

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

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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

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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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