



FIRE HOSE EXTENSION AND TORSION TESTER

Fire Hose Extension and Torsion Tester - ToronFT™ FH-ET

ToronFT™ FH-ET is a fire hose extension and torsion Tester designed to evaluate the expansion rate and torsional behavior of lined fire hoses under hydraulic pressure. The instrument tests fire hoses with nominal sizes of 25 mm, 40 mm, 50 mm, 65 mm, 80 mm, and 100 mm — covering the full range of standard fire fighter hose diameters used in attack, supply, and wildland fire suppression operations.

Extension rate testing measures how much the fire hose lengthens when pressurized, while torsion direction testing measures the angular rotation or twist imparted to the hose assembly under the same pressurization. Both parameters are important indicators of fire hose construction quality and lay angle precision — excessive extension or torsion under pressure can cause fire fighter hose to move unpredictably during deployment, creating operational safety hazards and potentially impairing coupling integrity.

The ToronFT™ FH-ET uses the ToronFT™ FH-HP Fire Hose Hydraulic Pressure Burst Tester and a fire coupling device as the water pressure source (sold separately). The instrument is built around a 16-meter torsion test frame constructed from square steel tube with a flat surface of 12 mm thick steel plate treated with high-temperature baking paint — providing a robust, dimensionally stable reference surface for accurate extension and torsion measurement across the full fire hose specimen length.

APPLICATIONS

Fire Hose Extension and Torsion Tester - ToronFT™ FH-ET Applications

The ToronFT™ FH-ET fire hose extension and torsion Tester is used in fire hose qualification, certification testing, and manufacturing quality control for the following applications:

- Lined fire hose expansion rate testing: measurement of pressurization-induced length extension in fire fighter hose to verify compliance with maximum allowable extension specifications
- Fire hose torsion direction testing: measurement of pressure-induced angular twist in lined fire hoses to verify jacket lay angle performance and torsional stability
- Fire hose certification and type approval: extension rate and torsion performance verification as part of a complete fire hose qualification test program to NFPA 1961, UL 19, or international standards
- Manufacturing quality control: production-batch extension and torsion testing to verify consistency of fire hose jacket construction and lay angle across production runs
- Fire hose design validation: extension and torsion characterization of new fire fighter hose designs, jacket constructions, and lay angles during product development
- Fire safety testing laboratories: standardized extension and torsion test capability as part of a comprehensive fire hose testing facility



FEATURES

Fire Hose Extension and Torsion Tester - ToronFT™ FH-ET Key Features

The ToronFT™ FH-ET extension and torsion Tester delivers a purpose-built, large-format test platform for fire hose dimensional stability characterization under hydraulic pressure:

1. 16-Meter Torsion Test Frame

The torsion test frame is 16 meters long (including the torsion device), 1.4 m high, and 0.4 m wide — providing sufficient length to accommodate standard 15-meter fire hose sections for extension and torsion testing at full hose length without coiling or folding the specimen.

2. Robust Steel Construction with High-Temperature Baked Surface

The test frame is constructed from square steel tube for structural rigidity, with a flat reference surface made from 12 mm thick steel plate treated with high-temperature baking paint. This construction provides a dimensionally stable, corrosion-resistant surface for precise fire hose extension and torsion measurements across the full 16-meter span.

3. Twisting Device Set Included

A complete set of twisting devices is included as standard with the ToronFT™ FH-ET, providing all the necessary fixtures for torsion direction testing of fire hoses across the specified nominal size range without additional tooling.

4. Multi-Diameter Fire Hose Compatibility

The apparatus tests lined fire hoses in nominal sizes 25 mm, 40 mm, 50 mm, 65 mm, 80 mm, and 100 mm — covering the full range of fire fighter hose sizes used in structural, industrial, and wildland fire suppression operations. Additional specifications beyond this standard range are available at additional cost.

5. Dual-Mode Test Capability — Extension Rate and Torsion Direction

The ToronFT™ FH-ET evaluates two distinct fire hose performance parameters on the same apparatus: extension rate (longitudinal dimensional change under pressure) and torsion direction (angular twist under pressure) — providing a complete pressurization-induced dimensional stability characterization in a single instrument.

6. Compatible with ToronFT™ FH-HP Hydraulic Pressure System

The ToronFT™ FH-ET uses the ToronFT™ FH-HP Fire Hose Hydraulic Pressure Burst Tester and an associated fire coupling device as the water pressure source (sold separately), providing precisely controlled and measured hydraulic pressure for both the extension rate and torsion direction test conditions.

THEORY & METHOD

Theory and Method

The ToronFT™ FH-ET measures fire hose extension rate by pressurizing a fire hose specimen of known initial length to the specified test pressure and measuring the change in hose length after pressurization. The extension rate is calculated as the percentage change in hose length relative to the unpressurized reference length. Fire hose construction standards specify maximum allowable extension rates to prevent uncontrolled movement of pressurized hose during operations.

Torsion direction testing measures the angular rotation of the fire hose assembly when pressurized. The hose specimen is laid flat on the torsion test frame in an unpressurized state, with reference marks applied at defined intervals along its length. After pressurization to the specified test pressure, the angular displacement of each reference mark from its initial orientation is measured — quantifying the helical twist introduced into the hose by internal pressure acting on the braided or woven jacket structure. The torsion test frame is 16 m long (including the torsion device), 1.4 m high, and 0.4 m wide, providing a flat, stable reference surface across which the full hose specimen length can be laid out and measured without interference from the Tester structure. A set of twisting devices is included as standard.

TECHNICAL SPECIFICATIONS

Fire Hose Extension and Torsion Tester - ToronFT™ FH-ET Technical Specifications

Parameter	Specification
Model	ToronFT™ FH-ET
Application	Extension rate and torsion direction testing of lined fire hoses
Compatible Fire Hose Sizes	25 mm, 40 mm, 50 mm, 65 mm, 80 mm, 100 mm (nominal diameter); additional sizes at extra cost
Torsion Frame Length	16 m (including torsion device)
Torsion Frame Height	1.4 m
Torsion Frame Width	0.4 m
Frame Construction Material	Square steel tube
Frame Surface Material	12 mm thick steel plate with high-temperature baking paint finish
Twisting Devices	One complete set (included as standard)
Water Pressure Source	ToronFT™ FH-HP Fire Hose Hydraulic Pressure Burst Tester + fire coupling device (sold separately)
Test Types	Extension rate; torsion direction



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