

HIGH TEMPERATURE REFRACTORY INSULATION TESTER



High Temperature Refractory Insulation Tester - ToronFT™ HT-RI

ToronFT™ HT-RI High Temperature Refractory Insulation Tester is a high-temperature precision furnace system designed for evaluating the thermal insulation performance of materials or structural assemblies using the hot air method. Thermal insulation performance testing is critical for qualifying industrial insulation materials, refractory linings, high-temperature protective barriers, and thermal management assemblies used in demanding industrial, metallurgical, and furnace applications.

The ToronFT™ HT-RI features a multi-layer furnace body capable of achieving internal temperatures above 1600°C, with an external surface temperature only slightly above ambient — demonstrating exceptional thermal insulation performance in the furnace structure itself. The system is designed as a non-standard custom instrument, developed and manufactured according to specific technical requirements and test specifications provided by the customer, making it a highly flexible thermal insulation performance testing platform for specialized industrial and research applications.

APPLICATIONS

High Temperature Refractory Insulation Tester - ToronFT™ HT-RI

Applications

The ToronFT™ HT-RI is applicable for hot air method thermal insulation performance testing of:

- Refractory materials and high-temperature insulation boards for industrial furnace and kiln applications
- Ceramic fiber blankets, mineral wool modules, and microporous insulation panels for high-temperature insulation performance characterization

- Structural insulation assemblies and composite thermal barriers for industrial equipment and process vessel applications
- Fire-resistant and thermally protective structural assemblies requiring hot air method insulation performance qualification
- Research and development of new high-temperature insulation materials and system designs for industrial thermal management
- Custom non-standard thermal insulation performance testing for specialized industrial, aerospace, or research applications per customer-defined technical requirements



Standards

The ToronFT™ HT-RI is designed to support the following international standards for thermal insulation performance and refractory material testing:

- ISO 8302: Thermal insulation: Determination of steady-state thermal resistance and related properties — Guarded hot plate apparatus
- ASTM C177: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
- ASTM C1520: Standard Test Method for High-Temperature Thermal Transmission Properties of Refractory Insulating Materials
- EN ISO 10211: Thermal bridges in building construction: Heat flows and surface temperatures — Detailed calculations

FEATURES

High Temperature Refractory Insulation Tester – ToronFT™ HT-RI Key Features

- Multi-layer furnace body construction achieves internal temperatures above 1600°C while maintaining an external surface temperature only slightly above ambient — demonstrating exceptional thermal insulation performance in the test system itself
- Five-layer furnace wall construction for outstanding thermal insulation: (1) lightweight alumina air brick inner layer; (2) 150 mm thick high-temperature insulation cotton; (3) stainless steel shell; (4) air circulation insulation layer; (5) electrostatic painted outer shell
- Dedicated hot surface temperature sensor arrangement frame and cold surface temperature sensor arrangement frame provide accurate, independent temperature measurement on both sides of the specimen for precise insulation performance calculation

- Insulation box cover assembly provides sealing and additional thermal insulation at the furnace opening, maintaining stable hot air temperature conditions during insulation performance tests
- Industrial control system provides automated temperature management, data acquisition, and test sequence control for reproducible hot air method insulation performance testing results
- Frame-type furnace mouth sealing using insulating lightweight alumina air bricks and multi-layer insulating asbestos minimizes heat leakage at the furnace opening, ensuring accurate hot air temperature conditions inside the test chamber
- Non-standard custom instrument design and manufacture: the ToronFT™ HT-RI is developed and built to technical specifications provided by the customer, making it suitable for unique or highly specialized hot air method insulation performance test requirements

THEORY & METHOD

Theory and Method

The hot air method for thermal insulation performance testing measures the steady-state heat transfer through a material or structural assembly when one face is exposed to a high-temperature hot air environment and the other face is maintained at or near ambient temperature. The temperature differential between the hot surface (above 1600°C internal) and the cold surface, combined with the measured heat flux, allows the thermal conductivity, thermal resistance, and overall insulation performance of the material to be calculated.

In the ToronFT™ HT-RI, the test furnace body is a multi-layer structure engineered to achieve the required internal hot air temperature while maintaining minimal external surface temperature — validating both the test furnace's own insulation performance and the thermal insulation performance of the specimen under test. The furnace body layers consist of: (1) lightweight alumina air brick inner lining, (2) 150 mm thick high-temperature insulation cotton, (3) stainless steel outer shell, (4) air circulation insulation layer, and (5) electrostatic painted outer shell. The hot and cold surface temperatures are measured by dedicated temperature sensor arrangement frames — a hot surface sensor frame and a cold surface sensor

frame — providing the data needed for insulation performance calculations. The industrial control system manages the furnace temperature profile, data acquisition, and test sequence.

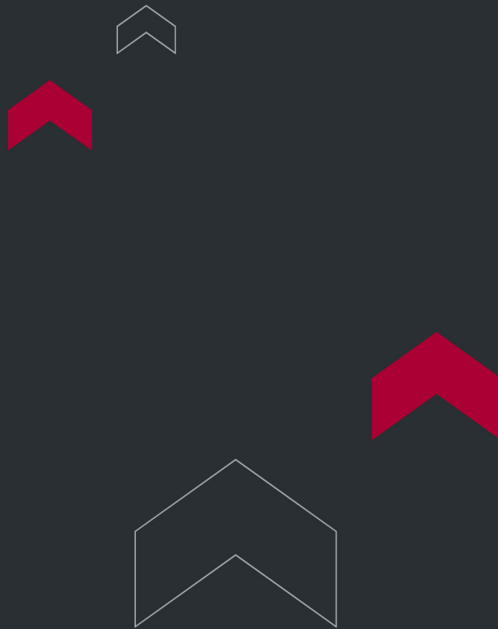
TECHNICAL SPECIFICATIONS

High Temperature Refractory Insulation Tester - ToronFT™ HT-RI

Technical Specifications

Parameter	Specification
Product Name	High Temperature Refractory Insulation Tester — ToronFT™ HT-RI
System Components	Test furnace, insulation box cover, hot surface temperature sensor frame, cold surface temperature sensor frame, industrial control system
Furnace Body Structure	5-layer: Lightweight alumina air brick inner layer; 150 mm high-temp. insulation cotton; stainless steel shell; air circulation insulation layer; electrostatic painted outer shell
Internal Temperature Capability	>1600°C
External Surface Temperature	Slightly above ambient temperature
Furnace Mouth Sealing	Frame type; insulating lightweight alumina air bricks; multi-layer insulating asbestos
Instrument Type	Non-standard custom instrument (designed per customer technical requirements)
Compliance Standards	ISO 8302; ASTM C177; ASTM C1520

For more information, pricing, or to request a quotation, please contact ToronFT. Specifications are subject to change without prior notice.



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

