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FIRE EXTINGUISHER SPRAY TEST LABORATORY

Fire Extinguisher Spray Test Laboratory — ToronFT™ FE-SL

ToronFT™ FE-SL is a dedicated fire extinguisher spray test laboratory system designed for conducting standardized spray performance evaluations of dry powder and foam fire extinguishers up to 8 kg. This self-contained test facility provides a controlled enclosed environment for measuring spray distance, spray lag time, effective spray time, and spray remaining rate — the core performance parameters required to characterize portable fire extinguisher discharge behavior under repeatable, documented test conditions.

The system consists of three integrated components: a fully enclosed spray test laboratory chamber, a spray injection device with adjustable lifting table, and a precision mass measurement and timing setup. The laboratory structure is constructed from color steel plates with an observation room and closed-door configuration, ensuring that discharge tests are conducted in a controlled indoor environment free from ambient airflow interference that would invalidate spray distance and distribution measurements. A 10-meter ruler installed along the spray direction and 12 collection trays positioned on the floor enable direct, traceable spray pattern and distance documentation across the full discharge arc.

APPLICATIONS

Fire Extinguisher Spray Test Laboratory — ToronFT™ FE-SL Applications

The ToronFT™ FE-SL is used by fire safety testing laboratories, regulatory compliance testing facilities, fire extinguisher manufacturers, and third-party certification bodies conducting performance verification of portable fire extinguishers:

- Spray Distance Measurement: determining the effective horizontal reach of dry powder and foam discharge under standardized test conditions
- Spray Lag Time Testing: measuring the delay between valve actuation and the onset of effective discharge
- Effective Spray Time Verification: documenting the continuous discharge duration from full actuation to discharge completion

- Spray Remaining Rate Assessment: calculating the proportion of agent remaining in the extinguisher after a standard discharge cycle
- Product Development and R&D: performance characterization of new extinguisher designs and agent formulations prior to regulatory submission
- Manufacturing Quality Control: production batch testing of portable extinguishers against defined spray performance acceptance criteria
- Third-Party Certification Testing: independent performance verification for fire extinguisher certification programs in international markets


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FEATURES

Fire Extinguisher Spray Test Laboratory — ToronFT™ FE-SL Key Features

Test Laboratory Structure

- Fully enclosed spray test chamber: approximately 10 m × 2 m × 2 m internal space
- Constructed from color steel plates with observation room for personnel monitoring during active discharge
- Closed-door testing configuration eliminates ambient airflow interference for repeatable test conditions
- Door: 1.8 m height × 0.84 m width

Spray Injection Device

- Adjustable lifting table positions fire extinguisher nozzle center at exactly 1 meter above floor level
- Accommodates dry powder and foam fire extinguishers of various specifications up to 8 kg

Mass Measurement System

- Integrated 0–30 kg electronic scale for discharge mass loss measurement
- Scale resolution: 0.005 kg for precise agent mass documentation
- Manual mass loss calculation from pre- and post-discharge readings

Spray Distance and Pattern Measurement

- 10-meter ruler installed along the spray direction for direct horizontal distance measurement
- 12 collection trays positioned on the floor for spray pattern and distribution documentation

Timing System

- Stopwatch-based manual timing for effective injection time and injection lag time measurement
- Direct operator observation method consistent with applicable standard test procedures

Theory and Method

Enclosed Spray Test Environment

The ToronFT™ FE-SL laboratory chamber provides a controlled indoor enclosure measuring approximately 10 m (length) × 2 m (width) × 2 m (height) with an observation room and closed testing configuration. The enclosed structure eliminates ambient wind interference — a variable that makes outdoor spray testing inherently unrepeatable — by creating a calm, still-air internal environment where discharge behavior reflects only the extinguisher's own performance characteristics. The color steel plate construction and observation windows allow personnel to monitor test progress without entering the active discharge zone.

Adjustable Injection Device and Nozzle Positioning

The spray injection device incorporates a lifting table that adjusts nozzle height so that the center of the fire extinguisher nozzle is positioned exactly 1 meter above the ground — the standardized reference height defined in applicable test methods. This consistent nozzle geometry ensures that spray distance and distribution measurements are taken from a repeatable, defined starting point across all test runs and extinguisher models. The lifting table accommodates fire extinguishers of various specifications and sizes within the 0 to 8 kg capacity range.

Mass Loss Measurement and Timing

Discharge mass loss is measured using an integrated 0–30 kg electronic scale with a resolution of 0.005 kg. Operators record the extinguisher mass before and after each discharge phase, and mass loss is calculated manually from the scale readings. Effective injection time and injection lag time are measured using a stopwatch with direct operator observation — a straightforward, calibration-traceable method consistent with the manual timing procedures referenced in applicable extinguisher test standards. The 10-meter ruler installed along the spray direction, combined with 12 collection trays positioned on the floor, enables direct measurement and physical documentation of spray distance and distribution pattern.

TECHNICAL SPECIFICATIONS

Fire Extinguisher Spray Test Laboratory — ToronFT™ FE-SL Technical Specifications

Parameter	Specification
Applicable Extinguisher Types	Dry powder and foam fire extinguishers
Maximum Extinguisher Capacity	8 kg
Laboratory Internal Dimensions (approx.)	10,000 × 2,000 × 2,000 mm (L×W×H)
Door Dimensions	1,800 × 840 mm (H×W)
Construction Material	Color steel plate with observation room
Nozzle Reference Height	1,000 mm above floor (adjustable via lifting table)
Electronic Scale Range	0–30 kg
Scale Resolution	0.005 kg
Spray Distance Measurement	10 m ruler + 12 collection trays
Timing Method	Manual stopwatch observation
Test Parameters	Spray distance, spray lag time, effective spray time, spray remaining rate

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