



TORONTECH



## INDUSTRIAL & LABORATORY FURNACES

# Industrial & Laboratory Furnaces

## ***The ToronTherm™ Series — Precision Thermal Processing up to 1800 °C***

Industrial and Laboratory Furnaces are precision thermal-processing systems that deliver controlled high-temperature environments for heat treatment, sintering, annealing, ashing, calcination, and the synthesis of advanced materials. From compact benchtop muffle furnaces for routine laboratory testing to large bogie-hearth furnaces designed for heavy industrial components, the right furnace is the foundation of consistent metallurgical, ceramic, semiconductor, and materials-science results.

Torontech proudly presents the ToronTherm™ Series — a comprehensive line of advanced electric resistance furnaces engineered for laboratories, research institutes, and industrial operations worldwide. The series spans tube furnaces (single-zone through multi-zone, rotary, vertical, CVD, hydrogen-reduction, and large-diameter variants), muffle furnaces (up to 1800 °C), industrial chamber furnaces (up to 1700 °C), vacuum and atmosphere furnaces, bogie-hearth and lifting furnaces, and dedicated controlled-atmosphere furnaces. Every ToronTherm™ unit features programmable PID control, premium heating elements (HRE resistance wire, MoSi<sub>2</sub>, SiC), N-type or B-type thermocouples for  $\pm 1$  °C precision, multi-layer asbestos-free insulation, integrated safety interlocks, and ISO/CE/SGS/TÜV-aligned compliance — delivering reliable, repeatable thermal performance for the most demanding applications.

## **Power Your Process with Precision Heat**

In modern materials science and industrial manufacturing, the quality of your final product is determined by the quality of the thermal cycle that produced it. A drifting setpoint, an uneven temperature profile, or a contaminated atmosphere can ruin a batch of advanced ceramics, fail a heat-treated component, or compromise months of research. The laboratories and production facilities that consistently deliver world-class results are the ones equipped with furnaces built for precision,

reliability, and uncompromising safety — and the Torontech ToronTherm™ Series gives you exactly that.

Whether you are sintering next-generation nanomaterials, heat-treating heavy industrial forgings, processing semiconductor wafers, or running routine ashing in a busy QC lab, Torontech has the furnace platform engineered to meet your exact needs. Equip your laboratory or production facility with the thermal-processing platform trusted by materials scientists, metallurgists, and process engineers worldwide.

## APPLICATIONS

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### Applications in Industries

- **Materials Science & R&D** — Synthesis and sintering of advanced ceramics, composites, nanomaterials, and functional materials for energy, catalysis, and electronics research.
- **Metallurgy & Heat Treatment** — Annealing, hardening, tempering, stress relief, and microstructural development of steels, alloys, and powder-metallurgy components.
- **Semiconductor & Electronics** — Annealing, diffusion, thermal oxidation, and CVD processes for semiconductor substrates, thin films, and microelectronic devices.
- **Aerospace & Defense** — High-temperature processing of aerospace alloys, refractory metals, ceramics, and composites for safety-critical applications.
- **Petrochemical & Chemical Labs** — Catalyst activation, pyrolysis, thermal decomposition, ashing, and gravimetric analysis under precise temperature control.
- **Energy & Battery Research** — Thermal processing of cathode, anode, and electrolyte materials for lithium-ion, solid-state, and next-generation battery systems.
- **Universities & Research Institutes** — Teaching laboratories, graduate research, and method development across chemistry, physics, materials science, and engineering.

## FEATURES

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### Why Choose Torontech for Your Furnace Needs

With more than two decades of experience supplying advanced thermal-processing equipment to laboratories and industrial facilities across more than 60 countries, Torontech delivers premium furnace performance backed by global expertise.

#### Comprehensive Single-Source Portfolio

From compact mini muffle furnaces to large bogie-hearth and vacuum-atmosphere systems, Torontech's ToronTherm™ Series covers every thermal-processing need — simplifying procurement, training, and service across your entire lab or production line.

#### Precision Control & Premium Components

Every ToronTherm™ furnace combines programmable PID + SCR temperature control with premium heating elements (HRE resistance wire, MoSi<sub>2</sub>, SiC), N-type or B-type thermocouples for  $\pm 1$  °C precision, and advanced controllers supporting up to 30 programmable thermal segments — delivering the repeatable accuracy that demanding applications require.

#### Engineered for Safety

Built-in door safety switches, over-temperature alarms, fault alarms, automatic safety shutdown, asbestos-free multi-layer insulation, and electrostatic corrosion-resistant external coatings protect both operators and samples throughout every thermal cycle.

#### Global Standards Compliance

Every Torontech furnace is fully aligned with ISO, CE, SGS, and TÜV standards — ensuring your thermal-processing data is universally accepted, audit-ready, and defensible in customer certifications and regulatory reviews.

**Cost-Effective Value & Global Support**

Torontech delivers premium thermal-processing performance at a transparent, competitive price point. With offices and authorized partners across the USA, Canada, UAE, KSA, GCC, EU, India, APAC, Africa, and Latin America, expert installation, training, and service are always within reach.

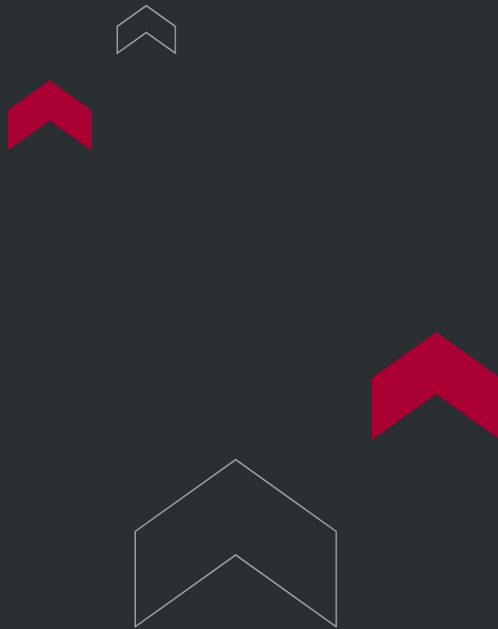
**TECHNICAL SPECIFICATIONS**

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**Product Comparison Table**

| Furnace Type    | Max Temp.     | Key Features                                                                                                                                                            | Typical Applications                                                                                             |
|-----------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Tube Furnaces   | Up to 1800 °C | Single-zone, 2-zone, 3-zone, multi-zone, rotary, vertical, CVD, hydrogen-reduction, large-diameter — under oxidizing, reducing, or inert atmospheres                    | Material synthesis, sintering, calcination, annealing, CVD, crystal growth, nanomaterials, thermal decomposition |
| Muffle Furnaces | Up to 1800 °C | Programmable PID + SCR control, N-type or B-type thermocouple, ±1 °C precision, multi-side heating, integrated door safety switch, asbestos-free multi-layer insulation | Ashing, gravimetric analysis, ceramic sintering, materials testing, QC, heat treatment of small samples          |

|                                          |                                               |                                                                                                                                  |                                                                                                                    |
|------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Industrial (Chamber) Furnaces</b>     | Up to 1700 °C                                 | Robust heavy-duty construction, large chamber volume, batch processing, programmable thermal cycles, industrial-grade insulation | Heavy heat treatment, batch processing, large-component sintering, annealing in production environments            |
| <b>Vacuum &amp; Atmosphere Furnaces</b>  | High-temp under vacuum / inert / reducing gas | Vacuum chamber, controlled gas environment, prevents oxidation/contamination, precision atmosphere control                       | Sintering of reactive/oxidation-sensitive materials, brazing, advanced ceramics, semiconductors, refractory metals |
| <b>Bogie-Hearth Furnaces</b>             | High-temp industrial                          | Movable hearth (bogie) for loading heavy parts, large workspace, heavy-duty construction                                         | Heat treatment of heavy/large industrial components, forgings, castings, large metal assemblies                    |
| <b>Lifting (Bottom-Loading) Furnaces</b> | High-temp                                     | Bottom-loading hearth lifts into chamber for excellent thermal uniformity, high thermal stability, easy sample access            | Precision heat treatment, sintering of advanced ceramics, applications needing top thermal uniformity              |
| <b>Atmosphere Furnaces</b>               | High-temp under controlled atmosphere         | Sealed chamber for inert, reducing, or oxidizing gas; precise gas flow control; programmable thermal profiles                    | Heat treatment of metals/alloys, sintering of metal powders, brazing, processes requiring controlled atmospheres   |



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