FACT SHEET

California Environmental Protection Agency
Air Resources Board

HEXAVALENT CHROMIUM

What Is Hexavalent Chromium?

Hexavalent chromium (Cr+6) is one of the two common valence states of chromium. Hexavalent chromium is produced by heating trivalent chromium (Cr+3) in the presence of mineral bases and oxygen, and is used in the manufacturing of paint, dyes and pigments. Hexavalent chromium can also be a by-product of an industrial process, (i.e., thermal spraying, hard chromium electroplating, stainless steel welding, power plant combustion, refining, and leather tanning).

What Are The Sources of Hexavalent Chromium Emissions?

Hexavalent chromium is found primarily in industrial settings. Three industries that are major sources of hexavalent chromium are: metallurgical, refractory and chemical. Occupational exposure can be from thermal spraying, welding of alloys or steel, leather tanning, chromate production, textiles and wood preservatives. Exposure to hexavalent chromium can also occur from airborne emissions from chemical plants, incineration facilities, cement plants and tobacco smoke.

Is Hexavalent Chromium A Toxic Air Contaminant?

Yes. In January 1986, the Air Resources Board (ARB/Board) published an *"Initial Statement of Reasons for Rulemaking – Proposed Identification of Hexavalent Chromium as a Toxic Air Contaminant".* The Air Resources Board reviewed epidemiological and animal studies and determined that hexavalent chromium should be considered a carcinogen *with no safe threshold level of exposure*. Based upon the evidence, ARB staff recommended that hexavalent chromium be identified as a toxic air contaminant (TAC). The Board identified hexavalent chromium as a TAC in 1986.

What Are The Possible Health Effects From Exposure To Hexavalent Chromium?

Exposure to hexavalent chromium can be through inhalation, ingestion and dermal (skin) contact. Inhalation exposure to hexavalent chromium has been known to cause lung and nasal cancers, respiratory irritation, severe nasal and skin ulcerations and lesions, perforation in the nasal septum, liver and kidney failure and birth defects. Hexavalent chromium is mutagenic in bacterial and mammalian cell systems. As a mutagenic environmental carcinogen, it has the ability to alter the DNA base sequence.

What Is The ARB Doing About Hexavalent Chromium Emissions?

ARB has adopted the following airborne toxic control measures (ATCM) for hexavalent chromium sources:

- February 1988 (amended May 1998)- "*Emission of Hexavalent Chromium from Chrome Plating and Chromic Acid Anodizing Operations"* which requires owners/operators of electroplating operations to use air pollution control devices;
- March 1989 - "*Chromate Treated Cooling Towers"* which prohibits adding hexavalent chromium to cooling tower circulating water*;* and
- September 2001 - *"Emissions of Hexavalent Chromium and Cadmium from Motor Vehicle and Mobile Equipment Coatings*", which prohibits the use of hexavalent chromium in automotive paints.

ARB's Neighborhood Assessment Program monitors the impacts of hexavalent chromium emissions on communities. The data collected assists in developing guidelines for reducing the impact of air pollution on the neighborhood scale. For additional information about ARB's activities regarding hexavalent chromium, please visit our website at *www.arb.ca.gov/homepage.htm*.