

Thermal stress is created by thermal expansion or contraction. A significant portion of the rise in sea level that is resulting from global warming is due to the thermal expansion of sea water. Glass cooking pans will crack if cooled rapidly or unevenly, because of differential contraction and the stresses it creates. Nuclear reactor pressure vessels are threatened by overly rapid cooling, and although none have failed, several have been cooled faster than considered desirable. Metal fillings (gold, silver, etc.) are being replaced by composite fillings (porcelain), which have smaller coefficients of expansion, and are closer to those of teeth. Thermal stress can be destructive, such as when expanding gasoline ruptures a tank. Thermal stress can explain many phenomena, such as the weathering of rocks and pavement by the expansion of ice when it freezes. Railroad tracks and roadways can buckle on hot days if they lack sufficient expansion joints.