TORONTECH

LABORATORY DRYING OVEN

Laboratory Drying Oven — ToronOVEN™ L Series

ToronOVEN™ L is a precision laboratory drying oven engineered for research, quality control, and industrial testing environments that require accurate, programmable high-temperature processing up to 300°C. Combining the BRIGHT II intelligent control system with a 5-inch color touchscreen, 30-segment/99-cycle programmable profiles, and a 4-million-data internal storage capacity, this drying oven delivers the thermal precision and data traceability that regulated laboratory workflows demand.

Available in four chamber volumes (65 L, 130 L, 280 L, and 450 L) the ToronOVEN™ L series gives laboratories a scalable selection of blast drying ovens that covers compact benchtop applications through large-capacity institutional requirements. Temperature fluctuation is held to ±0.3°C on the two smaller models and ±0.5°C on the larger configurations, both measured at 150°C — performance that reflects the preheating chamber architecture and BRIGHT II adaptive control working in combination. All data is stored in a tamper-evident, non-modifiable file format and exportable via USB drive, supporting audit trail requirements in regulated testing environments.

The rotary two-stage locking structure secures the chamber door with a positive mechanical engagement that goes beyond a standard single-latch design, maintaining consistent door sealing across extended high-temperature cycles. Two RS-485 interfaces and one USB port support integration with external data systems and laboratory networks. With optional inlet and outlet air filtration, GPRS SMS alarm notification, online monitoring platform access, and an embedded printer, the ToronOVEN™ L is configurable for a wide range of laboratory and industrial drying oven applications.

APPLICATIONS

Laboratory Drying Oven — ToronOVEN™ L Series Applications

The ToronOVEN™ L serves a broad range of laboratory, pharmaceutical, industrial, and research environments where precise, programmable high-temperature drying, heating, and thermal processing are required:

- Sample Drying and Moisture Determination: removal of moisture from soil, food, pharmaceutical, and material samples for gravimetric analysis and loss-on-drying testing in regulated laboratory drying oven workflows
- Sterilization and Dry Heat Processing: dry heat sterilization of glassware, metal instruments, and heat-stable laboratory consumables at defined time-temperature profiles
- Pharmaceutical QC and Stability Testing: accelerated thermal stability studies, excipient drying, and in-process drying steps for solid dosage form manufacturing and quality control
- Materials Testing and Aging Studies: thermal aging, annealing, and heat treatment of polymers, composites, rubber, and electronic components at controlled temperatures up to 300°C
- Food Science and Quality Control: moisture content determination, baking trials, and thermal processing validation in food manufacturing QC laboratories
- Electronic Component Testing: burn-in testing, solder curing, and thermal endurance validation of PCBs, connectors, and electronic assemblies
- Research and Academic Laboratories: general-purpose blast drying oven applications for chemistry, materials science, biology, and engineering research programs
- Industrial and Manufacturing QC: process validation, product conditioning, and thermal treatment of manufactured parts requiring precise, repeatable temperature-time profiles

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FEATURES

Laboratory Drying Oven — ToronOVEN™ L Series Key Features

Control System and Interface

- 5-inch color touchscreen for intuitive parameter entry and real-time display of temperature, program status, and operational data
- BRIGHT II intelligent control system with automatic ambient environmental parameter compensation
- Programmable multi-segment design: 30 segments per cycle, 99 repeatable cycles for complex thermal profile processing
- Reservation function for scheduled delayed-start operation

Data Management and Connectivity

- Internal storage capacity of 4 million data points in a non-modifiable, tamper-evident file format for audit trail integrity
- USB interface for data export to USB drive with timestamped data files
- Two RS-485 interfaces for integration with LIMS, data acquisition systems, and laboratory monitoring networks
- Real-time temperature curves and alarm recording history viewable directly on-screen
- Multi-level password management for access control in shared or regulated environments

Heating and Temperature Performance

- Temperature operating range: RT+5°C to 300°C
- Temperature fluctuation at 150°C: ±0.3°C (65 L and 130 L); ±0.5°C (280 L and 450 L)
- Temperature uniformity at 150°C: ±1.9°C to ±2.5°C depending on model

- Preheating chamber design for rapid heat-up to 150°C in 17–22 minutes
- Temperature recovery after 30-second door opening at 150°C: 7–9 minutes depending on model

Airflow and Exhaust Management

- 6-stage fan speed regulation for adjustable forced-convection air distribution — a true blast drying oven configuration
- 10-segment electric exhaust outlet control for independent management of internal atmosphere and moisture removal rate

Chamber and Physical Design

- Rotary two-stage locking door structure for consistent, positive chamber sealing at high operating temperatures
- Adjustable shelving with 25 kg load capacity per shelf across all models
- Double-door design for clean laboratory applications

Safety and Alarm Systems

- Dual over-temperature alarm protection: primary sensor-controlled alarm circuit plus independent hardware-level temperature control switch as a fully separate backup safety layer
- All alarm events logged and stored in non-modifiable format for documentation and review

Optional Add-Ons

- Embedded printer for on-site hardcopy data record generation
- Online monitoring platform for remote data access and centralized environmental logging
- Inlet and outlet air filter for controlled-atmosphere or cleanroom-adjacent installations
- GPRS SMS alarm for off-site alert notification

THEORY & METHOD

Theory and Method

BRIGHT II Precision Temperature Control

The ToronOVEN™ L operates on the BRIGHT II intelligent control platform, which continuously monitors the internal chamber temperature sensor and modulates output from the electric resistance heating elements to maintain the programmed setpoint. The BRIGHT II system applies adaptive parameter compensation in response to changes in ambient conditions, reducing setpoint drift without requiring manual recalibration. Temperature resolution is 0.1°C. Fluctuation at 150°C is held to ±0.3°C on the 65 L and 130 L models, and ±0.5°C on the 280 L and 450 L configurations — performance that positions the ToronOVEN™ L among the more precise options in the laboratory drying oven category at this temperature range.

Forced Convection and Preheating Architecture

The ToronOVEN™ L is a forced-convection blast drying oven, using a 6-stage adjustable fan to circulate heated air uniformly throughout the working chamber. This forced-convection design achieves the temperature uniformity specifications listed in the technical data — ±1.9°C to ±2.5°C at 150°C depending on model size — and supports consistent sample treatment whether the chamber is partially or fully loaded. A dedicated preheating chamber accelerates heat-up to 150°C within 17 to 22 minutes and supports temperature recovery following a 30-second door opening within 7 to 9 minutes.

The 10-segment electric exhaust outlet control gives operators independent management of internal atmosphere conditions — adjusting exhaust rate to accelerate moisture removal during drying cycles, manage volatile compound buildup, or maintain a more closed atmosphere for specific thermal processing protocols. This level of exhaust control is a distinguishing feature of the ToronOVEN™ L compared to standard drying ovens with fixed or manually adjusted single-position vents.

Programmable Profiles and Data Management

Test and process profiles are structured as multi-segment sequences supporting up to 30 configurable segments across 99 repeatable cycles. This programmability covers ramp-and-soak heating profiles, step gradients, and multi-phase thermal processing sequences without operator intervention between steps. A reservation function supports delayed-start

scheduling, allowing operators to program a cycle to begin at a specific time without manual intervention at the start point.

All operational data (temperature records, alarm events, and process history) are stored internally in a non-modifiable file format, protecting data integrity against tampering or accidental editing. The system stores up to 4 million data points, sufficient for extended continuous logging programs. Data is exported via USB drive using the onboard USB interface, generating timestamped files for documentation purposes. Real-time temperature curves and alarm records are viewable directly on the 5-inch touchscreen without connecting to an external system. Two RS-485 interfaces support integration with LIMS platforms, data acquisition systems, and online monitoring networks. Multi-level password management controls parameter access across shared or regulated laboratory environments.

Rotary Two-Stage Locking Structure

The ToronOVEN™ L door uses a rotary two-stage locking mechanism — a design that provides a more positive and consistent door seal than standard single-latch closures. At high operating temperatures, door seal integrity directly affects both temperature uniformity and energy efficiency. The two-stage engagement confirms that the door is fully and evenly seated before the locking position is reached, reducing the risk of partial-seal conditions that can cause localized heat loss and uniformity degradation near the door plane.

TECHNICAL SPECIFICATIONS

Laboratory Drying Oven — ToronOVEN™ L Series Technical Specifications

Parameter	ToronOVEN™ L-65	ToronOVEN™ L-130	ToronOVEN™ L-280	ToronOVEN™ L-450
Chamber Volume (L)	65	130	280	450
Voltage	220V ±10V, 50/60 Hz (110V is also available)			
Temp. Range (°C)	RT+5 to 300	RT+5 to 300	RT+5 to 300	RT+5 to 300
Temp. Fluctuation at 150°C (°C)	±0.3	±0.3	±0.5	±0.5

Parameter	ToronOVEN™ L-65	ToronOVEN™ L-130	ToronOVEN™ L-280	ToronOVEN™ L-450
Temp. Uniformity at 150°C (°C)	±2.0	±1.9	±2.2	±2.5
Heat-up Time to 150°C (min)	17	20	20	22
Recovery After 30s Door Open at 150°C (min)	7	8	8	9
Rated Power (kW)	1.5	1.8	2.7	3.5
Internal Dimensions W×D×H (mm)	410×350×450	570×400×570	720×530×745	600×580×1300
External Dimensions W×D×H (mm)	575×615×635	735×665×755	885×795×930	774×845×1575
Number of Shelves (Std./Max.)	2/5	2/7	3/9	4/13
Load per Shelf (kg)	25			
Net Weight (kg)	48	61	93	144
Gross Weight (kg)	69	82	116	173
Package Size (mm)	695×768×787	855×818×907	1005×948×1082	894×1005×1724

TORONTECH.com

TORONTECH

Torontech Inc.
251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC
601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE
Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE

Phone: +971 488 19252
Email: me@torontech.com

USA | Canada | EU | UAE | GCC | KSA | India | Africa | Latin America | Asia