



TORONTECH

FIRE RETARDANT COATING BOND STRENGTH TESTER



Fire Retardant Coating Bond Strength Tester — ToronFT™ FR-CB

ToronFT™ FR-CB Fire Retardant Coating Bond Strength Tester, also known as a pull-out test apparatus, is a precision mechanical testing instrument designed for the tensile bond strength evaluation of fire retardant coatings and a broad range of construction coating and adhesive materials. By applying a controlled, uniform tensile pull-out force perpendicular to the coated substrate surface, the ToronFT™ FR-CB quantifies the adhesion strength between the coating or adhesive and its substrate — a critical quality parameter for fire retardant coatings, interface agents, ceramic adhesives, thermal insulation mortars, and related construction materials.

With a maximum pulling force of 1000 kg, load resolution of 1 N (minimum indication), and a speed range of 0.2–500 mm/min, the ToronFT™ FR-CB delivers the force capacity, measurement precision, and speed flexibility required for the full range of fire retardant coating and construction adhesive bond strength qualification programs.

APPLICATIONS

Fire Retardant Coating Bond Strength Tester — ToronFT™ FR-CB

Applications

- Fire retardant coating manufacturers: bond strength (pull-out adhesion) qualification of intumescent and cementitious fire protection coatings
- Multi-layer building coating manufacturers: tensile bond strength testing for facade, interior, and exterior coating systems
- Interface agent and ceramic tile adhesive manufacturers: pull-out bond strength qualification for wall and floor tile installation systems

- Thermal insulation mortar and dry-mixed mortar manufacturers: tensile adhesion testing for external wall insulation composite system (EWICS) components
- Third-party certification and testing laboratories: bond strength testing per ASTM C1583, EN 1542, and related international standards
- Quality assurance departments: production-lot and incoming inspection pull-out strength sampling



Standards

The ToronFT™ FR-CB supports bond strength pull-out testing in compliance with internationally recognized construction and fire protection material standards, including:

- ASTM C1583: Standard test method for tensile strength of concrete surfaces and the bond strength or tensile strength of concrete repair and overlay materials by direct tension (pull-off method)
- EN 1542: Products and systems for the protection and repair of concrete structures — Test methods: Measurement of bond strength by pull-off
- ISO 4624: Paints and varnishes — Pull-off test for adhesion
- EN 13501-1: Fire classification of construction products and building elements (fire retardant coating reference)
- ASTM E736: Standard test method for cohesion/adhesion of sprayed fire-resistive materials applied to structural members

FEATURES

Fire Retardant Coating Bond Strength Tester — ToronFT™ FR-CB Key Features

- Maximum pulling force: 0–1000 kg — sufficient for the full range of fire retardant coating and construction adhesive bond strengths
- Load resolution: 1 N (minimum indication value) — high-resolution force data for precise bond strength characterization
- Load measurement accuracy: within $\pm 1\%$ of the indicated value — traceable, standard-compliant force measurement
- Dual pull mode: uniform displacement (0.2–500 mm/min crosshead speed) and uniform force (5–1000 N/S loading rate) — matching any standard-specified test protocol
- Specimen base dimensions — coating: 70 mm × 70 mm; ceramic tile adhesive: 400 mm × 400 mm; intermediate: 200 mm × 400 mm

- Maximum test piece thickness: 70 mm — accommodating thick-coat and multi-layer fire retardant coating systems
- Suitable for multi-layer building coatings, interior/exterior wall putty, interface agents, ceramic adhesives, dry-mixed mortars, thermal insulation mortars, and other construction bonding materials

THEORY & METHOD

Theory and Method

The pull-out (pull-off) bond strength test applies a uniform tensile force perpendicular to the coated surface of a substrate specimen until adhesive failure (separation at the coating-substrate interface), cohesive failure (rupture within the coating), or substrate failure occurs. The ToronFT™ FR-CB applies the pulling force through a test dolly bonded to the coating surface, using either uniform displacement control (constant crosshead speed: 0.2–500 mm/min) or uniform force control (constant loading rate: 5–1000 N/S) to match the requirements of the applicable test standard.

The maximum pulling force (1000 kg) and load resolution (1 N) ensure that both weak and high-strength coating systems can be tested with equally precise force data. The load measurement accuracy of $\pm 1\%$ of the indicated value provides traceable, standard-compliant bond strength results. Specimen base specifications accommodate coating specimens (70 mm × 70 mm), ceramic tile adhesive specimens (400 mm × 400 mm), and intermediate geometries (200 mm × 400 mm), covering the full range of standard bond strength test specimen sizes. Maximum test piece thickness is 70 mm.

TECHNICAL SPECIFICATIONS

Fire Retardant Coating Bond Strength Tester — ToronFT™ FR-CB

Technical Specifications

Parameter	Specification
Model	ToronFT™ FR-CB
Maximum Pulling Force	0 - 1000 kg
Load Resolution (Min. Indication)	1 N
Load Measurement Accuracy	Within $\pm 1\%$ of indicated value
Pulling Method	Uniform displacement / Uniform force
Crosshead Speed Range	0.2 mm/min - 500 mm/min
Uniform Force Speed Range	5 N/S - 1000 N/S
Specimen Base — Coating	70 mm × 70 mm
Specimen Base — Ceramic Tile Adhesive	400 mm × 400 mm; 200 mm × 400 mm
Maximum Test Piece Thickness	70 mm



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