

What is hexavalent chromium and how is it different than other forms of chromium?

Hexavalent chromium, or Cr(VI), is a form of chromium with six valence electrons. Hexavalent chromium is more toxic to humans compared to the other chromium forms. Generally, the chromium in stainless steel and other metal alloys is not particularly hazardous, but certain hot work processes, such as welding, grinding or cutting, can oxidize lower valence forms into hexavalent chromium. Other hot processes such as in steel mills may also result in hexavalent chromium.

Who is at risk for exposure?

Exposure may occur in specific industries such as electroplating, painting and coating operations, or metal manufacturing. Workers who weld, cut or grind stainless steel, chromium alloys or chromium coatings are also at risk for exposure to hexavalent chromium. The percentage of chromium in the base metal, the type of welding, the welding rate and amperage, the flux, the shielding gases, and the environment all influence the exposure to hexavalent chromium. It is important to follow your work procedures to minimize inhalation ex-



What are the health effects?



- Nose and throat irritation, nasal sores or even a perforated nasal septum
- Skin and eye irritation which can lead to allergic contact dermatitis or chrome ulcers
- Inhalation exposures are known to cause lung cancer in humans
- Some workers can become allergic to hexavalent chromium and can experience asthma like symptoms.

How can exposures be controlled?

Reduce worker exposures to less than the OSHA permissible exposure limit of 5 micrograms per cubic meter or better yet, the OSHA Action Level of 2.5 micrograms per cubic meter. Follow the hierarchy of controls as the best approach to reduce exposures:

- Eliminate the source or process, but this tends to not always be feasible
- Substitute for a material containing less chromium
- Implement engineering controls such as local exhaust ventilation
- Implement administrative or work practice controls
- Lastly, if all else fails, provide personal protective equipment (PPE) and respiratory protection.

