ANSI/AWS B2.1-1-203-96 (R2007) 
An American National Standard

Standard Welding Procedure Specification (SWPS) for

Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 through 3/4 inch Thick, E6010 (Vertical Uphill), As-Welded Condition, Primarily Pipe Applications

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Key Words—Welding Procedure Specification, base metal, allowable joint designs, filler metal, carbon steel, manual welding, shielded metal arc welding

Abstract
This standard contains the essential welding variables for carbon steel in the thickness range of 1/8 through 3/4 inch, using manual shielded metal arc welding with E6010 (vertical uphill). 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 pipe applications.
Standard Welding Procedure Specification (SWPS)

Shielded Metal Arc Welding of Carbon Steel
(M-1/P-1/S-1, Group 1 or 2), 1/8 through 3/4 inch Thick,
E6010 (Vertical Uphill), As-Welded Condition,
Primarily Pipe Applications

Welding Research Council—Supporting PQR Numbers:
001009, 003016, 003017, 103004, 106006, 107020, 200112, 200113,
200114, 200115, 200519, 200614, 200615, 200617, 200703, 500021,
500119, 197A, 198A, 199A

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 imple-
ment this Standard WPS.

Application. This Standard WPS 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 en-
gineering requirements such as design, need for
heat treatment, fabricating tolerances, quality con-
trol, and examination and tests applicable to the end
product.

User’s Responsibility. A Standard WPS does not
replace or substitute for fabrication codes, specifi-
cations, contract requirements, or capability and judg-
ment on the part of the user. A Standard WPS is to
be used only as permitted by the applicable fabrica-
tion 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 engineer-
ing 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 Stan-
dard 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 instruc-
tions 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 Standard WPS.

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

This specification may involve hazardous mate-
rials, operations, and equipment. The specification
does not purport to address all of the safety prob-
lems associated with its use. It is the responsibility of
the user to establish appropriate safety and health
practices. The user should determine the applica-
bility of any regulatory limitations prior to use.