SAFE PRACTICES
Health and safety considerations are paramount in all welding, cutting, brazing, and related processes. No activity is satisfactorily completed if personal injury or property damage occurs. This chapter presents an overview of the rules, regulations, and techniques that are implemented to minimize the safety hazards associated with welding, cutting, and allied processes. It examines safety management, the protection of personnel and the work area, process-specific safety considerations, and robotic safety.

The limited scope of this discussion precludes an exhaustive examination of the health and safety considerations related to all welding processes, particularly those involving sophisticated technology. Additional safety and health information relating to the various welding processes is presented in the American National Standard Safety in Welding, Cutting, and Allied Processes, ANSI Z49.1, and in Safety and Health Fact Sheets, the latter of which is available electronically at http://www.aws.org. Further process-specific information is published in Welding Processes, Volume 2 of the American Welding Society’s (AWS) Welding Handbook, 8th edition. The reader is encouraged to consult these sources and others listed in the Bibliography and Supplementary Reading List at the end of this chapter.

SAFETY MANAGEMENT

According to estimates made by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), over 30 million U.S. workers are potentially exposed to one or more chemical hazards from approximately 650,000 hazardous chemical products in the workplace. As these numbers increase with the growing workforce and the introduction of hundreds of new products annually, this situation poses a serious problem for exposed workers and their employers. Of these workers, an estimated 562,000 are at risk for exposure to chemical and physical hazards associated with welding, cutting, and brazing and related activities. Risks include injury from explosion, asphyxiation, electrocution, falling and crushing, and weld flash (burn to the eyes) as well as health hazards associated with overexposure to fumes, gases, or radiation produced or released during welding and related activities. These include lung disease, heavy metal poisoning, and metal fume fever, among others.

The Occupational Safety and Health Act of 1970 was promulgated to ensure safe and healthy working conditions for all workers by providing for the transmission of information, training, education, and research in the field of occupational health and safety. OSHA’s current standards for the welding, cutting and brazing in general industry and construction are based on the 1967 American National Standards Institute (ANSI) standard Z49.1 and the National Fire Protection

2. At the time of the preparation of this chapter, the referenced codes and other standards were valid. If a code or other standard is cited without a date of publication, it is understood that the latest edition of the document referred to applies. If a code or other standard is cited with the date of publication, the citation refers to that edition only, and it is understood that any future revisions or amendments to the code or standard are not included; however, as codes and standards undergo frequent revision, the reader is encouraged to consult the most recent edition.