

FIRE EXTINGUISHER VIBRATION TESTER



Fire Extinguisher Vibration Tester — ToronFT™ FE-VT

ToronFT™ FE-VT is an electromagnetic vibration tester designed for conducting standardized vibration endurance testing of portable and dry powder fire extinguishers in the 1 to 8 kg capacity range. This test system applies controlled sinusoidal vibration to fire extinguishers under defined frequency and amplitude conditions, evaluating the mechanical integrity, seal performance, and structural durability of the extinguisher assembly under transportation and handling vibration environments representative of real-world deployment conditions.

The ToronFT™ FE-VT uses electromagnetic vibration generation technology — the industry-standard approach for precision laboratory vibration testing — rather than mechanical excitation systems. Electromagnetic generation provides stable, frequency-modulated vibration output across the full 1 Hz to 100 Hz operating range with consistent amplitude control, and the service life of the electromagnetic generator significantly exceeds that of mechanical vibration systems operating under comparable test duty cycles. Maximum test load capacity is 100 kg, accommodating multiple extinguishers or larger assemblies within a single test run. Frequency range spans 1 Hz to 100 Hz, amplitude is adjustable from 0 to 5.2 mm, and maximum acceleration reaches 0 to 22g — parameters that cover the vibration environments defined in applicable portable extinguisher test standards.

APPLICATIONS

Fire Extinguisher Vibration Tester — ToronFT™ FE-VT Applications

The ToronFT™ FE-VT serves fire extinguisher manufacturers, certification testing laboratories, and third-party compliance facilities conducting vibration endurance testing of portable fire suppression equipment:

- Transportation Vibration Simulation: evaluating extinguisher assembly integrity under vibration profiles representative of road, rail, and air transport environments

- Structural Durability Assessment: verifying that valve assemblies, safety pins, discharge handles, pressure gauges, and cylinder welds maintain integrity through defined vibration exposure sequences
- Seal and O-Ring Integrity Testing: assessing whether valve seals and O-rings maintain pressure retention and leak-free performance after vibration exposure
- Dry Powder Fire Extinguisher Vibration Testing: specifically applicable to dry powder extinguishers where vibration can cause agent compaction, bridging, or flow path obstruction that affects discharge performance
- Certification Pre-Qualification Testing: internal vibration testing by manufacturers prior to formal third-party certification submission
- Regulatory Compliance Verification: documentation of vibration test results for product listing, certification, and export market compliance programs



FEATURES

Fire Extinguisher Vibration Tester — ToronFT™ FE-VT Key Features

Vibration Generation System

- Electromagnetic vibration generation technology for stable, precisely controlled sinusoidal vibration output
- Stepless electronic frequency modulation across the full 1 Hz to 100 Hz range — no mechanical frequency adjustment required
- Consistent amplitude control independent of frequency setting across the operating range
- Extended generator service life compared to mechanical vibration systems under equivalent test duty cycles

Test Performance Parameters

- Maximum test load: 100 kg
- Frequency range: 1-100 Hz
- Amplitude range: 0-5.2 mm
- Maximum acceleration: 0-22g

THEORY & METHOD

Theory and Method

Electromagnetic Vibration Generation

The ToronFT™ FE-VT generates vibration through an electromagnetic excitation system — a voice-coil type linear actuator that converts electrical input into precise mechanical displacement of the test platform. The electromagnetic approach delivers stable, continuously variable sinusoidal vibration across the full 1 Hz to 100 Hz frequency range with consistent amplitude control from 0 to 5.2 mm. Frequency modulation is electronic and stepless, enabling smooth sweep patterns and precise dwell testing at defined frequencies without the mechanical backlash, wear, and frequency instability that characterize cam-and-eccentric mechanical vibration systems.

The service life advantage of electromagnetic generation is significant for testing laboratories running high duty-cycle programs — the absence of mechanical wear components in the vibration generation mechanism removes the primary failure mode of mechanical vibrators and reduces maintenance downtime in production testing environments.

Test Parameters and Load Capacity

Maximum test load is 100 kg — sufficient to accommodate multiple portable extinguishers simultaneously or larger extinguisher assemblies. Frequency range covers 1 Hz to 100 Hz, spanning the low-frequency transport vibration spectrum through mid-frequency mechanical vibration environments. Amplitude is adjustable from 0 to 5.2 mm peak-to-peak, and maximum acceleration reaches 0 to 22g — parameters that encompass the vibration severity levels specified in applicable portable extinguisher and transport testing standards.

TECHNICAL SPECIFICATIONS

Fire Extinguisher Vibration Tester — ToronFT™ FE-VT Technical Specifications

Parameter	Specification
Vibration Generation Method	Electromagnetic (voice-coil linear actuator)
Maximum Test Load (kg)	100

Parameter	Specification
Frequency Range (Hz)	1-100
Amplitude Range (mm)	0-5.2
Maximum Acceleration (g)	0-22
Applicable Extinguisher Types	Portable and dry powder fire extinguishers, 1-8 kg
Frequency Modulation	Electronic, stepless



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