



# Billet heating

A guide to the benefits of induction heating



# How induction billet heating saves time, space and money

**Induction's speed, precision, repeatability and energy-efficiency make it the natural choice for heating billets.**

Using induction to heat billets prior to forging delivers numerous commercial and technical benefits. Chief among them are:

- **Low operating costs:** Induction generates heat directly within each billet. No energy is wasted heating ambient air. This, together with precise power controllability, makes induction extremely energy efficient.
- **High productivity:** Induction heating is fast, capable of heating even large billets to high temperatures in seconds. Throughput is enhanced by the use of automated loaders, feeders and extractors.
- **Improved quality:** Induction ensures uniform through-heating for each individual billet. This contributes to excellent grain flow characteristics in each forged billet. Also, induction's extremely

rapid temperature increases result in minimal scaling and surface defects, which in turn contribute to longer die life.

- **Compact footprint:** Induction heating saves valuable floorspace. The power source, capacitor bank, induction coils, feeding station, heat exchanger and PLC cabinet can all be contained on one frame.
- **Flexibility:** Modern induction heating systems feature quick and easy coil changeovers. With EFD Induction's multi-coil systems, for example, changeover is fully automatic. The operator only has to select the desired coil in the PLC, and the system automatically changes to the correct water and power connections. Induction also offers the possibility of heating billets in protective atmospheres.

Diameter: Round or square – in mm	Frequency	
8	25 KHz	
10		
15		
18		
20	10 KHz	
30		
40		
50	3 KHz	
60		
70		
80	1 KHz	
100		
120		
150	500 Hz	
180		
200		

*A rough guide to the frequencies needed for various diameters when heating billets in an EFD Induction system.*

## TECHNICAL DATA

<b>Material</b>	Steels, copper, brass, aluminum, silver, titanium, etc.
<b>Section type</b>	Round, square and profiled sections
<b>Available power</b>	50 kW–several MW
<b>Technology</b>	IGBT transistors or thyristors
<b>Frequency</b>	500 Hz–50 000 Hz
<b>Specific electrical consumption</b>	
Steel 1250°C	400 kWh/T
Aluminum 650°C	350 kWh/T
Brass 800°C	250 kWh/T

# Field-proven billet heating systems from EFD Induction

EFD Induction billet heaters heat practically any dimension of billets and slugs in materials as diverse as stainless steel, copper, aluminum, titanium and brass. Power ranges vary from 6 kW up to several MW, at frequencies of 500 Hz – 50 kHz. All our billet heaters feature EFD Induction Sinac converters, which are available in thyristor and IGBT transistor versions.

EFD Induction billet heaters can be fitted with a range of tipper, loader, feeder, extractor and other options.

- **Cabinets:** Compact and separate cabinet systems are available. In compact models, the Sinac and the heater are housed in a single cabinet. In separate versions, they are housed in two different cabinets.
- **Process controls:** The control solution for all EFD Induction billet heaters is a specially adapted PLC system based on one of the world's most trusted platforms. With a standard control solution, the entire process from loading to sorting is PLC controlled. The heating cycle parameters for each billet can be saved and deployed merely by using the billet reference.
- **Tipper:** Designed to match your billet containers, the tipper can be combined with a vibratory channel for smooth loading.
- **Loaders:** Various loaders are available to match blank sizes and planned throughput volume. The heaters can be fitted with single- or multi-stair hopper loaders, vertical sorting conveyors, vibratory bowl or robot arm.
- **Feeders:** Several variants are available, including hydraulic and servo-motor driven pushers and a motorized wheels system for continuous feeding.
- **Inductors:** Each coil is fastened to an insulating beam for stable positioning. The coils are coated, and thermally protected by casted refractory concrete.
- **Fast extractor and sorting device:** The heated billets are immediately extracted and sorted by temperature following a temperature reading by a pyrometer. The extractor can be easily removed when processing short billets.

*A billet exiting an EFD Induction billet heating system. Heated billets are read by a pyrometer and sorted according to temperature.*



# Get more from your equipment

When you choose a solution from EFD Induction you choose security and peace-of-mind. As one of the world's largest induction heating companies we

offer a full range of maintenance, logistics, training and spares services. Make the most of your heating system—with a little help from the people who built it.



*A complete on-site EFD Induction billet heating system. Each system can be customized (for example, with various tippers, loaders and feeders) to meet specific requirements.*

EFD Induction has to date installed thousands of heating solutions for a vast range of industrial applications—bringing the benefits of induction technology to many of the world's leading manufacturers and service companies. EFD Induction has manufacturing plants, workshops and service centers in the Americas, Europe and Asia.

**Learn more about EFD Induction and our solutions that are boosting productivity for companies around the world. Visit: [www.efd-induction.com](http://www.efd-induction.com)**