AWS Amendment Notice

The following amendments have been made and incorporated into the current edition of this document.

2\textsuperscript{nd} Printing:

AWS Standard: D1.6/D1.6M:2017-AMD1
Amendment Number: 1
Subject: Subclause 5.7.1(4)
Revision: Delete subclause 5.7.1(4)

5.7.1 In addition to the requirements of Tables 5.1 and 5.4, the following requirements shall also apply to all PWPSs:

(1) The classification and size of electrode, voltage, amperage, travel speed, and gas flow rate shall be suited to the thickness of the material, type of groove, and welding position.

(2) The progression for all passes in vertical position welding shall be upward, except that GTAW, GMAW-S, and FCAW-G are prequalified vertical down for base metal of 3/16 in [5 mm] maximum thickness. Undercut may be repaired vertically downwards on the joint faces only, by any prequalified welding process listed in 5.2.1, without base metal thickness limitation, within the limits of Table 8.1.

(3) Neither the depth nor the maximum width in the cross section of weld metal deposited in each weld pass shall exceed the width at the surface of that weld pass (see Figure 5.6). The Engineer may waive this requirement if test welds are made using PWPS variables to demonstrate that crack-free welds can be produced. Production welding shall be performed using these PWPS variables, including the same filler metal and flux trade designation.

(4) Prequalified GMAW in the spray transfer mode is limited to welds in the flat position and fillet welds in the horizontal position.

(5) Weld tabs shall be of any base metal group in Table 5.2.

(6) Steel for backing shall be of the same base metal group per Table 5.2 as the base metal, unless otherwise approved by the Engineer.
AWS Standard: D1.6/D1.6M:2017-AMD1
Amendment Number: 1
Subject: Table 6.3
Revision: In the Base Metal Thickness Qualified column, change “1/16 [2]” to “1/16 [1.5].”

### Table 6.3
PQR Type, Number of Test Specimens, and Range of Thickness Qualified for Procedure Qualification (see 6.4.1, 6.6.1, 6.7.1, 6.7.2, and 6.8.1)

#### (A) Groove Welds

<table>
<thead>
<tr>
<th>Test Weldment Thickness (T), in [mm]</th>
<th>Min. in [mm]</th>
<th>Max. in [mm]</th>
<th>Max. in [mm]</th>
<th>Macroetch Test Specimens Required ($)</th>
<th>Tension</th>
<th>Side Bend</th>
<th>Face Bend</th>
<th>Root Bend</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/16 to 3/8 [1.5 to 10]</td>
<td>1/16 [1.5]</td>
<td>2T</td>
<td>2t</td>
<td>3</td>
<td>2</td>
<td>(Note b)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6 [152] and over</td>
<td>1 [25]</td>
<td>1.33T</td>
<td>2t when t &lt; 3/4 [19]</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Partial joint penetration groove welds only.
- For 3/8 in [10 mm] plate or wall thickness, a side bend test may be substituted for each of the required face- and root-bend tests.
- All pipe/tube diameters qualified, all fillet sizes qualified on all base metal thicknesses and all diameters.
- For GMAW-S, the maximum thickness of base metal qualified is 1.1 times the thickness of the test weldment until the test weldment thickness is 1/2 in [13 mm], beyond which Table 6.3 applies. The maximum weld metal thickness qualified is 1.1 times the GMAW-S weld metal thickness deposited in the weldment. In addition, for thickness 3/8 in [10 mm] thick and greater, side bend tests shall be used to qualify GMAW-S short circuit WPSs.
- For fracture toughness applications less than 5/8 in [16 mm] thick, the base metal thickness of the test weldment is the minimum base metal thickness qualified.
- If any single pass in the test weldment is greater in thickness than 1/2 in [13 mm], the qualified base metal thickness is 1.1 times the test weldment thickness.
- For test weldments in austenitic, ferritic, or martensitic stainless steel base metals using austenitic stainless steel filler metal, the maximum qualified thicknesses are per Table 6.3 for postweld heat treatment (PWHT) below 1000°F [538°C]. For test weldment in these same base metals welded with other than austenitic stainless steel filler metal, the maximum qualified base metal and deposited weld metal thicknesses are 1.1 times the thicknesses of the test coupon for PWHT of 1000°F [538°C] or higher.

#### (B) Fillet Welds (see 6.8.1)

<table>
<thead>
<tr>
<th>Test Specimen$^b$</th>
<th>Fillet Weld Size</th>
<th>Macroetch Test Specimens Required$^b$ (6.9.3.4)</th>
<th>Plate/Pipe Thickness$^i$</th>
<th>Fillet Weld Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate T-test (Figure 6.4)</td>
<td>Single pass, max size to be used in construction</td>
<td>3 faces</td>
<td>Unlimited</td>
<td>Max. tested single pass and smaller</td>
</tr>
<tr>
<td></td>
<td>Multiple pass, min size to be used in construction</td>
<td>3 faces</td>
<td>Unlimited</td>
<td>Min. tested multiple pass and larger</td>
</tr>
<tr>
<td>Pipe T-test$^j$ (Figure 6.4)</td>
<td>Single pass, max size to be used in construction</td>
<td>3 faces (except for 4F and 5F, 4 faces required)</td>
<td>Unlimited</td>
<td>Max. tested single pass and smaller</td>
</tr>
<tr>
<td></td>
<td>Multiple pass, min size to be used in construction</td>
<td>3 faces (except for 4F and 5F, 4 faces required)</td>
<td>Unlimited</td>
<td>Min. tested multiple pass and larger</td>
</tr>
</tbody>
</table>

$^a$ Partial joint penetration groove welds only.
$^b$ For 3/8 in [10 mm] plate or wall thickness, a side bend test may be substituted for each of the required face- and root-bend tests.
$^c$ All pipe/tube diameters qualified, all fillet sizes qualified on all base metal thicknesses and all diameters.
$^d$ For GMAW-S, the maximum thickness of base metal qualified is 1.1 times the thickness of the test weldment until the test weldment thickness is 1/2 in [13 mm], beyond which Table 6.3 applies. The maximum weld metal thickness qualified is 1.1 times the GMAW-S weld metal thickness deposited in the weldment. In addition, for thickness 3/8 in [10 mm] thick and greater, side bend tests shall be used to qualify GMAW-S short circuit WPSs.
$^e$ For fracture toughness applications less than 5/8 in [16 mm] thick, the base metal thickness of the test weldment is the minimum base metal thickness qualified.
$^f$ If any single pass in the test weldment is greater in thickness than 1/2 in [13 mm], the qualified base metal thickness is 1.1 times the test weldment thickness.
$^g$ For test weldments in austenitic, ferritic, or martensitic stainless steel base metals using austenitic stainless steel filler metal, the maximum qualified thicknesses are per Table 6.3 for postweld heat treatment (PWHT) below 1000°F [538°C]. For test weldment in these same base metals welded with other than austenitic stainless steel filler metal, the maximum qualified base metal and deposited weld metal thicknesses are 1.1 times the thicknesses of the test coupon for PWHT of 1000°F [538°C] or higher.

$^h$ All welded test pipes and plates shall be visually examined per 6.9.3.1.
$^i$ The minimum thickness qualified is 1/16 in [2 mm].
$^j$ All pipe/tube diameters are qualified.
$^k$ See 6.8.1.2 and 6.10.3 for alternate fillet weld bend-break test.

(Amendment Notice: July 21, 2021)