COMPASS HEALTH & SAFETY

Tel: 847-440-7607
Email: info@compass-hs.com
Web: www.compass-hs.com

## Types of Chromium

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic ash and gases. Chromium is present in the environment in several forms. The most common forms are chromium (0), trivalent [or chromium(III)], and hexavalent [or chromium(VI)].

- Chromium(0) is a gray solid metal with a high melting point. It is produced by industrial processes and mainly used for making steel and other alloys.
- Chromium (III) is the naturally occurring mineral ore (chromite) and is an essential nutrient for humans. An intake of 50 to 200 µg of chromium(III) per day is recommended for adults. Chromium (III) occurs naturally in many fresh vegetables, fruits, meat, yeast, and grains – although the method of food processing and preparation can affect the actual amount.
- Chromium (VI) is produced by industrial processes. Synonyms include chromic acid and any type of chromate or dichromate compound. Stainless steel welding, chemical manufacturing, chrome plating, chrome pigments, leather tanning, wood preserving, manufacturing of dyes and pigments, and many other industries use or generate chromium(VI).

## Health Effects of Chromium(VI)

Inhalation

Inhaling high levels (greater than 2 µg/$m^3$) can cause a runny nose, sneezing, itching, nosebleed, nasal ulcers, lung irritation, and holes in the nasal septum (the wall separating the nasal passages). These effects have generally occurred in workers with long term exposures (several months to many years). In severe cases, however, the effects are more immediate. Acute exposures can cause perforation of the septum within a week of exposure.

Long term exposure has also been associated with significantly higher rates of cancer, which may occur years after the exposure has ended. Calcium chromate, chromium trioxide, lead chromate, strontium chromate, and zinc chromate are known human carcinogens. Studies of workers in the chromate production, pigment, and chrome plating industries show increased rates of lung cancer. Stainless steel welders have not been studied adequately, and the cancer association is inconclusive.

Eye and Skin Contact

Direct eye contact with chromic acid or chromate compounds can cause permanent eye damage. Prolonged skin contact can result in dermatitis and skin ulcers. Some persons develop allergic sensitization. In sensitized workers, contact with even small amounts can cause a serious skin rash. Kidney damage has been linked to high dermal exposures.

Ingestion

Particles of chromium dust can contaminate hands, clothing, food, etc. and lead to higher-than-normal ingestion of the metal. Ingesting large amounts can cause stomach upsets and ulcers, convulsions, kidney and liver damage, and even death.