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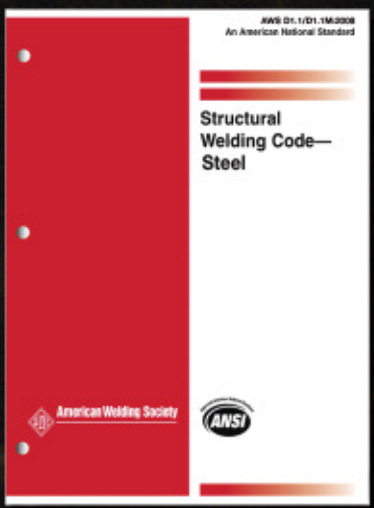

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See page 4

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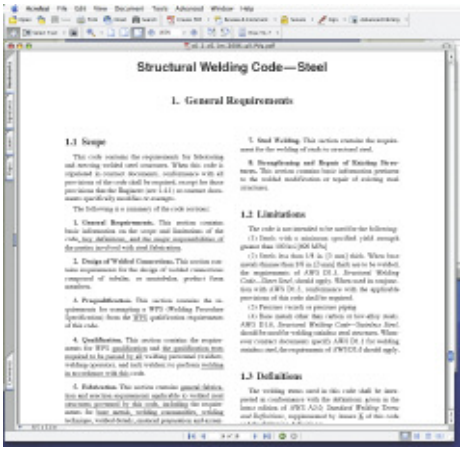
Structural Welding Code—Steel

1. General Requirements

1.1 Scope

1.2 Limitations

1.3 Definitions

Structural

NEW EDITION: D1.1/D1.1M:2008, Structural Welding Code—Steel

For everyone involved in any phase of welding steel structures – engineers, detailers, fabricators, erectors, inspectors, etc. – the new D1.1 spells out the requirements for design, procedures, qualification, fabrication, inspection, and repair of pipe, plate, and structural shapes that are subject to either static or cyclical stresses. D1.1 includes:

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U.S. Customary and SI units of measurement. Approx. 550 pages, 22 annexes, 174 figures, 68 tables, (2008).

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- Provisions for undermatching electrode usage
- Commentary section
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Order Code: AWS D9.1M/D9.1 **$72/$54**

NEW EDITION: D1.3/D1.3M:2008, Structural Welding Code—Sheet Steel *See page 4.*

NEW PUBLICATIONS AND EDITIONS

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A1.1:2001, Metric Practice Guide for the Welding Industry

Explains the base, supplementary, and derived International System of Units (SI), and – most important – the rules. Also covers conversion factors and rules for converting customary inch-pound units to SI units. Contains style and usage recommendations for prefixes, punctuation, number grouping, etc. Includes valuable suggestions on managing transition. *40 pages, (2001).*

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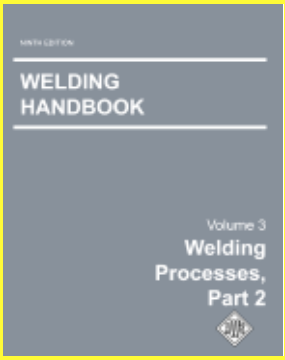

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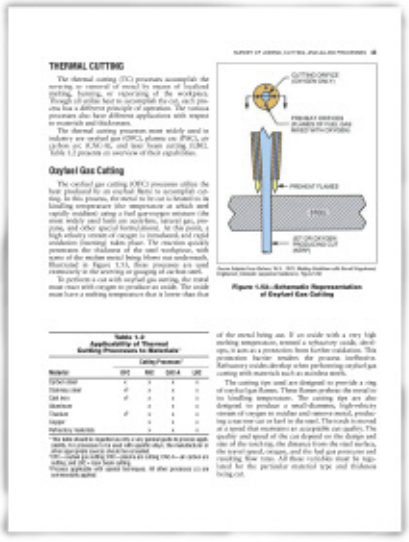
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ANSI Z49.1:2005, Safety in Welding, Cutting, and Allied Processes

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Covers contaminants in the welding environment, including ozone, carbon monoxide, nitric oxide, nitrogen dioxide, and gaseous fluoride. Uses OSHA and NIOSH analytical methods, and the International System of Units (SI). *54 pages, 9 figures, 10 tables, softbound, (2003).*

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Oxyfuel Gas Welding, Cutting, and Heating Safely

Description & preview online. 12 pages, (1990).

Order Code: AWS OWS **(25 copies) $28/$21**

PCWC:2001, Preparing Containers for Welding or Cutting: 2001

Description & preview online. 12 pages, (2001).

Order Code: AWS PCWC **(25 copies) $28/$21**

Safety and Health Fact Sheets

Download individual fact sheets as free PDFs at *www.aws.org/technical/facts*. New and revised fact sheets regularly posted online as they become available.

Safe Practices

Excerpted from the renowned *Welding Handbook* series, this book covers the basic elements of safety applicable to all welding, cutting, and related processes. It addresses subjects such as fumes and gases, precautionary labeling, handling of compressed gases, electrical safety, and hazards unique to particular welding or cutting processes. Includes a supplementary reading list. *42 pages, (1988).*

Order Code: AWS SP **$60/$48**

Ultraviolet Reflectance of Paint

Description & preview online. 124 pages, (1976).

Order Code: AWS ULR **$92/$70**

C4.2/C4.2M:2006, Recommended Practices for Safe Oxyfuel Gas Cutting Torch Operation *See page 18.*

C4.3/C4.3M:2007, Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation *See page 18.*

B2.1:2005, Specification for Welding Procedure and Performance Qualification

Covers all fusion welding processes and an exhaustive array of materials used in metal fabrication. Specifies requirements for the qualification of welding procedures, and for performance qualification of welders and welding operators for manual, semiautomatic, mechanized, and automatic welding.

WELDING PROCESSES INCLUDE:

- Oxyfuel Gas Welding
- Gas Tungsten Arc Welding
- Laser Beam Welding
- Flux Cored Arc Welding
- Electroslag Welding
- Electron Beam Welding
- Shielded Metal Arc Welding
- Submerged Arc Welding
- Gas Metal Arc Welding
- Plasma Arc Welding
- Electrogas Welding
- Arc Stud Welding

B2.1 GIVES COMPLETE COVERAGE OF:

- Base Metals
- Filler Metals
- Qualification Variables
- Testing Requirements

260 pages, 8 annexes, 44 figures, 28 tables, (2005).

Order Code: AWS B2.1 **$156/$117**

B2.1-BMG:2005, Base Metal Grouping for Welding Procedure and Performance Qualification

Key reference for standards that have welding procedure and performance requirements. Lists base and filler metals grouped into categories to minimize qualification testing. Extracted from AWS B2.1. *186 pages, (2006).*

Order Code: AWS B2.1-BMG **$56/$41**

B2.2-91, Standard for Brazing Procedure and Performance Qualification

Specifies requirements for qualification of brazing procedure specifications, brazers, and brazing operators for manual, mechanized, and automatic brazing. *45 pages, 6 annexes, 9 tables, 11 figures, 3 forms (1991).*

Order Code: AWS B2.2 **$64/$48**

NEW PUBLICATION: B2.3/B2.3M:2008, Specification for Soldering Procedure and Performance Qualification

Provides the qualification requirements for soldering procedure specifications and for performance qualification of solderers and operators. *66 pages, 11 tables, 12 figures (2008).*

Order Code: AWS B2.3 **$68/$51**

B2.4:2006, Specification for Welding Procedure and Performance Qualification for Thermoplastics *See page 17.*

B5.1:2003, Specification for the Qualification of Welding Inspectors

Defines qualification requirements for welding inspectors, including experience, satisfactory completion of an examination, and proof of visual acuity. *20 pages, (2003).*

Order Code: AWS B5.1 **$52/$39**
FREE - Download at *www.aws.org/certification/docs*

B5.2:2001, Specification for the Qualification of Welding Inspector Specialists and Welding Inspector Assistants

Description & preview online. 20 pages, (2001).

Order Code: AWS B5.2 **$52/$39**

B5.4:2005, Specification for the Qualification of Welder Test Facilities

Details qualification methods and test facility and assessment requirements including personnel, organization, procedures, equipment, and capability. Includes a non-mandatory annex covering qualification of assessors. *22 pages, 6 chapters, 4 annexes, (2005).*

Order Code: AWS B5.4 **$52/$39**
FREE - Download at *www.aws.org/certification/docs*

B5.5:2000, Specification for the Qualification of Welding Educators

26 pages, 1 mandatory annex, 1 non-mandatory annex, (2000).

Order Code: AWS B5.5 **$52/$39**
FREE - Download at *www.aws.org/certification/docs*

B5.9:2006, Specification for the Qualification of Welding Supervisors

ANSI Approved. 18 pages, (2006).

Order Code: AWS B5.9 **$48/$36**
FREE - Download at *www.aws.org/certification/docs*

B5.14:2002, Specification for the Qualification of Welding Sales Representatives

12 pages, (2002).

Order Code: AWS B5.14 **$48/$36**

B5.15:2003, Specification for the Qualification of Radiographic Interpreters

Defines requirements for qualification of radiographic interpreters, including experience, knowledge, and skills unique to interpretation of radiographic media and determination of acceptance criteria for weldments and adjacent base metal. Essential to the competence of individuals engaged in radiographic interpretation are training and work experience in radiographic theory, procedures, weld and adjacent base metal defect recognition, radiographic processing, handling, storage, and code requirements relating to radiographic acceptance criteria. *16 pages, (2003; amended 2007).*

Order Code: AWS B5.15 **$48/$36**
FREE - Download at *www.aws.org/certification/docs*

B5.16:2006, Specification for the Qualification of Welding Engineers

20 pages, (2006).

Order Code: AWS B5.16 **$52/$39**
FREE - Download at *www.aws.org/certification/docs*

B5.17:2008, Specification for the Qualification of Welding Fabricators

20 pages, (2008).

Order Code: AWS B5.17 **$52/$39**
FREE - Download at *www.aws.org/certification/docs*

C1.5:2005, Specification for the Qualification of Resistance Welding Technicians

Establishes requirements for qualification of resistance welding technicians. Defines minimum experience, examination, application, qualification, and requalification requirements and methods. Provides a method for technicians to establish a record of their qualification and abilities, such as development of machine troubleshooting, processes controls, quality standards, and problem solving. *16 pages, 2 annexes, (2005).*

Order Code: AWS C1.5 **$48/$36**

C2.16/C2.16M:2002, Guide for Thermal-Spray Operator Qualification *See page 16.*

NEW PUBLICATION: C7.4/C7.4M:2008, Process Specification and Operator Qualification for Laser Beam Welding *See page 19*

D16.4M/D16.4:2005, Specification for the Qualification of Robotic Arc Welding Personnel

Provides requirements for the qualification of robotic arc welding support personnel at three different levels: CRAW-L1, CRAW-O, and CRAW-T. The revisions in this edition align education and experience requirements more realistically with those in industry. This standard is the basis for the AWS Certification of Robotic Arc Welding Personnel (CRAW) program. (See AWS QC19:2002 on page 14.) *22 pages, 2 annexes, 3 figures, 4 tables, (2005).*

Order Code: AWS D16.4M/D16.4 **$52/$39**
FREE - Download at *www.aws.org/certification/docs*

EG2.0:2006, Curriculum Guide for Training and Qualification of Welding Personnel—Entry Welder

A competency-based curriculum guideline detailing the minimum acceptable skill requirements for training and qualifying entry-level welders. *162 pages, (2006).*

Order Code: AWS EG2.0 **$64/$48**
ELW Set (EG2.0:2006 and QC10:2004) **$76/$57**

EG3.0-96, Guide for the Training and Qualification of Welding Personnel: Level II—Advanced Welders

A competency-based curriculum guideline detailing the minimum acceptable skill requirements for training and qualifying advanced welders. *168 pages, (1996).*

Order Code: AWS EG3.0 **$32/$24**
ELW Set B (EG3.0-96 and QC11-96) **$76/$57**

EG4.0-96, Guide for the Training and Qualification of Welding Personnel: Level III – Expert Welders

A competency-based curriculum guideline detailing the minimum acceptable skill requirements for training and qualifying expert welders. *158 pages, (1996).*

Order Code: AWS EG4.0 **$36/$27**
ELW Set C (EG4.0-96 and QC12-96) **$76/$57**

ELW Set D (pkg. of 6 documents: EG2.0: 2006, EG3.0-96, EG4.0-96, QC10:2004, QC11-96, QC12-96) **$200/$150**

G1.6:2006, Specification for the Qualification of Plastics Welding Inspectors for Hot Gas, Hot Gas Extrusion, and Heated Tool Butt Thermoplastic Welds

Defines the qualification requirements for plastics welding inspectors. *22 pages, (2006).*

Order Code AWS G1.6 **$52/$39**

The Professional's Advisor on Procedure Qualification Variables

Provides insight and guidance in the preparation of Welding Procedure Specifications and Procedure Qualification Records for D1.1, D1.5, B2.1, ASME IX, and API 1104; and highlights differences in documentation and qualification requirements. Concentrates on common arc welding processes, including submerged arc welding, shielded metal arc welding, gas metal arc welding, flux cored arc welding, and gas tungsten arc welding. Not to be used in lieu of applicable standards and codes, which provide authoritative and comprehensive requirements for Welding Procedure Specifications and Procedure Qualification Records. *132 pages, spiral bound, tabbed, 5½" x 8½", (2006).*

Order Code: AWS PAPQV **$92/$69**

CM:2000, Certification Manual for Welding Inspectors

Self-study to prepare for AWS welding inspector exams

The best-selling reference and introduction used by thousands of CWI examination candidates since 1977.Chapters cover the welding inspector's responsibilities; standards; joint geometry and terminology; symbols; weldability; destructive testing; procedure and welder qualification; welding, brazing, and cutting processes; discontinuities; nondestructive examination; and inspector reports. Each chapter concludes with a self-administered test similar in content and style to the actual CWI exam questions. Features a contemporary layout that includes tip boxes. This book has been invaluable to literally thousands of CWI applicants who studied on their own for the AWS CWI exam. Edited by Eugene Hornberger, SCWI. *314 pages, 11 chapters, 152 figures, 23 drawings, 8 tables, (2000), 4th edition.*

Order Code: AWS CM **$180/$135**

CMWS:2005, Certified Welding Supervisor Manual for Quality and Productivity Improvement *See page 12.*

GWF-98, Guide for Setting Up a Welder Training Facility

Defines the physical requirements of a welding instruction facility. Intended to give step-by-step guidance to institutions that want to build or convert facilities for welder training. *20 pages, (1998).*

Order Code: AWS GWF **$52/$39**

NEW EDITION: Code Clinic for Study of AWS D1.1:2008 Structural Welding Code—Steel, Reference Manual

Official textbook for CWI preparatory seminar. Helps CWI candidates prepare for the open-book portion of the CWI examination, which tests ability to navigate through a code and find correct answers within a specified time. Includes practice questions similar to the exam questions, and the answers. *Approx. 79 pages, 9 chapters, 34 illustrations, (2008).*

Order Code: AWS D1.1 CCRM **$76/$57**

NEW EDITION: Study Guide for API Standard 1104 Welding of Pipelines and Related Facilities

Official textbook for CWI preparatory seminar. Helps CWI candidates prepare for the open-book portion of the CWI examination, which tests ability to navigate through a code and find correct answers within a specified time. Includes test questions similar to the exam questions, and the answers. *Approx. 99 pages, 2 tables, 8 figures, (2008).*

Order Code: AWS API-M **$76/$57**

NEW EDITION: Visual Inspection Workshop Reference Manual, 4th edition

Official textbook for CWI preparatory seminar. Helps CWI candidates prepare for the hands-on portion of the CWI examination. Includes information on use of visual inspection tools and sample exam questions and answers. *Approx. 129 pages, 4 chapters, 80 illustrations, (2008).*

Order Code: AWS VIW-M **$76/$57**

Certification

Call 800-443-9353, ext. 273, for a free copy of the standards below (except QC10, QC11, and QC12), or download them from www.aws.org/certification

QC1:2007, Standard for AWS Certification of Welding Inspectors

The Certified Welding Inspector (CWI) program identifies proven professionals who improve product quality through early detection of flaws and defects. Since 1976, over 52,000 professionals have earned CWI certification. *12 pages, (2007).*

FREE - Download at *www.aws.org/certification*

QC4-89, Standard for Accreditation of Test Facilities for AWS Certified Welder Program

12 pages, (1989).

FREE - Download at *www.aws.org/certification*

QC5-91, AWS Standard for Certification of Welding Educators

10 pages, (1991).

FREE - Download at *www.aws.org/certification*

QC7-93, Standard for AWS Certified Welders

10 pages, (1993).

FREE - Download at *www.aws.or*

QC7-93 Supplement C, Welder Performance Qualification Sheet Metal Test Requirements

38 pages, (1993).

FREE - Download at *www.aws.org/certification*

QC7-93 Supplement F, Chemical Plant and Petroleum Refinery Piping

22 pages, (1993).

FREE - Download at *www.aws.org/certification*

QC7-93 Supplement G, AWS Performance Qualification Test

10 pages, (1993).

FREE - Download at *www.aws.org/certification*

QC10:2004, Specification for Qualification and Registration of Level I— Entry Welders

(Description & preview online.) 34 pages, (2004).

Order Code: AWS QC10 **$24/$18**

QC11-96, Specification for Qualification and Certification for Level II— Advanced Welders

(Description & preview online.) 38 pages, (1996).

Order Code: AWS QC11 **$24/$18**

QC12-96, Specification for Qualification and Certification for Level III— Expert Welders

(Description & preview online.) 32 pages, (1996).

Order Code: AWS QC12 **$48/$36**

QC13:2006, Specification for the Certification of Welding Supervisors

16 pages, (2007).

FREE - Download at *www.aws.org/certification*

NEW: QC15:2008, Specification for the Certification of Radiographic Interpreters

16 pages, (2008).

FREE - Download at *www.aws.org/certification*

NEW: QC17:2008, Specification for AWS Accreditation of Certified Welding Fabricators

14 pages, (2008).

FREE - Download at *www.aws.org/certification*

QC19:2002, Standard for the AWS Certification of Robotic Arc Welding Personnel

24 pages, (2002).

FREE - Download at *www.aws.org/certification*

CM:2000, Certification Manual for Welding Inspectors

See page 11.

CMWS:2005, Certified Welding Supervisor Manual for Quality and Productivity Improvement

Self-study guide for the AWS Certified Welding Supervisor certification exam. Will appeal to everyone concerned with enhancing productivity in the welding workplace. Reviews management systems for welding supervisors, requirements of welds, detailed descriptions of four welding processes (SMAW, GMAW, FCAW, and SAW), welding metallurgy, welding symbols, welding instructions, welding economics, the application of welding standards, welding inspection, health and safety, and work reports and records. The welding economics chapter will help the welding supervisor estimate and control costs for welding jobs. Each chapter includes practice questions and additional references. *400 pages, 14 chapters, (2005).*

Order Code: AWS CMWS **$180/$135**

AWS Certification Schedule

Certification Seminars, Code Clinics and Examinations

Applications due 6 weeks before the scheduled seminar or exam. Late applications will be assessed a $250 Fast Track fee.

Certified Welding Inspector (CWI)

The CWI certification is widely recognized, both nationally and internationally, in the welding industry. Successful companies have come to rely on this AWS certification when ensuring the highest level of quality workmanship. The CWI examination is made up of three parts: Part A: Fundamentals (150 questions), Part B: Practical (46 questions) and Part C: Code Book (minimum 46 questions). The only way to qualify is by submitting a completed CWI application. Purchasing a seminar package that includes the cost of the exam does not automatically ensure registration for the exam.

Location	Seminar Date	Exam Date
Miami, FL	Aug. 3-8	Aug. 9
San Diego, CA	Aug. 3-8	Aug. 9
Charlotte, NC	Aug. 10-15	Aug. 16
San Antonio, TX	Aug. 10-15	Aug. 16
Rochester, NY	EXAM ONLY	Aug. 16
Bakersfield, CA	Aug. 17-22	Aug. 23
Portland, ME	Aug. 17-22	Aug. 23
Salt Lake City, UT	Aug. 17-22	Aug. 23
Houston, TX	Sept. 7-12	Sept. 13
Pittsburgh, PA	Sept. 7-12	Sept. 13
Seattle, WA	Sept. 7-12	Sept. 13
Miami, FL	EXAM ONLY	Sept. 18
Las Vegas, NV	Sept. 14-19	Sept. 20
Minneapolis, MN	Sept. 14-19	Sept. 20
St. Louis, MO	Sept. 14-19	Sept. 20
Corpus Christi, TX	EXAM ONLY	Sept. 20
Anchorage, AK	EXAM ONLY	Sept. 20
Miami, FL	Oct. 19-24	Oct. 25
New Orleans, LA	Oct. 19-24	Oct. 25
Tulsa, OK	Oct. 19-24	Oct. 25
Long Beach, CA	Oct. 26-31	Nov. 1
Newark, NJ	Oct. 26-31	Nov. 1
Portland, OR	Oct. 26-31	Nov. 1
Cleveland, OH	Nov. 2-7	Nov. 8
Atlanta, GA	Nov. 16-21	Nov. 22
Dallas, TX	Nov. 16-21	Nov. 22
Roanoke, VA	Nov. 16-21	Nov. 22
Corpus Christi, TX	EXAM ONLY	Nov. 22
Sacramento, CA	Nov. 30-Dec. 5	Dec. 6
Spokane, WA	Nov. 30-Dec. 5	Dec. 6
Syracuse, NY	Nov. 30-Dec. 5	Dec. 6
St. Louis, MO	EXAM ONLY	Dec. 6
Miami, FL	Dec. 7-12	Dec. 13
Reno, NV	Dec. 7-12	Dec. 13

9-Year Recertification for CWI and SCWI

For current CWIs and SCWIs needing to meet education requirements without taking the exam. If needed, recertification exam can be taken at any site listed under Certified Welding Inspector.

Location	Seminar Dates	
Miami, FL	Aug. 4-9	NO EXAM
Orlando, FL	Sept. 8-13	NO EXAM
Dallas, TX	Oct. 20-25	NO EXAM
Miami, FL	Dec. 1-6	NO EXAM

Certified Welding Educator (CWE)

Seminar and exam are given at all sites listed under CWI. Seminar attendees will not attend the Code Clinic portion of the seminar (usually first two days).

Senior Certified Welding Inspector (SCWI)

Exam can be taken at any site listed under Certified Welding Inspector. No preparatory seminar is offered.

Certified Welding Supervisor (CWS)

Welding Supervisors can make a valuable contribution to the four most important metrics in welding operations: quality, cost, productivity and safety. Often the underlying cause of a supervisor's inability to improve productivity can be traced to inadequate knowledge and the minimal amount of time that a supervisor actually spends with welders. The CWS program was created to rectify these conditions by offering welding supervisors and their companies the opportunity to put the welding supervisor in a support position for the welders, making them the most productive and best they can be. This innovative program identifies a body of knowledge all welding supervisors should know and understand in order to increase productivity and improve weld quality. The CWS exam can also be taken at any site where CWI exams are given.

Location	Seminar Dates	Exam Date
Philadelphia, PA	Aug. 18-22	Aug. 23
Atlanta, GA	Sept. 15-19	Sept. 20
Tulsa, OK	Oct. 20-24	Oct. 25
Atlanta, GA	Nov. 17-21	Nov. 22
Long Beach, CA	Dec. 8-12	Dec. 13

CWS exams are also given at all CWI exam sites.

Certified Radiographic Interpreter (CRI)

The AWS RI training and certification program assures employers and practitioners alike that the principles of radiographic interpretation are reliably applied to the examination of welds. If your job responsibilities include reading and interpretation of weld radiographs, this program is for you. You'll learn proper film exposure, correct selection of penetrameters, characterization of indications, and use of acceptance criteria as expressed in the AWS, API, and ASME codes. RI certification can be a stand-alone credential or can be an endorsement to your CWI or SCWI certification that can exempt you from your next 9-Year Recertification.

Location	Seminar Dates	Exam Date
St. Louis, MO	Aug. 18-22	Aug. 23
Denver, CO	Sept. 15-19	Sept. 20
Philadelphia, PA	Oct. 20-24	Oct. 25
Seattle, WA	Nov. 17-21	Nov. 22
Jacksonville, FL	Dec. 8-12	Dec. 13

Radiographic Interpreter certification can be a stand-alone credential or can exempt you from your next 9-Year Recertification.

Certified Welding Fabricator

This program is designed to certify companies to specific requirements in the ANSI standard AWS B5.17, *Specification for the Qualification of Welding Fabricators*. Call (800) 443-9353 ext. 211 for more information.

Code Clinics & Individual Prep Courses

The following workshops are offered at all sites where the CWI seminar is offered (code books not included with individual prep courses): Welding Inspection Technology (general knowledge and prep course for CWI Exam-Part A); Visual Inspection Workshop (prep course for CWI Exam-Part B); and D1.1 and API-1104 Code Clinics (prep courses for CWI Exam-Part C).

On-site Training and Examination

On-site training is available for larger groups or for programs that are customized to meet specific needs of a company. Call (800)443-9353 ext. 455 for more information.

International CWI Training and Exams

AWS training and certification for CWI and other programs are offered in many countries. For international certification program schedules and contact information, please visit http//:www.aws.org/certification/inter_contact.html

Visit www.aws.org/certification for applications and more information.

Testing and Inspection

For brazing inspection/testing standards, see page 22.
For plastics inspection/testing standards, see page 17.
For thermal spray inspection standards, see page 16.

B1.10:1999, Guide for the Nondestructive Examination of Welds

Addresses which examination method – visual, penetrant, magnetic, radiographic, ultrasonic, electromagnetic (eddy current), or leak testing – best detects various types of discontinuities. Note: Does not address acceptance criteria. *48 pages, 4 annexes, 29 figures, 4 tables, (1999), third edition.*

Order Code: AWS B1.10 **$104/$78**

B1.11:2000, Guide for the Visual Examination of Welds

Provides guidance on visual examination of welds, including sections on prerequisites, fundamentals, surface conditions, and equipment. Sketches and color photographs illustrate common weld discontinuities. *42 pages, 3 annexes, 48 figures, (2000).*

Order Code: AWS B1.11 **$104/$78**

B4.0:2007, Standard Methods for Mechanical Testing of Welds

Describes the most common mechanical test methods applicable to welds and welded joints. Each test method gives details concerning specimen preparation, test parameters, testing procedures, and suggested report forms. Acceptance criteria are not included. Three new weldability tests (WIC, trough, and GBOP) and resistance weld tests have been included in this new edition. (Note: Joint tests for brazements are covered in AWS C3.2M/C3.2.) U.S. Customary Units. *152 pages, 97 figures, (2007).*

Order Code: AWS B4.0 **$104/$78**

B4.0M:2000 (metric only)

Metric only. 114 pages, 64 figures, (2000).

Order Code: AWS B4.0M **$88/$66**

WI:2000, Welding Inspection Handbook

This invaluable training reference helps inspectors, engineers, and welders evaluate the difference between discontinuities and rejectable defects. Includes chapters on:

- Operations
- Safety
- Ferrous Welding Metallurgy
- Discontinuities
- Qualification of Welders
- Proof Tests
- Metrics
- Symbols
- Inspection
- QA
- Preheating/Postweld Heat Treating
- Qualification of Procedures
- Destructive Testing
- Nondestructive Examination
- Standards

254 pages 18 chapters, index, 108 figures, 16 tables, 6½" x 9", (2000), third edition.

Order Code: AWS WI **$76/$57**

NEW EDITION: WIT-T:2008, Welding Inspection Technology

For at-home study, this official reference textbook for the three-day AWS core seminar for CWI exam preparation is readable, informative, and comprehensive. *Approx. 344 pages, 10 modules, 379 figures and photographs, (2008).*

Order Code: AWS WIT-T **$272/$204**

NEW EDITION: WIT-W:2008, Welding Inspection Technology Workbook

A companion to *Welding Inspection Technology*. *Approx. 84 pages, (2008).*

Order Code: AWS WIT-W **$72/$54**

NEW EDITION: WIT-E:2008, Welding Inspection Technology Sample CWI Fundamentals Examination

This study aid, used at the CWI seminar, is also a good home-study tool for exam preparation. Contains approximately 224 practice questions, 2 tables, and answer key. *Approx. 41 pages, (2008), sixth edition.*

Order Code AWS WIT-E ....$60/$45

The Practical Reference Guide for Radiographic Inspection Acceptance Criteria

Description & preview online. 36 pages, charts and diagrams, (1995).

Order Code: AWS PRG **$56/$41**

The Everyday Pocket Handbook for Visual Inspection and Weld Discontinuities— Causes and Remedies

See page 29.

The Everyday Pocket Handbook for Visual Inspection of AWS D1.1 Structural Welding Code's Fabrication and Welding Requirements

See page 29.

The Practical Reference Guide for Welding Inspection Management— Visual Inspection of Pressure Vessels and Pressure Piping

See page 23.

G1.2M/G1.2:1999, Specification for Standardized Ultrasonic Welding Test Specimen for Thermoplastics

See page 17.

G1.6:2006, Specification for the Qualification of Plastics Welding Inspectors for Hot Gas, Hot Gas Extrusion, and Heated Tool Butt Thermoplastic Welds

See page 17.

G1.10M:2001, Guide for the Evaluation of Hot Gas, Hot Gas Extrusion, and Heated Tool Butt Thermoplastic Welds

See page 17.

Base Metal Weldability

C1.4M/C1.4:1999, Specification for Resistance Welding of Carbon and Low-Alloy Steels

Description & preview online. ANSI Approved. 28 pages, 9 sections, 5 figures, 6 tables, (1999).

Order Code: AWS C1.4M/C1.4 **$52/$39**

D11.2-89(R2006), Guide for Welding Iron Castings

Description & preview online. 135 pages, 69 figures, 26 tables, (Reaffirmed 2006).

Order Code: AWS D11.2 **$96/$72**

G2.1M/G2.1:2002, Guide for the Joining of Wrought Nickel-Based Alloys

The definitive guide to welding metals and alloys not covered by other standards. Learn the guidelines for welding different wrought nickel-based alloys, including solid-solution and precipitation-hardening alloys. *56 pages, 5 figures,17 tables, (2003).*

Order Code: AWS G2.1M/G2.1 **$64/$48**

G2.4/G2.4M:2007, Guide for the Fusion Welding of Titanium and Titanium Alloys

Best practices to allow first-time users of titanium as well as established fabricators to join titanium parts into quality components. *52 pages, 5 annexes, 8 figures, 20 tables, (2007)*

Order Code AWS G2.4/G2.4M **$64/$48**

The Practical Reference Guide for Corrosion of Welds—Causes and Cures

Description & preview online. 28 pages, 44 photographs, (1999).

Order Code: AWS PRGC **$52/$39**

The Practical Reference Guide for High Quality Fusion Welding of Aluminum

Description & preview online. 20 pages, illustrations, photos, (2001).

Order Code: AWS PRGQA **$52/$39**

The Practical Reference Guide to Welding Titanium

Description & preview online. 16 pages, 5 tables, (1999).

Order Code: AWS PRGT **$48/$36**

The Practical Reference Guide to Welding Aluminum in Commercial Applications

Description & preview online. 38 pages, 24 figures, 14 tables, (2002).

Order Code: AWS PRGWA **$56/$41**

The Practical Reference Guide to Welding Metallurgy—Key Concepts for Weldability

If you're not ready for the depth of George Linnert's *Welding Metallurgy*, then this guide is for you. An intelligent introduction for the engineer new to welding, and the up-and-coming senior technician. Tables and figures support these topics: metal structures, metal forms, diffusion, solid solubility, residual stress, shielding and purging, phase transformation, hardness and hardenability, grain size, stainless steels, aluminum and its alloys, copper and its alloys, refractory alloys, and repair welding. *34 pages, 32 figures, (1999).*

Order Code: AWS PRGWM **$56/$41**

The Professional's Advisor on Welding of Stainless Steels

Focuses mainly on austenitic stainless steels (200 and 300 series). Also covers ferritic and martensitic (400 series), precipitation-hardening series, and duplex stainless steels. Contains chapters on definitions, stainless steel filler materials, preweld cleaning and preparation, welding and cutting of stainless steels, postweld cleaning, heat treatments, weld discontinuities and defects, stainless steels in welding codes and standards, and safety and health considerations. Compiler/editor Dr. Richard Campbell. *103 pages, 13 figures, 47 tables, spiral-bound. 5½" x 8½", (1999).*

Order Code: AWS PASS **$84/$63**

Welding Zinc-Coated Steels

Results of a four-year work program sponsored by the International Lead Zinc Research Organization (ILZRO), provides procedures and safe practices. *144 pages, (1972).*

Order Code: AWS WZC **$100/$75**

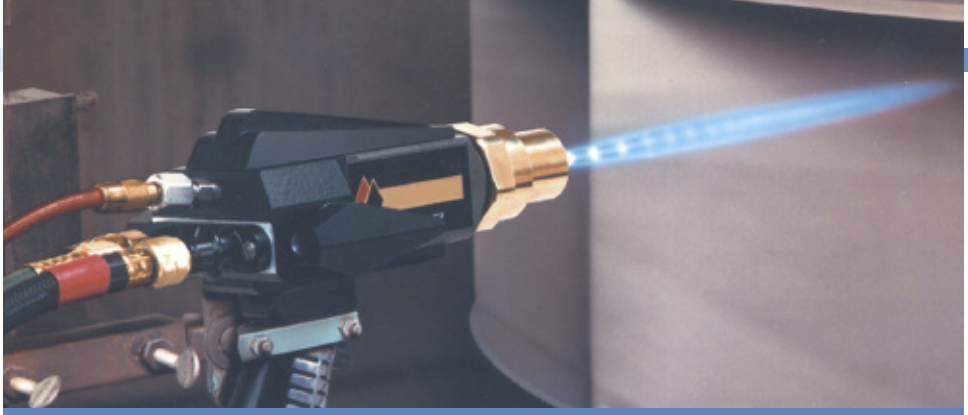
Guide to Weldability: Carbon and Low-Alloy Steels

Aimed at those responsible for the operation of fabrication shops and maintenance/repair facilities, this guide helps the non-welding engineer in the selection of method, materials, and procedures to produce the "desired results and stay out of trouble." Chapters include "Questions (you need to ask)," "Key Background Information," "What Happens When You Weld," "Selection of Proper Electrodes and Rods," "Weld Defects and Causes," "Weld Examination and Testing," and "Postweld Treatments." Also contains information on good practice and sources of other information. Provides specifics on:

- The effects of common alloying elements – carbon, silicon, chromium, and molybdenum – on carbon steels
- Calculation of carbon equivalents
- Why welding has been called "a mini steelmaking process"
- Determination of cracking susceptibility
- What happens when a weld cools
- The effect of hydrogen migration on weld integrity
- Metallurgically related or induced defects
- When to preheat, and when not to
- When to select an electrode that produces weld metal with tensile strength higher – or lower – than the base metal
- What mechanical tests can tell you
- What defects the naked eye can find easily in a weld cross section

Compiled from information taken from the *Welding Handbook*, George E. Linnert's *Welding Metallurgy*, *ASM Handbook*, and *Jefferson's Welding Encyclopedia*, among others. Edited/compiled by Fritz Saenger, Jr., PE, IWE. *51 pages, 9 chapters, 2 appendices, 20 figures, 14 tables, (2005).*

Order Code: AWS GTW **$60/$45**



Thermal Spraying

C2.16/C2.16M:2002, Guide for Thermal-Spray Operator Qualification

Description & preview online. 86 pages, (2002).

Order Code: AWS C2.16 **$76/$57**

C2.18-93, Guide for the Protection of Steel with Thermal Sprayed Coatings of Aluminum and Zinc and Their Alloys and Composites

Authoritative guide to select, plan, and control thermal sprayed coatings for preservation of steel. Indispensable for purchasers, architects, managers, supervisors, and contractors in the construction, marine, railroad, fabrication, and repair industries. *40 pages, 13 tables, (1993).*

Order Code: AWS C2.18 **$60/$45**

C2.20/C2.20M:2002, Specification for Thermal Spraying Zinc Anodes on Steel Reinforced Concrete

Description & preview online. 40 pages, 3 figures, 5 tables, (2003).

Order Code: AWS C2.20/C2.20M **$60/$45**

C2.21M/C2.21:2003, Specification for Thermal Spray Equipment Acceptance Inspection

Specifies thermal spray equipment acceptance requirements for plasma, arc-wire, flame-powder, flame-wire, flame-rod, and flame-cord, and high-velocity oxygen fuel equipment. Contains inspection report forms. *28 pages, (2004).*

Order Code: AWS C2.21M/C2.21 **$52/$39**

C2.23M/C2.23:2003, Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel

Covers safety, job reference standards, equipment setup and preparation, surface preparation, aluminum and zinc application, and sealer and topcoat application. Does not cover design and fabrication, thermal spray equipment qualification, coating selection, and operator and inspector certification. Same as NACE No. 12, SSPC-CS 23.00. *48 pages, 9 figures, 5 tables, (2003).*

Order Code: AWS C2.23M/C2.23 **$60/$45**

C2.25/C2.25M:2002, Specification for Thermal Spray Feedstock—Solid and Composite Wire and Ceramic Rods

Description & preview online. 26 pages, 4 figures, 7 tables, (2002).

Order Code: AWS C2.25/C2.25M **$52/$39**

Thermal Spray Manual

Description & preview online. 176 pages, 12 chapters, glossary, (1996).

Order Code: AWS TSM **$112/$84**

Thermal Spraying Practice, Theory, and Application

Description & preview online. 194 pages, 48 figures, 59 tables (1985).

Order Code: AWS TSS **$120/$90**

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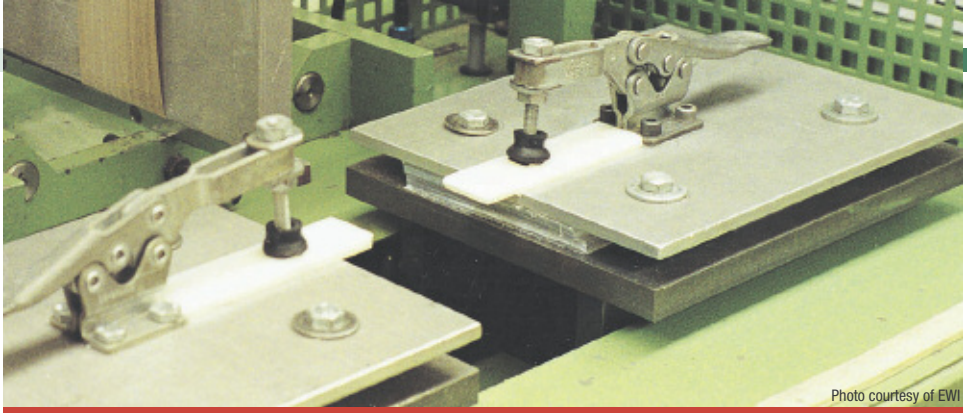

Photo courtesy of EWI

Plastics

B2.4:2006, Specification for Welding Procedure and Performance Qualification for Thermoplastics

Includes requirements for qualification of Welding Procedure Specifications, welders, and welding operators for manual, semi-automatic, mechanized, and automatic welding. Covers electrofusion, hot gas, socket fusion, butt contact fusion, infrared, extrusion welding, and flow fusion welding processes, as well as base materials, filler materials, qualification variables, and testing requirements. *Adopted by NBIC. 42 pages, 21 figures, 11 tables, 1 mandatory annex, 1 non-mandatory annex, (2006).*

Order Code: AWS B2.4 **$60/$45**

G1.1M/G1.1:2006, Guide to Ultrasonic Assembly of Thermoplastics

Details the ultrasonic equipment and processes used in fabricating thermoplastic parts. *94 pages, 45 figures, 9 tables, (2006).*

Order Code AWS G1.1M/G1.1 **$72/$54**

G1.2M/G1.2:1999, Specification for Standardized Ultrasonic Welding Test Specimen for Thermoplastics

Description & preview online. 28 pages, (1999).

Order Code: AWS G1.2M/G1.2 **$52/$39**

G1.6:2006, Specification for the Qualification of Plastics Welding Inspectors for Hot Gas, Hot Gas Extrusion, and Heated Tool Butt Thermoplastic Welds

Defines the qualification requirements for plastics welding inspectors. *22 pages, (2006).*

Order Code AWS G1.6 **$52/$39**

G1.10M:2001, Guide for the Evaluation of Hot Gas, Hot Gas Extrusion, and Heated Tool Butt Thermoplastic Welds

Description & preview online. 44 pages, (2001).

Order Code: AWS G1.10M **$60/$45**

Welding and Cutting Processes

C1.1M/C1.1:2000 (R2006), Recommended Practices for Resistance Welding

Covers resistance spot, seam, projection, flash, and upset welding, as well as weld bonding for uncoated and coated carbon and low-alloy steels, aluminum alloys, stainless steels, nickel, nickel-base alloys, cobalt-base alloys, copper and its alloys, and titanium and its alloys. Details equipment and its setup, welding variables, joint preparation, cleaning, welding schedules and parameters, weld quality testing, safety, and health. *116 pages, 36 figures, 59 tables, (Reaffirmed 2006).*

Order Code: AWS C1.1M/C1.1 **$88/$66**

C4.1-77 Set, Criteria for Describing Oxygen-Cut Surfaces, and Oxygen Cutting Surface Roughness Gauge

Consists of a plastic gauge with samples of oxygen-cut surfaces, a list of descriptive terms, and an accompanying chart. *5 pages.*

Order Code: AWS C4.1 SET **$56/$42**

C4.2/C4.2M:2006, Recommended Practices for Safe Oxyfuel Gas Cutting Torch Operation

Revised and expanded, describes the oxyfuel gas cutting process and presents the latest procedures and safety requirements, using terminology and practices compatible with International Organization for Standardization (ISO) documents. Illustrations show torch and nozzle configurations, and examples of production-cut surfaces. *44 pages, 4 annexes, 20 figures, 4 tables, (2006).*

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C4.3/C4.3M:2007, Recommended Practices for Safe Oxyfuel Gas Heating Torch Operation

Describes the best and most practical methods for safe and effective operation of oxyfuel gas heating torches, including information on equipment safety, setup, shutdown and operating procedures, and equipment maintenance. *36 pages, 10 figures, 4 tables, (2007).*

Order Code: AWS C4.3/C4.3M **$56/$42**

C4.4/C4.4M:2007, Recommended Practices for Heat Shaping and Straightening with Oxyfuel Gas Heating Torches

Describes methods and techniques for shaping and straightening metal parts (including steel plate, pipes, angles, channel, T bar, and compound structures) by careful application of heat. Presents theory and mathematical formulas for developing heat shaping patterns. Other topics include oxyfuel gas equipment (torches, tips, regulators, fuel gases, gas cylinders, and bulk supply); torch procedures for spot, line, and V heating patterns; and safety procedures. Figures show where to place heating patterns for straightening, forming, or bending. *56 pages, 39 figures, 4 tables, (2007).*

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Description & preview online. 18 pages, SI (metric) units, (2006).

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C5.1-73, Recommended Practices for Plasma Arc Welding

Description & preview online. 76 pages, (1973).

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C5.2:2001, Recommended Practices for Plasma Arc Cutting and Gouging

Description & preview online. 52 pages, 22 figures, 3 tables, (2001).

Order Code: AWS C5.2 **$64/$48**

C5.3:2000, Recommended Practices for Air Carbon Arc Gouging and Cutting

Description & preview online. 32 pages, 11 figures, 10 tables, (2000).

Order Code: AWS C5.3 **$56/$42**

C5.4-93, Recommended Practices for Stud Welding

Description & preview online. 44 pages, 37 figures, 11 tables, (1993).

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C5.5/C5.5M:2003, Recommended Practices for Gas Tungsten Arc Welding

Provides a fundamental explanation of the gas tungsten arc welding process, describes basic practices and concepts, and outlines advanced methods and applications. Addresses current uses of gas tungsten arc welding in the metal-

fabricating industry, new applications, and advances in research and development. Presents many practical recommendations on the use of gas tungsten arc welding, and a handy trouble-shooting section. Contents include process advantages and limitations; equipment and supplies; tungsten electrodes; gas shielding, purging, and backing; fixturing and tooling; welding techniques; quality control; troubleshooting and safety; joint design, preparation, and welding positions; and welding characteristics of selected alloys. *130 pages, 79 figures, 22 tables, (2003).*

Order Code: AWS C5.5/C5.5M **$96/$72**

C5.6-89R, Recommended Practices for Gas Metal Arc Welding

Learn from this document about the basic concepts of the gas metal arc welding (GMAW) process, including metal transfer modes, the nature of the process variables, and the necessary equipment and consumables. You'll obtain a fundamental understanding of GMAW and its variations, such as short circuit, spray, and pulse modes of metal transfer. *76 pages, (Reaffirmed 1994).*

Order Code: AWS C5.6 **$72/$54**

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Description & preview online. 68 pages, 23 figures, 14 tables. (Reaffirmed 2006).

Order Code: AWS C5.7 **$68/$52**

C5.10/C5.10M:2003, Recommended Practices for Shielding Gases for Welding and Cutting

Covers six industrial gases – argon, carbon dioxide, helium, hydrogen, nitrogen, and oxygen –and various mixtures of these. Covers gas properties, uses, safe handling, distribution, mixtures and effects of shielding gases on arc characteristics and welds for flux cored arc welding, gas tungsten arc welding, gas metal arc welding, electrogas welding, plasma arc welding, plasma arc cutting, laser welding, and laser cutting. Includes sections on gas purging and backing gases as well as shielding and cutting gas safety. *64 pages, 26 figures, 17 tables, (2003).*

Order Code: AWS C5.10/C5.10M **$68/$52**

C6.1-89R, Recommended Practices for Friction Welding

Description & preview online. 36 pages, 3 appendices, 9 figures, 2 tables. (Reaffirmed 1998).

Order Code: AWS C6.1 **$56/$42**

C6.2/C6.2M:2006, Specification for Friction Welding of Metals

Provides for the qualification of friction welding machines, procedures, and training of welding operators. Qualification of welding procedure specifications includes the material specifications involved, weld joint design, and destructive and nondestructive examination requirements, as well as guidelines for categories of quality assurance. Qualification of welding equipment includes weld parameter control and weld reproducibility. *32 pages, 1 table, 4 forms, (2006).*

Order Code: AWS C6.2/C6.2M **$56/$42**

C7.1M/C7.1:2004, Recommended Practices for Electron Beam Welding

Presents descriptions of electron beam welding equipment and procedures for welding a wide range of similar and dissimilar metals and thicknesses. Includes sections on safety, process fundamentals, equipment and maintenance, metallurgical and general process considerations, inspection and testing of welds, training and qualification of operators, weld process and procedure development, practical examples, and power curves for various alloys. *128 pages, 64 figures, 11 tables, (2004).*

Order Code: AWS C7.1 **$92/$69**

C7.2:1998, Recommended Practices for Laser Beam Welding, Cutting, and Drilling

Description & preview online. 116 pages, (1998).

Order Code: AWS C7.2 **$88/$66**

C7.3:1999R, Process Specification for Electron Beam Welding

Description & preview online. 18 pages. (Reaffirmed 2003).

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NEW PUBLICATION: C7.4/C7.4M:2008, Process Specification and Operator Qualification for Laser Beam Welding

Covers processing and quality control requirements for laser beam welding. *34 pages, 1 table. (2008).*

Order Code: AWS C7.4 **$56/$42**

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Description & preview online. 32 pages, 4 figures, 4 tables.(2007)

Order Code: AWS D16.2M/D16.2 **$56/$42**

Arc Welding with Robots: Do's and Don'ts

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Development and qualification of welding procedures can be time-consuming and expensive.

		BASE METAL	THICKNESS	PROCESS	FILLER METAL	CONDITION	ORDER NO.
SHEET METAL							
SHEET METAL	CARBON STEEL	Carbon Steel	10 – 18 gauge	GMAW-S	ER70S-6	As-welded, with or w/o backing	B2.1-1-004:2002
		Carbon Steel	10 – 18 gauge	GTAW	ER70S-2 or -3	As-welded, with or w/o backing	B2.1-1-008:2002
		Carbon Steel	10 – 18 gauge	SMAW	E6010 or E6013	As-welded, with or w/o backing	B2.1-1-012:2002
	GALVANIZED	Galvanized Steel	10 – 18 gauge	GMAW-S	ER70S-6	As-welded, with or w/o backing	B2.1-1-003:2002
		Galvanized Steel	10 – 18 gauge	GTAW	ER70S-2 or -3	As-welded, with or w/o backing	B2.1-1-007:2002
		Galvanized Steel	10 – 18 gauge	SMAW	E6010 or E6013	As-welded, with or w/o backing	B2.1-1-011:2002
	M-1 TO M-8	Carbon to Stainless	10 – 18 gauge	GMAW-S	ER309	As-welded, with or w/o backing	B2.1-1/8-006:2002
		Carbon to Stainless	10 – 18 gauge	GTAW	ER309	As-welded, with or w/o backing	B2.1-1/8-010:2002
		Carbon to Stainless	10 – 18 gauge	SMAW	E309-15,-16 or -17	As-welded, with or w/o backing	B2.1-1/8-014:2002
	STAINLESS	Stainless Steel	10 – 18 gauge	GMAW-S	ER3XX	As-welded, with or w/o backing	B2.1-8-005:2002
		Stainless Steel	10 – 18 gauge	GTAW	ER3XX	As-welded, with or w/o backing	B2.1-8-009:2002
		Stainless Steel	10 – 18 gauge	SMAW	E3XX-15,-16 or -17	As-welded, with or w/o backing	B2.1-8-013:2002
	AL	Aluminum	10 – 18 gauge	GTAW	ER4043 or R4043	As-welded, with or w/o backing	B2.1-22-015:2002
PIPE OR PLATE (ALL STANDARDS BELOW ARE ADOPTED BY *NATIONAL BOARD INSPECTION CODE*)							
PIPE OR PLATE	CARBON STEEL	Carbon Steel	3/16" – 7/8"	GTAW	ER70S-2 or -3	As-welded, with or w/o backing	B2.1-1-002:1990R
		Carbon Steel	1/8" – 1-1/2"	GTAW followed by SMAW	ER70S-2 & E7018	As-welded or PWHT	B2.1-1-021-94R
		Carbon Steel	3/16" – 3/4"	SMAW	E7016 & E7018	As-welded, with backing	B2.1-1-001:1990R
		Carbon Steel	1/8" – 1-1/2"	SMAW	E7018	As-welded or PWHT	B2.1-1-016-94R
		Carbon Steel	1/8" – 1-1/2"	SMAW	E6010	As-welded or PWHT	B2.1-1-017-94R
		Carbon Steel	1/8" – 1-1/2"	SMAW	E6010 & E7018	As-welded or PWHT	B2.1-1-022-94R
		Carbon Steel	1/8" – 1-1/2"	SMAW	E6010* & E7018	As-welded or PWHT	B2.1-1-026-94R
		Carbon Steel	1/8" – 1-1/2"	FCAW, self-shielded	E71T-8	As-welded	B2.1-1-018-94R
		Carbon Steel	1/8" – 1/2"	FCAW, self-shielded	E71T-11	As-welded	B2.1-1-027:1998
		Carbon Steel	1/8" – 1-1/2"	FCAW-G, CO_2 gas-shielded	E70T-1 or E71T-1	As-welded	B2.1-1-019-94R
		Carbon Steel	1/8" – 1-1/2"	FCAW-G, Ar-CO_2 gas-shielded	E70T-1 or E71T-1	As-welded or PWHT	B2.1-1-020-94R
	STAINLESS	Stainless Steel	1/16" – 1-1/2"	GTAW	ER3XX	As-welded	B2.1-8-024:2001
		Stainless Steel	1/8" – 1-1/2"	GTAW followed by SMAW	ER3XX & E3XX-XX	As-welded	B2.1-8-025:2001
		Stainless Steel	1/8" – 1-1/2"	SMAW	E3XX-XX	As-welded	B2.1-8-023-94R

**Downhill progression on root pass. All other vertical position passes are uphill.*

Specifications with order numbers indicated in red are adopted by ASME with additional requirements.

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PRIMARILY PIPE

ALL STANDARDS BELOW ARE ADOPTED BY *NATIONAL BOARD INSPECTION CODE*, except B2.1-1-202-96(R2007)

		BASE METAL	THICKNESS	PROCESS	FILLER METAL	CONDITION	ORDER NO.
PRIMARILY PIPE	CARBON STEEL	Carbon Steel	1/8" – 1-1/2"	GMAW-S followed by FCAW-G	ER70S-3 & E70T-1M, E71T-1M or -12M	As-welded or PWHT	B2.1-1-232:2006
		Carbon Steel	1/8" – 1-1/2"	GMAW-S followed by GMAW spray transfer	ER70S-3	As-welded or PWHT	B2.1-1-233:2006
		Carbon Steel	1/8" – 1-1/2"	FCAW-G, Ar-CO_2 shielded	E70T-1M, E71T-1M, or E71T-12M	As-welded or PWHT	B2.1-1-234:2006
		Carbon Steel	1/8" – 1-1/2"	GMAW spray transfer	ER70S-3	As-welded or PWHT	B2.1-1-235:2006
		Carbon Steel	1/8" – 1-1/2"	GTAW	ER70S-2	As-welded or PWHT	B2.1-1-207-96(R2007)
		Carbon Steel	1/8" – 1-1/2"	GTAW followed by SMAW	ER70S-2 & E7018	As-welded or PWHT	B2.1-1-209-96(R2007)
		Carbon Steel	1/8" – 1-1/2"	GTAW, consumable inserts	INMs-1 & ER70S-2	As-welded or PWHT	B2.1-1-210:2001
		Carbon Steel	1/8" – 1-1/2"	GTAW, consumable inserts/SMAW	INMs-1, E70S-2 & E7018	As-welded or PWHT	B2.1-1-211:2001
		Carbon Steel	1/8" – 3/4"	SMAW	E6010 & E7018	As-welded	B2.1-1-201-96(R2007)
		Carbon Steel	1/8" – 3/4"	SMAW	E6010* & E7018	As-welded	B2.1-1-202-96(R2007)
		Carbon Steel	1/8" – 3/4"	SMAW	E6010	As-welded	B2.1-1-203-96(R2007)
		Carbon Steel	1/8" – 3/4"	SMAW	E6010*	As-welded	B2.1-1-204-96(R2007)
		Carbon Steel	1/8" – 1-1/2"	SMAW	E6010 & E7018	As-welded or PWHT	B2.1-1-205-96(R2007)
		Carbon Steel	1/8" – 1-1/2"	SMAW	E6010* & E7018	As-welded or PWHT	B2.1-1-206-96(R2007)
		Carbon Steel	1/8" – 1-1/2"	SMAW	E7018	As-welded or PWHT	B2.1-1-208-96(R2007)
	M-1 TO M-8	Carbon to Stainless	1/16" – 1-1/2"	GTAW	ER309(L)	As-welded	B2.1-1/8-227:2002
		Carbon to Stainless	1/8" – 1-1/2"	GTAW followed by SMAW	ER309(L) & E309(L)-15,-16 or -17	As-welded	B2.1-1/8-229:2002
		Carbon to Stainless	1/16" – 1-1/2"	GTAW, consumable inserts	IN309 and ER309(L)	As-welded	B2.1-1/8-230:2002
		Carbon to Stainless	1/8" – 1-1/2"	GTAW, consumable inserts/SMAW	IN309, ER309 & E309-15,-16 or -17, or ER309(L) &E309(L)-15,-16 or -17	As-welded	B2.1-1/8-231:2002
		Carbon to Stainless	1/8" – 1-1/2"	SMAW	E309(L)-15,-16 or -17	As-welded	B2.1-1/8-228:2002
	STAINLESS	Stainless Steel	1/16" – 1-1/2"	GTAW	ER3XX	As-welded	B2.1-8-212:2001
		Stainless Steel	1/8" – 1-1/2"	GTAW followed by SMAW	ER3XX & E3XX-XX	As-welded	B2.1-8-214:2001
		Stainless Steel	1/8" – 1-1/2"	GTAW, consumable inserts	IN3XX & ER3XX	As-welded	B2.1-8-215:2001
		Stainless Steel	1/8" – 1-1/2"	GTAW, consumable inserts/SMAW	IN3XX, ER3XX & E3XX-XX	As-welded	B2.1-8-216:2001
		Stainless Steel	1/8" – 1-1/2"	SMAW	E3XX-XX	As-welded	B2.1-8-213-97(R2007)
	CHROME-MOLY STEEL	Cr-Mo (M-4/P-4)	1/8" – 3/4"	GTAW	ER80S-B2	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-4-217:1999
		Cr-Mo (M-4/P-4)	1/8" – 1-1/2"	GTAW followed by SMAW	ER80S-B2 & E8018-B2	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-4-219:1999
		Cr-Mo (M-4/P-4)	1/8" – 3/4"	GTAW, consumable inserts	IN515 & ER80S-B2	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-4-220:1999
		Cr-Mo (M-4/P-4)	1/8" – 1-1/2"	GTAW, consumable inserts/SMAW	IN515, ER80S-B2, & E8018-B2	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-4-221:1999
		Cr-Mo (M-4/P-4)	1/8" – 1-1/2"	SMAW	E8018-B2	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-4-218:1999
		Cr-Mo (M-5A/P-5A)	1/8" – 3/4"	GTAW	ER90S-B3	As-welded (≤1/2") or PWHT (all thickness-	B2.1-5A-222:1999
		Cr-Mo (M-5A/P-5A)	1/8" – 1-1/2"	GTAW followed by SMAW	ER90S-B3 & E9018-B3	As-welded (≤1/2") or PWHT (all thickness-	B2.1-5A-224:1999
		Cr-Mo (M-5A/P-5A)	1/8" – 3/4"	GTAW, consumable inserts	IN521 & ER90S-B3	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-5A-225:1999
		Cr-Mo (M-5A/P-5A)	1/8" – 1-1/2"	GTAW, consumable inserts/SMAW	IN521, ER90S-B3, & E9018-B3	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-5A-226:1999
		Cr-Mo (M-5A/P-5A)	1/8" – 1-1/2"	SMAW	E9018-B3	As-welded (≤1/2") or PWHT (all thicknesses)	B2.1-5A-223:1999


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Updated and expanded. Provides a comprehensive, organized survey of the basics of brazing, processes, and applications. Addresses the fundamentals of brazing, brazement design, brazing filler metals and fluxes, safety and health, and many other topics. Includes new chapters on induction brazing and diamond brazing. A must-have for all brazers, brazing engineers, and students. *740 pages, 36 chapters, 3 appendices, 308 figures, 116 reference tables, fifth edition.*

Order Code: AWS BRH **$136/$102**

NEW EDITION: C3.2M/C3.2:2008, Standard Method for Evaluating the Strength of Brazed Joints

Describes the test methods used to obtain reliable data on the strngth of metal-to-metal, metal-to-nonmetal, and nonmetal-to-nonmetal joints. *42 pages, 16 figures, 4 tables, (2008).*

Order Code: AWS C3.2M/C3.2 **$60/$45**

NEW EDITION: C3.3:2008, Recommended Practices for the Design, Manufacture, and Examination of Critical Brazed Components

Procedures that should be followed in the design, manufacture, and examination of brazed joints to ensure reliability of critical components. *42 pages, 4 tables, 1 figure (2008).*

Order Code: AWS C3.3 **$60/$45**

C3.4M/C3.4:2007, Specification for Torch Brazing

Provides the minimum fabrication, equipment, process procedure requirements, and inspection requirements for the torch brazing of copper, copper alloys, heat and corrosion-resistant alloys, and other materials that can be adequately torch brazed. *24 pages, (2007)*

Order Code: AWS C3.4 **$56/$42**

C3.5M/C3.5:2007, Specification for Induction Brazing

Provides minimum fabrication, equipment, material, process procedure requirements, and inspection requirements for induction brazing of steels, copper, copper alloys, and heat and corrosion-resistant alloys and other materials that can be adequately induction brazed. Provides criteria for classifying induction brazed joints based on loading and consequences of failure, and quality assurance criteria defining limits of acceptability of each class. Defines acceptable induction brazing equipment, materials, and procedures, as well as required inspection for each class of joint. *24 pages, (2007)*

Order Code: AWS C3.5 **$56/$42**

NEW EDITION: C3.6M/C3.6:2008, Specification for Furnace Brazing

Specifies minimum fabrication, equipment, material, process procedure, and inspection requirements for the furnace brazing of steels, stainless steels, copper, copper alloys, nickel, nickel alloys, heat- and corrosion-resistant alloys, and other materials that can be adequately furnace brazed. Provides criteria for classifying joints based on loading and the consequences of failure and quality assurance criteria defining the limits of acceptability of each class. (Brazing of aluminum alloys is covered in AWS C3.7M/C3.7). *26 pages, (2008).*

Order Code: AWS C3.6 **$56/$42**

C3.7M/3.7:2005, Specification for Aluminum Brazing

Specifies the minimum fabrication, equipment, material, process procedure, and inspection requirements for the brazing of aluminum by atmosphere furnace, vacuum furnace, and flux processes. Provides criteria for classifying aluminum brazed joints based on loading and the consequences of failure and quality assurance criteria defining the limits of acceptability of each class. *26 pages, (2005).*

Order Code: AWS C3.7 **$52/$39**

C3.8M/C3.8:2005, Specification for the Ultrasonic Examination of Brazed Joints

Specifies minimum fabrication, equipment, and process procedure requirements for the ultrasonic examination of brazed joints. Provides minimum requirements for equipment, procedures, and the documentation of such tests. New in this edition is a section on ultrasonic pulse-echo results, including A-scan, B-scan, and C-scan displays. *18 pages, 1 nonmandatory annex, 3 figures, (2005).*

Order Code: AWS C3.8M/C3.8 **$48/$36**

D10.13/D10.13M:2001, Recommended Practices for the Brazing of Copper Tubing and Fittings for Medical Gas Systems

Description & preview online. 20 pages, 1 figure, 3 tables, (2001).

Order Code: AWS D10.13/D10.13M **$56/$42**

Brazing Footprints

A collection of case studies in high-temperature brazing, compiled from Robert L. Peaslee's "Brazing Q&A" column in the *Welding Journal*. *299 pages, (2003).*

Order Code: AWS BFP **$160**

International Brazing & Soldering Conference Proceedings

2006 proceedings. *414 pages, 68 papers, on CD-ROM.*

Order Code: AWS IBSC2006 **$84/$63**

2003 proceedings. *619 pages, 88 papers, on CD-ROM.*

Order Code: AWS IBSC2003 **$84/$63**

Soldering Handbook

Description & preview online. 579 pages, 299 figures, 112 tables, (2000).

Order Code: AWS SHB **$152/$114**

Braze Safely *See page 8.*

A5.8/A5.8M:2004, Specification for Filler Metals for Brazing and Braze Welding *See page 25.*

A5.31-92R, Specification for Fluxes for Brazing and Braze Welding *See page 25.*

B2.2-91, Standard for Brazing Procedure and Performance Qualification *See page 10.*

NEW PUBLICATION: B2.3/B2.3M:2008, Specification for Soldering Procedure and Performance Qualification *See page 10*

Pipe and Tubing

D10.4-86R, Recommended Practices for Welding Austenitic Chromium-Nickel Stainless Steel Piping and Tubing

Description & preview online. 42 pages, (Reaffirmed 2000).

Order Code: AWS D10.4 **$60/$45**

D10.6/D10.6M:2000, Recommended Practices for Gas Tungsten Arc Welding of Titanium Piping and Tubing

Incorporates results of research on the effects of atmospheric exposure during welding. Provides coverage on power sources, tungsten electrodes, titanium base metal grades, filler metals, joint design and preparation, pickling and cleaning, fitting and tacking, preweld cleaning, gas shielding, welding procedures and techniques, and preheat and postweld heat treatment. *28 pages, 4 figures, 7 tables, (2000).*

Order Code: AWS D10.6/D10.6M **$52/$40**

NEW EDITION: D10.7M/D10.7:2008, Guide for the Gas Shielded Arc Welding of Aluminum and Aluminum Alloy Pipe

A comprehensive guide for the selection of filler metals which incorporates all the important weld metal characteristics. 56 different base metals and 13 filler metals are evaluated for weldability, strength, ductility, corrosion resistance, service temperature and color matching. *42 pages, 5 figures, 13 tables, (2008).*

Order Code: AWS D10.7M/D10.7 **$60/$45**

D10.8-96, Recommended Practices for Welding of Chromium-Molybdenum Steel Piping and Tubing

Description & preview online. 18 pages, 1 figure, 4 tables, (1996).

Order Code: AWS D10.8 **$48/$36**

D10.10/D10.10M:1999, Recommended Practices for Local Heating of Welds in Piping and Tubing

Description & preview online. 116 pages, 8 annexes, 23 figures, 16 tables. (1999).

Order Code: AWS D10.10/D10.10M **$88/$66**

D10.11M/D10.11:2007, Guide for Root Pass Welding of Pipe Without Backing

Description & preview online. 34 pages, 11 figures. (2007)

Order Code: AWS D10.11M/D10.11 **$56/$42**

D10.12M/D10.12:2000, Guide for Welding Mild Steel Pipe

Contains recommended practices for welding piping systems of sizes DN 200 (NPS 8) and under and wall thickness of 13mm (0.5 in) and under for low-pressure heating, air conditioning, refrigeration, and water supply, as well as some gas and chemical systems. Covers carbon steels such as ASTM A 53, A 106, A 135, A 179, A 524, A 587, and API-5L, Grades A25, A and B, and X42 joined using oxyacetylene, shielded metal arc, gas tungsten arc, gas metal arc, and flux cored arc welding. Explains techniques for preheating, joint preparation, alignment and positioning, fittings, and root and hot passes. Does not address the needs of pipe steels or service conditions which may require post weld heat treatment. *48 pages, 19 line drawings and photographs, 10 tables, (2000).*

Order Code: AWS D10.12M/D10.12 **$56/$42**

D10.13/D10.13M:2001, Recommended Practices for the Brazing of Copper Tubing and Fittings for Medical Gas Systems *See page 22.*

NEW PUBLICATION: D10.18M/D10.18:2008, Guide for Welding Ferritic/Austenitic Duplex Stainless Steel Piping and Tubing

Will enable you to take advantage of the increased corrosion resistance and higher mechanical strength of duplex stainless steels. The metallurgy of duplex stainless steels is explained and methods for obtaining a high-quality root pass are given for manual as well as automatic and orbital welding. Provides guidance for the selection of joint types and dimensions and filler metals. *34 pages, 5 tables, 5 figures (2008).*

Order Code: AWS D10.18M/D10.18 **$56/$42**

The Practical Reference Guide for Welding Inspection Management—Visual Inspection of Pressure Vessels and Pressure Piping

A planning survey for visual inspectors new to major in-service inspections of pressure vessels or pressure piping. Contains an annex on discontinuities. *32 pages, (1999).*

Order Code: AWS PRGVT **$52/$39**

F4.1:2007, Safe Practices for the Preparation of Containers and Piping for Welding and Cutting *See page 9.*

For pipe welding prequalified Standard Welding Procedure Specifications (SWPSs), see page 21.

Food Processing Systems

D18.1:1999, Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications

Specifies requirements for gas tungsten arc welding of austenitic stainless steel tube and pipe at least 1/4 inch (6 mm) diameter in the fabrication of sanitary processing systems for handling products for human and animal consumption. May also be applied to maintenance of food processing equipment. Addresses procedure and performance qualification, fabrication, visual examination requirements, and documentation.*18 pages, 2 figures, (1999).*

Order Code: AWS D18.1 **$48/$36**

D18.2:1999, Guide to Weld Discoloration Levels on Inside of Austenitic Stainless Steel Tube

Laminated sheet with color photograph showing degrees of coloration on the inside of an austenitic stainless steel tube with increasing amounts of oxygen in the backing shielding gas. Suitable as a specifying tool and visual examination guide. Includes two-page instruction sheet. *(1999).*

Order Code: AWS D18.2 **$40/$30**

D18.3/D18.3M:2005, Specification for Welding of Tanks, Vessels, & Other Equipment in Sanitary (Hygienic) Applications

Description & preview online. 38 pages, 3 nonmandatory annexes, 2 figures, 3 tables, (2005).

Order Code: D18.3/D18.3M **$56/$42**

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AWS Filler Metal Specifications by Material and Welding Process

	OFW	SMAW	GTAW, GMAW, PAW	FCAW	SAW	ESW	EGW	BRAZING	THERMAL SPRAYING
Carbon Steel	A5.2/A5.2M	A5.1/A5.1M	A5.18/A5.18M	A5.20/A5.20M	A5.17/A5.17M	A5.25/A5.25M	A5.26/A5.26M	A5.8/A5.8M & A5.31	C2.25/C2.25M
Low-Alloy Steel	A5.2/A5.2M	A5.5/A5.5M	A5.28/A5.28M	A5.29/A5.29M	A5.23/A5.23M	A5.25/A5.25M	A5.26/A5.26M	A5.8/A5.8M & A5.31	C2.25/C2.25M
Stainless Steel		A5.4/A5.4M	A5.9/A5.22	A5.22	A5.9/A5.9M	A5.9/A5.9M	A5.9/A5.9M	A5.8/A5.8M & A5.31	C2.25/C2.25M
Cast Iron	A5.15	A5.15	A5.15	A5.15				A5.8/A5.8M & A5.31	
Nickel Alloys		A5.11/A5.11M	A5.14/A5.14M	A5.34/A5.34M	A5.14/A5.14M	A5.14/A5.14M		A5.8/A5.8M & A5.31	C2.25/C2.25M
Aluminum Alloys		A5.3/A5.3M	A5.10/A5.10M					A5.8/A5.8M & A5.31	C2.25/C2.25M
Copper Alloys		A5.6/A5.6M	A5.7/A5.7M					A5.8/A5.8M & A5.31	C2.25/C2.25M
Titanium Alloys			A5.16/A5.16M					A5.8/A5.8M & A5.31	
Zirconium Alloys			A5.24/A5.24M					A5.8/A5.8M & A5.31	
Magnesium Alloys			A5.19					A5.8/A5.8M & A5.31	
Tungsten Electrodes			A5.12/A5.12M						
Brazing Alloys and Fluxes								A5.8/A5.8M & A5.31	
Surfacing Alloys	A5.21	A5.13	A5.21	A5.21	A5.21				C2.25/C2.25M
Consumable Inserts			A5.30/A5.30M						
Shielding Gases			A5.32/A5.32M	A5.32/A5.32M			A5.32/A5.32M		
Ceramics									C2.25/C2.25M

A4.2M:2006 (ISO 8249: 2000 MOD), Standard Procedures for Calibrating Magnetic Instruments to Measure the Delta Ferrite Content of Austenitic and Duplex Ferritic-Austenitic Stainless Steel Weld Metal

Calibration procedures include those for the Magnet-Gauge, Ferritescope, and Inspector Gauge, using primary standards. Appendix discusses problems in measuring ferrite content. *56 pages, 17 figures, 14 tables, 7 annexes, (2006).*

Order Code: AWS A4.2M **$64/$48**

A4.3-93 (R2006), Standard Methods for Determination of the Diffusible Hydrogen Content of Martensitic, Bainitic, and Ferritic Steel Weld Metal Produced by Arc Welding

26 pages, (Reaffirmed 2006).

Order Code: AWS A4.3 **$52/$39**

A4.4M: 2001 (R2006), Standard Procedures for Determination of Moisture Content of Welding Fluxes and Welding Electrode Flux Coverings

32 pages, 4 figures, 3 tables, (Reaffirmed 2006).

Order Code: AWS A4.4M **$56/$42**

NEW EDITION: A5.01M/A5.01:2008 (ISO 14344:2002 MOD), Procurement Guidelines for Consumables–Welding and Allied Processes–Flux and Gas Shielded Electrical Welding Processes

Essential to today's purchaser. Describes how to state required filler metal specifications clearly, concisely, and completely, including heat, lot, testing, and certification requirements. *38 pages, 12 tables (2008).*

Order Code: AWS A5.01 **$52/$39**

A5.02/A5.02M:2007, Specification for Filler Metal Standard Sizes, Packaging, and Physical Attributes

Prescribes size, package, appearance, and identification requirements for filler metals for solid, tubular, bare, covered, and strip electrodes used in fusion processes, but not brazing, braze welding, thermal spraying, or granular products such as SAW fluxes. *28 pages, 4 figures, 4 tables, (2007).*

Order Code: AWS A5.02/A5.02M **$52/$39**

FMC:2000, Filler Metal Comparison Charts

Contains:

- 83 national and international suppliers, with their mailing address, telephone, fax, and Web site address.
- Handy indexes arranged by classification numbers (1,500) and brand names (11,000) for finding information quickly.
- AWS classifications used as "chapters."

494 pages, (2000).

Order Code: AWS FMC **$168/$126**

IFS:2002, International Index of Welding Filler Metal Classifications

55 pages, 4 figures, 42 tables. (2002.) CD-ROM only.

Order Code: AWS IFS CD **$52/$39**

User's Guide to Filler Metals

130 pages, (1995).

Order Code: AWS UGFM **$68/$52**

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AWS A5 Filler Metal Specifications

ORDER CODE	=D1.1 REFERENCED	NONMEMBERS	AWS MEMBERS
AWS A5.1/A5.1M:2004	Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding *(54 pages)*	$52	$39
AWS A5.2/A5.2M:2007	Specification for Carbon and Low Alloy Steel Rods for Oxyfuel Gas Welding *(26 pages)*	$52	$39
AWS A5.3/A5.3M:1999(R2007)	Specification for Aluminum and Aluminum-Alloy Electrodes for Shielded Metal Arc Welding *(28 pages)*	$52	$39
AWS A5.4/A5.4M:2006	Specification for Stainless Steel Electrodes for Shielded Metal Arc Welding *(52 pages)*	$52	$39
AWS A5.5/A5.5M:2006	Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding *(54 pages)*	$52	$39
NEW! AWS A5.6/A5.6M:2008	Specification for Copper and Copper-Alloy Electrodes for Shielded Metal Arc Welding *(36 pages)*	$52	$39
AWS A5.7/A5.7M:2007	Specification for Copper and Copper Alloy Bare Welding Rods and Electrodes *(30 pages)*	$52	$39
AWS A5.8/A5.8M:2004	Specification for Filler Metals for Brazing and Braze Welding *(46 pages)*	$52	$39
AWS A5.9/A5.9M:2006	Specification for Bare Stainless Steel Welding Electrodes and Rods *(40 pages)*	$52	$39
AWS A5.10/A5.10M:1999(R2007)	Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods *(40 pages)*	$52	$39
AWS A5.11/A5.11M:2005	Specification for Nickel and Nickel-Alloy Welding Electrodes for Shielded Metal Arc Welding *(48 pages)*	$52	$39
AWS A5.12/A5.12M-98(R2007)	Specification for Tungsten and Tungsten-Alloy Electrodes for Arc Welding and Cutting *(24 pages)*	$52	$39
AWS A5.13:2000	Specification for Surfacing Electrodes for Shielded Metal Arc Welding *(36 pages)*	$52	$39
AWS A5.14/A5.14M:2005	Specification for Nickel and Nickel-Alloy Bare Welding Electrodes and Rods *(38 pages)*	$52	$39
AWS A5.15-90 (R2006)	Specification for Welding Electrodes and Rods for Cast Iron *(32 pages)*	$52	$39
AWS A5.16/A5.16M:2007	Specification for Titanium and Titanium-Alloy Welding Electrodes and Rods *(36 pages)*	$52	$39
AWS A5.17/A5.17M-97(R2007)	Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding *(40 pages)*	$52	$39
AWS A5.18/A5.18M:2005	Specification for Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding *(42 pages)*	$52	$39
AWS A5.19-92(R2006)	Specification for Magnesium Alloy Welding Electrodes and Rods *(26 pages)*	$52	$39
AWS A5.20/A5.20M:2005	Specification for Carbon Steel Electrodes for Flux Cored Arc Welding *(48 pages)*	$52	$39
AWS A5.21:2001	Specification for Bare Electrodes and Rods for Surfacing *(40 pages)*	$52	$39
AWS A5.22-95(R2005)	Specification for Stainless Steel Electrodes for Flux Cored Arc Welding and Stainless Steel Flux Cored Rods for Gas Tungsten Arc Welding *(Reaffirmed 2005, 44 pages)*	$52	$39
AWS A5.23/A5.23M:2007	Specification for Low-Alloy Steel Electrodes and Fluxes for Submerged Arc Welding *(58 pages)*	$52	$39
AWS A5.24/A5.24M:2005	Specification for Zirconium and Zirconium-Alloy Welding Electrodes and Rods *(18 pages)*	$52	$39
AWS A5.25/A5.25M-97R	Specification for Carbon and Low-Alloy Steel Electrodes and Fluxes for Electroslag Welding *(Reaffirmed 2003, 34 pages)*	$52	$39
AWS A5.26/A5.26M-97R	Specification for Carbon and Low-Alloy Steel Electrodes for Electrogas Welding *(Reaffirmed 2003, 34 pages)*	$52	$39
AWS A5.28/A5.28M:2005	Specification for Low-Alloy Steel Electrodes and Rods for Gas Shielded Arc Welding *(46 pages)*	$52	$39
AWS A5.29/A5.29M:2005	Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding *(48 pages)*	$52	$39
AWS A5.30/A5.30M:2007	Specification for Consumable Inserts *(36 pages)*	$52	$39
AWS A5.31-92R	Specification for Fluxes for Brazing and Braze Welding *(Reaffirmed 2003, 20 pages)*	$52	$39
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AWS A5.34/A5.34M:2007	Specification for Nickel Alloy Electrodes for Flux Cored Arc Welding *(40 pages)*	$52	$39
AWS C2.25/C2.25M:2002	Specification for Thermal Spray Feedstock—Solid and Composite Wire and Ceramic Rods *(26 pages)*	$52	$39

Automotive

D8.1M:2007, Specification for Automotive Weld Quality—Resistance Spot Welding of Steel

Establishes acceptance criteria for resistance spot welds in autos fabricated from steels, including Advanced High Strength Steels. *38 pages, 24 figures, 4 tables, (2007).*

Order Code: AWS D8.1M **$56/$42**

D8.6:2005, Standard for Automotive Resistance Spot Welding Electrodes

Supplement to RWMA Bulletin 16, *Resistance Welding Equipment Standards*. Specifies chemical composition, physical requirements, dimensions, and identification of various shapes and nose configurations of electrodes, electrode caps, and cap-adaptor shanks used in the automotive industry. Annexes describe recommended electrode material for spot welding similar and dissimilar metals, and standard gauges for confirmation of RWMA electrode tapers. *98 pages, 8 annexes, 47 figures, 37 tables, (2006).*

Order Code: AWS D8.6 **$80/$60**

D8.7M:2005, Recommended Practices for Automotive Weld Quality – Resistance Spot Welding

Presents recommended practices and criteria for evaluating resistance spot welds typical of automotive sheet steel applications. Contains weld characteristics, metrics, and testing methods useful in evaluating spot welding quality on coated and uncoated automotive sheet steels of all strength levels and compositions. The test methods are designed to assess static and dynamic properties of automotive sheet steel welds. *28 pages, 18 figures, 3 tables, (2005).*

Order Code: AWS D8.7M **$52/$39**

D8.8M:2007, Specification for Automotive Weld Quality—Arc Welding of Steel

Description & preview online. 26 pages, 17 figures, (2007).

Order Code: AWS D8.8M **$52/$39**

D8.9M:2002, Recommended Practices for Test Methods for Evaluating the Resistance Spot Welding Behavior of Automotive Sheet Steel Materials

Description & preview online. 78 pages, 3 annexes, 30 figures, 12 tables, (2002).

Order Code: AWS/SAE D8.9M **$72/$54**

D8.14M/D8.14:2000, Specification for Automotive and Light Truck Components Weld Quality—Aluminum Arc Welding

Description & preview online. 28 pages, 3 annexes, 15 figures, 6 tables, (2000).

Order Code: AWS D8.14M/D8.14 **$52/$39**

The Professional's Advisor on Resistance Welding *See page 30.*

Marine and Aerospace

D3.5-93R, Guide for Steel Hull Welding

The best practical methods to weld steel hulls for ships, barges, mobile offshore drilling units, and other marine vessels. Includes information on steel plates, shapes, castings, and forgings, their selection, and their weldability. *118 pages, 72 illustrations, 9 tables, (Reaffirmed 2000).*

Order Code: AWS D3.5 **$88/$66**

D3.6M:1999, Specification for Underwater Welding

Developed by leaders in underwater welding, this specification covers the requirements for the underwater welding of structures or components in wet and dry environments. *144 pages, 6 annexes, (1999).*

Order Code: AWS D3.6M **$100/$75**

D3.7:2004, Guide for Aluminum Hull Welding

Provides guidance on proven processes, techniques, and procedures for welding aluminum hulls and related ship structures. Applies chiefly to welding of aluminum hulls over 30 ft. (9 m) long and made of sheet and plate 3/16 in. (4.8 mm) thick and greater. Includes sections on hull materials, construction preparation, welding equipment and processes, procedure and performance qualification, welding techniques, and safety precautions. *86 pages, (2004).*

Order Code: AWS D3.7 **$76/$57**

D17.1:2001, Specification for Fusion Welding for Aerospace Applications

Specifies general welding requirements for welding aircraft and space hardware. Includes fusion welding of aluminum-based, nickel-based, iron-based, cobalt-based, magnesium-based, and titanium-based alloys using arc and high energy beam welding processes. Includes sections on design of welded connections, personnel and procedure qualification, fabrication, inspection, repair of existing structures and nonflight hardware acceptance. Additional requirements cover repair welding of existing hardware. Includes a commentary offering guidance on use of this standard. *94 pages, 5 annexes, commentary, 47 figures, 14 tables, (2001).*

Order Code: AWS D17.1 **$160/$120**

D17.2/D17.2M:2007, Specification for Resistance Welding for Aerospace Applications

Requirements for aerospace resistance spot and seam welding of aluminum, magnesium, steel, nickel, cobalt, titanium, and their alloys. Intended to replace MIL-W-6858D and AMS-W-6858A. *42 pages, 13 figures, 13 tables (2007).*

Order Code: AWS D17.12/D17.2M **$60/$45**

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Machinery

D14.1/D14.1M:2005, Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment

Specifies requirements for welding of all principal structural weldments and all primary welds used to manufacture cranes for industrial, mill, powerhouse, and nuclear facilities. Also applies to other overhead material-handling machinery and equipment that support and transport loads within the design rating, vertically or horizontally, during normal operations. Additionally, when agreed upon between the owner and manufacturer, it may apply to loading caused by abnormal operations or environmental events, such as seismic loading. All provisions apply equally to strengthening and repairing of existing overhead cranes and material handling equipment. Contains figures and tables with prequalified joint details, allowable stress ranges, stress categories, and nondestructive examination techniques. Does not apply to construction or crawler cranes or welding of rails. *150 pages, 60 figures, 21 tables (2005).*

Order Code: AWS D14.1/D14.1M **$104/$78**

D14.3/D14.3M:2005, Specification for Welding Earthmoving, Construction, and Agricultural Equipment

For Self-Propelled, On- and Off-Highway Machinery and Agricultural Equipment

Specifies requirements for structural welds used in the manufacture of crawlers, tractors, graders, loaders, off-highway trucks, power shovels, backhoes, mobile cranes, draglines, and other heavy earthmoving, construction, and agricultural equipment. Provides exhaustive illustrations of prequalified complete and partial penetration welded joints (butt, corner, T-, or combination) for shielded metal arc welding, submerged arc welding, gas metal arc welding, and flux cored arc welding. Includes variables for prequalified fillet welds. Emphasizes workmanship and welder qualification. Annexes include a forms collection and "Recommended Practices for Treatment of Shielded Metal Arc and Flux Cored Arc Electrodes." Tables include "Weldability Classification—Typical Steel Products" and "Minimum Preheat and Interpass Temperature for Prequalified Procedures." *114 pages, 42 figures, 4 forms, 14 tables, 1 mandatory annex, 6 nonmandatory annexes, (2005).*

Order Code: AWS D14.3/D14.3M **$88/$66**

D14.4/D14.4M:2005, Specification for Welded Joints in Machinery and Equipment

Specifies common acceptance criteria for carbon and low-alloy steel welded joints in machines and equipment subject to static and dynamic loading. Covers classification of welded joints, weld joint design, workmanship, quality control requirements and procedures, welding operator and welding procedure qualification, weld joint inspection (visual, radiographic, ultrasonic, magnetic particle, liquid penetrant), repair, and post weld treatments. Describes the effect of weld joint geometry, welding practices, and quality control on allowable stress levels, and provides practices for qualification and examination of welded joints in machinery and equipment fabrication. Contains figures and tables with prequalified joint details, nondestructive examination techniques, and weld-inspection criteria. *132 pages, 1 mandatory annex, 2 nonmandatory annexes (including a bibliography), 68 figures, 20 tables, (2005).*

Order Code: AWS D14.4/D14.4M **$96/$72**

D14.5-97, Specification for Welding of Presses and Press Components

Description & preview online. 156 pages, 78 figures, 21 tables, (1997).

Order Code: AWS D14.5 **$104/$78**

D14.6/D14.6M:2005, Specification for Welding of Rotating Elements of Equipment

Specifies requirements for weld joint detail and welding of rotating elements in new equipment of a few inches to over 200 inches (5 m) in diameter. Also applies to modification or repair welding of rotating elements in existing equipment. Equipment types covered by this specification include crushers, fans, gears, crankshafts, flywheels, centrifugal impellers, kilns, air moving devices, and blowers. Includes sections on materials, welding processes, procedure and performance qualification, fabrication requirements, inspection and quality control, modification and repair. Contains a useful updated table on ferrous and nonferrous material groupings for procedure qualification. Not applicable to steam or combustion turbine rotors or blading, camshafts, or power transmission shafts. *222 pages, 42 figures, 18 tables, (2005).*

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D14.7/D14.7M:2005, Recommended Practices for Surfacing and Reconditioning of Industrial Mill Rolls

Provides guidance on surfacing, repair, and reconditioning of industrial mill rolls in the heavy metals, paper, plastic, and lumber industries. Emphasizes the use of submerged arc welding, but also addresses gas metal arc welding, and flux cored arc welding, with suitable modifications. Applicable to electroslag cladding. Covers welding, postweld heat treating, finish machining, inspection, and record keeping. Provides detailed guidelines, tables, figures, and forms for use in establishing documented, qualified Welding Procedure Specifications. *66 pages, 20 figures, 13 tables, (2005).*

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Railroad

D15.1/D15.1M:2007, Railroad Welding Specification—Cars and Locomotives

Specifies requirements for the manufacture and maintenance of railroad equipment. Part I covers metallic components 1/8 in. or greater in thickness generally applicable to freight cars, locomotives, and passenger train vehicles. Part II covers welding of base metals thinner than 1/8 in. Includes sections on procedure and performance qualification, including welder operator and tack welder qualification, design of welded joints, inspection, and acceptance criteria. Not applicable to tank car tanks, or welding of rails. *224 pages, 7 appendices, 85 figures, 33 tables, (2007).*

Order Code: AWS D15.1/D15.1M **$132/$99**

D15.2:2003, Recommended Practices for the Welding of Rails and Related Rail Components for Use by Rail Vehicles

Recommends standards for the joining, repair, maintenance, and inspection of rail welds, and related rail components. Includes railroad rails, crane rails, guard rails, electrical contact rails, girder rails, and retarder rails. Related rail components include rail crossings and turnouts, which further include switch points, stock rails, switch point guards, spacer blocks, connecting rods, switch rods, plates, frogs, and frog components. Welding processes include shielded metal arc welding, gas metal arc welding, flux cored arc welding, flash welding, thermite welding, and oxyfuel gas welding. *48 pages, annex, charts and figures, (2003).*

Order Code: AWS D15.2 **$60/$45**

Resistance Welding

RWMA Bulletin #5: Resistance Welding Control Standard

Discusses weld controls, timing diagrams, input/output connections, SCR sizing, and terminal markings. Explains voltage compensation and other critical performance standards, plus safety, construction, installation, and operation standards. *62 pages, (1994).*

Order Code: AWS RW5 **$55/$42**

RWMA Bulletin #14: Maintenance Manual for Resistance Welding Machines

Explains installation, maintenance, and operation of a resistance welding machine's electrical, pneumatic, hydraulic and cooling systems. Includes a trouble-shooting section. Useful for maintenance personnel and operators. *(1996).*

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RWMA Bulletin #16: Resistance Welding Equipment Standards

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Description & preview online. 74 pages, 9 chapters (tabbed for quick access), spiral-bound. 5½" x 8½", (1998).

Order Code: AWS PARW **$76/$57**

A10.1M:2007, Specification for Calibration and Performance Testing of Secondary Current Sensing Coils and Weld Current Monitors Used in Single-Phase AC Resistance Welding

Sets forth accepted methods for testing and describing the performance of Rogowski-type air core current sensing coils (CSC) and weld current monitors (WCM) used in the measurement of single-phase AC resistance welding currents. Definitions of terms relevant to this measurement are included. CSC and system tests and calibration methods are described in detail. Detailed information that shall be made available to the user is prescribed.*54 pages, 15 figures, 5 tables, (2007).*

Order Code: AWS A10.1M **$64/$48**

C1.1M/C1.1:2000 (R2006), Recommended Practices for Resistance Welding *See page 18.*

C1.4M/C1.4:1999, Specification for Resistance Welding of Carbon and Low-Alloy Steels *See page 15.*

C1.5:2005, Specification for the Qualification of Resistance Welding Technician *See page 10.*

D8.1M:2007, Specification for Automotive Weld Quality—Resistance Spot Welding of Steel *See page 26.*

D8.6:2005, Standard for Automotive Resistance Spot Welding Electrodes

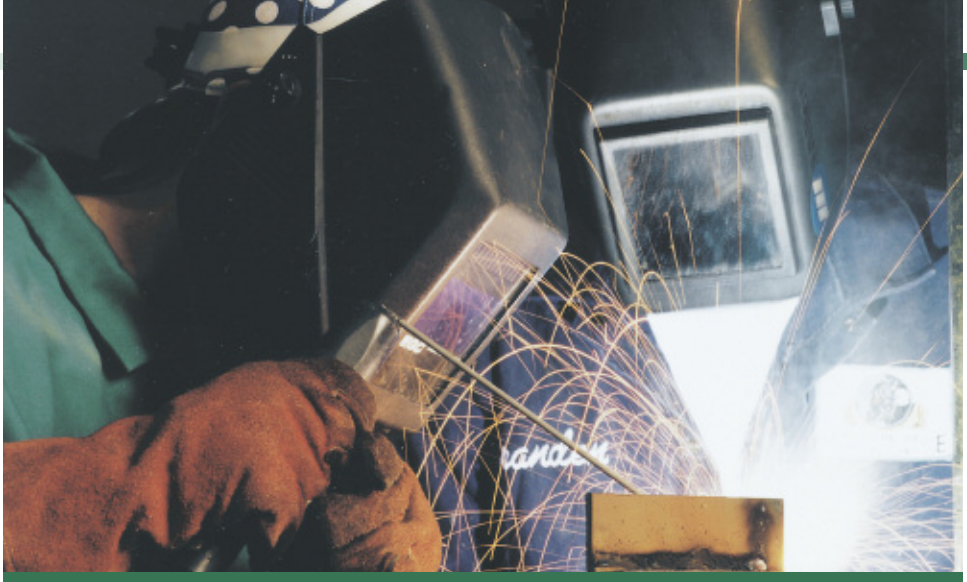
See page 26.

D8.7M:2005, Recommended Practices for Automotive Weld Quality – Resistance Spot Welding *See page 26.*

D8.9M:2002, Recommended Practices for Test Methods for Evaluating the Resistance Spot Welding Behavior of Automotive Sheet Steel Materials

See page 26.

D17.2/D17.2M:2007, Specification for Resistance Welding for Aerospace Applications *See page 26.*



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Compilation of excerpts from D1.1/D1.1M:2004. Includes transitions between unequal thickness, access hold requirements, pre-weld joint detail, base material surface and weld profile requirements, and five pages of visual acceptance criteria. Useful when actual D1.1 code is too cumbersome for tight, on-the-job areas. Cites actual D1.1 page, figure, and table numbers. *38 pages, spiral-bound. 3½" x 6", (Revised 2004).*

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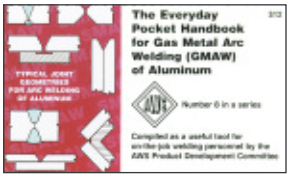
The Everyday Pocket Handbook for Gas Metal Arc Welding (GMAW) of Aluminum



Covers preparation of aluminum for welding, tips and troubleshooting, typical procedures for groove and fillet welds in aluminum alloys with argon shielding, aluminum filler metal properties (as-welded condition), and guide to selection of filler metal for general-purpose welding. *32 pages, spiral-bound. 3½" x 6", (1998).*

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