(17)

Figure QW-466.1
Test Jig Dimensions

Tapped hole to suit testing machine

As required

Hardened rollers $1\frac{1}{2}$ in. (38 mm) may be substituted for jig shoulders

As required

$\frac{3}{4}$ in. (19 mm)

Shoulders hardened and greased

$\frac{3}{4}$ in. (19 mm)

$\frac{1}{2}$ in. (13 mm)

$1\frac{1}{8}$ in. (29 mm)

A

$\frac{3}{4}$ in. (19 mm)

$1\frac{1}{8}$ in. (29 mm)

$\frac{1}{4}$ in. (6 mm)

3 in. min. (75 mm)

2 in. min. (50 mm)

$\frac{3}{4}$ in. R (19 mm)

$6\frac{3}{4}$ in. (170 mm)

$\frac{1}{8}$ in. (3 mm)

Plunger

B R

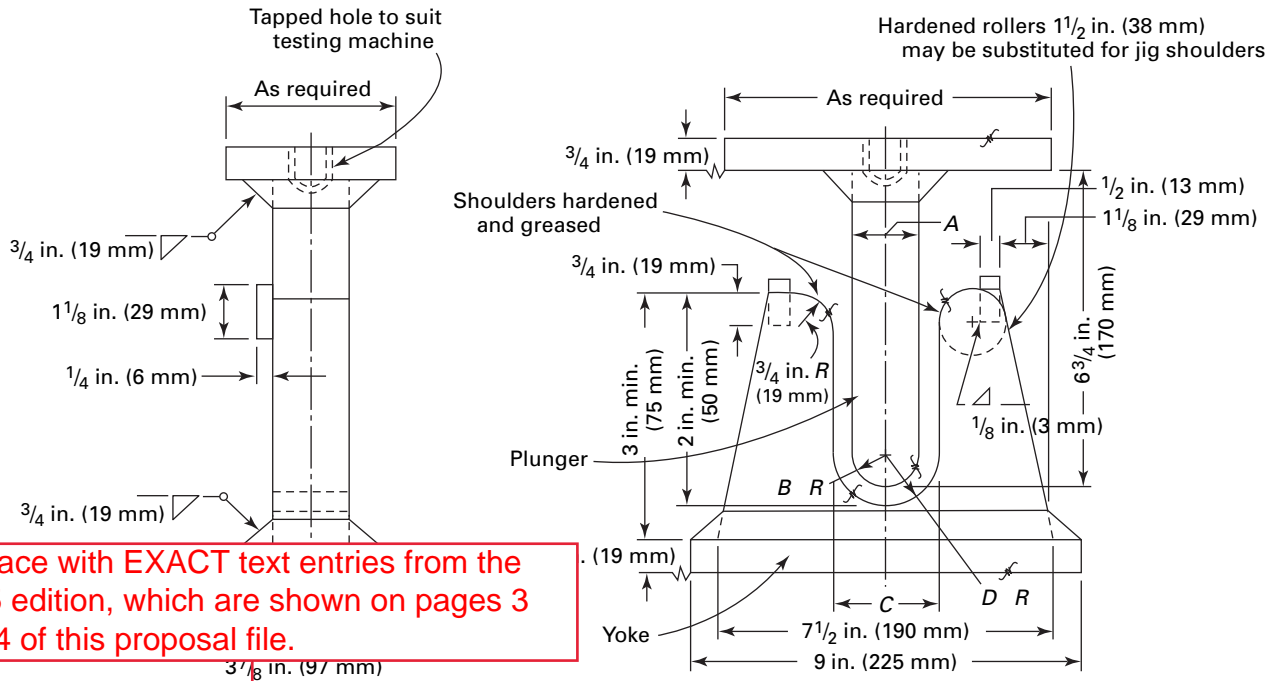$\frac{3}{4}$ in. (19 mm)

. (19 mm)

D R

Yoke

C

$7\frac{1}{2}$ in. (190 mm)

9 in. (225 mm)

Replace with EXACT text entries from the 2015 edition, which are shown on pages 3 and 4 of this proposal file.

$3\frac{7}{8}$ in. (97 mm)

U.S. Customary Units

Material	Thickness of Specimen, in.	A, in.	B, in.	C, in.	D, in.
P-No. 23 to P-No. 21 through P-No. 25; P-No. 21 through P-No. 25 with F-No. 23 or 26; P-No. 35; any P-No. metal with F-No. 33, 36, or 37	$t = \frac{1}{8}$ or less	$16\frac{1}{2}t = 2\frac{1}{16}$	$8\frac{1}{4}t = 1\frac{1}{32}$	$18\frac{1}{2}t + \frac{1}{16} = 2\frac{3}{8}$	$9\frac{1}{4}t + \frac{1}{32} = 1\frac{3}{1}$
P-No. 11A, P-No. 11B; P-No. 25 to P-No. 21 or P-No. 22 or P-No. 25	$t = \frac{3}{8}$ or less	$6\frac{2}{3}t = 2\frac{1}{2}$	$3\frac{1}{3}t = 1\frac{1}{4}$	$8\frac{2}{3}t + \frac{1}{8} = 3\frac{3}{8}$	$4\frac{1}{3}t + \frac{1}{16} = 1\frac{11}{16}$
P-No. 51; P-No. 49	$t = \frac{3}{8}$ or less	$8t = 3$	$4t = 1\frac{1}{2}$	$10t + \frac{1}{8} = 3\frac{7}{8}$	$5t + \frac{1}{16} = 1\frac{15}{16}$
P-No. 52; P-No. 53; P-No. 61; P-No. 62	$t = \frac{3}{8}$ or less	$10t = 3\frac{3}{4}$	$5t = 1\frac{7}{8}$	$12t + \frac{1}{8} = 4\frac{7}{8}$	$6t + \frac{1}{16} = 2\frac{5}{16}$
All others with greater than or equal to 20% elongation	$t = \frac{3}{8}$ or less	$4t = 1\frac{1}{2}$	$2t = \frac{3}{4}$	$6t + \frac{1}{8} = 2\frac{3}{8}$	$3t + \frac{1}{16} = 1\frac{3}{16}$
Materials with 3% to less than 20% elongation	$t = $ [see Note (1)]	$32\frac{7}{8}t$ max.	$16\frac{7}{16}t$ max.	$A + 2t + \frac{1}{16}$ max.	$\frac{1}{2}C + \frac{1}{32}$ max.

SI Units

Material	Thickness of Specimen, mm	A, mm	B, mm	C, mm	D, mm
P-No. 23 to P-No. 21 through P-No. 25; P-No. 21 through P-No. 25 with F-No. 23 or 26; P-No. 35; any P-No. metal with F-No. 33, 36, or 37	$t = 3$ or less	$16\frac{1}{2}t = 50$	$8\frac{1}{4}t = 25$	$18\frac{1}{2}t + 1.6 = 57$	$9\frac{1}{4}t + 0.8 = 29$
P-No. 11A, P-No. 11B; P-No.25 to P-No. 21 or P-No. 22 or P-No. 25	$t = 10$ or less	$6\frac{2}{3}t = 67$	$3\frac{1}{3}t = 33$	$8\frac{2}{3}t + 3.2 = 90$	$4\frac{1}{3}t + 1.6 = 45$
P-No. 51; P-No. 49	$t = 10$ or less	$8t = 80$	$4t = 40$	$10t + 3.2 = 103$	$5t + 1.6 = 52$
P-No. 52; P-No. 53; P-No. 61; P-No. 62	$t = 10$ or less	$10t = 100$	$5t = 50$	$12t + 3.2 = 123$	$6t + 1.6 = 62$
All others with greater than or equal to 20% elongation	$t = 10$ or less	$4t = 40$	$2t = 20$	$6t + 3.2 = 63$	$3t + 1.6 = 32$
Materials with 3% to less than 20% elongation	$t = $ [see Note (1)]	$32\frac{7}{8}t$ max.	$16\frac{7}{16}t$ max.	$A + 2t + 1.6$ max.	$\frac{1}{2}C + 0.8$ max.

FOR ASME COMMITTEE USE ONLY

Figure QW-466.1
Test Jig Dimensions (Cont'd)

GENERAL NOTES:
(a) For P-Numbers, see QW/QB-422; for F-Numbers, see QW-432.
(b) For guided-bend jig configuration, see QW-466.2, QW-466.3, and QW-466.4.
(c) The weld and heat-affected zone, in the case of a transverse weld bend specimen, shall be completely within the bend portion of the specimen after testing.
(d) For materials with less than 3% elongation, a macro-etch specimen shall be used in lieu of bend test at each bend test location. Acceptance criteria shall be in accordance with QW-183(a).
(e) When the bending properties of the weldment make it unlikely that the requirements of General Note (c) can be met, the wrap around jig shown in Figure QW-466.3 should be considered.

NOTE:
(1) The dimensions of the test jig shall be such as to give the bend test specimen a calculated percent outer fiber elongation equal to at least that of the base material with the lower minimum elongation as specified in the base material specification.
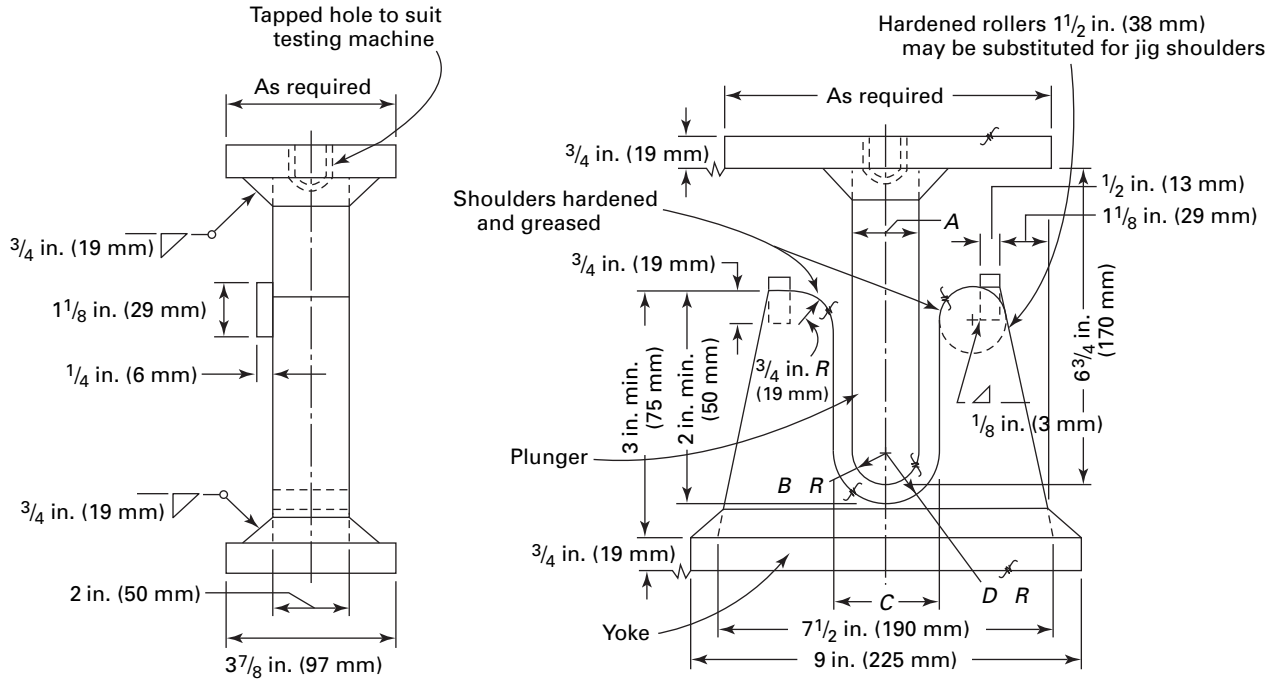
$$\text{percent outer fiber elongation} \ = \ \frac{100t}{A \ + \ t}$$

The following equation is provided for convenience in calculating the bend specimen thickness:

$$\text{thickness of specimen}(t) \ \ = \ \frac{A \ \times \ \text{percent elongation}}{\left[100 - \left(\text{percent elongation} \right) \right]}$$

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(15)

Figure QW-466.1
Test Jig Dimensions

Tapped hole to suit testing machine

As required

$3/4$ in. (19 mm)

$3/4$ in. (19 mm)

$1^1/8$ in. (29 mm)

$1/4$ in. (6 mm)

$3/4$ in. (19 mm)

2 in. (50 mm)

$3^7/8$ in. (97 mm)

Hardened rollers $1^1/2$ in. (38 mm) may be substituted for jig shoulders

As required

$3/4$ in. (19 mm)

Shoulders hardened and greased

$3/4$ in. (19 mm)

$1/2$ in. (13 mm)

$1^1/8$ in. (29 mm)

A

$6^3/4$ in. (170 mm)

$3/4$ in. R (19 mm)

$1/8$ in. (3 mm)

3 in. min. (75 mm)

2 in. min. (50 mm)

Plunger

B R

$3/4$ in. (19 mm)

Yoke

C

D R

$7^1/2$ in. (190 mm)

9 in. (225 mm)

U.S. Customary Units

Material	Thickness of Specimen, in.	A, in.	B, in.	C, in.	D, in.
P-No. 23 to P-No. 21 through P-No. 25; P-No. 21 through P-No. 25 with F-No. 23 or 26; P-No. 35; any P-No. metal with F-No. 33, 36, or 37	$1/8$ $t = 1/8$ or less	$2^1/16$ $16^1/2\,t$	$1^1/32$ $8^1/4\,t$	$2^3/8$ $18^1/2\,t + 1/16$	$1^3/16$ $9^1/4\,t + 1/32$
P-No. 11A, P-No. 11B; P-No. 25 to P-No. 21 or P-No. 22 or P-No. 25	$3/8$ $t = 3/8$ or less	$2^1/2$ $6^2/3\,t$	$1^1/4$ $3^1/3\,t$	$3^3/8$ $8^2/3\,t + 1/8$	$1^{11}/16$ $4^1/3\,t + 1/16$
P-No. 51; P-No. 49	$3/8$ $t = 3/8$ or less	3 $8t$	$1^1/2$ $4t$	$3^7/8$ $10t + 1/8$	$1^{15}/16$ $5t + 1/16$
P-No. 52; P-No. 53; P-No. 61; P-No. 62	$3/8$ $t = 3/8$ or less	$3^3/4$ $10t$	$1^7/8$ $5t$	$4^5/8$ $12t + 1/8$	$2^5/16$ $6t + 1/16$
All others with greater than or equal to 20% elongation	$3/8$ $t = 3/8$ or less	$1^1/2$ $4t$	$3/4$ $2t$	$2^3/8$ $6t + 1/8$	$1^3/16$ $3t + 1/16$
Materials with 3% to less than 20% elongation	$t =$ [see Note (1)]	$32^7/8\,t$ max.	$16^7/16\,t$ max.	$A + 2t + 1/16$ max.	$1/2\,C + 1/32$ max.

SI Units

Material	Thickness of Specimen, mm	A, mm	B, mm	C, mm	D, mm
P-No. 23 to P-No. 21 through P-No. 25; P-No. 21 through P-No. 25 with F-No. 23 or 26; P-No. 35; any P-No. metal with F-No. 33, 36, or 37	3 $t = 3$ or less	50 $16^1/2\,t$	25 $8^1/4\,t$	57 $18^1/2\,t + 1.6$	29 $9^1/4\,t + 0.8$
P-No. 11A, P-No. 11B; P-No. 25 to P-No. 21 or P-No. 22 or P-No. 25	10 $t = 10$ or less	67 $6^2/3\,t$	33 $3^1/3\,t$	90 $8^2/3\,t + 3.2$	45 $4^1/3\,t + 1.6$
P-No. 51; P-No. 49	10 $t = 10$ or less	80 $8t$	40 $4t$	103 $10t + 3.2$	52 $5t + 1.6$
P-No. 52; P-No. 53; P-No. 61; P-No. 62	10 $t = 10$ or less	100 $10t$	50 $5t$	123 $12t + 3.2$	62 $6t + 1.6$

Figure QW-466.1
Test Jig Dimensions (Cont'd)

Material	Thickness of Specimen, mm	A, mm	B, mm	C, mm	D, mm
All others with greater than or equal to 20% elongation	10	40	20	63	32
	t = 10 or less	$4t$	$2t$	$6t + 3.2$	$3t + 1.6$
Materials with 3% to less than 20% elongation	t = [see Note (1)]	$32\frac{7}{8}$ t max.	$16\frac{7}{16}\,t$ max.	$A + 2t + 1.6$ max.	$\frac{1}{2}\,C + 0.8$ max.

GENERAL NOTES:
(a) For P-Numbers, see QW/QB-422; for F-Numbers, see QW-432.
(b) For guided-bend jig configuration, see QW-466.2, QW-466.3, and QW-466.4.
(c) The weld and heat-affected zone, in the case of a transverse weld bend specimen, shall be completely within the bend portion of the specimen after testing.
(d) For materials with less than 3% elongation, a macro-etch specimen shall be used in lieu of bend test at each bend test location. Acceptance criteria shall be in accordance with QW-183(a).
(e) Figure QW-466.3 shows the recommended method of testing aluminum weldments.

NOTE:
(1) The dimensions of the test jig shall be such as to give the bend test specimen a calculated percent outer fiber elongation equal to at least that of the base material with the lower minimum elongation as specified in the base material specification.

$$\text{percent outer fiber elongation} = \frac{100t}{A + t}$$

The following equation is provided for convenience in calculating the bend specimen thickness:

$$\text{thickness of specimen}(t) = \frac{A \times \text{percent elongation}}{\left[100 - \left(\text{percent elongation}\right)\right]}$$

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