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NON-COMBUSTIBILITY TESTER

Non-Combustibility Tester – ToronFT™ BMT-NF

ToronFT™ BMT-NF Non-Combustibility Tester is a precision furnace-based testing instrument designed for evaluating the non-combustibility of homogeneous and non-homogeneous building products and their components under standardized high-temperature conditions. Non-flammability (non-combustibility) is the highest level of fire performance that a building material can achieve — and accurate, reproducible testing is essential for product certification and building code compliance.

The ToronFT™ BMT-NF is built around a high-temperature bauxite refractory heating furnace with a precision wound resistance heating coil, stabilized by a conical airflow system and controlled by a microcomputer. It complies with ISO 1182, the primary international standard for the non-combustibility test for building products, and is suitable for use in accredited testing laboratories in North America and internationally.

APPLICATIONS

Non-Combustibility Tester – ToronFT™ BMT-NF Applications

The ToronFT™ BMT-NF is applicable for non-flammability testing of the following building product categories:

- Main components of homogeneous building products: including mineral boards, cement boards, and ceramic tiles — for non-combustibility classification per ISO 1182
- Non-homogeneous building products with non-combustible core or surface components requiring component-level non-flammability testing
- Insulation boards, fire-rated boards, and mineral wool products for non-combustibility certification
- Structural building materials and cladding systems requiring non-combustibility evidence for building code compliance

- Fire-resistant building products: including fire doors, structural panels, and partition systems — for non-flammability component qualification
- Research and development testing of new mineral-based and inorganic building material formulations for non-combustibility classification


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Standards

The ToronFT™ BMT-NF is designed to comply with the following international standards for building material non-flammability testing:

- ISO 1182: Reaction to fire tests for products: Non-combustibility test
- EN ISO 1182: Reaction to fire tests for building products: Non-combustibility test
- ASTM E136: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
- BS 476-4: Fire tests on building materials and structures: Non-combustibility test for materials

FEATURES

Non-Combustibility Tester – ToronFT™ BMT-NF Key Features

- High-density bauxite refractory heating furnace tube (density 2800 ± 300 kg/m³) provides the thermal mass, stability, and heat resistance required for reproducible non-flammability tests at 750°C
- Precision heating coil specification — 3 mm × 0.2 m nickel 80% chromium 20% resistance tape — delivers uniform, stable furnace temperature throughout the non-flammability test
- Heat insulation layer over the external surface of the heating furnace tube minimizes heat loss and maintains stable furnace temperature during non-flammability test sequences
- Conical airflow stabilizer fixed at the furnace base and airflow hood at the furnace top establish the standardized airflow conditions required by ISO 1182 and EN ISO 1182
- Complete instrument assembly includes heating furnace, sample rack, airflow hood, thermocouple, voltage stabilizer, voltage regulator, control instrument, and computer control part — a fully integrated non-flammability test system
- Cylindrical tube assembly (height 150 mm, wall thickness 10 mm) with top and bottom thermal insulation plates and inner concave edges precisely positions the heating furnace tube for repeatable non-flammability test geometry

- Microcomputer control and data acquisition platform automates furnace temperature control, specimen insertion timing, and test result recording for ISO 1182-compliant non-flammability testing
- Complies with ISO 1182 and ASTM E136, providing internationally recognized non-flammability test data for building material certification in North American and global markets

THEORY & METHOD

Theory and Method

The non-flammability test for building materials evaluates whether a specimen sustains combustion or causes a significant temperature rise when placed in a preheated furnace tube at 750°C (per ISO 1182). Non-combustible materials will not ignite, and the temperature rise inside the furnace during specimen insertion will remain below specified limits. Materials that ignite or cause temperature rises above the threshold are classified as combustible.

In the ToronFT™ BMT-NF, the heating furnace tube — made of high-density bauxite refractory material (density 2800 ± 300 kg/m³, height 150 ± 1 mm, inner diameter 75 ± 1 mm, wall thickness 10 ± 1 mm) — is wound with a 3 mm × 0.2 m nickel 80% chromium 20% resistance tape heating coil. The conical airflow stabilizer at the furnace base and airflow hood at the top maintain the standardized airflow conditions required by ISO 1182. The cylindrical tube (height 150 mm, wall thickness 10 mm, with top and bottom insulating plates and inner concave edges) precisely positions the heating furnace tube within the test assembly. Computer control and data acquisition record furnace temperature and specimen behavior throughout the non-flammability test.

TECHNICAL SPECIFICATIONS

Non-Combustibility Tester – ToronFT™ BMT-NF Technical Specifications

Component / Parameter	Specification Details
General Information	
Product Name	Non-Combustibility Tester — ToronFT™ BMT-NF
Model	ToronFT™ BMT-NF
Compliance Standards	ISO 1182; EN ISO 1182; ASTM E136
Instrument Components	Heating furnace, sample rack, airflow hood, thermocouple, voltage stabilizer, voltage regulator, control instrument, computer
Control System	Microcomputer + computer data acquisition
Heating Furnace System	
Furnace Tube Material	Bauxite refractory
Furnace Tube Density	2800 ± 300 kg/m³
Furnace Tube Dimensions	Inner Diameter: 75 ± 1 mm; Height: 150 ± 1 mm; Wall Thickness: 10 ± 1 mm
Cylindrical Tube Dimensions	Height: 150 mm; Wall Thickness: 10 mm
Heating Coil Specification	3 mm × 0.2 m; Nickel 80% / Chromium 20% resistance tape
Temperature & Heating Control	
Maximum Temperature	900°C
Furnace Working Temperature	Stable at 750±5°C (≤1h heating time, 10 min stabilization time)
Heating Power	Approx. 2500W (Current: 9–10A)
Airflow System	
Air Flow Stabilizer (Base)	Inverted conical structure (75 mm tapering to 10 mm); Length: 500 mm
Airflow Hood (Top)	Height: 50 mm; Inner Diameter: 75 mm

Component / Parameter	Specification Details
Sensors & Data Acquisition	
Thermocouple	Type K, high accuracy (±1°C level), multi-point temperature measurement (furnace temperature / wall temperature / sample center)
Temperature Acquisition	Accuracy: 0.1°C; Sampling frequency: 3 times/second
Timer Accuracy	1 s/h
Sample Handling & Accessories	
Sample Holder / Rack	Heat-resistant steel structure, supports center positioning; Weight: Approx. 15±2g
Balance Requirement	Self-provided; Required accuracy: 0.01g

TORONTECH.com

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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