

7.31 (a) We want to compute the ductility of a brass that has a yield strength of 345 MPa (50,000 psi). In order to solve this problem, it is necessary to consult Figures 7.19(a) and (c). From Figure 7.19(a), a yield strength of 345 MPa for brass corresponds to 20%CW. A brass that has been cold-worked 20% will have a ductility of about 24%EL [Figure 7.19(c)].

(b) This portion of the problem asks for the Brinell hardness of a 1040 steel having a yield strength of 620 MPa (90,000 psi). From Figure 7.19(a), a yield strength of 620 MPa for a 1040 steel corresponds to about 5%CW. A 1040 steel that has been cold worked 5% will have a tensile strength of about 750 MPa [Figure 7.19(b)]. Finally, using Equation 6.20a

$$HB = \frac{TS(\text{MPa})}{3.45} = \frac{750 \text{ MPa}}{3.45} = 217$$