

**AWS B2.1-1-019-94R**

**Standard Welding Procedure  
Specification (WPS) for**

**CO<sub>2</sub> Shielded  
Flux Cored Arc  
Welding of Carbon  
Steel (M-1/P-1/S-1,  
Group 1 or 2),  
1/8 through 1-1/2 inch  
Thick, E70T-1 and  
E71T-1, As-Welded  
Condition**

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**Key Words**—Welding Procedure Specification,  
base metal, allowable joint designs,  
filler metal, carbon steel, semi-  
automatic, CO<sub>2</sub> shielded flux  
cored arc welding

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**Approved by  
American National Standards Institute  
April 15, 1993**

**Standard Welding Procedure  
Specification (WPS)  
CO<sub>2</sub> Shielded Flux Cored Arc Welding of  
Carbon Steel (M-1/P-1/S-1, Group 1 or 2)  
1/8 through 1-1/2 inch Thick, E70T-1 and E71T-1  
As-Welded Condition**

Prepared by  
AWS Committee on Welding Qualification

Under the Direction of  
AWS Technical Activities Committee

Approved by  
AWS Board of Directors

**Abstract**

This standard contains the essential welding variables for carbon steel in the thickness range of 1/8 through 1-1/2 inch, using semiautomatic CO<sub>2</sub> shielded flux cored arc welding. It cites the base metals and operating conditions necessary to make the weldment, the filler metal specifications, and the allowable joint designs for fillet and groove welds. This WPS was developed primarily for plate and structural applications.



**American Welding Society**

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# Standard Welding Procedure Specification (WPS)

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## CO<sub>2</sub> Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 through 1-1/2 inch Thick, E70T-1 and E71T-1, As-Welded Condition

**Welding Research Council—Supporting PQR Numbers:**  
003066, 003067, 007008, 007010, 007012, 103030, 103031, 103032,  
103033, 103034, 106001, 106002, 200292, 200430, 200763, 200764,  
200765, 200767, 200768, 200769, 200770, 200773, 200774, 200775,  
200776, 200780, 200781, 200782, 200783, 200784, 200785

### Requirements for Application of Standard WPSs

**Scope.** The data to support this Standard Welding Procedure Specification (WPS) 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 Standard WPS is not valid using conditions and variables outside the ranges listed. The American Welding Society considers that this Standard WPS 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 Standard Welding Procedure Specification.

**Application.** This Standard WPS is to be used only as permitted by the applicable fabrication document [such as code, specification, or contract document(s)]. The fabrication document 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 Standard WPS does not replace or substitute for fabrication codes, specifications, contract requirements, or capability and judgment on the part of the user. A Standard WPS

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 Standard WPS with appropriate performance qualification tests and sound engineering judgement. The user is responsible for the quality and performance of the final product in accordance with the provisions of the fabrication document.

**Supplementary Instructions.** To adapt this Standard WPS 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. These instructions shall not be less restrictive than provided in the Standard WPS.

**Safety.** Safety precautions shall conform to the latest edition of ANSI/ASC Z49.1, *Safety in Welding and Cutting*, 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.