Equiax Furnace Melt Process Terms

Casting Temperature
The temperature at which an alloy is ready to be poured into a Mold. This value is entered into the Tcast field of a recipe using Redit.

Closed Loop Temperature Control
Closed loop temperature control refers to automated control of alloy temperature by the PLC through adjustment of the output from the Melt Power Supply. This feature relies on feedback from the Melt Optical Pyrometer to determine the current temperature of the melted alloy. Using special software and a communications link to the Melt Power Supply, the PLC sets the output of the Melt Power Supply to change the alloy temperature to some desired value or keep it at its current value.

KW Lock Mode
A Melt Power Supply Mode set with a button (named KW LOCK) on the Melt Power Supply Control Screen. Press the KW Lock button on the Melt Power Supply Control Screen to hold the Melt Power Supply output at the level in use when KW Lock is pressed. The KW Lock button is a toggle switch; press it once to lock the power and again to unlock it.

Manual Temperature Mode
Manual Temperature Mode is a Melt Power Supply Mode set with a button (named MANUAL MODE) on the Melt Power Supply Control Screen. In this mode, closed loop temperature control is inactive. The Power Limit potentiometer on the Operator Station determines the power level.

Melt Temp Final
The current target for alloy temperature. This target is reached either through closed loop temperature control by the PLC (in Temp Mode) or, when in Manual Temperature Mode, by adjusting the Power Limit Potentiometer.

Prior to a melting cycle, Melt Temp Final is typically set by the Tcast field in a recipe. During super heating, Melt Temp Final is temporarily raised by adding the super heat offset to it.

Melting Temperature
The temperature at which an alloy melts. Prior to a melting cycle, the melting temperature is typically set by the Tmelt field in a recipe.

Power Limit Potentiometer
A control dial located on the Operator Station that is used in Furnace Auto Mode and Furnace Sequenced Mode to clamp or limit the output of the Melt Power Supply. In Furnace Manual Mode, the Power Limit Potentiometer sets the output of the Melt Power

Supply. In Furnace Auto Mode and Furnace Sequenced Mode this potentiometer cannot be used to increase the output of the Melt Power Supply.

Profile
A predefined sequence of settings for the Melt Power Supply output or the angle of the Crucible Tilt Mechanism that are created using Retech-supplied software on the Control Console. These settings consist of a series of points, each containing a setting (PS output or Crucible angle) and the elapsed time from zero (when the profile started).

Melt Power Supply output or power profiles are created with VBPower and are used during billet melting because no feedback is available from the Melt Optical Pyrometer to assist in setting the Power Supply output. [If closed loop temperature control were used in such as case the high output power set by the PLC would result in overshooting of the desired alloy temperature]. Crucible angle or pour profiles are created with VBPour and are used during a pour of molten metal into a Mold to replicate a successful pour. In both cases the profile is downloaded into the PLC from the Control Console (typically as part of a recipe).

Profile Mode
A Melt Power Supply Mode in which the output of the Melt Power Supply is set by a profile created with VBPower. As explained above under "Profile", these are typically used during billet melting because no feedback is available from the Melt Optical Pyrometer to assist in setting the Power Supply output.

Temp Mode
Temp Mode is a Melt Power Supply Mode set with a button (named TEMP MODE) on the Melt Power Supply Control Screen. In this mode, closed loop temperature control is active and the PLC controls the alloy temperature by using feedback from the Melt Optical Pyrometer to set the output of the Melt Power Supply. The Power Limit potentiometer on the Operator Station can be used in this mode to limit the power level output of the Melt Power Supply. Pressing the KW LOCK button in Temp Mode locks the Melt Power Supply Output at the value present when the KW LOCK button was pressed.