

# GEAR UP!



**Environmentally friendly  
solutions with  
induction heating  
available for you worldwide**

Induction hardening  
Heat treatment  
Billet heating



## One company – one group – one corporation

### The performance portfolio of the INDUCTOTHERM Group

Since 1953, the group and its approximately 3,200 employees have ensured the complete coverage of all hardware and software areas within the field of inductive heat treatment. Comprising more than 40 individual companies, the group provides communication and services in 18 industrialized countries around the globe and can draw on a worldwide network of technology companies for customer service, equipment, appliance engineering and metrology services. It coordinates work within the group's centers for development and special competences and maintains its international network of production sites, as well as ensuring on-time procurement, even from overseas.

### The most importance fields of business:

- Induction melting and casting
- Induction heating
- Induction pipe welding
- Vacuum induction, vacuum light arc, ESR and precision casting systems
- Vacuum heat treatment
- Mass induction heating for rolling, continuous electroplating baths and electroplating melting furnaces
- Electrically resistance heated aluminium smelting furnaces





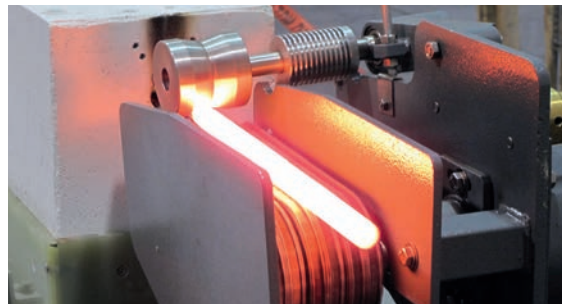
We produce standard and customized hardening systems. Furthermore, we operate one hardening shop near Stuttgart and another near Darmstadt.

#### Services:

- Comprehensive process development and metallurgical lab
- Complete engineering in design and plant construction
- Large inductor production and repair department
- In-house and on-site customer training
- Experienced service technicians
- Dedicated after-market spare parts supply

#### Operations:

- Hardening, tempering and annealing
- Billet heating for forging and hot forming
- Shrinking, stress relief annealing and preheating
- Sheet and strip heating
- Copper pipe annealing (sections and in-line annealing)
- Gluing, soldering and connecting
- Hardening of epoxy resins and melting of plastic coatings

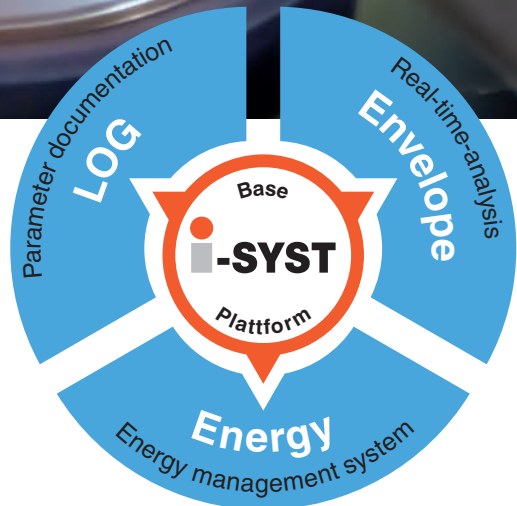






## Inductive heating systems – from the idea to the implementation

- Hardening and tempering systems
- Billet heating systems
- Customized hardening systems
- Low frequency heating systems
- Plants for preheating, brazing,
- Annealing, gelling, shrinking, etc.
- Innovative Industry 4.0 applications  
**i-SYST / i-MATCH**



### INDUCTOSCAN-flex modular hardening system

HF to 150 kW

MF to 200 kW

IFP to 200 kW, variable frequency

Our universal hardening machine stands out due to a flexible, modular design for hardening a wide range of workpieces. It consists of a basic machine, on which various interchangeable machining modules can be quickly, easily and precisely adapted depending on the application case.



### INDUCTOSCAN-PLATINUM compact hardening system

HF to 100 kW

MF to 150 kW

The **INDUCTOSCAN-PLATINUM** is a compact vertical feed machine for hardening and tempering a wide range of workpieces. It contains leading-edge inverter technology, as well as up to two heating stations, a Siemens controller and a recooling system for energy and quench. On-site assembly is reduced to connecting the power and water.



### INDUCTOSCAN-MOVE compact hardening system with indexing plate

HF to 100 kW

MF to 150 kW

The **INDUCTOSCAN-MOVE** is a universal vertical hardening system with indexing plate module, designed for hardening and tempering a wide range of workpieces. It contains leading-edge inverter technology on a transistor basis, as well as up to two heating stations, a controller and a recooling system for energy cooling medium and quenchant. All components are installed on a base console, which reduces the on-site assembly to the power, water and compressed air connection.



## Our customized systems

For everything from small parts to large systems

In order to meet your specific hardening or workpiece requirements, we manufacture tailored hardening systems specifically to your range of parts.

With our decades of experience in the design of induction hardening systems, we can provide you with solutions to your hardening problems. If in doubt about the inductive curability of your parts, please contact our research department continues with security.

INDUCTOHEAT Europe can offer a whole range of special equipment.

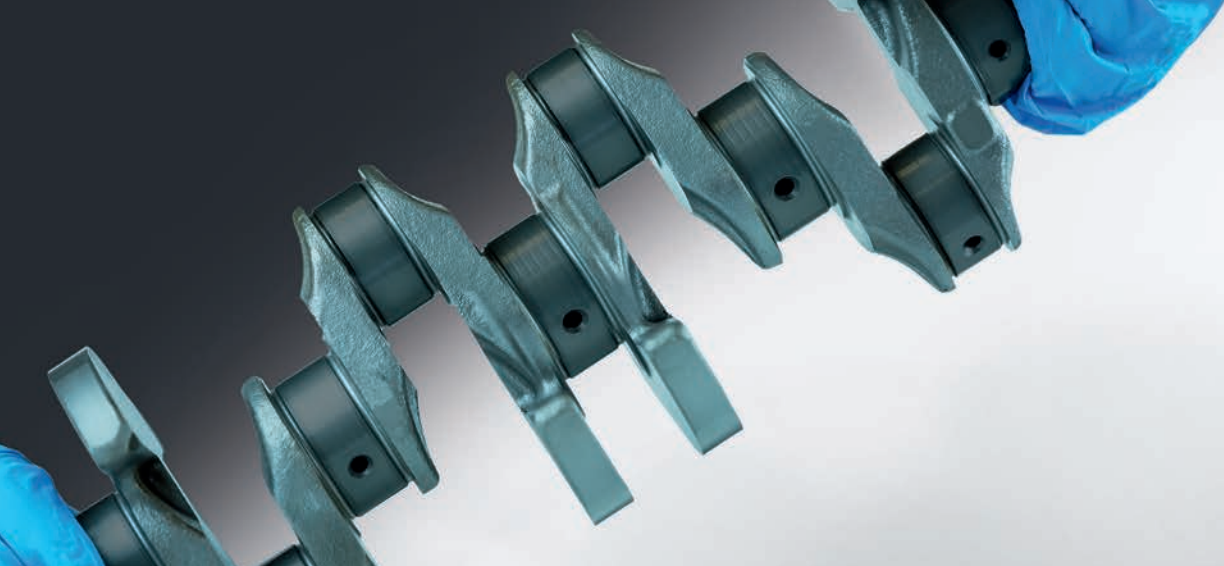
Here, our range of equipment is sufficient for small parts with cycle times of about 1 second to large plants with capacities of several hundred kilowatts. The degree of automation within INDUCTOHEAT systems ranges from fully automatic to simple, manually loaded machines.

### Hardening systems for:

- Linear guides
- Bolts
- Single cams
- Camshafts
- Drive shafts
- Gears
- Shift forks
- Cylinder liners
- Cam discs
- Formed sheet metal parts
- Bearing rings
- and much more ...



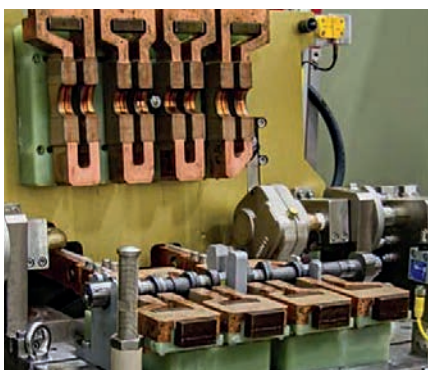




## Sharp C™ - Technology

### Non-rotating inductive heat treatment system for crankshafts and camshafts

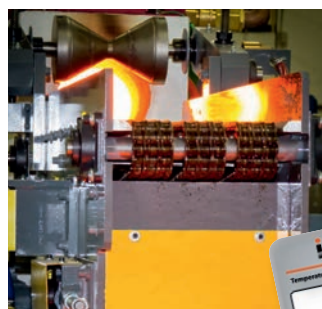
CrankPro® systems utilise the patented Sharp-C™ technology, which eliminates the turning of the crankshaft and the movement of the inductor during heating and quenching. This standard heating process offers additional practical and technical advantages, e.g. reduced space requirement, simple operation, robust, stable inductors and less warping of the workpiece.



#### Advantages of the static methods in comparison with conventional rotating methods:

Static	Rotating
Almost no warping 0 to 45 µm max.	Part has warping and length changes, depending on the heating time
Short warming time: < 3 sec. Production rates up to 120 parts/hr.	Over 8 sec. warming time
More robust, CNC-milled block inductor. Hardening in the inductor – no moving components.	Soldered connection points. Hard metal spacers. Shorter service life.
Smaller installation surface – modular unit basis. Compatible for I4/V6/V8 crankshafts.	Installation surface 75 % larger for hardening systems, water systems, tempering furnaces, straightening and grinding machines...
High surface pressure tension – dramatic reduction in the periphery and edge decarburisation.	After hardening, grinding and polishing systems are required





## InductoForge® modular billet heating system

Fulfil the flexible production requirements of forges today

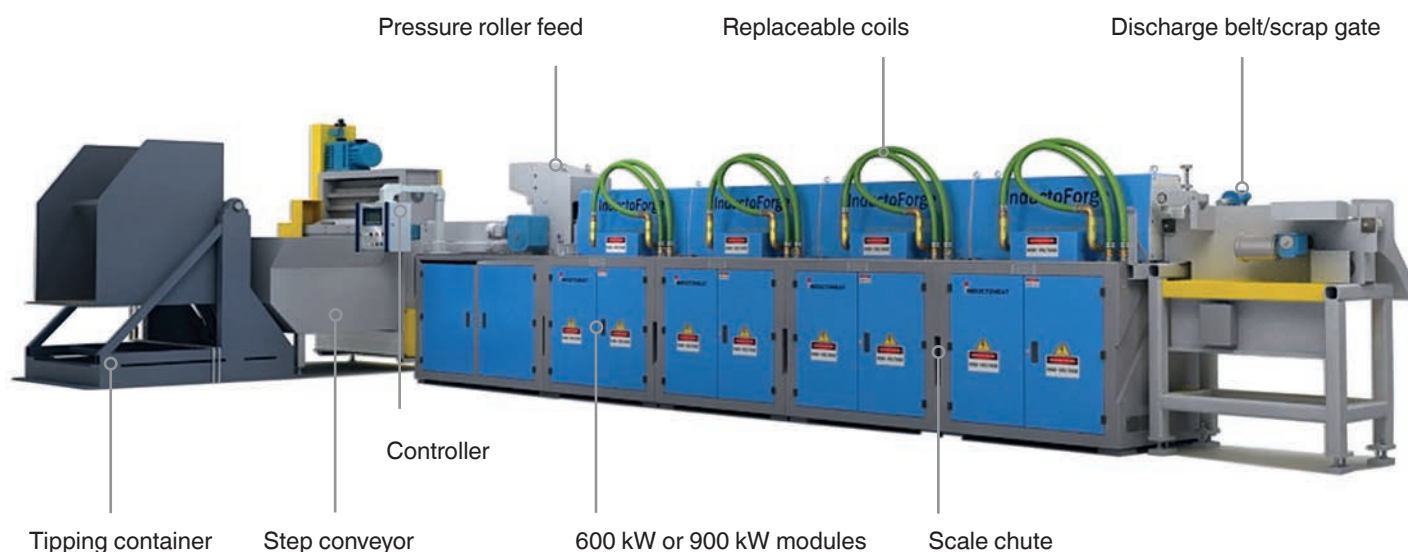
The powerful combination of advanced technology, product innovations and over 50 years of experience in the area of induction heating has contributed to INDUCTOHEAT Europe becoming a leading global supplier for heating systems for billets and bars for the forging industry.

With its individually controlled power modules (500 Hz – 6,000 Hz), the modular **InductoForge®** heating system for billets offers diverse and efficient application possibilities. The flexible modular design results in extremely finely tuned and precise control of the billet temperature.

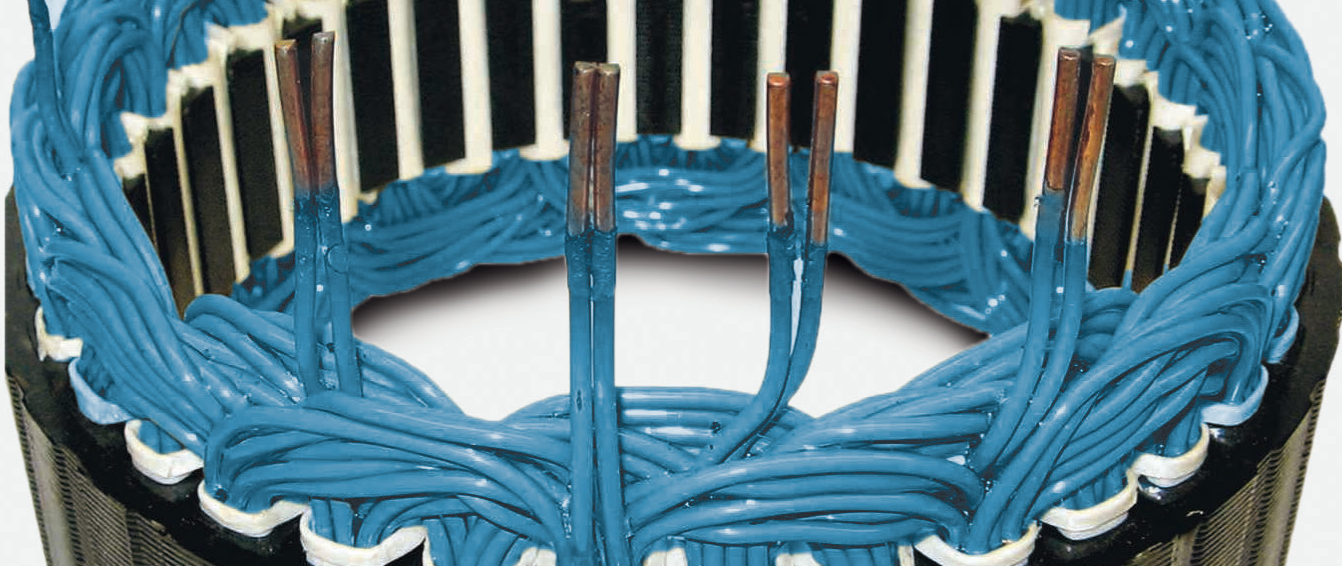
The **iHAZ™ temperature profile modelling software** enables advanced temperature control of the billet heating process. With the **iHAZ™ software** you can adjust the billet temperature profile (Induction Heat Affected Zone) to your special requirements with billet or bar heating. It also generates the optimum operating parameters and target values for standby and quick start, which are stored as a processing profile in the CNC of the billet warming system.

### Additional features & advantages:

- Optimised operating costs
- Reduced switch-off times & maintenance costs
- Spare coil sets
- Maximum efficiency
- Quick coupling connections
- Variable drive speeds for the feed
- Compact, robust, modular design







## iROSS™ mains frequency system

50/100 Hz for annealing, shrinking, joining, hardening, tempering, coating

The iROSS mains frequency heating system has been developed for the quick and efficient inductive heating of steel, aluminium, powder metal, cast iron and many other metallic materials. INDUCTOHEAT Europe produces low frequency heating systems (50/100 Hz) for a broad application spectrum, e.g. for the automotive sector and electric motor production.

### iROSS low frequency systems

use patented flux concentrators, which enable an unrivalled temperature homogeneity.

### iROSS systems are suitable for:

- Homogeneous inductive heating of complex components
- Thermal joining and shrinking
- Heating for assembly/disassembly
- Motor housing heating
- Drying/paint drying
- Tempering complex components
- Bulk goods heating
- Preheating
- Soldering
- Annealing
- Glue curing
- Heating coatings

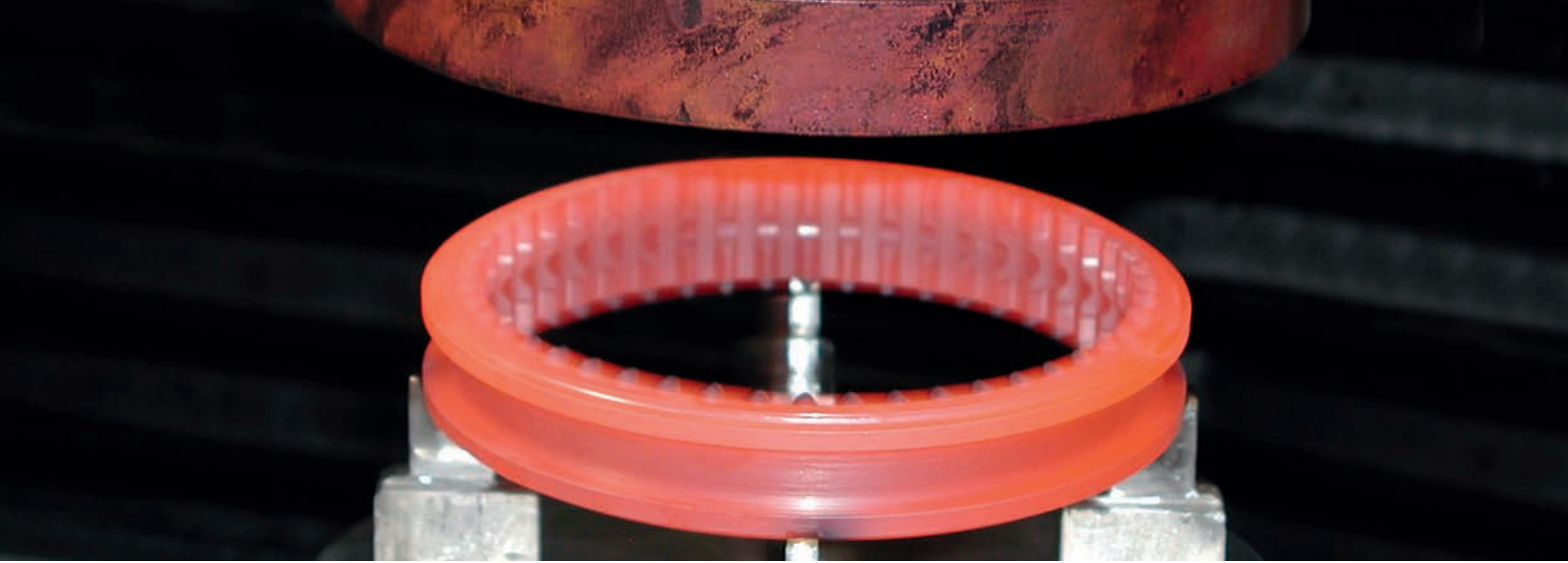


### A flexible, modular system

The exchangeable heating accessories enable the heating of a wide range of workpieces, such as motor housings, rotors, fittings, gears, bearings, etc.







## Solutions for electromobility

Our systems are a guarantee for high quality and efficient production conditions



### Examples:

- Adhesive curing
- Shrink heating and joining processes for electric motor production
- Hardening of steering parts such as ball nuts, ball pins, steering pinions, rotor shafts
- Drying
- Partial screw hardening
- Induction hardening of gears and sprockets
- Fixture hardening of synchronizer rings / sliding sleeves
- and much more ...





## Global market leader with revolutionary power supplies for every type of induction heating

Tailored to your individual application and integratable into our system as a module

Our engineers are able to realise customer and application-specific power supplies from proven SCR, IGBT and MOSFET power modules for every application and every customer. We offer the broadest bandwidth of power and frequency around the world!

The continuous increase of power and efficiency of our systems is driven by a clear desire to remain the global market leader for induction power supplies. INDUCTOHEAT Europe is constantly endeavouring to drive the innovation and further development of our patented technology forward in terms of system power and efficiency, without relinquishing the proven reliability.

A perfect example of this is the revolutionary **STATITRON IFP** (Independent Power & Frequency). **STATITRON IFP** is the only power supply of its kind with steplessly adjustable output frequency during the heating process.

Model	Semi-conductor	Load	Frequency (kHz)	Power (kW)	Output voltage (V)
SP6	SCR	Series	0.5–6	150–4000	600–2000
SP5	SCR	Parallel	1–10	100–600	400–800
SP7	SCR	Parallel	0.5–3	250–1350	400–800
UP16	IGBT	Series	3–50	50–1000	Set by tuning
SP18	IGBT	Parallel	3–50	100–600	800
TF	IGBT	Series	3–75	40–2000	800–2000
STATITRON IFP	IGBT	Inductive	5–60	75–480	Set by tuning
Flexitune	IGBT	Parallel	20–60	5–30	25–75
SP16	IGBT	Series	3–50	75–900	800–2000
Versapower	MOSFET	Parallel	10–400	3–100	500–1000
SP11 / LSS	MOSFET	Series	50–200	2.5–150	Set by tuning
STATITRON	MOSFET	Parallel	50–1200	40–5000	Set by tuning





## Contract Hardening

### Inductive surface hardening of your parts

**With the benefit of no fewer than 26 state-of-the-art systems, we can cover a wide performance spectrum**

- MF range from 3-30 kHz / 300 KW
- HF range from 50 – 400 kHz / 400 KW
- Special applications
- Tempering / stress relief

The hardening shops of INDUCTOHEAT Europe GmbH are specialized in inductive surface hardening. In our induction hardening plants in Reichenbach near Stuttgart and in Muehlthal near Darmstadt we offer:

- Induction hardening of everything from single parts to large series for high and medium frequency applications and special applications
- Tempering in modern air circulation furnaces
- Washing and corrosion protection
- Quality assurance:
  - Hardness testing (HV, HRC, HB)
  - Crack testing (fluxing, dye penetrant testing)
  - Polish specimen preparation
  - Microstructure evaluations
  - Material analysis via spectral analysis/radio spectrometry

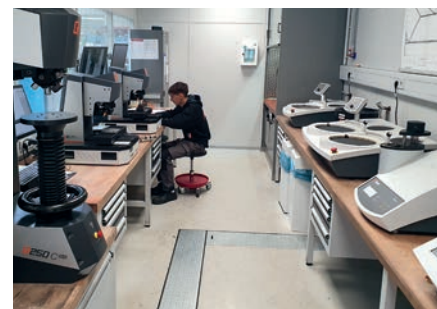
#### When is inductive hardening recommended?

All workpieces which are electrically conductive can also be inductively heated. However, the carbon content of the material plays a decisive role when it comes to hardening. Where an appreciable increase in hardness is required, the C component should be no less than 0.35%.

It makes most sense for inductive hardening technology to be used on workpieces whose skin is required to demonstrate good wear resistance, while the core calls for a high degree of toughness. However, a high degree of abrasion resistance can be achieved alongside good torsional and alternate bending strength. Different hardening processes exist such as stationary hardening, progressive hardening, stationary spin hardening and progressive spin hardening.

#### Process development / Prototyping / feasibility analysis

Our in-house process development department and metallurgical lab develop machinable solutions for your demanding hardening tasks using the most modern numerical simulation methods.





## Global Service Inductoheat

Customer-focused approach through full product support:

- Customer service / maintenance contracts / installation work as on-site service or helpline and teleservice
- Inductor development and inductor manufacturing for all brands in 3D-print or CNC technology, as well as inductor express repair service
- Hardening accessories / heating accessories e.g. quenching showers, recooling systems, inductor calipers, inductor ceramization etc.
- Process development / prototyping / feasibility analysis / trials
- Numerical simulation
- Consulting / training / workshops
- Worldwide availability
- 24 hour Service



Services



Spare parts



Machine Upgrades



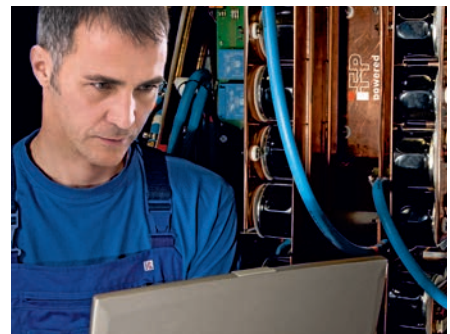
Induktors



Training



Maintenance



### INDUCTOHEAT Europe GmbH

Ostweg 5  
73262 Reichenbach/Fils  
GERMANY  
Telefon +49 (0) 7153 504-200  
Telefax +49 (0) 7153 504-340  
info@inductoheat.eu  
www.inductoheat.eu



Leading Manufacturers of Melting, Thermal Processing & Production Systems for the Metals & Materials Industry Worldwide