AWS D14.6/D14.6M:2012
An American National Standard

Specification for Welding of Rotating Elements of Equipment

American Welding Society®

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ANSI

AWS D14.6/D14.6M:2012
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Specification for Welding of Rotating Elements of Equipment

4th Edition

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Prepared by the
American Welding Society (AWS) D14 Committee on Machinery and Equipment

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This standard establishes material and workmanship standards for manufacturers, fabricators, repair organizations, purchasers, and owner/operators of rotating equipment which are fabricated or repaired by welding. Included are sections defining process qualifications, operator qualifications, quality control, inspection requirements, and repair requirements.

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Dedication

In Memoriam

Gordon Earle Cossaboom
1925–2007

This edition of AWS D14.6 is dedicated in memory of Gordon Earle Cossaboom. Gordon was the chair of the D14.6 standard when it was first published in 1981, and the second edition in 1996. Gordon was a member of the AWS D14G Subcommittee for about 33 years.

Gordon Earle Cossaboom, an AWS Life Member, graduated from the Boston Latin School in 1943. He served in the U.S. Army in Europe during WWII, then returned to Boston where he graduated from Northeastern University with a BS in civil engineering. After receiving his BS degree, he studied at The Ohio State University where he earned a MS degree in welding engineering.

In 1954, Cossaboom started his career at General Electric Company where he worked for several years. Later, he worked with Westinghouse Electric Company, Syosset, New York, and with the Eutectic Corporation. With these welding equipment manufacturers, he focused on new product development and participated in the development of CO_2 welding. In 1967, he joined American Standards' Industrial Products Division in Dearborn, Michigan, as manager of engineering.

From 1978 to 1986, Cossaboom worked as a welding engineer for the Manufacturing and Quality Division of Gilbert Commonwealth, Jackson, Michigan. From 1986 to his retirement in 1988, he served on the faculty at Ferris State University as an associate professor in the Welding Technology Department. He was an AWS member for 54 years and an active member of the Central Michigan Section.

Gordon was awarded the Samuel Wylie Miller Memorial Medal (Posthumous Recognition) in 2007. Gordon died at age 82 on January 10, 2007.

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Foreword

This foreword is not part of AWS D14.6/D14.6M:2012, *Specification for Welding of Rotating Elements of Equipment*, but is included for informational purposes only.

This is the fourth edition of the D14.6 specification. AWS first published the Specification for Welding of Rotating Elements of Equipment in 1981 to provide a welding specification that would apply to dynamic applications for new, modified, or the repair of welded rotating elements. Rotating elements can range from a few inches in diameter to over 200 in [5 m] in diameter. This specification is directed toward (but not limited to) crushers, fans, impellers, centrifugal impellers, kilns, pulpers, gears, sheaves, drive trains, crankshafts, flywheels, power transmission shafts, air moving devices, blowers, and rotating elements of hydro electric generating equipment. By definition, the types of equipment covered by the specification are numerous and varied. The specifications that were used prior to this specification were ASME *Boiler and Pressure Vessel Code* in part or in whole and AWS D1.1, *Structural Welding Code—Steel*. AWS D14.6/D14.6M:2012 utilizes information from these codes. The sections on design have been omitted. It is felt that a separate study of how practices do or should differ in design of welding rotating equipment from those published for stationary structures is needed. Such a study was beyond the scope of this subcommittee.

This edition has some revisions that require the use of AWS B2.1/B2.1M:2009, *Specification for Welding Procedure and Performance Qualification*, to supplement the information that has been removed from this edition. The following information has been removed and can be found in B2.1/B2.1M:2009:

(1) F number grouping for filler metals

(2) Permitted welding processes

(3) Procedure qualification specimen for groove welds

(4) Allowable base metals and filler metals for performance qualification

(5) Grouping of base metals by M number and specification number

(6) The following figures:

(a) Limits of Welding Positions for Groove Welds

(b) Welding Test Positions—Plate Groove Welds

(c) Welding Test Positions—Pipe Grove Welds

(d) Limits of Welding Positions for Fillet Welds

(e) Welding Test Positions for Plate Fillet Welds

(f) Welding Test Positions for Pipe Fillet Welds

(g) Tension Test Specimens—Test Plate

(h) Tension Test Specimens—Test Pipe 2 in [50 mm] and 3 in [75 mm] Diameters

(i) Tension Test Specimens—Test Pipe 6 in [150 mm] and 8 in [200 mm] Diameters

(j) Tension Test Specimens—Cylindrical Test Bar for All-Weld-Metal and Crossweld Tensile Specimens

(k) Tension Test Specimens—Typical Locations for Multiple Specimens

(l) Transverse Side Bend Specimens

(m) Transverse Face and Root Bend Specimens

(n) Longitudinal Face and Root Bend Specimens

(o) Jigs for Guided Bend Test—Standard Test Fixture

(p) Jigs for Guided Bend Test—Alternate Wrap-Around Guided Bend Test Fixture

(q) Jigs for Guided Bend Test—Alternate Roller-Equipped Guided Bend Test Fixture for Bottom Ejection of Test Specimens

(r) Test Specimen Layout for Procedure Qualification

(s) Location of Cladding Test Specimens

(t) Weld Cladding Side Bend Test Specimens

(u) Weld Cladding and Hardfacing Chemical Analysis Specimens

(v) Test Specimen Layout for Performance Qualification of Welders and Welding Operators

(w) Method of Applying Load on Fillet-Weld Break-Test Specimen

(7) Welder performance requirements for welding positions

No restrictions are placed on the use of any welding process or procedure provided the weld produced by the process meets the qualification requirements of the specification. No attempt is made to limit or restrict technology progression on the Welding of Rotating Elements, nor should any such limitation be inferred. Similarly no limitation is intended on the use of any base metal, weld joint preparation, or welding consumable capable of being qualified.

Underlined areas in text, tables, or figures indicate changes from the previous edition. A vertical line in the margin next to a figure, equation, or other item also indicates a revision from the previous edition.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D14 Committee on Machinery and Equipment, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

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