ADVANCED THERMAL PROCESSING SYSTEMS

HIGH TEMPERATURE FURNACES

Laboratory  ■  Production
THERMAL TECHNOLOGY’S PROCESS AND EQUIPMENT ENGINEERS CAN PROVIDE A FURNACE TO MEET YOUR MOST DEMANDING APPLICATION REQUIREMENTS. WITH THERMAL TECHNOLOGY’S UNMATCHED SERVICE AND SUPPORT, YOUR SYSTEM WILL MAINTAIN ITS HIGH PRODUCTIVITY AND RELIABILITY YEAR AFTER YEAR.

With an impressive 70-year history of high-temperature furnace system design, Thermal Technology has helped pioneer the use of innovative advanced materials in industries such as medical, lighting and renewable energy. Our systems are used in the manufacturing process of a wide range of components found in a variety of applications, including life-saving coronary stents, aircraft turbine blades, orthodontia, high intensity discharge (HID) lighting and vacuum interrupters for the growing network of electric grids in BRICS nations.

Thermal Technology has made some of the most innovative advancements for thermal processing in the industry. Throughout our extensive experience we have partnered with customers in many industries to successfully develop their processes. Our steady growth rests on a foundation of customer-first commitment and the resulting long-term relationships forged with our clients.

Applications surround a furnace radial heating element (clockwise): power grid vacuum interrupters, radial heating element, tungsten targets for medical imaging, turbine blades for aircraft, high intensity discharge lights, coronary stents.
PRODUCTION FURNACES

Thermal Technology’s production furnace applications include sintering, pre-sintering, annealing, brazing, metallizing and debinding. They operate in vacuum, inert or reducing atmospheres and have a very long usable life.

Features include:

- High level of temperature uniformity maximizing hot zone productivity
- 2, 4 or 6-sided heating accommodates large loads
- Automatic controls for attended or unattended operation

Model APF 2444-MS
20”Ø x 40” refractory metal hot zone

Automatic Processing Furnaces (APF) have refractory metal hot zones with optional top and bottom trim heaters for optimum temperature uniformity and heightened productivity. This bell-series furnace lends itself to fully automated production requirements and reaches temperatures up to 2000° C.

I have been using these APF systems for over 18 years. They are of the highest quality and have proven to be very reliable. Equally impressive is their customer support team. Their response time for troubleshooting and parts replacement has been excellent.

—Thomas C., Manager, Plant Engineering

PRODUCTION FURNACE CONFIGURATIONS

<table>
<thead>
<tr>
<th>Graphite Production Furnace</th>
<th>Refractory Metal Production Furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK ZONE</td>
<td>LOADING TYPE</td>
</tr>
<tr>
<td>12”x12”x12”</td>
<td>Front</td>
</tr>
<tr>
<td>16”x16”x30”</td>
<td>Front</td>
</tr>
<tr>
<td>24”x24”x24”</td>
<td>Front</td>
</tr>
<tr>
<td>65”x65”x65”</td>
<td>Front</td>
</tr>
<tr>
<td>26”Ø x 36”h</td>
<td>Bottom</td>
</tr>
<tr>
<td>18”Ø x 20”h</td>
<td>Top</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WORK ZONE</th>
<th>LOADING TYPE</th>
<th>MAXIMUM TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12”x12”x12”</td>
<td>Front</td>
<td>2,500°C</td>
</tr>
<tr>
<td>12”x12”x24”</td>
<td>Front</td>
<td>1,800°C</td>
</tr>
<tr>
<td>16”x16”x32”</td>
<td>Front</td>
<td>2,000°C</td>
</tr>
<tr>
<td>16”x16”x48”</td>
<td>Front</td>
<td>1,800°C</td>
</tr>
<tr>
<td>24”Ø x 30”h</td>
<td>Bottom</td>
<td>1,800°C</td>
</tr>
<tr>
<td>8”Ø x 16”h</td>
<td>Bell</td>
<td>2,000°C</td>
</tr>
<tr>
<td>60”Ø x 90”h</td>
<td>Bell</td>
<td>1,400°C</td>
</tr>
</tbody>
</table>

Many more sizes and temperatures are available. Please inquire for more information: sales@thermaltechnology.com.
LABORATORY FURNACES

Thermal Technology’s laboratory furnaces are suitable for a wide variety of laboratory and small scale production applications. High level of temperature uniformity maximizing hot zone productivity

Features include:

- Versatile design
- Easy to install and operate
- Highly reliable with very long usable life
- Customized models reach temperatures of 3,000° C

Model 1000-3560-FP24

Model 1000 series high temperature graphite furnace systems come in a variety of configurations and have numerous available options. They can be top or bottom loading, function vertically or horizontally, and reach temperatures up to 2,900° C.

Model 1100-4080-W4

Model 1100 series high temperature refractory metal furnace systems are available with either a molybdenum or tungsten hot zone. They have options and configurations similar to the 1000-series and reach temperatures up to 3000° C.

Model HTG 9020-FP23

Model HTG series mid-size, bottom loading, high temperature graphite furnace systems offer a variety of available configurations and options. They are very similar to the 1000 series, but on a larger scale, and reach temperature up to 2300° C.

“I've purchased a few systems over the course of my career and currently own two. I've been very satisfied with the customer service and support.”

—George N., PhD, Professor of Physics

PRODUCTION FURNACE CONFIGURATIONS

<table>
<thead>
<tr>
<th>Graphite Production Furnace</th>
<th>Graphite Production Furnace</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
<td>WORK ZONE (IN)</td>
</tr>
<tr>
<td>1000-2560-FP-24</td>
<td>2 Ø x 6 h</td>
</tr>
<tr>
<td>1100-3560-FP-24</td>
<td>3 Ø x 6 h</td>
</tr>
<tr>
<td>1000-4560-FP-30</td>
<td>4 Ø x 6 h</td>
</tr>
<tr>
<td>1000-45120-FP-30</td>
<td>4 Ø x 12 h</td>
</tr>
<tr>
<td>1000-6580-FP-40</td>
<td>6 Ø x 8 h</td>
</tr>
<tr>
<td>HTG 9020-FP23</td>
<td>8 Ø x 16 h</td>
</tr>
</tbody>
</table>

Many more sizes and temperatures are available. Please inquire for more information: sales@thermaltechnology.com.
ENABLING PROCESS TECHNOLOGY FOR GLOBAL LEADERS SINCE 1946.

> Developed and patented BreWeave™ technology
> An install base of over 3,000 systems in 40 countries
> Decades of technical innovation, process knowledge, full-factory testing, installation assistance and aftermarket support
> Markets served include lighting, electronics, healthcare, renewable energy, communications and aerospace

Pictured:
Bottom shield pack and heater
THERMAL TECHNOLOGY
THERMAL PROCESSING SYSTEMS

SPARK PLASMA SINTERING SYSTEMS
A revolutionary, high speed powder densification technology offering significant savings of time and energy and the ability to retain nano structures.

DIRECT CURRENT SINTERING SYSTEMS
All the benefits of spark plasma sintering with a constant (non-pulsed) current designed for larger systems.

HOT PRESS SYSTEMS
For the simultaneous application of high temperature and high pressure. Effective and efficient powder densification, diffusion bonding and processing of composite materials.

PRODUCTION FURNACES
We offer vacuum, inert or reducing atmospheres and automatic controls. Two, four or six-side heating provides optimized uniformity. Effective for sintering, presintering, debinding, annealing, brazing and metallizing.

APF AND CPF SYSTEMS
Provide fully automatic, unattended operation at temperatures to 2,500°C. Parts processing is quickly cycled with rapid temperature ramp up and ramp down.

LABORATORY FURNACES
Suitable for a wide variety of laboratory and small scale production applications. These furnaces are reliable, versatile and easy to use with specific models ranging up to 3,000 °C.

HOT PRESS SYSTEMS
For the simultaneous application of high temperature and high pressure. Effective and efficient powder densification, diffusion bonding and processing of composite materials.

LABORATORY FURNACES
Suitable for a wide variety of laboratory and small scale production applications. These furnaces are reliable, versatile and easy to use with specific models ranging up to 3,000 °C.

PRODUCTION FURNACES
We offer vacuum, inert or reducing atmospheres and automatic controls. Two, four or six-side heating provides optimized uniformity. Effective for sintering, presintering, debinding, annealing, brazing and metallizing.

APF AND CPF SYSTEMS
Provide fully automatic, unattended operation at temperatures to 2,500°C. Parts processing is quickly cycled with rapid temperature ramp up and ramp down.

Service Commitment
Thermal Technology is dedicated to delivering the highest levels of satisfaction in the implementation of our processes and equipment. We respond to the needs of our customers with proven solutions, comprehensive training and support.

Mission Statement
Enable our customers’ businesses by providing high quality thermal processing equipment solutions with outstanding support and service.