

# Rotating Beam Fatigue Tester

Blockwise Engineering, LLC  
<http://www.blockwise.com>  
(602) 954-7703



The Blockwise Rotating Beam Fatigue Tester Model FTX is used to test wires to failure by rotating the ends of the specimen while it is bent through 180 degrees, causing a once-per-revolution bending stress cycle in the specimen. Unlike competitive machines, the wire is driven from both ends, which eliminates the possibility of induced torque in the wire.

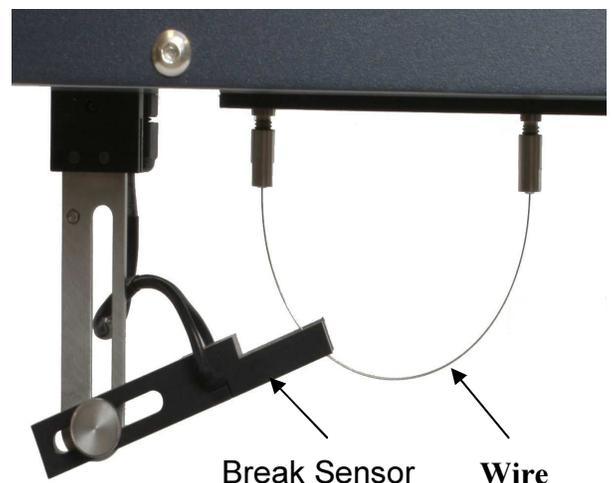
Machine control is executed by a high-speed microcontroller and associated digital servo drive controllers. The user interface displays the cycle count, test RPM, rotation direction, and the distance between the chucks. Test parameters are easily input using the intuitive menu-driven interface.

The FTX is equipped with integral sample break detection. The standard detector is our unique Optical Break Detector, which is capable of reliably detecting a wire break with wire diameters 0.004" and up, in air or clear liquid. Detection of a break event traps the cycle count, automatically stops the motors, and displays a message on the user interface. The sensor is easy to set up, and is supported on a 'swing-away' arm which allows easy access to the spindles for wire change without adjusting the sensor each time.

An optional sensor design based on conduction between two plates is available for applications testing multi-strand cables; this sensor requires that any liquid bath used be of high resistivity. Consult Blockwise for more details.

When testing wires, the stress depends on the wire diameter, wire material properties, the length of wire between the spindles, and the spacing of the spindles. (We can provide references for calculating test parameters.) Spacing can be set in seconds by entering the desired distance into the intuitive interface, after which the spindles will automatically move into position. Unlike competitive machines, there are no belts to readjust when changing the spacing.

Rotation speed and direction are also set through the user interface. The range of speed available is 0 - 10,000 RPM on a standard FTX.



Each spindle is equipped with Blockwise's MCG Microchuck, a spring-loaded self-centering 3-jaw wire holder with precise depth stop.

The FTX system is equipped with an RS485 communications capability, which allows the user to collect data on various operating parameters and conditions.

**Optional Features and Accessories**

- A high-speed model (25,000 max RPM) is available for extremely quick test times.
- Water Bath with recirculation and temperature control (heating only). (See picture below.)
- Close spacing adapter, which reduces the minimum spindle center-to-center distance to 9 mm.
- V-style conduction break sensor for testing multi-strand wire cables
- Micro-Collets in place of the Microchucks (grip range of 0.020" to 0.100" sample diameter).
- Tester Arrays (multiple FTX on a common support bench, common water tray, single-point utility connections, etc.) Compact systems for efficient floor space utilization.
- F400 Data Logging System. Event-based data logger capable of collecting test information directly from multiple FTX units. Simplifies test data management. Includes laptop, interface cable, and software.

**Specifications:**

Drive Type	Direct drive high-speed servo-motors
Wire Diameter Capacity (standard Microchucks)	0.005 inch to 0.035 inch (0.13mm - 0.9 mm)
Wire Diameter Capacity (optional MicroCollets)	0.020 inch to 0.100 inch (0.5 mm - 2,54 mm)
Shaft Speed (Standard Model)	1 to 10,000 RPM
Shaft Speed (High-Speed Model)	1 to 25,000 RPM
Shaft Speed Accuracy (all speeds)	Better than 0.002%
Shaft Direction	User Selectable: Forward, Reverse, Alternating at programmed count
Shaft Spacing Adjustment Range (standard unit)	0.8 inch to 5.5 inch (20.5mm – 140mm)
Shaft Spacing Adjustment Range (close spacing adapter)	0.35 inch to 5.05 inch (9.0mm - 128mm)
Shaft Spacing Accuracy	±0.001 inch (.025 mm)
Service Connections - FTX Tester	110 to 240 VAC, 1.4 A electric power
Service Connections - Water Bath Option	110 or 240 VAC, 11 A
Dimensions (standard Unit)	7.5w x 19d x 16h inches (190 x 482 x 406 mm)
Weight (Standard Unit)	30 lb. (13.6 Kg)

Model FTX Rotary Fatigue Tester - shown with Optional Temperature-Controlled Water Bath



**Model G10 Bench Assembly**  
**10 FTX with common bath, water management system**