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Welding Fume: The risks



The International Agency for Research on Cancer's re-classification of welding fume as a Class 1 carcinogen has emphasized the very real health risks welders face on the job

Previously classified as "possibly carcinogenic to humans," this re-classification serves as a reminder that welders should take precautions consistent with the latest standards, regulations, and best practices to protect their health, even if the risk is not obviously visible. Along with various forms of cancer, welding fume can cause a number of other serious, sometimes fatal diseases. This document provides some information about the danger of welding fume and the health risks it poses to welders.

What is welding fume? The exact composition of welding fume varies based on the application and welding method being used. In general, welding fume consists of two main components:

Extremely fine metal dust (particulates) Metal dust particles caused by welding are so fine (approximately 0.0001mm) and highly concentrated that they appear like smoke, which can be inhaled without proper precautions.

This dust can be made up of a number of toxic metals, including Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Iron, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Titanium, Vanadium and Zinc.

Gases Welding can expose workers to a number of gases that are potentially harmful to humans. These include Argon, Carbon Dioxide, Carbon Monoxide, Helium, Hydrogen Fluoride, Nitric Acid, Nitrogen, Nitrogen Dioxide, Ozone, and Phosgene.

Why is welding fume dangerous?

According to the Occupational Safety and Health Administration (OSHA), the process of welding produces harmful metal fume and gas by-products that can easily enter the human respiratory system. Potential health effects associated with the inhalation of welding fume include a range of serious lung complications and diseases, as well as damage to the brain and nervous system.

Some of the most common ones include:

■ **Cancer**

Various types of cancer - commonly lung, larynx and urinary tract - can be caused by exposure to nickel and chromium

■ **Emphysema**

A long-term, progressive lung disease, emphysema

causes shortness of breath and is incurable. Cadmium exposure can lead to emphysema.

■ **Kidney Failure**

Acute kidney failure requires intensive treatment and can often be fatal. Exposure to cadmium and lead oxide may lead to kidney failure.

■ **Lead Poisoning and Anemia**

Lead poisoning can result in severe mental and physical impairment. Though it is treatable, the damage cannot be reversed. In severe cases, it can lead to anemia, which can result in damaged organs. This can be caused by exposure to fumes containing lead oxide.

■ **Manganese (Parkinson's disease-like syndrome)**

Like Parkinson's, manganese symptoms affect the central nervous system and may include tremors, slowness of movement, muscle rigidity, and poor balance. According to the U.S. Centers for Disease Control and Prevention (CDC), this can be caused by chronic exposure to high concentrations of manganese fume.

■ **Metal Fume Fever**

Symptoms of metal fume fever include chills, sweating and stomach pains. This can be caused by inhaling excessive zinc fumes during welding of galvanized metal. Irritation of the nose, sinus, throat and lungs: General irritation and discomfort across the respiratory system may be caused by inhalation of fumes containing iron oxide or chromium.

■ **Asthma**

Those with asthma often suffer from coughing, wheezing, and shortness of breath. Exposure to nickel can worsen symptoms and increase the frequency of attacks.

Many harmful gases and particulates can have a cumulative effect on health without presenting immediate symptoms. To reduce welders' chances of being affected by such ailments, these substances should always be controlled in accordance with the latest standards, regulations, and best practices.

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