

50+
Years of Legacy

PioneerTM
Furnaces
Pvt Ltd

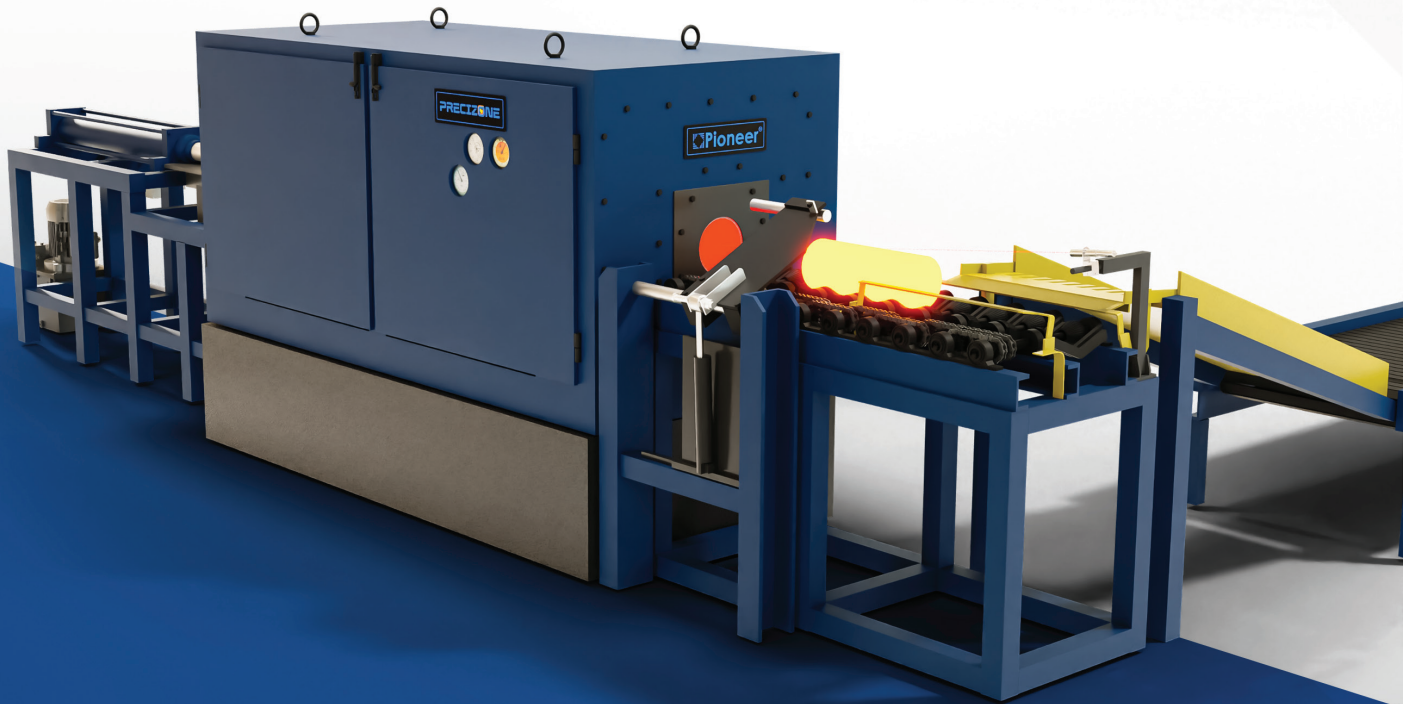
Trusted Non-Ferrous Solutions

S I N C E 1 9 7 2

INDUCTION BILLET HEATER

WITH

PRECIZONE



Pioneer Furnaces is a trusted name in the field of induction melting and heating technology, designing and manufacturing advanced induction furnaces for the non-ferrous metal melting, heating, heat-treatment, and coating industries since 1972. With an engineering legacy spanning over five decades, Pioneer is recognized for delivering robust, energy-efficient and highly reliable furnace systems backed by prompt and committed service support. The company is ISO 9001:2015 certified, reflecting its strong process discipline, quality orientation and customer-centric approach.

Reliability | Precision | Performance

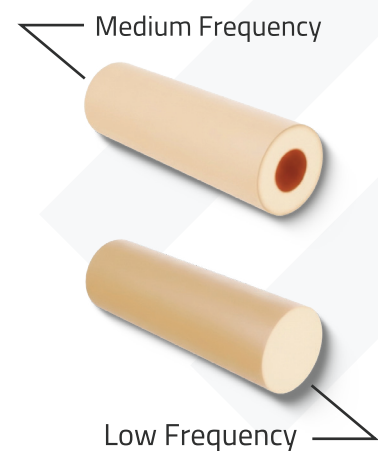
www.pioneerfurnaces.com

An induction billet heater works on the principle of Faraday's Law of Electromagnetic Induction to heat metal billets / bars / tubes rapidly and uniformly utilizing the material's characteristics of Joule resistivity

When an alternating current flows through a copper induction coil, it produces rapidly alternating magnetic field around it. When a conductive billet / bar / tube enters this field, the changing magnetic flux induces circular electric current, the eddy current inside the metal. The eddy current encounters the electrical resistance of the metal, generating heat proportionate to $I^2 R$, Skin effect, i.e. the depth of penetration of magnetic flux and thereby the flow of eddy current is inversely proportional to the square root of frequency. That means higher the frequency lower is the depth of metal that gets heated up. The rate of heating, temperature and depth of heating are controlled precisely by controlling the power, frequency and coil design for further extrusion or forging with high repeatability.

Advantages of Pioneer Induction Billet Heater:

- ▶ Highly suitable for non-ferrous metals and their alloys
- ▶ Lowest energy consumption
- ▶ Minimal temperature difference between core and the surface
- ▶ Lowest Scale Loss
- ▶ Power Factor close to unity
- ▶ Precise process control and repeatability
- ▶ Sturdy equipment, built for continuous operations
- ▶ Efficient and heavy-duty material handling system



Capacity Range:

Power Rating:

100 KW to 2000 KW

Billet / Bar Section:

50 mm to 300 mm
(square / rectangle / round)

Frequency:

50 Hz to 250 Hz

Salient Features:

- ▶ Starts production within 10 minutes, unlike 120 minutes waiting in a gas-fired furnace
- ▶ Clean, eco-friendly operations
- ▶ Single layer and multi-layer coil options which can heat multiple billets / bars / tubes with ease, accommodating various lengths without tap adjustment
- ▶ Dual-coil PRECIZONE heating system – higher power heating coil for rapid heating, and lower power soaking coil for uniform temperature of billet / bar / tube
- ▶ Independent zone control system ensures coils of both zones operate at optimized frequency, power and duty cycle optimal for their roles
- ▶ The soaking coil ensures that during cold start or restart after a holding period, even the first billet reaches the required temperature minimizing process wastages
- ▶ Power supply unit with IGBT-based Pulse Width Modulation (PWM) technology for stepless and linear power control

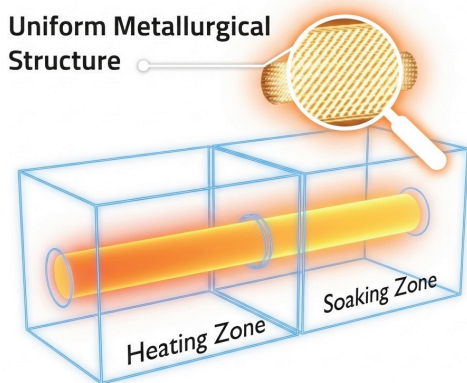
- ▶ Power Supply unit with IGBT based DirectMOD inverter technology eliminates the need of conventional LC resonant tank circuit reducing system complexity and losses
- ▶ The simplified design provides instantaneous response to load changes, higher efficiency and lower maintenance
- ▶ Option of high-level automation with PLC and SCADA for real-time data exchange, centralized supervision, and predictive maintenance through online analytics
- ▶ Touch-Screen, user-friendly HMI for operators for real time data monitoring and data logging enabling better process control
- ▶ Equipped with zero rejection mechanism
- ▶ Options of mechanized and semi-mechanized loading and unloading system

▪ Heavy-Duty Feeding Mechanism:

- ▶ Ramp loader, Elevator and Lifter for cold billet loading
- ▶ Chain conveyor / V-flight conveyor / step conveyor with pinch roller
- ▶ Pneumatic & hydraulic pusher
- ▶ Gripper mechanism



▪ PRECIZONE Heating Technology for Billet Heaters:



The PRECIZONE Heating Technology is a dual-zone configuration developed for uniform billet heating.

- ▶ The Heating Zone rapidly raises billet temperature with uniform energy distribution
- ▶ The Soaking Zone homogenises temperature between the billet core and surface

This arrangement minimizes temperature difference between both ends and of core to surface which ensure uniform metallurgical structure, reduced oxidation, and superior extrusion quality.

▪ Robust Discharge Mechanism:



Pinch roll extraction system



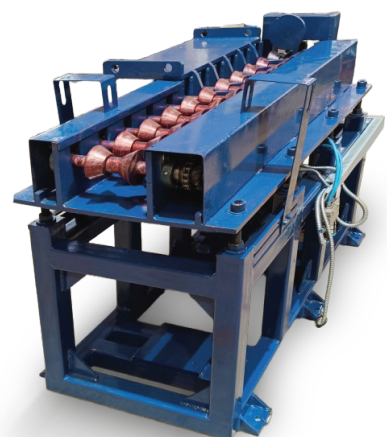
Multiple chains type quick extractors



Two-way accept/reject system



Gripper assembly



Product Portfolio

- ▶ **Coreless & Channel Type Induction Melting and Holding Furnaces**
for aluminium, copper, and copper alloys (like brass, bronze, etc.) and zinc & zinc alloys
- ▶ **Custom-designed Induction Heating Systems**
specially for non-ferrous extrusion applications
- ▶ **Heat-treatment Furnaces**
for a wide spectrum of metallurgical applications
- ▶ **Coating Solutions**
Pre-melt furnaces
Launders
Pots with inductors for GI | GL | GA | ZAM | Al-Si | Galfan

Our Key Clientele



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