



Induction Barrel Heating: Cut Costs and Improve Quality

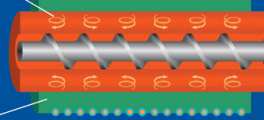
U.S. patents pending

Induced eddy currents generate powerful resistive heating directly within the barrel wall

Helical Litz windings form a "tunnel coil" geometry that produces extremely efficient electromagnetic coupling

Advantages

- Energy savings
- Faster heat-up
- Faster, tighter temperature control
- Reduced shear
- Improved reliability
- Increased heating capacity
- Process higher temperature materials



High-performance thermal insulating layer virtually eliminates barrel heat losses and keeps the Litz windings cool

nxheat™ insulating sheet is made of vacuum-formed bio-soluble Superwool™ material that withstands temperatures up to 1000°C (1832°F). High-temperature Teflon-coated Litz cabling is then wound around the insulation to form a high-efficiency induction "tunnel-coil."



nxheat™ can be easily applied in hybrid arrangements alongside band-heaters to provide accelerated ROI in zones with high power use that have a major impact on process performance.



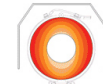
nxheat™ Induction Barrel Heating. The ideal way to melt the resin on injection molding machines. Xaloy nxheat™ sharply cuts energy costs, improves temperature control and reduces shear to improve melt quality and increase yields. nxheat™ uses an induction power supply and helical coils to generate heat directly in the barrel, and a thermal insulating layer between the barrel and coils to virtually eliminate heat losses. Thermal inertia is eliminated to maximize heating and cooling response during processing for improved control and significantly faster startups on smaller machines. Induction maximizes heat addition in the feed zone to deliver a uniformly hotter, less viscous melt to the compression zone of the screw to minimize viscous heating and shear. Reduced shear saves screw power, improves process controllability, reduces component wear and improves material properties and part quality.

Highlights

- Reduce Energy Costs
(Barrel heating + air conditioning + peak demand)
- Increase Capacity / Avoid Expansion Costs
(air-conditioning and power transmission)
- Increase Yields
 - Reduce startup time
 - Reduce downtime
 - Reduce cycle times
 - Reduce material use
 - Reduce scrap



Uniform, efficient heating with nxheat™



Non-uniform, wasteful heating with band-heaters



www.xaloy.com

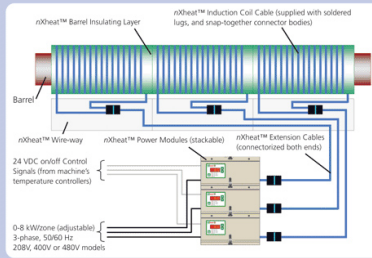


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Induction Barrel Heating

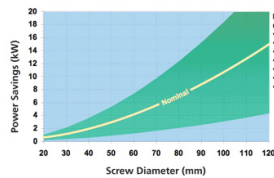
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Specifications

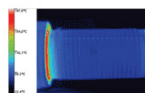
- 0-8 kW adjustable power output
- Three models to meet global voltage requirements (50/60 Hz) without the need for a transformer:
 - 208V 3-phase (190-240V)
 - 400V 3-phase (360-440V)
 - 480V 3-phase (430-510V)
- 20-40 kHz coil frequency
- ≈ 0.93 power factor at 8 kW
- <5% harmonic distortion (current)
- Controlled just like a band-heater (On/Off 24VDC control input from existing temperature controls)
- Alarm display and contact-closure alarm output

Typical Range of Power Savings (kW/machine)

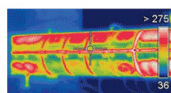


Power savings depends upon many factors, including:

- Barrel lot
- Process temperature
- Material throughput rate
- Screw design
- Band-heater type and insulation
- Operating time
- etc.



Uniform heating and cool external surface with nxheat™



Non-uniform heating and hot external surfaces with band-heaters

Band-heaters: Contact resistive heating

- Typically 30-70% efficiency
- Heat must conduct across contact resistance
- Heater mass adds thermal inertia to the system
- Heat is not applied uniformly around the barrel
- Element operates hot so it has limited life

Induction: Non-contact electromagnetic heating

- Typically 90-95% efficiency
(coil losses 2%, power module losses 2%, insulation reduces ambient losses by >90%)
- Heat is generated directly within the barrel wall
- Heater thermal inertia is eliminated
- Heat is applied uniformly around the barrel
- Coil operates cold so it has unlimited life

Our worldwide presence includes sales and service offices located in the United States, Europe, Thailand, Japan, China and India and a global network of agents geographically positioned to serve customers throughout the world.

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