### 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 Time at Normal Temperature for Weld Thickness (Nominal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum Holding Temperature, °F (°C)</td>
</tr>
<tr>
<td>P-No. 1 Group No. 1, 2, 3</td>
<td>1,100 (595)</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.

\[
CE = C + \frac{\text{Mn} + \text{Si}}{6} + \frac{(\text{Cr} + \text{Mo} + \text{V})}{5} + \frac{(\text{Ni} + \text{Cu})}{15} \leq 0.45
\]

(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 as defined in PW-39.3 is (19 mm) or less.

(2) when the nominal thickness of the weld as defined in PW-39.3 exceeds 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).

(3) For stays welded in accordance with PW-19, the diameter of the stay is not used to determine preheat requirements.

(4) for stays welded in accordance with PW-27.3 and PW-39.7.

(5) When the nominal thickness of the weld as defined in PW-39.3 is greater than 3/4 in. (19 mm) but does not exceed 1 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 3/4 in. (6 mm)

(d) for welds used to attach extended heat-absorbing surface to tubes and insulation attachment pins to pressure parts

(e) for stays 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)

(f) 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 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 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

(g) 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

(h) 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.

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**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 used in accordance with PW-39.1.
Q: In note (b)(2) of Table PW-39-1, is it the intent that P No. 1 Groups 2 and 3 are exempt from preheat requirements when the nominal thickness of the weld does not exceed 1 in. (25mm) and the CE does not exceed 0.45?
R: Yes