Soldering and Brazing

Soldering and brazing are similar joining procedures. The materials to be joined are not melted, but bonded by a lower melting-point filler material between them. Commonly, when the filler material melts below about 450 ºC, the process is referred to as *soldering*, and the use of a higher melting filler is referred to as *brazing*.

Capillary action is used to pull the molten filler into the space between the parts to be joined. At least two concerns need to be addressed. First, the surfaces of the materials to be joined must be as clean as possible. This is accomplished with combinations of chemical and/or mechanical cleaning. Fluxes are generally used during joining to avoid oxidation.

Second, the joint should be as narrow as possible to wick in the molten filler. A positive consequence is that the strength of a narrow band of solidified filler can exceed the strength of bulk filler material. Also, tolerances of the joined parts can be more tightly controlled than with welding.

Another advantage of brazing over welding is that a greater variety of different materials can be joined. For example, ceramics can be joined to metals. A disadvantage is that the operating temperature of the joined part is now limited by the filler material rather than the higher-melting joined materials.