

## EVERY FURNACE IS SPECIAL



# L&L SPECIALIZES IN:

- PRECISION FURNACES & OVENS
- HIGH UNIFORMITY
- BATCH SYSTEMS
- ATMOSPHERE CONTROL
- HEAT TREATING FURNACES
- GAS & ELECTRIC FURNACES



MODEL CBB96 PIT CARBONITRIDING FURNACE

L&L Special Furnace Co., Inc. has developed a long-standing reputation for designing special furnaces, ovens, kilns, quench tanks and heat treating systems. All manufacturing and engineering is done in-house from one location just south of Philadelphia. L&L sells and services its equipment all over the world, offering startup as well as repair services. An extensive parts department provides quick response. Great care and attention is given to instructions, wiring diagrams, assembly drawings and support information. L&L continually updates its product offerings and improves quality. A reputation for sophisticated engineering, quality workmanship and professional service has resulted in an extensive and growing base of satisfied customers, many of them larger and very particular clients.



## CONTINUOUS IMPROVEMENT

L&L continually updates its product offerings and improves quality. A reputation for sophisticated engineering, quality workmanship and professional service has resulted in an extensive and growing base of satisfied customers, many of them larger and very particular clients.

## CUSTOM FURNACES AT STANDARD PRICES

A major commitment at L&L is to offer a furnace tailored to the special needs of each customer at a reasonable price. We do this by providing a wide range of standardized options that keep our deployment costs down.

## EXCELLENT CUSTOMER SUPPORT

An extensive parts department offers quick response. Great care and attention is given to instructions, wiring diagrams, assembly drawings and support information.

## WORLDWIDE SERVICE

Although L&L designs for easy in-house startup and maintenance, worldwide factory service and startup assistance is always available, and is sometimes recommended.

## FOR MORE INFORMATION

Visit [www.lfurnace.com](http://www.lfurnace.com) and download PDF files of all of our Product Bulletins plus on-line RFQs and more technical information.

## OPTIONS

### A Wide Range of Options Customize the Furnace or Oven for Your Specific Application

Some of our most widely used accessories include:

#### HIGH UNIFORMITY OPTIONS

- HIGH TEMPERATURE FANS
- MULTI-ZONING

#### ATMOSPHERE OPTIONS

- ATMOSPHERE SEALED CASE WITH FLOWMETER / REGULATOR
- COMBUSTIBLE ATMOSPHERE OPTIONS
- ALLOY MUFFLES & BETWEEN MUFFLES & RETORTS

#### HEARTHES & LOAD SYSTEMS

- SILICON CARBIDE HEARTHES
- ALLOY HEARTHES
- ROLLER HEARTHES AND TRAYS
- CASTABLE PIERS

#### DOOR OPTIONS

- COUNTERBALANCED VERTICAL DOORS

Manual, pneumatic and electric operation

#### VENTURI SYSTEMS

- MOTOR DRIVEN VENTURI SYSTEMS

For fast cooling. 300, 600, 1200 CFM capacity

## MARKETS

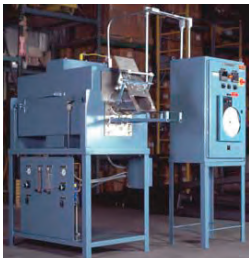
### L&L serves customers who manufacture products to many types of markets worldwide. Some of these include:

- Aerospace
- MRO Maintenance, Repair & Overhaul
- Automotive
- Ceramics
- Glass
- Optics
- Heat Treating, Ferrous and Non-Ferrous
- Magnetics
- Medical Devices
- Dental
- Power Generation
- Superconductors
- Tool & Die
- Precision Technology
- Research, Science & Development

## PROCESSES

### L&L excels at providing solutions for our customers. Some processes that we have developed solutions for include:

- Tool Steel Hardening
- Tool Steel Tempering
- Aluminum Age Hardening (Aging)
- Aluminum Precipitation Hardening
- Aluminum Solution Annealing
- Annealing & Stress Relieving
- Forging
- Heat Treating Magnetic Steel
- Weldment Preheat
- Atmosphere Treating
- Inert
- Neutral Hardening
- Hydrogen
- Brazing
- Bright Annealing
- Glass processing
- Slumping
- Annealing
- Fusing
- Coatings
- Ceramic
- Titanium
- Sintering
- Powdered Metal
- Ceramic
- Dental Powders
- Curing Ovens
- Burn-Off
- Drying
- Laminations
- High Temperature
- Ceramic Processing
- Ceramic Armor
- Ceramic Components
- Ceramic Lasers
- Precious Metal Processing
- Casting
- Recovery
- Assay
- Forging
- Quenching
- Agitated Quench Tanks
- Integral Quench Furnaces



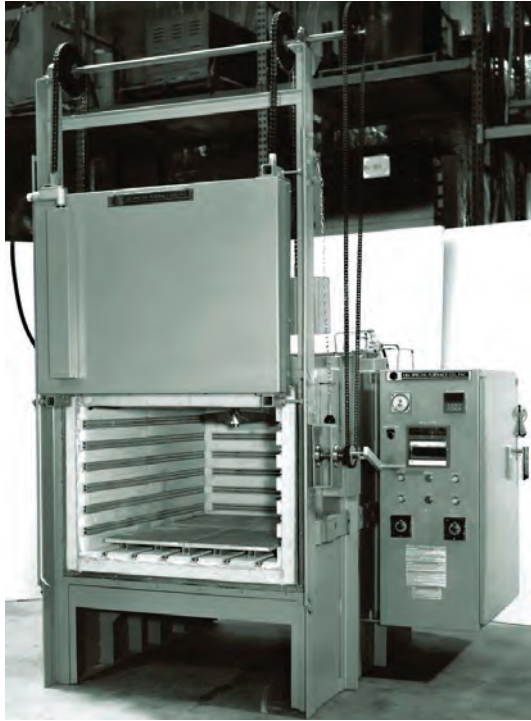
Model PFT 412 inert Atmosphere Pusher Furnace

Model IQV 1224 Vertical Integral Quench Furnace

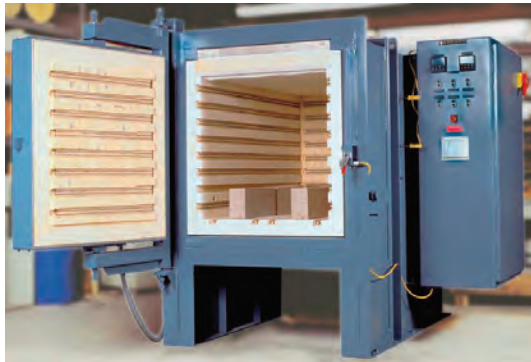


## LARGE AND MEDIUM SIZED ELECTRIC BOX FURNACES

Many Options Make L&L Electric Box Furnaces Highly Configurable for Tailoring to Customers' Exact Requirements at a Reasonable Cost



This XLE 3648 features a hand-crank operated vertical door, NEMA 12 control panel, high temperature fan and strip chart recorder.



This is a typical XLE 246 with cast piers and a standard double pivoted horizontal door.

## XLE SERIES

### Firebrick Lined 2350°F Electric Box Furnaces

The XLE Series Electric Box Furnaces are highly uniform, controllable and widely adaptable to many applications. In the heat treating field these include hardening, neutral hardening, solution heat treating, stress relieving, annealing, aging, precipitation hardening and tempering. Ceramic applications include ceramic bisque firing, thin film processing, glazing and decorating. Other applications include brazing, calcining, drying, melting of glass and metals, glass annealing, fusing and bending, enameling and sintering. Although standard configurations are made, each furnace is normally fitted with both standard and special options to suit specific needs. These include vertical doors, fans, cooling venturis, vents, special hearths, racks, baskets and loading devices, quenching systems, various controlled atmospheres, retorts, viewing ports, special element alloys, special thermocouples, various kinds of alarms, program controls and recorders.

### XLE OPTIONS

- **VERTICAL DOORS:** Pneumatic, hand-crank or electric gear drive operated. Door is counterbalanced. Special safety latches can be supplied.
- **PROGRAM CONTROLS:** Any make. Multi-program controls. Computer interfaced controls with communications.
- **MULTIPLE HEATING ZONES:** For the utmost in temperature uniformity, L&L couples its unique even element design with multi-zoning (four to sixteen in an XLE furnace).
- **FANS:** Various fans for temperatures up to 2200°F for high uniformity and even atmosphere distribution. Motors are air cooled up to 1875°F.
- **TEMPERATURE RECORDERS:** Round chart, strip chart, paperless recorders as well as dataloggers (like the HC900) are available.
- **SCR POWER CONTROLS:** These make control finer, with less cycling.
- **ATMOSPHERE CONTROL:** The case is sealed for inert atmospheres. Atmosphere panels with manual or automatic shut off systems are available. Up to 4% hydrogen or other combustible gas can be used.
- **MANY OTHER OPTIONS:** NEMA 12 panels, various hearths and loading systems, vents, view ports, etc. are available.



This Model FB 454 features a pneumatically operated vertical door with a NEMA 12 control panel and a 2000 pound hydraulic loader.



This is a modified Model FB 4410 with bottom heating elements and a pneumatically operated vertical door.

## FB SERIES

### Large Ceramic Fiber Lined Electric Box Furnaces Up To 2200°F

The FB Series Electric Box Furnaces are large, general-purpose ceramic fiber lined furnaces. They achieve high precision by featuring highly accurate digital controls, solid-state contactors for fast cycle times, two zone control (top and bottom) and even spacing of elements. They reach temperatures up to 2200°F (1200°C) with 2600°F (1425°C) fiber and up to 2000°F (1095°C) with 2300°F (1260°C) fiber. The insulation is all ceramic fiber, except for hearth and hearth support. They are available in standard sizes up to eight feet cubed and even larger in custom sizes.

### TYPICAL FB FEATURES

- HIGH TEMPERATURE UNIFORMITY
- EVEN ELEMENT PLACEMENT
- ZONE CONTROL FOR HIGH UNIFORMITY
- CERAMIC ELEMENT HOLDERS
- CERAMIC FIBER INSULATION FEATURES FAST HEAT UP AND COOL DOWN

### FB OPTIONS

- **VERTICAL DOORS:** Pneumatic, hand-crank or electric gear drive operated. The door is counterbalanced. Special safety latches can be supplied.
- **PROGRAM CONTROLS:** Any make. Multi-program controls. Computer interfaced controls with communications.
- **MULTIPLE HEATING ZONES:** For the utmost in temperature uniformity, L&L couples its unique even element design with multi-zoning.
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- **MANY OTHER OPTIONS:** NEMA 12 panels, various hearths and loading systems, vents, view ports, etc. are available.

## STANDARD FURNACES

L&L Designs, Builds and Sells Many Standard Furnaces for General Heat Treating

A Small Sample of These are Described Below:



### GS 1714

#### 2350°F Laboratory, Glass & Heat Treating Bench Furnace

The GS 1714 Bench Furnace is an excellent general-purpose, inexpensive laboratory grade box furnace. The spring-loaded vertical door makes loading and unloading effortless. Elements are located uniformly around the sides, top and bottom. A sophisticated program control allows up to six programs to be stored. Standardized production makes the price and value of this furnace remarkable. It can be used for heat treating, tempering, annealing, solution heat treating, glass fusing, glass and quartz annealing, ceramics, enameling and many other applications.

#### GS 1714 SPECIFICATIONS

Internal Dimensions: 17" w X 12" h X 14-1/2" d

Hearth Dimensions: 16" w X 13" d

Outside Dimensions: 26" w X 32" h X 34" d

Height with Door Open: 45" h

Max Load Weight: 125 pounds

Shipping Weight: 475 pounds

240 Vac Elec: 6000 Watts, 25.0 Amps



### QD 29

#### Small Economical Dual Chamber Hardening/Tempering Furnace

The QD 29 Dual Chamber Heat Treating furnace features a 2275°F (1245°C) high heat chamber for hardening and a 1250°F (675°C) recirculating oven for tempering. The over/under configuration saves floor space. The hardening furnace is mounted on top, with the tempering oven below. A roll away quench tank is optional. Controls are digital. The tempering oven features a fan and recirculation muffle for high uniformity. This is the most economical dual chamber furnace in the QD line. It is a good basic all-purpose heat treating system.

#### QD 29 SPECIFICATIONS

Internal Dimensions: 12" w X 8" h X 24" d - Hardening Chamber

Hearth Dimensions: 11" w X 22" d

Tempering Chamber Inside Muffle Dimensions: 10" w x 8" h x 20" d

Outside Dimensions: 55" w X 70" h X 56" d

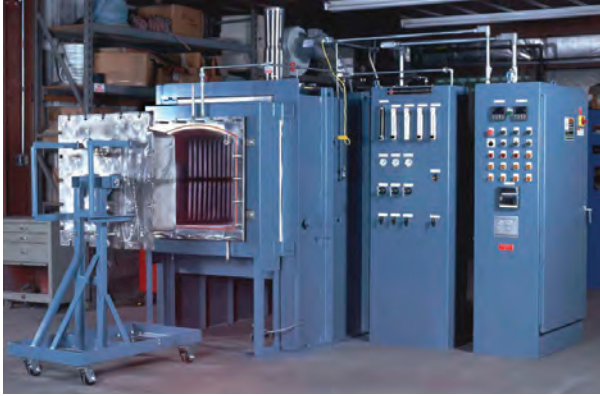
Max Load Weight: 100 pounds

Shipping Weight: 1200 pounds

16,000 Watts, 70 Amps @ 240 V / 1 Phase

## CONTROLLED ATMOSPHERE FURNACES

Furnaces with Inert Atmosphere Capability, Neutral Hardening, Hydrogen Atmosphere Retorts and Many Other Possibilities are Available



Model XLC246 Hydrogen Retort Furnace

## XLC SERIES

### Alloy Retort Furnaces (for Hydrogen and Low Dew Point Inert Atmospheres)

The XLC Series Atmosphere Retort Furnaces represent an advanced design that emphasizes process quality and control as well as operator safety. The control system, alloy retort and flow system are completely integrated as one unified array. Any application requiring 100% hydrogen or a mix of hydrogen, carbon monoxide, natural gas or any other combustible atmosphere (as well as any purely inert atmospheres) may be used in the XLC Series. Hydrogen brazing, magnetic steel processing, special coatings and stainless steel annealing are typical examples. Any batch process that cannot tolerate oxygen or that requires a high degree of atmosphere reliability, repeatability and low dew point is a candidate for this furnace. The maximum temperature is 2200°F (1200°C) with Inconel retorts. Depending on the purity of the gas used, these furnaces can maintain a dew point as low as -60°F (-50°C).



Model XLFS 246 Inert Atmosphere Furnace

## XLFS SERIES

### Inert Atmosphere Furnace with Low Mass Ceramic Fiber Insulation for Quick Heat/Cool Cycles and Precise Uniformity

Zones are controlled by a Honeywell HC900 Hybrid Logic Controller with multiple independent PID loops of control. The maximum temperature is 2200°F (1200°C) with ceramic fiber hard board rated for 2600°F.

### OTHER ATMOSPHERE FURNACE TYPES

- **FN SERIES:** Atmosphere Box Furnaces with Certifiable Uniformity of  $\pm 5^\circ\text{F}$  from 300°F to 2200°F
- **CBH 124:** Atmosphere Controlled Neutral Hardening Tool Room Furnace
- **JSC SERIES:** Vertical Lift Bell Shuttle Retort Furnaces
- **MOST STANDARD L&L BOX FURNACES CAN BE FITTED WITH SEALS FOR INERT ATMOSPHERE CONTROL**

The XLFS Series Inert Atmosphere Furnaces feature low mass insulation packages for quick heat up and cool down cycles. These are very precise ( $\pm 10^\circ\text{F}$  is the typical chamber uniformity).



Model DR 3648 Oven with pneumatic vertical door.

## DV/DR SERIES TEMPERING OVENS

### 1300°F Floor Standing Batch Tempering & Annealing Ovens (Gas or Electric)

The DV and DR Series Floor Standing Recirculating Heat Treating Ovens feature high-volume air recirculation for high temperature uniformity, a stainless steel interior and plenum chamber, and a precision digital control system. They are designed for heavy-duty production heat treating applications such as tempering, annealing and solution heat treating, although they have many other uses. They are rated to 1300°F (700°C); 1400°F (760°C) is optional. Horizontal doors (DV Series) or vertical doors (DR Series) are available. They are offered in electric or gas fired versions.



Model QT 1824 Quench Tank

## QT SERIES QUENCH TANKS

### Agitated and Heated Heavy-Duty Quench Tanks

The QT Series Quench Tanks are used for uniform quenching of hot steels. They may be used with water, lightweight polymer or oil. They are not designed for use with brine. Water or polymer must have rust inhibitors (or tank must be stainless steel). They feature proper agitation, which ensures uniform quench temperatures and disperses the bubbles of vaporized quenchant that form on the surface of the hot parts being quenched. These bubbles, if not dispersed, can cause uneven quenching times, which would result in an unevenly and poorly quenched part. The agitation also prevents localized overheating, which, in the case of oil quench media, could cause a fire. The QT Series Quench Tanks also include integrated controlled heaters and large inlet and outlet taps for optional cooling systems. An optional hinged lid provides a means to extinguish any potential quench oil fires and keep quench media clean.

### OTHER AVAILABLE FURNACE TYPES

- GL, GLF, GF SERIES: High Temp Silicon Carbide Element Furnaces
- GHE, GHH SERIES: Very High Temp Molybdenum Disilicide Element Furnaces
- XLM, XLG SERIES: Gas Fired Furnaces
- TB, TBU SERIES: Electric Tube Furnaces
- WB, WQ SERIES: Electric Bell-Lift Furnaces

VISIT OUR WEBSITE AT [LLFURNACE.COM](http://LLFURNACE.COM) FOR OUR FULL LINE OF EQUIPMENT



L&L Special Furnace Company, Inc.