



# **Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment**



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**Key Words**—Cranes, industrial cranes, lifting devices, material handling equipment, mill cranes

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# **Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment**

**4th Edition**

**Supersedes ANSI/AWS D14.1-97**

Prepared by  
AWS D14 Committee on Machinery and Equipment

Under the Direction of  
AWS Technical Activities Committee

Approved by  
AWS Board of Directors

## **Abstract**

Requirements are presented for the design and fabrication of constructional steel weldments that are used in industrial and mill cranes, lifting devices and other material handling equipment. Requirements are also included for modification, weld repair, and postweld treatments of new and existing weldments. Filler metal and welding procedure guidelines are recommended for the applicable base metals, which are limited to carbon and low-alloy steels. Allowable unit stresses are provided for weld metal and base metal for various cyclically loaded joint designs.



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## Foreword

(This Foreword is not a part of AWS D14.1/D14.1M:2005, *Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment*, but is included for informational purposes only.)

This specification was prepared for the overhead crane and material handling industries to continue the advancement of welding and to increase product reliability. This 4th edition provides revisions to ANSI/AWS D14.1-97, *Specification for Welding of Industrial and Mill Cranes and Other Material Handling Equipment*, under the direction of the AWS Machinery and Equipment Committee.

The participating committee, representing manufacturers, users, and government, joined in the preparation of this document. It will provide all concerned, including the general public, with high quality, reliable products and an economical approach to production, consistent with the industry's capabilities.

This specification will be reviewed periodically to assure its success in serving all parties concerned with its provisions. Revisions will be issued when warranted.

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, 8669 NW 36 St, # 130, Miami, FL 33166.

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# Amendment

The following Amendment has been identified and is incorporated in this reprint.

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

**Amendment Number:** 1

**Subject:** Table 2, Allowable Stress in Weld Metal

**Table 2**  
**Allowable Stress in Weld Metal**

Type of Weld	Stress in Weld <sup>(1)</sup>		Allowable Stress	Required Weld Strength Level <sup>(2)</sup>
Complete joint penetration groove welds (Joint Class I, II, III, or IV)	Shear on the effective area		0.27 times nominal tensile strength of weld metal, except shear stress on base metal shall not exceed <u>0.36</u> times yield strength of base metal.	Weld metal with a strength level equal to or less than matching weld metal may be used.
Partial joint penetration groove welds (Joint Class IV or V)	Compression normal to effective area	Joint not designed to bear	0.45 times nominal tensile strength of weld metal, except shear stress on base metal shall not exceed 0.55 times yield strength of base metal.	Weld metal with a strength level equal to or less than matching weld metal may be used.
		Joint designed to bear	Same as base metal	
	Tension or compression parallel to the axis of the weld <sup>(3)</sup>		Same as base metal	
	Shear parallel to axis of metal		0.27 times nominal tensile strength of weld metal, except shear stress on base metal shall not exceed <u>0.36</u> times yield strength of base metal.	
	Tension normal to effective area		0.27 times nominal tensile strength of weld metal, except tensile stress on base metal shall not exceed <u>0.55</u> times yield strength of base metal.	

*NOTE: Underlined values are revised. This is a partial representation of Table 2.*

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