Levitation melting of steel balls

Objective Levitation of steel balls during the melting process

Material 1010 low carbon steel balls ¼" (6.35mm) diameter

Temperature 2800 ºF (1538 ºC)

Frequency 195 kHz

Equipment
- Ambrell 10 kW induction heating system, equipped with a remote workhead containing two 1.5µF capacitors for a total of 0.75µF
- An induction heating coil designed and developed specifically for this application.

Process A conical coil is used with a total of five turns with two turns on the bottom, a central turn and two turns wound the opposite direction on the top, this creates opposing fields that causes the steel ball to levitate. The ball is introduced into the coil on a quartz rod. When the power is turned on the metal is heated and the opposing magnetic fields levitate the metal ball inside the coil. The metal continues to heat until it melts.

Results/Benefits Induction heating provides:
- Minimal contamination of conductive material during manufacturing
- Removes insoluble inclusions while leaving desired alloying constituents in tact
- Even distribution of heating

Steel ball levitated in specially designed coil