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**AWS B2.1-1-003:2002 (S2022)**  
**An American National Standard**

**Standard Welding  
Procedure Specification  
(SWPS) for Gas Metal  
Arc Welding (Short  
Circuiting Transfer  
Mode) of Galvanized  
Steel (M-1), 18 through  
10 Gauge, in the  
As-Welded Condition,  
with or without Backing**

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**AWS B2.1-1-003:2002 (S2022)  
An American National Standard**

**Approved by the  
American National Standards Institute  
June 10, 2002  
Stabilized Maintenance: November 14, 2022**

**Standard Welding Procedure Specification (SWPS) for  
Gas Metal Arc Welding (Short Circuiting  
Transfer Mode) of Galvanized Steel  
(M-1), 18 through 10 Gauge,  
in the As-Welded Condition,  
with or without Backing**

**2nd Edition**

**Revises ANSI/AWS B2.1.003-90**

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 standard contains the essential welding variables for welding galvanized steel in the thickness range of 18 through 10 gauge, using semiautomatic gas metal arc welding (short circuiting transfer mode). It cites the base metals and operating conditions necessary to make the weldment, the filler metal specifications, and the allowable joint designs for groove welds and fillet welds.



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## Foreword

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

The American Welding Society generates Standard Welding Procedure Specifications (SWPSs) for industry through the cooperative efforts of the AWS B2 Committee on Procedure and Performance Qualification, the AWS B2D Subcommittee on Standard Welding Procedure Specifications, and the AWS B2G Subcommittee on Procedure Qualification Records. The Welding Procedures Committee (WPC) of the Welding Research Council (WRC) originally managed the procedure qualification records in support of AWS Standard Welding Procedure Specifications and was formally transitioned to the AWS B2G Subcommittee on Procedure Qualification Records in 2019.

The need for pretested welding procedures that are supported by adequate test data and that satisfy the technical requirements for the commonly used construction codes and specifications has been expressed by many individuals and organizations. The purpose of a welding procedure qualification is to provide test data for assessing the properties of a weld joint.

This Standard Welding Procedure Specification is an outgrowth of the coordinated work of the AWS B2G Subcommittee on Procedure Qualification Records and the AWS B2 Committee on Procedure and Performance Qualification. The AWS B2G Subcommittee on Procedure Qualification Records has provided the data documented on the Summary of Procedure Qualification Records.

The welding terms used in this specification shall be interpreted in accordance with the definitions given in the latest edition of AWS A3.0M/A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*. Welding symbols shall be those shown in the latest edition of AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*. The A5.32 designation for welding gases should be those shown in the latest edition of AWS A5.32/A5.32M, *Specification for Welding Shielding Gases*.

The AWS B2 Committee on Welding Procedure and Performance Qualification was formed in 1979 to provide welding standards concerning the subject of qualification. The primary document developed by this committee is AWS B2.1/B2.1M, *Specification for Welding Procedure and Performance Qualification*. This document established the foundation and framework for Standard Welding Procedure Specifications.

The first two Standard Welding Procedure Specifications were published in 1990. Since then, SWPSs are continuing to be developed and published by the American Welding Society.

This standard has been approved for stabilized maintenance because it addresses mature technology or practices, and as a result, is not likely to require revision. A request for maintenance of this standard may be submitted at any time by following the maintenance request given in the Statement on the Use of American Welding Society Standards at the front of this document.

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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# Standard Welding Procedure Specification (SWPS)

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## Gas Metal Arc Welding (Short Circuiting Transfer Mode) of Galvanized Steel (M-1), 18 through 10 Gauge in the As-Welded Condition, with or without Backing

**Welding Research Council—Supporting PQR Numbers:  
005A, 006A, 007A, 008A, 047A, 048A, 049A, 050A, 051B,  
052B, 053A, 054B, and 055B**

### Requirements for Application of SWPSs

**Scope.** The data to support this Standard Welding Procedure Specification (SWPS) have been derived from the above listed Procedure Qualification Records (PQRs) which were reviewed and validated under the auspices of the Welding Research Council. This SWPS is not valid using conditions and variables outside the ranges listed. The American Welding Society considers that this SWPS presents information for producing an acceptable weld using the conditions and variables listed. The user needs a significant knowledge of welding and accepts full responsibility for the performance of the weld and for providing the engineering capability, qualified personnel, and proper equipment to implement this SWPS.

**Application.** This SWPS is to be used only as permitted by the applicable fabrication document(s) [such as code, specification, or contract document(s)]. The fabrication document(s) should specify the engineering requirements such as design, need for heat treatment, fabricating tolerances, quality control, and examination and tests applicable to the end product.

**User's Responsibility.** A SWPS does not replace or substitute for fabrication codes, specifications, contract requirements, or capability and judgment on the part of the user. A SWPS is to be used only as permitted by the applicable fabrication code, specification, or contract document.

The ability to produce production welds having properties suitable for the application depends upon supplementing the SWPS with appropriate performance qualification tests and sound engineering judgment. The user is responsible for the quality and performance of the final product in accordance with the provisions of the fabrication document(s).

**Supplementary Instructions.** To adapt this SWPS to a specific application, a user may issue supplementary instructions. Such instructions may consist of tighter fit-up tolerances, higher minimum preheat temperature or any other instructions necessary to produce a weldment that meets the requirements of the fabrication document(s). These instructions shall not be less restrictive than provided in the SWPS.

**Safety.** Safety precautions shall conform to the latest edition of ANSI Z49.1, *Safety in Welding, Cutting, and Allied Processes*, published by the American Welding Society.

This specification may involve hazardous materials, operations, and equipment. The specification does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to establish appropriate safety and health practices. The user should determine the applicability of any regulatory limitations prior to use.