NCPWB
National Certified Pipe Welding Bureau

Technical Bulletin

January 2024

NCPWB has revised the following Brazing Procedure Specifications (BPSs)

BPS 107-1 is now BPS 300-1
BPS 107-2 is now BPS 300-2
BPS 107A-1 is now BPS 300 A-1
BPS 107:101-1 is now BPS 300:100-1

These changes were made in response to Section IX reassigning all materials in Section IX to new brazing P-numbers. Other than changing the P-number assignments, the updated BPSs are identical to the previous versions.

NCPWB members may continue to use the old BPSs for work that is already in process under existing contracts. **Members must begin to use the revised version for contracts that begin after January 1, 2024**. Members must fill in their company names and someone must sign the BPSs and PQRs, but there is no need to qualify one brazer following the revised BPSs since they are the same as the previous revisions.

Existing brazer qualification records should be editorially revised after January 1 to show the new P-number assignments. That may be done by lining out the previous P-number (107 or 100) and writing in the new P-number (300 or 100 respectively). Revised qualification records must be signed and dated.

New JPQTs and BPQTs using the new P-numbers will replace the previous JPQTs and BPQTs in the National Welder Database after January 1.

Background

About 10 years ago, Section IX committee asked the AWS C2 committee (AWS's brazing experts) if the committee's basis for assigning P-numbers for brazing made sense (Section IX members are mostly welding people, not brazing people).

Brazing is entirely different from welding except that both processes happen to join metal together.

In welding, the bond between members is formed by melting metal and letting it solidify. As a result, weld metal is a mixture of melted base metal plus whatever is added to the weld metal from the electrode or filler metal. The composition of the weld metal controls the properties of the joint.

In brazing, the base metal does not melt, but the surface of the metals being joined need to be clean and free of any oxides so that the braze metal wets and metallurgically bonds to the base metal. The main thing that affects the ability of the braze metal to wet the base metal is the nature of the oxides that are present on the base metal surface. The flux (or the atmosphere in the case of furnace brazing) needs to be able to remove those oxides so that the braze metal bonds properly to the base metal. For example, the flux used to braze carbon steel works for all carbon steels until you add about 1% chromium to the steel; then it does not work anymore. Removing chromium oxides require a different flux type, but once a BPS for brazing steel containing some chromium has been qualified, that BPS can be used for brazing stainless steel which contains a lot of chromium.

Our brazing procedures for brazing copper to itself, interestingly, do not need to use a flux. Rather, BCuP filler metals that are specified contain 5 to 7% phosphorous, and the phosphorous in the wire acts as a fluxing agent. This behavior is limited to copper-to-copper joints.

The materials that can be brazed following our BPSs with the new P-number assignments has not changed except for BPS 300-2 (formerly BPS 107-2). That BPS uses flux and is suitable for brazing copper to some brass, bronze and copper-nickel alloys as well as to copper. In that BPS, a limited number of brass alloys that could be brazed following BPS 107-2 can no longer be brazed following BPS 300-2, but some copper-nickel alloys that were not allowed under BPS 107-2 can be brazed following BPS 300-2.

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