

Welding Procedure Specification

A36 Plate with SMAW E7018

Document	DEMO-SMAW-001 Rev 0
Status	SOURCE-BASED DEMONSTRATION
Code review basis	AWS D1.1/D1.1M:2025 base + registered base errata through 2026-07-28; AMD1 excluded

This worked example shows how a public WPS input set can be organized into a usable procedure document. The source is WABO sample WPS 201 for welder qualification; the product name below is a separate demonstration selection.

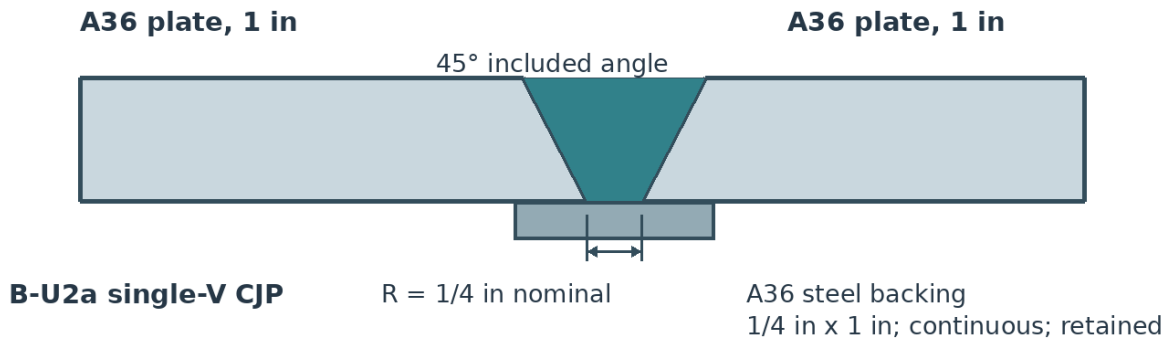
1 Scope and base materials

Application	Non-tubular 1 in A36-to-A36 plate CJP butt joint, B-U2a, SMAW, 3G and 4G vertical-up. Demonstration assumptions: static loading, no CVN requirement and no PWHT requirement. Verify the actual contract, drawings, material certificates, consumable lot/product and applicable code edition before production issue.
Base metals	ASTM A36 plate to ASTM A36 plate; 1 in (25.4 mm) each side
Current-edition group check	Group II for A36 at 1 in under AWS Table 5.6. The source form labels Group I; that source label is not carried forward.
Weld type	CJP groove weld, non-tubular plate; demo assumes static loading, no CVN requirement and no PWHT requirement.

2 Joint design and fit-up

Joint detail	AWS B-U2a, US customary; single-V butt, one side, steel backing; no backgouging
Groove geometry	45° included angle; 1/4 in root opening nominal for this demonstration; root face N/A
As detailed tolerance	Root opening: +1/16 in / -0. Groove angle: +10° / -0°.
Code fit-up tolerance	Root opening: +1/4 in / -1/16 in. Groove angle: +10° / -5°.
Selected demo fit-up	Root opening held to 3/16-1/4 in; do not exceed 1/4 in. Groove angle held nominal 45°.
Backing	Demo condition: ASTM A36, 1/4 in thick x 1 in wide, continuous full weld length, tight fit and retained for static loading. The source gives no dimensions.

Joint cross-section



Schematic for this demonstration only. Apply Figure 5.1 B-U2a; the sketch does not replace design drawings or project fit-up inspection.

3 Process, consumable and position

Process	SMAW, manual
Electrode	AWS A5.1 E7018, 1/8 in (3.2 mm), DCEP
Demo product selection	Lincoln Electric Excalibur 7018 MR, AWS A5.1 E7018 H4R. This trade name is selected for this demonstration; it is not identified in WABO WPS 201.
Manufacturer range check	Lincoln C2.10.10 issue 05/14 lists 90-160 A for 1/8 in DCEP; the source range 100-140 A is within it. Confirm current product data for actual work.
Positions	3G vertical-up; 4G overhead
Shielding gas	N/A

4 Welding parameters

The operating ranges below reproduce the source values for all passes. The amperage interval also falls within the separately selected manufacturer data for the demonstration electrode.

Pass / layers	Current & polarity	Voltage	Travel speed	Technique
Root pass	100-140 A, DCEP	21-25 V	6-12 in/min	Stringer; up in 3G
Fill passes	100-140 A, DCEP	21-25 V	6-12 in/min	Stringer; up in 3G
Cap pass	100-140 A, DCEP	21-25 V	6-12 in/min	Stringer; up in 3G

Multipass procedure; no fixed pass count is stated. Use stringer beads and deposit each pass to its appropriate joint-fill stage.

5 Preheat, interpass and workmanship

Minimum preheat	50°F (10°C). Matches reviewed Table 5.11 Category B for 1 in low-hydrogen SMAW.
Minimum interpass	50°F (10°C), as recorded by the source.
Maximum interpass	Not stated; confirm any project limit.
Electrode control	Keep sealed and dry before use. After opening, hold at $\geq 250^{\circ}\text{F}$. This demo uses a conservative 4-hour exposure limit; do not use damp electrodes. Follow manufacturer and project handling instructions.
Surface and pass cleaning	Remove loose scale, rust, oil and moisture before welding. Chip slag and wire-brush between passes.
Bead limits	Table 5.1: root bead $\leq 1/2$ in vertical and $\leq 5/16$ in overhead; fill/cap bead $\leq 3/16$ in in all positions. The 1/8 in low-hydrogen electrode is within the 5/32 in vertical/overhead maximum.
Bead shape	Each pass: weld-metal depth and maximum width do not exceed its surface width (5.8.2.1).
PWHT	N/A in source; none assumed for this demo.

6 Source and interpretation notes

Primary input: Washington Association of Building Officials (WABO), Standard 27-13, Twelfth Edition, June 2023, sample WPS 201, WPS 201, printed page 66. The source records A36, 1 in plate, SMAW E7018 1/8 in, DCEP, 100-140 A, 21-25 V, 6-12 in/min, B-U2a, 45°, 1/4 in maximum root opening, steel backing, 3G/4G vertical-up, stringer multipass, 50°F minimum preheat/interpass, chip and wire brush, and PWHT N/A.

The source sketch calls the root opening “1/4 in maximum.” This demonstration identifies 1/4 in as its selected nominal geometry for mapping to the 2025 Figure 5.1 row; it does not claim that this wording was present in the source. The source does not provide the electrode trade name, exact pass count, maximum interpass temperature, or backing dimensions.

This is not an issued production WPS, customer record, or qualification result. Current-edition review is limited to the specific material-group, minimum-preheat, joint-detail and selected-electrode range checks stated here. Confirm the contract edition, design requirements, actual materials, product identity, backing details and any additional limits before issuing a production WPS.

Source references

WABO Standard 27-13 Twelfth Edition (June 2023), sample WPS 201, p. 66: <https://www.wabo.org/assets/Weld/STD%2027-13%20Twelfth%20Edition%20June%202023.pdf>

Lincoln Electric C2.10.10, issue 05/14 (selected demo product data):

<https://ch-delivery.lincolnelectric.com/api/public/content/1e5acff4045643c0941db43b3728d119?v=a43a00d7>

No PQR number, test result, customer approval, engineer signature, or inspection result is asserted in this document.