

Innovation

national laboratories

thin film

chemis

metals

universities

powders

solar

glass

plastics

physics

ce

uc

material

Discover Micropyretics Heaters International, Inc.

engineering

semiconductor

aluminum melting

battery

bio-scienc

anti-bacterialization

recycling

processing coatings

green technology

manufacturing

MHI Micropyretics
Heaters
International

www.mhi-inc.com

750 REDNA TERRACE CINCINNATI, OHIO 45215 USA • PH: 513-772-0404 FX: 513-672-3333

DISCOVER MHI

Micropyretics Heaters International

MHI has been in business for over 20 years with a stellar performance that encompasses at its core, the tradition of rapid invention and innovation/manufacturing for energy efficiency and environmental impact. MHI headquarters are located in Cincinnati, OH USA. Today the company exports products to over 25 countries world-wide and is one of the few Ohio companies with such an experienced innovation profile. MHI

factories are located in Cincinnati and other cities. MHI has close to a thousand customers with good testimonials from all over the world particularly for service and after sales interactions. MHI was founded in late 1991, and soon after, started R&D operations with one employee in a business incubator. Repeat and growing sales ensued around 1994-1995, first of MoSi₂ heating elements followed by furnaces and devices that used these heating elements, and other accessories and electronics that were developed exclusively for these products. Over the years, MHI has grown vertically, making its own unique electronics, refractories, materials, controls, software systems, designs and components since 1996. It currently has an extremely versatile, modular platform of technologies and products from which new products and innovations are launched like the nanostructured heaters, one atmosphere superheated steam and Cascade e-Ion Plasma.



MHI Awards:

- Governor's Award - Excellence in Energy Efficiency 1996
- Ohio's Thomas Edison Program - Energy Technology Award 1999
- R&D Award Best 100 Products 1999, 2001, 2004 and 2005
- Entrepreneurial Excellence 2002/2003
- Hamilton County Development Company - Business Development Award 2003
- Fast 50 Award 2004
- 2005 Corporate Environmental Achievement Award of The American Ceramic Society





Cascade e-Ion Plasma™

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One Atmosphere Boiler

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Accessories & Controllers

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Cascade e-Ion Plasma™

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One Atmosphere Boiler

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Air Heaters

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Furnaces

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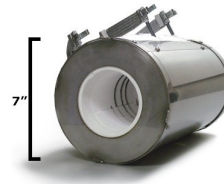
Temperature Range	2500K Recombination Temperature	Up to 1300 °C	Up to 1100 °C	Up to 1760 °C
Description	Clean ElectricFlame™ technology creates a plume of ions, electrons, radiation and hot gas. Excellent for surface deposition applications. Capable of welding/brazing wide array of materials.	Boilerfree™ technology generates steam at one atmosphere of pressure. Various flow rates and temperatures available. Highly modular designs allow for easy integration into existing systems.	Process air/gas heaters with a large variety of output temperatures and input options. Variety of configurations featuring small footprints allow for easy implementation.	Highly uniform furnaces with continuous operating temperature of up to 1760 °C. Laboratory scale models up to production sized models. Easily programmable with electronic controls.
Features	Rapid heat-up rate of 200 °C per second Large aperture, up to 150mm	Plug and play operations Integrated thermocouples Zero Emissions from device.	Highly efficient Silent operation Excellent control	Non-toxic FiberFree™ refractory improves efficiency Double walled stainless steel construction.
Benefits	Rapid, large heating area	Versatile, on-demand steam	Efficient, faster heating	Safe, uniform heating





Microheaters

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Robust Radiators

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Elements

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Control Panels

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Temperature Range	Up to 1900 °C	Up to 1700 °C	Up to 1900 °C	N/A
Description	High temperature micro-scaled heaters with a variety of configurations. Easy to integrate into existing systems. Small design allows for versatile applications.	Ideal for use in applications requiring high temperatures in close quarters. Easily mountable, allowing for diverse number of applications. Stainless steel shell adds to durability and versatility.	Molybdenum disilicide elements offer temperature up to 1900 °C. NoAge™ Silicon Carbide offer high temperatures and long life from our patented technology. GAXP™ offer high efficiency and reliability.	Control panels allow users to program heating cycles and record data. Most controls are remotely locatable, allowing for centralized control of multiple devices.
Features	Small footprint Temperatures up to 1900 °C	Robust construction Vertical or horizontal operations	Long lasting Variety of accessories High performance	Programmable Remotely locatable Easy to use
Benefits	Small size, high power	Versatile heat where needed	High temp., highly efficient	Improve heating processes



Cascade e-Ion Plasma™ Products

DISCOVER MHI

Rapid Heat. Unparalleled Efficiency.



Cascade e-Ion Plasma™

Rapid 200°C per second heating rate with large aperture

Produces plasma plume containing ions, electrons, radiation and hot gas

Great for RTP (rapid thermal processing) applications. Ideal for thin film deposition and processing, heat treating, surface enhancing, brazing and a number of other processes

Capable of treating a variety of materials, including plastics, metals and a number of other surfaces.

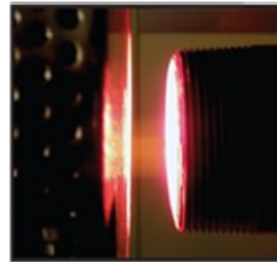
Silent operation

No combustion related residues, fumes or safety issues.

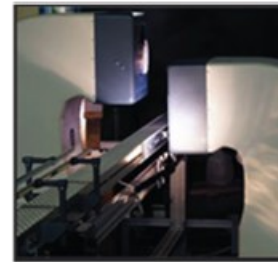
Energy efficient alternative to electron beam, lasers or induction.



e-Ion Plasma™ Source
Base unit with large aperture



e-Ion Zapper™
ion concentrator for metals/ceramics



e-Ion LIP System
Production system for plastics

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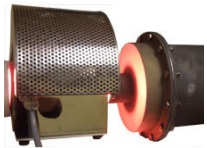
Cascade e-Ion Plasma™ Products

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Rapid Heat. Unparalleled Efficiency.



Cascade



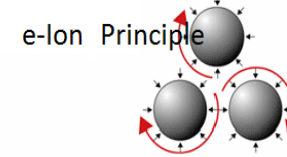
E-Ion Zapper



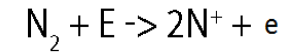
LIP System

E-Ion Plasma™ Source Models		
Model #	Voltage	kW
Cascade e-Ion-10	208/220/230/240 or 3 Phase.	10
Cascade e-Ion-14	208/220/230/240 or 3 Phase.	14-15
Cascade S-e-Ion-10	208/220/230/240 or 3 Phase.	10
Cascade S-e-Ion-14		14-15
De-e-Ion-10		10
DRO-e-Ion-3.5		10
DRO-e-Ion-10		10
DRO-e-Ion-14		14-15
EIZ-C		9-30
LIP-G3-6.5	208/220/230/240	6.5

When you immerse in an e-Ion CleanElectricFlame™

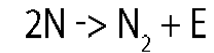
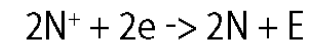


Example of Plasma Formation



E stands for energy

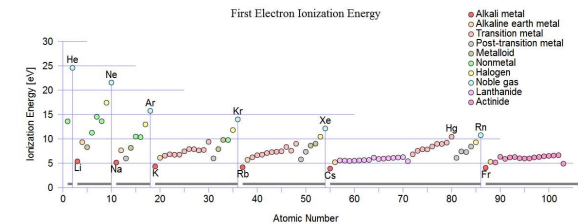
Example of Plasma Recombination



Possible species include O₂, N₂, O₂⁺, N₂⁺, N, O, N⁺, O⁺, e⁻, in e-Ion Plasma of air

Possible species include N₂⁺, N₂⁺, N⁺, e⁻, in e-Ion Plasma of nitrogen.

Many elemental or molecular masses/species can be ionized including Ar, Xe, H₂O and others.

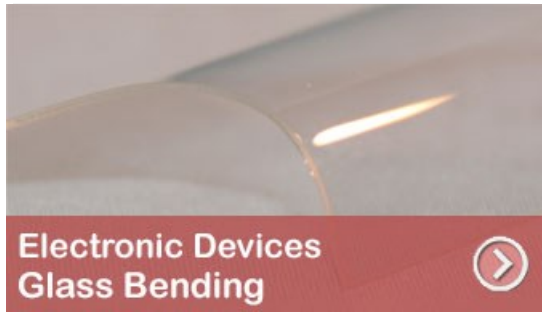


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Cascade e-Ion Plasma™ Products

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CleanElectricFlame™ Case Studies Solutions



See our web site at
www.mhi-inc.com
for in depth case study results



Superheated Steam Products

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Superheated Steam. BoilerFree™



HGA-S-CX1300

Superheated steam up to 1300 °C

BoilerFree™ technology allows for one atmosphere operation

Quiet operations

Small footprint. No boilers or piping to route.

Plug and play. Most superheated steam devices feature plug and play operations.

Rapid start-up times. BoilerFree™ generates steam faster and without a high pressure boiler.

Can produce Steam or Steam/Gas Mixture, depending on model.



HGA-M Devices

VISIT OUR **MHI**
ON-LINE STORE



HGA-S Devices

Laboratory class: Available at www.mhi-inc.com/store

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Superheated Steam Products

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Superheated Steam. BoilerFree™



HGA-S-01

HGA-S-02

Exit Temperature	Power	Steam Output
550 °C	Call	1Kg/Hr
500 °C	Call	2Kg/Hr



HGA-M-01

Exit Temperature	Power	Output
650 °C	Call	Steam Gas Mixture



HGA-S-01-CX1300

HGA-S-02-CX1300

Exit Temperature	Power	Output
1300 °C	Call	1Kg/Hr
1300 °C	Call	2Kg/Hr



MS-400

Exit Temperature	Power	Output
150 °C–400 °C	1kW	1Kg/Hr



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Superheated Steam Products

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One Atmosphere Boiler



MHI's One Atmosphere Boiler superheated steam boiler features patented InstaSteam™ technology, allowing for rapid startup times, unparalleled efficiencies and up to 1300°C temperatures. BoilerFree™ technology allows most OAB units to be installed without the need for traditional boiler certifications. The OAB is ideal for use as an industrial steam generator, for dewrinkling operations, superheated steam drying and dozens of other specific applications requiring a high efficiency boiler.

Pure Steam. Clean Steam. One Atmosphere Boilers generate superheated steam that is free of contaminants. The OAB's steam is ideal for pharmaceutical, cosmetics and other industries requiring the highest quality steam. OAB steam is also suitable for use as utility steam in many applications due to its high energy content.

Highly Scalable. OAB units can produce from 1 kg/hr to over 1000kg/hr. Modular design allows for easy upgrades and utilizing the unit where it is needed, all without routing steam or venting pipes.

Efficient. Boiler efficiencies improve when operated at lower pressures. Better conversion factors allow OAB units to use less resources to produce more steam. The OAB's rapid startup results in less energy used getting up to temperature, lower operating costs, less downtime and higher productivity. The output velocity of 550°C steam is almost 40m/s which is useful for uniform heating of kettles.

New flow at a higher stagnation pressure or velocity? Unique Nanostructured isenthalpic pressure enhancers for MHI.



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Superheated Steam Products

DISCOVER MHI

One Atmosphere Boiler

Feature	One Atmosphere Boiler	Water Tube Steam Boilers	Electric High Pressure Steam Boilers
Maximum Steam Temp.	300°C–1300°C Standard	600° with Economizer and Superheater	135° C for 3 bar steam
Efficiency	~95%	<90%	~85% - 95%
Idle Energy Waste	Low(Choice of Continuous or On-Off steady-state steam)	High	Moderate
Non Steam Producing Energy Usage Time	Nearly Instant	60+ minutes. Becomes slower with higher pressures and volume requirements	~60Minutes. Becomes slower with higher pressures and volumes. (Not including cool down and pressure release for autoclaves)
Suggested Inlet Temp.	Tap	4-16°C	20-35°C
Capital Cost per Kg of Steam	Low	High	Moderate. Depends on temperature/pressure required.
Operational Costs	Low	High	Low-Moderate
Unit Footprint	Starting at 1' x 1' x 1'	Large	Depends on size and pressure requirements
Plug & Play Operations	Yes	No	No
Requires Boiler Certifications	No	Yes	Yes
Downtime	Low(Unit can be used for continuous steady-state steam) Because of the low foot print MHI Never Down Service is available	Low-Moderate	Low



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Superheated Steam Products

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One Atmosphere Boiler

Feature	One Atmosphere Boiler	Water Tube Steam Boilers	Electric High Pressure Steam Boilers
Utilizes Combustion (Requires Ventilation)	No	Yes	No
Energy Needed to produce 100kg/hr steam from cold start	~100 kWh	~150-200 kWh Equivalent (Including start up time consumption)	~150-200 kWh Equivalent (Including start up time consumption)
Power weight [Kg Equipment/(Kg/hr) of steam] for a 100kW Generator	~2 Kg per Kg/hr of steam	~5 Kg per Kg/hr of steam (Weight increases with temperature/pressure)	
Maximum Work Potential (Based on second law limitation) Base is 1 Bar 100C liquid water for all	672 kJ/Kg for 500 °C superheated steam 1973 kJ/Kg for 1300 °C superheated steam	755 kJ/Kg for 10 Bar saturated steam 1169 kJ/Kg at 100 Bar saturated steam	Generally not used for creating work
Enthalpy (heat) Content	3489 kJ/Kg for 500 °C superheated steam at 1 Bar	2777 kJ/Kg for 10 Bar saturated steam Saturation steam temperature 180 °C	2725 kJ/Kg for 3 Bar saturated steam Saturation steam temperature 311 °C
Running at Partial Capacity	With MHI Electronic Controls, No loss of efficiency	Significantly lower efficiencies, if model is capable	Lower efficiencies
Air Contamination Effects	Extremely high operation temperatures diminish effects of air	Air contamination harms output	No air contamination is allowed (strict)
Piping Losses	Discrete, locatable units reduce necessary piping. Low, 1 atmosphere pipe pressure.	High pipeline pressure combined with long piping distances leads to heat loss and dangerous conditions in the event of pipe failure.	High pipeline pressure combined with long piping distances leads to heat loss and dangerous conditions in the event of pipe failure.
How far can I run my pipe?	Call MHI	Call MHI	Call MHI



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Superheated Steam Products

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One Atmosphere Boiler



Model	Amount of Steam Produced	Total Electrical Power/Exit Temperature
OAB-4-Solution	4 kg/hr	~ 4-6 kW Single Phase Model 350 °C
OAB-12-Solution	12 kg/hr	~ 12-14 kW Single Phase Model 350 °C
Custom	Custom	550 °C, 700 °C, 1300 °C

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Whether for safety, aesthetics or combo-packaging, shrink-wrap is one of the fastest growing packaging solutions. However, shrink wrap traditionally has carried with it expensive energy and water usage. Now with the advent of OAB® steam it is possible that one may easily save 85-95% energy and water.

Rapid labelling even for filled bottles and for bottles with unusual curvature has never been easier. Move towards 90% savings in energy and water even with complex bottles.

Machines Specifications:

- 1 SW-OAB-12-300 - [Download Specs sheet](#) (For medium loads)
- 2 SW-OAB-4-550 - [Download Specs sheet](#) (For small loads)
- 3 Hybrid-SW OAB-12-300-4 [\(For high speed super saving loads\).](#)

MHI is a leader in hybrid designs for batch and continuous loads.



Tunnel Designs and Basic Tunnels are free with the OAB® System for CPG shrink wrap. For some models, the belt is provided at no charge.

- 1 Simple and Elegant. Multiple wall. Heat contained. Designed by thermal leader MHI. Simple lift off. Light weight.
- 2 Modular - Each Zone is three to five feet. Some basic tunnels and even belts are free.
- 3 Turn OAB® on and off . No need to idle. Move OAB® across various SW lines if required.
- 4 Easy adjustment by flaps and height adjusters for entire tunnel when required.
- 5 Intuitive Design - Graduated indicators simplify setups and adjustments.
- 6 Use with 12 kW OAB® steam. Overcome the energy disadvantage of traditional 150kW- 300 kW (15-30 BHP) Boilers. Reduce your cost per label.



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Superheated Steam Products

DISCOVER MHI

One Atmosphere Boiler—Applications

Shrink Labeling



Vat Heating for the
Food and Beverage
Industry



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Air Heater Products

DISCOVER MHI

Airtorch™



LTA750-01



MTA925-2 2kW (NPT Outlet)

MTA925-02
MTA925-2-SS



LTA750-04



LTA750-02



MTA925-04



VTA750-4GS



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Air Heater Products

DISCOVER MHI

High Efficiency. Easy Operations.



Model	Power	Voltage	Max Temp	Max CFM @ Max Temp	Diameter	Height	Air Supply	Inlet Integrated with Fan or Inlet Accepts Blower	Exit	Air Connection
VTA900-4BL	4kW	208/220/230/240	900 °C	Call	Call	Call	Call	Blower	2" NPT	Yes
VTA900-10BL	10kW	208/220/230/240	900 °C	Call	7" (177.8mm)	27.5" (698.5mm)	Call FANCS: Fan speed controller and	Blower	Call	Yes temperature indicator
3-Phase VTA's with fans	60-300kW	240/440/480	900 °C	Call	Call	Call				



MVTA925-12

Model	Power
MVTA925-12	12kW



Model	Power	Maximum Temperature
GVTA750-12	12kW	850 °C
GVTA750-24	24kW	850 °C
GVTA750-36	36kW	850 °C
GVTA750-48	48kW	850 °C
GVTA750-60	60kW	850 °C
GVTA750-120	120kW	850 °C

Model numbers may vary depending on country.



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Air Heater Products

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High Efficiency. Easy Operations.



Model	Power	Controller	Voltage	Integral Fan	Transformer
DPF220MP-3	3kW	BPAN-O-2014-PLUS	230/240 Volts	No	Yes
DPF220MP-3 with Fan	3kW	BPAN-O-2014-PLUS + FANCS	230/240 Volts	Yes	Yes
DPF220MP-10.5	10.5 kW	HIPAN	230/240 Volts	No	Yes
DPF220MP-10.5 with Fan	10.5 kW	HIPAN + FANCS	230/240 Volts	Yes	Yes
DPF220MP-15	15 kW	XPAN	208/230/240 Volts	No	Yes
DPF220MP-15 with Fan	15 kW	XPAN + FANCS	208/230/240 Volts	Yes	Yes

Models	Power	Maximum Temperature	Voltage
3DPF10.5MP	30kW	Variable 1200 °C/2200 °F	208/220/480 Volts
3DPF15MP	45kW	Variable 1200 °C/~2200 °F	208/220/480 Volts



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Furnace Products

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High Temperature. High Quality. High Uniformity.



MHI furnaces meet the highest standards of quality, energy efficiency, and performance. From the laboratory scale Z-Series box furnace, robust motorized bottom-loading/opening furnace, to our novel steam furnaces with a rapid heat-up rate, MHI has a high temperature heating solution for even the most demanding user. From laboratory, lab scale, prototyping to large scale with established high safety heating devices, furnaces and refractories.



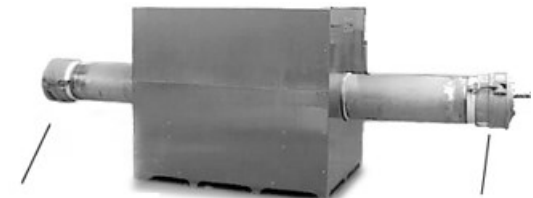
Box Furnace



Horizontal Tube Furnace



Motorized Bottom Opening Furnace



Metallic tube shown is 5.75" dia. x 50" L New Quick Disconnect End Cap

Horizontal Tube Industrial Scale



Furnace Products

DISCOVER MHI

High Temperature. High Quality. High Uniformity.

- **Safety:** Double walled Stainless Steel construction. This along with the FiberFree™ refractory allow for a safe exterior working environment (~50 °C or lower). MHI furnaces, where applicable, have three-arm balanced swing away doors that keep the hot surface side away from users.
- **Warranty:** Contact us to learn about the best warranty for your furnace.
- **High Temperature Furnace Classes:** Almost all MHI furnaces are lined with non-toxic FiberFree™ refractory in the furnace chamber. FiberFree™ refractory is a safe-to-use insulation which does not contain any toxic short fibers.
- **Non-sag roof technology:** MHI also uses the unique FiberFree™ refractory for the roof of most furnaces. This novel refractory does not crack during cycling at operating temperatures which allows for longer life of the furnace and longer life from the heating elements. Less cracks and longer life means you will be running your furnace for efficiently and have an overall savings (monetary, energy, replacement materials, etc.) This FiberFree™ material advantage is uniquely available from MHI.
- **Robustness:** MHI uses nanofractal roof hangers.
- **Unique Hearth Designs:** Several bottom loader type furnaces now have floors that come standard with removable hearths. On large bottom loading furnaces we have added a new design feature, which makes the already sturdy door-top fully removable and lockable. If you ever damage the floor of the door—simply change out this piece without incurring the larger cost for the entire door. Hearths can reach 2000 °C operating temperatures with the unique non-toxic FiberFree™ refractory.
- **Uniformity:** As high as +/- 2™C temperature uniformity for small chambers. Slightly more as the size increases. Uniformity is related to insulation quality and quantity, furnace design, best heating elements and high class control system that for example are easily accepted in US government laboratories. Overall care matters when mating ceramics, thick gauge stainless steel and high temperature heating elements. We often find MHI provides an additional layer of insulation compared to other manufacturers and provides the latest in feedback control electronics.
- **Our heating elements routinely outperform:** MHI offers the highest temperatures and longest life available in MoSi2 heating elements.
- **Awards:** MHI has received the prestigious R&D100 and other awards for its heating elements, refractory materials and furnaces. This shows our commitment to innovation and continuous improvement so that you have the highest quality and best performing furnaces.
- **Versatile:** MHI furnaces are used in diverse applications from chemical processing, vapor deposition, nano scale processing, materials processing and energy conversion from R&D to prototype to industrial scale operations.



Furnace Products

DISCOVER MHI

1700°C - 1800°C Max. High Quality. High Uniformity.



Model	Temperature	Chamber Size
Z18-40	Up to 1760°C (1800°C/3272°F Max)	6" H x 5" W x 6" D
M18-40	Up to 1760°C (1800°C/3272°F Max)	12" H x 12" W x 16" D
Single Zone Horizontal Furnace		
H18-40HT	Up to 1760°C (1800°C/3272°F Max)	2.5" D x 12" L
3-Zone Horizontal Tube Furnace		
3H18-40HT2.5x27	Up to 1760°C (1800°C/3272°F Max)	2.5" D x 27" L
Vertical Split Tube Furnace		
3H11-17VST	1100° - 1700° (2012–3092°F)	3: D x 8" L
Bottom Loading Furnace		
H18-40BLE	Up to 1760°C (1800°C/3272°F Max)	8" H x 9" W x 9" D
H18-40BLE12x12	Up to 1760°C (1800°C/3272°F Max)	12" H x 12" W x 12" D
H18-40BLE15x15	Up to 1760°C (1800°C/3272°F Max)	15" H x 15" W x 15" D
H18-40BLE18X18	Up to 1760°C (1800°C/3272°F Max)	18" H X 18" W X 18" D

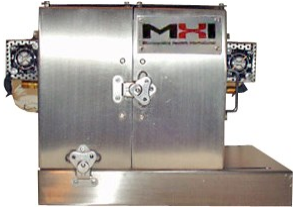


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Furnace Products

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Specialty Furnaces. High Quality. High Uniformity.



CSF1700

Model	Maximum Temperature
CSF1700	1700 °C



HP220-HIGHBO-1250

Model	Maximum Temperature	Maximum Power	Heated Surface Dimensions
HP220-HIGHBO-1250	1250 °C	3000W	9" W X 9"
HeatPad T HM-500-1	1000 °—1600°		1" Diameter with comprehensive controls



HEATPAD-THM-500-1

Model	Continuous Operating Temperature	Chamber Size
3H14VST-GAXP	1400 °C	3" D x 8" L
H14-GAXP	1400 °C	
M14-GAXP	1400 °C	12" H x 12" W x 16" D
H14BLE15x15-GAXP	1400 °C	15" L x 15" D
575H14HT-GAXP	1400 °C	



Vertical Split Tube



Microheater™ Products

DISCOVER MHI

Small Size. High performance.



High power devices with minimal footprint.

Small heaters with temperatures up to 1900°C

High watt density allows for efficient heating in numerous applications.

Multiple configurations allow for easy integration into existing processes.

Excellent for Research and Development and Laboratories.

Suggested uses include: substrate heating, crucible heating and fiber heating amongst others.



GUHE-10-SS



MC-MP1900-350-IPL



FIBHEAT200



THM-200 with
Quartz Tube



Microheater™ Products

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Specialty Microheaters



Model	Maximum Temperature	Key Selection
THM-200	~1700 °C	2mm ID Quarts Tube
THM-500	~1700 °C	6mm ID Quartz Tube
THM-500-XRD	~1700 °C	6mm ID Quartz Tube with Orthogonal holes for X-ray beams



Model	Maximum Temperature	Key Selection
FIBHEAT200	1900 °C	Dim. 1.13" W x 1.13" D x 2.13" H
FIBHEAT200-XRD	1900 °C	Custom X-ray slot Partial slot opening (60° from center)



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Microheater™ Products

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Specialty Microheaters



Model	Maximum Temperature	Specifications
GUHE-10-SS	1900°C	300 Watts
GUHE-3-SS	1900°C	Narrow 3mm zone



Model	Maximum Temperature	Specifications
PH-G4-1	1250°C	1" Hot Zone
PH-G4-2	1250°C	2" Hot Zone



Model	Maximum Temperature	Specifications
MPT20	1000°C—1900°C	100 Watts



Model	Maximum Temperature	Specifications
MHGI-1250	1200°C—1900°C	30 Watts



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Microheater™ Products

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Small Size. High performance.



1"



2"



Model	Maximum Temperature	Specifications
MC-MP1900-150	1900°C	1" Serpentine, ~ 500 Watts
MC-MP1900-150-IPL	1900°C	1" Serpentine, In Line Plane, ~500 Watts
MC-MP1900-300	1900°C	2" Serpentine, ~1100 Watts
MC-MP1900-300-IPL	1900°C	2" Serpentine, In Line Plane, ~1100 Watts
MC-MP1900-170	1900°C	1" Spiral, ~ 500 Watts
MC-MP1900-170-IPL	1900°C	1" Spiral, In Line Plane, ~500 Watts
MC-MP1900-350	1900°C	2" Spiral, ~1100 Watts
MC-MP1900-350-IPL	1900°C	2" Spiral, In Line Plane, ~1100 Watts



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Microheater™ Products

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Small Size. High performance.



Model	Maximum Temperature	Specifications
MC-GAXP-30	1400 °C	1" Ceramic Base Included Connectors Included
MC-GAXP-130	1400 °C	2" Ceramic Base Included Connectors Included
MC-GAXP-375	1385 °C	3" Ceramic Base Included Connectors Included
MC-GAXP-485	1385 °C	3.5" Ceramic Base Included Connectors Included
MC-GAXP-6.5	1400 °C	Ceramic Base 14" x 14" x 2" Included Connectors Included



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RobustRadiator™ Products

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Modular Heating. Highly Customizable.



MHI Patented MP1900 and MagnaCoil Heating Elements

Non-toxic, high performance FiberFree™ Refractory

May be operated in Vertical or Horizontal orientations

Fully Controllable

Optional Stainless Steel Casing for Easy Mounting

Customizable and Made-To-Order

Max Temperature 1400°C–1700°C

Fully controllable (BPAN-O-2014 Recommended)

Ideal for tube/pipe heating, annealing, wafer production, crystal growth, material testing, crucible melting and a variety of other R & D and production applications.



RHUL-MP2125-4



RHUL-MP4125-4



IRHUL-MP4125-4



IRHUL-MP4125-4



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RobustRadiator™ Products

DISCOVER MHI

Modular Heating. Highly Customizable.

Model	Temperature	Maximum Power	Heated Length	Overall Length	ID	OD
RHUL-MP1125-4	1400°C–1700°C	825 Watts	2"	4"	1"	5"
RHUL-MP2125-4	1400°C–1700°C	1428 Watts	2"	4"	2"	6"
RHUL-MP3125-5	1400°C–1700°C	2925 Watts	2"	4"	4"	8"
RHUL-MP4125-4	1400°C–1700°C	3075 Watts	3"	5"	3"	7"
RHUL-MP1125-4-SS	1400°C–1700°C	825 Watts	2"	4"	1"	5"
RHUL-MP2125-4-SS	1400°C–1700°C	1428 Watts	2"	4"	2"	6"
RHUL-MP3125-5-SS	1400°C–1700°C	2925 Watts	2"	4"	4"	8"
RHUL-MP4125-4-SS	1400°C–1700°C	3075 Watts	3"	5"	3"	7"



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RobustRadiator™ Products

DISCOVER MHI

Modular Heating. Highly Customizable.

Model	Temperature	Maximum Power	Heated Length	Overall Length	ID	OD
MRCL-GA1125-4	1450 °C	600 Watts	2"	4"	1"	5"
MRCL-GA2125-6	1450 °C	Call	4"	6"	5"	9"
MRCL-GA3125-6	1450 °C	Call	4"	6"	2"	6"
MRCL-GA4125-6	1450 °C	Call	4"	6"	4"	8"
MRCL-GA5125-6	1450 °C	Call	4"	6"	3"	7"
MRCL-GA7125-10	1450 °C	Call	8"	10"	7"	11"
Model	Temperature	Maximum Power	Heated Length	Overall Length	ID	OD
SLH-1.5	1500 ° - 1700 °C	350 Watts	.025"	2"	1.5"	5"
SLH-3.0	1500 °C—1700 °C	800 Watts	.25"	2"	3"	6.5"

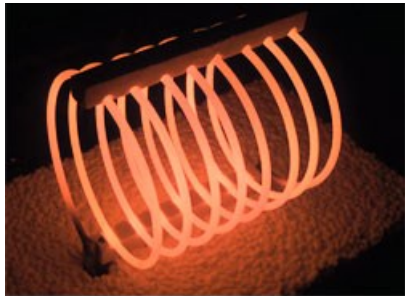


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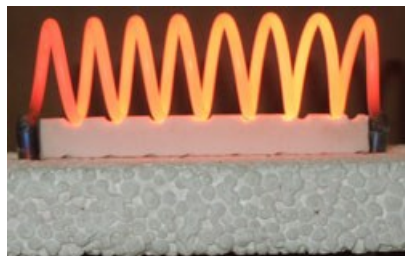
MagnaCoil™ Elements

DISCOVER MHI

High Performance. High Value.



MC-8/3/4/4 with CHS-OD



MC-8/1/4/4 with CHS-OD Coil
Spacer and Refractory



MagnaCoil™ heating elements offer temperatures up to 1450 °C

Coil sizes range from 1" to 5"

Inline, Cross-line, in-plane and cross-line out of plane are the most popular configurations offered.

Coils feature high power handling and exceptional service lifespans.

Model	Coil In- side Di- ameter	Coil Length	Approx. Num- ber of turns	Max. Watts
MC-8/1/4/4	1"	4"	8	.7kW
MC-8/2/4/4	2"	4"	8	1.3kW
MC-8/3/4/4	3"	4"	8	2.0kW
MC-8/4/4/4	4"	4"	8	2.5kW
MC-8/5/4/4	5"	4"	8	3.2kW



GAXP™ Elements

DISCOVER MHI

High Performance. High Value.



U-Shaped Hairpin	Lu:	Le:	A:
Design Power in well insulated furnace	Le x 2 x 50W/inch		

Patented technology helps create highly efficient and reliable heating elements rated for use up to 1450°C.

Variety of shapes including U-Shaped hairpins, dumbbell and U-Shaped hairpin bent.



Dumbbell	Cz:	Hz:
Design Power in well insulated furnace	Hz x 50W/inch	

Compatible for use in a number of environments.

Use for oxidation, carbon reduction, neutral environments or in combustion processes.



U-Shaped Hairpin Bent	Luh:	Le:	A:
Design Power in well insulated furnace	Le x 2 x 50W/inch		



Molybdenum DiSilicide Elements

DISCOVER MHI

High Performance. High Value.



U-Shaped Hairpin	Lu:	Le:	A:
Classes	MP1850		

Patented technology helps create our highest temperature heating elements rated for use up to 1900 °C

Variety of shapes including U-Shaped hairpins, dumbbell and U-Shaped hairpin bent.



U-Shaped Hairpin Bent	Lu:	Le:	A:
Classes	MP1800—MP1900		

Sizes available include 3/6, 4/9, 6/12 and 9/18.

Compatible for use in a number of environments.



Pancake Elements	Model	Power	Element Shape
	UPESP-6.5	~6000W	Complex

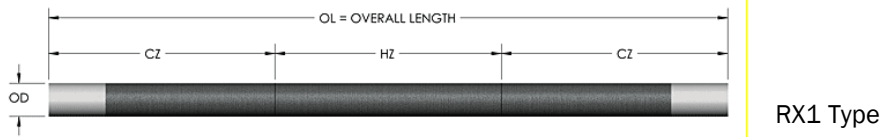
Use for oxidation, carbon reduction, neutral environments or in combustion processes.



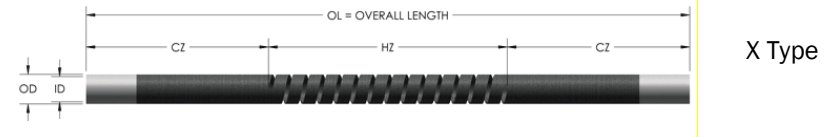
NoAge™ Silicon Carbide Elements

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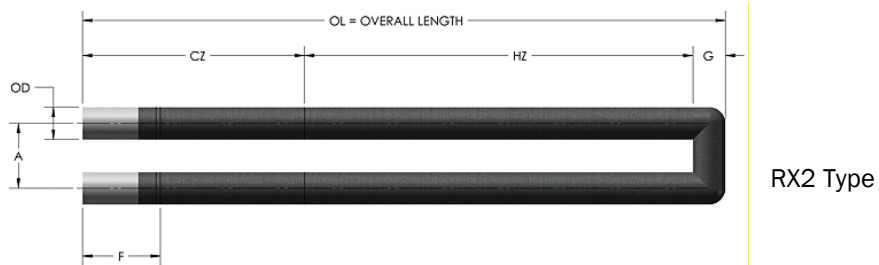
Minimum order 20 Units



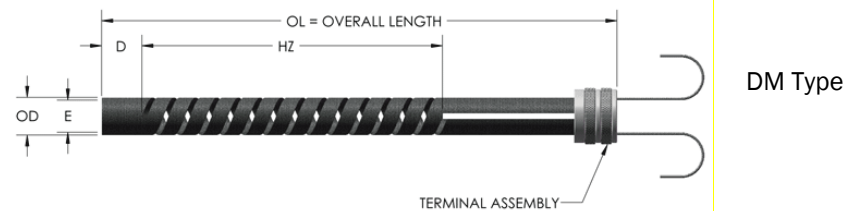
RX1 Type



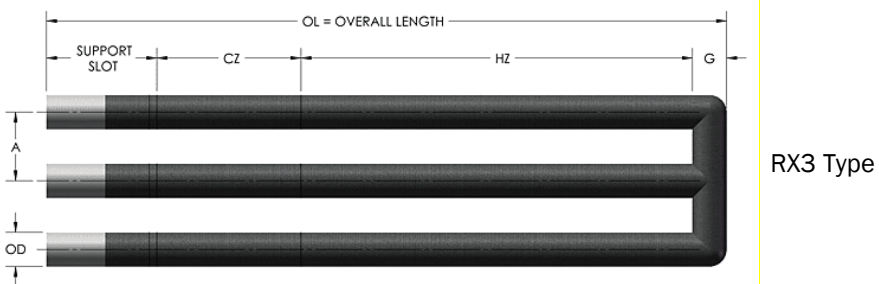
X Type



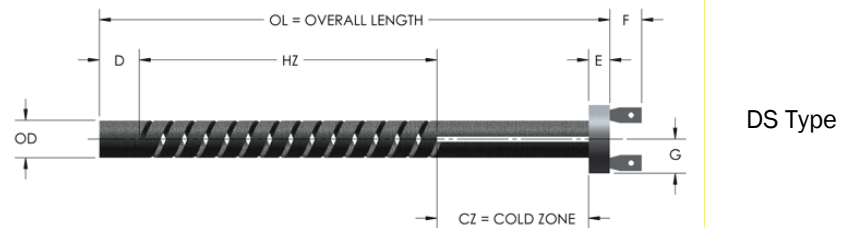
RX2 Type



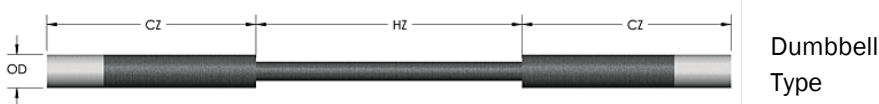
DM Type



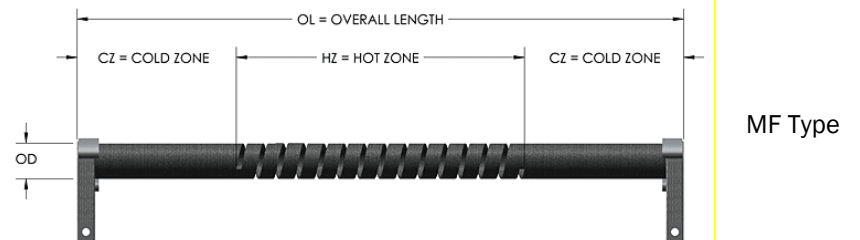
RX3 Type



DS Type



Dumbbell Type



MF Type



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Accessory Packages

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Quicker Delivery. Less Downtime.



MHI offers the highest quality heating element accessories available to keep your furnace working at peak efficiency. MHI accessories are used for all MHI furnaces and many other modern high temperature furnaces, from small laboratory to production size furnaces. We also offer quick disconnect end caps for tube furnaces.

Full Accessory Kits



- Heating Elements
- Element Holders
- Connecting Wire
- Connecting Clips
- TC Extension Cable
- Replacement Ceramic
- Fan
- Alumina Tube
- Mullite Tube
- Metallic End Caps
- Ceramic End Caps
- Terminal Block
- Thermocouple
- Fuse



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Controllers

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Programmable Cycles. Remotely Locatable.



TRIPAN-RPAN3

Furnace controllers allow for better process control through the use of programmable steps and precise temperature controls.

All controllers are compatible with MHI-DACS for data logging and remote control of units.



HIPAN-2014-XPAN-2014

Most controllers include over-temperature controllers.

Durable stainless steel enclosures.

Ability to locate controls remotely from device, allowing centralized control of multiple heating devices.



BPAN-O-2014-BPAN-O-PLUS-2014

Single phase and 3 phase compatible models.

Helps improve energy use through more efficient temperature control.



MHI-DACS

DISCOVER MHI

Record Data. Improve Processes

DACS—Data Acquisition Control Software v7.2 for MHI Furnaces, Airtorch™ and other devices



MHI DACS1 and DACS2

- Do your projects faster. The MHI Data Acquisition and Control Software offers unparalleled control and data management.
- Remotely turn ON/OFF MHI devices.
- Easily download data, create cycle programs, provide graphical analysis and monitor and manage up to 12 MHI Heating devices.
- Fully programmable up to 16 programmable steps.
- Great for controlling multi-zone furnaces or multiple furnaces simultaneously.

DACS2

- Advanced built in data acquisition system combined with PID Control.
- Four universal inputs for data recording and two PID control loops with a full color 320x240 pixel graphic TFT display.
- Configurable real time views including horizontal and vertical trends, Horizontal and vertical bar graphs, alarm status and control loops.
- Optional Dual programmer supporting up to 100 programs with 25 segments each.
- Built in 50MB of non-volatile flash memory for data storage.



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