

AWS D14.3/D14.3M:2019  
An American National Standard

**Specification  
for Welding  
Earthmoving,  
Construction,  
Agricultural, and  
Ground-Based  
Material Handling  
Equipment**



**AWS D14.3/D14.3M:2019**  
**An American National Standard**

**Approved by the**  
**American National Standards Institute**  
**February 28, 2018**

# **Specification for Welding Earthmoving, Construction, Agricultural, and Ground-Based Material Handling Equipment**

**7th Edition**

**Supersedes AWS D14.3/D14.3M:2010**

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 producing structural welds used in the manufacture and repair of earthmoving, construction, agricultural, and ground-based material handling equipment. Such equipment is defined as self-propelled, on- and off-highway machinery and associated implements. Manufacturer's responsibilities are presented as they relate to the welding practices that have been proven successful within the industry in the production of weldments on this equipment. Requirements for basic weld details, base material, filler material, processes, welding procedure qualification and documentation, welding personnel qualification, weld quality, inspection, and repair are included.



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This standard is subject to revision at any time by the AWS D14 Committee on Machinery and Equipment. It must be reviewed every five years, and if not revised, it must be either reaffirmed or withdrawn. Comments (recommendations, additions, or deletions) and any pertinent data that may be of use in improving this standard are requested and should be addressed to AWS Headquarters. Such comments will receive careful consideration by the AWS D14 Committee on Machinery and Equipment and the author of the comments will be informed of the Committee's response to the comments. Guests are invited to attend all meetings of the AWS D14 Committee on Machinery and Equipment to express their comments verbally. Procedures for appeal of an adverse decision concerning all such comments are provided in the Rules of Operation of the Technical Activities Committee. A copy of these Rules can be obtained from the American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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M. A. Stevenson	<i>Stevenson Fabrication Services Inc</i>
*E. G. Yevick	<i>Weld-Met International Group</i>

### Advisors to the AWS D14 Committee on Machinery and Equipment

P. Collins	<i>WeldCon Engineering</i>
T. J. Landon	<i>Chicago Bridge &amp; Iron Co</i>
P. J. Palzkill	<i>Consultant</i>
J. L. Warren	<i>Chicago Bridge &amp; Iron Co</i>

### AWS D14C Subcommittee on Earthmoving, Construction, and Agricultural Equipment

J. E. Campbell, Chair	<i>Machinery &amp; Welder Corp</i>
J. R. Douglass, Secretary	<i>American Welding Society</i>
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P. T. Snyder	<i>The Raymond Corporation</i>
A. J. Thomas	<i>Caterpillar Inc</i>
*E. G. Yevick	<i>Weld-Met International Group</i>

**Advisors to the AWS D14C Subcommittee on Earthmoving and Construction Equipment**

R. M. Gneiting	<i>John Deere &amp; Co</i>
T. J. Landon	<i>Chicago Bridge &amp; Iron Co</i>
L. L. Schweinegruber	<i>Consultant</i>
R. T. Taylor	<i>Caterpillar Inc</i>
J. L. Warren	<i>Chicago Bridge &amp; Iron Co</i>

\*Deceased

## Foreword

This foreword is not part of this standard but is included for informational purposes only.

AWS first published the Specification for Welding Earthmoving and Construction Equipment in 1977 to provide a welding specification where none previously existed. By definition, the types of equipment covered by the specification are numerous and varied. Every effort was made to reflect the best welding practices employed by manufacturers within the industry and to incorporate all the various methods which have proven successful by individual manufacturers. This edition builds on these foundations to improve interpretation and effect implementation. Text, tables, and figures have been updated or clarified to reflect more recent developments and promote standardization.

Underlined text or a vertical line in the margin indicates a revision of that item from the previous edition. Revisions to tables, figures, or annexes are marked with a vertical line in the margin.

Comments and inquiries concerning this standard are welcome. They should be sent to the Secretary, AWS D14 Committee on Machinery and Equipment, American Welding Society, 8669 NW 36 St, # 130 Miami, FL 33166.

## Dedication

The AWS D14 Committee on Machinery and Equipment dedicates this edition of the D14.3/D14.3M, Specification for Welding Earthmoving, Construction, Agricultural, and Ground-Based Material Handling Equipment, to Edward G. Yevick for his significant contributions to the committee and his efforts to advance the science, technology and application of welding.

Ed joined AWS in 1963 and achieved the Life Membership Award with Gold Certificate for more than 51 years of service. He received the Samuel Wylie Miller Memorial Award in 2017 and the Honorary Membership Award in 2014. He served as technical representative for the AWS Pittsburgh Section for 15 years, and as chairman from 1980 to 1981. Ed was an active member of D14 Committee on Machinery and Equipment; D14B Subcommittee on Design of Welded Joints; D14C Subcommittee on Earthmoving, Construction, and Agricultural Equipment; D14E Subcommittee on Cranes and Presses; D14G Subcommittee on Rotating Equipment; D14I Subcommittee on Hydraulic Cylinders; and served as chairman of D14H Subcommittee on Surfacing of Industrial Mill Rolls. In addition to the Machinery and Equipment committee and subcommittees, Ed also served as chairman of the AWS D11 Committee on Welding Iron Castings and was serving his third term on the AWS Technical Activity Committee.

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# Specification for Welding Earthmoving, Construction, Agricultural, and Ground-Based Material Handling Equipment

## 1. General Requirements

**1.1 Scope.** This specification applies to all structural welds used in the manufacture and repair of earthmoving, construction, agricultural, and ground-based material handling equipment.<sup>1</sup> It reflects the welding practices employed by manufacturers within the industry and 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 the progression of welding technology for earthmoving, construction, agricultural, and/or ground-based material handling equipment manufacturing and repair, nor should any such limitation be inferred. Design criteria for allowable stresses for the base and weld metal and the fatigue analysis for welded joints are not published in the specification. The user shall utilize AWS D14.4/D14.4M, *Specification for the Design of Welded Joints in Machinery and Equipment*, or appropriate engineering practices and principles for design criteria.

**1.1.1** 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 and using written Welding Procedure Specifications (WPSs);
- (4) ensuring that qualified welders are used to make welds;
- (5) recording and maintaining results of all welder performance and procedure qualification tests;
- (6) controlling use of designated base metals and consumables;
- (7) inspecting the welds to the requirements of this specification;
- (8) having a quality system in place. The requirements of AWS B5.17, *Specification for the Qualification of Welding Fabricators* may be used as a guide in establishing this quality program. Accreditation of quality systems of welding fabricators may be obtained through the AWS Certified Welding Fabricator (CWF) or equivalent programs.
- (9) determining the responsible technical authority when the term "Engineer" is used. If the Owner wants to assume engineering responsibility, it shall be specified in the contract documents.

<sup>1</sup> For purposes of this specification, earthmoving, construction, agricultural, and ground-based material handling equipment are described as on- and off-highway machinery and associated implements, as well as support equipment such as conveyors. Products that this specification covers include, but are not limited to, crawlers, tractors, graders, loaders, off-highway trucks, power shovels, backhoes, mobile cranes, draglines, forklifts, power trucks, and similar equipment. Products such as gantry and jib cranes are not within the scope of this specification.