



TORONTECH

BUILDING MATERIALS RADIANT HEAT FIRE TESTER



Building Materials Radiant Heat Fire Tester — ToronFT™ BMT-FP

ToronFT™ BMT-FP Building Materials Radiant Heat Fire Tester is a precision thermal radiation ignition testing instrument designed to evaluate the ignitability and fire performance of the exposed surface of building materials and composite materials with a thickness not exceeding 70 mm when placed horizontally under specified thermal radiation conditions. The instrument is applicable to wall and ceiling lining materials, flooring systems, external cladding materials, and air-heated pipe insulation — providing the irradiance-based ignitability data required for building material fire classification and certification.

The building materials fire performance tester uses a 3 kW radiation cone heating system delivering 1–5 W/cm² irradiance, combined with a modern electronic automation design and thyristor-based power temperature regulation, to provide stable, accurately controlled thermal radiation conditions throughout each test event.

APPLICATIONS

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Applications

- Building material manufacturers: ignition resistance and fire performance qualification for wall linings, ceiling materials, flooring, external cladding, and pipe insulation
- Third-party fire testing and certification laboratories: ignitability and fire performance testing per ISO 5657
- Construction product specifiers: fire performance evaluation of composite materials for building envelope and interior applications
- R&D departments: evaluation of flame retardant treatments, surface coatings, and material composites for improved ignition resistance

- Quality assurance departments: production-lot fire performance sampling for building material compliance programs



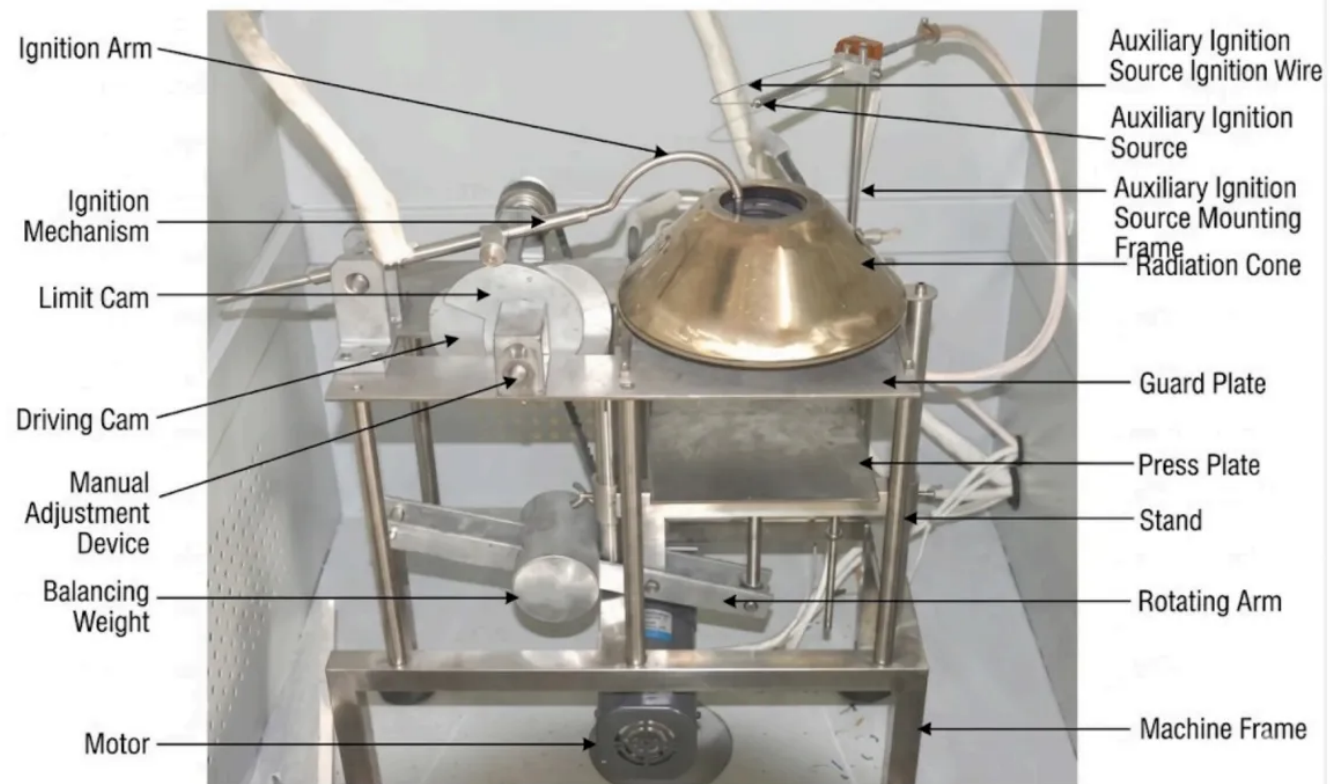
Standards

The ToronFT™ BMT-FP supports fire performance testing in compliance with internationally recognized building material fire standards, including:

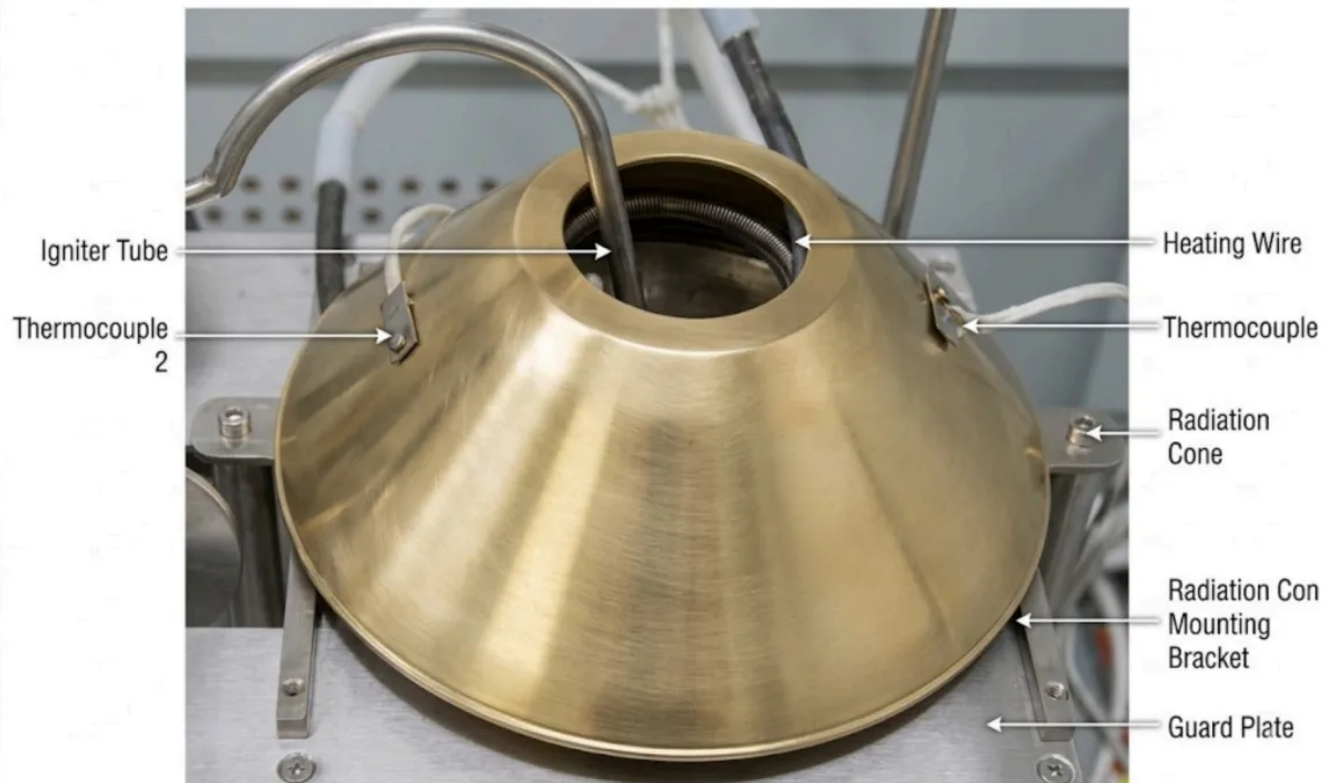
- ISO 5657: Reaction to fire tests — Ignitability of building products using a radiant heat source
- ISO 5660-1: Reaction to fire tests — Heat release, smoke production, and mass loss rate (irradiance methodology reference)
- ASTM E1321: Standard test method for determining material ignition and flame spread properties
- EN 13501-1: Fire classification of construction products and building elements — Classification using data from reaction to fire tests

FEATURES

Building Materials Radiant Heat Fire Tester — ToronFT™ BMT-FP Key Features



Test apparatus



Radiating cone

- Suitable for horizontal specimen testing of building materials and composites up to 70 mm thick — covering wall linings, ceiling materials, flooring, external cladding, and pipe insulation
- Radiation cone heating power: 3 kW — delivering stable, uniform irradiance across the specimen surface
- Radiation intensity range: 1-5 W/cm² — matching the irradiance levels specified by ISO 5657 and related standards
- Complete instrument composition: radiating cone, ignition device, nozzle, pressure plate mechanism, support frame, temperature recorder, gas system, timer, and oven
- Modern electronic automation design for repeatable, operator-independent test execution
- Thyristor technology for body temperature regulation through power control — precise, stable irradiance maintenance

- Compliant with ISO 5657 — the primary international standard for building material ignitability under radiant heat

THEORY & METHOD

Theory and Method

Building material ignitability testing exposes a horizontally mounted specimen to a defined, uniform level of thermal radiation from the radiation cone heater. The irradiance level (1-5 W/cm²) is set to match the test conditions specified by the applicable standard, and the time to ignition of the specimen surface is recorded. The test evaluates whether the material's surface ignites under a given irradiance level and how quickly ignition occurs — both of which are fundamental inputs to fire risk assessment and material classification.

The ToronFT™ BMT-FP radiation cone delivers controlled irradiance through a 3 kW heating element with thyristor power regulation, which continuously adjusts electrical power to the cone to maintain the target irradiance regardless of ambient temperature variations. The instrument composition — radiating cone, ignition device, nozzle, pressure plate mechanism, support frame, temperature recorder, gas system, timer, and oven — provides the complete measurement and control infrastructure required for standard-compliant ignitability testing. The modern electronic automation design ensures repeatable, accurate test conditions with minimal operator intervention.

TECHNICAL SPECIFICATIONS

Building Materials Radiant Heat Fire Tester — ToronFT™ BMT-FP

Technical Specifications

Component / Parameter	Specification Details
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General Information	
Model	ToronFT™ BMT-FP
Standard Compliance	ISO 5657
Applicable Materials	Wall/ceiling linings, flooring, external cladding, pipe insulation
Instrument Composition	Radiating cone, ignition device, nozzle, pressure plate mechanism, support frame, temperature recorder, gas system, timer, oven
Radiation Cone System	
Radiation Cone Power	3 kW
Radiation Intensity	Range 1: 10 kW/m² – 70 kW/m² Range 2: 1 – 5 W/cm²
Heating Element	Stainless steel heating tube (Length: 3500 mm; Diameter: 8.5 mm)
Ignition & Gas System	
Ignition Device	High-voltage electronic automatic ignition
Flame Nozzle	Propane flame; Flame length: 15 mm; Heat output: 50 W
Gas Supply & Filtration	Equipped with filters to remove impurities from the gas path
Air-Propane Supply Control	Mass flow meter regulates precise propane and air flow rates • Propane: 19 mL/min – 20 mL/min • Air: 160 mL/min – 180 mL/min
Sample Handling	
Support Frame	Stainless steel; Dimensions: 275 mm × 230 mm
Pressure Plate Mechanism	Applies a constant pressure of 20N
Max Specimen Thickness	70 mm (in horizontal orientation)
Control & Software System	

Control System Architecture	PLC programming + Computer control (16-bit high-precision board, accuracy up to 1%)
User Interface	LabVIEW-developed software (Windows XP interface) / HMI for simple operation
Automation Capabilities	Real-time data acquisition, processing, saving, and result output
Temperature Control	• Method: PID control with thyristor power regulation (electronic automation) • Range: 0°C – 1000°C • Accuracy: $\pm 1^{\circ}\text{C}$
Measurement & Sensors	
Radiometer (Heat Flux Meter)	• Type: Military-grade Gardon thermopile • Measurement Range: 0 kW/m² – 100 kW/m² • Accuracy: $\pm 3\%$
Timer	Resolution: 0.01s; Accuracy: 1 s/h
Dimensions & Power	
Voltage	AC 220V $\pm 10\%$, 50Hz (110V is also available)
Equipment Dimensions	570 mm × 350 mm × 1100 mm (L × W × H)
Equipment Weight	Approx. 35 kg



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