# FURNACE SELECTION

Our industrial furnaces can be classified as one of two basic types, "Heat Treating Furnaces" also known as hardening furnaces, and "Draw Furnaces" also known as annealing, tempering or forced convection furnaces.

Heat treat (Hardening) furnaces have higher heat output power than draw furnaces due to the elevated temperatures at which they operate. Heat transfer to the tool steel is accomplished by a very efficient process called direct radiation. Temperature uniformity in these furnaces is best in the red heat range. Normal maximum temperature is 1232 °C (2250 °F). Optional 1316 °C (2400 °F.) maximum temperature versions are available.

Draw furnaces are used for tempering and other low temperature processes. They normally operate at temperatures below red heat range where heat transfer to the tool steel is accomplished by the process of convection heat transfer. To increase convection efficiency, these furnaces are equipped with a fan in the heating chamber to move air (Forced Convection). This delivers a temperature uniformity of ± 6 °C (± 10 °F) or better. Maximum temperature is 677 °C (1250 °F.). Optional 1093 °C (2000 °F.) maximum temperature versions are available.

Heat treating processes consist of two basic steps, hardening and tempering.

Hardening processes occur at high temperatures that are well into the red heat range. Drawing, tempering and annealing processes normally occur at temperatures below red heat range.

When a part is hardened, it is heated to a high temperature, held there for a required time period, then removed from the furnace to be quenched (Cooled) This is usually accomplished by submerging the part into a liquid quenching material or by placing the part on a cooling rack in still air. The part should only be cooled to about 66 °C (150 °F), and then placed into a furnace at the tempering temperature. Due to the heat treat furnace not being able to cool as fast as the part, it is best to have a separate furnace for each step of the process.