Hexavalent Chromium (Cr(VI)) Exposure in the Workplace

Chromium Hexavalent (CrVI) compounds, often called hexavalent chromium, exist in several forms. Hexavalent chromium can also be formed when performing "hot work" such as welding on stainless steel or melting chromium metal. In these situations the chromium is not originally hexavalent, but the high temperatures involved in the process result in oxidation that converts the chromium to a hexavalent state.

Workers who breathe hexavalent chromium compounds at their jobs for many years may be at increased risk of developing lung cancer. Breathing high levels of hexavalent chromium can irritate or damage the nose, throat, and lungs. Irritation or damage to the eyes and skin can occur if hexavalent chromium contacts these organs in high concentrations or for a prolonged period of time.

All forms of hexavalent chromium are regarded as carcinogenic to workers. The risk of developing lung cancer increases with the amount of hexavalent chromium inhaled and the length of time the worker is exposed. Studies of workers in chromate production, chromate pigment, and chrome electroplating industries employed before the 1980s show increased rates of lung cancer mortality. Certain hexavalent chromium compounds produced lung cancer in animals that had the compounds placed directly in their lungs.

Hexavalent chromium can irritate the nose, throat, and lungs. Repeated or prolonged exposure can damage the mucous membranes of the nasal passages and result in ulcers. In severe cases, exposure causes perforation of the septum (the wall separating the nasal passages). Breathing small amounts of hexavalent chromium even for long periods does not cause respiratory tract irritation in most people. Some employees become allergic to hexavalent chromium so that inhaling the chromate compounds can cause asthma symptoms such as wheezing and shortness of breath

Prolonged skin contact can result in dermatitis and skin ulcers. Some workers develop an allergic sensitization to chromium. In sensitized workers, contact with even small amounts can cause a serious skin rash.

There are several ways to reduce exposure to hexavalent chromium. Recommended controls vary from operation to operation. The preferred approach is to use engineering controls such as ventilation or equipment and process modification. If these controls are not sufficient, other controls may be implemented, including the use of respirators, eye protection, showering, and changing into street clothes before leaving the work area.

OSHA has specific requirements for workplaces who have employees exposed to hexavalent chromium. In addition to needing to provide training to exposed employees regarding potential exposure risks, employers also have other responsibilities such as; medical surveillance (if required), providing protective clothing and equipment, monitoring exposure levels, and keeping required records related to exposures.

OSHA standards 1910.1026 (General Industry), 1915.1026 (Shipyard), and 1926.1126 (Construction) address hexavalent chromium specifically and provide full details of the workplace requirements.

Maine Oxy offers a full line of ventilation systems, respirators and other personal protective equipment to help you comply with the OSHA requirements for hexavalent chromium. Maine Oxy also offers a full line of safety related supplies and services. Talk with your sales representative today about the many different types of safety related solutions available for your needs.