

HAZARD ALERT

CPWR 
THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

WELDING FUMES AND GASES



Am I in danger?

The following types of “hot work” on metal surfaces produce toxic fumes and gases:

- ▶ welding
- ▶ cutting
- ▶ brazing
- ▶ burning

If you are not using ventilation or an appropriate respirator, then you are in danger.



A respirator protects this welder—the respirator hose is circled in red.

Find out more about construction hazards.

To receive copies of this Hazard Alert
and cards on other topics
call **301-578-8500** or
email **cpwr-r2p@cpwr.com**

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 welded, cut or burned. Make sure all dangerous materials have been removed before you start work.

This worker is removing lead paint from a metal surface using a needle gun with a vacuum attachment.



2 Use ventilation

There is a broad range of exhaust systems available to capture fumes and gases at the source on construction sites. The key is to get the suction as close to the work as possible and to pull fumes away from your breathing zone. You should take advantage of any wind to further direct fumes away from you, but do not rely on outdoor air movement. Overexposures can occur outdoors even on windy days.



3 Beware of confined spaces

Before you weld or cut in a confined space, your employer must:

- ▶ Test the air for toxic gases and vapors.
- ▶ Make sure you have enough oxygen to breathe.

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 ₂) shielding gas	Carbon monoxide (CO)	Deadly: CO gas reaches poisonous concentrations; CO ₂ gas displaces air to cause suffocation
MIG and TIG Welding	Ozone and nitrogen oxides	Irritating: eyes, ears, nose, throat and lungs affected; can damage lungs
Welding through or near solvents with chlorine	Phosgene	Deadly: fluid can fill lungs hours after exposure
Welding on steel	Manganese, nickel, chromium and hexavalent chromium	Serious: long-term nerve damage like Parkinson's disease, asthma, irritation and damage to the nose and throat, and lung cancer
Hot work on galvanized steel or paint with zinc	"Metal-fume fever"	Nonfatal: flu-like symptoms that pass
Welding stainless steel	Nickel and chromium	Serious: asthma and sometimes lung cancer
Cutting or welding metal with paint or coatings	Lead, cadmium, and other toxins	Serious: nerve damage, reproductive damage, kidney disease and cancer
Welding using shielding gases like argon	Hazards in confined space	Serious to Deadly: 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. Visit CPWR's eLCOSH (<http://elcosh.org>) for health hazard information and the Exposure Control Database (<http://ecd.cpwr.construction-solutions.org>) for estimated welding exposures.

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