THERMAL TECHNOLOGY LLC
HIGH TEMPERATURE EXPERTS

ADVANCED THERMAL PROCESSING SYSTEMS

HIGH TEMPERATURE FURNACES

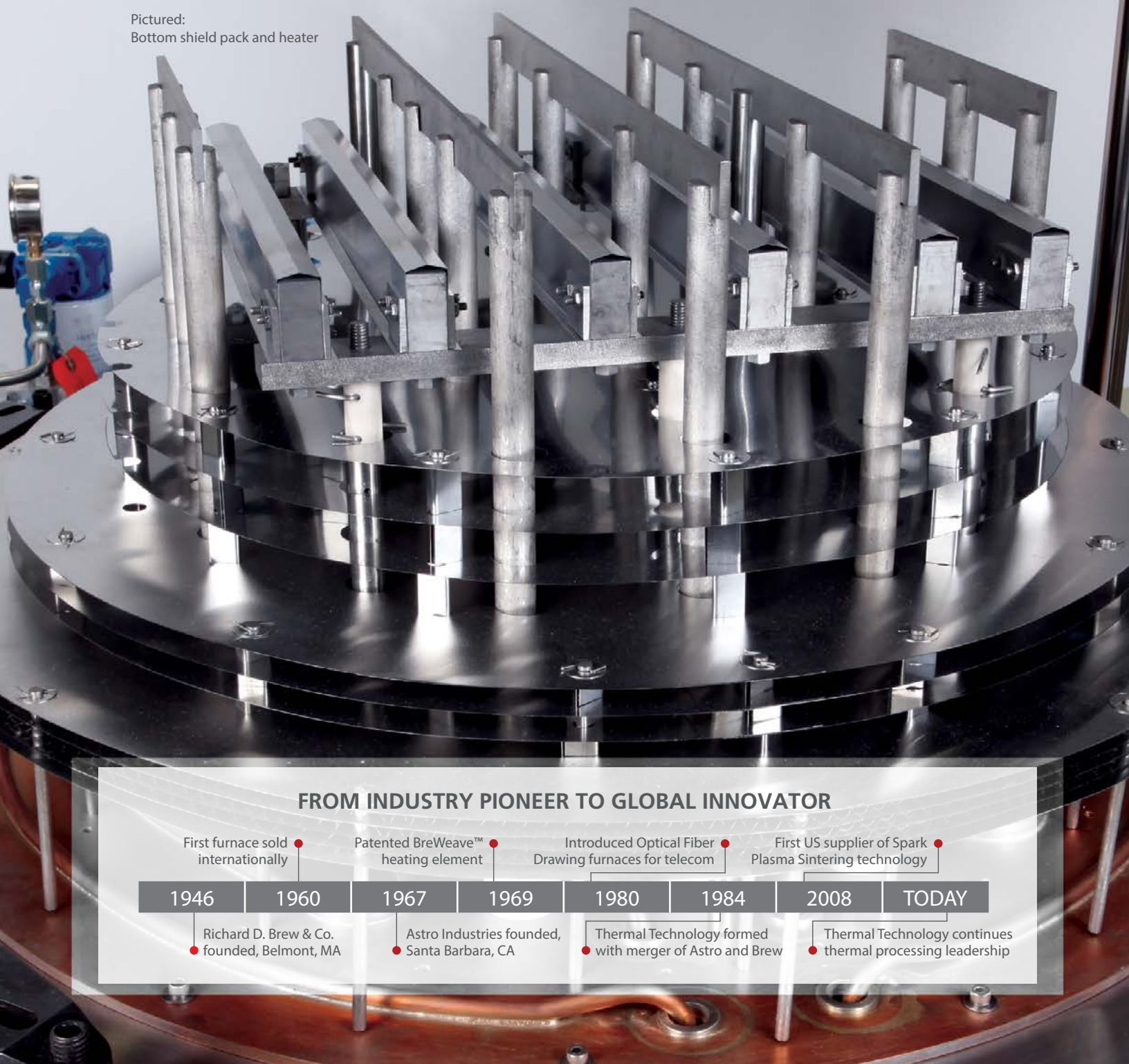
Laboratory ■ Production

3,000 systems installed in 40 countries
help safeguard your processing performance

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

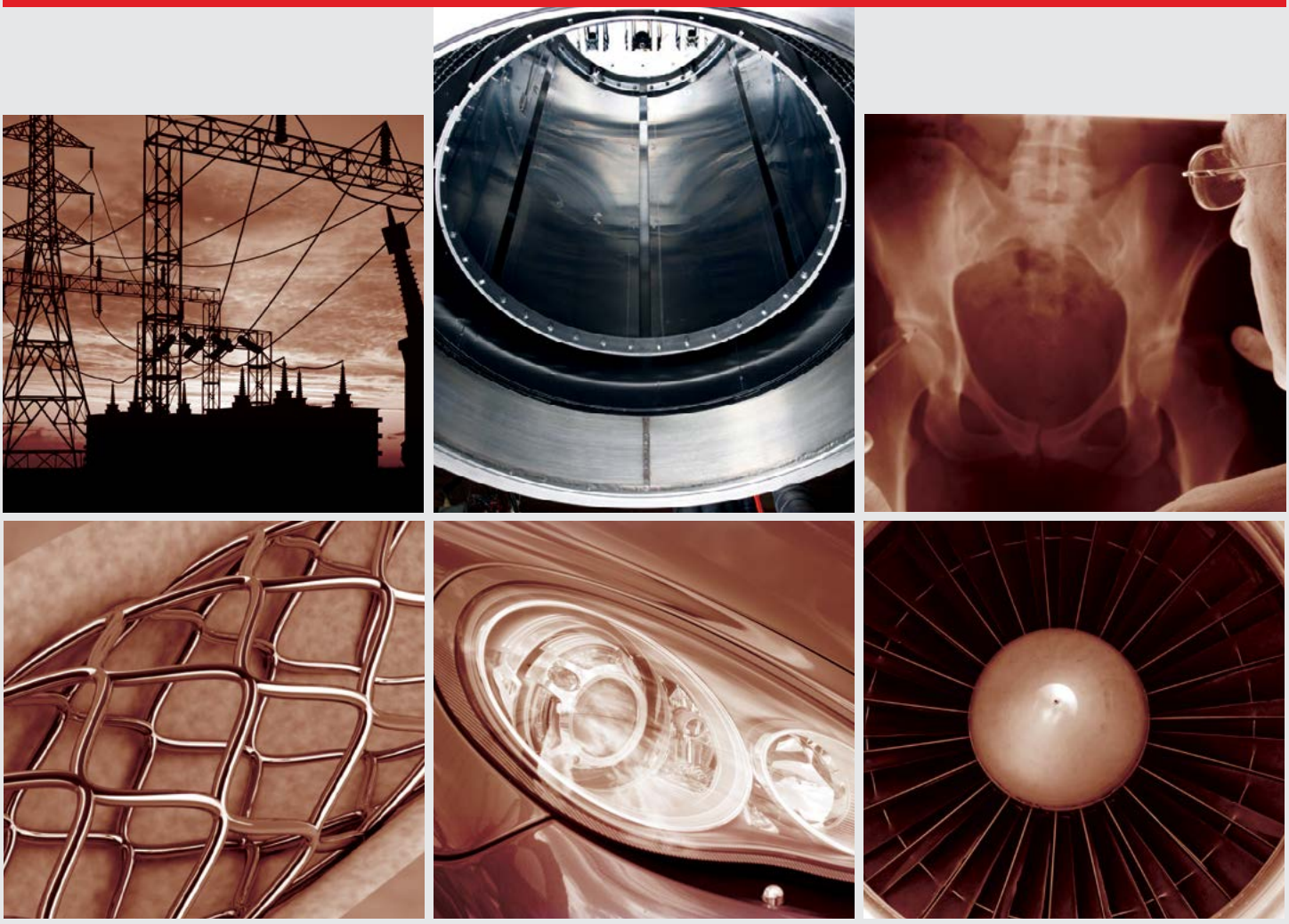


FROM INDUSTRY PIONEER TO GLOBAL INNOVATOR

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 60-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 one of the highest IQs in the advanced thermal processing 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:

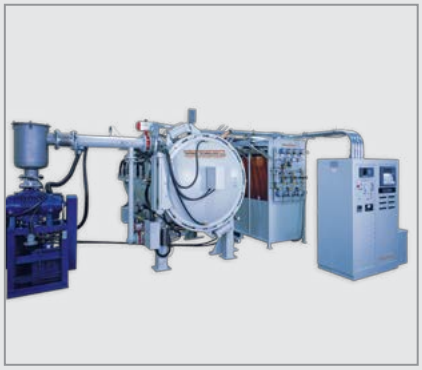
- High level of temperature uniformity maximizing hot zone productivity
- 2, 4 or 6-sided heating accommodates large loads
- Automatic controls for attended or unattended operation

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.

Model 161648-W
16"x 16"x 48" refractory metal hot zone

Front loading refractory metal production furnace systems come in a variety of sizes with 2, 4, or 6-sided heating and temperatures ranging up to 2,500° C. The quick-cooling gas quenching system is just one of many available options.



Model 182460-G
18"x 24" x 60" graphite hot zone

Front loading graphite sintering furnace systems offer a variety of configurations with temperatures ranging up to 2,500° C. Retorts and debinding equipment are among the numerous available options.

"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

Graphite Production Furnace			Refractory Metal Production Furnace		
WORK ZONE	LOADING TYPE	MAXIMUM TEMPERATURE	WORK ZONE	LOADING TYPE	MAXIMUM TEMPERATURE
12"x12"x12"	Front	2,500° C	12"x12"x12"	Front	2,500° C
12"x12"x24"	Front	1,800° C	12"x12"x24"	Front	1,800° C
8" Ø x 14" h	Bottom	2,300° C	16"x16"x32"	Front	2,000° C
26" Ø x 36" h	Bottom	2,300° C	16"x16"x48"	Front	1,800° C
12" Ø x 24" h	Bell	2,300° C	24" Ø x 30" h	Bottom	1,800° C
8" Ø x 20" h	Top	2,500° C	10" Ø x 24" h	Bell	2,000° C
			20" Ø x 36" h	Bell	1,700° C

Other 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.

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 temperature 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

LABORATORY FURNACE CONFIGURATIONS

Graphite Production Furnace				Refractory Metal Production Furnace			
MODEL	WORK ZONE (IN)	WORK ZONE (MM)	MAX TEMP	MODEL	WORK ZONE (IN)	WORK ZONE (MM)	MAX TEMP
1000-2560-FP-24	2 Ø x 6 h	50 Ø x 150 h	2,900° C	1100-2560	2 Ø x 4 h	50 Ø x 100 h	3,000° C
1000-3560-FP-20	3 Ø x 6 h	75 Ø x 150 h	2,650° C	1100-3580	3 Ø x 6 h	75 Ø x 150 h	2,700° C
1000-4560-FP-30	4 Ø x 6 h	100 Ø x 150 h	2,500° C	1100-4080	3.5 Ø x 6 h	88 Ø x 150 h	2,500° C
1000-45120-FP-30	4 Ø x 12 h	100 Ø x 300 h	2,000° C	1100-40100	3.5 Ø x 8 h	88 Ø x 200 h	2,200° C
1000-6580-FP-40	6 Ø x 8 h	150 Ø x 200 h	2,300° C	1300-70160	6 Ø x 12 h	150 Ø x 300 h	2,000° C
HTG 9020-FP23	8 Ø x 16 h	200 Ø x 400 h	2,300° C				

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

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.

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, easy to use and specific models each 3,000 ° C.

DIRECT CURRENT SINTERING SYSTEMS

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

PRODUCTION FURNACES

Offer vacuum, inert or reducing atmospheres and automatic controls. Two, four or six-sided 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.

THERMAL TECHNOLOGY LLC™
HIGH TEMPERATURE EXPERTS

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