



Norax Canada  
celebrating

25

years of experience  
in induction technology

- Customized Induction Heating Systems
- Patented Technology
- Designed for Best Performance
- Enhanced Efficiency

[www.noraxinduction.com](http://www.noraxinduction.com)

# NORAX TECHNOLOGY

Norax Canada Inc., celebrating 25 years of experience in induction technology, can supply to your company unique induction units based on a patented technology.

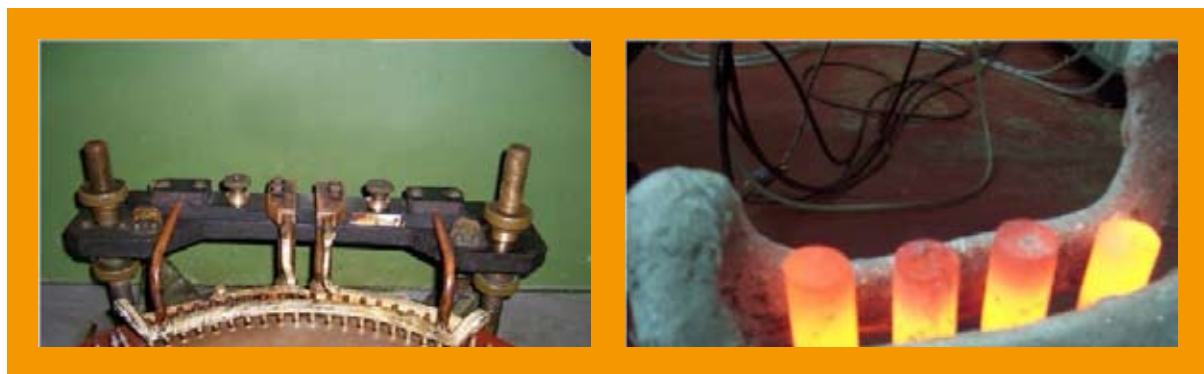
- Norax is a Canadian manufacturer of customized induction heating systems.
- Norax can build equipment to meet very stringent unique customers' requirements.
- The company is located in St-Romuald, South Shore of Quebec City, Canada.
- The systems are manufactured based on a patented technology, US patent 5,715,155 and Canadian patent 2,217,121.



- Soft switching of power transistors is enhanced, allowing them to operate at higher frequencies, while switching losses are reduced.
- Very efficient light weight induction heating systems, using fewer components, more compact and highly reliable can be manufactured at competitive price.

## FLEXIBLE CONCEPT

Coil design, proper frequency and power are easily adapted for different materials and applications.



# GENERAL TECHNICAL SPECIFICATIONS OF NORAX'S INDUCTION EQUIPMENT

Output Power	1 to 500 kW and above
Working Frequency	1 to 500 K Hz
Main Supply Voltage	208-600 volts, 50-60 Hz, 3 phase
Main Power Regulations	Manual/ remote/ adaptable to any control system. The power can be controlled gradually from 1 to 100% either manually or through a remote signal 4-20 m A.

- **Tap or recycled water can be used for cooling the induction coil and power components.**
- **Auxiliary function (inter-lock, ON/OFF remote etc.) are custom designed.**
- **Units equipped with an intelligent circuit which monitors phase-changed in the load: magnetic transformation at Curie temperature, weight, electric properties, etc.**
- **Units are protected against short circuiting, voltage transients and power failure.**

## MANAGEMENT CONSIDERATIONS

**Capability:** With 25 years of experience, Norax can meet any industrial or research application requirements.

**Reliability:** Norax induction systems are reliable and built to customers satisfaction.

**Maintainability and Supportability:** Upon customer requests for adjustments or for any specific technical problems Norax will reply to their request within a short period, estimated to 2 days to 1 week.

**Robustness:** The Norax's induction systems are robust and do not need any particular maintenance.

**Flexibility / Adaptability:** The Norax's induction systems are easily adapted for different materials and applications.

## INSTALLATIONS

Norax has sold induction equipment for industrial, military and research applications to many countries including USA, Canada, Australia, Sweden, Brazil, Malaysia, Singapore, South Korea and United Arab Emirates. Some examples are:

### Industrial Applications

- Ferrous and non-ferrous melting
- Wire galvanization
- Forging of automotive parts
- Chain hardening
- Wire and cable manufacturing
- Heat treatment, etc.

### Military Application

- Annealing of brass cartridge case (body and mouth anneal)
- Canada, USA, Malaysia

### Various Installations at Research Institutes

- ALCOA / USA
- NRC-CANMET / Canada
- IREQ/Hydro-Québec/ Canada
- McGill University / Canada

- Laval University / Canada
- Noranda Mines / Canada
- Sao Paulo University / Brazil
- Singapore Institute of Manufacturing Technology/Singapore
- Royal Institute of Technology / Stockholm, Sweden

NORAX CANADA INC.  
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# HP SERIES

## HIGH POWER INDUCTION

### APPLICATIONS :

- Forging
- Hardening
- Continuous annealing
- Annealing furnace
- Continuous Rod Heating, 1 – 5 cm dia.
- Chain Hardening, link 1 – 15 cm dia.
- Wire Heating, 3 – 10 mm dia.
- Ferrous & non ferrous Melting
- Induction Coupled Plasma
- Cold Crucible

### TECHNICAL SPECIFICATIONS :

- |                         |   |
|-------------------------|---|
| Output Power :          | 80 – 500 kW   |
| Working Frequency :     | 5 – 500 kHz   |
| Input Voltage :         | 400 – 600 volts, 50/60 Hz, 3 Phase  |
| Power Regulation :      | Manuak / Remote 4-20 mA   |
| Communication Signals : | Compatible with industrial standards  |
| Cooling :               | Circulating water 4 – 10 LPM<br>Maximum water temperature 48°C<br>Minimum water pressure 30 PSI |
| Dimensions :            | 180 x 60 x 50 cm  |



300 kW Power Supply

# MP SERIES

## MEDIUM POWER INDUCTION

### APPLICATIONS :

Ferrous & non-ferrous melting  
Annealing  
Forging  
Hardening  
Wire heating  
Levitation melting  
Medical applications

### TECHNICAL SPECIFICATIONS :

Output Power :	20 - 70 kW
Working Frequency :	5 - 500 kHz
Input Voltage :	208 - 600 volts, 50/60 Hz, 3 phase
Power Regulation :	Manual / Remote 4 - 20 mA
Communication Signals :	Compatible with industrial standards
Cooling :	Circulating water 2-6 LPM Maximum water temp. 48°C Minimum water pressure 30 PSI
Dimensions :	60 x 40 x 30 cm



# LP SERIES

## LOW POWER INDUCTION

### APPLICATIONS :

Melting  
Annealing  
Brazing  
Materials Research  
Medical Applications

### TECHNICAL SPECIFICATIONS :

Output Power :	1 - 15 kW
Working Frequency :	5 - 500 kHz
Input Voltage :	120 - 600 volts, 50/60 Hz, 1 or 3 Phase
Power Regulation :	Manual / Remote 4 - 20 mA
Communication Signals :	Compatible with industrial standards
Cooling :	Circulating / tap water, 0.5 - 3 LPM Maximum water temperature 48°C Minimum water pressure 30 PSI
Dimensions:	50 x 40 x 30 cm



# CLOSED LOOP WATER TO AIR HEAT EXCHANGER

## RECOMMENDED FOR CONTINUOUS OPERATION OF INDUCTION SYSTEMS

Norax canada water-cooled power supplies and induction coils require a heat exchanging mechanism to remove heat from the cooling water. It is recommended to use a closed loop water-to-air heat exchanger with proper rating for continuous operation. The dissipation rating of the heat exchanger depends on the power level of the generator, the efficiency of the coil and the surrounding environment.

### ADVANTAGES :

Low operating cost (fan and a pump only).

No water condensation (common with using chiller).

### TECHNICAL SPECIFICATIONS :

Water flow :	1 - 10 GPM
Pressure :	40 - 60 PSI
Input voltage :	120 - 240 volts, 50-60 Hz
Heat dissipation :	10,000 BTU/Hr for 10 kW system up to 500,000 BTU/Hr for 300 kW system *

\* This includes power losses in the generator as well as in the coil with 70% efficiency.



Closed Loop Water to Air Heat Exchanger

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# APPLICATIONS

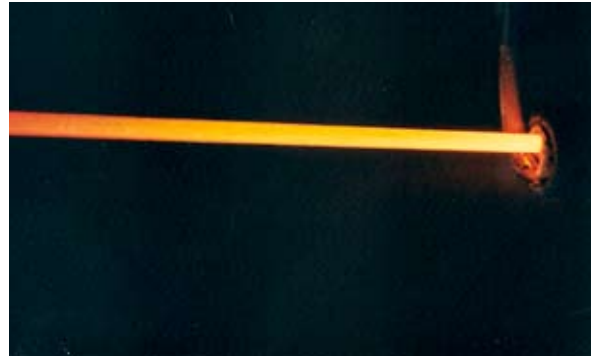
## HOT FORMING



HP Series  
200 kW – 20 kHz  
Induction Heating System with  
close loop heat exchanger

Local heating of steel plate with thickness  
of ¼" to 2"

## WIRE HEATING



Annealing, Galvanizing & Patenting  
30 - 150 m/min 3 - 8 mm wire 30 - 300 kW



## PLATINUM HEATING



LP Series,  
3 kW - 70 kHz

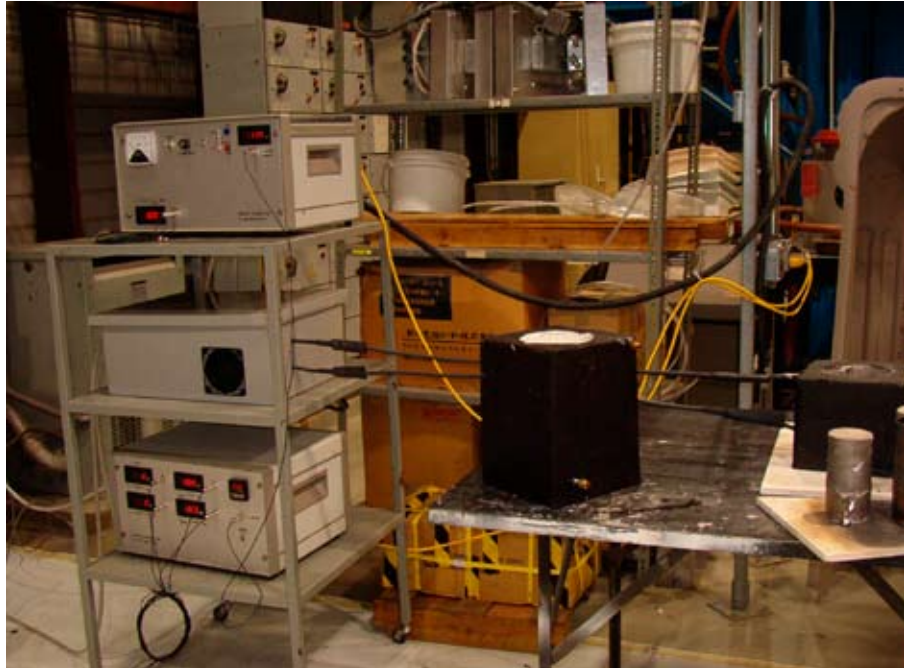
# APPLICATIONS

## CABLE MANUFACTURING



MP Series, 40 kW - 20 kHz for preheating cable

## SEMI SOLID MOLDING

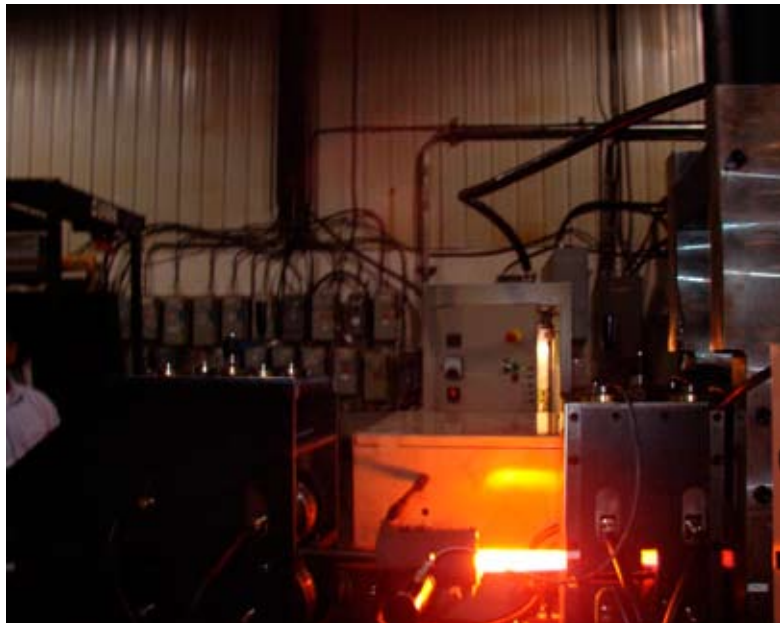


Aluminium Semi Solid Molding, 30 kW - 8 kHz, with power analyser

## ROD HEATING



120 kW - 20 kHz, Rod Heating



# APPLICATIONS

## HARDENING



Chain Hardening 150 kW - 20 kHz

## FOUNDRY



Bronze & Aluminum Melting

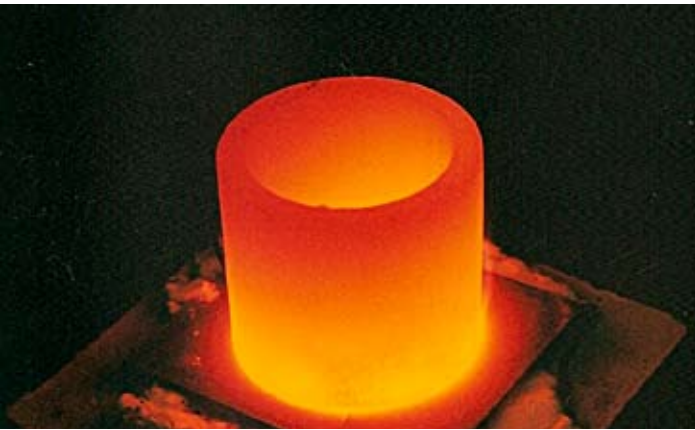


80 kW - 15 kHz  
for Aluminium Melting

20 kW Induction System

# APPLICATIONS

## GRAPHITE HEATING

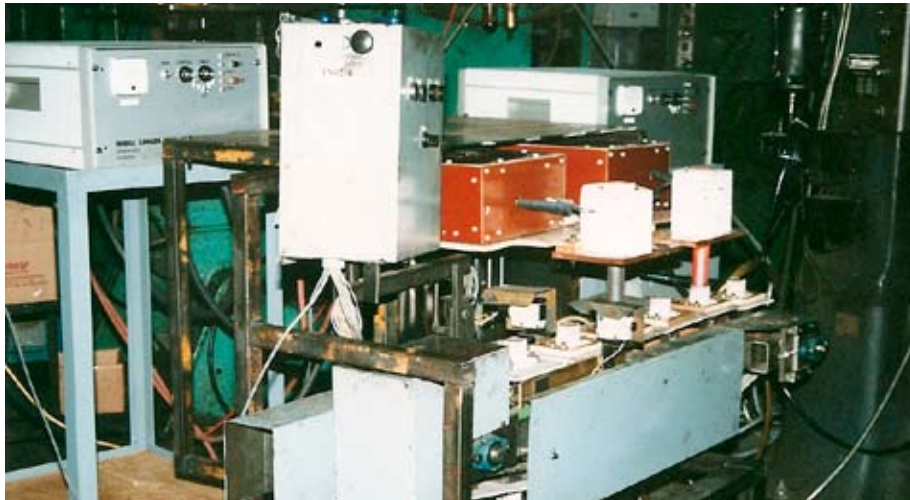


Directional Heating by Pancake Coil



10 kW – 20 kHz Induction Heating System

## FORGING

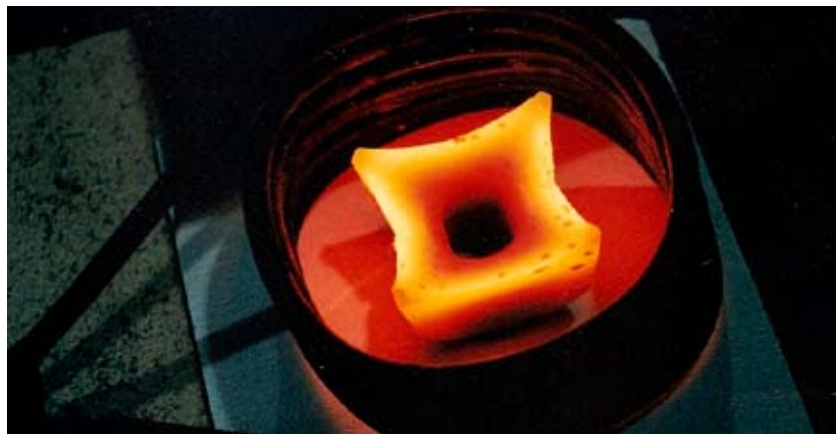


Automated Heating Stations



2 units MP Series Induction Heating

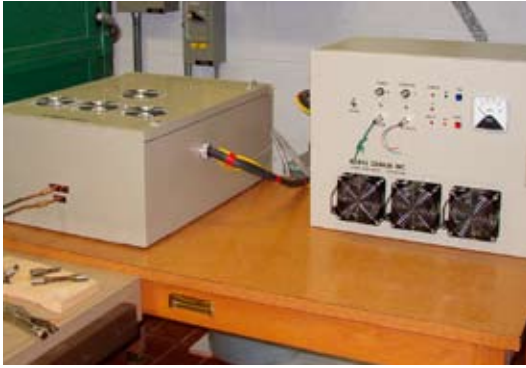
## HEAT TREATMENT



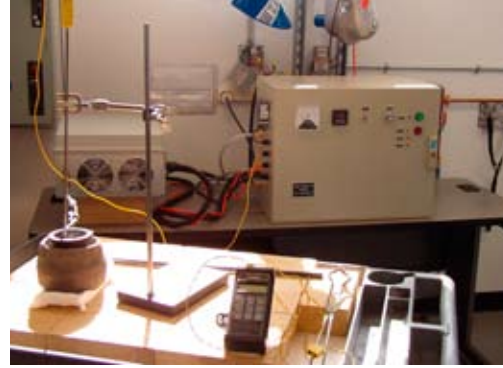
Hardening,  
Tempering 20 kW - 10 kHz

# APPLICATIONS

## RESEARCH



30 kW - 300 kHz for surface treatment



20 kW, 5 kHz, Melting furnace with stirring effect



## POWDER METALLURGY



Centrifugal heated disc for metallic & non metallic powder manufacturing

## GALVANIZING



Magnetic Zinc Wiping Systems for galvanized wires and tubes

# APPLICATIONS

## MEDICAL (Stainless Steel Enclosures)

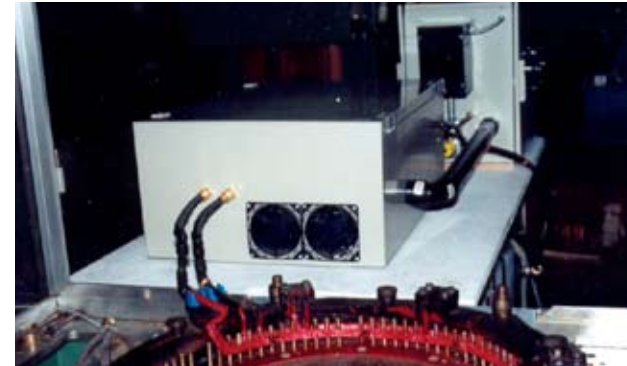


Sealing,  
Preheating,  
Capsuling

## MOUTH & BODY ANNEALING



Cartridge Annealing with a 50 kW – 20 kHz Induction System



2 Cartridge Annealing Systems of 30-50 kW - 20 kHz each

## DESIGN CRITERIA FOR INTER-DRAW ANNEALING



Critical parameters for successful inter draw annealing:

- Intensity of induction power / part
- Residence time of the parts in the coil
- Frequency of induction
- Spacing between turns
- Distance between the part and the coil

# INDUCTION LEAD MELTING FURNACE

**Norax Canada**, celebrating 25 years of experience in induction technology, can supply to your company unique induction units based on a patented technology for lead melting furnaces.

- **Economic, compact, light, versatile, easy to use and reliable**
- **Crucible is manufactured from:**  
Low carbon steel with 1/4" or 3/8" wall thickness (depending on total capacity)

Stainless steel for extended life time

## CRUCIBLE SPECIFICATIONS AND MELT CAPACITY

Top diameter	Height	Approx. melt capacity a 80 % full, kg (lb)v
cm(inch)	cm (inch)	kg (lb.)
50 (20)	75 (30)	1,350 (3,000)
75 ( 30)	75 (30)	3,000 (6,600)
100 (40)	75 (30)	5,300 (12,000)

## MELTING RATES

Pouring temperature @ 400 °C (750 °F)  
operating cost is calculated with 0.08(\$/kWhr)

800 (Lb/Hr)	10 kW (LP Series)	0.80\$/Hr
1600 (Lb/Hr)	20 kW (MP Series)	1.60\$/Hr
3200 (Lb/Hr)	40 kW (MP Series)	3.20\$/Hr
4800 (Lb/Hr)	60 kW (HP Series)	4.80\$/Hr
6400 (Lb/Hr)	80 kW (HP Series)	6.40\$/Hr

# INDUCTION LEAD MELTING PACKAGE INCLUDES

- Crucible (Stainless or Low Carbon Steel)
- Power supplies from LP, MP or HP Series
- Digital temperature regulator with type K thermocouple
- Working Voltage (as available at the plant)
- Closed loop water to air heat exchanger
- Lid to cover the crucible when not in use
- Designed to operate at 100 % duty cycle, 24/7



40 kW Induction Lead Melting System with Crucible



Crucible



40 kW Induction Lead Melting System



80 kW Power Supply



Closed Loop Water to Air Heat Exchanger



10 kW, Graphite Heating



3x30 kW multi zone high temperature furnace, 2000C

# HIGH TEMPERATURE INDUCTION FURNACES CAPABLE TO REACH UP TO 2,500°C

## APPLICATIONS

- Ceramic processing
- Crystal growth
- Glass annealing
- Material processing

## HEATING MECHANISM

Induction heating of SiC (1,400°C) or Graphite cores (2,500°C)

## TECHNICAL SPECIFICATIONS

Output Power	10 kW to 120 kW, multi Zone furnaces with programmable profiling
Working Frequency	10 to 30 kHz depending on furnace design
Input Voltage	208-600 volts, 15-100 amperes, 3 phase
Temperature Control	Pyrometer /Thermocouple
Temperature Profile	Programmable temperature regulator with ramp up/down to avoid thermal shocks
Furnace Atmosphere	Inert, oxidizing or reducing

**Compact design, shock proof, reliable**

**Complete furnace is designed with built in internal heat exchanger for continuous operation**

**Manufacturing and delivery 4 to 6 weeks**



20 kW, Graphite core High temperature furnace



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