

An American National Standard



# Specification for the Design of Welded Joints in Machinery and Equipment



**American Welding Society<sup>®</sup>**



**AWS D14.4/D14.4M:2012**  
**An American National Standard**

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**American National Standards Institute**  
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# **Specification for the Design of Welded Joints in Machinery and Equipment**

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

Under the Direction of the  
AWS Technical Activities Committee

Approved by the  
AWS Board of Directors

## **Abstract**

This specification establishes common acceptance criteria for classifying and applying carbon and low-alloy steel welded joints used in the manufacture of machines and equipment. It also covers 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 of weld defects, and heat treatment.



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# Specification for the Design of Welded Joints in Machinery and Equipment

## 1. Scope

### 1.1 General

This specification sets forth requirements dealing with the allowable stresses, welded joint design, workmanship, procedure and performance qualification, inspection, repair and post weld treatments of welded connections used in machinery and equipment, subject to static and cyclic loading. It is intended to be used in conjunction with other specifications that provide application specific requirements (such as D14.1, D14.3, etc.). In the event a conflict arises between the application specific standard and AWS D14.4/D14.4M, the application specific standard shall take precedence. The intent of this document is to establish the effect of weld joint geometry, welding practices, and quality control on allowable stress levels. The specification also provides practices that can be used for examination of welded joints used in fabrication of machinery and equipment.

### 1.2 Limitations

This specification does not dictate load determination, design assumptions, safety factors, or calculation methods. It is not the intent of this specification to restrict the use of other proven welding methods and procedures that are not mentioned herein, which achieve acceptable results and which have been agreed to in writing by the Owner and Manufacturer.

### 1.3 Units of Measurement

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 in any way. The specification with the designation D14.4 uses U.S. Customary Units. The specification D14.4M 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.

### 1.4 Safety and Health

Safety and health issues and concerns are beyond the scope of this standard; some safety and health information is provided, but such issues 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 Applicable Regulatory Agencies