

# **PENDULUM IMPACT TESTER**



The 50 Joule Pendulum Impact Tester is a high-precision instrument engineered to evaluate the toughness and impact resistance of various materials, including metals and polymers. Designed to meet international standards such as **ASTM E23** and **ISO 148**, this tester provides accurate measurements of material behavior under impact loading, making it an indispensable tool for materials testing laboratories, research institutions, and quality control departments.



**VTR-11-0050**



# 50 Joule Pendulum Impact Tester

## Advanced Precision for Material Impact Testing

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### Innovative Design and Superior

One of the standout features of the Pendulum Impact Tester is its ability to automatically identify the pendulum in use. This ensures that measured values are always determined in the correct range and in accordance with the relevant standards, eliminating the risk of erroneous measurements. Each pendulum carries electronically readable coding, including data such as standard type, energy capacity, starting angle, and other physical parameters. The instrument also stores data on air and bearing friction, further enhancing measurement accuracy.

A world-first innovation is the use of carbon double rods for the pendulum. High-performance carbon materials provide significantly greater pendulum stiffness and an ideal distribution of mass, concentrating it at the point of impact. This results in repeatable and reproducible test results with low natural vibrations. The high ratio of instrument mass to pendulum mass allows testing in a measurement range up to 80% of potential energy, ensuring precise and reliable data.

### User-Friendly Operation and Ergonomic Design

Operator convenience is a prominent aspect of the design. Controls are easy to reach and are positioned at a uniform height to minimize user fatigue. The pendulum can be easily changed using a quick-release lock without the need for additional tools, simplifying operation and saving time. Fixtures can be swapped quickly by slightly loosening the retaining bolts, withdrawing the fixture from the guides, and sliding in a new one. Limit stops ensure reliable positioning, and specimen disposal is facilitated by an integrated collecting tray.

The tester features an intuitive touch screen interface complemented by physical buttons for essential functions such as raising and lowering the pendulum hammer and initiating tests. All test-related settings are logically grouped and separated from higher-level system settings, guiding the operator through the test configuration step by step. Integrated user management reduces the number of input options to a minimum, allowing users to focus on the task at hand.

### Advanced Safety Features

Safety is a paramount consideration in the design of the Pendulum Impact Tester. The tester includes a protective enclosure that shields the operator from moving parts and potential debris. During Charpy tests, a safety guard on the fixture ensures that specimen fragments remain within the tester. The swiveling safety housing allows optimum access during Izod tests while maintaining protection.

An electrically interlocked safety device eliminates air supply during a test and provides maximum protection from shattering specimens. The tester is equipped with emergency stop buttons that immediately halt the moving hammer mechanism when activated.

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### Versatility and Adaptability for Various Testing Methods

The electronics of the tester contain a high-resolution digital encoder for accurate measurement of the impact angle, with a precision of 0.01 degrees. Freely selectable starting angles enable optimum test parameters, such as impact speed and energy loss at impact. After the test, the pendulum is automatically caught and returned to its initial position by a motor, enhancing efficiency.

All test data is automatically saved within the software, facilitating easy retrieval, analysis, and reporting. The system supports exporting data in various formats for integration with external analysis tools or laboratory information management systems (LIMS). A USB interface is available for connection to laboratory data-management systems, and a PC can be connected via a USB plug-and-play interface. Regular software updates ensure that the system stays current with the latest testing standards and functionalities.

### Versatility and Adaptability for Various Testing Methods

The Pendulum Impact Tester is built with a massive support frame and stable base to guarantee maximum stiffness and reliable test results regardless of local conditions. The welded table frame and wide-based leveling feet provide firm, stable support. The base plate is constructed with vibration-damping metal casting, and the ratio of its mass to the pendulum mass complies with standard requirements. Three sturdy, lockable leveling feet enable horizontal alignment of the instrument.

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### Testing at Low Temperatures

Understanding that impact strength is critical at low temperatures, the tester offers optional equipment for quick testing under such conditions. A temperature-conditioning box and magazine allow specimens to be cooled and then quickly attached to the specimen feeder on the tester. This enables specimens to be removed and tested promptly, maintaining the desired low temperature during impact testing.

### Compliance with International Standards

The Pendulum Impact Tester complies with major international standards for impact testing, including:

- \* Charpy tests: ISO 179, ASTM D6110
- \* Izod tests: ISO 180, ASTM D256, ASTM D4812
- \* Tensile impact tests: ISO 8256 Methods A and B, ASTM D1822
- \* Dynstat bending impact tests: DIN 53435

This compliance ensures that results are globally recognized and accepted, making the tester suitable for research and quality control across various industries.

### Key Advantages

**Quick-Change Pendulum and Fixtures:** Allows for rapid tool-less changes between different tests and pendulum capacities.

**Virtually Wear-Free Disc Brake:** Enhances the longevity and reliability of the braking system.

**Ergonomic Design:** Easy-to-reach controls and uniform operational heights reduce user fatigue.

**High-Resolution Encoder:** Delivers precise impact angle measurements for accurate calculations.

**Flexible Operation:** Can be used with or without a PC, allowing operators to move seamlessly between the instrument and computer interfaces.

**Reliable Test Results:** Low natural vibrations and optimal mass distribution lead to repeatable, reproducible results.

**Safety Features:** Protective enclosures, interlocked safety devices, and emergency stops ensure operator safety during all testing procedures.

### Conclusion

The 50 Joule Pendulum Impact Tester represents the pinnacle of impact testing technology, combining precision engineering with user-friendly operation and advanced safety features. Its versatility in accommodating different test methods, quick adaptability, and compliance with international standards make it an invaluable asset for any materials testing laboratory. Whether for research, quality control, or material development, this tester provides the tools necessary to accurately assess material toughness and impact resistance, contributing to advancements in material science and engineering.

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### Versatility and Adaptability for Various Testing Methods

The Pendulum Impact Tester is designed with a modular approach, accommodating multiple jaws and anvils that can be easily exchanged to perform Charpy, Izod, and tensile impact tests. The quick-change adapter plates and precision guides guarantee a continuous positive fit to the baseplate, allowing for rapid configuration changes between different test methods.

For Charpy tests (ISO 179, ASTM D6110), the tester uses heavy cast base fixtures with precision CNC-machined anvils that are 100% dimensionally accurate. An optional swiveling protective shield and positioning aids enhance safety and specimen alignment.

In Izod testing (ISO 180, ASTM D256, ASTM D4812), the tester offers both manual and pneumatic fixtures. The manual fixture allows sensitive clamping of soft and hard samples via a fine-threaded lead screw, while the pneumatic fixture enables quick testing with high reproducibility due to the constant gripping force. Both fixtures include a centering unit to ensure specimens are always positioned at the notch root level.

For tensile impact tests (ISO 8256 Methods A and B, ASTM D1822), the specimen and yoke are aligned in a jig and clamped together. Depending on the method, the specimen plus yoke are clamped in either the pendulum or tensile impact fixture. Yokes of various masses are available, and appropriate templates are used to set up for different specimen types.

# TECHNICAL SPECIFICATION

<b>Encoder Type</b>	High-resolution digital encoder
<b>Data Storage Capacity</b>	Up to 10,000 test records
<b>Password Management</b>	Up to 8 user passwords
<b>Test Methods Supported</b>	Charpy, Izod, Tensile impact, Dynstat bending impact
<b>Specimen Types</b>	Metals, Polymers
<b>Specimen Sizes</b>	Adjustable lower bracket for different sizes
<b>Interchangeable Jaws and Anvils</b>	Yes; quick-change adapter plates
<b>Dual Testing Capability</b>	Yes; Charpy and Izod without additional equipment
<b>Interface</b>	Touch screen and physical buttons
<b>Real-Time Monitoring</b>	Displays hammer position and potential energy
<b>Automatic Hammer Return</b>	Yes; motorized system
<b>Emergency Stop Functionality</b>	Yes; emergency stop buttons
<b>Lid Sensor Mechanism</b>	Yes; automatic braking when lid is opened
<b>Password Protection</b>	Yes; required before control access
<b>Operation Modes</b>	Test mode and manual mode
<b>Protective Enclosure</b>	Yes; shields operator from moving parts
<b>Safety Interlocks</b>	Operation restricted unless safety conditions met
<b>Grounding Requirements</b>	Proper grounding with resistance $\leq 1.5$ ohms
<b>Protective Covers</b>	Side and front covers with secure screws
<b>Data Export Options</b>	Supports various formats
<b>Connectivity</b>	USB Type-B port
<b>Device Dimensions (W x D x H)</b>	<b>121cm x 71cm x 107cm (desktop 170cm)</b>
<b>Device Weight</b>	<b>200kg</b>
<b>Leveling Feet</b>	Three sturdy, lockable feet
<b>Voltage Requirement</b>	220 V AC ( $\pm 5\%$ )
<b>Included Accessories</b>	Pendulum (capacity specified), Sample centering table (V), Security cabinet
<b>Optional Accessories</b>	Anvils and pendulums for various tests, Temperature chamber for impact samples, Notching device, Mounting table