations and standards as outlined on the relevant pages of the OSHA website (www.osha.gov). Particularly, the General Industry Standards under 29 CFR 1910 Subpart Z "Toxic and hazardous substances" and those related to Shipyard Employment 29 CFR 1915 Subpart Z, the construction industry 29 CFR 1926 Subpart Z, and the agricultural industry 29 CFR 1928 Subpart L, [Reserved]. The standards outline employers' responsibilities, the exposure limits for cadmium and requirements for employee training, medical monitoring, air monitoring, compliance program, protective equipment and evaluation and recordkeeping.

Cadmium exposure

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KEY POINT SUMMARY:

- Cadmium (Cd) is a blue-white metal compound with highly toxic and carcinogenic properties
- Cd is in the content of some batteries (Nickel-Cadmium), some pigments, paints and coatings, stabilizing plastics and some electroplating applications
- A recent (2008) profile titled '*Draft toxicological profile for Cadmium*' has been documented by the Agency for Toxic Substances and Disease Registry and lists the health effects of Cd
- Acute inhalation of Cd causes damage to the lungs and respiratory conditions (eg respiratory edema) and eventually respiratory failure leading to death
- Ingestion and inhalation of lower levels over time can cause kidney disease as Cd targets the organ
- There are strict OSHA regulations regarding the handling and use of Cd with which employers should be very familiar

FIND OUT MORE...

OSHA website

www.osha.gov/SLTC/cadmium/index.html

US EPA

www.epa.gov/ttn/atw/hlthef/cadmium.html

National Institute for Occupational Safety and Health

www.cdc.gov/niosh/topics/Cadmium/

Business Owner Briefing

"Cadmium" (OSHA)

www.osha.gov/Publications/osh3136.pdf

Medical Director Review

"Draft Toxicological Profile For Cadmium"

(Agency for Toxic Substances and Disease Registry, 2008)

www.atsdr.cdc.gov/toxprofiles/tp5.pdf

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