TORONTECH

# THERMAL RADIATION FLAME PROPAGATION TESTER

# Thermal Radiation Flame Propagation Tester — ToronFT™ TRF-M

ToronFT™ TRF-M Thermal Radiation Flame Propagation Tester is a precision fire performance testing instrument designed for the evaluation of rail train materials — including single and composite rigid materials, materials with adhesive coatings, and flexible materials with a thickness greater than 5 mm — under controlled thermal radiation flame propagation conditions. By exposing specimens to a defined thermal radiation field from a 500 W quartz disk radiator and assessing subsequent flame propagation behavior, the ToronFT™ TRF-M provides the fire performance data required for rail vehicle interior material qualification under the EN 45545 and NFPA 130 frameworks.

The micro-controlled thermal radiation flame propagation tester features a stainless steel test box with flame-resistant inner wall lining, a transparent observation window, stainless steel tubular air inlet devices with an integrated filter to shield against indoor pollution sources, and a high-voltage electronic ignition system — providing a complete, controlled flame propagation test environment in a compact, bench-top platform.

## APPLICATIONS

# Thermal Radiation Flame Propagation Tester — ToronFT™ TRF-M Applications

- Rail vehicle interior material manufacturers: thermal radiation flame propagation qualification for seat materials, wall panels, flooring, and ceiling materials
- Adhesive coating and surface treatment manufacturers: flame propagation performance evaluation of coated composite materials for rail applications
- Third-party fire testing and certification laboratories: flame propagation testing per NFPA 130 and EN 45545-2

- R&D departments: evaluation of new rail interior materials and flame retardant treatments for thermal radiation flame propagation resistance
- Quality assurance departments: production-lot sampling for flame propagation compliance of rail vehicle interior materials

TORONTECH
ToronFT™ TRF-M

## Standards

The ToronFT™ TRF-M supports thermal radiation flame propagation testing in compliance with internationally recognized rail fire safety and material standards, including:

- NFPA 130: Standard for fixed guideway transit and passenger rail systems (fire performance requirements for interior materials)
- EN 45545-2: Railway applications — Fire protection on railway vehicles — Requirements for fire behaviour of materials and components
- ISO 5658-2: Reaction to fire tests — Spread of flame — Part 2: Lateral spread on building and transport products in vertical configuration
- ASTM E162: Standard test method for surface flammability of materials using a radiant heat energy source

## FEATURES

## Thermal Radiation Flame Propagation Tester — ToronFT™ TRF-M Key Features

- Designed for single and composite rigid materials, adhesive-coated materials, and flexible materials (thickness > 5 mm) for rail vehicle interior qualification
- Stainless steel test box with flame-resistant inner wall lining — preventing box wall contribution to the combustion event
- Transparent observation window — continuous visual monitoring of flame propagation without opening the enclosure
- Stainless steel tubular air inlet device with integrated filter — shielding indoor pollution sources from contaminating the test atmosphere
- Radiator: 500 W, 100 mm quartz disk radiating surface — providing a defined, stable irradiance field across the specimen

- High-voltage electronic ignition system — reliable, consistent specimen ignition at the designated ignition point
- Micro-controlled test management for accurate timing, data acquisition, and standardized result output
- Compliant with NFPA 130 and EN 45545-2 — the primary North American and European rail vehicle fire safety standards

## THEORY & METHOD

# Theory and Method

Thermal radiation flame propagation testing evaluates the rate and extent of flame spread across the surface of a specimen when a portion of the specimen is ignited and the surface is exposed to a thermal radiation field. The 500 W quartz disk radiator provides a defined irradiance at the specimen surface, creating a temperature gradient that influences whether the flame self-propagates away from the ignition zone or self-extinguishes.

The specimen is placed in the stainless steel test box, which is fitted with a flame-resistant inner wall lining to prevent the box walls from contributing to the fire event. The transparent observation window allows continuous visual monitoring of flame propagation throughout the test without opening the enclosure. Fresh air is supplied through the stainless steel tubular air inlet device — equipped with a filter to shield indoor pollution sources from entering the test environment and altering combustion behavior. The high-voltage electronic ignition system ensures reliable, repeatable specimen ignition at the designated ignition point. The micro-controller manages test timing, data acquisition, and result output throughout the test sequence.

## TECHNICAL SPECIFICATIONS

# Thermal Radiation Flame Propagation Tester — ToronFT™ TRF-M Technical Specifications

| Parameter | Specification |
|---|---|
| Model | ToronFT™ TRF-M |
| Applicable Materials | Single/composite rigid materials, adhesive-coated materials, flexible materials (thickness > 5 mm) |
| Application Sector | Rail train interior materials |
| Radiator Power | 500 W |
| Radiating Surface | 100 mm quartz disk |
| Test Box Construction | Stainless steel outer body; flame-resistant inner wall lining |
| Observation Window | Transparent (visual monitoring) |
| Air Inlet Device | Stainless steel tubular; with pollution filter |
| Ignition System | High-voltage electronic ignition |
| Standard Compliance | NFPA 130; EN 45545-2 |

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