8.D5 This problem asks that we determine, for an 18-8 Mo stainless steel, the time to rupture for a component that is subjected to a stress of 100 MPa (14,500 psi) at 600°C (873 K). From Figure 8.35, the value of the Larson-Miller parameter at 100 MPa is about 22.4 x 10^3, for T in K and t_r in h. Therefore,

$$22.4 \text{ x } 10^3 = T(20 + \log t_r)$$

$$= 873(20 + \log t_r)$$

And, solving for t_r

$$25.66 = 20 + \log t_r$$

which leads to $t_r = 4.6 \text{ x } 10^5 \text{ h} = 52 \text{ yr.}$