

Hot work is potentially dangerous for the following reasons.

1. It provides a source of ignition that could ignite a vapor release from another location.
2. The person doing the hot work may cut through the wrong line or burn a hole in the wrong piece of equipment. This could lead to the release of hazardous chemicals, or cause a fire or explosion.
3. The person doing the work could be burned by the equipment that they are using.
4. In confined spaces, the hot work itself can create a harmful atmosphere, leading to the possibility of a worker being overcome by fumes.

Types of Hot Work

The term hot work is used in industry to denote work involving equipment which causes a significant rise in temperature, sufficient to cause ignition. The ignition might be of materials, resulting in smoldering or flaming combustion, or of flammable gases, resulting in explosion.



This rattan furniture factory was destroyed by a contractor working unsupervised on a weekend. He was welding on one side of a wall and ignited foam on the other side. The equipment left behind can be seen on the right.



The cutting of these high-carbon steel strands at dusk at a site in Taiwan produced a spectacular display of sparks, illustrating the potential for initiation of fire.

Various types of hot work are as follows.

Electric welding

Cutting with an oxygen/acetylene gas torch.

Soldering, brazing or welding with a gas torch.

The use of a hot air or flame blower to strip paint or lay bitumen.

Sometimes included are grinding or other

Ignition of Solids

Common materials such as paper, wood and textiles will ignite if heated to 300-400°C and are also capable of smoldering. By comparison, a flame involves temperatures of 600°C or more, while welding and oxy-acetylene cutting involve temperatures of at least 2000°C.



Smoke from burning paint along a line of weld being laid down on the other side of this steel plate.

A worker cutting through a steel vessel with an oxy-acetylene torch. The man was obviously aware of the danger, squinting through lidded eyes, but chose not to wear any eye protection.



mechanical processes that create sparks. Although not conventionally classed as hot work, the sparks are for a brief moment in excess of 1000°C and are capable of starting smoldering fires or igniting flammable gases.

Fires and Hot Work



A number of severe fires have been started by grinding or abrasive cutting in inappropriate environments.

Many destructive fires are started by hot work. In our experience a significant proportion involve contractors. More than half of the marine fires and explosions that we have investigated were initiated by hot work. It is also apparent from investigations that it is simplistic to blame hot work alone.



A worker cutting through piping with an oxy-acetylene torch. The balancing act on a plank high off the ground, with no safety shoes, gloves or eye protection typifies a casual approach to hot work that is so prevalent in many countries.

Hot work cannot be avoided and is carried out safely in thousands of instances each day. In most cases that we have investigated where hot work is the cause, there has been a clear breach of safety standards. Ignorance, miscommunication or laziness are more often than not the root causes of the hot work fires that we look at.

Ignition of Liquids, Vapours & Gases

With liquids, vapours and gases, hot work can ignite a mixture of the flammable gases or vapour in correct proportion with air. By comparison with solid ignition, very low ignition energies are required and all of the hot work processes, including grinding, are capable of ignition.

Oxy-acetylene Cutting

From our experience it is justifiable to highlight the particular hazards of oxy-acetylene cutting. Large globules of molten metal and slag in excess of 1600°C can be projected considerable distances vertically and horizontally. It is also apparent from watching building sites at night that red hot globules of metal can remain hot enough to ignite fires while falling 10 storeys or more.

The use of an oxyacetylene torch on a busy street in Makati, Manila. Molten metal and slag rained down on the footpath, with no barricades or other attempts to stop passers-by from being injured.

