


**AWS D18.1/D18.1M:2009**  
**An American National Standard**



**Specification for  
Welding of  
Austenitic  
Stainless Steel  
Tube and Pipe  
Systems in  
Sanitary (Hygienic)  
Applications**



**American Welding Society**



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**Approved by the**  
**American National Standards Institute**  
**April 17, 2009**

**Specification for Welding**  
**of Austenitic Stainless Steel**  
**Tube and Pipe Systems in**  
**Sanitary (Hygienic) Applications**

**2nd Edition**

**Supersedes AWS D18.1:1999**

Prepared by the  
American Welding Society (AWS) D18 Committee on Welding in Sanitary Applications

Under the Direction of the  
AWS Technical Activities Committee

Approved by the  
AWS Board of Directors

**Abstract**

This specification provides the requirements for welds in tubing systems in dairy and other food processing plants. The document addresses qualifications, fabrication, extent of visual examination, acceptance criteria, and documentation requirements.



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## Foreword

This foreword is not part of AWS D18.1/D18.1M:2009, *Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications*, but is included for informational purposes only.

The formation of D18 Committee was approved in October and November 1995 by the Technical Activities Committee and the Board of Directors, respectively. The Committee was formed to respond to the request of the 3-A Sanitary Standards Committee for help in preparing welding standards for use in the manufacture and construction of dairy and food product processing plants. The 3-A Sanitary Standards Inc. (3-A SSI) Committees develop and promulgate sanitary design standards for dairy and food processing, packaging, and handling equipment and systems. Several members of the Committee are active members of 3-A, and the Committee has maintained liaison with 3-A.

This document supersedes AWS D18.1:1999, *Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications*. Principal changes in the second edition involve enhancements to the sections on welding procedure qualifications and qualification records.

The D18 Committee has adopted AWS B2.1, *Specification for Welding Procedure and Performance Qualification*, as a basis for welding procedure and welding performance qualifications. Exceptions as they relate to sanitary applications are included in this document. It should be noted that the terms “essential variable” and “nonessential variable” have been changed to “qualification variable” and “welding variable” to be consistent with AWS B2.1.

A vertical line in the margin indicates a revision from the previous 1999 edition.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS D18 Committee on Welding in Sanitary Applications, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.

# Table of Contents

	<b>Page No.</b>
<i>Dedication</i> .....	v
<i>Personnel</i> .....	vii
<i>Foreword</i> .....	ix
<i>List of Figures</i> .....	xi
<b>1. Scope</b> .....	1
<b>2. Normative References</b> .....	1
<b>3. Terms and Definitions</b> .....	2
<b>4. Qualification</b> .....	3
4.1 Procedure Qualification .....	3
4.2 Performance Qualification .....	5
<b>5. Fabrication</b> .....	7
5.1 Material Preparation .....	7
5.2 Preconstruction Weld Samples (PWS) .....	7
<b>6. Visual Examination Requirements</b> .....	7
6.1 Extent of Examination .....	7
6.2 Visual Examination Acceptance Criteria .....	8
<b>7. Documentation</b> .....	8
Annex A (Informative)—Guidelines for the Preparation of Technical Inquiries .....	11
Annex B (Informative)—Documentation Sample Forms .....	13
List of AWS Documents on Welding in Sanitary Applications .....	21

## List of Figures

<b>Figure</b>		<b>Page No.</b>
1	Examples of Maximum Allowable Discontinuities .....	9
2	Weld Discoloration Levels on Inside of Austenitic Stainless Steel Tube .....	10

# Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications

## 1. Scope

This specification covers the requirements for Gas Tungsten Arc Welding and Plasma Arc Welding of stainless steels and nickel alloy tube and pipe 1/4 in [6 mm] diameter and larger in the fabrication and construction of new sanitary (hygienic) processing systems. This specification includes the welding of tube and pipe for the transportation of sanitary (hygienic) system products and cleaning or sanitizing solutions. It includes manual welding as well as automatic or mechanized welding, such as orbital welding. This specification addresses welding qualification and visual examination requirements for as-welded surfaces as well as finished surfaces.

This specification is intended for new construction. However, the requirements may also be applied to maintenance and repair of food processing equipment. When there is a conflict between this specification and a design specification to which the equipment is being constructed, the applicable code shall govern on issues that apply to structural design or structural integrity. This specification does not address requirements designed to prevent corrosion damage during service or any structural design or integrity aspects of components or systems used for sanitary (hygienic) applications.

Sanitary processing systems are intended to include those systems handling products for human and animal consumption, or for cleaning and sanitizing solutions used in these systems. Such products include dairy, meat, poultry, vegetables, beverages, personal care items (such as shampoo, soap, toothpaste, cosmetics), and other products consumed or used by humans or animals, which require freedom from contamination.

When this specification is stipulated in contract documents, conformance with all provisions of this specification are required, except for those provisions that the Owner, their representative, or contract documents specifically modifies or exempts. The Owner or their representatives shall provide a complete specification for the piping or tubing system.

This specification makes use of both U.S. Customary Units and the International System of Units (SI). The latter are shown within brackets [ ] or in appropriate columns in tables or figures. The measurements may not be exact equivalents; therefore, each system must be used independently.

Safety and health issues are beyond the scope of this standard, and therefore are not fully addressed herein. Safety and health information is available from other sources, including, but not limited to federal, state, and local regulations as well as other safety standards such as ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*.

## 2. Normative References

The following standards contain provisions which, through reference in this text, constitute mandatory provisions of this AWS standard. For undated references, the latest edition of the referenced standard shall apply. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply.

AWS Standards<sup>1</sup>:

AWS A3.0, *Standard Welding Terms and Definitions*;

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<sup>1</sup> AWS standards are published by the American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126.