



Thermal Expertise from Pilot to Production

FULLY CUSTOMIZED SOLUTIONS | SUPERIOR PROCESS CONTROL



VAST PROCESS EXPERIENCE IN SOLVING CRITICAL PROCESS PROBLEMS

Lowering time to production | Increasing production yield
Batch-to-inline conversions

EXPERTISE IN:

Brazing | Glass-to-Metal Sealing | LTCC | Direct Copper Bonding
Thick Film | Sintering | Diffusion | Advanced Ceramics
Solar Cell | Powder Processing | Curing | Drying

USA Made Quality since 1950



SINCE 1950, AND WITH OVER 10,000 UNITS SHIPPED, BTU INTERNATIONAL HAS BEEN THE TRUSTED NAME FOR HIGH-TECH CUSTOMERS WITH A NEED TO SOLVE HIGH-VOLUME THERMAL PROCESSING CHALLENGES. BTU'S HIGH TEMPERATURE BELT FURNACES HAVE BEEN MANUFACTURED IN MASSACHUSETTS FOR OVER SIX DECADES; ISO 9001 QUALITY CERTIFICATION SAFEGUARDS THAT EACH UNIT IS SUBJECT TO EXACTING BUILD AND TEST CRITERIA. TODAY, IN THE 100,000 SQFT STATE OF THE ART MANUFACTURING FACILITY, CRAFTSMEN WITH DECADES OF EXPERIENCE ENSURE THE HIGHEST QUALITY PERFORMANCE AND RELIABILITY FOR EACH UNIT.

Continuous belt furnaces from BTU are known for long-term reliability, superior process performance, and service excellence. In partnering with BTU, manufacturers can expect a customized solution that will exceed expectations, not only for process performance, but also for reliability and usable lifetime.

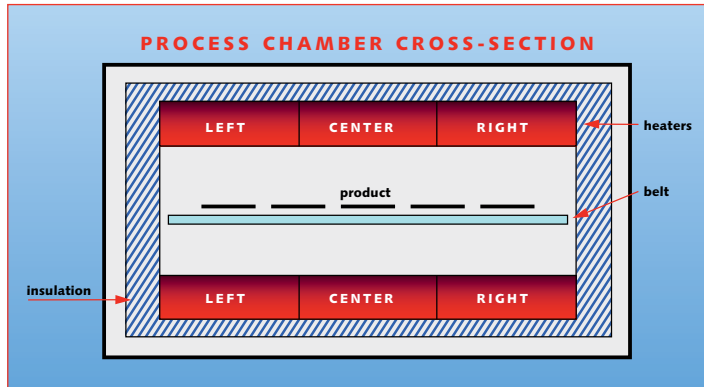


BTU Technology

Temperature Control

BTU's muffle furnaces maintain temperature uniformity by utilizing automated thermal controls and segmented programmed and controlled by the WINCON™ system software.

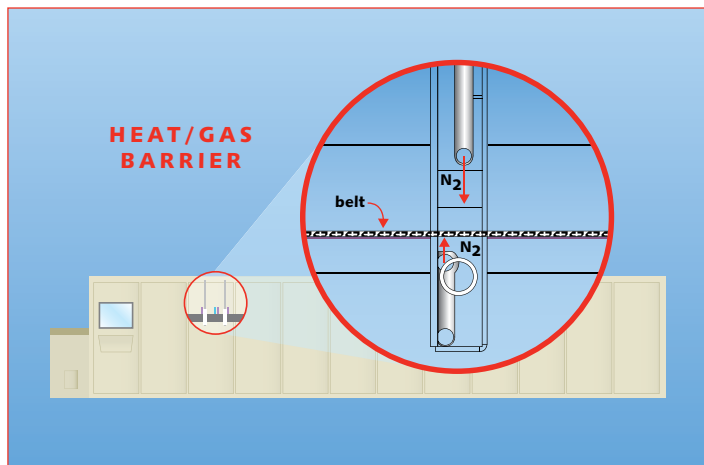
- Equipped with top and bottom heaters (side heaters optional)
- $\pm 2^{\circ}\text{C}$ across belt uniformity typical



Atmosphere Control

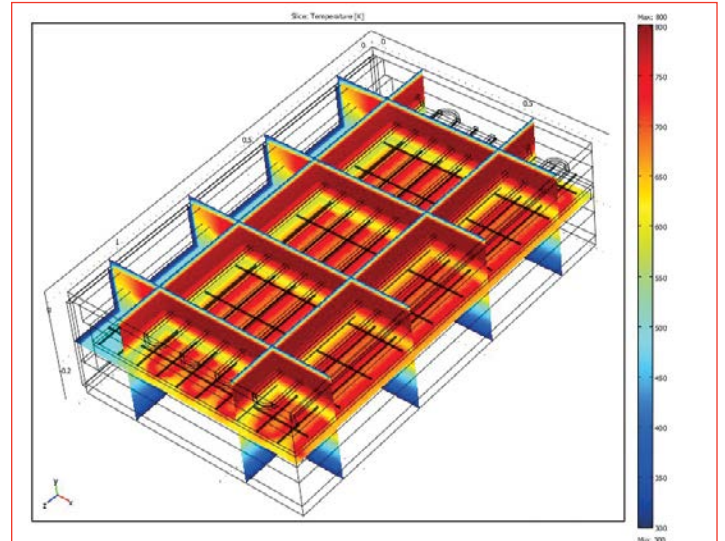
The Controlled Atmosphere Furnace from BTU features precise atmosphere controls to monitor critical parameters within the process chamber. The gas control panel is designed to operate in a safe/ failsafe manner while minimizing operator intervention.

- Achieves O_2 and moisture levels of $< 2\text{ppm}$ and H_2 purity of 95%
- Optional gas barriers provide isolation of gases for maximum atmosphere control
- Monitoring devices for flow and pressure confirm adequate gas supply
- Gas safety system monitors ignitors to ensure spent process gas is combusted prior to entering the atmosphere (Hydrogen or reducing atmosphere)



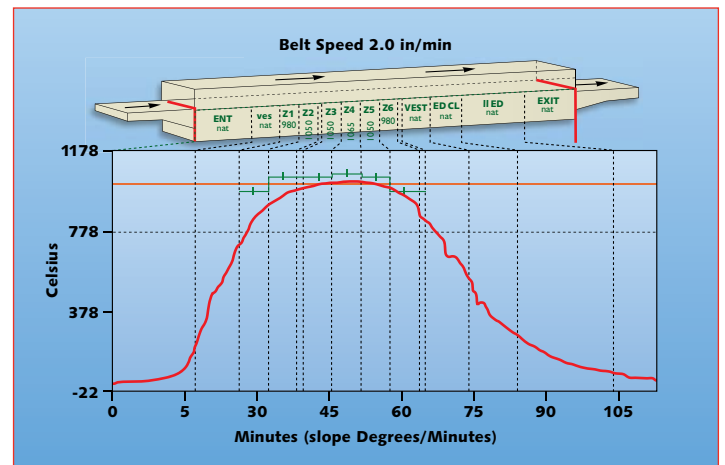
Advanced Analytical/Modeling Capabilities

BTU's experienced team of engineers employs the latest technology in system design including CAD, Finite Element Analysis, and Computational Fluid Dynamics. These advanced techniques accelerate the development process while reducing errors and variation in design. In partnership with customers, these tools can be used to analyze and solve the most complex thermal processing challenges resulting in the world's best performing continuous furnaces.



Applications Support/Process Development

BTU International has advanced process applications labs in both the USA and China. Staffed by expert process engineers, the labs boast an impressive array of equipment including a wet lab and metrology. These labs, near Boston, Massachusetts in the USA, and Shanghai in China, are available for both demonstration and process development work including batch-to-inline conversions.



Typical specifications represent common configurations, all furnaces are fully customizable

Controlled Atmosphere Furnace

Standard Features

- 1180°C maximum temperature rating
- Air/Nitrogen/Hydrogen capable
- FEC (fully enclosed coil) heaters formed into ceramic insulation panels
- Water cooling
- Gas tight muffle
- Cross belt temperature of $\pm 2^\circ\text{C}$ for belt widths up to 36 inches
- Independent over temperature control in each zone
- WINCON Multi-Language Control Software
- Closed loop belt speed control
- Atmosphere safety NFPA 86C compliant

Options

- Heat/gas barriers to isolate gases
- Eductors for heating or cooling
- Venturi controlled exhaust stacks
- Atmosphere analyzer and sample systems
- Gas saturators for dew point control
- $\pm 1^\circ\text{C}$ across belt uniformity (pre-test qualification)

Typical Specification*

Typical Specification*	Electronic Brazing TCA 6 inch	Glass to Metal Seal TCA 14 inch
Atmosphere	Nitrogen or Hydrogen	Nitrogen or Hydrogen
Atmosphere purity**	2 ppm O ₂ and moisture	2 ppm O ₂ and moisture
Conveyor width	6 in (15 cm)	14 in (36 cm)
Heated length	72 in (183 cm)	120 in (305 cm)
Heated zones	6	10
Conveyor speed	1-6 in/min	1-6 in/min
Cooling length	60 in (152 cm)	84 in (213 cm)

* All specifications are subject to change without notice. Additional configurations available to meet your exact process requirements.
**Less than background supply.



Dryers Convection | IR

Typical Specification*

Temperature Rating	400°C
Operating Temperature	100-350°C
Atmosphere	Air or Nitrogen
Throughput	Scalable
Conveyor Width	9-48 in (230-1220 mm)
Conveyor Type	Mesh Belt - Edge or Standoff Support available
Conveyor Speed	5-30 in/min (12.7-76 cm/min)
Available Furnace Length	8-138 ft (2.5-42 m)

* All specifications are subject to change without notice. Additional configurations available to meet your exact process requirements.

Standard Features

- Air cooling
- Closed-loop belt speed control
- Sealing layers
- WINCON Multi-Language Control Software

Options

- Water cooling
- Closed-loop convection control
- Ultrasonic belt cleaner

Fast Fire Furnace

Standard Features

- 1180°C maximum temperature
- Independent over temperature control for each zone
- Type N thermocouple standard
- Unlimited recipe storage and scheduling
- WINCON Multi-Language Control Software
- Closed-loop belt speed control
- Active cooling
- Full atmosphere distribution across belt
- Voltage 208-240 VAC other voltage configurations available

Options

- Air purification/drying
- KBP (Platinel II) thermocouples
- Ultrasonic belt cleaner
- Water cooling
- N2 atmosphere
- $\pm 1^\circ\text{C}$ across belt uniformity setup and test
- Thermostatic water cooling temperature control
- 480 volt operation



Typical Specification*	Fast Fire 9 inch	Fast Fire 14 inch	Fast Fire 25 inch
Atmosphere	Air	Air	Air
Conveyor speed	1-6 in/min	1-6 in/min	1-6 in/min
Conveyor width	9 in (23 cm)	14 in (36 cm)	15 in (64 cm)
Heated length	90 in (229 cm)	126 in (320 cm)	126 in (320 cm)
Heated zones	8	7	7
Cooling length	24 in (61 cm)	48 in (122 cm)	48 in (122 cm)

* All specifications are subject to change without notice. Additional configurations available to meet your exact process requirements.

Pusher Furnace

Options

- Gas analyzers
- Hygrometer
- Gas sampling
- Gas saturators
- Flame curtains
- Purge chambers
- Debinder furnace
- Shadow walls
- Eductor convection heating
- Eductor convection cooling
- PLC control system
- Spare parts kit
- Mullite hearth plates for thermal shock resistance (cooling)

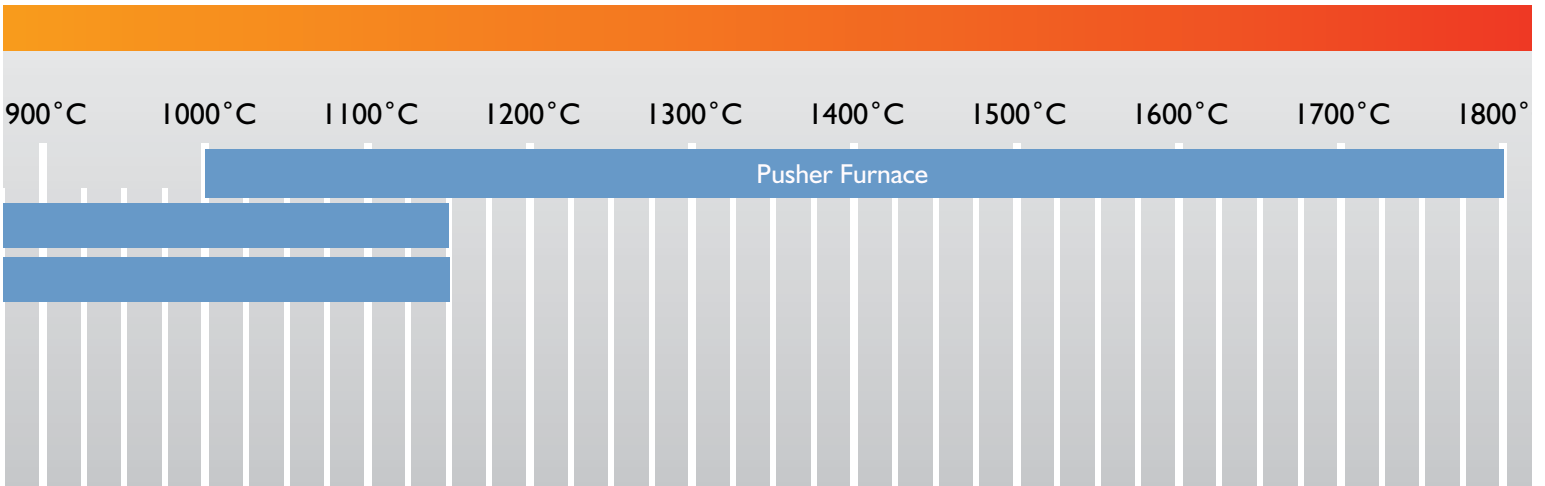
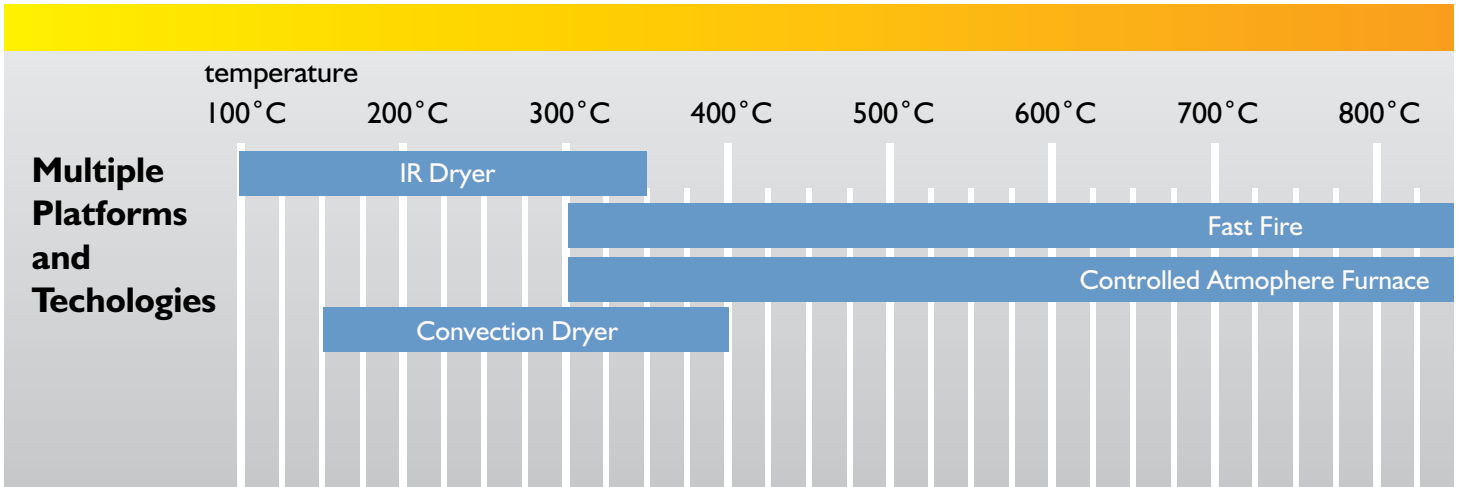
Standard Features

- Custom zone configuration
- Alumina hearth plates (heating)
- WINCON control system
- Over temperature protection
- Drive speed control
- Electronic shear pin
- Jam detection
- Ball-screw drive



Heater Type	Molybdenum Ribbon	Molydisilicide	Silicon Carbide
Atmosphere	Hydrogen	Air	Air
Max. Operating Temp.	1800°C	1700°C	1550°C
Process Chamber Liner	AlO3	AlO3	AlO3
Applications	Multi-Layer Ceramics, Nuclear Fuel	Fuel Cells, Membrane	Fuel Cells, Battery
Processes	High Temperature Reduction	Ultra-pure Applications	General Firing

* All specifications are subject to change without notice. Additional configurations available to meet your exact process requirements.



Global Strength

BTU provides world-class service and customer support in over 30 countries around the globe.



- ★ BTU Production and Engineering Facilities
- BTU Regional Locations
- BTU Representatives

- 24/7 Worldwide Customer Support
- Manufacturing and Engineering in the US and China
- Process Applications Laboratories in the US and China
- Multiple Global Training Locations

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