

AWS B2.1/B2.1M:2026
An American National Standard

Specification for Welding Procedure and Performance Qualification



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Specification for Welding Procedure and Performance Qualification

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Prepared by the
American Welding Society (AWS) B2 Committee on Procedure and Performance Qualification

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This specification provides the requirements for qualification of welding procedure specifications, welders, and welding operators for manual, semiautomatic, mechanized, and automatic welding. The welding processes included are electrogas welding, electron beam welding, electroslog welding, flux cored arc welding, gas metal arc welding, gas tungsten arc welding, laser beam welding, oxyfuel gas welding, plasma arc welding, shielded metal arc welding, stud arc welding, and submerged arc welding. Base metals, filler metals, qualification variables, welding designs, and testing requirements are also included.



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Foreword

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

The AWS B2 Committee on Procedure and Performance Qualification was formed in 1979. The first edition of B2.1, *Standard for Welding Procedure and Performance Qualification*, was published in 1984. This standard introduced the concept of Standard Welding Procedure Specifications (SWPSs) in addition to a set of rules for qualifying welding procedures, welders, and welding operators. The following edition, renamed B2.1:1998, *Specification for Welding Procedure and Performance Qualification*, was an extensive revision of B2.1-84. The Committee has published numerous Standard Welding Procedure Specifications; B2.2, *Standard for Brazing Procedure and Performance Qualification*; B2.3, *Specification for Soldering Procedure and Performance Qualification*; and B2.4, *Specification for Welding Procedure and Performance Qualification for Thermoplastics*.

AWS B2.1-84, *Standard for Welding Procedure and Performance Qualification*, was revised in 1998, 2000, 2005, 2009, 2014, and 2021.

This is the eighth edition of B2.1, *Specification for Welding Procedure and Performance Qualification*.

A vertical line in the margin or underlined text in clauses, tables, or figures indicates an editorial or technical change from the 2021 edition; vertical lines denote omissions, and underlining denotes new information.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary, AWS B2 Committee on Procedure and Performance Qualification, American Welding Society, 8669 NW 36 St, # 130, Miami, FL 33166.

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Table of Contents

	Page No.
<i>Personnel</i>	v
<i>Foreword</i>	vii
<i>List of Tables</i>	xi
<i>List of Figures</i>	xi
<i>List of Forms</i>	xii
1. General Requirements	1
1.1 Scope	1
1.2 Units of Measure	2
1.3 Safety	2
2. Normative References	2
3. Terms and Definitions	3
4. Procedure Qualification	5
4.1 General	5
4.2 Standard Welding Procedure Specifications	5
4.3 Welding Procedures Qualified by Employer	7
4.4 Evaluation of Test Coupons	8
4.5 Qualification Thickness Limitations	9
4.6 Special Test Coupon Acceptance Criteria	11
4.7 Pipe and Plate Groove Test Coupons and Acceptance Criteria	11
4.8 Fillet Test Coupons and Acceptance Criteria	13
4.9 Cladding Test Coupons and Acceptance Criteria	15
4.10 Hardfacing Test Coupons and Acceptance Criteria	18
4.11 Stud Welds and Acceptance Criteria	19
4.12 Test Coupons Less than 1/16 in [1.5 mm] Acceptance Criteria	20
4.13 Welding Procedure Specification Data	22
4.14 Procedure Qualification Variables	24
4.15 <u>Additional Procedure Qualification Variables for Hybrid Welding</u>	33
5. Performance Qualification	35
5.1 General	35
5.2 Qualification by Standard Test	37
5.3 Qualification by Workmanship Test	37
5.4 Test Coupons	37
5.5 Examination Procedures and Acceptance Criteria	47
5.6 Performance Qualification Variables	49
<i>Annexes</i>	51
Annex A (Normative)—Illustrations—Weld Position, Test Specimens, and Text Fixtures	53
Annex B (Normative)—Filler Metal Grouping	73
Annex C (Normative)—Base Metal Grouping	77
Annex D (Normative)—Radiographic Examination Procedure	215
Annex E (Normative)— <u>Wire-Additive Material Manufacturing</u>	219
Annex F (Informative)—Basis for Establishing a Standard Welding Procedure Specification (SWPS)	225

Annex <u>G</u> (Informative)—Sample Forms	227
Annex <u>H</u> (Informative)—Macroetch Procedure	233
Annex <u>I</u> (Informative)—Requesting an Official Interpretation on an AWS Standard	237
Annex <u>J</u> (Informative)—Guidelines for Requesting Adoption of New Materials Under the AWS B2.1 Standard . . .	239
List of AWS Documents on Welding Procedure and Performance Qualification.	243

List of Tables

Table	Page No.
4.1	Test Methods Required for Procedure Qualification 9
4.2	Thickness and Size Limitations for Fillet Welds for Procedure Qualification 9
4.3	Thickness Limitations of Plate and Pipe for Groove Welds for Procedure Qualification 10
4.4	Thickness Limitations for Cladding and Hardfacing for Procedure Qualification 10
4.5	Minimum Shear Strength for Aluminum Fillet Welds 17
4.6	Minimum Tensile Load Requirements for Aluminum Stud Welds 19
4.7	Minimum Torque Requirements for Steel Stud Welds 20
4.8	Minimum Torque Requirements for Aluminum Stud Welds 21
5.1	Examination Requirements for Performance Qualification 36
5.2	Number of Bend Tests for Performance Qualification 39
5.3	Allowable Base Metals for Performance Qualification 39
5.4	Allowable Filler Metals for Performance Qualification 40
5.5	Position Limitations for Performance Tests 42
5.6	Limitations for Performance Qualification on Groove Welds in Pipe and Tube 50
5.7	Limitations for Performance Qualification in Plate Groove Welds 50
5.8	Limitations for Performance Qualification in Pipe Fillet Welds 50
B.1	Grouping of Welding Electrodes and Rods for Qualification 74
B.2	Classification of Ferrous Weld Metal for Procedure Qualification 76
C.1	Listing of Base Metal Specifications—Ferrous Alloys 78
C.1	Listing of Base Metal Specifications—Nonferrous Alloys 116
C.2	M-Number Listing of Base Metals—Ferrous Alloys 137
C.2	M-Number Listing of Base Metals—Nonferrous Alloys 170
C.3	Listing of Base Metal Specifications—Iron Castings 198
C.4	Listing of Base Metal Specifications for Standard Welding Procedure Specifications for Naval Applications—Ferrous Alloys 200
D.1	Acceptable Linear Discontinuities for Radiographic Examination 216
D.2	Acceptable Rounded Discontinuities for Radiographic Examination 216
<u>E.1</u>	<u>Variables for Wire-Additive Material Manufacturing WPS and PQR 220</u>
<u>E.2</u>	<u>Wire-Additive Material Manufacturing Qualification Layer Width Limits 221</u>

List of Figures

Figure	Page No.
4.1	Welding Procedure Selection Criteria 6
4.2	Location of Groove Weld Test Specimens—Pipe 11
4.3	Location of Test Specimens for Welded Box Tubing 12
4.4	Location of Tension, Longitudinal Bend, and Fracture Toughness Test Specimens—Plate 13
4.5	Location of Tension, Fracture Toughness, and Transverse Bend Test Specimens—Plate 14
4.6	Location of Fillet Weld Shear Test and Macroetch Specimens 15
4.7	Fillet Weld Break Test and Macroetch Specimens for Procedure Qualification 16

4.8	Location of Cladding Test Specimens	17
4.9	Location of Hardfacing Test Specimens	18
4.10	Rotating Tool Design Characteristics (FSW).	33
5.1	Selection of Performance Qualification Method—Workmanship Test or Standard Test.	36
5.2	Typical Workmanship Test Coupons	38
5.3	Location of 1G, 2G, 5G, and 6G Bend Specimens—Pipe Groove Test Coupon.	40
5.4	Location of Bend Specimens—Combined Pipe Positions 2G and 5G	41
5.5	Location of Bend Specimens for Box Tube	43
5.6	Location of Transverse Bend Specimens—Plate Groove Test Coupon.	43
5.7	Location of Longitudinal Bend Specimens—Plate Groove Test Coupon	44
5.8	Location of Fillet Test Specimens—Plate	44
5.9	Location of Fillet Test Specimens—Alternate Test Coupon—Plate	45
5.10	Location of Fillet Test Specimens—Pipe.	45
5.11	Location of Fillet Test Specimens—Alternate Weld—Pipe.	46
5.12	Location of Cladding Specimens—Plate	46
5.13	Location of Test Specimen—Hardfacing Test Coupon—Plate	47
A.1A	Welding Test Positions—Groove, Cladding, and Hardfacing Welds.	55
A.1B	Limits of Welding Positions—Groove, Cladding, and Hardfacing Welds.	56
A.1C	Welding Test Positions—Fillet Welds	57
A.1D	Limits of Welding Positions—Fillet Welds	58
A.1E	Welding Positions—Stud Welds	59
A.2A	Transverse Face and Root Bend Specimens	60
A.2B	Longitudinal Face and Root Bend Specimens	61
A.2C	Transverse Side Bend Specimens	61
A.3A	Reduced Section Tension Specimen—Rectangular	62
A.3B	Reduced Section Tension Specimen—Round	63
A.3C	Alternate Tension Specimen for Pipe 3 in [76 mm] O.D. or Less	63
A.3D	Alternate Tension Specimen for Pipe 2 in [51 mm] O.D. or Less	64
A.4A	Weld Cladding Side Bend Specimen	65
A.4B	Weld Cladding and Hardfacing Chemical Analysis Specimens.	65
A.5A	Guided Bend Fixture—Bottom Ejecting Type.	66
A.5B	Guided Bend Fixture—Bottom Type.	67
A.5C	Guided Bend Fixture—Wrap-Around	68
A.5D	Stud Weld Bend Test Fixture	69
A.5E	Stud Weld Torque Test Fixture.	70
A.5F	Stud Weld Tension Test Fixture	71
D.1	Rounded Indication Charts for Radiographic Examination.	217
E.1	<u>Layer Width (W) > 1/2 in [13 mm] Procedure Qualification.</u>	223
E.2	<u>Layer Width (W) ≤ 1/2 in [13 mm] Procedure Qualification</u>	224

List of Forms

Form		Page No.
<u>G.1</u>	Example of a Performance Qualification Test Record.	228
<u>G.2</u>	Example of a Welding Procedure Specification.	229
<u>G.3</u>	Example of a Procedure Qualification Record.	230

Specification for Welding Procedure and Performance Qualification

1. General Requirements

1.1 Scope. This specification provides requirements for welding procedure and welding performance qualification. It is the intent that this specification be referenced by other documents, such as codes, specifications, contracts, and quality control or quality assurance manuals. Such documents are recognized in this specification as Referencing Documents. Requirements imposed by the Referencing Document supersede the requirements of this specification.

The requirements for the qualification of welding procedures are provided in Clause 4, Procedure Qualification. The requirements for the performance qualification of welders and welding operators are provided in Clause 5, Performance Qualification.

This specification also defines and establishes qualification variables. Qualification requirements are based on the premise that the Referencing Document will specify fabrication, design, base metal, filler metal, preheat, interpass temperature, postweld heat treatment (PWHT), nondestructive examination, and test requirements applicable to the product. Welding procedure and performance qualifications which meet the requirements of other codes and specifications are acceptable, provided they also meet the requirements of this specification.

Base metals and filler metals have been grouped into categories that will minimize the number of qualification tests required. Substitution of one base metal or filler metal for another, even when within the allowable rules, should only be made after an evaluation of the material's suitability for its intended use. For some materials, additional tests may be appropriate to verify the material's suitability. Materials not listed require separate qualification.

This specification is intended for use with the following welding processes:

EBW = Electron Beam Welding

EGW = Electrogas Welding

ESW = Electroslag Welding

FCAW = Flux Cored Arc Welding

GMAW = Gas Metal Arc Welding

GTAW = Gas Tungsten Arc Welding

LBW = Laser Beam Welding

OFW = Oxyfuel Gas Welding

PAW = Plasma Arc Welding

SAW = Submerged Arc Welding

SMAW = Shielded Metal Arc Welding

SW = Arc Stud Welding

Employers shall be responsible for the welding performed by their organization, including the use of qualified welding procedures, qualified welders, and qualified welding operators. The welding procedure may be an AWS Standard Welding Procedure Specification (SWPS) published by the American Welding Society, or it shall be qualified by the Employer as required under the rules of Clause 4, Procedure Qualification. It is the Employer's responsibility to assure that welding procedure specifications (WPSs) meet all requirements of the Referencing Document.