



TORONTECH

LITHIUM BATTERY FLAME RETARDANT TESTER



Lithium Battery Flame Retardant Tester - ToronFT™ TRP

ToronFT™ TRP Lithium Battery Fire Prevention (Fire Jet) Testing Machine is an advanced thermal runaway performance test instrument designed for fire jet testing of lithium batteries — including individual cells and complete battery packs. As a dedicated thermal runaway performance tester, the system evaluates the fire hazard behavior of lithium batteries under direct flame exposure, generating the safety data required for battery product certification, regulatory compliance, and research programs targeting the prevention of thermal runaway events.

The TRP is engineered with an explosion-proof enclosure and safety-rated transparent observation panel, providing the containment and visibility required for safe testing of energetic lithium battery samples. It is an essential tool for battery manufacturers, safety testing laboratories, and research institutions involved in lithium battery safety evaluation and thermal runaway performance characterization.

APPLICATIONS

Lithium Battery Flame Retardant Tester - ToronFT™ TRP Applications

- Fire jet thermal runaway performance testing of individual lithium battery cells
- Fire exposure testing of lithium battery packs and modules for consumer electronics and electric vehicle applications
- UL certification testing for lithium battery fire prevention performance
- Thermal runaway performance evaluation for battery safety qualification programs
- Research and development testing of lithium battery chemistries and cell designs for fire safety improvement
- Safety screening of lithium batteries for transportation, energy storage, and portable device applications



Standards

- UL: Lithium Battery Safety Standard (Fire Prevention Test section)
- IEC 62133: Safety Requirements for Portable Sealed Secondary Lithium Cells and Batteries for Use in Portable Applications
- IEC 62619: Safety Requirements for Secondary Lithium Cells and Batteries for Use in Industrial Applications
- UN 38.3: Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria — Lithium Battery Fire Test

FEATURES

Lithium Battery Flame Retardant Tester - ToronFT™ TRP Key Features

- Complete system with three integrated sections: explosion-proof enclosure box, test device, and control section — providing a safe, contained environment for lithium battery thermal runaway performance testing
- Explosion-proof enclosure constructed from explosion-proof mesh and explosion-proof glass, ensuring operator safety when testing energetic lithium battery cells and packs
- Test device assembly consisting of steel plate, cover plate, and wire mesh cage for standardized specimen positioning and containment
- KW premix-type combustion nozzle made of pure copper, adjustable to a calibrated blue flame for precise, repeatable thermal input during the fire jet test
- Burner nozzle positioned below the specimen, heating the cover plate until it glows bright red before specimen ignition — replicating realistic fire zone conditions
- Wire mesh cage installed on each face of the specimen for consistent test geometry and post-ignition fragment containment
- Suitable for testing both individual lithium battery cells and complete battery packs, supporting a broad range of thermal runaway performance test configurations

- Designed for compliance with UL lithium battery safety fire prevention test requirements

THEORY & METHOD

Theory and Method

The ToronFT™ TRP places the lithium battery specimen (individual cell or battery pack) on a cover plate, which rests on a steel plate with a square central aperture. The burner nozzle is positioned below the specimen, directing a calibrated flame upward through the aperture to heat the cover plate and specimen from beneath. A wire mesh cage is installed around the specimen on each face to provide containment and maintain consistent test geometry while allowing visual observation.

The burner flame is adjusted to a blue (premixed) flame using the KW premix-type combustion nozzle made of pure copper — blue flame conditions indicate a well-defined, calibrated heat input to the specimen. The cover plate is heated until it glows bright red, at which point heating continues until the specimen self-ignites or undergoes thermal runaway. The explosion-proof enclosure and explosion-proof glass observation panel ensure operator safety throughout the thermal runaway performance test.

TECHNICAL SPECIFICATIONS

Lithium Battery Flame Retardant Tester - ToronFT™ TRP Technical Specifications

Parameter	Specification
Product Name	Lithium Battery Fire Prevention (Fire Jet) Testing Machine

Parameter	Specification
Brand / Platform	ToronFT™ TRP
System Sections	Explosion-proof box, test device, control section
Explosion-Proof Enclosure	Explosion-proof mesh and explosion-proof glass
Test Device Components	Steel plate, cover plate, wire mesh cage
Burner Type	KW premix-type combustion nozzle (pure copper)
Flame Type	Blue premix flame (calibrated)
Specimen Types	Individual lithium cells and battery packs



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