

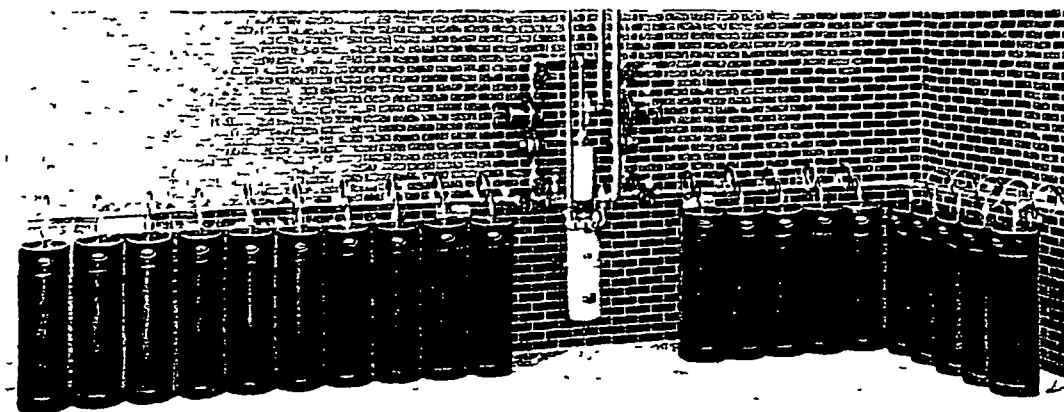


FIG 31-1 – Well-designed manifold system for acetylene cylinders

Courtesy Linde Co., Division of Union Carbide Corp

Most welding and cutting processes—for construction, demolition, maintenance, and repair—use portable, manually operated equipment. The major portion of this chapter discusses ways of minimizing the hazards encountered in this type of intermittent operation. Since production line welding and cutting equipment is usually permanently installed, the source of a hazard can be minimized through safe design. The safety professional, however, can use this chapter to help him check the operation and maintenance of production line equipment.

The detailed specifications of ANSI Standard Z49.1, *Safety in Welding and Cutting*, should be followed. In addition, city, state, and Federal government codes and regulations, where applicable, should be consulted.

This chapter uses the American Welding Society's welding and cutting definitions.

A **WELDER** is "one who is capable of performing a manual or semiautomatic welding operation."

A **WELDING OPERATOR** is "one who operates machine or automatic welding equipment."

Gas Welding and Oxygen Cutting

A gas-welding process unites metals by heating them with the flame from the combustion of a fuel gas or gases and sometimes includes the use of pressure and a filler metal.

An oxygen-cutting process severs or removes metal by the chemical reaction of the metal with oxygen at an elevated temperature maintained with heat from the combustion of fuel gases. In the powder-cutting process, a finely divided material, such as iron powder, is added to the cutting oxygen stream. The powder bursts into flame in the oxygen stream and starts cutting without preheating the material to be cut. Powder cutting is used on stainless and other steels, on many nonferrous metals, and on concrete in construction and demolition jobs.

Welding and cutting gases

Oxygen is furnished to the consumer in steel cylinders, usually under a pressure of about 2200 psi at 70 F, or as a liquid to be gasified on the consumer's premises.

Pure oxygen will not burn or explode. It supports combustion, that is, it causes other substances to burn when they are raised to the kindling temperature. Combustible materials burn much more rapidly in oxygen than in air. Oxygen forms explosive mixtures in certain proportions with acetylene, hydrogen, and other combustible gases.

This chapter was revised by Joseph Van Sickle, based upon reviews by selected members of the National Safety Council.