Airgas
an Air Liquide company

INFORMATION FOR YOUR SAFETY

FYS

OSHA's Hexavalent Chromium Standard

Hexavalent chromium [Cr(VI)] may be present in fumes that are created in the welding and cutting processes of stainless steel, non-ferrous chromium alloys and chrome plated metals. The Occupational Safety and Health Administration's (OSHA) Hexavalent Chromium Cr(VI) Standard sets the permissible exposure limit for Cr(VI) as 5µg/m3 (micrograms per cubic meter) as an eight-hour time-weighted average (TWA).

Make sure to use respiratory protection when needed. Refer to the filler metal SDS sheets for information about the respiratory and contact dangers of hexavalent chromium.

Welding Fumes and Gases

Welding and cutting processes generate fumes that can be hazardous if inhaled. Welding fumes are comprised of:

- Vaporized metal from the base metal itself, from welding rods, wires, coatings and fluxes
- Rust, mill scale and coatings that may be on the surface of the metal
- By-product gases such as ozone, carbon monoxide and nitrogen dioxide

It is important that workers be protected from over-exposure to these fumes and gases.

National Institute for Occupational Safety and Health (NIOSH) studies suggest that welders have an increased risk of respiratory illness, including bronchitis, airway irritation, lung function changes and lung cancer[1].

Help protect yourself with safety equipment designed specifically for the professional welder. Welders must have proper ventilation and an approved respirator to protect them from hazardous fumes and gases. Respirators should be comfortable and not hamper the use of other face-shielding equipment.

There are situations when standard air-purifying respirators alone will not guarantee an adequate supply of breathable air. Welding operations in areas with poor ventilation and air quality increase the risk of inhaling toxic fumes. Therefore, it may be necessary to provide additional ventilation or an air-supplied respirator. Exhaust hoods or fume extractors, combined with the use of exhaust fans, are common means of removing fumes.

Your representative can provide additional information to assist you in your selection of the proper respiratory protection for your application.

Contaminant/Application	Potential Health Effects from Over Exposure[2,3]
Steel/Manganese Alloys	Pneumoconiosis, Siderosis, Central Nervous System effects
Stainless Steel	Pneumoconiosis, kidney effects, lung irritation, cancer
Aluminum	Respiratory irritation (due to ozone)
Galvanized Steel	Metal Fume Fever
Cadmium	Metal Fume Fever, respiratory irritation, lung cancer, kidney effects
Lead	Central Nervous System effects, systemic poisoning
Ozone	Respiratory irritation, lung congestion, bronchitis, headache, dry throat
Carbon Monoxide	Anoxia, Central Nervous System effects
Carbon Dioxide	Asphyxiation
Phosgene	Respiratory irritation, anoxia, pulmonary edema
Oxides of Nitrogen	Respiratory irritation and edema

1. Health Effects of Welding, Antonini (Health Effects Laboratory Division, NIOSH), Critical Reviews in Toxicology, 2003.
2. Documentation of TLVS and BEIS, American Conference of Governmental Industrial Hygienists, 7th. edition, 2004.
3. Clayton, G.D., Clayton, F.E. Patty's Industrial Hygiene and Toxicology. Vol II New York John Wiley and Sons Inc., 1994.