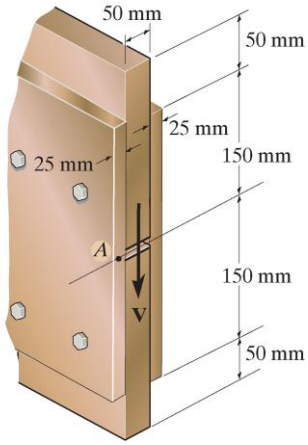
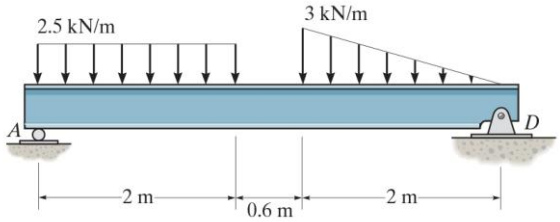
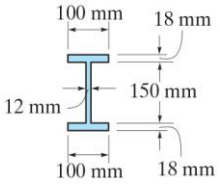
1. If the beam is made from four plates and subjected to a shear force of V=20 kN, determine the maximum shear stress at point A. [15%] Ans:1.65 MPa

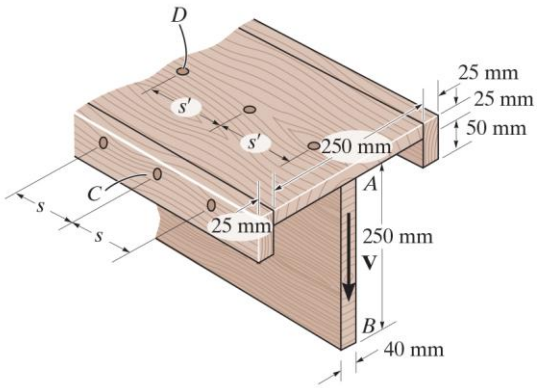


2. Determine the maximum shear stress acting in the fiberglass beam at the section where the internal shear force is maximum. [20%] Ans:2.55 MPa



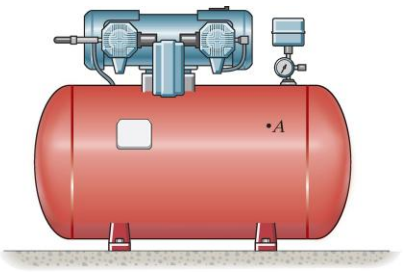


3. The beam is made from four boards nailed together as shown. If the nails can each support a shear force of 500 N, determine their required spacing s' and s to the nearest mm if the beam is subjected to a shear force of V=3.5 kN. [15%] Ans: 30 mm, 216 mm

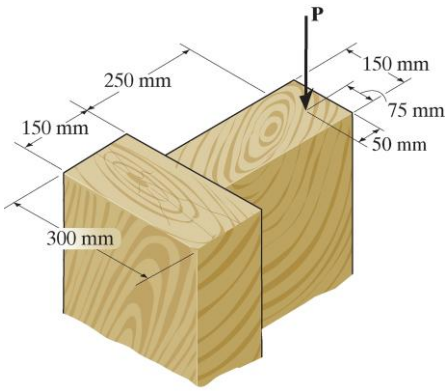


4. (a) A spherical gas tank has an inner radius of r=1.5m. If it is subjected to an internal pressure of p=300 kPa, determine its required thickness if the maximum normal stress is not to exceed 12 MPa. [7%] Ans: 18.8 mm

   (b) The tank of a cylindrical air compressor is subjected to an internal pressure of 0.63 MPa. If the internal diameter of the tank is 550 mm, and the wall thickness is 6 mm, determine the stress components acting at point *A*. [8%] Ans:28.9, 14.4 MPa



5. The column (柱) is built up by gluing the two boards together. Determine the maximum normal stress on the cross section when the eccentric (偏心的) force o P=50 kN is applied. [15%] Ans:-2.342 MPa



6. The sign is subjected to the uniform wind loading. Determine the stress components at points *A*, *B*, *C* and *D* on the 100-mm-diameter supporting post. [20%] Ans:A:107.0, 15.28 Mpa, B:0, 14.77 MPa, C:-107.0, 15.28 MPa, D:0, 15.79 MPa