Heating a cutting knife, improving cut

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Objective Heating a cutting knife to 100 ºC

Requirements We are requested to heat a cutting knife to a temperature of 100 degrees Celsius within 10 minutes. At this temperature it is believed that the knife will be able to cut a continuous plastic strip of material with less force then when it is unheated. The reason for reducing the force is to get a better cut with the potential of less dust being produced.

Temperature 100ºC (212 ºF)

Frequency 300 kHz

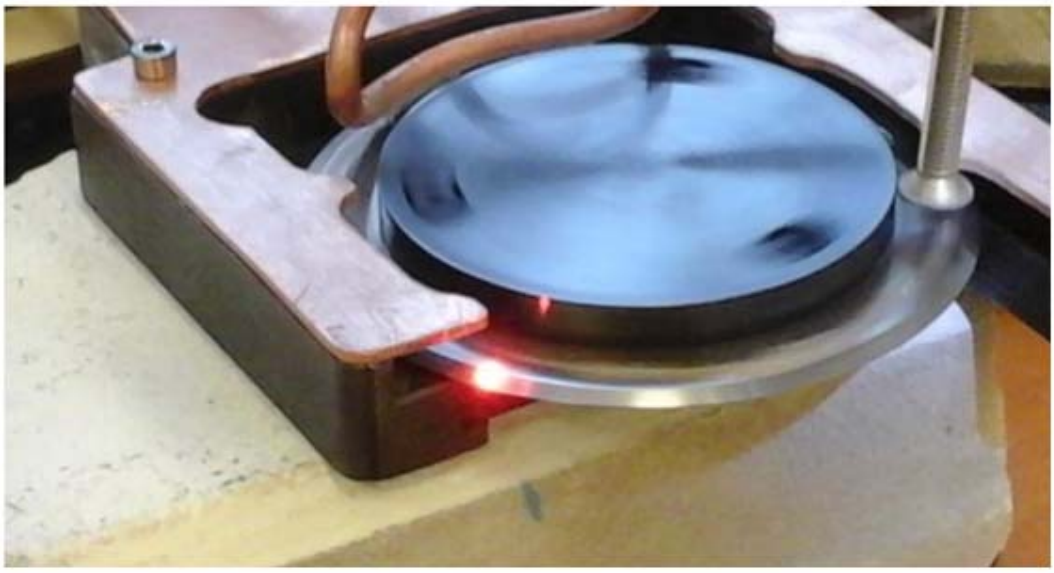
Equipment

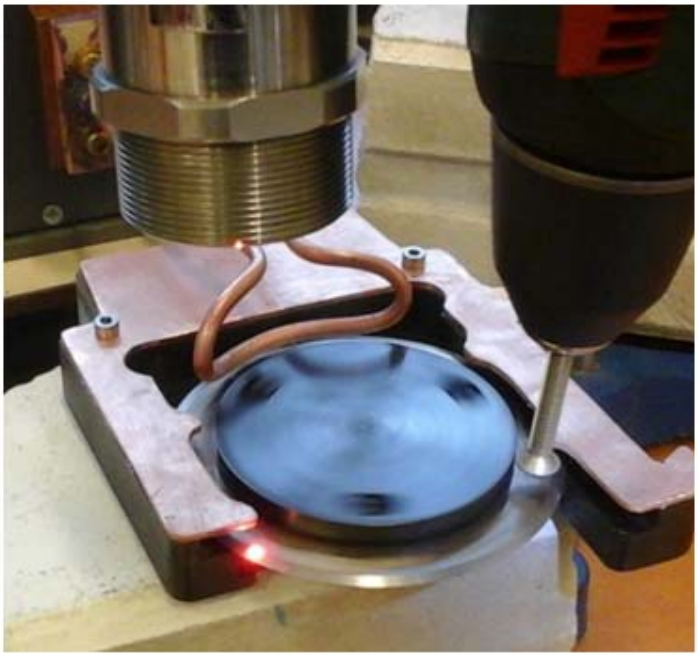
- Ambrell EASYHEAT 0224 2, 4 kW induction heating system equipped with a remote workhead (300P) containing two 0.33 µF capacitors. Pyrometer with a temperature range 50 - 400ºC.
- An induction heating coil designed and developed specifically for this application.

Process A simple setup was created using a drill in order to turn the cutting knife. The induction heating coil was positioned over the top of the knife and power was controlled by measuring temperature at the tip.
Coil design:
Single turn oval coil specially designed for the application

Results/Benefits Induction heating provides:

- Consistent, repeatable results
- Safe, reliable source of heat
- Measurable & stable results
- Less production scrap





The assembly during heating.