

34—Welding and Cutting

obtained from a single cylinder. Manifolds must be of substantial construction and of a design and material suitable for the particular gas and service for which they are to be used. Manifolds should be obtained from, and installed under the supervision of, a reliable manufacturer familiar with safe practices in construction and use of manifolds.

Portable manifolds connect a small number (usually not over five) of cylinders for direct supply to a consuming device. The cylinders may be connected by individual leads to a single, common coupler block or individual cylinders may be connected to a common line with coupler tees attached to the cylinder valves. A properly supported regulator serves the group of connected cylinders.

Stationary manifolds connect a larger number of cylinders for supply through piped distribution systems. This type of manifold consists of a substantially supported stationary pipe header to which the cylinders are connected by individual leads (Fig 34-1). One or more permanently mounted regulators serve to reduce and regulate the pressure of the gas flowing from the manifold.

Oxygen manifolds should be located away from highly flammable material, especially oil, grease, and the like. They should not be located in acetylene generator rooms, or in close proximity to cylinders of combustible gases. There should be a fire-resistant partition between an oxygen manifold and combustible gas cylinders, unless the manifold and such cylinders are separated at least 50 ft. Regulations of NFPA Standard No 51, *Oxygen-Fuel Gas Systems for Welding*, should be followed.

Distribution piping

Distribution piping carrying oxygen from a manifold or other centralized supply should be of steel, wrought iron, brass, or copper. For pressures over 150 psi, extra-heavy pipe and fittings should be used. For lower pressures, standard weight pipe and fittings or seamless nonferrous gas tubing and fittings may be used.

All pipe and fittings for oxygen service lines should be examined before use, and, if necessary, tapped with a hammer to free them from dirt and scale. They should, in every case, be washed out with a suitable non-

flammable cleaner—hot water solutions of caustic soda and trisodium phosphate are effective.

Only steel or wrought iron piping should be used for acetylene distribution systems. Under no circumstances should acetylene gas be brought into contact with unalloyed copper except in a torch treated to prevent chemical reaction. Joints in steel or wrought iron pipe should be welded or made up with threaded or flanged fittings. Flanged connections in acetylene lines should be electrically bonded. Cast iron fittings should not be used.

Joints in brass or copper pipe may be welded, threaded, or flanged. A socket joint may be brazed with silver solder or similar high melting point material. Threaded connections in oxygen piping should be tinned or made up with litharge and glycerine (litharge and water for service pressures over 300 psi) or other joint compound approved for oxygen service.

In fuel gas distribution systems, a pressure-reducing regulator, back-flow check valve, or hydraulic seal should be used to prevent back flow at every point where gas is withdrawn from the piping system to supply a torch or machine. Such devices should be listed (or approved) by an agency such as Factory Mutual or Underwriters Laboratories Inc.

Portable outlet headers

Portable outlet headers are assemblies of valves and connections used for service outlet purposes and are connected to a permanent service piping system by means of hose or other nonrigid conductors. Devices of this nature are commonly used at piers and dry docks in shipyards where the service piping cannot be located close enough to the work to provide a direct supply. Their use should be restricted to outdoor locations and to temporary service where conditions preclude a direct supply, and they should be used in accordance with regulations in NFPA Standard No 51.

Regulators

Regulators or reducing valves must be used on both oxygen and fuel gas cylinders to maintain a uniform gas supply to the torches at the correct pressure. The oxygen regulator should be equipped with a safety relief valve.