AWS D14.9/D14.9M:2013
An American National Standard

Specification for the Welding of Hydraulic Cylinders

American Welding Society®

Approved American National Standard
ANSI

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Approved by the
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Specification for the Welding of Hydraulic Cylinders

1st Edition

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 specification provides standards for the design and manufacture of pressure containing welded joints and structural welded joints used in the manufacture of hydraulic cylinders. Manufacturer's responsibilities are presented as they relate to the welding practices that have been proven successful within the industry in the production of hydraulic cylinders. Included are sections defining welding procedure qualification, welding performance qualification, workmanship and quality requirements as well as inspection requirements and repair requirements.

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Foreword

This foreword is not part of AWS D14.9/D14.9M:2013, *Specification for the Welding of Hydraulic Cylinders*, but is included for informational purposes only.

This specification reflects the welding processes and practices employed by manufacturers within the industry and it incorporates various methods which have been proven successful by individual manufacturers. No restrictions are placed on the use of any welding process or procedure, provided the weld produced meets the qualification requirements of this specification. No attempt is made to limit or restrict technological progress in the welding of hydraulic cylinders, nor should any such limitation be inferred.

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Specification for the Welding of Hydraulic Cylinders

1. Scope and General Provisions

1.1 Scope

1.1.1 This specification provides requirements for the design and manufacture of welded joints of hydraulic cylinders. When specified in the purchasing documents, compliance with all the requirements shall be required. This specification does not apply to the manufacture of welded tubing used for hydraulic cylinders which is covered under ASTM and other recognized specifications. This specification does not specify load determination, design assumptions, safety factors, or calculation methods for non-weld related areas of the hydraulic cylinder.

1.1.2 The Manufacturer's adherence to this specification shall include responsibility for the following:

(1) welding, as defined in 1.1.1, in accordance with this specification;

(2) producing welds as designated on drawings by appropriate symbols and notes, with sufficient detail to show joint preparation compatible with applied processes;

(3) providing written welding procedure specifications (WPSs);

(4) recording and maintaining results of all welding procedure and welder performance qualification tests;

(5) controlling use of designated base metals and welding consumables;

(6) inspecting the welds to the requirements of this specification;

(7) having a welding quality program in place. The requirements of AWS B5.17, *Specification for the Qualification of Welding Fabricators* may be used as a guide in establishing this welding quality program. Accreditation of quality systems of welding fabricators may be obtained through the AWS Certified Welding Fabricator (CWF) or equivalent programs.

1.2 Units of Measure. This specification makes use of both U.S. Customary Units and the International System of Units (SI). The measurements may not be exact equivalents; therefore each system must be used independently of the other without combining them in any way. The specification with the designation D14.9 uses U.S. Customary Units. The specification D14.9M uses SI Units. The latter are shown in appropriate columns in tables and figures or within brackets [ ] when used in the text. Detailed dimensions on figures are in inches. A separate tabular form that relates the U.S. Customary Units with SI units may be used in tables and figures.

1.3 Safety. Safety and health issues and concerns are beyond the scope of this standard, and therefore are not fully addressed herein. Safety and health information is available from the following sources:

American Welding Society:

(1) ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*

(2) AWS Safety and Health Fact Sheets

(3) Other safety and health information on the AWS website

Material or Equipment Manufacturers:

(1) Material Safety Data Sheets supplied by materials manufacturers

(2) Operating Manuals supplied by equipment manufacturers