Heating a crucible for melting plastic

Objective  
To heat a crucible for a plastic melting application.

Material  
Stainless steel crucible, 3in.(76mm.) diameter, 18in.(457mm.) height, ground plastic compound

Temperature  
400°F (204°C)

Frequency  
288 kHz

Equipment  
- Ambrell 5kW 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 single-position 6-turn helical coil is used to generate the required heating for application. The crucible is heated in 70 seconds with the 5kW power supply. The plastic takes approximately 7 minutes to melt. This melting time may be decreased by either mixing, or by increasing the surface area in contact with the plastic material.

Narrative  
The customer is designing a medical disposal system. The medical bottles and pills are run through a grinding machine, and then put into the stainless steel crucible. They want to melt the material into a solid mass, and eventually empty the crucible through the bottom and dispose of the waste. What would benefit the customer is that induction heating would provide a small and portable process. Control of bio hazards would also be optimally maintained, as opposed to a more open heating environment.

Results/Benefits  
Induction heating provides:
- Flexible and cleanliness can not be duplicated by conventional methods.
- Fast, controllable temperature ramp, allowing for consistent, quality results.
- Faster startup/shutdown time saves energy
Heating plastics and medical products in steel crucible

Heating steel crucible for a melting application