



TORONTECH

METAL WIRE REVERSE BEND TESTING MACHINE TORONWRBT™-10Z



Metal Wire Reverse Bend Testing Machine ToronWRBT™ is designed for reverse bend testing of metal wire, evaluating its plastic deformation behavior and identifying defects during the bending process. It complies with ISO 7801 standards: Metallic Materials – Wire – Reverse Bend Test.

Metal Wire Reverse Bend Testing Machine is commonly used in the steel and construction industries, as well as in the production of prestressed steel wire, wire rope, and cable.

With additional fixtures, it can also perform bend tests on metal sheets of various specifications.

APPLICATIONS

Structural Characteristics and Working Principle

Metal Wire Reverse Bend Testing Machine ToronWRBT™ is composed of three main components: the main mechanical system, the electrical measurement and control system, and the adjustable sample tension device. It uses a two-stage reduction drive to apply torque and repeatedly bend the sample. A photoelectric switch tracks the number of bends. Once the sample breaks, the machine stops automatically, the swing arm resets, the digital display shows the test results, and the number of bends is recorded automatically.

Main Unit

Metal Wire Reverse Bend Testing Machine ToronWRBT™-10Z uses a motor and a two-stage reducer to apply force, driving a crank-pendulum mechanism. This mechanism moves the pendulum in a repeated swinging motion—clockwise $90^\circ \pm 1^\circ$ and then counterclockwise $90^\circ \pm 1^\circ$. This motion causes the pendulum to drive the test sample through repeated bending, fulfilling the test procedure.

Metal Wire Reverse Bend Testing Machine ToronWRBT™-10Z includes a counting system. Each time the sample bends, a photoelectric switch captures a signal, allowing the system to track the number of bending cycles.

If the swinging rod does not return to the center after the test, pressing the reset button will bring it back to its starting position.

A lever is mounted on the swinging rod, and interchangeable guide sleeves with various inner diameters are fitted to accommodate different sample sizes within the standard range. The lever height is adjustable to meet standard specifications, and appropriate guide sleeves should be selected accordingly.

Below the swinging rod, a clamping device holds the sample. For different sample diameters, matching radius jaws should be installed.

Electrical Measurement and Control System

The electrical measurement and control system is divided into two sections: high-voltage (power) and low-voltage (signal). The high-voltage section controls the motor, while the low-voltage section consists of three signal pathways:

1. **Signal Collection:** A photoelectric switch detects each bending cycle. The signal is shaped into pulses, sent to a decoder, and then displayed and stored on the LCD screen.
2. **Swing Rod Reset:** Another signal from the photoelectric switch triggers the reset function. Upon receiving this signal, the system stops the motor and initiates the rod's return to the center position.
3. **Motor Braking:** The third pathway also receives a signal to stop the motor and activate the braking mechanism, ensuring the swing rod stops precisely in the correct position.

Sample Adjustable Tension Device

The analog tension meter features automatic peak hold and manual release functions. It also allows for sample tension adjustment and real-time force value display.

According to the applicable standard, in the event of a dispute, the tension force (T) should be set to 0.5-2% of the sample’s nominal tensile strength (relative stress value).

TECHNICAL SPECIFICATIONS

Specification	Details
Wire sample diameter	Φ1.2mm - Φ8mm
Wire sample length	≥200mm
Reverse bending angle	90° ±1° (plane bending)
Counting range	1 to 99999
Display	Digital display
Counting method	Automatic record bending times
Bending frequency	≤60/min
Motor power	1.5kW
Voltage	Three-phase, 380V, 50Hz
Overall dimensions	600 × 350 × 670mm
Main unit weight	230kg

Working Conditions

1. At room temperature of 10-40 °C;
2. Horizontal placement on a stable foundation;
3. In a vibration free environment;
4. No Corrosive substance around;
5. No obvious electromagnetic interference;
6. The fluctuation range of the power supply voltage shall not exceed $\pm 10V$ of the rated voltage 380V, and a ground wire must be connected;
7. There should be a certain operating space left around the testing machine.

Main Configuration

1. Main unit one set;
2. Tension device one set;
3. Jaws, Guide sleeve one for each; (on-demand configuration, options are as follows)

Wire Jaw Reverse Bend Test - Technical Specifications

Circular metal wire nominal diameter d	Cylindrical roller radius r	Distance L	Leverhole diameter d_g^a
$0.3 \leq d < 0.5$	1.25 ± 0.05	15	2.0
$0.5 \leq d < 0.7$	1.75 ± 0.05	15	2.0
$0.7 \leq d < 1.0$	2.5 ± 0.1	15	2.0
$1.0 \leq d < 1.5$	3.75 ± 0.1	20	2.0
$1.5 \leq d < 2.0$	5.0 ± 0.1	20	2.0 & 2.5

Circular metal wire nominal diameter d	Cylindrical roller radius r	Distance L	Leverhole diameter d _g ^a
2.0 ≤ d < 3.0	7.5 ± 0.1	25	2.5 & 3.5
3.0 ≤ d < 4.0	10.0 ± 0.1	35	3.5 & 4.5
4.0 ≤ d < 6.0	15.0 ± 0.1	50	4.5 & 7.0
6.0 ≤ d < 8.0	20.0 ± 0.1	75	7.0 & 9.0
8.0 ≤ d ≤ 10.0	25.0 ± 0.1	100	9.0 & 11.0



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