

ARE THERE PREQUALIFIED WELDING PROCEDURE SPECIFICATIONS?

There are welding procedures that do not require testing or procedure qualification; however there are no prequalified welding procedure specifications (WPS).

In the Structural Welding Code – Steel, there are lists of prequalified joints, prequalified base materials and prequalified filler metals. These elements of the WPS need to be properly assembled to create an approvable WPS. We review thousand of WPS's a year and find that the large majority of those submitted are not code compliant.

While the code provides prequalified joints, base metals and filler metals; these can easily be assembled in a manner that is not code compliant and would not result in a viable weldment. The Structural Welding Code - Steel has sample forms to use to produce a WPS.

When describing base metals it is required to list the base metal to be welded by the specification and grade; such as ASTM A572 Grade 60. We have seen the base metal described as Table 3.1 (this is the table that contains prequalified base metal and filler metal combinations). The problem with this is that a WPS submitted with this base metal description, with a submitted filler metal of E7018, is not acceptable. This filler metal is not compatible with every base metal listed in Table 3.1. It is mandatory to list the base metal specification and grade as well as the filler metal specification and provide the filler metal manufacturer's data sheet showing the recommended typical welding parameter combinations, with storage and exposure limits if applicable (AWS D1.8-2005, 1.2.2.3).



Often times we receive WPS's with voltage, amperage or wirefeed speed (WFS) ranges beyond what is allowable by code. Table 4.5 of The Structural Welding Code – Steel, lists the allowable tolerances to be submitted for a particular process. Some flux-cored arc welding (FCAW) process WPS's are submitted to us with the manufacturer's minimum and maximum ranges provided. Not only does this not give the Welder or the Inspector a recipe for a successful weldment; it is not compliant with the structural welding code. The code requires a range of essential variables to be submitted for a specific base metal, with a restricted tolerance, such as +/- 10% of the mean average of the submitted range for WFS. Supplying the correct WFS and voltage to be used will result in the best possibility of a successful weldment.

Another common mistake we see is having WPS's submitted with incorrect root openings and groove angles. It is important for a WPS to contain joint information that falls within the tolerances allowed by Figure 3.4 of the Structural Welding Code – Steel. Other joint configurations can be used, but these would have to be qualified by testing.

The AWS D1.1-2008 Structural Welding Code – Steel provides clear succinct instructions and allowable tolerances to remain within, to produce a viable WPS that does not require testing. However; this publication does not provide approved WPS's (Annex N examples excluded).

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