

AWS C1.1M/C1.1:2000 (R2006)
An American National Standard

Recommended Practices for Resistance Welding



American Welding Society



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Recommended Practices for Resistance Welding

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Abstract

This Recommended Practice is a collection of data and procedures that are intended to assist the user in setting up resistance welding equipment to produce resistance welded production parts. While the recommendations included are not expected to be final procedures for every production part or every welding machine, they serve as starting points from which a user can establish acceptable welding machine settings for specific production welding applications.

In some cases, recommended machine data is not available. In these instances, some description of the process is given to assist the reader in determining if the process might be suitable for application.



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Recommended Practices for Resistance Welding

1. Scope

It is the intent of this publication to present current concepts and practices for resistance welding (and related processes) of ferrous and nonferrous metals including coated and dissimilar metals. Where practical, welding schedules are included. In other instances where schedules are too varied or the state-of-the-art is not sufficiently developed, descriptive guidelines are included to enable the user to establish welding procedures to meet its requirements.

It is important to recognize that these recommended practices are not presented as the only conditions for welding the materials and thicknesses shown. Rather they are offered as a guide for setting up welding schedules for any particular fabrication, and may have to be modified according to the specific part conditions and production requirements.

In using the data shown in the tables, it is imperative that reference be made to the appropriate text. Failure to refer to the text may result in misinterpretation of the data in the tables. The text has been kept as brief as possible and all extraneous comments have been omitted.

For more detailed information on the fundamentals of the resistance welding processes and the types of equipment utilized for the different processes, consult the current *AWS Welding Handbook*.

This standard makes use of both the International System of Units (SI) and U.S. Customary Units. The measurements may not be exact equivalents; therefore, each system must be used independently of the other without combining in any way. The standard with the designation C1.1M:2000 uses SI units. The standard designation C1.1:2000 uses U.S. Customary Units. The latter are shown within parenthesis () or in appropriate columns in tables and figures. An inch/millimeter conversion table is found in Table 59.

2. Referenced Documents

- (1) AWS C1.4M/C1.4:2000, *Specification for Resistance Welding of Carbon and Low-Alloy Steels*
- (2) AWS A2.4, *Standard Symbols for Welding, Brazing and Nondestructive Testing*
- (3) AWS A3.0, *Standard Welding Terms and Definitions*
- (4) AWS D8.6, *Standard for Automotive Resistance Spot Welding Electrodes*
- (5) AWS D8.7, *Recommended Practices for Automotive Weld Quality—Resistance Spot Welding*
- (6) AWS D8.9, *Recommended Practices for Test Methods for Evaluating the Resistance Spot Welding Behavior of Automotive Sheet Steels*
- (7) AWS *Welding Handbook*, Volume 2, Eighth Edition, Chapter 17, "Spot, Seam, and Projection Welding," American Welding Society
- (8) AWS PARW, *The Professional's Advisor on Resistance Welding*, American Welding Society
- (9) *Welding Aluminum: Theory and Practice*, Chapter 13 "Resistance Welding," The Aluminum Association,¹ Washington DC, 1991
- (10) ASTM E 340 and E 407, *Annual Book of ASTM Standards*, Vol. 3.01²
- (11) ASM Handbook Volume 8: Mechanical Testing,³ *Resistance Welding Manual*, 4th Edition, Resistance Welder Manufacturers' Association, 1989⁴

¹ AA standards are published by the Aluminum Association, 900 19th Street, NW, Washington, DC 20006.

² ASTM standards are published by the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

³ Available from ASM International, 9639 Kisman Road, Materials Park, OH 44073-0002.

⁴ Available from RWMA, 1900 Arch Street, Philadelphia, PA 19103-1498.