



9-9


Rank




$$\text{fom}' = \frac{J_u}{lh} = \frac{a^3/12}{ah} = \frac{a^2}{12h} = 0.0833 \left(\frac{a^2}{h} \right) \quad (5)$$




$$\text{fom}' = \frac{a(3a^2 + a^2)}{6(2a)h} = \frac{a^2}{3h} = 0.3333 \left(\frac{a^2}{h} \right) \quad (1)$$




$$\text{fom}' = \frac{(2a)^4 - 6a^2a^2}{12(a+a)2ah} = \frac{5a^2}{24h} = 0.2083 \left(\frac{a^2}{h} \right) \quad (4)$$



$$\text{fom}' = \frac{1}{3ah} \left[\frac{8a^3 + 6a^3 + a^3}{12} - \frac{a^4}{2a+a} \right] = \frac{11a^2}{36h} = 0.3056 \left(\frac{a^2}{h} \right) \quad (2)$$



$$\text{fom}' = \frac{(2a)^3}{6h} \frac{1}{4a} = \frac{8a^3}{24ah} = \frac{a^2}{3h} = 0.3333 \left(\frac{a^2}{h} \right) \quad (1)$$



$$\text{fom}' = \frac{2\pi(a/2)^3}{\pi ah} = \frac{a^3}{4ah} = \frac{a^2}{4h} = 0.25 \left(\frac{a^2}{h} \right) \quad (3)$$

These rankings apply to fillet weld patterns in torsion that have a square area $a \times a$ in which to place weld metal. The object is to place as much metal as possible to the border. If your area is rectangular, your goal is the same but the rankings may change.

Students will be surprised that the circular weld bead does not rank first.