OpsPilot

Weld Procedure Specification — User Manual

Defensible Welding Qualification · ISO 15614 / ASME IX · AI Engineering Co-Pilot

What this guide covers — what a WPS is (and how it relates to a PQR), how the OpsPilot module builds one, what to have ready, and the document you receive.

> **Qualification required.** A WPS must be qualified by a Procedure Qualification Record (PQR) — destructive-test evidence that the procedure produces sound welds. OpsPilot structures the WPS; the welding engineer is accountable for qualification and acceptance to code.

1. What is a Weld Procedure Specification?

A Weld Procedure Specification (WPS) is the qualified instruction for how to make a specific weld — the base metals, filler, process, position, parameters, joint design and any heat treatment — so that any qualified welder following it produces a sound, code-compliant weld. It is not a free-form instruction: a WPS is only valid once it has been

OpsPilot builds to *the ISO 15614 series, ASME BPVC Section IX, AWS D1.1/D1.6, the AS/NZS 1554 series, AS 3992, EN ISO 9606 and ISO 3834*.

2. WPS and PQR — the relationship

Document	Role
WPS	The instruction — how to make the weld, with its qualified ranges of parameters.
PQR	The evidence — the record of a test weld and its destructive-test results that qualifies the WPS.

Essential variables (process, base-metal group, filler, thickness range, preheat, PWHT) are what a change to requires re-qualification — change one beyond its qualified range and the WPS no longer covers the weld.

3. What the OpsPilot module does

Role	Responsibility
🎯 **AI Coach — Welding**	Structures a defensible WPS to the applicable code — base metals, filler,

Role	Responsibility
Engineer (OpsPilot)	process, position, parameters, joint design, preheat and PWHT — and keeps the essential variables and their qualified ranges explicit so the WPS stays valid.
👷 Welding Engineer / QA-QC / Fabrication Manager (you)	Provide the joint, materials, process and the supporting PQR — and you are accountable for qualification and code acceptance.

4. What you will be asked — have this ready

- The base metals (material group) and the joint design.
- The welding process, filler metal and position.
- The parameters — current, voltage, travel speed, preheat, interpass, PWHT.
- The supporting PQR (or the plan to qualify one), and the governing code.

5. What you receive — the output

A complete Weld Procedure Specification (Word): base metals, filler, process, position, joint design, the welding parameters with their qualified ranges, preheat and post-weld heat treatment, and the essential-variable record — referenced to its PQR and the governing code.

6. Worked example (illustrative)

A WPS is needed for a structural steel joint. OpsPilot structures it to AS/NZS 1554 (or AWS D1.1): the base-metal group, the GMAW process, the filler classification, the joint preparation, and the parameter ranges (amperage, voltage, travel speed) within which it's qualified, plus preheat for the plate thickness. It keeps the essential variables explicit — so when a fabricator later wants to weld a thicker section or switch filler, it's immediately clear whether that's still inside the qualified range or needs a new PQR. The WPS references the PQR that qualifies it; without that destructive-test evidence, the document isn't a qualified procedure, and OpsPilot makes that dependency clear rather than letting a WPS masquerade as qualified on its own.

7. Getting the best result

- **No WPS without a PQR.** The destructive-test evidence is what makes the procedure real — not the document alone.
- **Track essential variables.** A change beyond a qualified range needs re-qualification — keep them visible.
- **State qualified ranges.** A WPS covers a range of thickness/parameters — be explicit about its limits.
- **Build to the governing code.** ISO 15614, ASME IX and AWS differ — qualify to the one your contract calls up.