CHAPTER 10

SAFETY AND HEALTH

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Prepared by:
C. Philp
Brazing & Safety Engineering Consultant
S. Mayers
Pratt & Whitney

Contents

Introduction 194
Historical Background 194
Safety Management 195
General Work Area Safe Practices 198
Personal Protective Equipment 201
Protection against Fumes and Gases 202
Safe Handling of Compressed Gases, Gas Cylinders, and Containers 208
Electrical Safety 212
Fire Prevention and Protection 214
Noise Hazards 214
Ergonomics 215
Process-Specific Safe Practices 216
Combustibility of Metal Powders 222
Bibliography 224
Suggested Reading List 225

CHAPTER 10

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INTRODUCTION

Safety and health are of utmost concern in all brazing operations. This chapter presents an overview of the governmental rules and regulations as well as of the adopted industrial standards that must be implemented. Additionally, other standards, guidelines, and recommended practices that augment legal safety requirements should be implemented to minimize the hazards associated with brazing. Topics discussed include a historical overview, safety management, protection of personnel and the work area, ergonomics, and process-specific safety and health concerns.

The limited scope of this chapter precludes an exhaustive examination of all health and safety concerns related to brazing. Brazing safety is subject to the provisions of the American National Standard *Safety in Welding, Cutting, and Allied Practices*, ANSI Z49.1.[1,2] The requirements of this standard apply to brazing and braze welding, as well as to the other welding and cutting processes. For additional information on safe practices in brazing, the reader is encouraged to consult this document as well as the sources listed in the Bibliography and the Suggested Reading List at the end of this chapter.

HISTORICAL BACKGROUND

The huge demands placed on U.S. production facilities during World War II created a tremendous expansion in the use of welding processes. In mid-1943, it was recognized that some type of code or standard was needed to encourage increased safety for welding and related processes. In 1944, under the auspices of the American Standards Association, the document *Safety in Electric and Gas Welding and Cutting Operations*, American War Standard Z49.1, was drafted and published.

American War Standard Z49.1 was revised several times between 1950 and 1999. Each revision updated the standard in accordance with changing technology and practices. The revisions up to and including 1973 were largely evolutionary and closely preserved the format of the original standard.

In 1983, the standard underwent a major rewrite to incorporate the vast changes in welding, cutting, and allied processes that had occurred during the 40 years of the standard's existence and to clarify the patchwork presentation that had evolved during early revisions. The 1983 edition focused on safety rules to be practiced by welding, cutting, and brazing personnel and enforced by supervision and management. Material concerning building construction and piping installation, over which personnel had little control, was deleted. The 1988 and 1999 revisions followed the same philosophy.

The American Standards Association has become the American National Standards Institute, and *Safety in Electric and Gas Welding and Cutting Operations,* American War Standard Z49.1-1944, is now *Safety in Welding, Cutting, and Allied Processes*, ANSI Z49.1:2005.[3] This edition features a new section on brazing and soldering safety.

The *Occupational Safety and Health (OSH)* Act of 1970[4] was promulgated as law to ensure safe and

1. American National Standards Institute (ANSI) Accredited Standards Committee Z49, *Safety in Welding, Cutting, and Allied Processes,* ANSI Z49.1, Miami: American Welding Society.

2. At the time of the preparation of this chapter, the referenced standards were valid. If a standard is cited without a date of publication, it is understood that the latest edition of the document referred to applies. If a 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 standards undergo frequent revision, the reader is encouraged to consult the most recent edition.

3. American National Standards Institute (ANSI) Accredited Standards Committee Z49, 2005, *Safety in Welding, Cutting, and Allied Processes*, ANSI Z49.1:2005, Miami: American Welding Society.

4. *Occupational Safety and Health (OSH) Act*, 1970, 91st Congress, Public Law 91-596, Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office.