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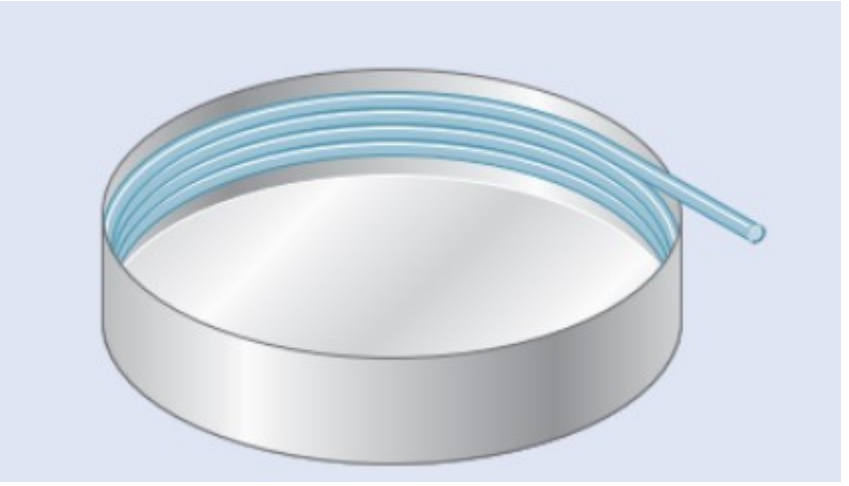
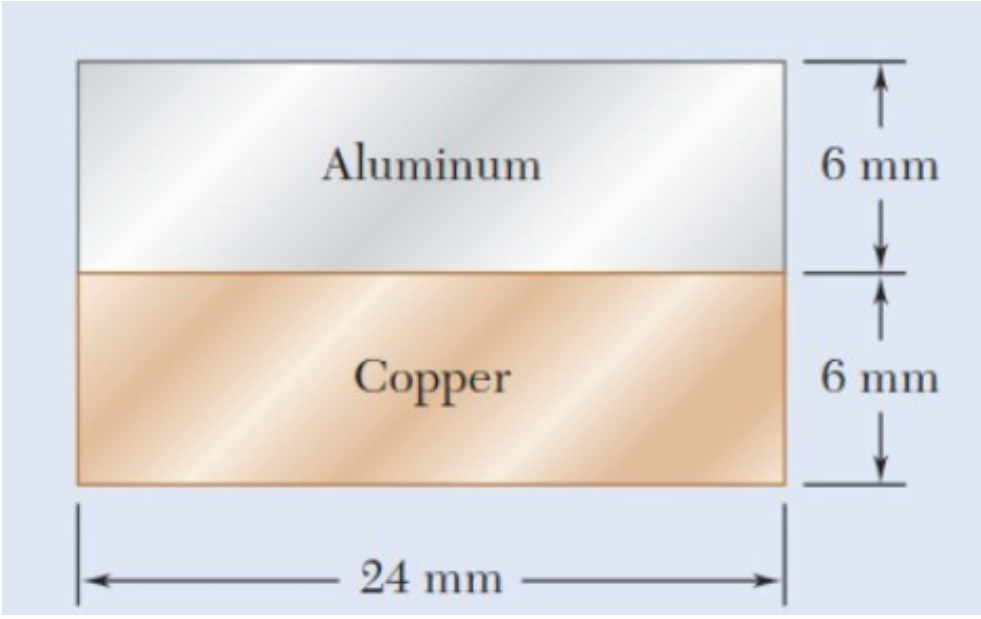
PROBLEM HOUR V

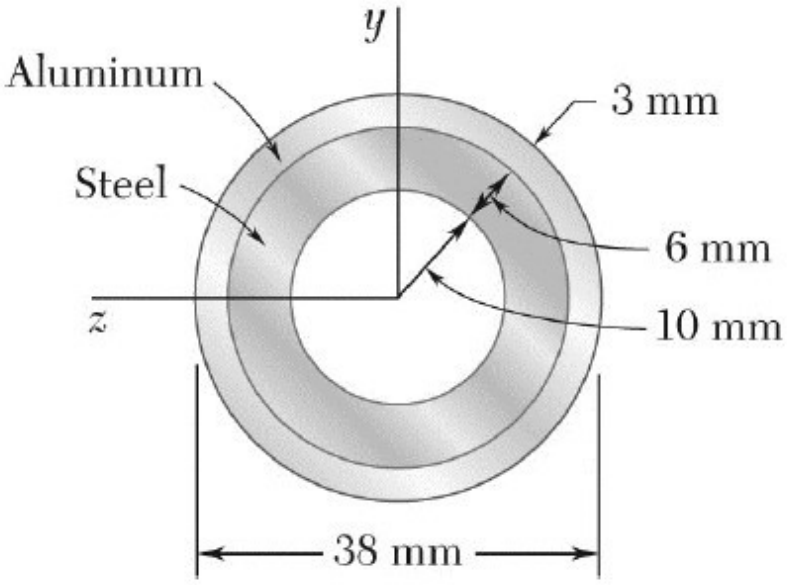
Q1) Straight rods of 6-mm diameter and 30- m length are stored by coiling the rods inside a drum of 1.25 m inside diameter. Assume that the yield strength is not exceeded. E = 200 GPa Determine a) The maximum stress in a coiled rod b) The corresponding bending moment in the rod.

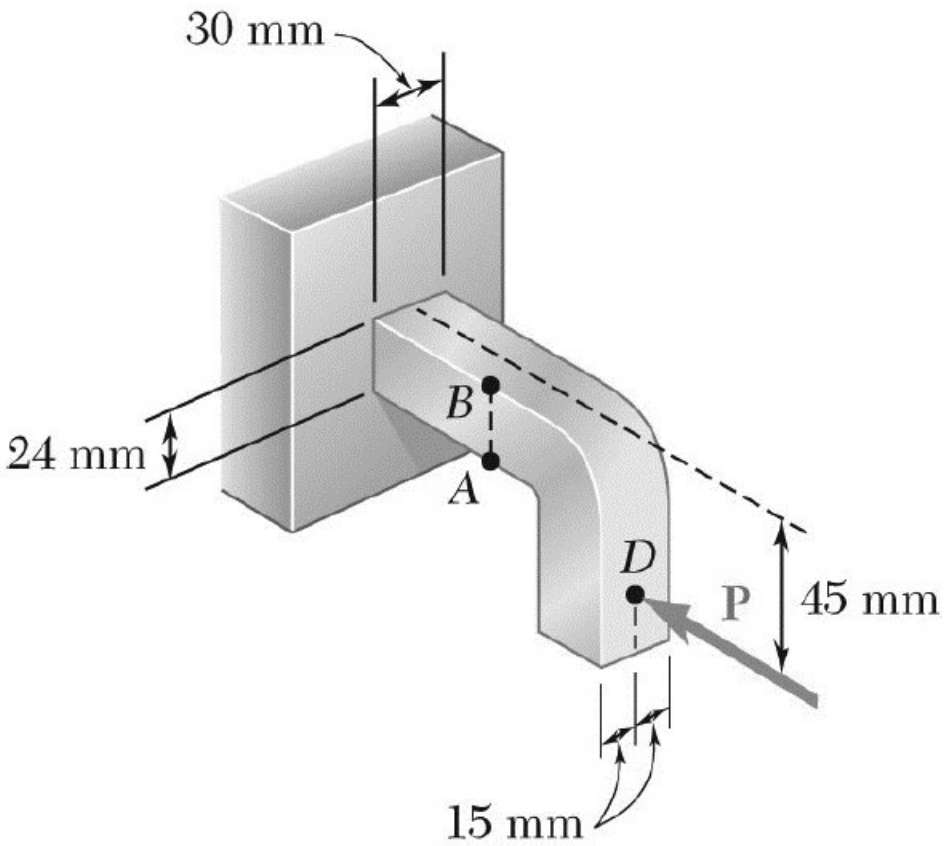


Q2) A copper strip E_c = 105 GPa and an aluminum strip E_a = 75 GPa are bonded together to form the composite beam shown. Knowing that the beam is bent about a horizontal axis by a couple of moment M = 35 Nm determine the maximum stress in (a) the aluminum strip, (b) the copper strip.



Q3) A steel pipe and an aluminum pipe are securely bonded together to form the composite beam shown. The modulus of elasticity is 200 GPa for the steel and 70 GPa for the aluminum. Knowing that the composite beam is bent by a couple of moment 500 Nm, determine the maximum stress
(a) in the aluminum, (b) in the steel.





Q4) Knowing that the magnitude of the horizontal force P is 8 kN, determine the stress at (a) point A, (b) point B.

Q5) Knowing that the clamp shown has been tightened until P = 400 N, determine (a) the stress at point A, (b) the stress at point B, (c) the location of the neutral axis of section *a* − *a*.