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Postweld heat treatment is not mandatory for attaching bare wire thermocouples by capacitor discharge welding or electric resistance welding provided the following requirements are met:

(a) Postweld heat treatment is not mandatory for electric resistance welds used to attach extended heat absorbing fins to pipe and tube materials, provided the following conditions are met:

- (a) the maximum throat thickness of fillet welds shall be 1/2 in. (13 mm)
- (b) the maximum continuous length of fillet welds shall be not over 4 in. (100 mm)
- (c) electrodes or filler metal shall be dry and shall provide a low-hydrogen weld deposit. Chromium-molybdenum filler metals shall have a maximum specified chromium content of not more than 3.0% and a maximum specified carbon content of not more than 0.05%.
- (d) the thickness of the test plate used in making the welding procedure qualification of Section IX shall not be less than that of the material to be welded

(b) Postweld heat treatment is not mandatory for electric resistance welds used to attach extended heat-absorbing fins to pipe and tube materials, provided the following requirements are met:

- (1) a maximum pipe or tube size of NPS 4 (DN 100)
- (2) a maximum specified carbon content (SA material specification carbon content, except when further limited by the Purchaser to a value within the specification limits) of not more than 0.15%
- (3) a maximum specified carbon content (SA material specification carbon content, except when further limited by the Purchaser to a value within the specification limits) of not more than 2.50%
- (4) a nominal base metal thickness of 3/8 in. (16 mm) or less
- (5) a maximum specified chromium content of not more than 2.50% and a maximum specified carbon content of not more than 0.05%
- (6) a minimum preheat of 300°F (150°C)

(c) General Note (a) does not apply to welds using the inertia and continuous drive friction welding processes. Postweld heat treatment is mandatory for all thicknesses of materials welded using inertia and continuous drive friction welding.

(d) Postweld heat treatment is not mandatory for attaching bare wire thermocouples by capacitor discharge welding or electric resistance welding provided the following requirements are met:

- (2) The maximum carbon content of the base material is restricted to 0.15%.
- (3) The minimum wall thickness shall be 0.20 in. (5.0 mm).

GENERAL NOTES:

(a) Postweld heat treatment is not mandatory under the following conditions:

- (1) for circumferential butt welds in pressure parts with all of the following conditions:
  - (a) a maximum specified chromium content of 3.0%
  - (b) a nominal base metal thickness of 3/8 in. (16 mm) or less at the weld
  - (c) a maximum specified carbon content (SA material specification carbon content, except when further limited by the Purchaser to a value within the specification limits) of not more than 0.15%
  - (d) a minimum preheat of 300°F (150°C)

- (2) for fillet welds used on socket welding fittings conforming to the rules of PW-41, when the following conditions are met:
  - (a) a maximum specified chromium content of 3.0%
  - (b) a fillet weld throat thickness of 1/2 in. (13 mm) or less, regardless of base metal thickness
  - (c) a maximum specified carbon content (SA material specification carbon content, except when further limited by the Purchaser to a value within the specification limits) of not more than 0.15%
  - (d) a minimum preheat of 300°F (150°C)

- (3) for pipe and tube materials meeting the requirements of (1)(a) through (1)(c) above having fillet welds attaching nonpressure parts to them, provided the fillet weld has a throat thickness of 3/8 in. (13 mm) or less and the material is preheated to 300°F (150°C) minimum; or combination groove and fillet welds attaching nonpressure parts to pressure parts, with a weld thickness of 1/2 in. (13 mm) or less, and the material is preheated to a minimum of 300°F (150°C); or heat-absorbing surfaces and non-load-carrying studs attached to them, provided the material is preheated to 300°F (150°C) minimum. A lower preheating temperature may be used, provided specifically controlled procedures necessary to produce sound joints are used. Such procedures shall include but shall not be limited to the following:
  - (a) the maximum throat thickness of fillet welds shall be 1/2 in. (13 mm)
  - (b) the maximum continuous length of fillet welds shall be not over 4 in. (100 mm)
  - (c) electrodes or filler metal shall be dry and shall provide a low-hydrogen weld deposit. Chromium-molybdenum filler metals shall have a maximum specified chromium content of not more than 2.50% and a maximum specified carbon content of not more than 0.05%.
  - (d) the thickness of the test plate used in making the welding procedure qualification of Section IX shall not be less than that of the material to be welded

- (4) for tubes or pressure-retaining handhole and inspection plugs or fittings with a specified maximum chromium content of 6% that are secured by physical means (rolling, shoulder construction, machine threads, etc.) and seal welded, provided the seal weld has a throat thickness of 1/2 in. (13 mm) or less, and the material is preheated to a minimum temperature of 300°F (150°C) before welding, provided the following requirements are met:
  - (a) a minimum preheat of 300°F (150°C) is applied when the thickness exceeds 3/8 in. (16 mm)
  - (b) the material is preheated to a minimum temperature of 300°F (150°C) before welding
  - (c) overlay cladding thickness does not exceed 1/8 in. (3 mm)
  - (d) the tube or pipe material does not exceed NPS 5 (DN 125) and is not used as a drum or shell

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

- (6) for corrosion-resistant weld metal overlay of P-No. 5A pipe or tube, provided the following conditions are met:
  - (a) a minimum preheat of 300°F (150°C) is applied when the thickness exceeds 1/2 in. (13 mm)
  - (b) overlay is applied using GTAW or GMAW with a 360 deg spiral deposition technique
  - (c) overlay cladding thickness does not exceed 1/8 in. (3 mm)
  - (d) the tube or pipe material does not exceed NPS 5 (DN 125) and is not used as a drum or shell

Table PW-39-4

<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. 5A Group No. 1 and P-No. 5B Group No. 1</td>
<td>1,250 (675)</td>
<td>1 hr/in. (1 h/25 mm), 15 min minimum</td>
</tr>
</tbody>
</table>