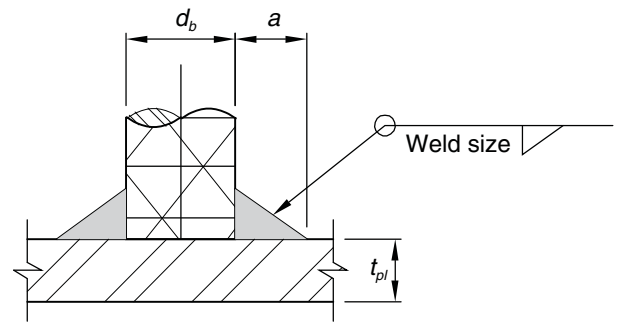


Design Aid 6.15.4 Size of Fillet Weld Required to Develop Full Strength of Bar. Butt Weld.**BAR PERPENDICULAR
TO PLATE, WELDED
ONE SIDE**

$$\ell_w = \pi \left(d_b + \frac{a}{2} \right)$$

$$\text{Plate} = F_y = 36 \text{ ksi}$$

$$\text{Plate area} = \pi(d_b + 2a)t_{pl}$$

**Grade 40 bar**

Bar size, #	E70 electrode		E80 electrode ^a		E90 electrode ^a	
	Weld size, ^b in.	Minimum plate thickness, ^c in.	Weld size, ^b in.	Minimum plate thickness, ^c in.	Weld size, ^b in.	Minimum plate thickness, ^c t_{pl} in.
3	3/16	1/4	3/16	1/4	3/16	1/4
4	1/4	1/4	3/16	1/4	3/16	1/4
5	1/4	1/4	1/4	1/4	1/4	1/4
6	5/16	1/4	1/4	1/4	1/4	1/4
7	3/8	5/16	5/16	5/16	5/16	5/16
8	7/16	5/16	1/8	5/16	5/16	1/8
9	7/16	1/8	7/16	1/8	1/8	1/8
10	1/2	1/8	7/16	7/16	7/16	7/16
11	9/16	7/16	1/2	7/16	7/16	1/2

Grade 60 bar^d

3			3/16	1/4	3/16	1/4
4			1/4	1/4	1/4	1/4
5			5/16	1/4	5/16	5/16
6			3/8	5/16	3/8	5/16
7			7/16	3/8	3/8	3/8
8			1/2	7/16	7/16	7/16
9			9/16	1/2	1/2	1/2
10			5/8	1/2	9/16	9/16
11			11/16	9/16	5/8	5/8

a. Refer to AWS D1.1 Table 3.1 – Prequalified Base Metal – Filler Material Combinations for Matching Strength and AWS D1.4 Table 5.1 Matching Filler Metal Requirements. Use E80 Electrodes for ASTM A706 rebar; use E90 electrodes for ASTM A615 rebar.

b. A minimum of 3/16 in. weld size is suggested.

c. Theoretical thickness for shear stress on base metal = 0.9(0.6)(36) ksi. A more practical thickness might be taken as 1/2 d_b as used with headed studs. A minimum of 1/4 in. plate thickness is suggested.

d. E70 electrodes are not permitted for grade 60 reinforcement.