Welding

Welding and flame cutting are widely used in many different workplaces and can result in injuries such as burns, damaged eyesight, asphyxiation, etc. The main hazard is that of fire due to, for example, the leakage of gases from the hoses catching fire and or the ignition of nearby flammable materials. Other hazards include explosion of the cylinders, intense light, hot particles of molten metal being discharged and "flashback" which occurs when the cutting torch is lit where there is an ignitable mixture of fuel gas and oxygen in one hose. Following the steps below will help you to control the risks associated with welding in your workplace. You may find them useful as a safety checklist.

STEP 1

Equipment: Gas cylinders should be kept secure and upright, e.g. chained on a mobile stand; the cylinders should be clearly marked with their contents and hoses should be colour coded:

- Oxygen - blue
- Acetylene - red
- LPG - orange
- Inertgases - black

The hose length should be kept a short as possible (5m maximum for welding and 20m maximum for cutting). Flame or "flash-back" arresters should be fitted to both the fuel and oxygen hoses at the regulator end. Non-return valves and pressure volume gauges should also be fitted to equipment as appropriate. Only use proprietary hose couplers and clamps where lengths of hose need to be joined.

STEP 2

Maintenance: Cylinder valves should be kept free from oil, grease and dirt. All equipment should be checked for damage each day, or before use if it is used less than daily. In testing for leaks use soapy water. Introduce a system whereby leaks are reported immediately to a supervisor and the damaged equipment is taken out of use until repaired or replaced. In addition a formal system of regular inspection at suitable intervals by a competent person should be devised and implemented.

STEP 3

Storage: Oxygen and fuel cylinders should be stored separately in suitable storage sites away from the working area. The storage area should be well ventilated and full and empty cylinders should be segregated. In order to prevent handling injuries and damage to the cylinders they should be transported around the workplace on a cylinder trolley and **never** rolled along the ground.

STEP 4

Operating Area: Where possible welding should be done in a designated area which is suitably laid out and well ventilated in order to prevent a build up of fumes. Should the ventilation be limited or area confined, it may be necessary to extract the dust and fumes - portable extractors can be used but it is important to remember to reposition the extractor nozzle as welding progresses. Prior to starting work all combustible materials must be removed from the area and if this is not possible they should be protected by non-combustible screens. Ensure that suitable fire extinguishers are provided close to the welding operations and ensure that staff know what to do in the event of a fire.

STEP 5

Use: Only those trained in the use of welding equipment should be allowed to handle, maintain and use it. Operators should be provided with suitable protective clothing and equipment, e.g. goggles or headshields to protect against flying molten metal, sparks and intense light. Overalls, gloves and boots should also be provided.

Operators should stand the cylinders as far away as possible from the welding area and follow the manufacturer's procedures for ignition. During use it is important to ensure that the hose does not become kinked, crushed, etc. and hoses should be purged after use in order to prevent "flash-back" the next time they are used. All cylinders should be returned to their designated storage area after use.

STEP 6

Arc Welding: Electrical flexes, associated fittings and electrode holders must be properly insulated for outdoor use and there should be a suitable means of isolating the electrical power supply in close proximity to the operator. All electrical circuits should be fitted with an over current device, e.g. a miniature circuit breaker (MCB) and supplies used outside or powered by a portable generator should be protected by a 30mA residual current device (RCD). Workpieces should be earthed **unless** a double insulated transformer is being used, in which case the transformer casing should be earthed and **NOT** the workpiece.

For Further Information:

Booklet: HS(G) 139 The Safe Use of Compressed Gases in Welding, Flame Cutting and Allied Processes

Health and Safety Executive
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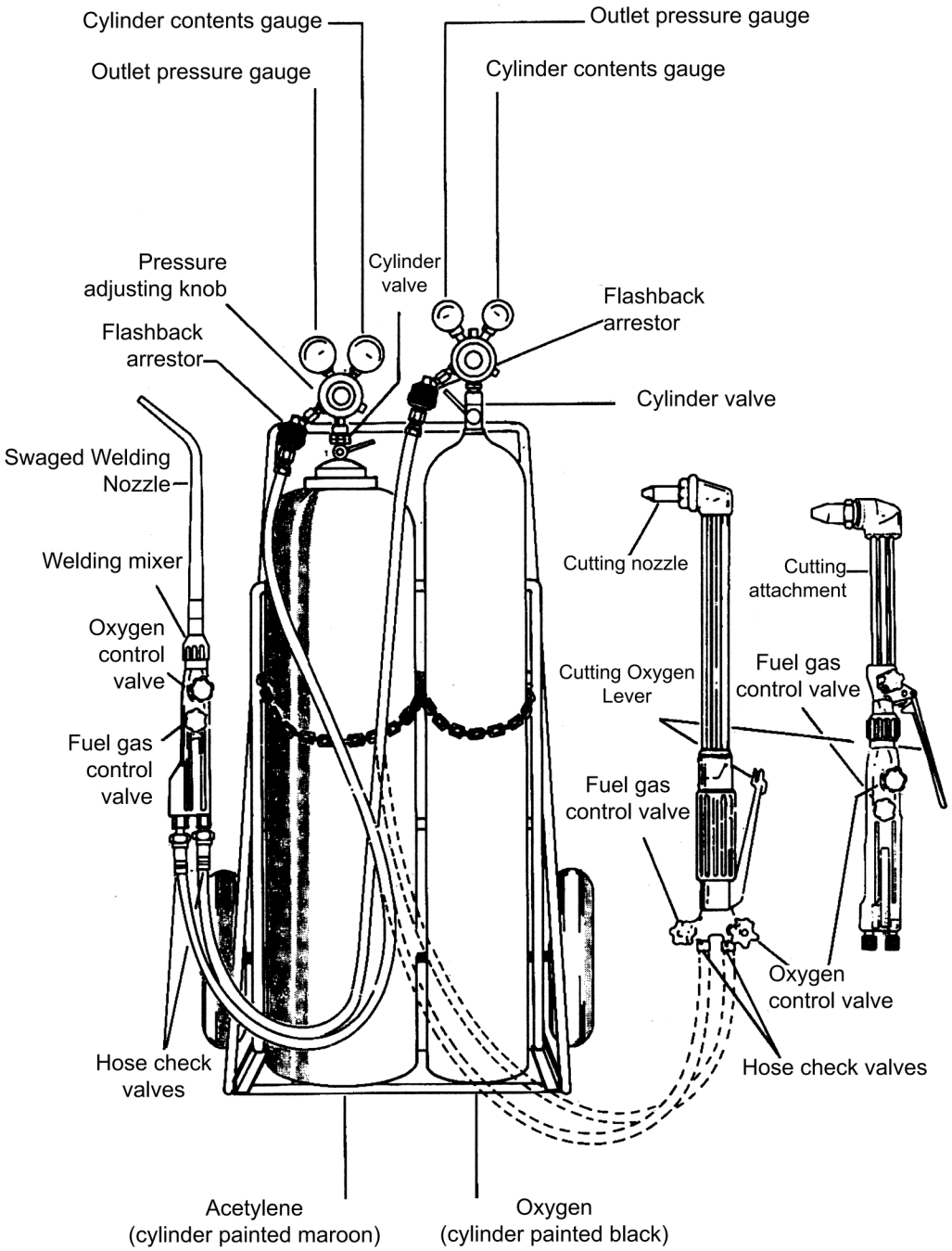
Safety Pays £

Remember - Skilled welders are rare - ensure they don't become extinct



Typical equipment used in gas welding and allied processes

Illustration courtesy of Murex Saffire from the publication "The Safe Use of Oxy-Fuel Gas Equipment".