



HOT WORK SAFETY

Hot work fires result in avoidable death, injury, and hundreds of millions of dollars in property loss each year. When everyone follows safe hot-work practice, these fires are preventable. The risk with hot work is high because it introduces a hazard—an ignition source. That's why the number one safety recommendation is to determine whether there is an alternative to hot work and by avoiding hot work, you minimize the risk.

What Is Hot Work?

- Work involving burning, welding, or a similar operation that is capable of initiating fires or explosions.
- Activity involving flame, spark production, or heat.
- Welding and allied processes include arc welding, oxy-fuel gas welding, open-flame soldering, brazing, thermal spraying, oxygen cutting, and arc cutting.

Hot Work Hazards

Hot work has the potential to unite all three parts of the fire triangle: oxygen, fuel, and an ignition source.

Oxygen is present in the ambient air. Unsafe practices involving pure oxygen can cause oxygen enrichment (over 22 percent by volume) in the workplace.

Fuel includes anything that can be ignited. Examples of common fuels include the following:

- Construction materials such as wood, plastic, insulation, roofing materials, including those in concealed spaces
- Flammable and combustible liquids or gases such as fuel, paint, cleaning solvents
- Simple combustibles such as rags, paper, cardboard, lumber, furnishings

Ignition sources can be as simple as the hot work itself. Ignition results when any heat source sufficient to ignite a fuel does so. It can occur through the direct or indirect application of heat. *Direct* application of heat includes: welding, cutting and burning. *Indirect* application includes heat conducted through metal surfaces to fuel sources on the other side (e.g., through to the other side of a bulkhead) and sparks travelling to a distant fuel source (e.g., to a pool of liquid or other combustible material).

DID YOU KNOW?

NFPA 51B is required by reference, and therefore, compliance is not optional. OSHA references NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, in 29 CFR 1910 Subpart Q, and NFPA 1, *Fire Code*, requires compliance with NFPA 51B in Chapter 41.

HOT WORK DANGER: FACTS AND FIGURES

When looking at data from 2013-2017, it is clear just how dangerous hot work can be to the public as well as to first responders. The 2019 NFPA report, "Structure Fires Caused by Hot Work," found the following statistics. *

4,630

Structure fires involving hot work per year

Of the fires involving hot work...

57%

were in or on non-home properties

43%

were in or on homes



15

Civilian deaths are caused per year from these fires



198

Civilian injuries are caused per year from these fires



\$355M

In direct property damage results from these fires per year



5

Number of firefighter fatalities (between 2001-2018)

*These statistics do not include near miss fire events from improper hot work. Near miss events include those where the fire department was not contacted because the fire watch dealt with the fire event, or those where no open fire resulted but there was localized scorched or charred material following improperly performed hot work.

The hot work permit helps the permit authorizing individual, hot work operator, and fire watch recognize potential hazards. Areas can be protected with the use of welding pads, blankets, or curtains, clearing combustibles from a 35-ft (11-m) radius space around the hot work, or moving the hot work to an area free of combustibles.

Identify Alternatives to Hot Work

Hot work hazards can be avoided if there is an alternative method to complete the job. Some options include the following:

- Screwed, flanged, or clamped pipe
- Manual hydraulic shears
- Mechanical bolting or pipe cutting
- Compressed air-actuated fasteners

Fires can start after the hot work is complete. The fire watch must remain on site for a minimum of 60 minutes to monitor for smoldering fires, per NFPA 51B. The permit authorizing individual could require the fire watch to remain on site longer depending on the conditions of the work site