

Assignment #31

19.1 *Estimate the energy required to raise the temperature of 2 kg (4.420 lb_m) of the following materials from 20°C to 100°C (68°F to 212°F): aluminum, steel, soda-lime glass, and high density polyethelen.*

19.8 *A 0.1-m (3.9-in.) rod of a metal elongates 0.2 mm (0.0079 in.) on heating from 20°C to 100°C (68°F to 212°F). Determine the value of the linear coefficient of thermal expansion for this material.*

19.27 *If a cylindrical rod of nickel 100.00 mm long and 8.000 mm in diameter is heated from 20°C to 200°C while its ends are maintained rigid, determine its change in diameter. Hint: You may want to consult Table 6.1.*

19.D1 *Railroad tracks made of 1025 steel are to be laid during the time of year when the temperature averages 10°C (50°F). If a joint space of 4.6 mm (0.180 in.) is allowed between standard rails of length 11.9 m (39 ft), what is the highest possible temperature that can be tolerated without the introduction of thermal stresses?*