Intent Interpretation

Subject; ASME BPV I, Table PW-39-1, Note b(6)

Committee Question: Is it the intent that Note b (6) in BPV I, Table PW-39-1 can be applied to P-No 1 Group 1 base metals for exemption of PWHT when applying a corrosion resistant overlay?

Reply: Yes.

Code revision shown on page 2.
Insert A shown on page 3.
Table PW-39-1
Mandatory Requirements for Postweld Heat Treatment of Pressure Parts and Attachments — P-No. 1

<table>
<thead>
<tr>
<th>Material</th>
<th>Minimum Holding Temperature, °F (°C)</th>
<th>Minimum Holding Time at Normal Temperature for Weld Thickness (Nominal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Up to 2 in. (50 mm)</td>
</tr>
<tr>
<td>P-No. 1 Group No. 1, 2, 3</td>
<td>1,100 (595)</td>
<td>1 hr/in. (1 h/25 mm), 15 min minimum</td>
</tr>
</tbody>
</table>

GENERAL NOTES:

(a) Postweld heat treatment is not mandatory for P-No. 1 Group 1 materials under the following conditions:
   (1) when the nominal thickness as defined in PW-39.3 is 1 in. (25 mm) or less.
   (2) when the nominal thickness as defined in PW-39.3 exceeds 1 in. (25 mm), postweld heat treatment is not required when the calculated carbon equivalent, CE, of each base metal in the weld joint is less than or equal to 0.45 using the following formula, and a minimum preheat of 200°F (95°C) is applied.

   \[ CE = C + \frac{Mn}{6} + \frac{(Cr + Mo + V)}{5} + \frac{(Ni + Cu)}{15} \]

   NOTE: The maximum chemical composition limit from the material specification or the actual values from a chemical analysis or material test report shall be used in computing the CE. If the chemistry values required for the last two terms are not available, 0.15% shall be substituted for those two terms as follows:

   \[ CE = C + \frac{Mn}{6} + 0.15 \]

(3) electroslag welds shall follow the postweld heat treatment requirements in PW-27.3 and PW-39.7.

(4) for stays welded in accordance with PW-19, the diameter of the stay is not used to determine the preheat requirement.

(b) Postweld heat treatment is not mandatory for P-No. 1 Groups 2 and 3 materials under the following conditions:
   (1) when the nominal thickness of a weld as defined in PW-39.3 is \( \frac{3}{4} \) in. (19 mm) or less.
   (2) when the nominal thickness of the weld as defined in PW-39.3 exceeds \( \frac{3}{4} \) in. (19 mm) but does not exceed 1 in. (25 mm) and the calculated CE of each of the base metals in the weld joint is less than or equal to 0.45 using the formula in General Note (a)(2). For stays welded in accordance with PW-19, the diameter of the stay is not used to determine preheat requirements.
   (3) when the nominal thickness of a weld as defined in PW-39.3 is greater than \( \frac{3}{4} \) in. (19 mm) but does not exceed 1\( \frac{1}{2} \) in. (38 mm), and:
   (a) the calculated carbon equivalent, CE, of each of the base metals in the weld joint is less than or equal to 0.45, using the formula in General Note (a)(2)
   (b) a minimum preheat of 250°F (120°C) is applied
   (c) no individual weld pass thickness exceeds \( \frac{3}{4} \) in. (6 mm)
   (4) for welds used to attach extended heat-absorbing surface to tubes and insulation attachment pins to pressure parts
   (5) for studs welded to pressure parts, provided preheat to a minimum temperature of 200°F (95°C) is applied when the thickness of the pressure part exceeds 1 in. (25 mm)

1. for corrosion-resistant weld metal overlay cladding of pipe or tube materials, provided that all of the following conditions are met:
   (a) the thickness of the overlay cladding is \( \frac{3}{4} \) in. (6 mm) or less
   (b) preheat to a minimum temperature of 200°F (95°C) is applied when the thickness of the pressure part exceeds \( \frac{3}{4} \) in. (19 mm)
   (c) the pipe or tube material
   (1) does not exceed NPS 5 (DN 125) outside diameter
   (2) is not used as a drum or shell
   (f) for welds attaching nonload-carrying studs not exceeding \( \frac{1}{2} \) in. (13 mm) in diameter when using an automatic arc stud welding or automatic resistance stud welding process
   (3) (f) for attaching bare wire thermocouples by capacitor discharge welding or electric resistance welding, provided the following requirements are met:
   (a) the requirements of PW-39.8
   (b) the minimum wall thickness shall be 0.200 in. (5.0 mm) or greater

When it is impractical to postweld heat treat at the temperature specified in this Table, it is permissible to carry out the postweld heat treatment at lower temperatures for longer periods of time in accordance with Table PW-39.1.
Code Revision to Support intent interpretation;

Information Only;

Existing Notes 6 and above in Table PW-39-1

The Notes below are under General Note (b)

(6) for corrosion-resistant weld metal overlay cladding of pipe or tube materials, provided that all of the following conditions are met:

(a) the thickness of the overlay cladding is 1/4 in. (6 mm) or less

(b) preheat to a minimum temperature of 200°F (95°C) is applied when the thickness of the pressure part exceeds 3/4 in. (19 mm)

(c) the pipe or tube material

(-1) does not exceed NPS 5 (DN 125) outside diameter

(-2) is not used as a drum or shell

(7) for welds attaching nonload-carrying studs not exceeding 1/2 in. (13 mm) in diameter when using an automatic arc stud welding or automatic resistance stud welding process

(8) for attaching bare wire thermocouples by capacitor discharge welding or electric resistance welding, provided the following requirements are met:

(a) the requirements of PW-39.8

(b) the minimum wall thickness shall be 0.200 in. (5.0 mm) or greater

(c) When it is impractical to postweld heat treat at the temperature specified in this Table, it is permissible to carry out the postweld heat treatment at lower temperatures for longer periods of time in accordance with Table PW-39.1.

Revisions in red and underlined to existing Notes 6 and above in Table PW-39-1

(c) Post Weld Heat treatment is not mandatory for P-No. 1 Groups 1, 2, or 3 under the following conditions:

(1) for corrosion-resistant weld metal overlay cladding of pipe or tube materials, provided that all of the following conditions are met:

(a) the thickness of the overlay cladding is 1/4 in. (6 mm) or less

(b) preheat to a minimum temperature of 200°F (95°C) is applied when the thickness of the pressure part exceeds 3/4 in. (19 mm)

(c) the pipe or tube material
(-1) does not exceed NPS 5 (DN 125) outside diameter

(-2) is not used as a drum or shell

(2) for welds attaching nonload-carrying studs not exceeding 1/2 in. (13 mm) in diameter when using an automatic arc stud welding or automatic resistance stud welding process

(3) for attaching bare wire thermocouples by capacitor discharge welding or electric resistance welding, provided the following requirements are met:

(a) the requirements of PW-39.8

(b) the minimum wall thickness shall be 0.200 in. (5.0 mm) or greater

d(e) When it is impractical to postweld heat treat at the temperature specified in this Table, it is permissible to carry out the postweld heat treatment at lower temperatures for longer periods of time in accordance with Table PW-39.1.