



Engineering & Technologies

# INDUCTION HEATING & HARDENING APPLICATION



ELECTROTHERM®

## A Brief Profile of Electrotherm (India) Limited Engineering & Projects Division



The Engineering & Projects (E&P) division of Electrotherm is a leading designer and manufacturer of Induction Melting Furnaces, Electric Arc Furnaces, Metal Refining Konverters (AOD), Electrotherm Refining Furnaces (ERF) (patented for design & process), High Speed Continuous Casting Machine, Power Distribution and Furnace Transformers and other equipment for Steel Plants, Foundries, Induction Heating and Hardening equipment for Heat Treatment. The E&P division is a customer centric organization delivering total solutions.

The E&P division of Electrotherm has supplied over 4300 equipments for various applications, 2000 furnaces for steel, alloy steel and stainless steel making, 1550 furnaces for ferrous and non-ferrous foundries and around 750 equipment for heat-treatment applications. It has exported over 550 furnaces to 58 countries around the world. Besides, it has made several mini steel plants overseas on turnkey basis in countries like Turkey, Iran, Iraq, Saudi Arabia, Pakistan, Bangladesh and some African countries for capacities ranging from 50,000 TPA to 1,000,000 TPA.

Being a customer centric organization with focus on meeting changing needs of its customers, Electrotherm has full-fledged Research & Development Centre at its Corporate Office & Works in Ahmedabad with state of the art manufacturing set up and modern office complex.



## INDUCTION HEATING POWER SUPPLY

### DIGITAL TECHNOLOGY IG-NITE

Electrotherm is recognized and known for designing, developing and manufacturing state of the art induction heating and hardening equipments. Electrotherm through its latest, most energy efficient IGBT based digital technology in the form of IG-NITE which offers constant power factor ( $> 0.96$ ) at any power level up to the 2000 kW.



## FORGING- INDUCTION BILLET HEATER

Forge your future using the latest modular concept for Induction Billet / Bar Heating System

**DIGI-Forge<sup>®</sup>**

**Billet size : 16 mm to 80 mm  
(Round/Square)**

**Power rating : 25 – 250 kW**

**Frequency : 1 KHz – 30 KHz**



**DIGI-Forge<sup>®</sup> Plus**

**Billet size : 16 mm to 400 mm  
(Round/Square)**

**Power rating : 300 – 4000 kW**

**Frequency : 300 Hz – 30 KHz**



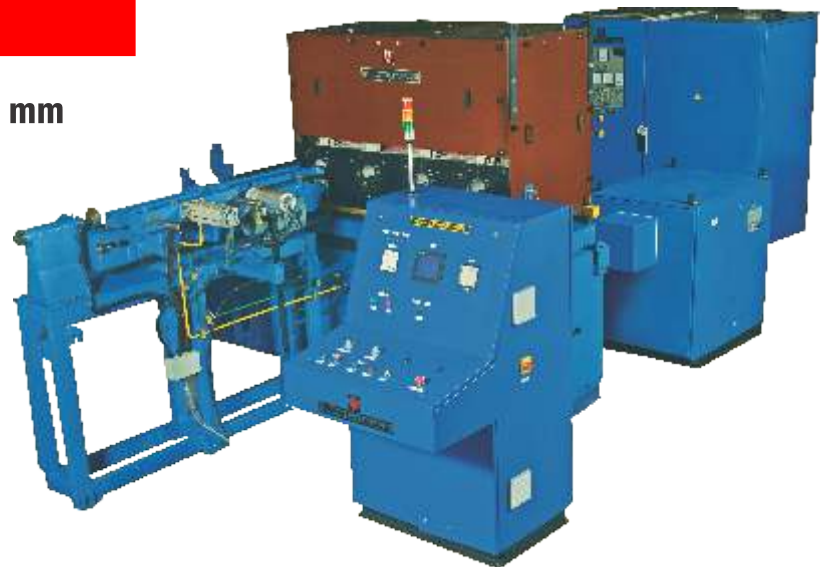
## INDUCTION BAR HEATER

**Bar size** : Round 16 mm to 120 mm  
**Power rating** : 300 – 4000 kW  
**Frequency** : 300 Hz – 30 KHz  
**Temperature** :  $1150 \pm 50^{\circ}\text{C}$

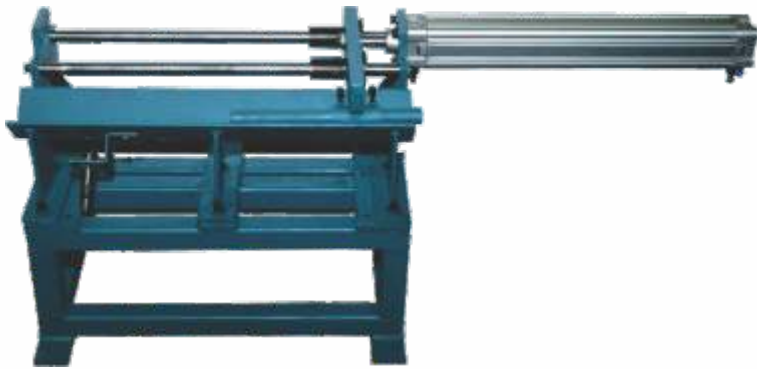


## INDUCTION BAR END HEATER

**Bar size** : Round 16 mm to 120 mm  
**Power rating** : 50 – 1500 kW  
**Frequency** : 500 Hz – 30 KHz



# BILLET/ BAR END FEEDING SYSTEM



Pneumatic Pusher with V guide



Compact 3-Way Accept-Reject



Infeed Chain Conveyor with Tractor Drive



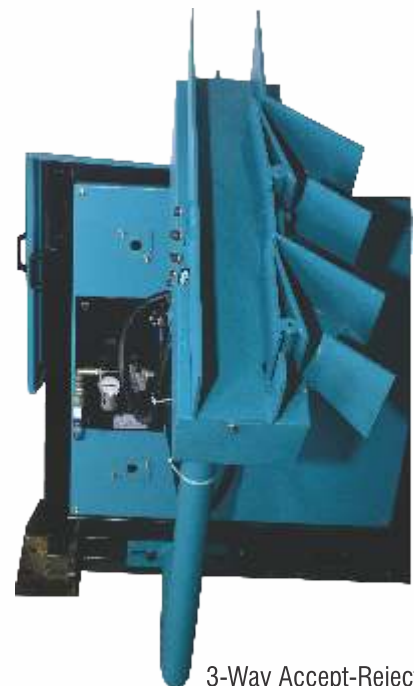
Stepper Feeder



3-Way Accept-Reject with Infrared Pyrometer



Quick Extractor



3-Way Accept-Reject

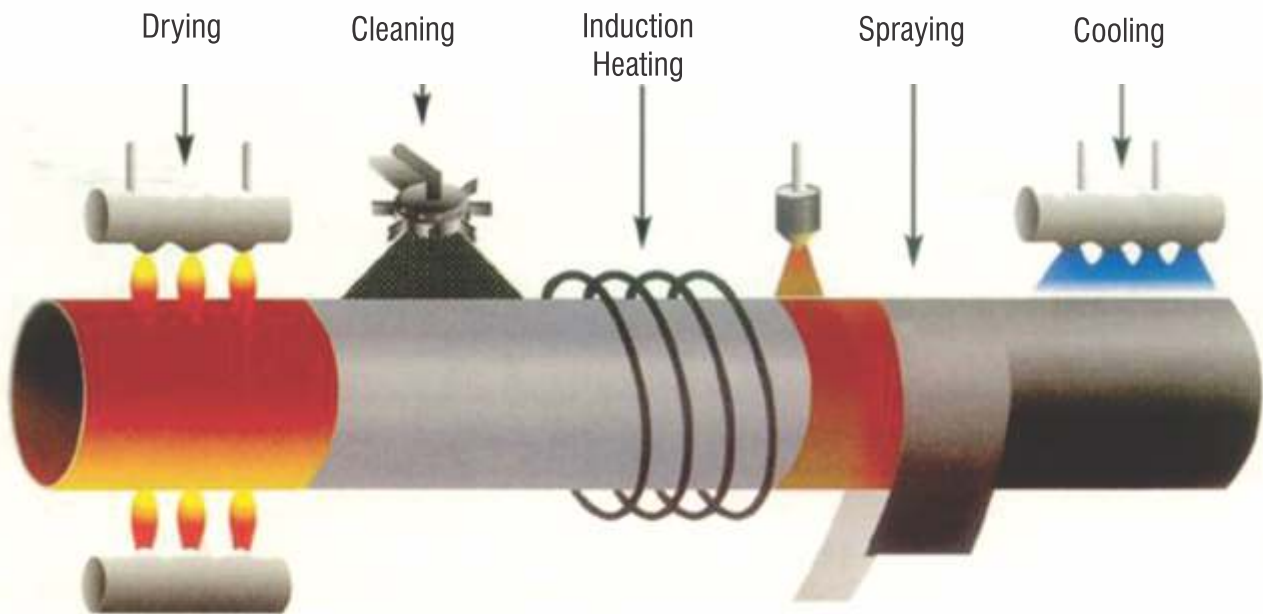
## PIPES AND TUBES HEATING

Induction pipe heating is generally used for pre and post heating applications such as

- Shaping
- Solution Annealing
- Shrink fitting
- Bending
- Coating
- Forming
- Spinning
- Chromate
- Seam normalizer

### 3 LPE / 3 LPP COATING

Pipe Size	: 4" - 158"
Pipe Wall Thickness	: 6 mm - 25.4 mm
Heating Temperature	: 250°C
Power Rating	: 2000 - 3000 kW
Frequency	: 1000Hz



Schematic of Induction Heating for Pipe Coating



## SEAM ANNEALER (NORMALIZER)

Pipe Size	: 4 - 40 Inch
Pipe Wall Thickness	: 5 - 15 mm
Heating Temperature	: 950°C
Power Rating	: 250 - 1500 kW
Frequency	: 1000 & 3000 Hz
Automatic	: Auto Seam Tracking
Temperature	: Close loop



## PIPE BENDING

Pipe Size	: 4" - 48"
Pipe Wall Thickness	: 3.2 - 60 mm
Heating Temperature	: 850 - 1150°C
Power Rating	: 150 - 1000 kW
Frequency	: 500 - 1000 Hz





## PIPE END HEATING

Pipe Size	: 108 - 406 mm
Heating Temperature	: 1200°C
Power Rating	: 100 - 700 kW
Frequency	: 3000 - 6000 Hz



## HEAT TREATMENT OF WIRES AND STANDS

### ANNEALING OF STEEL WIRES OR WIRE ROD

Wire Size	: 10 - 40 mm
Heating Temperature	: 1080°C
Power Rating	: 200 - 500 kW
Frequency	: 3 - 10 kHz



### STRESS RELIEVING OF STEEL WIRES AND STRANDS

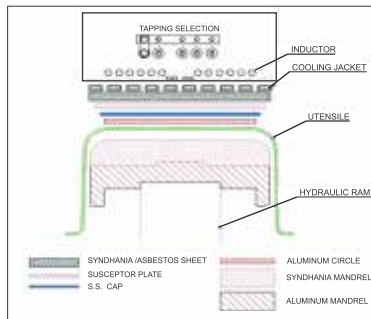
Wire Size	: 3 mm, 4 mm, 3 ply and 7 ply
No's of wires running at a time	: Max. 2 Nos.
Heating Temperature	: 400± 30°C
Power Rating	: 75 - 500 kW
Frequency	: 3000 - 10000 Hz



## UTENSIL BOTTOM BRAZING

Sandwich / Capsule brazing is advancement of induction heating technology in the field of cookware Industry

Utensil bottom disc diameter : 90 - 350 mm  
Aluminum Plate Thickness : 0.5 - 5 mm  
Utensil Thickness : 0.4 - 0.6 mm  
Power Rating : 50 kW  
Frequency : 50 - 75 kHz



## REBAR COATING

Rebar Size : Dia. 8 mm - 40 mm  
Rebar length : 12 meter  
Line Speed : 3 - 10 meter/ minute  
No. of Bars running at a time : 8/4, 12/6, 18/9, 24/12  
Heating Temperature : 200 - 250°C  
Coating thickness : 100 - 300 micron  
Power Rating : 300 - 1000 kW  
Frequency : 3 kHz



# ALUMINUM CAST BAR HEATING AND ALUMINUM CLADDING

Cast bar cross section : 639 Sq. mm, 1670 Sq. mm, 2107 Sq. mm, 2213 Sq. mm

## ALUMINUM CAST BAR HEATER

Cast bar shape	: Trapezoidal
Entry Temperature	: 410 - 450°C
Exit Temperature	: 525 - 550°C
Power Rating	: 150 - 450 kW
Frequency	: 1 kHz

## ALUMINUM CLADDING

Wire Size	: 3.8 - 8.5 mm
Heating Temperature	: 350 ± 30°C
Power Rating	: 200 - 400 kW
Frequency	: 6 kHz



## INLINE BILLET/ BLOOM HEATING FOR DIRECT ROLLING

Applications	: Boosting temperature for rolling
Billet Size	: SQ 65 - SQ 250 mm
Temperature rise	: 100 - 300°C
Power Rating	: 500 kW - 10000 kW
Frequency	: 250Hz - 1000 Hz
Zone control	: Multi zone heating
Heating	: Progressive/ Oscillating



## NON FERROUS HEATING

Electrotherm non ferrous heating systems are working with the following materials :

### Heating :

- Aluminum
- Brass - Copper
- Silver & Gold
- Zirconium
- Magnesium
- Cupronickel
- Platinum
- Titanium



# INDUCTION HARDENING

Scanning length : 600 - 4000 mm  
Scanning speed : 100 - 250 mm/sec  
Controller : PLC/ CNC  
Power Rating : 5 - 1000 kW  
Frequency : 3 TO 400 kHz



## STRIP HEATER (INDUCTION DRYER)

Application	: Dryer for non - metallic coating on GI/GL line
Strip Width	: 600 - 1600 mm
Process Temperature	: 120°C
Power Rating	: 300 - 1000 kW
Frequency	: 30 kHz



## CHANNEL TYPE INDUCTOR FOR GI/ GL COATING POT

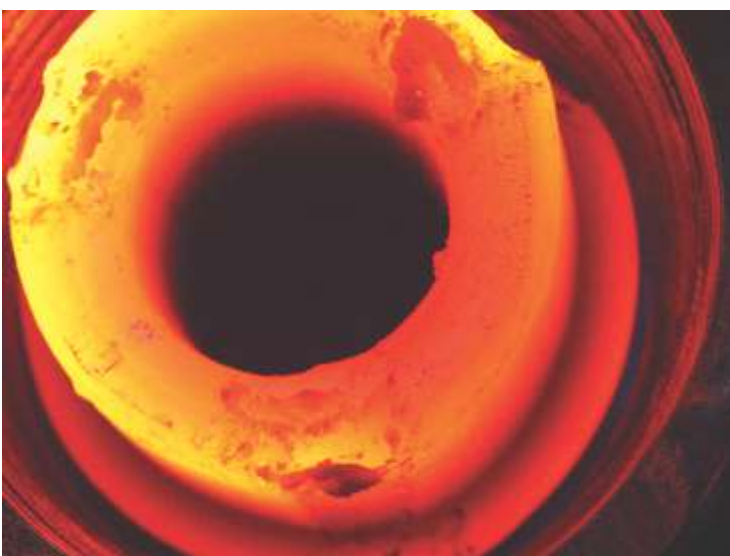
Application	: Galvanizing and Aluminum Zinc coating
Power Supply Unit	: Phase Balance, Air cooled
Power Rating	: 300 - 600 kW
Frequency	: 50 Hz



## SPECIALIZED APPLICATIONS

Our metallurgical, technical and product expertise assure reliable and efficient performance when dealing with customized heating and specialized heat treating applications such as

- Brazing & Soldering
- Shrink fitting
- Heating of rotor and stator
- Carbide tool tip brazing for tools
- Crown heating of cap sealing
- Glass Melting
- Chemical Vessel heating for various applications
- Laboratory applications
- Through Hardening
- Rail Hardening
- Graphite / Carbon-Carbon Cylinder heating



# GLOBAL NETWORK - ENGINEERING & PROJECTS



**ELECTROTHERM<sup>®</sup> (INDIA) LIMITED**

72, PALODIA, (VIA THALTEJ) AHMEDABAD, GUJARAT- 382 115, INDIA  
 Phone: + 91 2717-2345 54 – 55, 660 550  
 Email: [mkt@electrotherm.com](mailto:mkt@electrotherm.com); Website: [www.electrotherment.com](http://www.electrotherment.com)

