Heat Treatments

Annealing
Annealing is a rather generalized term. Annealing consists of heating a metal to a specific temperature and then cooling at a rate that will produce a refined microstructure. The rate of cooling is generally slow. Annealing is most often used to soften a metal for cold working, to improve machinability, or to enhance properties like electrical conductivity.

Normalizing
Normalizing is a technique used to provide uniformity in grain size and composition throughout an alloy.

Stress relieving
Stress relieving is a technique to remove or reduce the internal stresses created in a metal.

Aging
Some metals are classified as precipitation hardening metals.
Examples of precipitation hardening alloys include 2000 series, 6000 series, and 7000 series aluminium alloy, as well as some superalloys and some stainless steels.

Quenching
Quenching is a process of cooling a metal at a rapid rate.

Tempering
Untempered martensitic steel, while very hard, is too brittle to be useful for most applications. A method for alleviating this problem is called tempering.