



CELLULAR HORIZONTAL BURNING TESTER

Cellular Horizontal Burning Tester - ToronFT™ BT-CH

ToronFT™ BT-CH Cellular Horizontal Burning Tester is a precision laboratory instrument specifically designed for evaluating the horizontal combustion performance of small samples of cellular (foam) plastics with a density less than 250 kg/m³, measured in accordance with ISO 845-1985 under small flames under laboratory conditions. Cellular plastics — including polyurethane foam, polystyrene foam, and polyethylene foam — are widely used in furniture, building insulation, packaging, and automotive components, and their horizontal burning performance is a critical fire safety parameter for product certification and regulatory compliance.

The ToronFT™ BT-CH meets ISO 9772 test standards and features a 0.5 m combustion box, a natural gas burner with calorific value of 37 MJ/m³, a calibrated light meter (illumination ≤20 lx), and a precision stainless steel sample support net — providing a complete, standards-compliant cellular plastic horizontal burning tester platform.

APPLICATIONS

Cellular Horizontal Burning Tester - ToronFT™ BT-CH Applications

The ToronFT™ BT-CH is applicable for cellular plastic horizontal burning performance testing of:

- Flexible and rigid polyurethane (PU) foam materials for furniture, bedding, and automotive interior applications requiring horizontal burning classification
- Expanded polystyrene (EPS) and extruded polystyrene (XPS) cellular plastics for building insulation and packaging requiring burning tester qualification
- Polyethylene (PE) and polypropylene (PP) foam cellular materials for packaging, sports equipment, and construction applications

- Melamine foam and other specialty cellular plastics requiring horizontal burning performance data for product certification
- Composite foam products and laminated cellular plastic materials for furniture, transportation, and industrial applications
- Research and development of new flame-retardant cellular plastic formulations — using horizontal burning rate data to verify fire safety improvement



Standards

The ToronFT™ BT-CH is designed to comply with the following international standards for cellular plastic horizontal burning testing:

- ISO 9772: Cellular plastics: Determination of horizontal burning characteristics of small specimens subjected to a small flame
- ASTM D4986: Standard Test Method for Horizontal Burning Characteristics of Cellular Polymeric Materials
- UL 94 HB: Standard for Tests for Flammability of Plastic Materials (Horizontal Burning for Cellular Materials)
- ISO 10093:1998 — Plastics: Fire tests — Standard ignition sources

FEATURES

Cellular Horizontal Burning Tester - ToronFT™ BT-CH Key Features

- Dedicated cellular plastic horizontal burning tester compliant with ISO 9772 — providing a purpose-built platform for small-flame horizontal burning performance testing of foam and cellular plastic materials with density $<250 \text{ kg/m}^3$
- Applicable to both horizontal and vertical cellular plastic burning tests — maximizing instrument versatility and allowing comparison of burning behavior in both orientations
- Combustion box volume of 0.5 m provides the standardized enclosure required for ISO 9772 and ASTM D4986 cellular plastic burning tests
- Natural gas burner with calorific value of 37 MJ/m^3 delivers a stable, reproducible small flame for consistent cellular plastic horizontal burning test ignition conditions
- Integrated light meter confirms illumination inside the combustion box is $\leq 20 \text{ lx}$ — meeting the low-light test environment requirement of ISO 9772 for accurate flame and afterglow observation during cellular plastic burning tests
- Gas flow rate controlled at 965 mL/min ensures standardized combustion energy delivery to the cellular plastic specimen for reproducible horizontal burning test results

- ISO 10093:1998-compliant combustion blowtorch provides the precise small flame geometry and energy specified for cellular plastic burning tester ignition
- Precision $\varnothing 0.8$ mm stainless steel wire sample support net (215 mm long $\times$ 75 mm wide $\times$ 13 mm high, 6.4 mm mesh spacing) supports cellular foam specimens in the required horizontal orientation with minimal thermal interference
- 300 mm steel ruler with 1.0 mm minimum scale division installed adjacent to the specimen support net enables accurate burn length measurement throughout the horizontal burning test
- Complies with ISO 9772, ASTM D4986, and UL 94 HB, providing cellular plastic burning tester results recognized by certification bodies in North America and internationally

THEORY & METHOD

Theory and Method

Cellular plastic horizontal burning testing evaluates the rate of flame propagation across the surface of a horizontally positioned foam specimen when exposed to a small standardized flame under controlled laboratory lighting conditions. The horizontal orientation promotes surface flame spread along the cellular plastic specimen, and the low illumination condition (≤ 20 lx in the combustion box) ensures that any faint afterglow or slow-burning behavior can be visually detected and recorded.

In the ToronFT™ BT-CH, the cellular foam specimen is placed on the stainless steel sample support net ($\varnothing 0.8$ mm wire, 6.4 mm mesh spacing, net length 215 mm, width 75 mm, height 13 mm) with a 300 mm steel ruler installed adjacent at a minimum scale of 1.0 mm for accurate burn length measurement. The natural gas combustion blowtorch — fully ISO 10093:1998 compliant — applies the standardized small flame to the cellular plastic specimen. Gas flow is controlled at 965 mL/min. The light meter verifies that the illumination inside the combustion box is ≤ 20 lx, maintaining the low-light conditions required by ISO 9772. Both horizontal and vertical cellular plastic burning tests can be performed on this instrument.

TECHNICAL SPECIFICATIONS

Cellular Horizontal Burning Tester - ToronFT™ BT-CH Technical Specifications

Component / Parameter	Specification Details
General Information	
Product Name	Cellular Horizontal Burning Tester — ToronFT™ BT-CH
Model	ToronFT™ BT-CH
Compliance Standards	ISO 9772; ASTM D4986; UL 94 HB; ISO 10093:1998
Test Orientations	Horizontal and vertical burning
Applicable Material Density	<250 kg/m³ (per ISO 845-1985)
Test Chamber & Construction	
Chamber Volume	0.5 m³
Construction Material	CNC machined, arc-shaped; high-quality SUS304 stainless steel or painted material (rust and corrosion-resistant)
Observation Window	Front-mounted tempered glass, sealable during testing
Exhaust System	Top-mounted exhaust system discharges gases outdoors; stops operating during active testing
Chamber Illumination	≤20 lx (verified by built-in illuminometer)
Combustion Torch System	
Torch Standard Compliance	Fully compliant with ISO 10093:1998 (Self-made torch)

Component / Parameter	Specification Details
Nozzle Specifications	Inner Diameter: $\Phi 9.5$ mm; Cylinder Length: 100 mm (Without Tail End)
Wings Specifications	Internal Length: 48 mm; Internal Width: 1.3 mm
Flame Height & Scale	Blue flame core height: 25–30 mm (adjustable); Blue flame scale minimum graduation: 1.0 mm
Gas Control System	
Gas Source	Natural gas (Calorific value: 37 MJ/m ³)
Gas Flow Rate	Adjustable from 10 to 1000 mL/min (Standard test flow: 965 mL/min)
Pressure Measurement	U-tube manometer (50 mm water column height)
Sample Support & Handling	
Standard Sample Size	Length: 150 mm; Width: 50 mm; Thickness: 5 mm < thickness $\leq$ 13 mm (or per specific test standards)
Sample Support Net	$\varnothing 0.8$ mm stainless steel wire; Mesh spacing: 6.4 mm per side
Support Net Dimensions	215 mm $\times$ 75 mm $\times$ 13 mm (L $\times$ W $\times$ H)
Sample Holder	Two iron frames with adjustable clamps; positioned 175 mm above the chamber bottom
Measurement Tool	Included 300 mm steel ruler (minimum scale division: 1.0 mm)
Control & Automation	
Automatic Control System	Microcomputer control: Automatic ignition, timing, and real-time temperature display
Timer	Range: 0–99.99 seconds (adjustable); Accuracy: ≤ 1 s
Operating Conditions	
Environmental Requirements	Temperature: Room temperature to 40°C; Humidity: $\leq 75\%$
Voltage	AC 220V ± 10 V (110V is also available)

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



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