

# HAZARD ALERT

CPWR [●]  
THE CENTER FOR CONSTRUCTION  
RESEARCH AND TRAINING

# WELDING FUMES AND GASES



## Am I in danger?

If you are doing "hot work" on metal surfaces ...

- welding
- cutting
- brazing
- burning

and you aren't using ventilation or an appropriate respirator, then the answer is **YES**.



A respirator protects this welder.

## Find out more about construction hazards.

Get more of these Hazard Alert cards –  
and cards on other topics.

**Call 301-578-8500**

**If you think you are in danger:**  
Contact your supervisor. Contact your union.  
**Call OSHA 1-800-321-OSHA**

## Before you start ...



### 1 Remove all coatings

Some paints, laquers and solvents on metal surfaces can generate toxic fumes and gases when welding, cutting or burning. Make sure all dangerous materials have been removed before you start work.

*The worker at left is removing lead paint from the metal surface using a needle gun with a vacuum attachment.*



### 2 Use ventilation

Effective ventilation captures fumes and gases at the source. If used correctly, an exhaust system removes fumes before they reach you. These systems are easiest to use indoors. But if wind shielding can be set up, they may be used outdoors.

**Don't assume outdoor air movement is enough.**  
**Overexposures have occurred outdoors on windy days.**



### 3 Beware of confined spaces

Before you weld or cut in a confined space, **your employer must provide a ventilation system and should test the air quality** so you have enough oxygen and low toxic gases or vapors. Caution: shielding gases displace oxygen. While in a confined space, you must have **adequate breathable air**.

**OSHA requires it - and so do your lungs.**

## What you should know about welding fumes and gases.\*

When you are ...	your work creates:	... and your health problem could be ...**
MIG welding using carbon dioxide (CO <sub>2</sub> ) shielding gas	Carbon monoxide (CO)	<b>Deadly:</b> CO gas reaches poisonous concentrations; CO <sub>2</sub> gas displaces air to cause suffocation
MIG and TIG Welding	Ozone and nitrogen oxides	<b>Irritating:</b> eyes, ears, nose, throat and lungs affected; can damage lungs
Welding through or near solvents with chlorine	Phosgene	<b>Deadly:</b> fluid can fill lungs hours after exposure
Welding on steel	Manganese	<b>Serious:</b> long-term nerve damage like Parkinson's disease
Hot work on galvanized steel or paint with zinc	"Metal-fume fever"	<b>Non-fatal:</b> flu-like symptoms that pass
Welding stainless steel	Nickel and chromium	<b>Serious:</b> asthma and sometimes lung cancer
Cutting or welding metal with paint or coatings	Lead, cadmium, and other toxins	<b>Serious:</b> nerve damage, reproductive damage, kidney disease and cancer
Welding using shielding gases like argon	Hazards in confined space	<b>Serious to Deadly:</b> reduced oxygen, even suffocation from lack of fresh air

\* There are more hazards. This list shows the most common ones. \*\* The amount of exposure determines whether your health will be affected and how severely. Go to [www.elcosh.org](http://www.elcosh.org) to learn more.