RM Insight®

Flashback Arrestors

Introduction

The apparatus used in gas welding and cutting consists of an oxygen cylinder and a fuel gas source, usually a cylinder containing acetylene, two pressure regulators and two flexible hoses (one for each cylinder) and a torch. The cylinders are often carried in a special wheeled trolley.

Oxygen-fuel equipment is quite versatile and is not only used for welding but also lends itself to brazing, metal heating (for annealing or tempering, bending or forming), rust or scale removal, the loosening of corroded nuts and bolts and is widely used in the cutting of ferrous metals.

The hazards

Gas pressure

One cause of fires and explosions is high acetylene gas pressure. If gas pressure in excess of 100 kPa is used then the acetylene can become unstable and may decompose explosively. Other fuels such as LPG can be safely used with higher operating fuel pressures.

Burn back

If the oxygen cylinder is low or empty, reverse flow of gas may occur. The fuel gas, being at a higher pressure, can travel up the oxygen line and mix with gas in the hose, regulator and cylinder. Lighting the torch without first purging the line may result in a burn back which is likely to result in an explosion in the hose, regulator, or cylinder.

Backfire

The same problem as encountered with a burn back can occur when there is a high oxygen pressure and a low gas fuel pressure, in which case a backfire may occur. A backfire usually occurs when the torch is held too close to the work surface. This can cause gas starvation of the cutting flame resulting in the flame being sucked into the torch head, usually with an associated popping sound or even a loud bang.

Flashback

Flashbacks are commonly caused by a reverse flow of oxygen into the fuel gas hose (or fuel into the oxygen hose), producing an explosive mixture within the hose. The flame can then burn back through the torch by way of a backfire, progress into the hose and may even reach the regulator and the cylinder. A flashback explosion can result in damage or destruction of equipment, and could even cause the cylinder to explode.

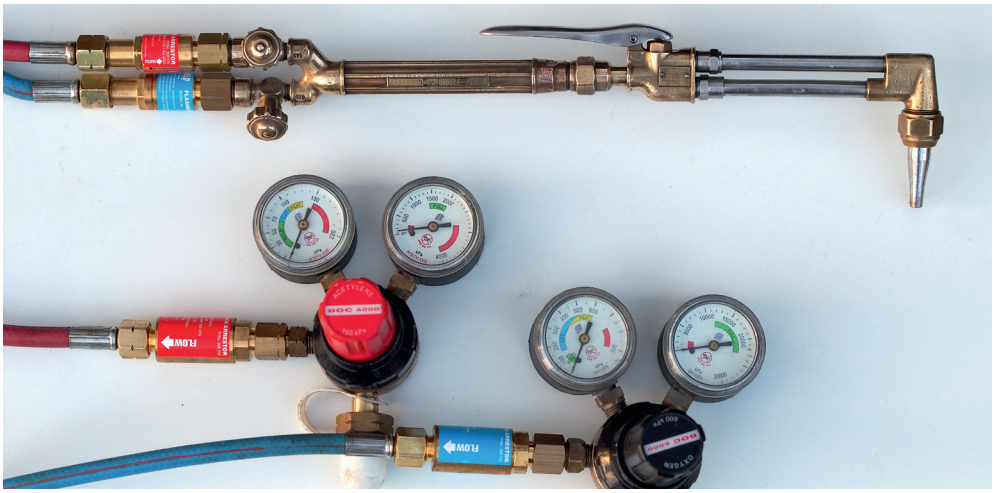
Protection

Install flashback arrestors!

Flashback arrestors automatically cut off the gas supply and extinguish the flame if a flashback occurs. Consequently, both the oxygen and fuel gas regulator outlets and generally the torch inlets need to have flashback arrestors fitted.

Flashback arrestors can be damaged by a flashback or similar event. Consequently, all flashback arrestors, hoses and fittings should be replaced following a flashback event. When gas hoses are less than three metres long, it is generally accepted that flashback arrestors need only be fitted to the outlets of both regulators. For gas hoses longer than three metres, flashback arrestors need to be fitted to both ends of both of the gas hoses, at the outlet of both regulators and also at both torch inlets.

For more information:
Contact us at riskengineering@vero.com.au



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