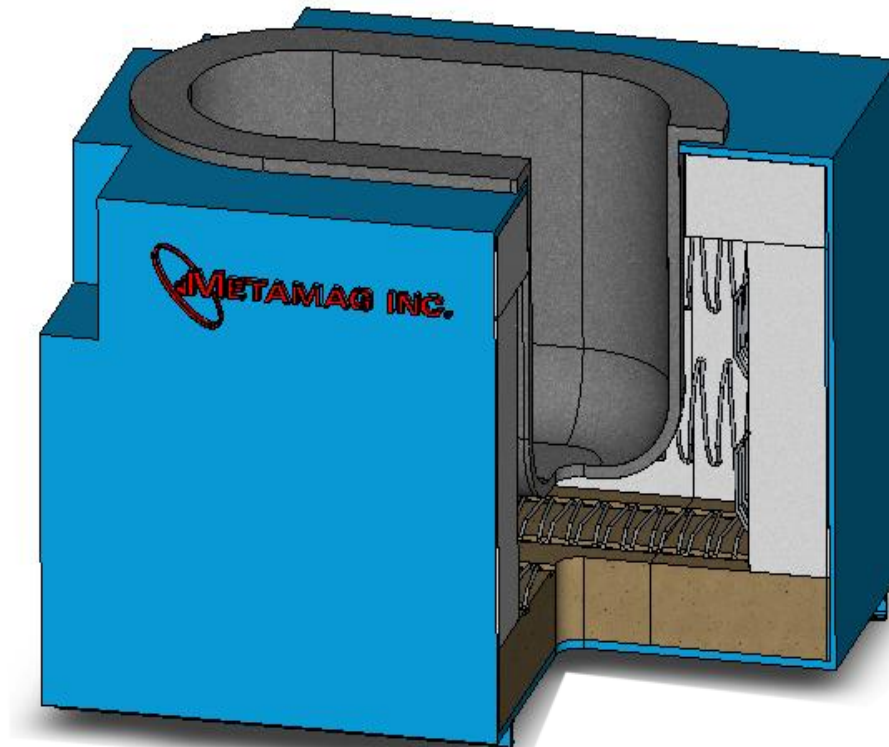


Three colored circles (dark teal, light teal, and grey) are arranged horizontally to the left of a vertical black line that extends downwards from the top of the page.

Hot Chamber Furnace Systems

Contoured Element Design for Hot Chamber Furnaces

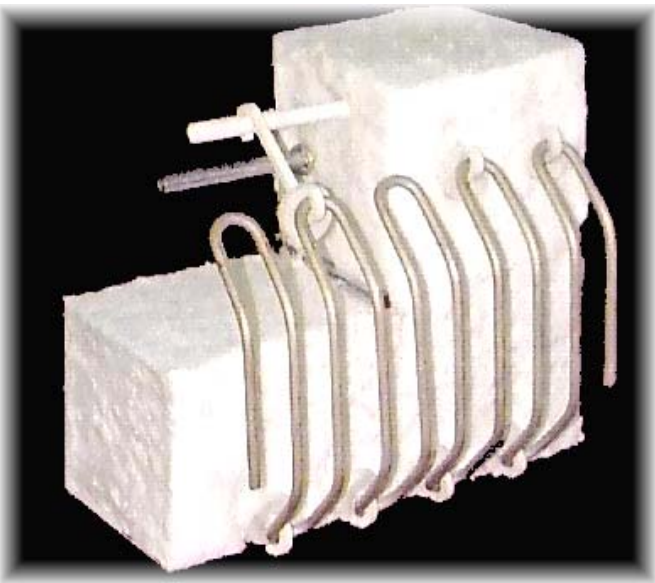




Advantage of Contoured Element Design

- Up to 35% more kW
- Floor heating for more direct heat transfer crucible
- Even heat distribution to crucible results in longer life
- Converts solid ingot into a liquid much faster

Thermal Heating System



- Insulating modules also supports heating system
- EES Ceramic Modular replaceable insulation
- Superior heat retention compared to brick and board insulation
- Lower furnace cold face temperature
- Heavy gage solid rod over bend element wire

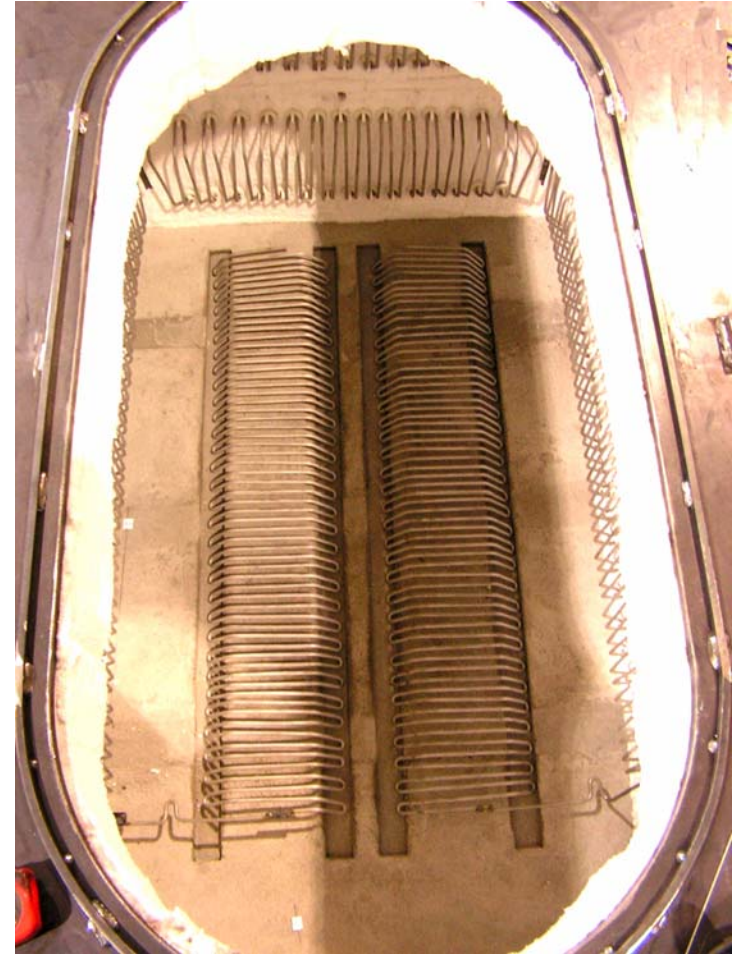
SSR Power Controls



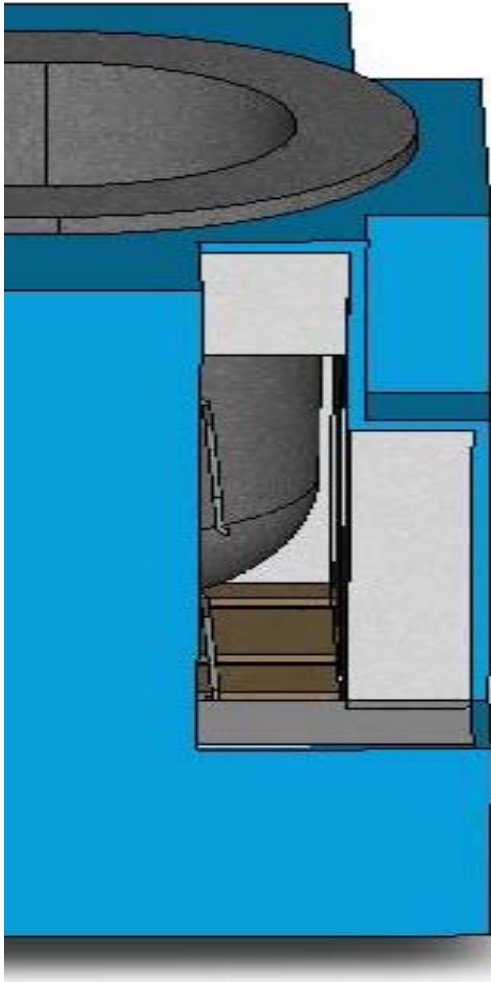
- Dramatically increase element life
- Minimizing temperature extremes
- No replacing of mechanical contactors
- Operates seamlessly with Feed Forward PID® Systems Board

Contoured Design Applications

- Hot or Cold Chamber Furnaces
- 1 TO 3 Heating Zones
- 40 to 800 kW
- EES Rod over bend element design
- Up to 35% more kW
- 3 to 5 years element life



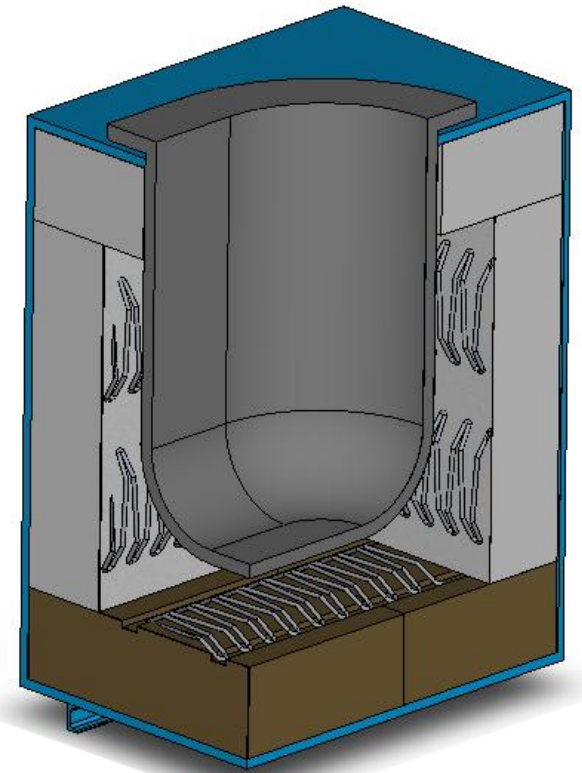
Crucible Forward Furnace Design



- No heating elements at the front of furnace, additional floor elements supply required heat
- Air space for heat circulation
- A Shorter nozzle can be used
- Counters gooseneck heat sink effect

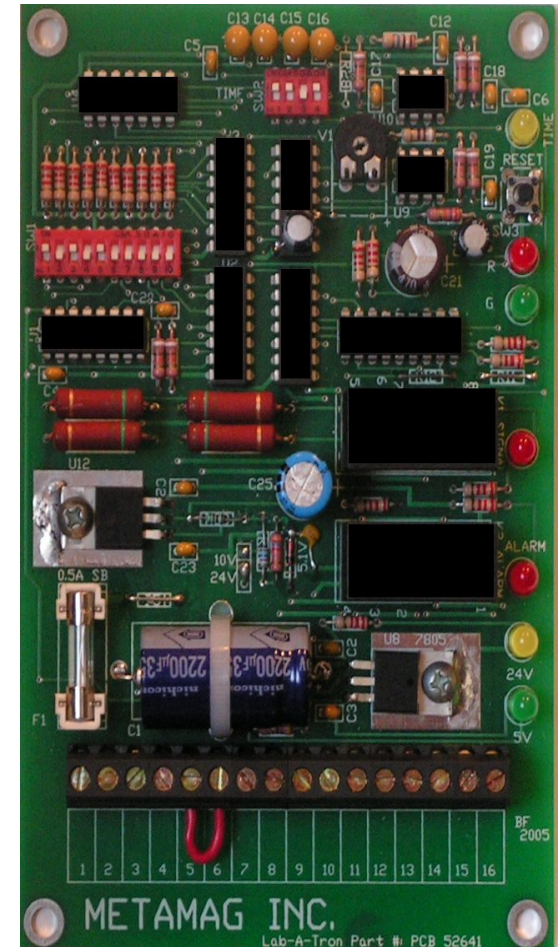
Castable Refractory Floor

- Deeper furnace box
- Thicker refractory floor
- Silica free refractory
- Once refractory floor is super heated it acts as a heat spreading “hot plate” distributing heat evenly along crucible bottom even when heat is not cycling
- Prevents spikes in molten bath temperature



Feed Forward PID Heating Controls

- Takes over PID as soon as production mode is selected. Reacts faster and ahead of slow acting temperature controllers typically supplied to control furnace
- Reduces temperature swings at start of production
- Fully adjustable to suit small or large melt rate
- Boosts furnace melt rate by up to 30%
- Minimize power consumption per Kilogram of magnesium melted



Casted Nickel Free Crucibles

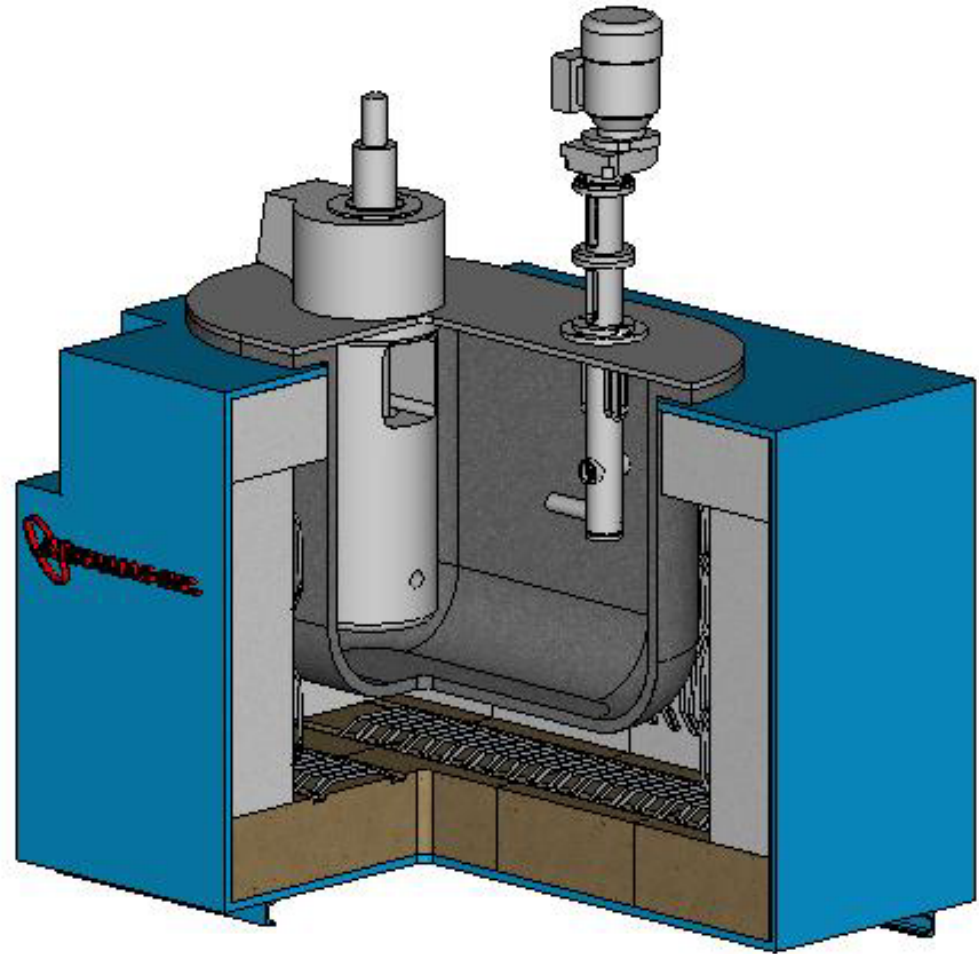
- 410 nickel free alloy Stainless Steel
- From 250 to 2,800 kg holding capacity
- Minimum thickness 35mm
- Even thermal conductivity eliminates hot spots
- Prevents thermal currents
- No deformation
- Long life



Process Improvement

Metamag Thermal Pump

- Improve gooseneck performance
- Prevent built up between crucible and gooseneck
- Stabilizes metal temperature
- Allows process to operate at higher metal temperatures
- Prevent sludge from accumulating at the bottom
- Improved heat transfer from thermal system



Process Improvement

Metamag Ingot Preheating

- Meets safety requirements
- Charges ingots automatically
- Prevent large temperature swings
- Stabilizes metal temperature
- Reduce sludge built up





Metamag Hot Chamber Solutions

- Metamag has been providing Magnesium Melting Solutions for over 25 years
- Metamag is the leader in heating technology solutions
- Solutions by Innovative designs
- Solutions through experience