

22 WELDING AND CUTTING

ANSWERS—QUIZ 1

1. b
2. a
3. b
4. a
5. a, d
6. a
7. d
8. Safety hazards associated with welding include potential for fire or explosion, and injuries from arc radiation, electrical shock, or materials handling.
9. *Acetylene gas*, burned with oxygen, can produce a higher flame temperature than any other gas used commercially.
10. Only steel or wrought iron piping should be used for acetylene distribution systems.
11. Serious, even fatal, accidents have resulted when oxygen regulators have been attached to cylinders containing fuel gas, or vice versa. To guard against this hazard, it has been customary to make connections for oxygen regulators with right-hand threads and those for acetylene with left-hand threads, to mark the gas service on the regulator case, and to paint the two types of regulators different colors.
12. Test a gas hose for leaks by immersing the hose in water under normal working pressure.
13. Torches are usually constructed of *brass, bronze, or stainless steel*.
14. If containers cannot be removed for standard cleaning procedures, the following two practices are sometimes used: (1) the containers are purged with an inert gas, or (2) they are filled with water to within an inch or two of the place where the work is to be done and a vent is left open.
15. Resistance welding is a metal-joining process whereby welding heat is generated at the joint by the resistance to the flow of electric current. The three fundamental parameters of resistance welding are current magnitude, current time, and tip pressure. Each of these must be accurately controlled.

ANSWERS—QUIZ 2

1. a
2. b

3. b
4. d
5. a
6. c
7. b
8. A worker's liver or kidney and bone marrow can be injured by the presence of cadmium.
9. Local exhaust ventilation means fixed or movable exhaust hoods placed as near as practical to the work and able to maintain a capture velocity sufficient to keep airborne contaminants below regulatory limits.
10. The most significant health hazard in the welding process is the generation of toxic metal fumes, vapors, and gases.
11. Gas cylinders need to be secured in an upright position in a safe, dry, well-ventilated place. Flammable substances should not be stored in the same area.
12. The four types of benign pneumoconiosis associated with welding are aluminosis, anthracosis, siderosis, and stannosis.
13. When it is necessary to weld or cut near wood construction or combustible material that cannot be removed or protected, a fire hose, water pump tank extinguisher, or fire pails should be conveniently located. Portable extinguishers for specific protection against Class B and Class C fires should also be provided. Pails of limestone dust or sand may be useful.

ANSWERS—CASE STUDY

1. The inhalation of freshly formed fumes may produce a brief self-limiting illness known as metal fume fever. The condition is characterized by chills, fever, nausea, vomiting, muscular pain, dryness of mouth and throat, headache, fatigue, and weakness. These signs and symptoms usually abate in 12 to 24 hours with complete recovery following. Immunity from this condition is rapidly acquired if exposure occurs daily, but is quickly lost during holidays or over weekends. Because of this behavior, metal fume fever is sometimes known as "Monday morning sickness."
2. To keep fumes, vapors, and other toxic by-products of welding at safe levels, management must ensure that the workplace is properly ventilated. Natural and mechanical ventilation can be used to reduce the levels of airborne contaminants to acceptable levels.

3. Special equipment has been developed to remove welding fumes at their source. For example, fume extraction nozzles using high-velocity, low-volume exhaust units are designed to fit over the end of the hand-held welding torch. The sleeve-like fixture is usually connected to a small exhaust fan by a flexible hose.